Audi A6 (type 4A)

Self-study programme 670

For internal use only

Audi Service Training

The new Audi A6 (type 4A) is an impressive mix of elegance, high quality and advanced technology. The vehicle is even more comfortable, convenient and efficient than its predecessor thanks to the use of Mild Hybrid Electric Vehicle (MHEV) technology. All the connect services used in the Audi A8 (type 4N) and the Audi A7 (type 4K) are included in the Audi A6 (type 4A) to make it into a fully networked vehicle. The Audi A6 (type 4A)'s driver assist systems aren't lagging behind its big sisters either. With its numerous driver assist systems, the Audi A6 (type 4A) is a safe and helpful companion on the road.

In the interior, the Audi A6 (type 4A) has increased legroom and shoulder space. With its dynamic four-wheel steering system, the Audi A6 (type 4A) is as agile as a sports car and as versatile as a compact car. For the engines, Audi is using the V6 power units from the Audi A8 (type 4N). In addition, a newly developed 4-cylinder TDI engine serves as the entry level engine for the Audi A6 (type 4A). All in all, a sporty exterior and a progressive interior featuring different equipment versions with something to suit every customer.

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Learning objectives of this self-study programme:

This self-study programme describes the design and function of the Audi A6 (type 4A). Once you have completed this self-study programme you will be able to answer questions on the following topics:

- Engines available at market launch
- 12/48 Volt electrical system
- New running gear features
- New power transmission features
- New features of the infotainment systems

This self-study programme teaches a basic knowledge of the design and functions of new models, new vehicle components or new technologies.
It is not a Workshop Manual. Any figures given here are for explanatory purposes only and refer to the data valid at the time of writing.
Content is not updated.
It is essential that you refer to the latest technical literature when carrying out maintenance and repair work.

Note

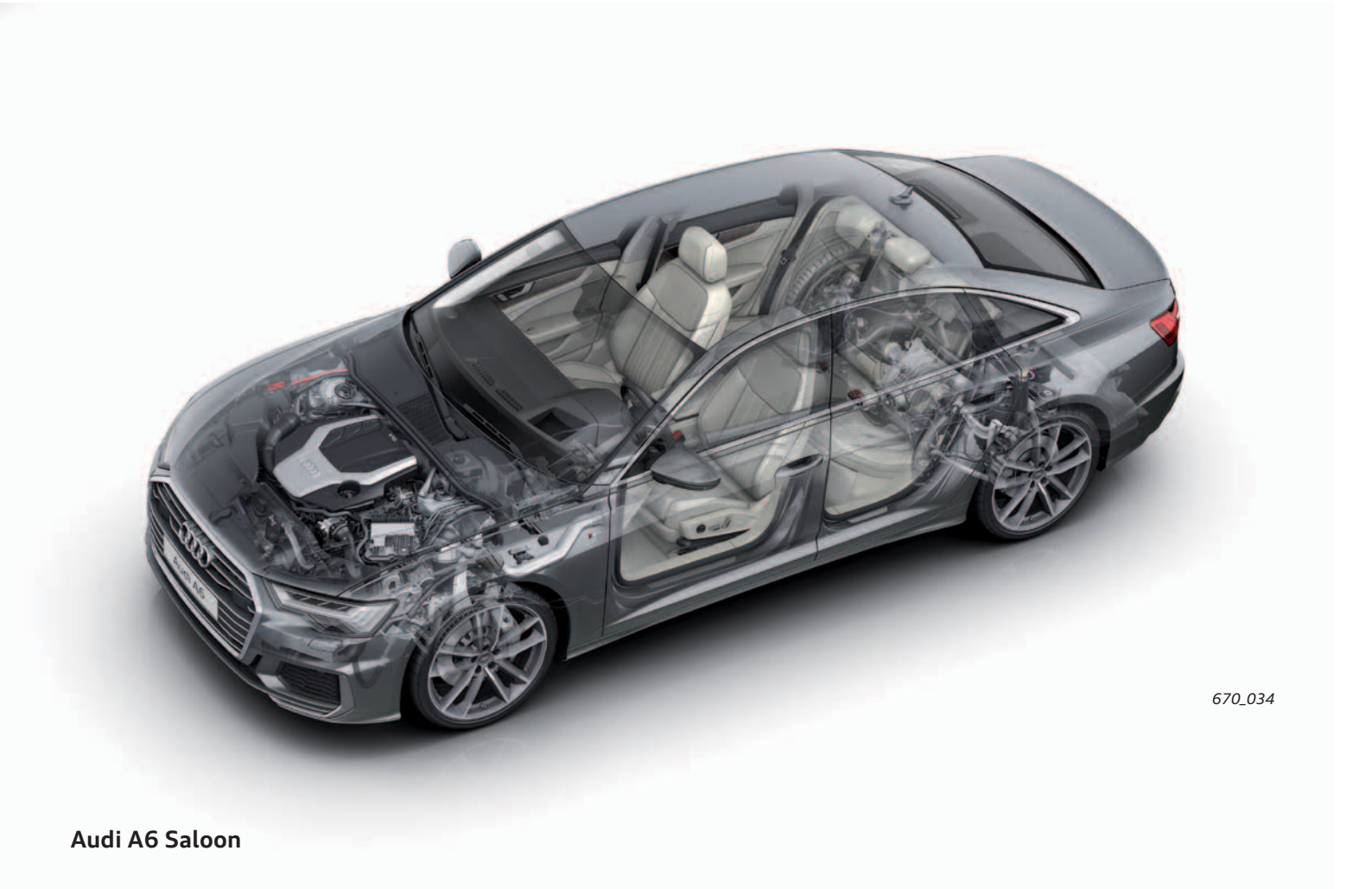
Reference

Contents

Introduction

Presentation

The Audi A6 (type 4A) completes the C8 product line. This self-study programme deals with the differences to the Audi A7 (type 4K) and the Audi A8 (type 4N) and the new features on the Audi A6 (type 4A). For further information, please refer to the self-study programmes 662, 663, 664, 665, 666, 668 and 669.



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Audi A6 Saloon

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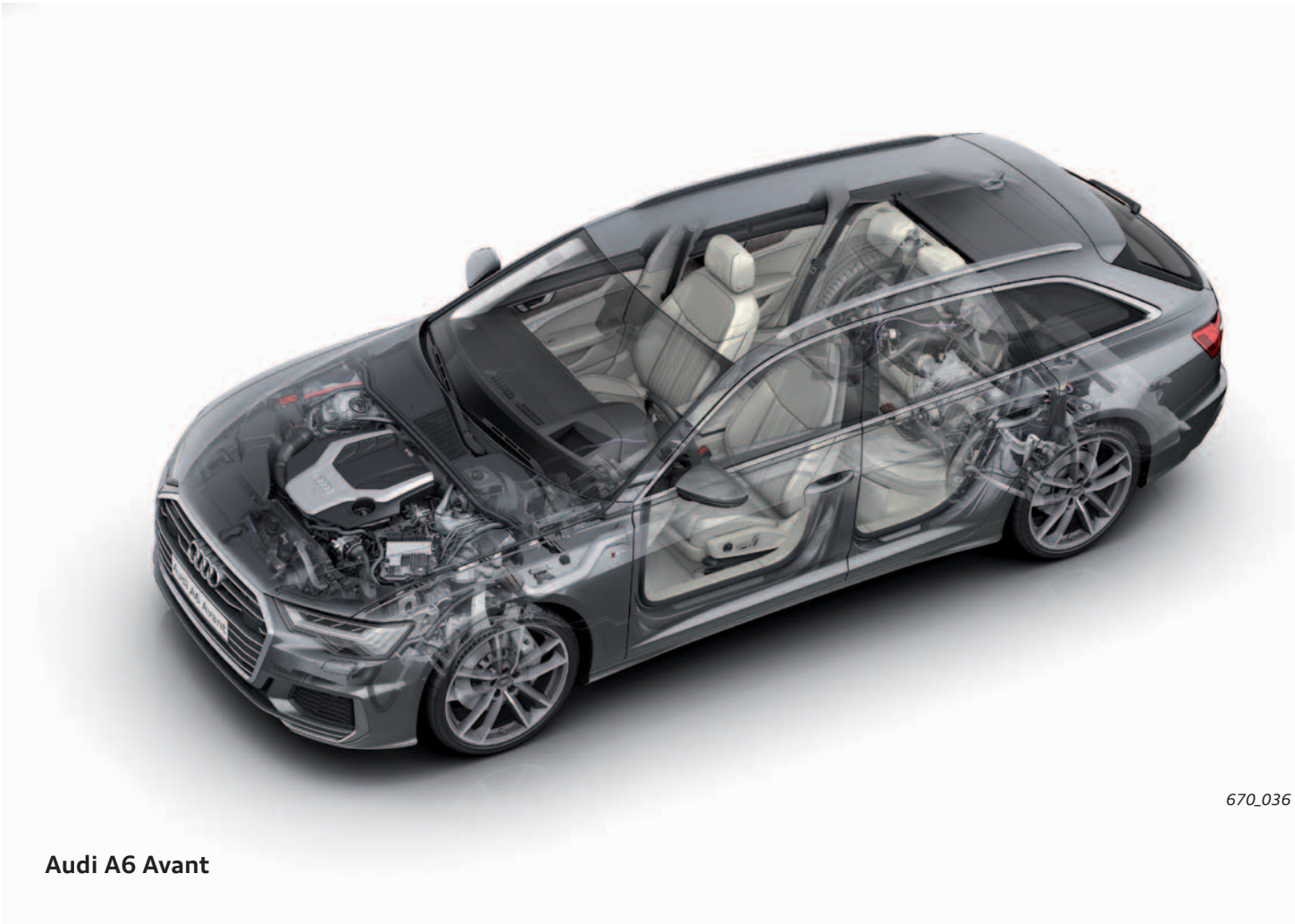
Audi A7 Sportback



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Audi A6 Avant

Dimensions

Audi A6 Saloon

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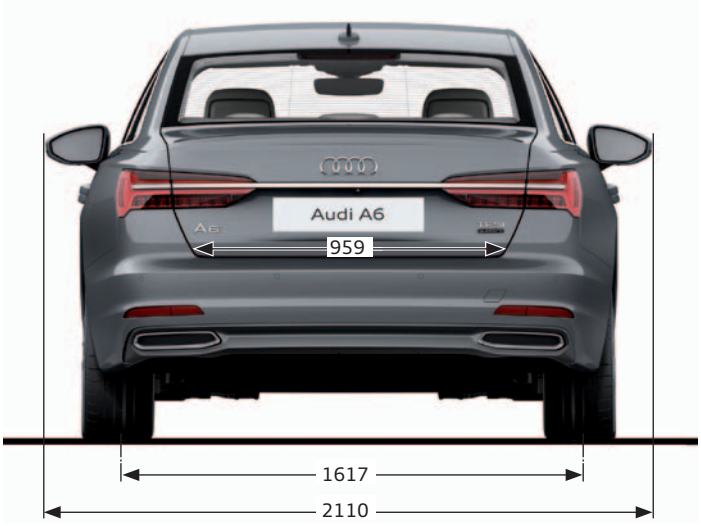

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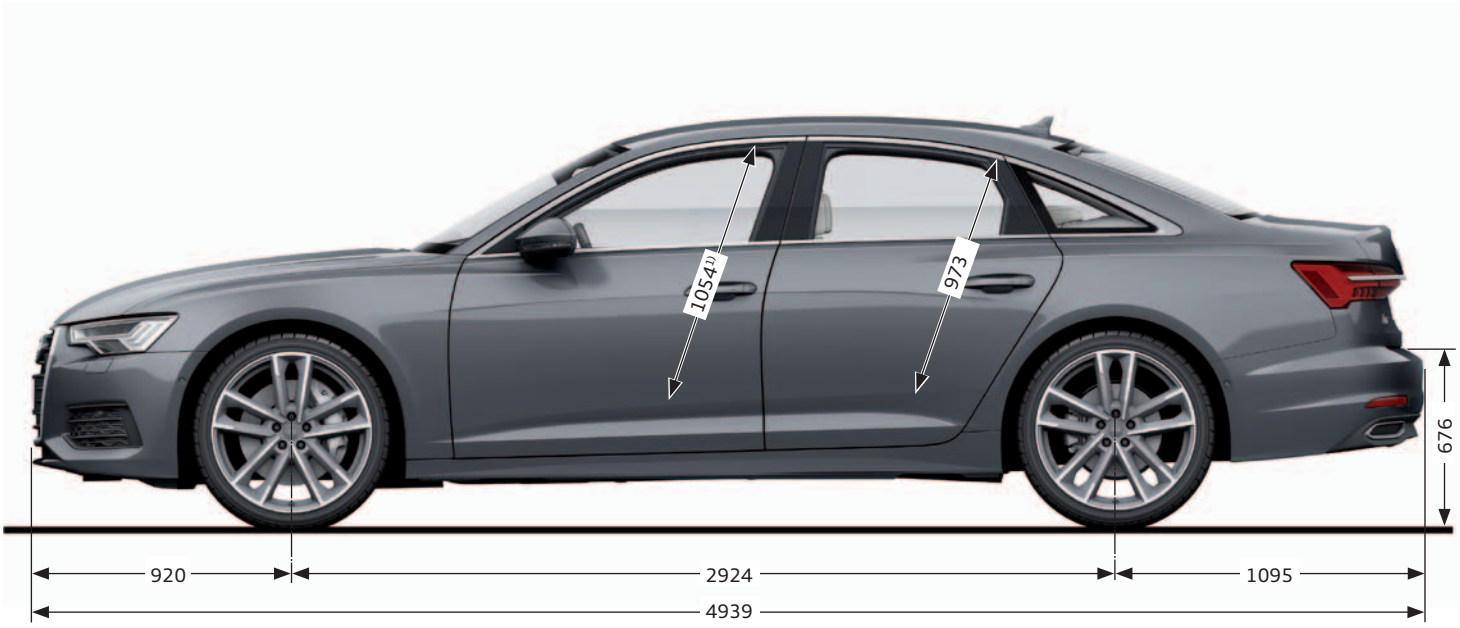

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670_006

Exterior dimensions and weights

Length in mm	4939
Width (not incl. mirrors) in mm	1886
Width (incl. mirrors) in mm	2110
Height in mm	1457
Front track in mm	1630
Rear track in mm	1617
Wheelbase in mm	2924
Unladen weight in kg	1825
Max. gross weight in kg	2475

Interior dimensions and other specifications

Front cabin width in mm	1527²⁾
Front shoulder width in mm	1467³⁾
Rear cabin width in mm	1501²⁾
Rear shoulder width in mm	1436³⁾
Load sill height in mm	676
Luggage compartment capacity in ltr.	530
Drag coefficient cw	0.24
Capacity of fuel tank in ltr.	63/73⁴⁾

[1] Maximum headroom
[2] Elbow room width
[3] Shoulder room width
[4] Optional

All dimensions are given in millimetres and refer to the unladen weight of the vehicle.

Audi A6 Avant

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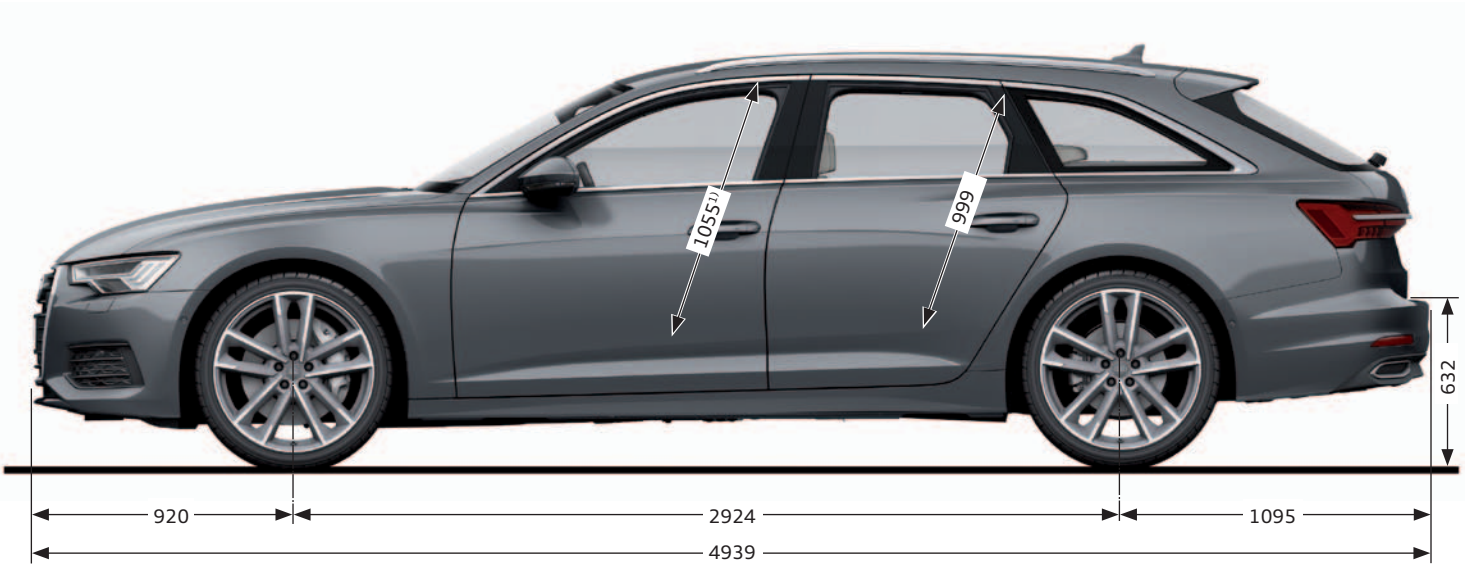
670_008



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Exterior dimensions and weights

Length in mm	4939
Width (not incl. mirrors) in mm	1886
Width (incl. mirrors) in mm	2110
Height in mm	1467
Front track in mm	1630
Rear track in mm	1617
Wheelbase in mm	2924
Unladen weight in kg[6)]	–
Max. gross weight in kg[6)]	–

Interior dimensions and other specifications

Front cabin width in mm	1527[2)]
Front shoulder width in mm	1467[3)]
Rear cabin width in mm	1501[2)]
Rear shoulder width in mm	1436[3)]
Load sill height in mm	632
Luggage compartment capacity in ltr.	565/1680[4)]
Drag coefficient cw[6)]	–
Capacity of fuel tank in ltr.	63/73[5)]

[1)] Maximum headroom
[2)] Elbow room width
[3)] Shoulder room width
[4)] With rear backrest folded down
[5)] Optional
[6)] Data were unavailable at time of publication.

All dimensions are given in millimetres and refer to the unladen weight of the vehicle.

Body

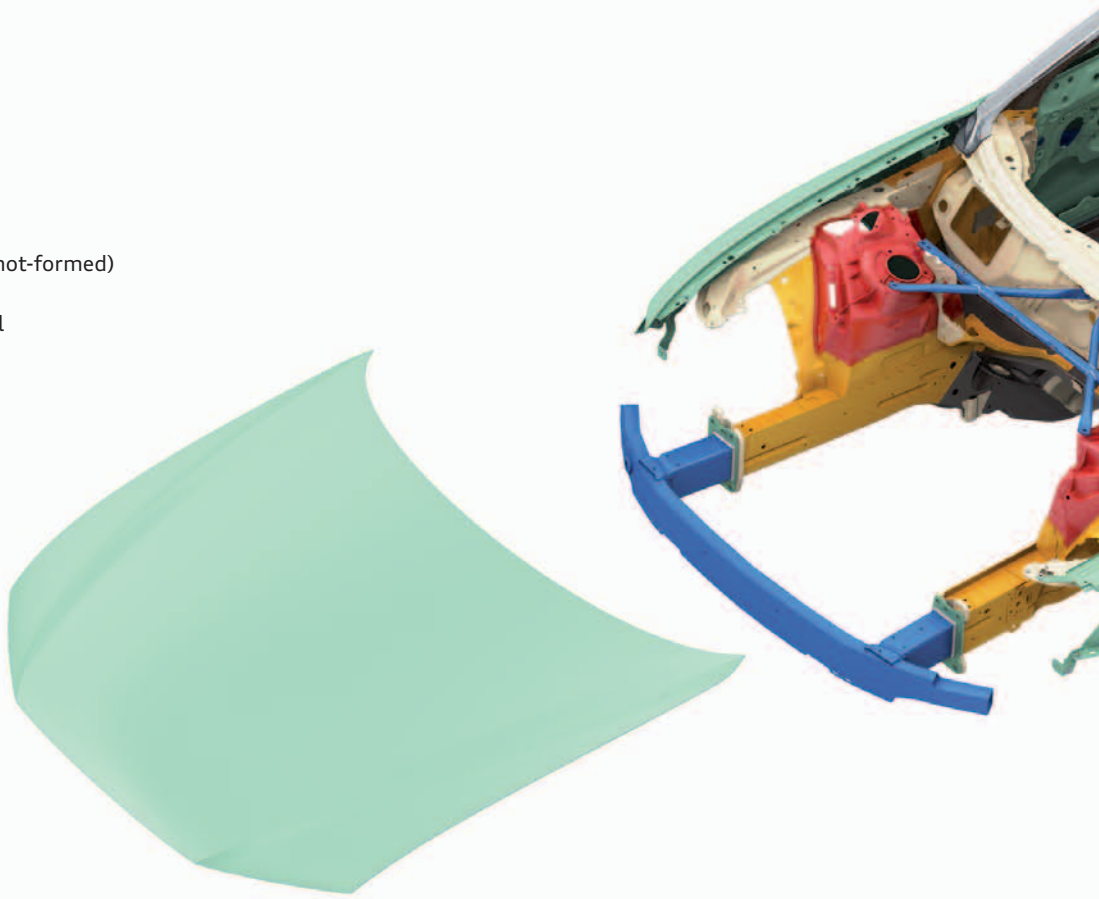
Introduction

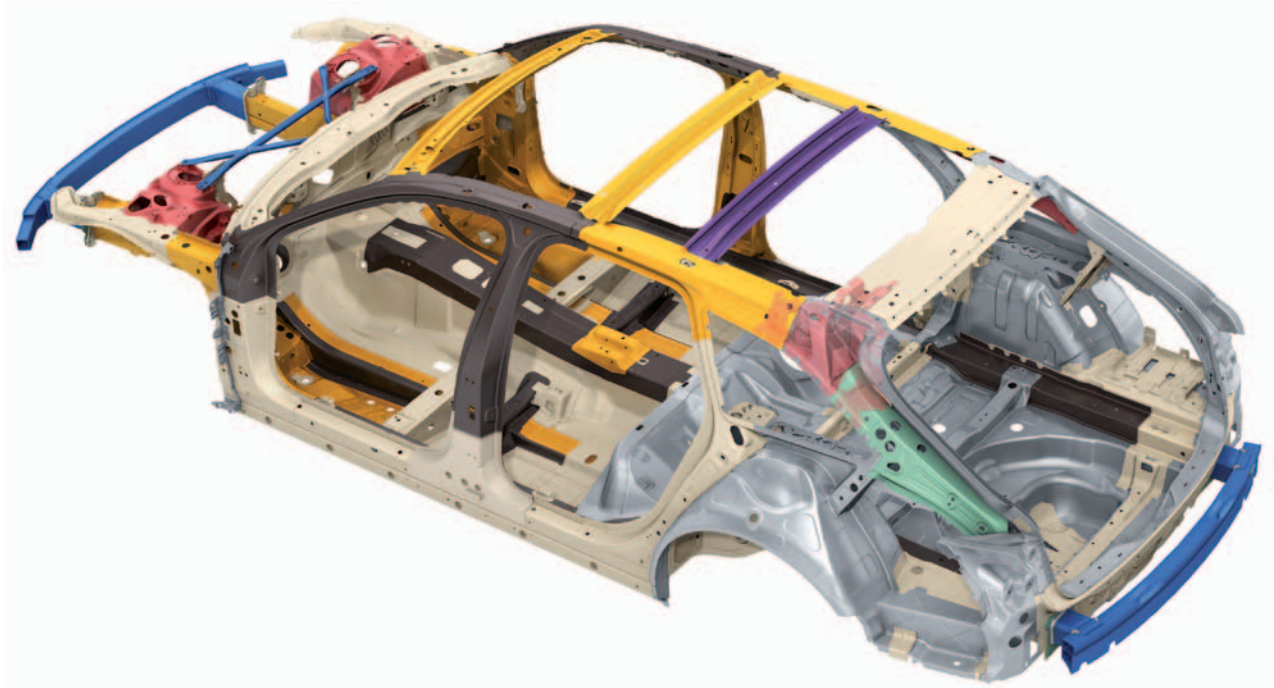
As with their predecessors, the bodies of the Audi A6 and Audi A6 Avant (type 4A) are a composite construction using various materials. Their composition and structure largely corresponds to the Audi A7 (type 4K).

On the Audi A6 Saloon, the rear roof cross member, the connection to the side roof frame and the D-pillar are fully manufactured from steel.
In addition, the Audi A6 Avant uses a roof cross member made of a composite steel/plastic material in the area of the C-pillars. There is also an aluminium reinforcement plate in the D-pillar extension. The rear shelf on the Audi A6 Saloon is also made of sheet aluminium.

Key:

- Sheet aluminium
- Die-cast aluminium
- Aluminium section
- Ultra-high-strength steel (hot-formed)
- Modern high-strength steel
- High-strength steel
- Soft steel
- Composite steel/plastic





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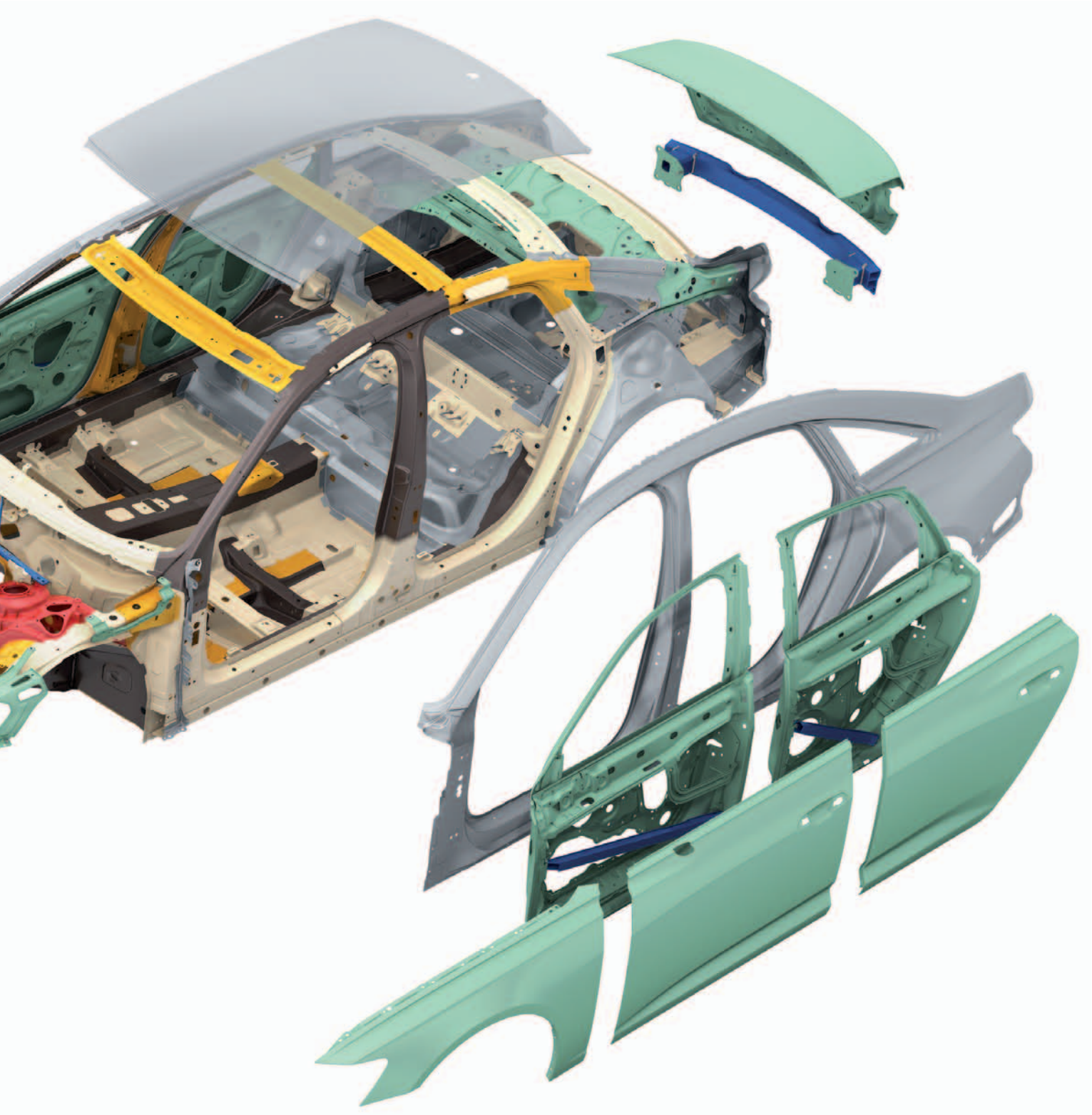

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Reference
For further information on the construction and structure of the body, please refer to self-study programme 669 (Audi A7 type 4K).

Body assembly

On the topic of body assembly, it is also very clear that the Audi A6 (type 4A) is related to the Audi A7 (type 4K). For example, the Audi A6 (type 4A) also has semi-electric door locks. The construction of its dash panel is also practically identical to the one in the Audi A7 (type 4K).

Seats

The same four different versions of front seat as in the Audi A7 (type 4K) are also available for the Audi A6 (type 4A):
The standard seat, the convenience seat, the sports seat with contoured side bolsters in both the backrest and the seat bench and, at a later date, the super sports seat with integrated head restraint. The Audi A6 (type 4A)'s rear seats vary from the Audi A7 (type 4K) and the Saloon and Avant versions also vary.
While the Avant is only available with a folding rear backrest, the Saloon may have either a fixed or a folding rear backrest. On the Avant, the folding backrest is either released from the luggage compartment via handles and Bowden cables or directly at the backrest itself. The two connector points linking the Bowden cables in the luggage compartment to the Bowden cables in the backrest frame are under the rear seat bench.
The Audi A6 Saloon's backrest can only be released directly at the backrest itself in the vehicle interior. On the Saloon, the backrest can be locked with the vehicle key so that the luggage compartment cannot be accessed from the vehicle interior.

A6 Saloon (standard): fixed rear seat backrest

A6 Saloon (optional): folding and lockable rear seat backrest

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A6 Avant: folding rear seat backrest with remote release function

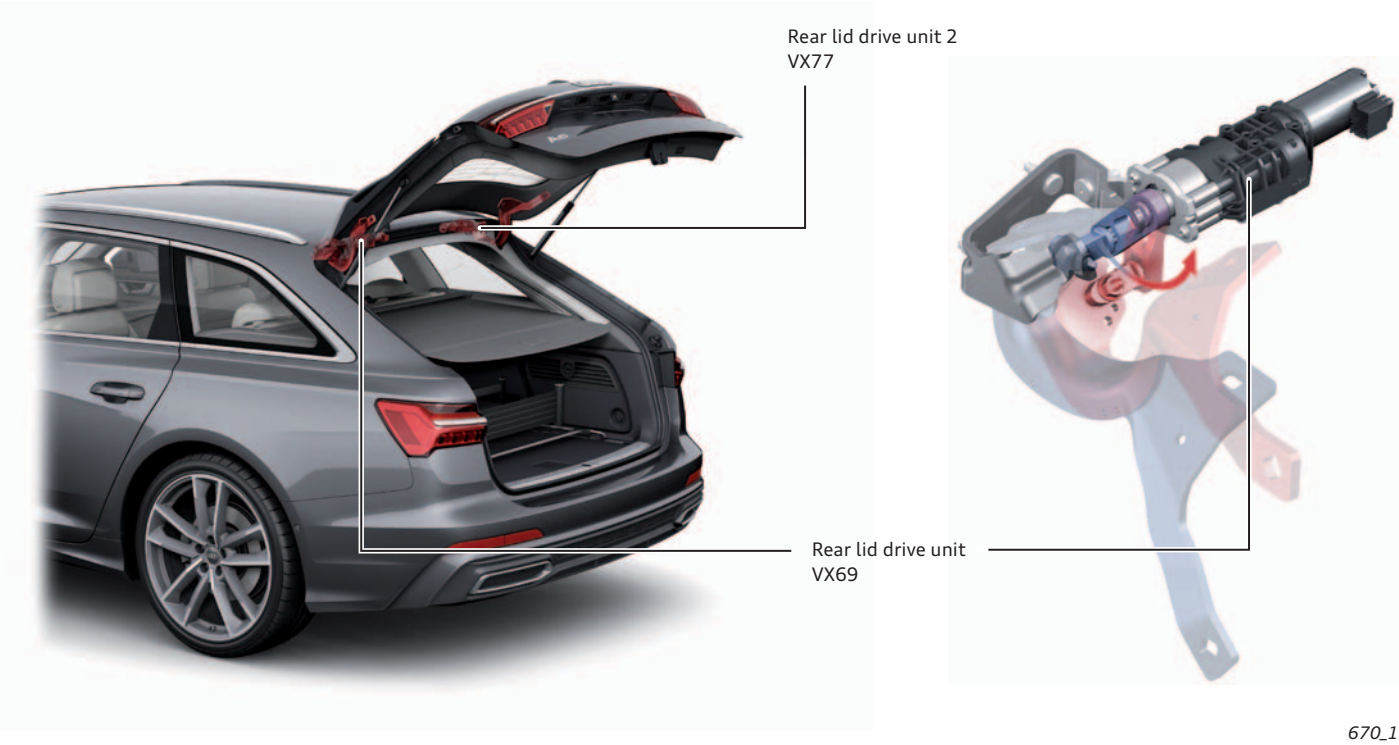
Rear lid

The main exterior differences between the Saloon and the Avant are also largely at the rear of the Audi A6.
The large rear lid on the Avant opens and closes electrically via rear lid drive unit VX69 and rear lid drive unit 2 VX77. These components engage directly on the rear lid hinge. The motors in both drive units are actuated by rear lid control unit J605. Two Hall senders in the left drive unit VX69 provide feedback to the rear lid control unit J605 on whether the rotor is turning, at what speed and how many rotations. The rear lid control unit J605 uses this information to actuate the motor in the right drive unit VX77 at the same time.

When removing and installing the drive units, it is important to observe the sequence in which the connectors are unplugged and plugged back in again.

- The connector on the left drive unit must be unplugged before the connector for the right drive unit.
- When the connectors are being plugged back in, the right drive unit must be connected prior to the left unit.

This prevents motor 1 for rear lid V444 in rear lid drive unit VX69 from starting to operate automatically when rear lid movement is detected by the Hall senders.



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There are two rear lid versions for the Saloon. The manual rear lid is opened via two mechanical extension springs. A hydraulic damper (left-side) is fitted with the sole task of reducing the speed of opening in the last 45° of the opening procedure.

The Saloon can also be fitted with an electric rear lid as optional equipment. With this system, motor 1 for rear lid V444 moves the left rear lid hinge via a spindle drive. An extension spring on the right hinge supports this process. However, the locations at which this spring is engaged in the rear of the body vary depending on the version.

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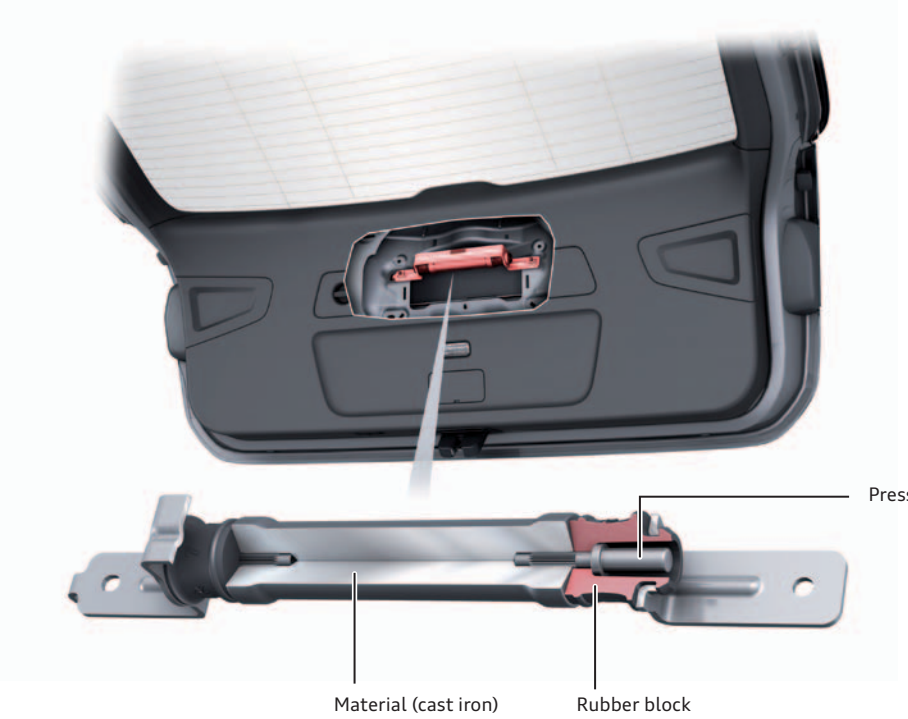
Damper weight

The road and the drive train cause vibrations when the vehicle is moving. These are transmitted to the rear lid via the individual assembly groups (wheels, axles, subframe), the body structure and the rear of the vehicle. Because of their position and size, the rear lid on Q models or Avant vehicles then acts like a loudspeaker membrane. This can cause a distracting droning sound in the vehicle interior. Various factors such as wheel/tyre combinations and the weight of the equipment at the rear of the vehicle can influence how strongly these vibrations are transmitted. A damper weight is therefore fitted in the rear lid on vehicles with critical equipment combinations. The resonance frequency of this damper weight is precisely diametrically opposed to the rear lid vibration. As a result, the amplitude of the “rear lid membrane” is reduced and the noise level in the vehicle interior goes down. To ensure that it functions correctly, it is important that the damper weight is always secured in the rear lid with the correct tightening torque.



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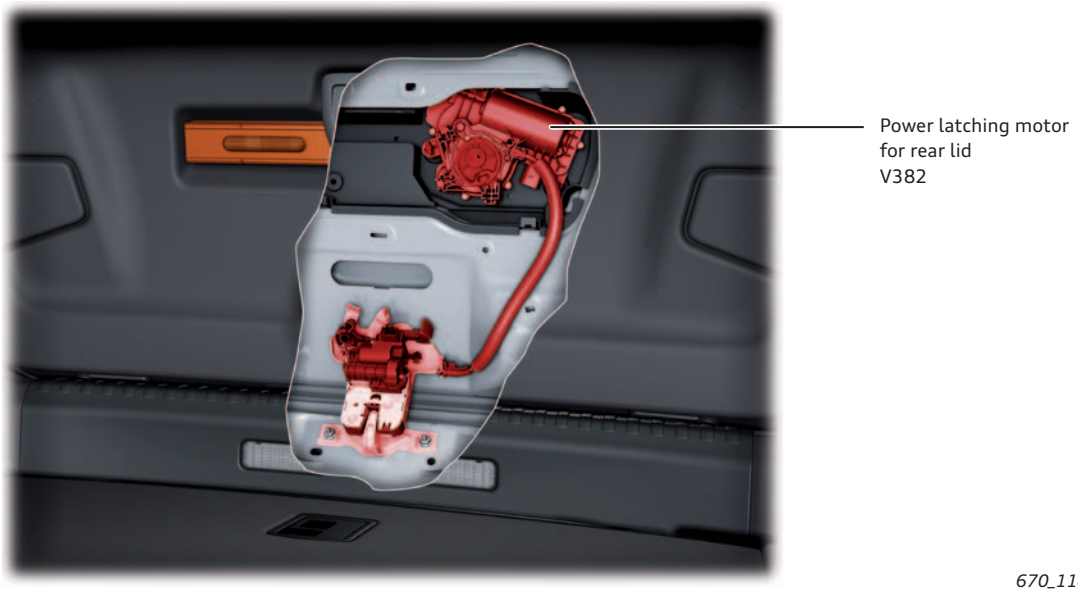
Power latching system

The power latching system for the rear lid has also been integrated into the rear lid lock on the Audi A6 (type 4A). On the previous model, the striker on the lock carrier was moved downwards after the lock was engaged. However, the power latching motor for rear lid V382 now pulls the rotary latch of the rear lid lock into its end position after the initial catch has engaged.



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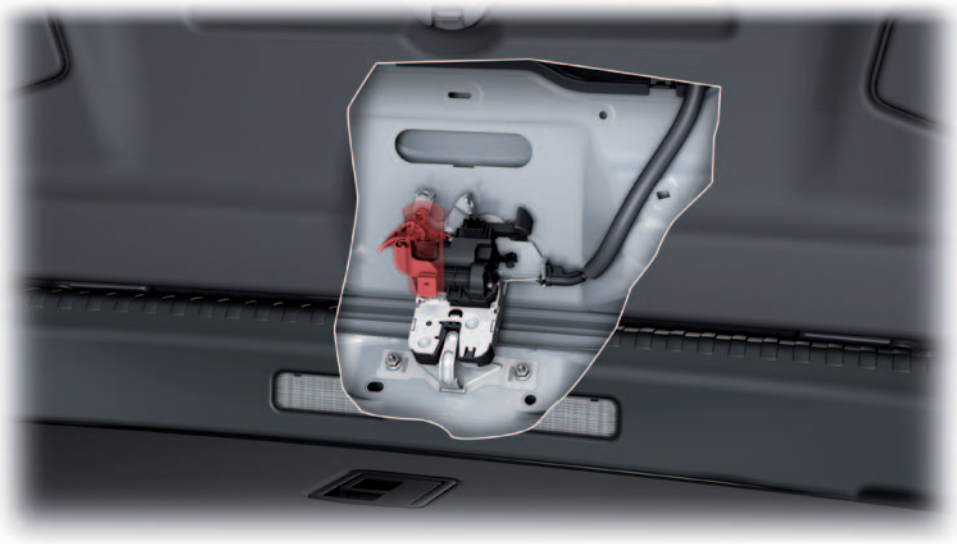
Operation of rear lid lock

The rear lid is usually opened when the rear lid lock is actuated by the convenience system central control unit J393 via the rear lid central locking motor V53. It is possible to release the rear lid manually if this function is not available (e.g. in the event of a fault). There are different ways of doing this:

- On Avant vehicles or Saloon vehicles with folding backrest, the small cover in the rear lid trim in the luggage compartment must be removed and the lever on the lock pressed upwards.
- As it is not possible to access the rear lid trim in the event of a fault on Saloon vehicles with fixed backrest, the lever on the lock can be operated via a Bowden cable which ends under the rear seat bench. To access the eyelet on the Bowden cable, the rear seat bench must be pulled out of its retainers.
- Legal requirements mean that, in some countries, the lever on the lock may be opened via a fluorescent manual release in the rear lid trim. An adapter on the lock transmits the movement of the manual release mechanism to the lever on the lock.



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Rear lid manual release with folding rear seat backrest

Rear lid manual release with fixed rear seat backrest 670_116

Rear lid manual release (country-specific version) 670_117

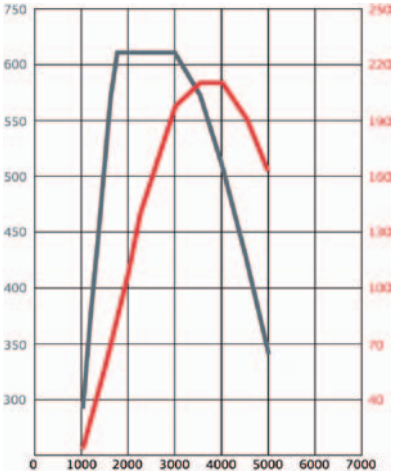
Power units

Diesel engine

Torque/power curve of 3.0 ltr. TDI engine EA897evo2

Engine with code DDVB

Power in kW
Torque in Nm

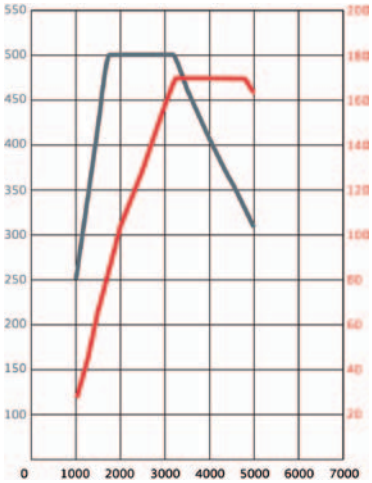


Engine speed [rpm] *670_158*

Torque/power curve of 3.0 ltr. TDI engine EA897evo2

Engine with code DDVE

Power in kW
Torque in Nm

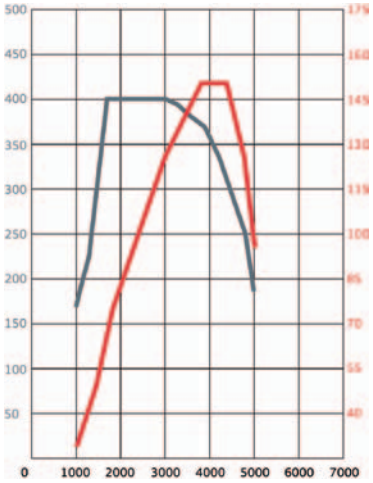


Engine speed [rpm] *670_109*

Torque/power curve of 2.0 ltr. TDI engine EA288evo

Engine with code DFBA

Power in kW
Torque in Nm



Engine speed [rpm] *670_025*

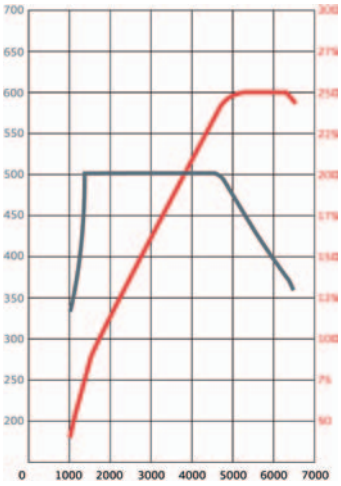
Features	Technical data		
Engine code	DDVB	DDVE	DFBA
Type	V6 engine with 90° V angle	V6 engine with 90° V angle	Four-cylinder in-line engine
Capacity in cm^3	2967	2967	1968
Stroke in mm	91.4	91.4	95.5
Bore in mm	83.0	83.0	81.0
Number of valves per cylinder	4	4	4
Firing order	1-4-3-6-2-5	1-4-3-6-2-5	1–3–4–2
Compression ratio	15.5 : 1	15.5 : 1	15.5 : 1
Power output in kW at rpm	210 at 3500 – 4000	170 at 3250 – 4750	150 at 3800 – 4200
Torque in Nm at rpm	620 at 1750 – 3000	500 at 1750 – 3250	400 at 1750 – 3000
Fuel	Diesel to EN 590	Diesel to EN 590	Diesel to EN 590
Turbocharging	Single turbocharger with variable turbine geometry (VTG) and E-positioner	Single turbocharger with variable turbine geometry (VTG) and E-positioner	Single turbocharger with variable turbine geometry (VTG) and E-positioner
Engine management	Bosch MD1 with OBD	Bosch MD1 with OBD	Bosch MD1 with OBD
Maximum injection pressure in bar	2000	2000	2200
Emission control	NO_x storage catalytic converter with SCR-coated diesel particulate filter	NO_x storage catalytic converter with SCR-coated diesel particulate filter	NO_x storage catalytic converter with SCR-coated diesel particulate filter
Emission standard	EU6 (AG)	EU6 (AG)	EU6 (AG)
Concept	Mild hybrid (48V)	Mild hybrid (48V)	Mild hybrid (12V)

Petrol engine

Torque/power curve of 3.0 ltr. TFSI engine EA839

Engine with code DLZA

Power in kW
Torque in Nm

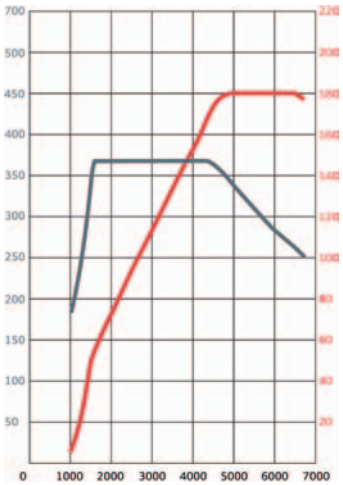


Engine speed [rpm] *670_023*

Torque/power curve of 2.0 ltr. TFSI engine EA888 Gen. 3

Engine with code DLHA

Power in kW
Torque in Nm

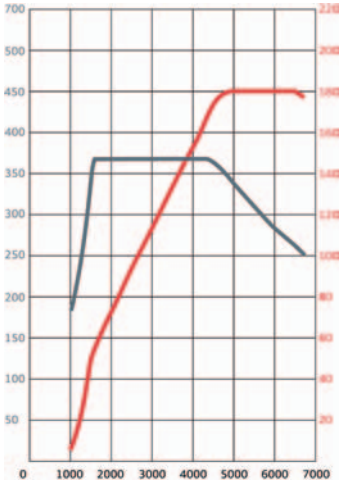


Engine speed [rpm] *670_108*

Torque/power curve 2.0 ltr. TFSI engine Gen. 3

Engine with code DKNA

Power in kW
Torque in Nm



Engine speed [rpm] *670_024*

Features	Technical data		
Engine code	DLZA	DLHA	DKNA
Type	V6 engine with 90° V angle	Four-cylinder in-line engine	Four-cylinder in-line engine
Capacity in cm^3	2995	1984	1984
Stroke in mm	89.0	92.8	92.8
Bore in mm	84.0	82.5	82.5
Number of valves per cylinder	4	4	4
Firing order	1-4-3-6-2-5	1–3–4–2	1–3–4–2
Compression ratio	11.2 : 1	9.6 : 1	9.6 : 1
Power output in kW at rpm	250 at 5200 – 6400	180 at 5000 – 6500	180 at 5000 – 6500
Torque in Nm at rpm	500 at 1370 – 4500	370 at 1600 – 4300	370 at 1600 – 4300
Fuel	Min. 95 ROZ	Min. 95 ROZ	Min. 95 ROZ
Turbocharging	Turbocharger with wastegate	Turbocharger with wastegate	Turbocharger with wastegate
Engine management	Bosch MD1 with OBD	Bosch MD1 with OBD	Bosch MD1 with OBD
Maximum injection pressure in bar	250	250	250
Emission control	One close-coupled catalytic converter, split into main and secondary catalytic converters, Lambda pr. before & after main cat. conv.	Close-coupled ceramic catalytic converters, Lambda probe before and after catalytic converter	Close-coupled ceramic catalytic converters, petrol particulate filter, Lambda probe before and after catalytic converter
Emission standard	EU6 plus/EU4	EU6 ZD/E/F	EU6 BG/H/I
Concept	Mild hybrid (48V)	Mild hybrid (12V)	Mild hybrid (12V), PPF

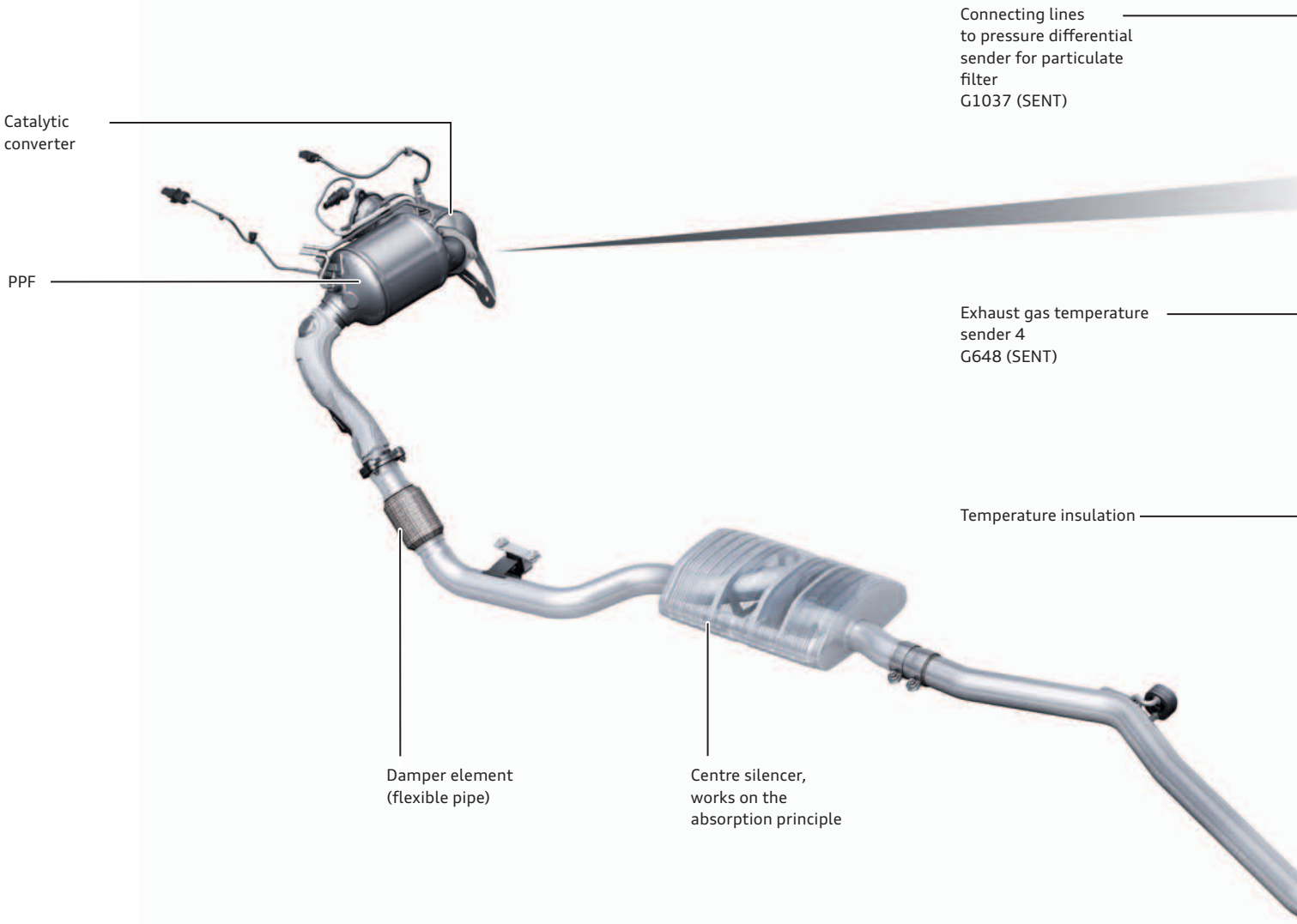
Reference
For further information about the engines used, please refer to SSP 655 "Audi 3.0l V6 TFSI engines of EA839 series", SSP 645 “Audi 2.0l TFSI engines EA888 series” and SSP 656 "Audi 3.0l V6 TDI engine of EA897evo2 series". The construction of the fuel tank and SCR tank corresponds to the components in the Audi A7 (type 4K). For information, refer to self-study programme 669.

Exhaust system

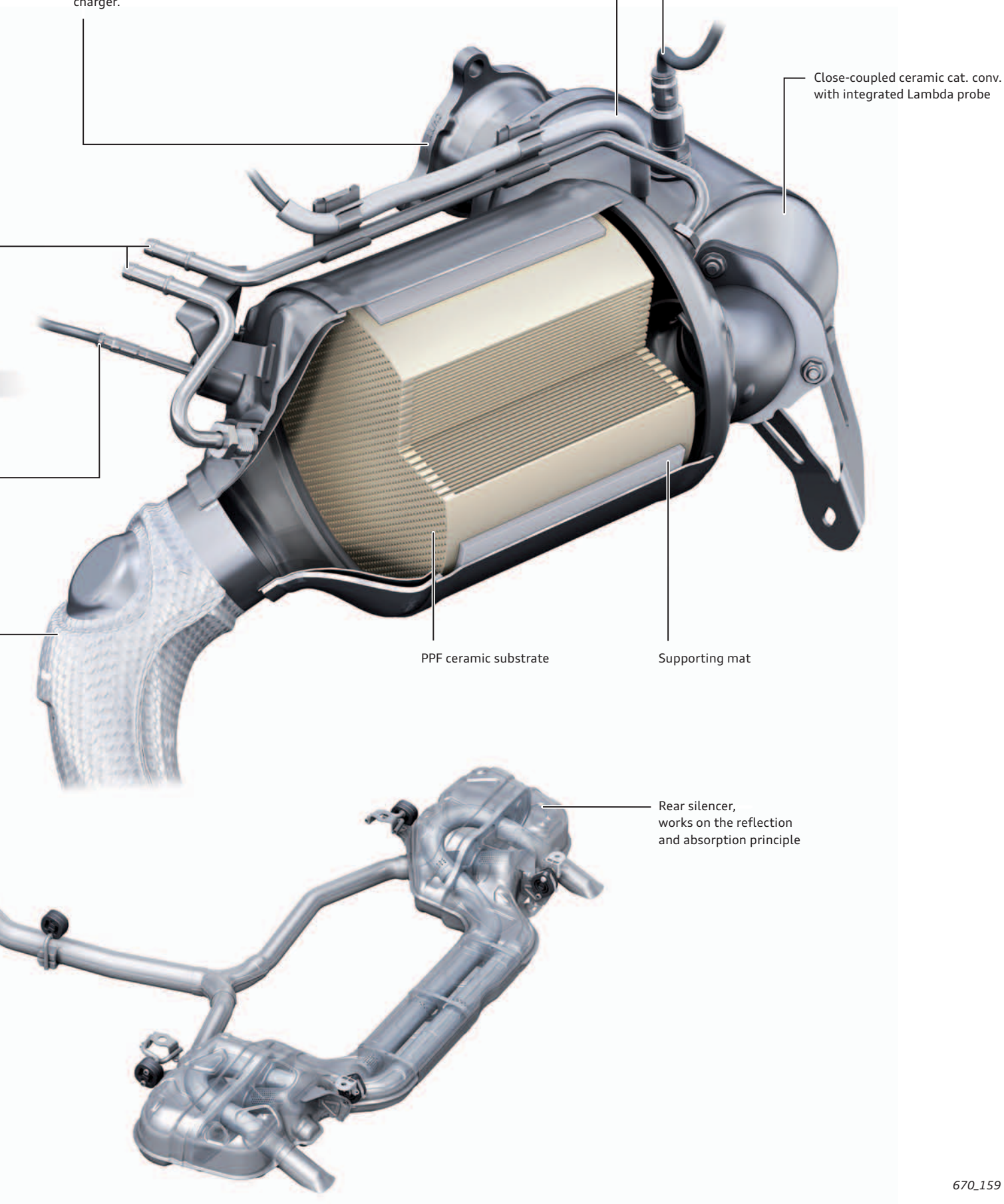
2.0 ltr. TFSI engine of EA888 series (Gen. 3 DKNA)
With petrol particulate filter (PPF) for emissions standard EU6 BG/H/I PR No.: 7CS.

The PPF is a new technology for vehicles with petrol engine and will be the standard for emission control systems in many countries in the future. Its task is to reduce the soot particulate emissions produced by direct injection petrol engines.

The PPF functions in a similar way to the diesel particulate filter (DPF). The sensors for controlling and monitoring the PPF are also derived from the DPF technology.



Reference
For more detailed information on the petrol particulate filter, refer to self-study programme 558 "The close-coupled petrol particulate filter".



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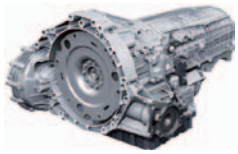
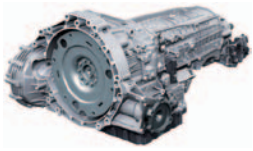
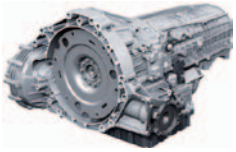
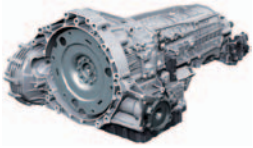
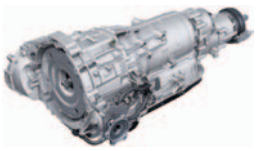
Note
When performing service work, follow the instructions in the service literature. There are also corresponding diagnosis programs in Guided Fault Finding.

Engine/gearbox combinations

Petrol engines[1]	**2.0 ltr. TFSI series 888 Gen. 3 140 kW - 180 kW**	**3.0 ltr. TFSI series 839 250 kW**
Power output designation[2]	40 TFSI 45 TFSI 45 TFSI quattro	55 TFSI quattro
		
7-speed dual clutch gearbox 0CK DL382-7F[3]		
7-speed dual clutch gearbox 0CJ DL382-7A[3]		
7-speed dual clutch gearbox 0HL DL382+ -7A[3]		
8-speed automatic gearbox 0D5 AL552-8Q[3]		
Rear final drive 0B0 HL165.U1 M[3] (quattro ultra)		
Rear final drive 09R HL195.U1 M[3] (quattro ultra)		

Diesel engines[1]	2.0 ltr. TDI EA288evo series 100 kW – 150 kW	3.0 ltr. TDI 897evo2 series 155 kW – 210 kW
Power output designation[2]	30 TDI 35 TDI 40 TDI 40 TDI quattro	40 TDI quattro 45 TDI quattro 50 TDI quattro
		
7-speed dual clutch gearbox 0CK DL382-7F[3]		
7-speed dual clutch gearbox 0CJ DL382-7A[3]		
8-speed automatic gearbox 0D5 AL552-8Q[3]		
Rear final drive 0B0 HL165.U1 M[3] (quattro ultra)		
Rear final drive 0G2 HL195.S3 M[3] (standard)		
Rear final drive 0D3 HL195.T2 M[3] (sport differential)		

The engine/gearbox combinations shown here may not be offered in all markets and may only be available after the vehicle's market launch. The Audi A6 / A6 Avant (type 4A) is only available with an automatic gearbox.

[1] Engines with different amounts of power are offered (there are also country-specific power variations). They can be differentiated using the engine code, refer to page 16.

[2] New power output designation on rear right of vehicle, refer to page 22.

[3] The breakdown of the manufacturer's gearbox and final drive designations can be found on page 23.

New power output designation

To make it easier to compare the power produced by the different drive versions, Audi has changed the way its models are identified and implemented this standard power designation worldwide.

The previous power designation method was purely designed for combustion engines and was fundamentally measured based on the engine capacity. Because the designations were based on engine capacity, the vehicle's performance was, in some cases, watered down significantly as, for example, turbocharged engines with the same engine capacity are offered with major differences in power output.

For example, three different power levels are available for an Audi A5 with 2.0 ltr. TFSI engine (110 kW, 140 kW, 185 kW) but currently all of the engines have the same designation. The new designations (35 TFSI, 40 TFSI and 45 TFSI) make it far easier to differentiate the different amounts of power and vehicle performance.

An additional aspect is that the previous power output designation is unsuitable for vehicles with hybrid drive or fully electric drive train concepts. A suitable power output designation needed to be created for these drive train concepts.
In addition, there were previously three country-specific versions of the power output designation. These have been standardised by the new system.

The reference value for the new power output designation is the power output in kilowatts (kW). The different power outputs are allocated two-digit power codes. At present, these start at 30 and end at 60. They increase in steps of 5. The allocation of the power outputs to the power codes is based on the power outputs currently offered and has been specified according to the table below. The table will be updated accordingly if necessary.

The new power output designations were introduced at the market launch of the Audi A8 (type 4N) at the beginning of 2018 and have been used for all model launches since. All models will be switched to the new power output designation system from model year 2019 onwards.

670_082

How will models be designated in the future?

- There were previously three different methods for designating the power output. In the future, the power outputs for all drive train concepts will have a standardised designation worldwide using the kilowatt (kW) as the reference value.
- This will use a two-digit number which is placed before the drive train technology (e.g. TDI, e-tron, g-tron) in steps of 5. Refer to allocation of power codes to power designations.
- The rear of R, S, RS, allroad quattro, and TT models will not have a power designation[1)].
- The Audi A8 with 12-cylinder engine will still be designated "W12".

Advantages of the new power output designation?

- Standardised worldwide.
- The kilowatt (kW) is a reference value for all drive train types and can therefore be used to compare them.
- A simple and understandable way of differentiating the hierarchy of models - more power = higher power code.
- The designation on the vehicle is largely the same as the model designation in the sales catalogues (exceptions: allroad quattro, TT, R, S and RS models).
- Can be applied to all future drive train concepts.

Allocation of power codes to power designations

	30	35	40	45	50	55	60
kW[2)]	81	110	125	169	210	245	320
	85	115	132	170	220	250	330
	90	120	135	175	221	260	331
	96		140	180	228	265	338
	100		145	185	230	270	
			147			275	
			150				

Versions of the model designation and power code on the rear of the vehicle (rear designation)

The rear designation can be personalised with the following equipment production control numbers (PR numbers).

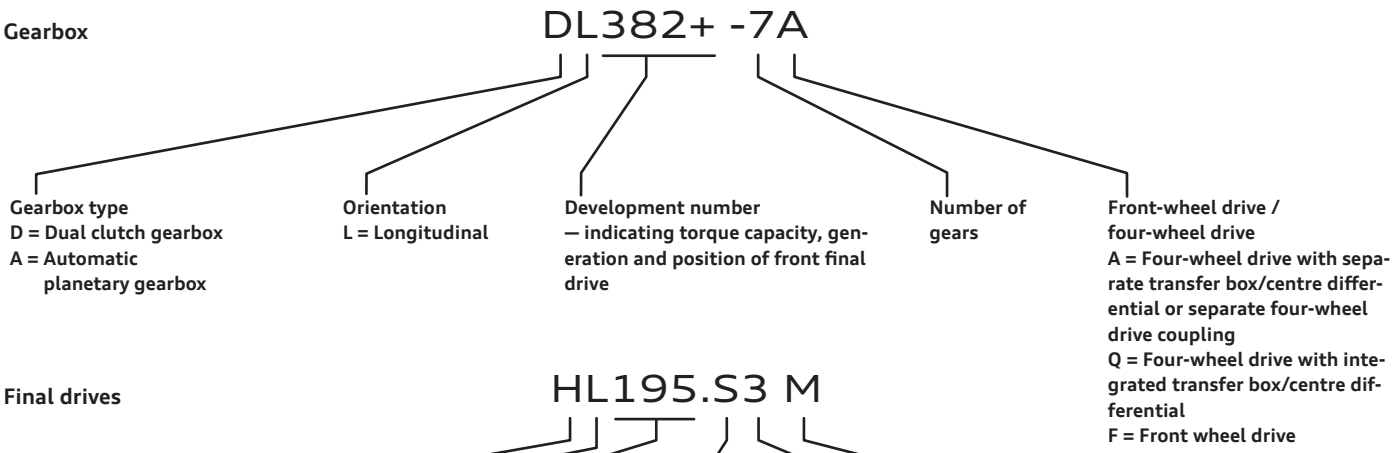
PR No.:	Description
2Z8	Model designation according to new power output designation (series production) › Standard examples (2Z7 and 2Z0 as an option): A6 50 TDI quattro A8 W12 quattro A4 40 TFSI › Examples of exceptions (only 2Z0 as an option): S7 A6 allroad quattro TT quattro
2Z7	No power/technology badge › Example: A6 ~~50 TDI~~ quattro
2Z0	No model designation or power/technology badge › Example: ~~A6~~ ~~50 TDI~~ quattro ~~A6~~ ~~allroad~~ quattro

[1] On some models, it is necessary to differentiate between the model **designation** in the various sales documents (catalogues, price lists, configurator) and the **designation** on the rear of the vehicle. Example for S models:
- › Sales documentation: S6 TDI or S6 TFSI (model designation with technology badge)
- › Designation on rear: left - S6 only - right - no designation

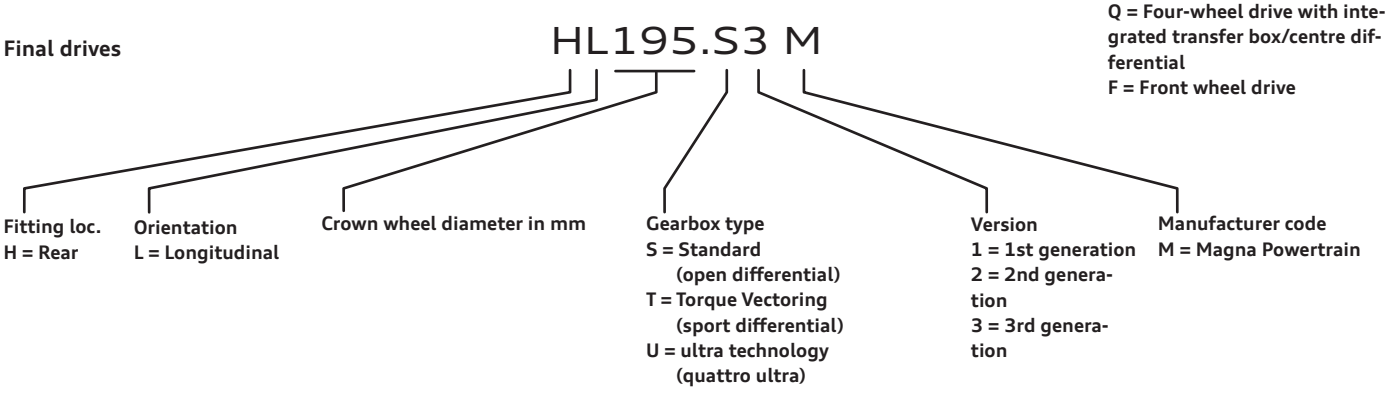
[2] Current power outputs of the Audi model range as part of the new power output designation (no guarantee of completeness).

Key to manufacturer code designation

Gearbox



Final drives



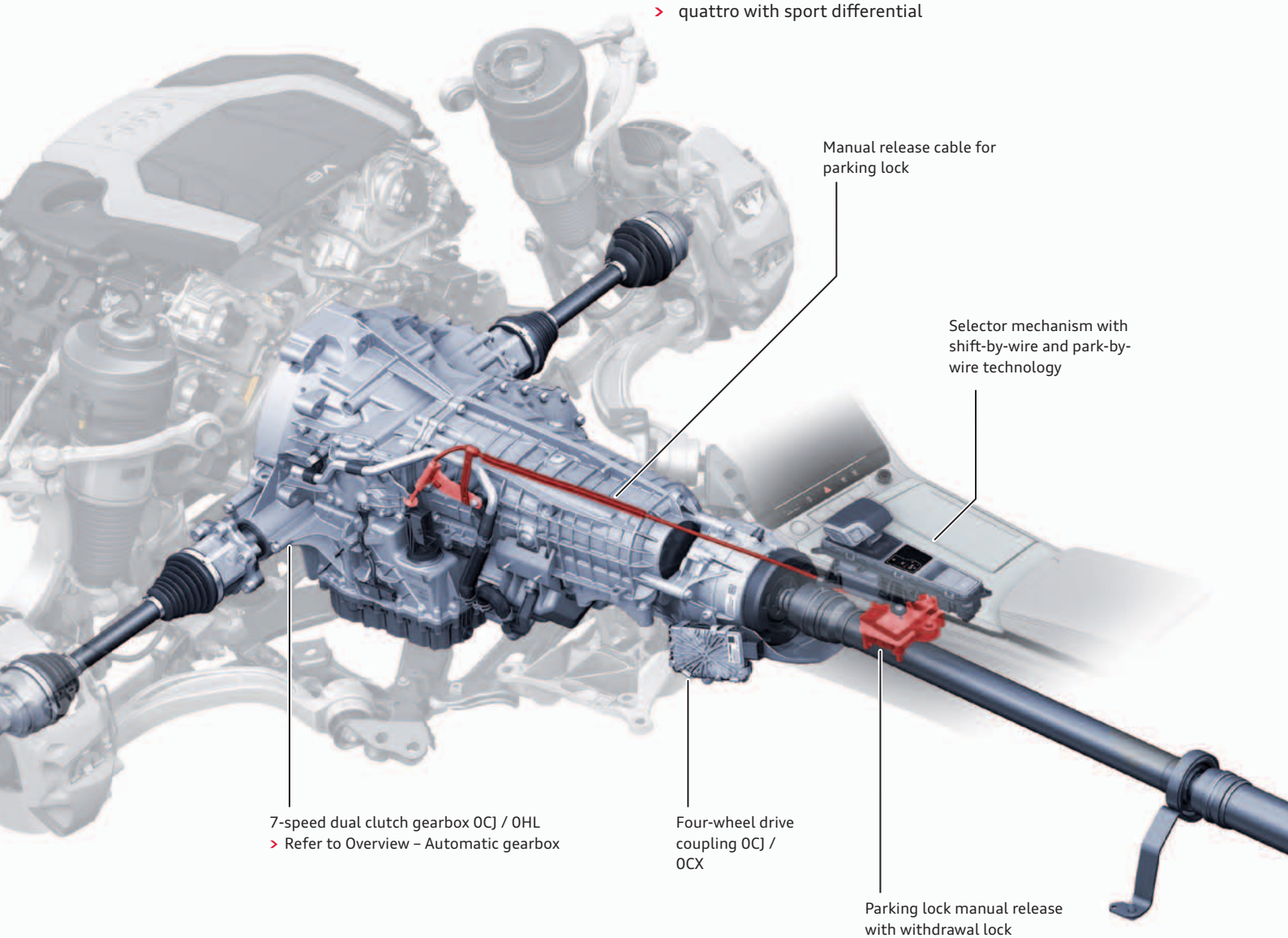
Power transmission

Overview

In terms of its power transmission system the Audi A6 (type 4A) is almost identical to the Audi A7 (type 4K) and has much in common with the B9 series, e.g. Audi A4 (type 8W), Audi Q5 (type FY) and Audi Q7/SQ7 (type 4M).
Information on the power transmission system can be found in the SSPs 669, 657 and 644 as well as the Service TV programmes referenced in them.

The Audi A6/A6 Avant (type 4A) is only available with an automatic gearbox. Front-wheel drive is offered for engine torques of up to 400 Nm. The following four-wheel drive concepts are available, depending on engine type and customer requirements:

- quattro with ultra technology
- quattro with self-locking centre differential
- quattro with sport differential



quattro with ultra technology

The quattro with ultra technology four-wheel drive system can be used for engine torques of up to 500 Nm.

The following gearbox/engine combination is used for engines up to 400 Nm:

- 7-speed dual clutch gearbox 0CJ with four-wheel drive coupling 0CJ and rear final drive 0B0.

The following gearbox/engine combination is used for engines up to 500 Nm:

- 7-speed dual clutch gearbox 0HL with four-wheel drive coupling 0CX and rear final drive 09R.

This combination was first used in the Audi A7 (type 4K).

Overview – Automatic gearbox

Depending on engine type, the following gearboxes are available:

PR no. [1]	Manufact. designation	Service designation	Marketing designation	Drive version
G1C	DL382-7F	7-speed dual clutch gearbox 0CK[2]	S tronic	Front-wheel drive
G1D	DL382-7A	7-speed dual clutch gearbox 0CJ[2]	S tronic	quattro with ultra technology
G1D	DL382+ -7A	7-speed dual clutch gearbox 0HL	S tronic	quattro with ultra technology
G1G	AL552-8Q	8-speed automatic gearbox 0D5	tiptronic	quattro with self-locking centre differential quattro with sport differential (optional)

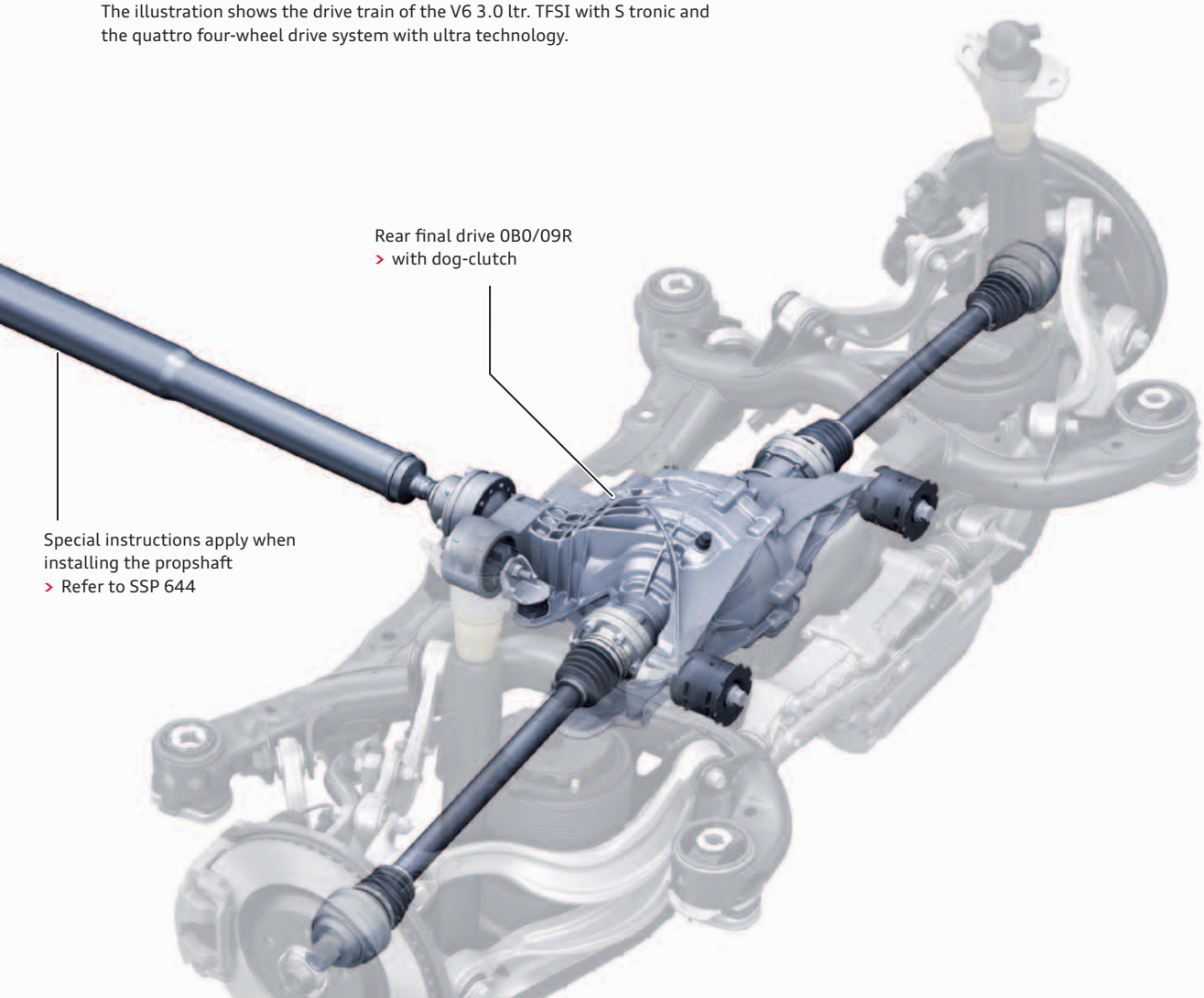
Overview – Rear final drive

Depending on the quattro concept and customer requirements, the following rear final drive versions are available:

PR no. [1]	Manufact. designation	Service designation	Combination with gearbox	quattro concept
GH1	HL195.S3 M	Rear final drive 0G2	0D5	quattro with self-locking centre differential
GH2	HL195.T2 M	Rear final drive 0D3	0D5	quattro with sport differential (optional)
GH4	HL165.U1 M	Rear final drive unit 0B0[2]	0CJ	quattro with ultra technology
GH4	HL195.U1 M	Rear final drive 09R	0HL	quattro with ultra technology

[1] Production no./equipment
[2] To be introduced at a later date (not at time of market launch)

The illustration shows the drive train of the V6 3.0 ltr. TFSI with S tronic and the quattro four-wheel drive system with ultra technology.



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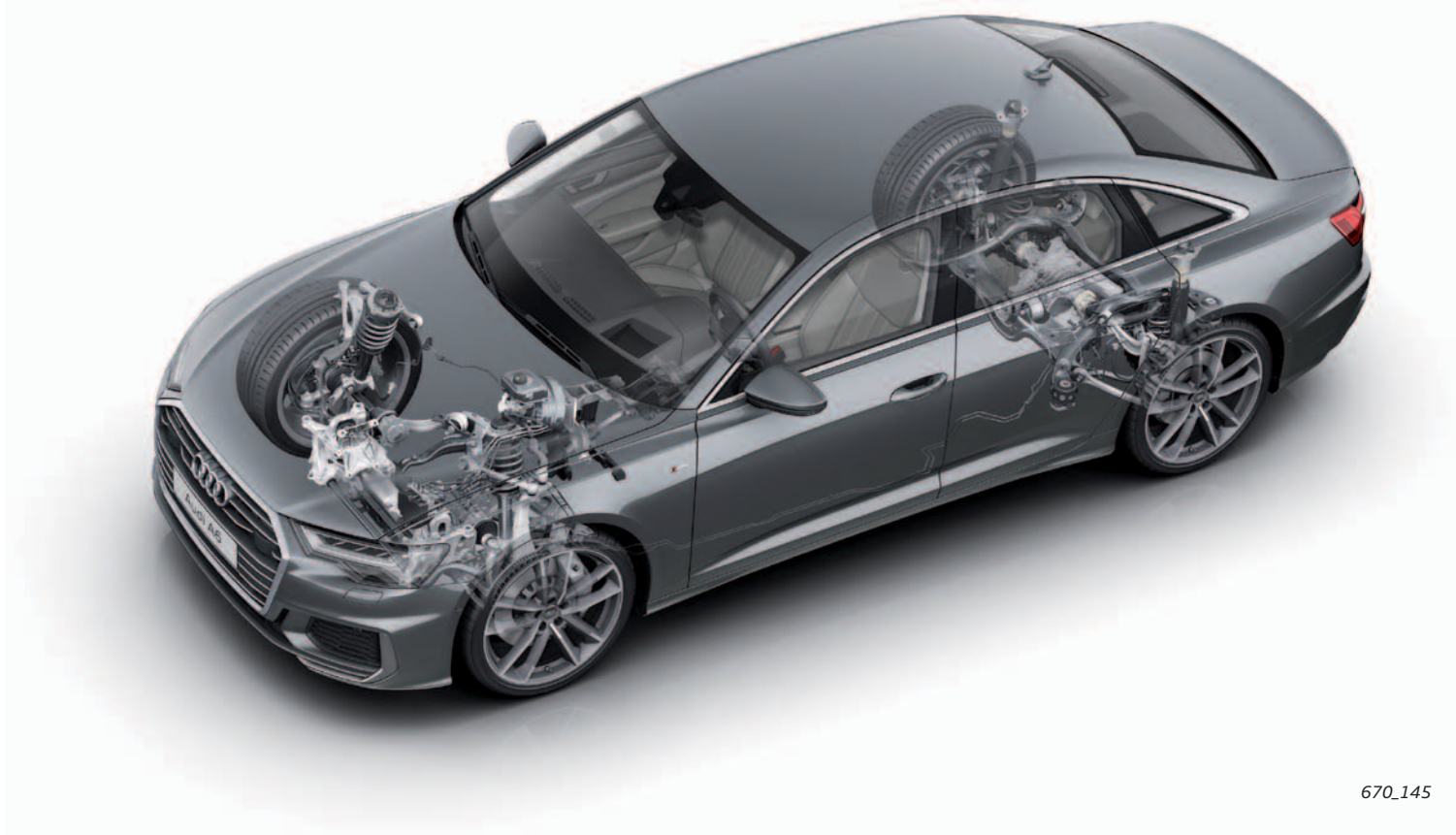
Running gear

Overview

The running gear for the Audi A6 (type 4A) has been completely redesigned compared to the previous model. The new technology and control systems already used in the Audi A8 (type 4N), A7 (type 4K) and Q7 (type 4M) make it even more comfortable and dynamic. Versions are available with steel suspension and controlled or non-variable damping in addition to air suspension with electronic damping control (adaptive air suspension).
The front and rear axles are based on a high-precision lightweight five-link design.
Progressive steering, included in the standard vehicle equipment, reduces the amount of steering effort required. The dynamic four-wheel steering system introduced in the Audi A8 (type 4N) is available as an optional extra for the Audi A6 (type 4A).

The generously proportioned brake system offers substantial performance reserves for any corresponding driving situation.
The 9th generation ESC system provides high-performance stability control for the vehicle.
A wide range of steering wheels, wheels and tyres is available for further customisation. Thanks to the MLBevo platform, which was the basis for the running gear development of the new Audi A6 (type 4A), the majority of the system components from the Audi A7 (type 4K) could be used.



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The following suspension variants are available for the Audi A6 (type 4A):

Running gear with steel suspension and non-variable damping (1BA)
This is the standard running gear.

Sport running gear with steel suspension and non-variable damping (1BE)
This suspension system is optional. The springs, dampers and anti-roll bars are set up for dynamic handling. The ride height is approx. 20 mm lower than version 1BA.

Running gear with steel suspension and damping control (1BL)
This suspension system is optional. The ride height is approx. 10 mm lower than version 1BA.

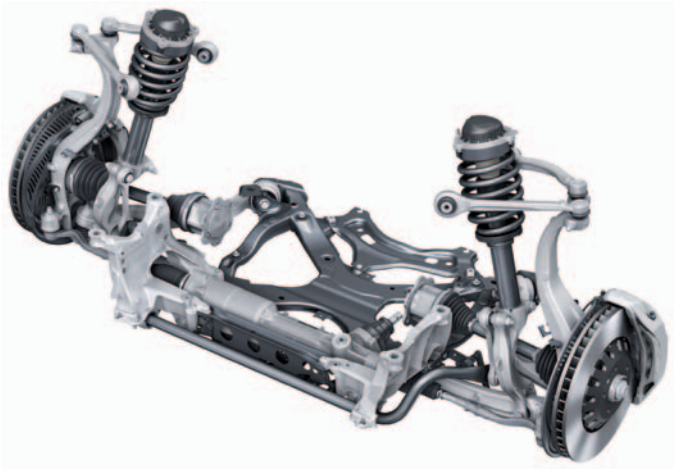
Heavy-duty running gear (1BR)
Thanks to its higher ride height (approx. +13 mm compared to 1BA) and the special set-up of the springs, dampers and anti-roll bars, this running gear is particularly suitable for use on uncomfortable roads or tracks.

Suspension with air springs and damping control (adaptive air suspension – 1BK)
This suspension system is optional. The ride height in “Auto” mode (normal level) is approx. 20 mm lower than version 1BA and therefore corresponds to that of the sport running gear.

Axles and wheel alignment

Front axle

The front axle is based on the proven design principle of the five-link suspension. A particular emphasis was placed on the lightweight construction. The MLBevo platform is used as the basis. Because the axle loads are similar, the front axle from the Audi A7 (type 4K) has been used. Springs, dampers and anti-roll bars have been specially adjusted for use in the Audi A6 (type 4A).



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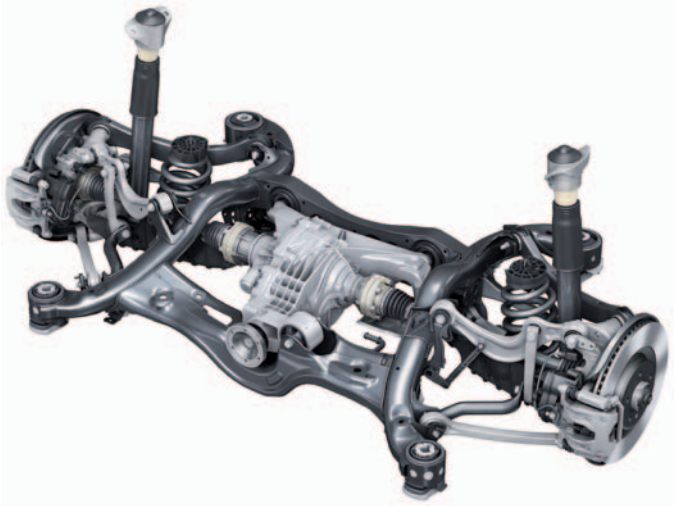
Rear axle

The trapezium link rear axle used in the previous model has been replaced by a five-link axle which is largely a new development. The MLBevo platform is used as the basis. The axle for quattro is from the Audi A7 (type 4K). The springs and dampers have been adapted.



Rear axle for quattro

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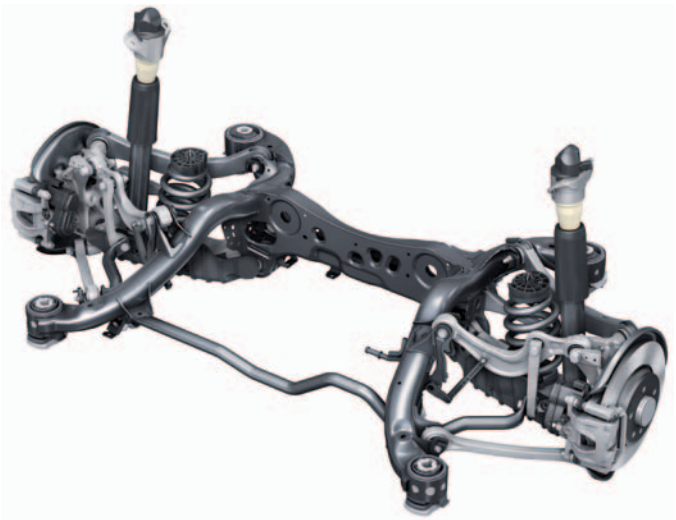
The subframe and hub carrier have been newly developed for the front-wheel drive axle in addition to the concept for connecting the wheel bearing unit to the hub carrier. The wishbones, anti-roll bars and anti-roll bar couplings are from the quattro rear axle. The springs and dampers have been adapted.

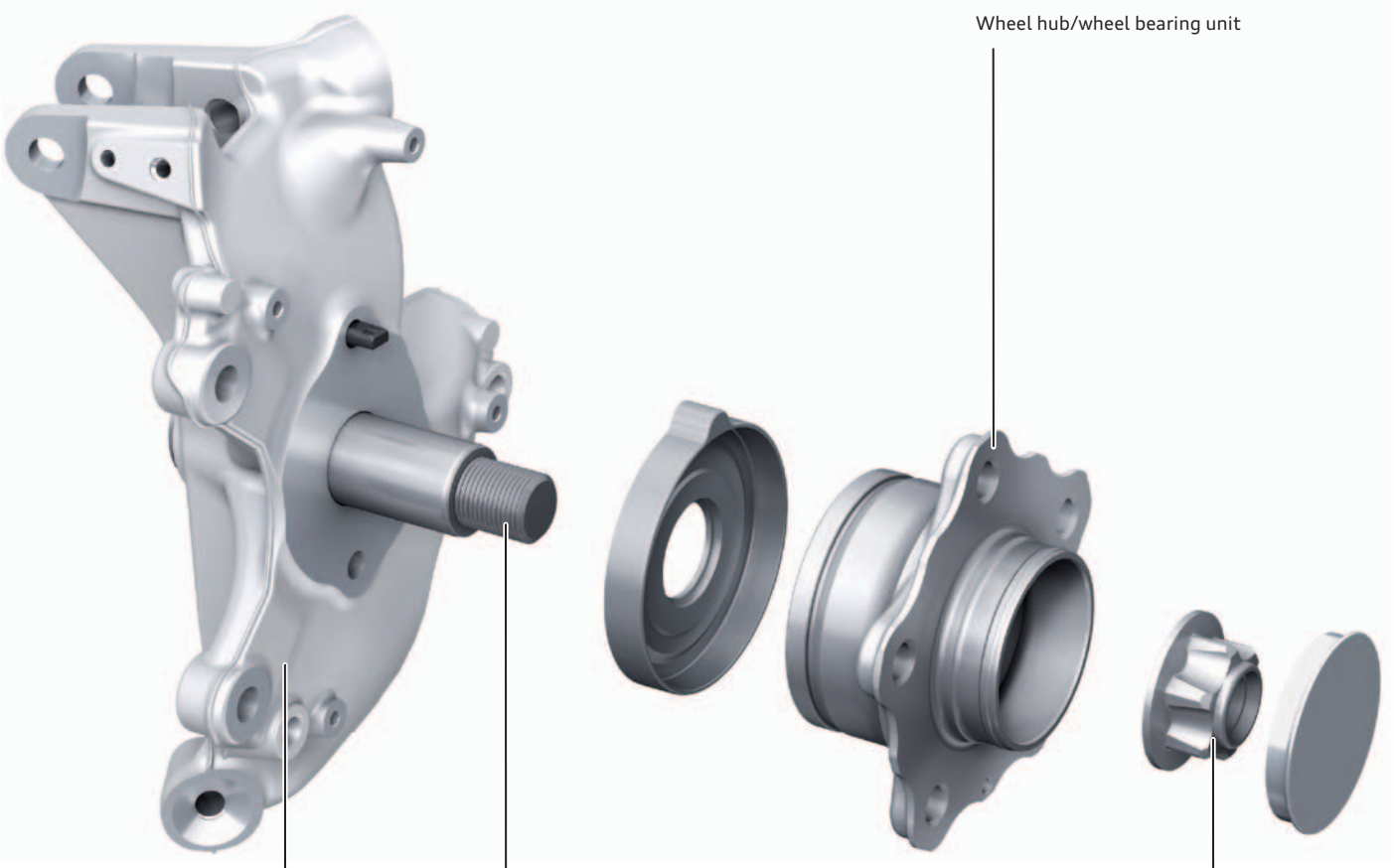


Rear axle for front wheel drive

670_148

Rear axle

On the rear axle for front-wheel drive, the method for securing the wheel bearing unit to the hub carrier has been changed from a bolt to a nut. The stub axle of the subframe now has an external thread. The hub carrier is geometrically identical to that of the Audi Q5 (type FY). The new method of securing the wheel bearing unit will be implemented in the Audi Q5 (type FY) in the future and the hub carriers of both models will be standardised.



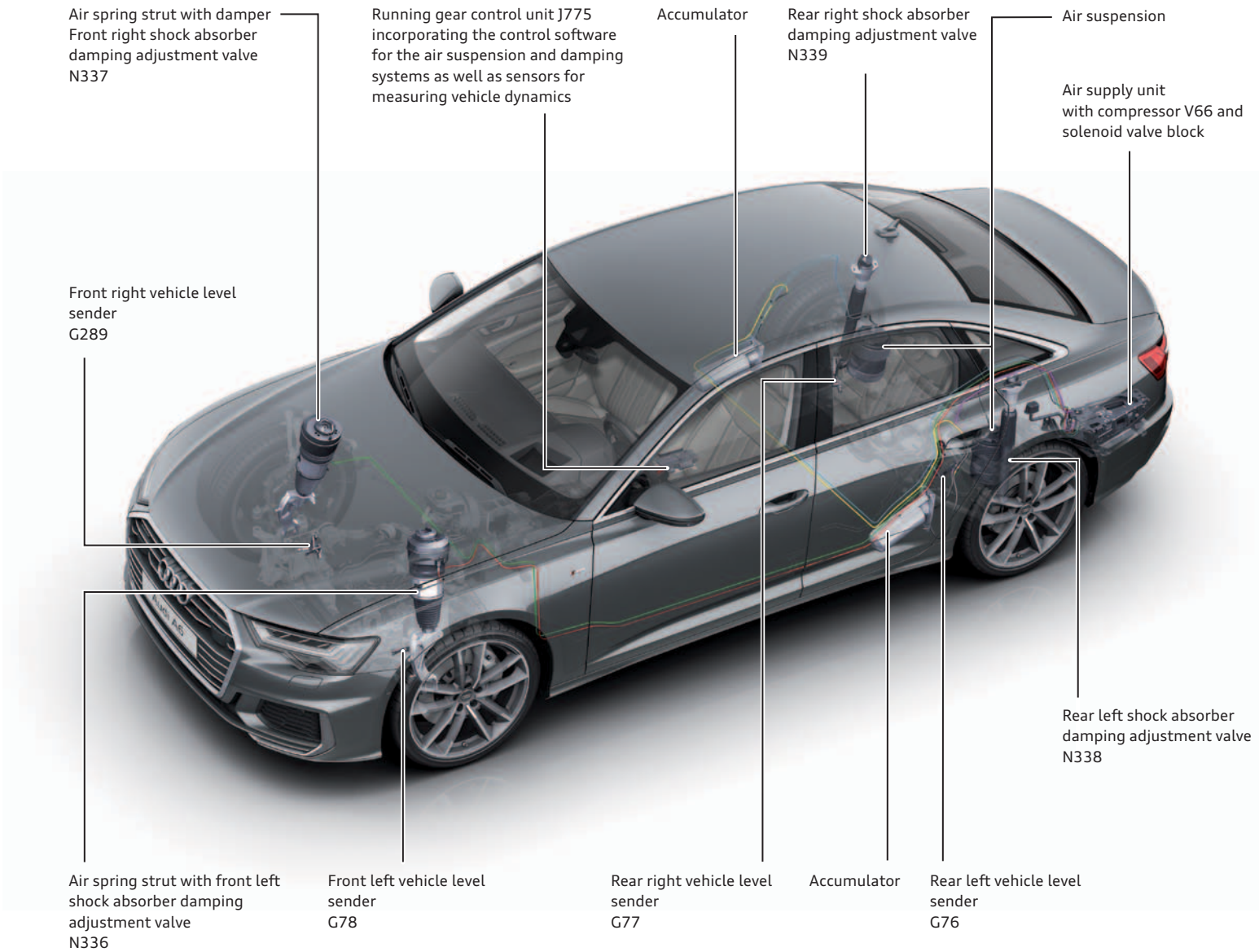
Reference
For further information on the construction of the axles and the wheel alignment adjustment options, please refer to self-study programme 669 “Audi A7 (type 4K)”.

Adaptive air suspension

Design and function

The adaptive air suspension is an optional extra for the Audi A6 (type 4A). The system construction corresponds to the adaptive air suspension system in the Audi A7 (type 4K); its system components have also been used. The running gear control unit J775 (EFP 2.0) is likewise fitted. In addition to the regulating software for the air suspension and damping, the control unit also contains the sensor for registering vertical acceleration (upwards acceleration of the vehicle) as well as pitching and rolling moments (rotation about the vehicle's lateral and longitudinal axes). This eliminates the need for the body acceleration senders fitted in previous systems.

The measured values for the yaw rate (rotation about the vehicle's vertical axis) and the lateral acceleration are transmitted via FlexRay from the airbag control unit J234 to the regulating software.
The control strategy corresponds to that of the Audi A7 (type 4K). The servicing needs are also the same.



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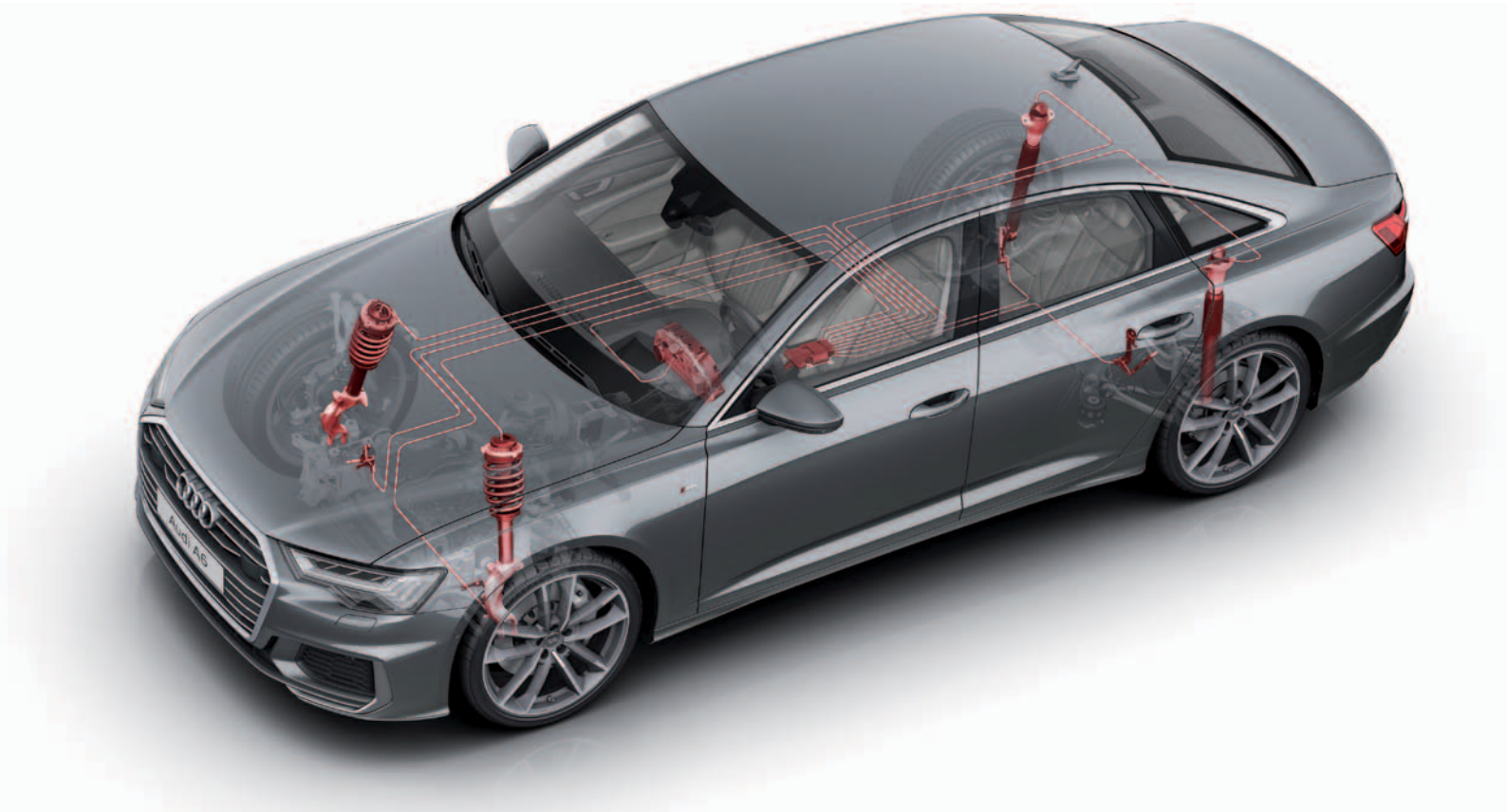
Reference
For further information about the adaptive air suspension system, refer to self-study programme 669 "Audi A7 (type 4K)".

Electronic damping control

Suspension version 1BL available for the Audi A6 (type 4A) is equipped with steel springs and controlled dampers on the front and rear axles. The control software is implemented in the running gear control unit J775 (EFP 2.0). The controlled dampers on MLBevo models with steel suspension are CDCivo dampers.

The supplement “i” = “internal” in the designation refers to the integration of the solenoid valve in the damper. The addition “vo” = “evolution” refers to the latest technically advanced damper generation.



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Reference
For further information on design and function, operation, driver information and service operations, please refer to self-study programme 644 "Audi A4 (type 8W)".

Steering system

The steering system has been completely redeveloped compared to the previous model.
The electromechanical power steering (EPS), the steering columns, the dynamic steering and the steering wheels are from the Audi A7 (type 4K).

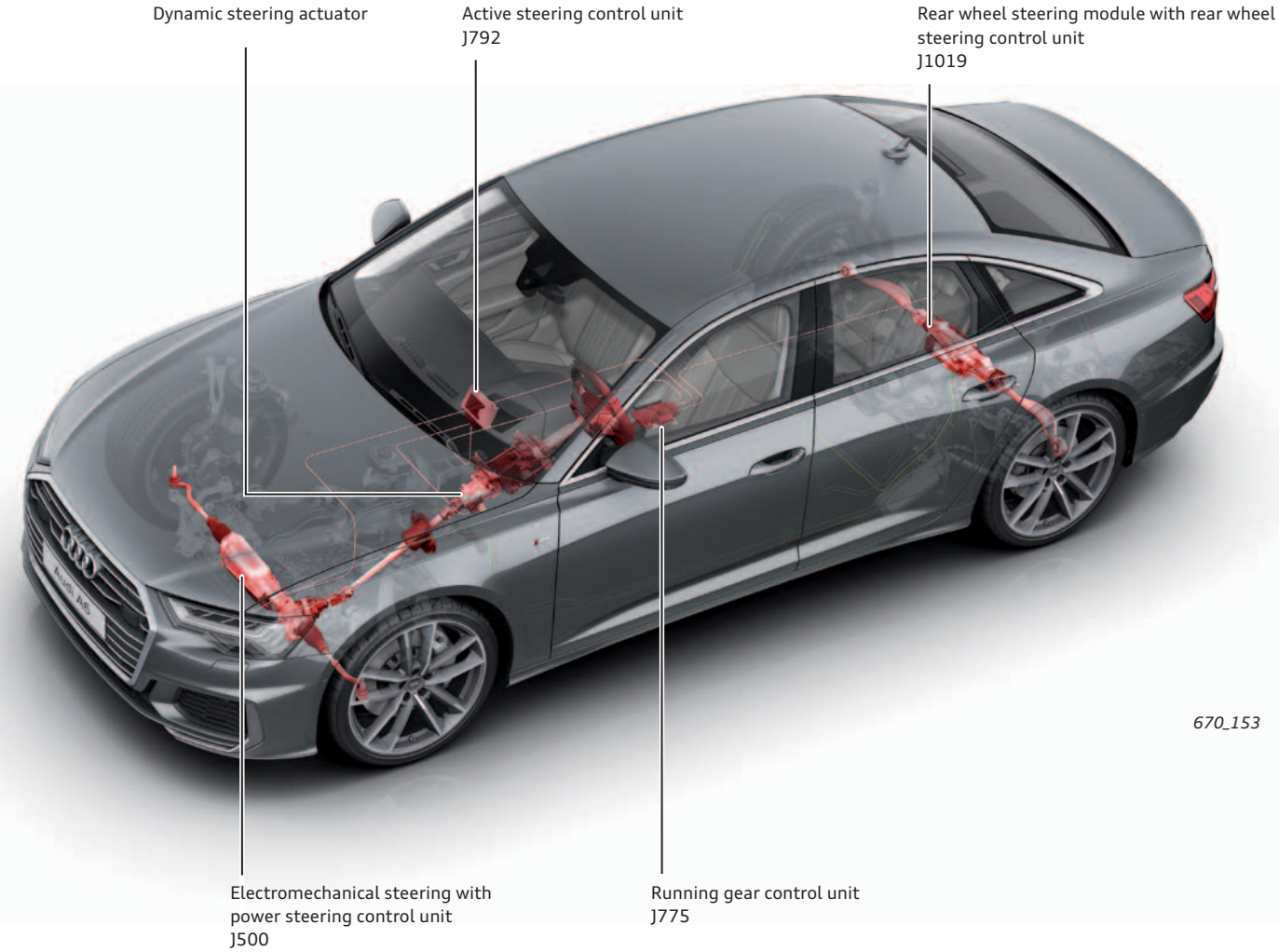
670_152

Reference
For further information about the steering components, refer to self-study programme 669 "Audi A7 (type 4K)".

Dynamic four-wheel steering

The dynamic four-wheel steering system, which was introduced for the first time in the Audi A8 (type 4N), is also available as an optional extra for the quattro versions of the Audi A6 (type 4A).

In terms of design, function and operation as well as service operations, the system in the Audi A6 (type 4A) is identical to that used in the Audi A8 (type 4N).



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Reference
For further information, please refer to self-study programme 663 “Audi A8 (type 4N) Running gear.”

Brake system

The Audi A6 (type 4A) is equipped with a generously dimensioned brake system. As with the current MLBevo models, the brakes on the front and rear axles of the Audi A6 (type 4A) have separate brake circuits (“black and white” system).

The brakes, brake servo, electromechanical parking brake and ESC are from the Audi A7 (type 4K).

Brake system, front axle

Engine	2.0 ltr. TDI (150 kW)	2.0 ltr. TFSI (180 kW)	3.0 ltr. TDI (170, 210 kW)	3.0 ltr. TFSI (250 kW)
Minimum wheel size	16"	17"	17"	18"
Type of brakes	Continental fixed caliper brakes (42-30)	Continental fixed caliper brakes (42-30)	ATE fixed caliper brakes (30-36-38)	ATE fixed caliper brakes (30-36-38)
Number of pistons	4	4	6	6
Brake disc diameter	318 mm	338 mm	350 mm	375 mm
Brake disc thickness	30 mm	30 mm	34 mm	36 mm

Continental 4-piston fixed caliper brakes on front axle

670_154

ATE 6-piston fixed caliper brakes on front axle

670_155

Brake system, rear axle

Engine	2.0 ltr. TDI (150 kW)	2.0 ltr. TFSI (180 kW) 3.0 ltr. TFSI (250 kW) 3.0 ltr. TDI (170, 210 kW)
Minimum wheel size	16"	17"
Type of brakes	TRW PC42HE EPBi Floating caliper brakes	TRW PC43HE EPBi Floating caliper brakes
Number of pistons	1	1
Brake disc diameter	300 mm	330 mm
Brake disc thickness	12 mm	22 mm

TRW EPBi 43 brakes for rear axle with electromechanical parking brake

670_156

Reference
For further information, refer to self-study programme 669 "Audi A7 (type 4K)".

Wheels, tyres and tyre pressure monitoring

The Audi A6 (type 4A) comes as standard with 17" forged aluminium wheels. Wheels with size 17" to 21" are available as optional extras. The available tyres range from 225/60 R17 to 255/35 R21.
Run-flat tyres are not available.

The Tyre Mobility System (TMS) is part of the standard equipment. As on the Audi A7 (type 4K), a temporary spare wheel (4.5Jx20 with 145/65 R20 tyre) is available as an optional extra.
A jack is included for vehicles with a temporary spare wheel or with winter wheels ordered from the factory. All winter wheels offered are compatible with snow chains.

The 3rd generation Tyre Pressure Monitoring System (direct measurement system) is available as optional equipment in the Audi A6 (type 4A) as an alternative to the standard Tyre Pressure Loss Indicator. The system has the same design and function as the system in the Audi Q7 (type 4M) and Audi A8 (type 4N).

Standard wheels	Optional wheels			Winter wheels
				
Forged aluminium wheel 7.5J x 17 225/60 R17	Cast aluminium wheel Flow form 7.5J x 17 205/65 R17	Cast aluminium wheel 8.0J x 18 225/55 R18	Cast aluminium wheel Flow form (S line) 8.5J x 19 245/45 R19	Forged aluminium wheel 7.5J x 17 225/60 R17
				
Standard wheel for North America Cast aluminium wheel Flow form 8.5J x 19 245/45 R19	Cast aluminium wheel 8.0J x 18 225/55 R18	Cast aluminium wheel Flow form 8.5J x 19 245/45 R19	Cast aluminium wheel Flow form 8.5J x 20 255/40 R20	Cast aluminium wheel 8.0J x 18 225/55 R18
				
	Cast aluminium wheel 8.0J x 18 225/55 R18		Forged aluminium wheel 8.5J x 21 255/35 R21	Cast aluminium wheel Flow form 8.0J x 19 245/45 R19

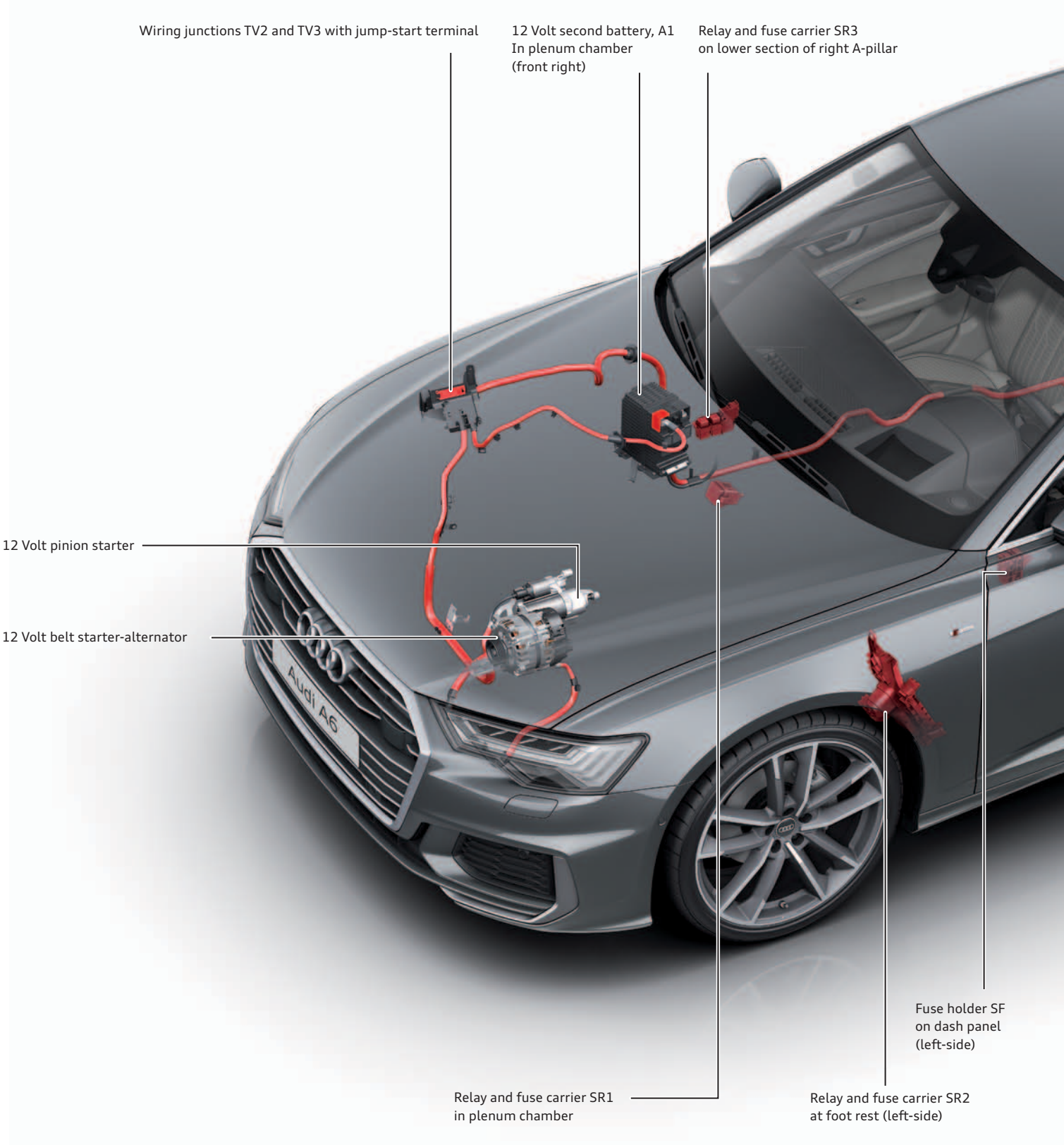
Electrics and electronics

Introduction

The Audi A6 (type 4A) is a Mild Hybrid Electric Vehicle (MHEV). Audi MHEVs are equipped, in addition to the traditional lead battery, with an additional lithium-ion battery and a starter-alternator.

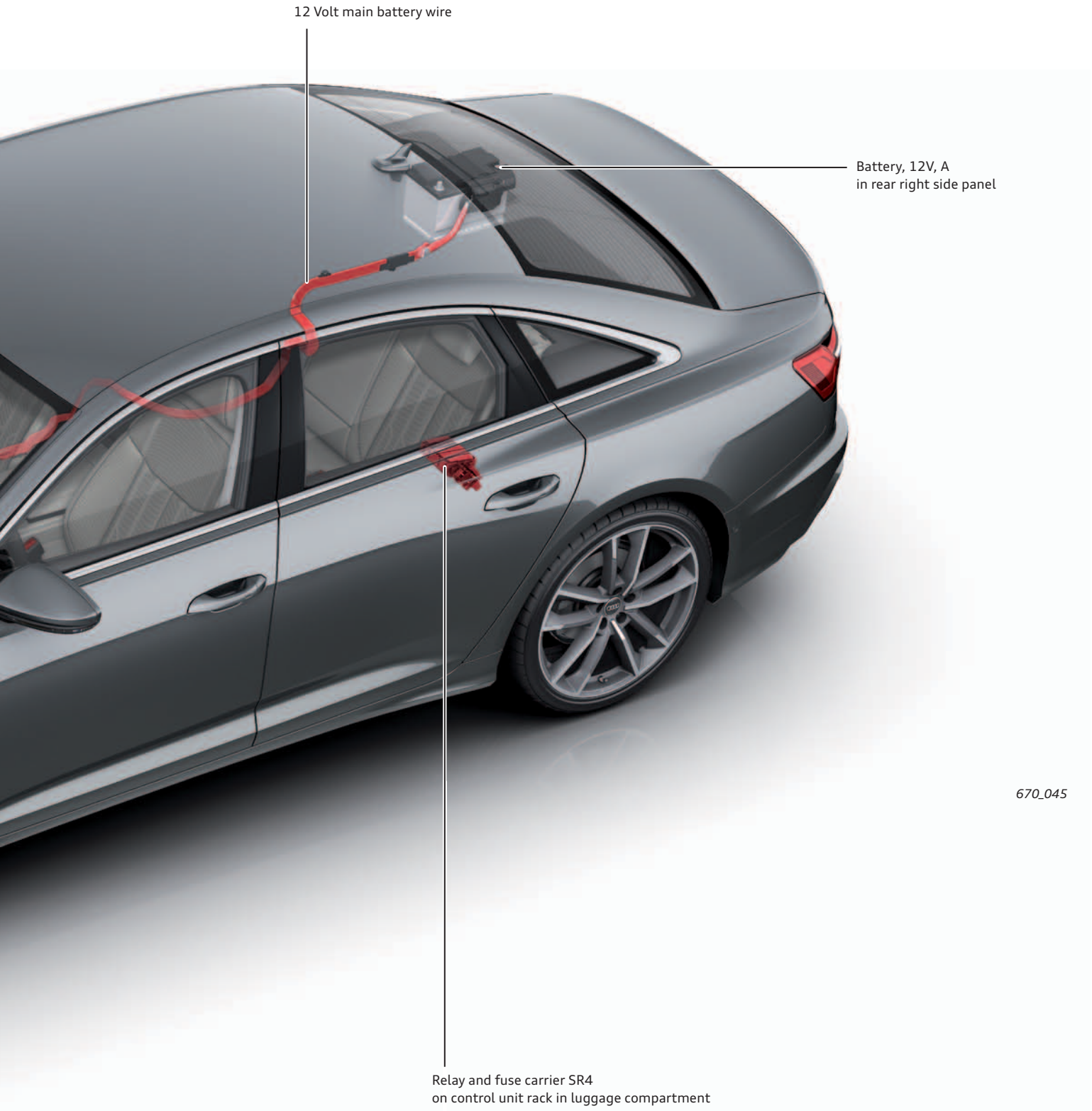
The power for the drive train and the electrical energy are generated by the combustion engine. Fully electric driving is not possible with the Audi A6 MHEV.

12 Volt MHEV electrical system



Because of the different engines, there are two different types of electrical system on the Audi A6 (type 4A) - the Audi A6 12 Volt MHEV and the Audi A6 48 Volt MHEV.

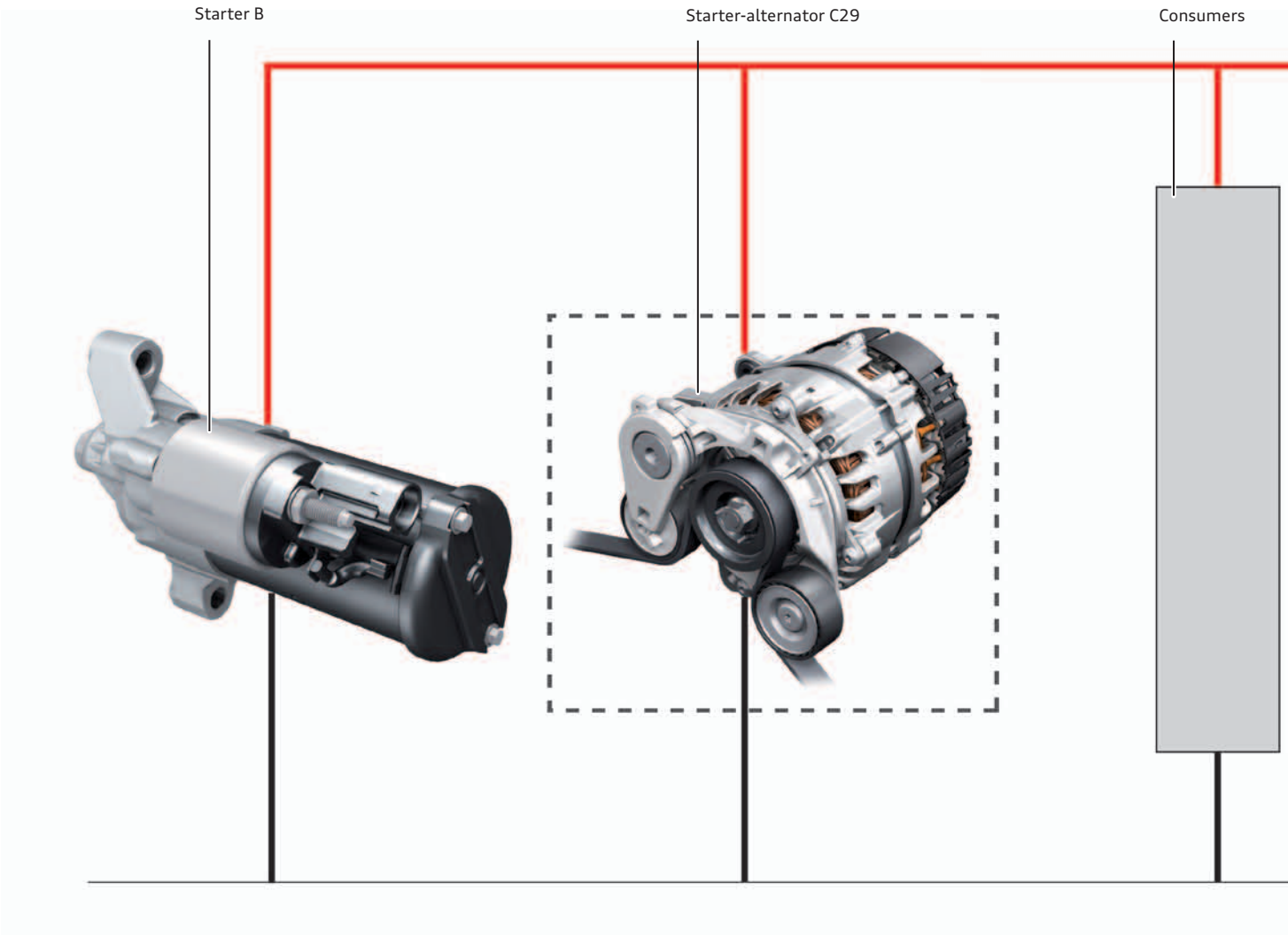
Audi A6 (type 4A) vehicles with 4-cylinder engine are 12 Volt MHEVs. Vehicles with 6-cylinder engine are 48 Volt MHEVs and have a 48 Volt main electrical system.



Reference
For further information about mild hybrid functions, refer to self-study programme 664 "Audi A8 (type 4N) Electrics and electronics".

Layout of 12 Volt MHEV

The Audi A6 (type 4A) models with 4-cylinder engine are 12 Volt MHEVs. In addition to the usual components, they have a 12 Volt lithium-ion battery and a 12 Volt starter-alternator.

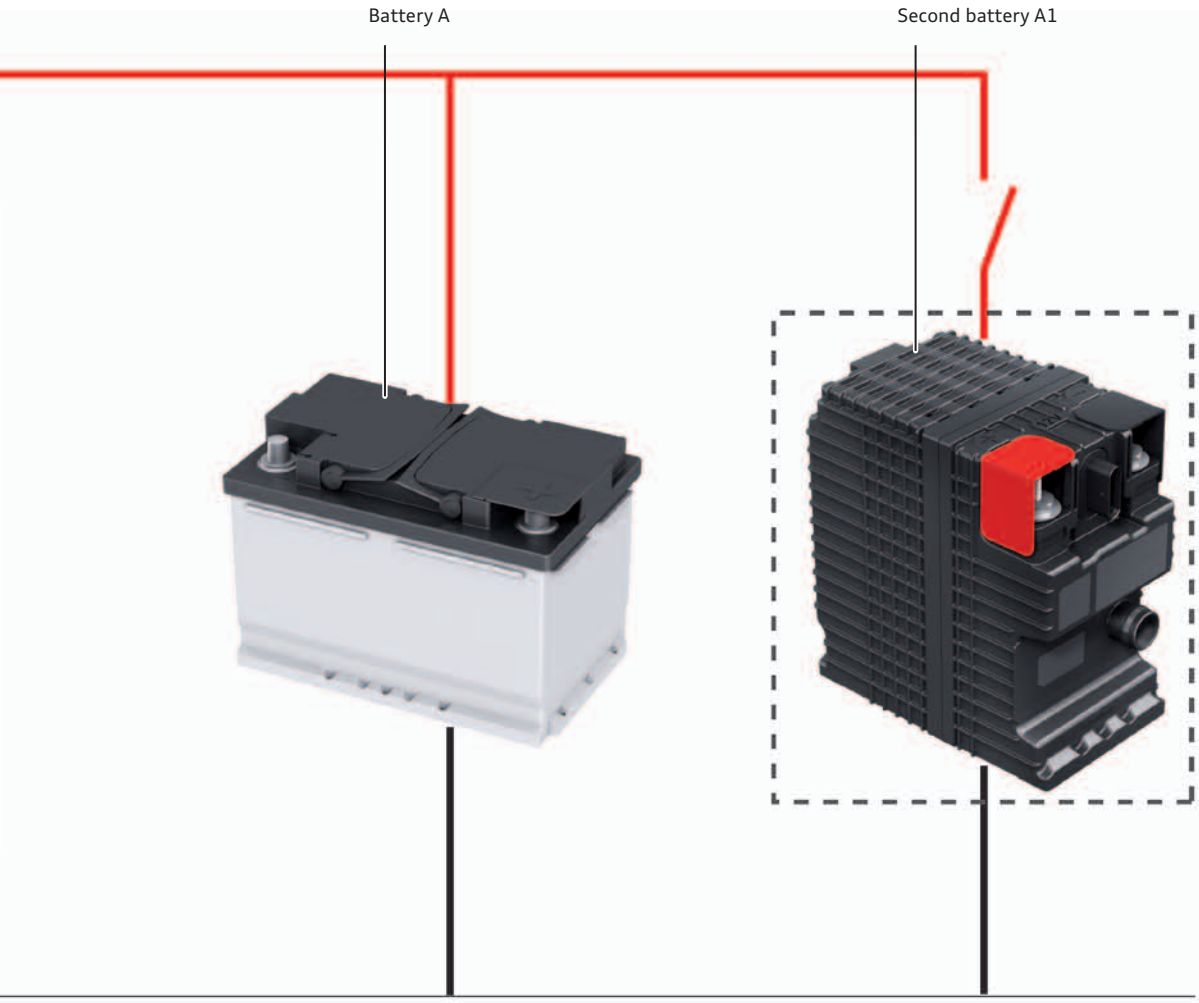


Starter B

The starter is a 12 Volt pinion starter. It is used to start the combustion engine at engine oil temperatures of less than 45 °C. The pinion starter meshes its pinion with the starter ring gear on the engine flywheel.

Starter-alternator C29

As the name implies, this component has two functions. When operated as an alternator, it provides the electrical system with electrical energy and charges both batteries.
Its electric motor function is used to start the combustion engine when the engine oil temperature is above 45 °C and in start/stop mode. It is also able to support the combustion engine in certain driving situations.
Thanks to the connection via the poly V-belt, an engine start using the starter-alternator is very quiet and almost completely free of vibrations.



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Battery A

This battery is a 68Ah/380A AGM battery. It is fitted in the rear right side panel. As on the vast majority of Audi models, the battery monitor control unit J367 is fitted on its negative terminal. The battery must be adapted to the energy management system after it is replaced. The pyrotechnic battery isolation unit is located in the positive wire on the battery housing. This enables the main battery wire to be de-energised by the airbag control unit J234 in the event of a crash.

Second battery A1

The second battery uses lithium-ion technology and is connected in parallel to the lead battery. It is activated via an internal relay of the lead battery. It is fitted in the plenum chamber (right-side) and can be accessed via a service flap in the plenum chamber cover. The second battery is fitted with an aluminium housing to protect it from mechanical damage.

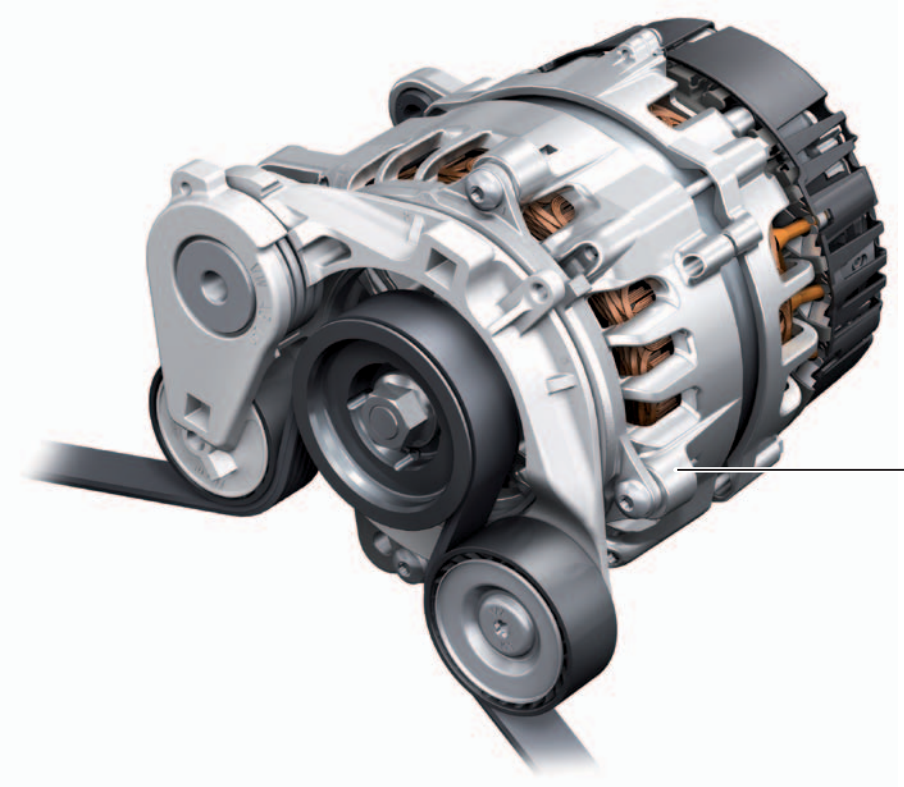
Reference
For further information about the dangers of lithium-ion technology, refer to self-study programme 664 "Audi A8 (type 4N) Electrics and electronics".

Starter-alternator C29

General description

On the 12 Volt MHEV, the starter-alternator C29 is a 12 Volt belt starter-alternator. In its alternator function, it charges both batteries. The electric motor can be used both as a starter and to assist the combustion engine. The 12 Volt belt starter-alternator is air-cooled.

It is connected to the engine control unit J623 via a LIN data wire. As on any starter-alternator, a special tensioner is used to ensure that the poly V-belt has a large wrap angle around the drive pulley of the starter-alternator.



670_047

Technical data

Designation	Starter-alternator C29
Diagnostic address	None/engine control unit is master
Communication	LIN data wire to engine control unit
Terminal designations 12 Volt positive/negative	30 / 31
Engine speed range	1,500 rpm - 22,000 rpm
Ratio (starter-alternator - combustion engine)	Approx. 3:1 (depends on engine)
Nominal voltage in motor mode	12 Volt
Nominal voltage in alternator mode	14.3 Volt
Nominal power in motor mode (supporting combustion engine for max. 5 seconds)	Approx. 2 kW
Maximum power in alternator mode (recuperation[1)] for max. 30 seconds)	Approx. 6 kW
Maximum continuous nominal power in alternator mode	Approx. 3 kW
Maximum torque in motor mode	60 Nm
Weight	Approx. 9.5 kg

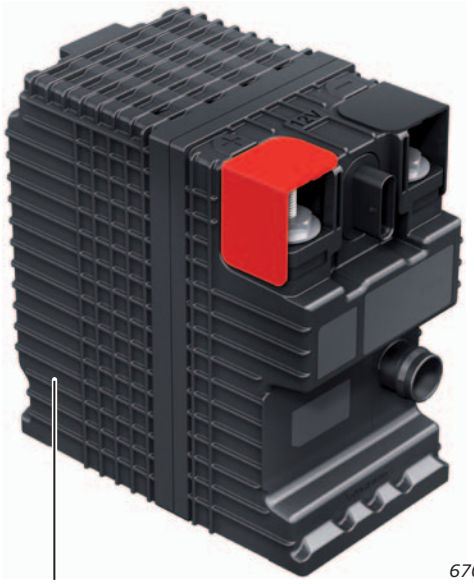
[1)] Recuperation: Energy recovery. This means that the kinetic energy of the vehicle is converted into electric energy in overrun mode or under braking.

Second battery A1

General description

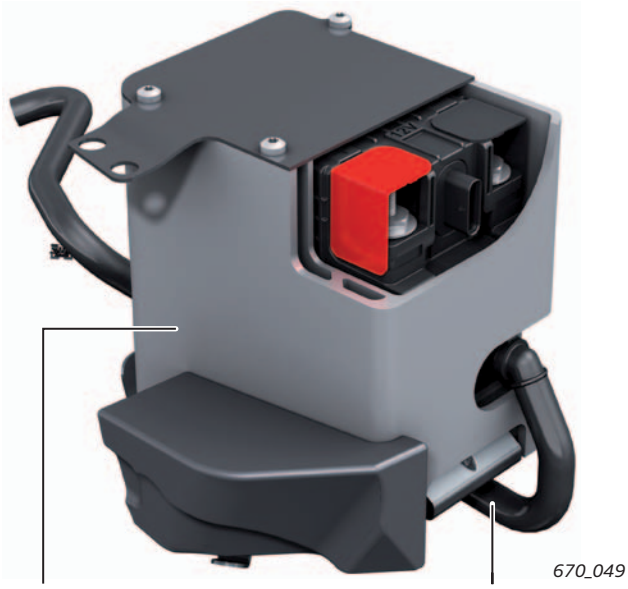
The main components in the housing of a lead battery are the battery cells, the separators, the cell connectors and the electrolyte. In contrast, the lithium-ion battery houses additional components such as an internal battery control unit and a relay. With the assistance of this relay, the positive terminal stud can be “switched off”.

When the relay is open, there is then no voltage at the terminal stud. The lithium-ion battery is fitted in an aluminium housing to protect it from mechanical damage. The 12 Volt lithium-ion battery is not actively cooled.



670_048

Second battery A1



670_049

Protective metal housing

Breather line

Operation of second battery

The second battery is connected in parallel to the lead battery. The second battery’s relay is closed during the start procedure or shortly after it, depending on the engine. If the ignition is switched off, the relay is reopened and the second battery is once again disconnected from the electrical system. In certain operating conditions, such as for the duration of the continued operation of the radiator fans or the auxiliary pump, the relay may remain active after terminal 15 has been deactivated.

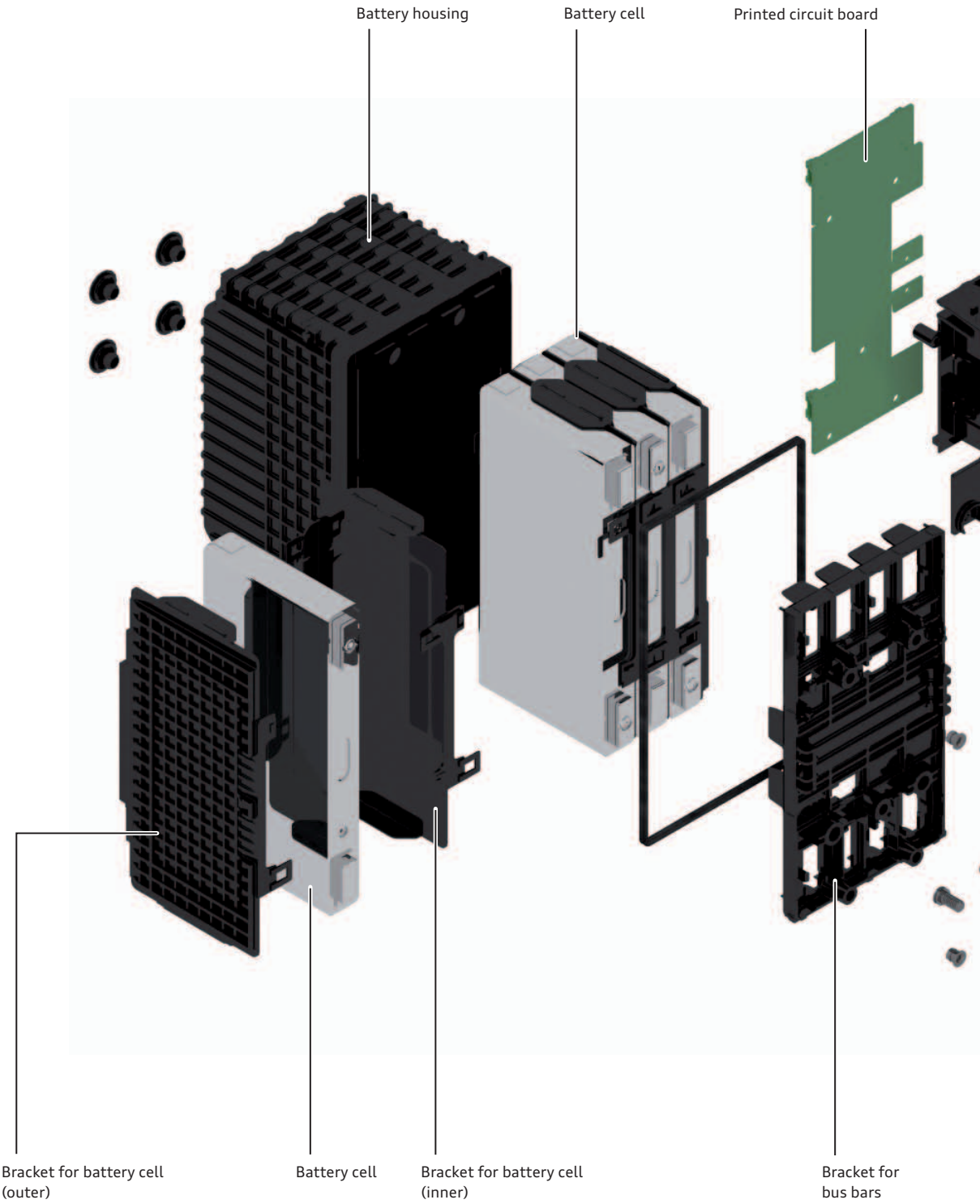
If an external charging unit is connected to the vehicle’s electrical system, the relay is closed after approximately 30 seconds (despite terminal 15 being inactive) so that the second battery can also be charged. In the event of an accident in which the airbag is triggered, the airbag control unit J234 sends a signal to the control unit in the battery and the relay is opened. A visual check and a classification of the second battery must be undertaken before it is removed.

Technical data

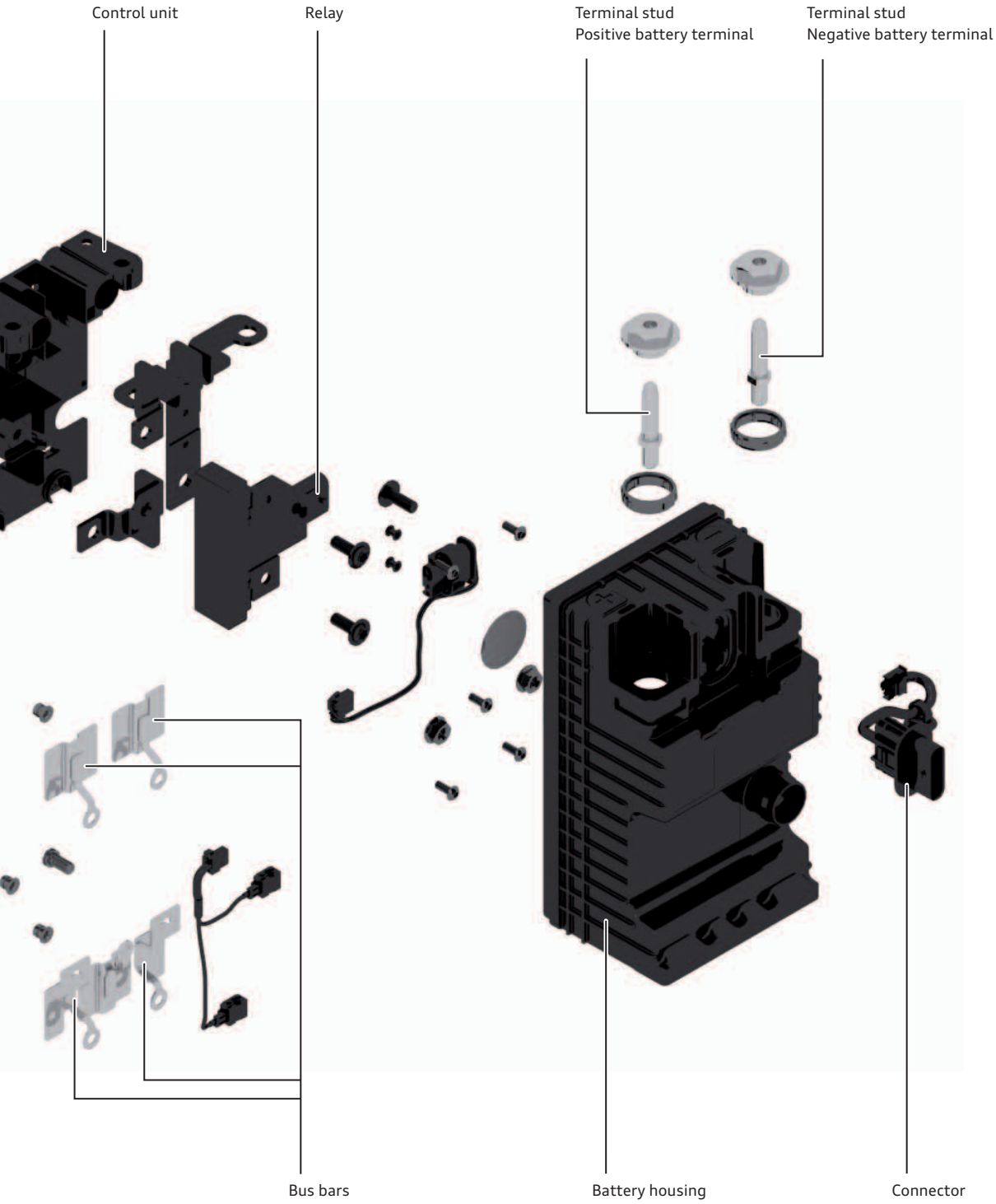
Designation	Second battery A1
Diagnostic address	80
Communication	Hybrid CAN node
Terminal designations 12 Volt positive/negative	30 / 31
Nominal voltage	12 Volt
Number of cells	4
Capacitance	11 Ah
Usable energy	0.15 kWh
Operating temperature	-30 °C to 65 °C
Weight	Approx. 5 kg, without protective housing
Cooling	Air (passive)
Fitting location	Plenum chamber (right-side), in protective housing

Construction of battery

The two halves of the housing are laser welded together. They are also sealed with liquid sealant.
There is no provision for replacing battery cells or other individual components inside the battery.



Note
When handling lithium-ion batteries, please observe all the legal requirements in your country as well as all the safety notes and work instructions in the service literature and in the Guided Fault Finding programs in ODIS.

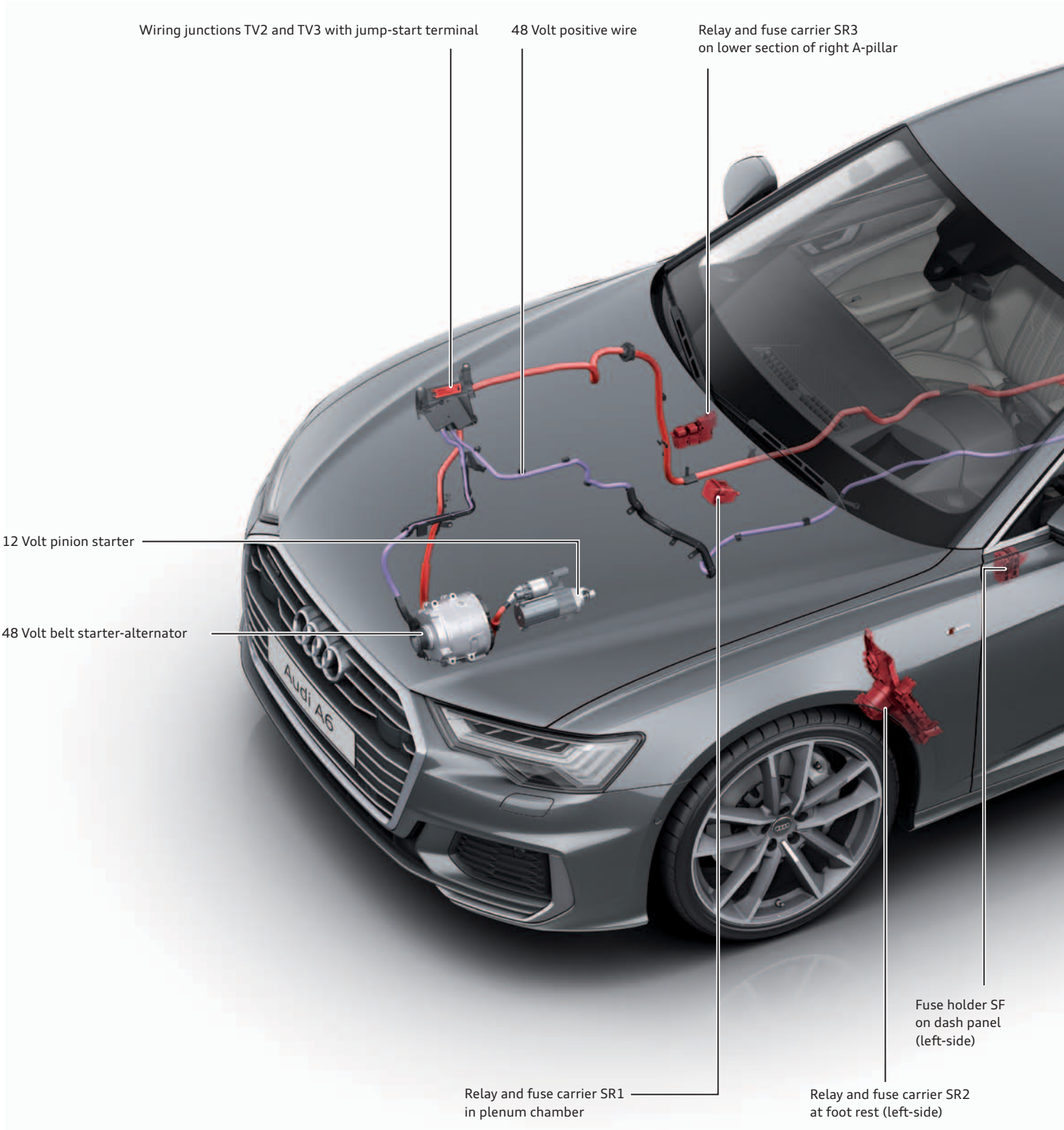

Control unit
Relay
Terminal stud
Positive battery terminal
Terminal stud
Negative battery terminal
Bus bars
Battery housing
Connector

670_050

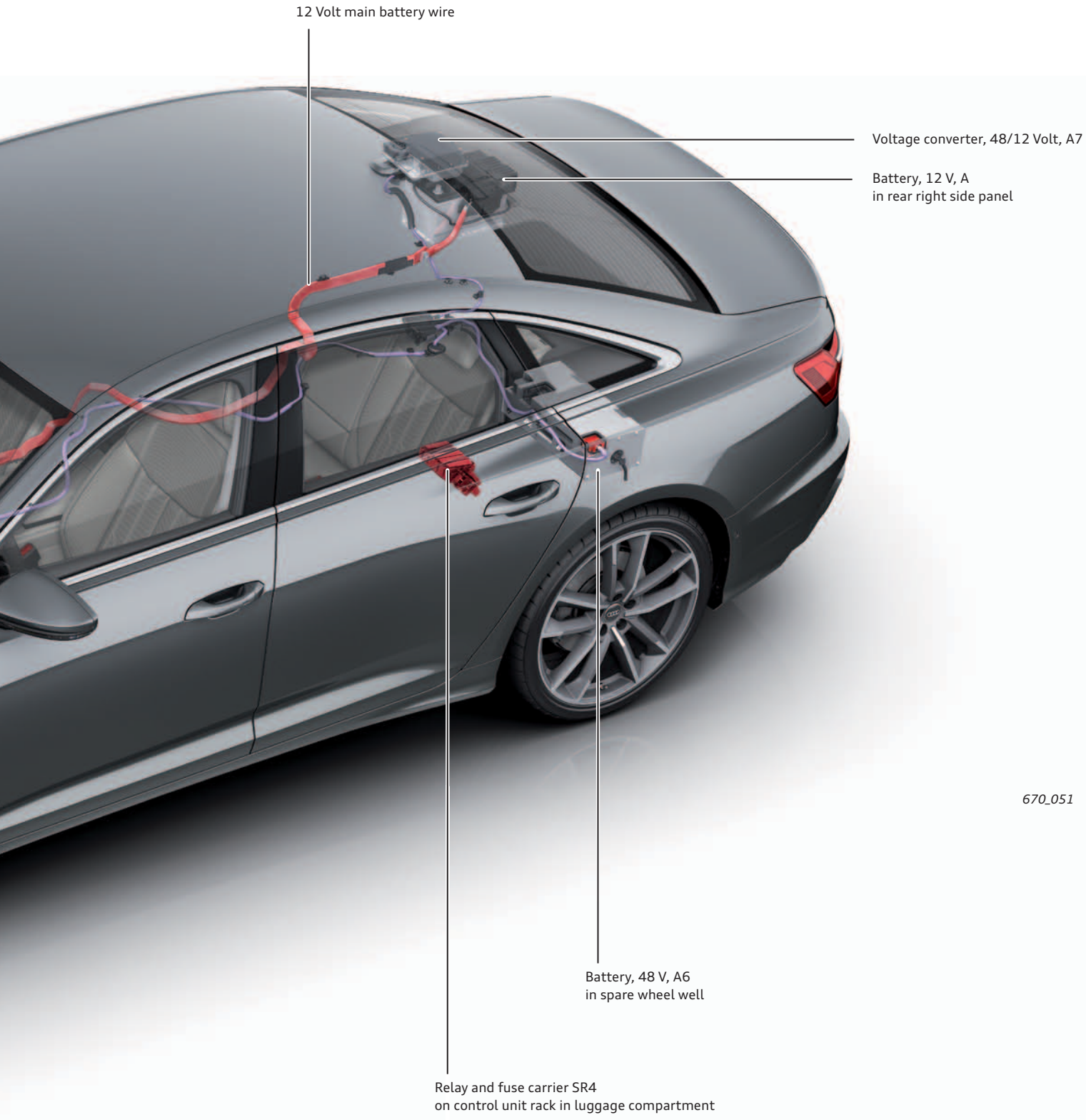
48 Volt MHEV electrical system

The Audi A6 (type 4A) models with 6-cylinder engine are 48 Volt MHEVs. They require a voltage converter in addition to the 48 Volt lithium-ion battery and a 48 Volt starter-alternator. This converts the voltage from 48 Volts to 12 Volts to charge the 12 Volt battery.

The fitting locations of the batteries, the voltage converter, the 12 Volt pinion starter and the 48 Volt starter-alternator are, along with their functions and layout, identical to the components in the Audi A8.



The fitting locations of the relay and fuse carriers hardly differ from the Audi A8 (type 4N), as can be seen in the illustration below. As the layout and functions of the electrical system components on the Audi A6 (type 4A) do not differ from those described for the Audi A8 (type 4N), please refer to SSP 664 “Audi A8 (type 4N) Electrics and electronics” for descriptions thereof.



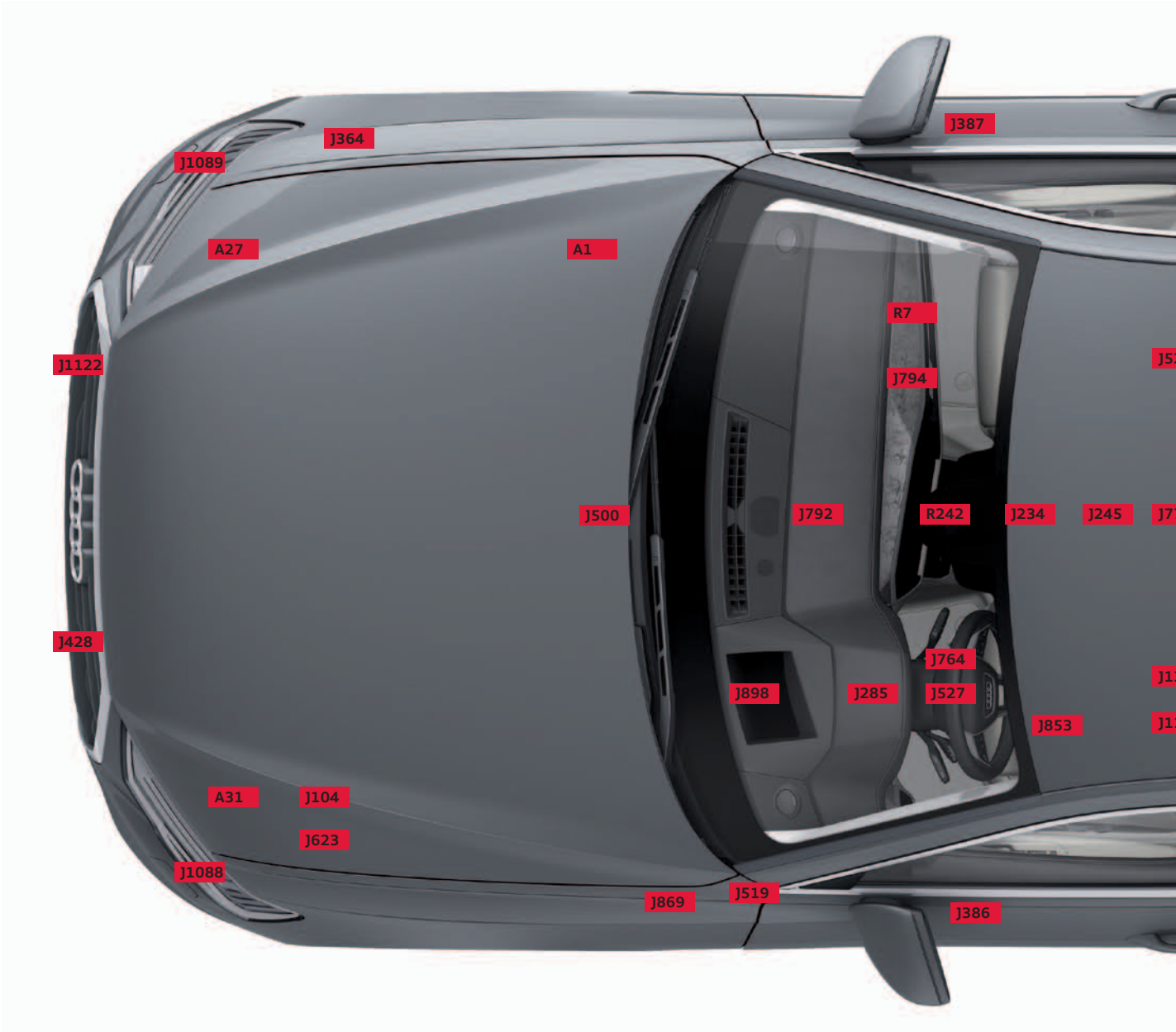
Reference
For further information about mild hybrid functions, refer to self-study programme 664 "Audi A8 (type 4N) Electrics and electronics”.

Networking

Fitting locations of control units

Some of the control units shown in this overview are optional and/or country-specific equipment. For reasons of clarity, not all control units fitted in the vehicle can be shown here.

Refer to the current service literature for details of control unit fitting locations, as well as instructions for installation and removal.

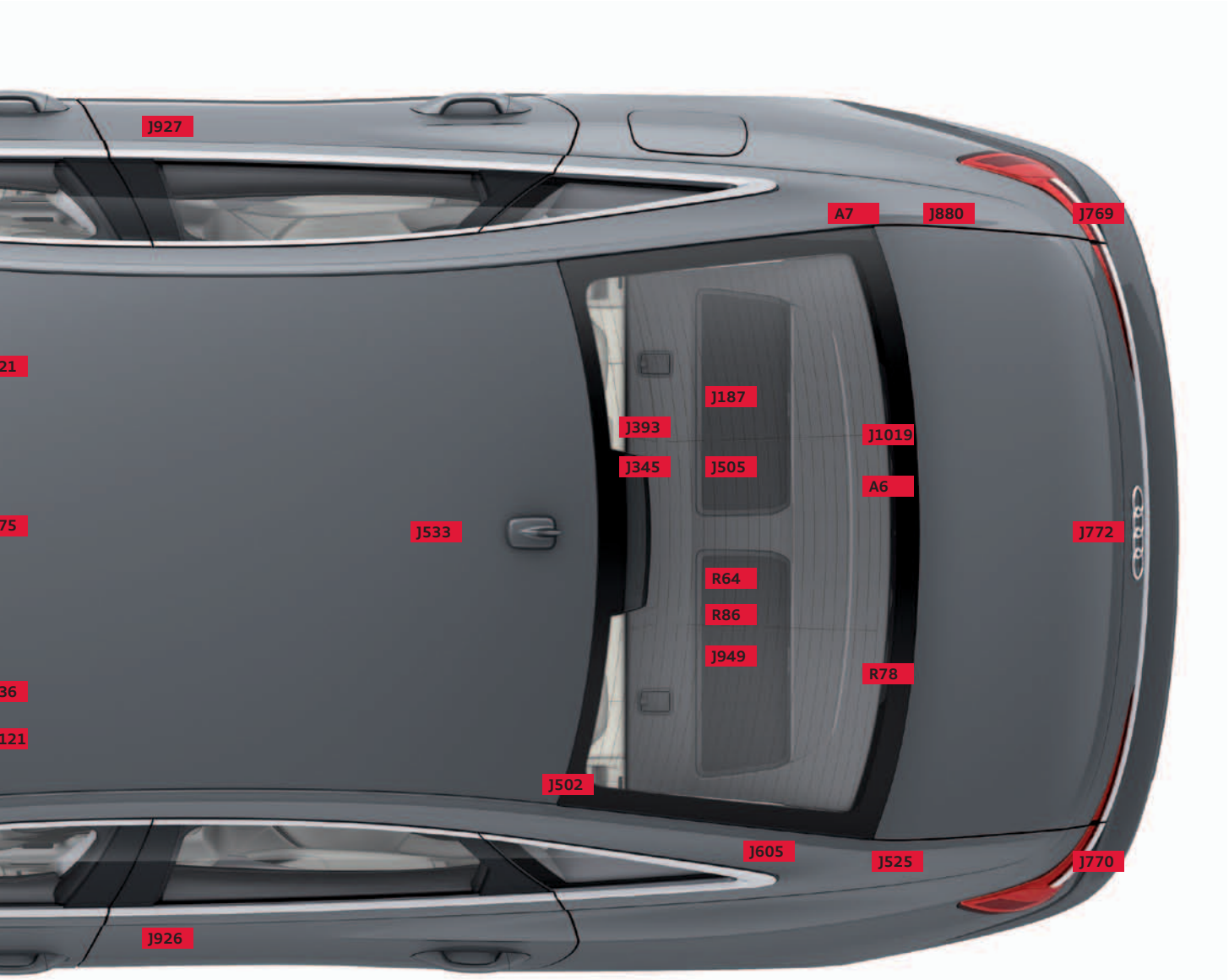


Key:

A1	Second battery
A6	Battery, 48 V
A7[1)]	Voltage converter (48 V/12V)
A27	Output module 1 for right LED headlight
A31	Output module 1 for left LED headlight
J104	ABS control unit
J136	Seat and steering column adjustment control unit with memory
J187	Differential lock control unit
J234	Airbag control unit
J245	Sliding sunroof adjustment control unit
J285	Control unit in dash panel insert
J345	Trailer detector control unit
J364	Auxiliary heater control unit
J386	Driver door control unit
J387	Front passenger door control unit
J393	Convenience system central control unit
J428	Adaptive cruise control unit
J500	Power steering control unit
J502	Tyre Pressure Monitoring System control unit
J505	Heated windscreen control unit
J519	Onboard supply control unit
J521	Front passenger seat adjustment with memory control unit
J525	Digital sound package control unit
J527	Steering column electronics control unit
J533	Data bus diagnostic interface
J605	Rear lid control unit
J623	Engine control unit

The biggest difference between the Audi A6 (type 4A) and the Audi A8 (type 4N) regarding the fitting locations of the control units results from the luggage compartment concept.

This necessitated the use of a rack to hold a large number of control units in the luggage compartment of the Audi A6 (type 4A). On the Audi A8 (type 4N), these control units were fitted behind the luggage compartment trim on both sides.



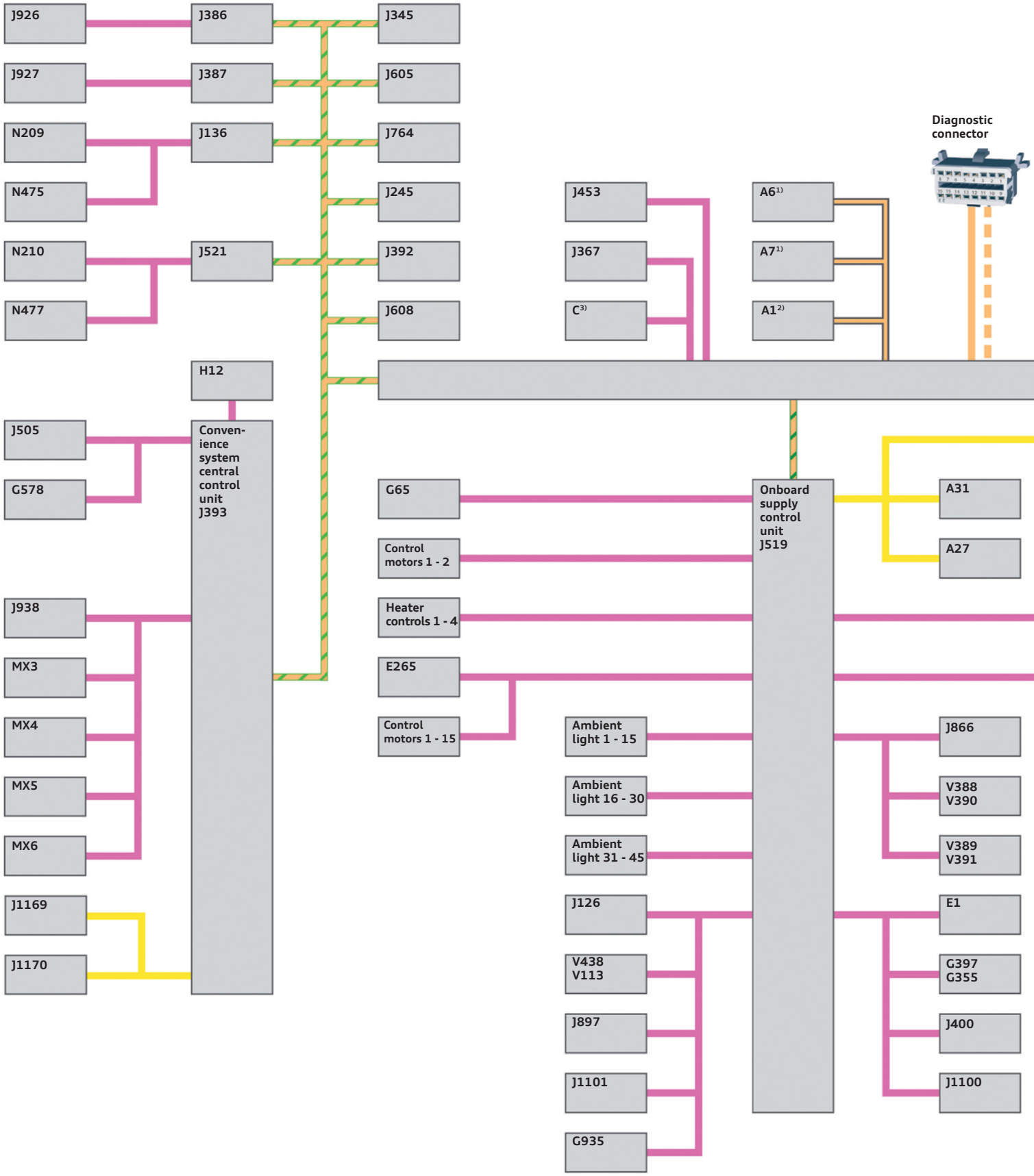
670_052

J764 Control unit for electronic steering column lock
J769 Lane change assist control unit
J770 Lane change assist control unit 2
J772 Reversing camera system control unit
J775 Running gear control unit
J792 Active steering control unit
J794 Control unit 1 for information electronics
J853 Control unit for night vision system
J869 Control unit for structure-borne sound
J880 Control unit for reducing agent metering system
J898 Control unit for head-up display
J926 Rear driver side door control unit
J927 Rear passenger side door control unit
J949 Emergency call module control unit and communication unit

J1019 Rear wheel steering control unit
J1088 Front left radar sensor control unit for object detection
J1089 Front right radar sensor control unit for object detection
J1121 Driver assist systems control unit
J1122 Control unit for laser distance control

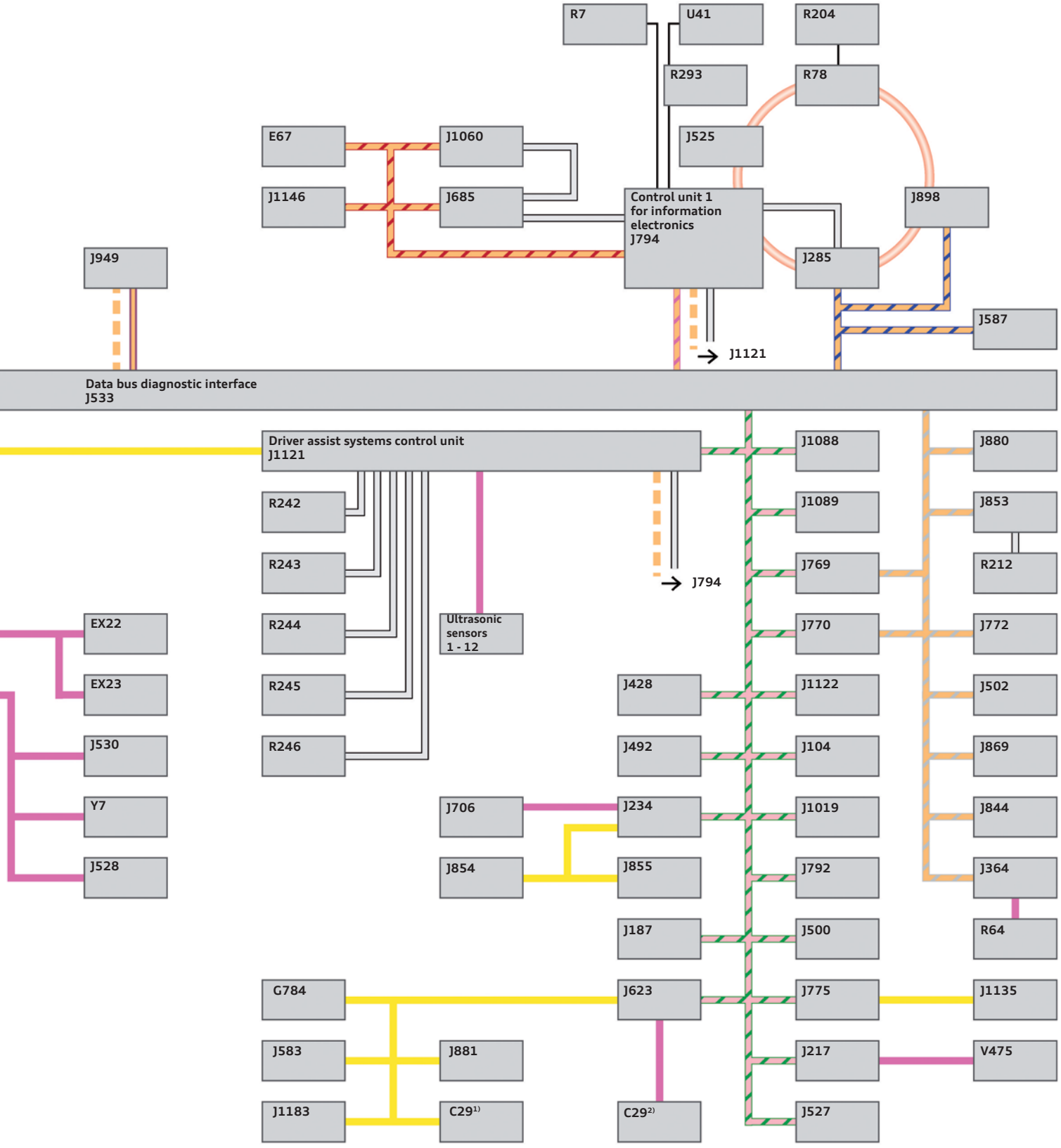
R7 DVD player
R64 Remote control receiver for auxiliary heater
R78 TV tuner
R86 Aerial amplifier for mobile telephone
R242 Front camera for driver assist systems

Topology



Key:

- Convenience CAN
- Hybrid CAN
- Extended CAN
- Infotainment CAN
- Sub-bus systems/private CAN
- MOST bus
- LVDS
- Dash panel insert CAN
- Diagnostics CAN
- FlexRay
- Modular infotainment matrix CAN (MIB)
- LIN bus
- USB wires
- Ethernet connection
- Convenience CAN 2
- Connect CAN



670_053

1) 48 Volt MHEV only
2) 12 Volt MHEV only
3) Vehicles without an additional lithium-ion battery only

For presentation reasons, the FlexRay topology does not mirror the actual configuration of the control units. The order of the control units in the MOST ring in this illustration is also not identical to the actual sequence.

Key:

A1 Second battery
A6[1)] Battery, 48 V
A7[1)] Voltage converter (48 V/12V)
A27 Output module 1 for right LED headlight
A31 Output module 1 for left LED headlight
C Alternator
C29 Starter-alternator
E1 Light switch
E67 Driver side volume regulator
E265 Operating and display unit for rear air conditioning system
EX22 Centre switch module in dash panel
EX23 Switch module 1 in centre console
G65 High-pressure sender
G355 Humidity sender
G397 Rain and light sensor
G578 Anti-theft alarm sensor
G784 Particulate sensor
G935 External air quality and air humidity sensor
H12 Alarm horn
J104 ABS control unit
J126 Fresh air blower control unit
J136 Seat and steering column adjustment control unit with memory
J187 Differential lock control unit
J217 Automatic gearbox control unit
J234 Airbag control unit
J245 Sliding sunroof adjustment control unit
J285 Control unit in dash panel insert
J345 Trailer detector control unit
J364 Auxiliary heater control unit
J367 Battery monitor control unit
J386 Driver door control unit
J387 Front passenger door control unit
J392 Rear sliding sunroof control unit
J400 Wiper motor control unit
J428 Adaptive cruise control unit
J453 Multifunction steering wheel control unit
J492 Four-wheel drive control unit
J500 Power steering control unit
J502 Tyre Pressure Monitoring System control unit
J505 Heated windscreen control unit
J521 Front passenger seat adjustment with memory control unit
J525 Digital sound package control unit
J527 Steering column electronics control unit
J528 Roof electronics control unit
J530 Garage door operation control unit
J583 Control unit for NO_x sender
J587 Selector lever sensors control unit
J605 Rear lid control unit
J608 Special vehicle control unit
J623 Engine control unit
J685 MMI display
J706 Seat occupied recognition control unit
J764 Control unit for electronic steering column lock
J769 Lane change assist control unit
J770 Lane change assist control unit 2
J772 Reversing camera system control unit
J775 Running gear control unit
J792 Active steering control unit
J844 Main beam assist control unit
J853 Control unit for night vision system
J854 Control unit for front left belt tensioner
J855 Control unit for front right belt tensioner
J866 Control unit for electrically adjustable steering column
J869 Control unit for structure-borne sound
J880 Control unit for reducing agent metering system
J881 Control unit for NO_x sender 2
J897 Control unit for air ionisation system
J898 Control unit for head-up display
J926 Rear driver side door control unit
J927 Rear passenger side door control unit
J938 Rear lid power opening control unit
J949 Emergency call module control unit and communication unit
J1019 Rear wheel steering control unit
J1060 Lower touch display
J1088 Front left radar sensor control unit for object detection
J1089 Front right radar sensor control unit for object detection
J1100 Windscreen washer pump control unit
J1101 Control unit for fragrance diffuser system
J1122 Control unit for laser distance control
J1135 Adaptive suspension compressor electronics
J1146 Charging unit 1 for mobile devices
J1169 Near field communication control unit
J1170 Near field communication control unit 2
J1183 Control unit for NO_x sender 3
MX3 Left tail light
MX4 Right tail light
MX5 Left tail light 2
MX6 Right tail light 2

Key:

N209	Lumbar support adjustment valve block on driver side
N210	Lumbar support adjustment valve block on front passenger side
N475	Valve block 1 in driver seat
N477	Valve block 1 in front passenger seat
R7	DVD player
R64	Remote control receiver for auxiliary heater
R78	TV tuner
R204	TV card reader
R212	Camera for night vision system
R242	Front camera for driver assistance systems
R243	Front overhead view camera
R244	Left overhead view camera
R245	Right overhead view camera
R246	Rear overhead view camera
R293	USB hub
U41	USB connection 1
V113	Air recirculation flap control motor
V388	Driver seat backrest fan
V389	Front passenger seat backrest fan
V390	Driver seat cushion fan
V391	Front passenger seat cushion fan
V438	Fresh air flap control motor
V475	Auxiliary hydraulic pump 1 for gearbox oil
Y7	Automatic anti-dazzle interior mirror

Bus systems used in the Audi A6 (type 4A)

The bus systems used in the Audi A6 (type 4A) are known from the Audi A8. The only new feature is connect CAN, which connects the emergency call module control unit and communication unit J949 to the gateway.

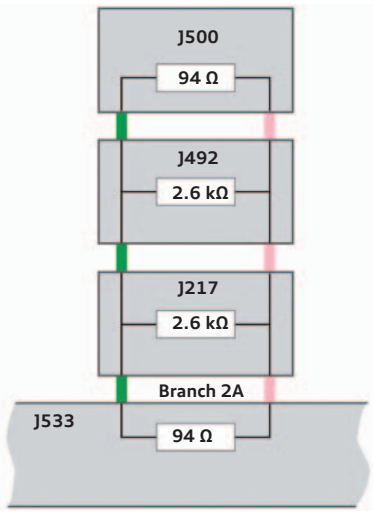
Bus system	Wire colour	Configuration	Data transfer rate
Connect CAN		Electrical bus system	500 kbit/s

FlexRay

The FlexRay topology of the Audi A6 is identical to that of the Audi A8 (type 4N). However, the four-wheel drive control unit J492 may also be connected at branch 2A.

Key:

J217	Automatic gearbox control unit
J492	Four-wheel drive control unit
J500	Power steering control unit
J533	Data bus diagnostic interface (gateway)



670_054

Reference
For further information about FlexRay, refer to self-study programme 664 "Audi A8 (type 4N) Electrics and electronics".

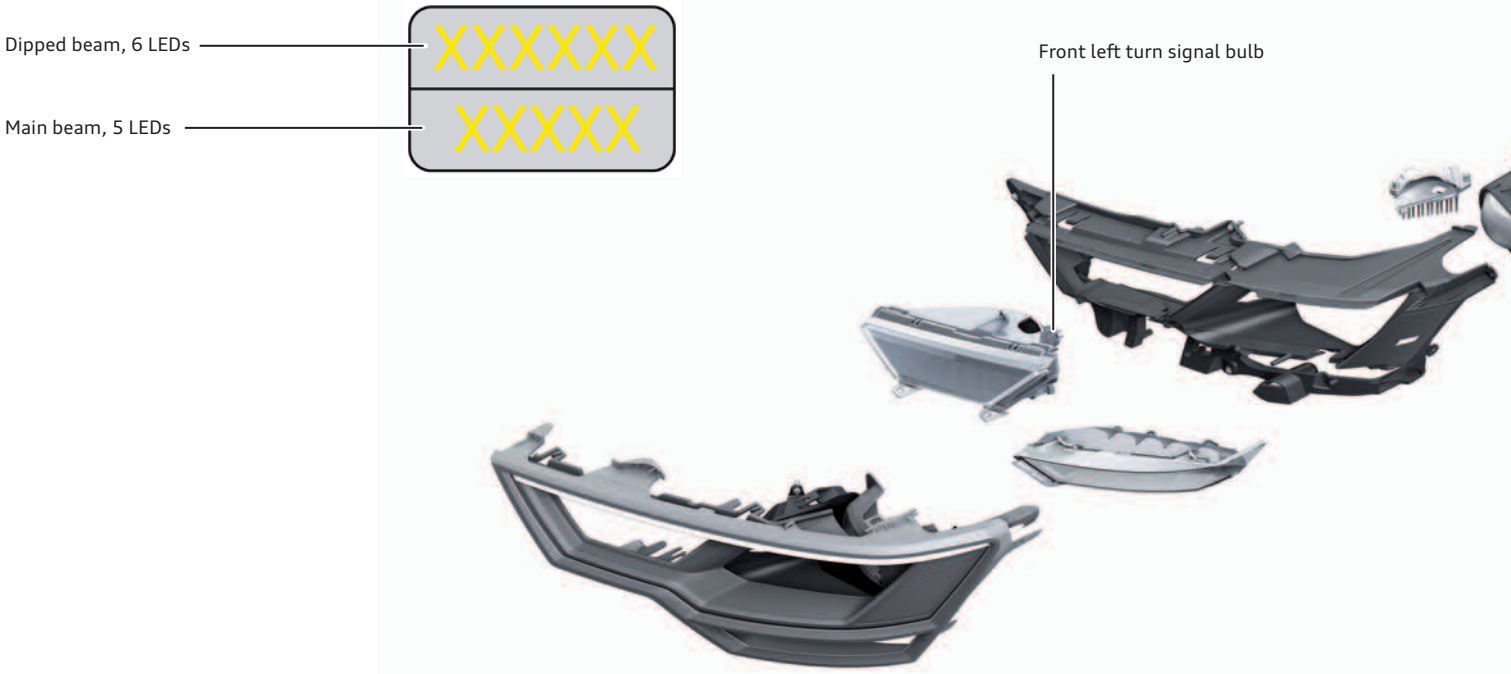
Exterior lighting

Headlights

LED headlights (PR No.: 8IT + 8G1/8G0)

Available as ECE[1] and SAE[2] version.
The illustration shows the left headlight in the ECE[1] version.

670_055



Lighting functions

- Daytime running light
- Side light
- Dipped beam
- Main beam
- All-weather light
- Turn signal
- Side marker light (SAE only[2], not illustrated)

Special features of the lighting functions

The daytime running lights (“turn signals during the day”) and the marker light (“turn signals at night) remain active while the turn signals are active. This applies to both the ECE[1] and the SAE[2] versions.

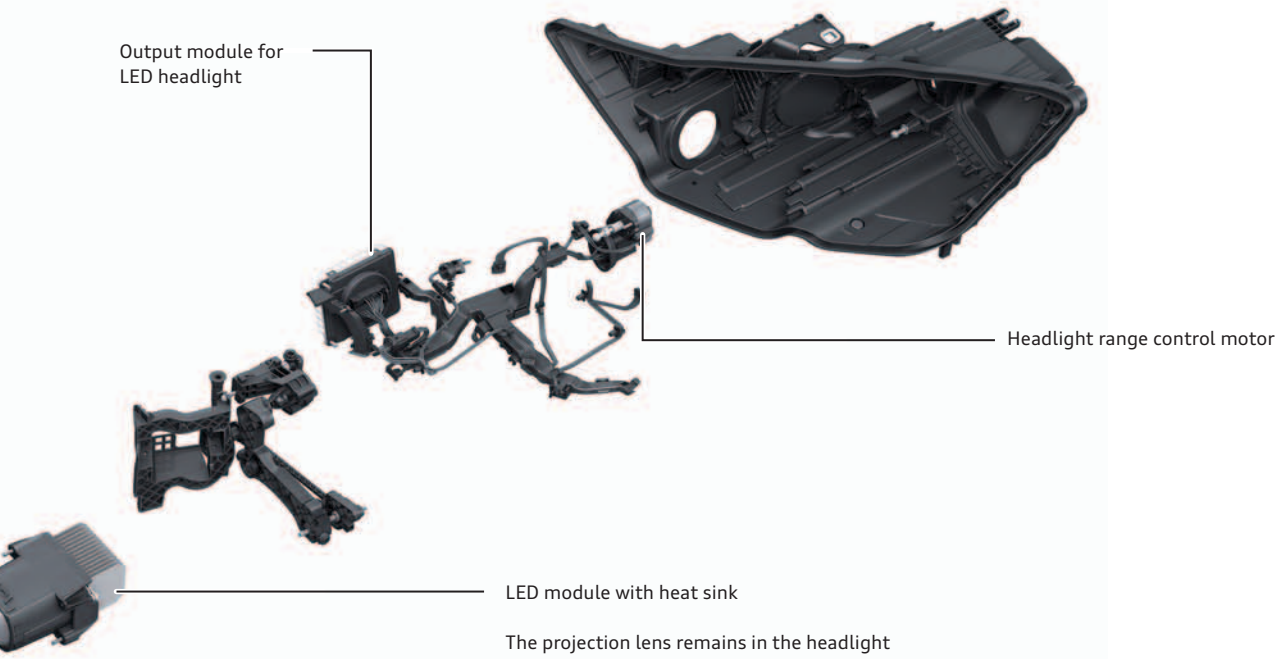
Adjusting headlights for driving on other side of road

It is not necessary to adjust the headlights. The legal requirements are met without additional measures.

[1] ECE = for the European market
[2] SAE = for the North American market

An LED headlight is available as standard for the Audi A6 (type 4A). With one exception, all lighting functions are performed by LEDs. The turn signal is produced by a 24 W bulb. The LEDs for the dipped beam and the main beam are fitted in a projection module. In the top row, the dipped beam is generated by 6 LEDs.

In the bottom row, 5 LEDs are used for the main beam function. Thanks to its comparatively simple construction, the LED headlight is the lightest of the three headlights available for the Audi A6 with a weight of approximately 4.5 kg.



670_056

The projection lens remains in the headlight if the LED module is replaced.

Equipment

The LED headlights can be combined with the main beam assist as an option. A headlight washer system is also available optionally.

Headlight range adjustment

The LED headlights are equipped with automatic dynamic headlight range adjustment.

Service

The control unit fitted on the outside of the headlight housing, the bulb module for the turn signal, the LED module, and the headlight range control motor (ECE[1)] only) can be renewed in the event of a defect. The LED module and the control motor can only be renewed on the ECE[1)] version. In the event of damage to the upper and inner headlight attachments, repair tabs can be attached to the headlight housing.

It is very important to keep the inside of the headlight as clean as possible when renewing components in the inside of the headlight. It is also recommended to use the ESD workplace VAS 6613 to prevent electrostatic discharge. Wear gloves and avoid touching components to protect the parts of the optical system relevant to lighting. Renewing the LED module is a very delicate procedure and requires precise skill from the mechanic.

Smart matrix LED headlights (PR No.: 8IT + 8G4)

Available as ECE[1] and SAE[2] version.
The illustration shows the left headlight in the ECE[1] version.

670_057

Lighting functions

- Daytime running light
- Marker light
- Dipped beam
- Matrix beam main beam
- Turn signal
- All-weather light
- Turning light
- Intersection light (in combination with navigation system)
- Motorway light
- Cornering light
- Side marker light (SAE only[2], not illustrated)

Special features of the lighting functions

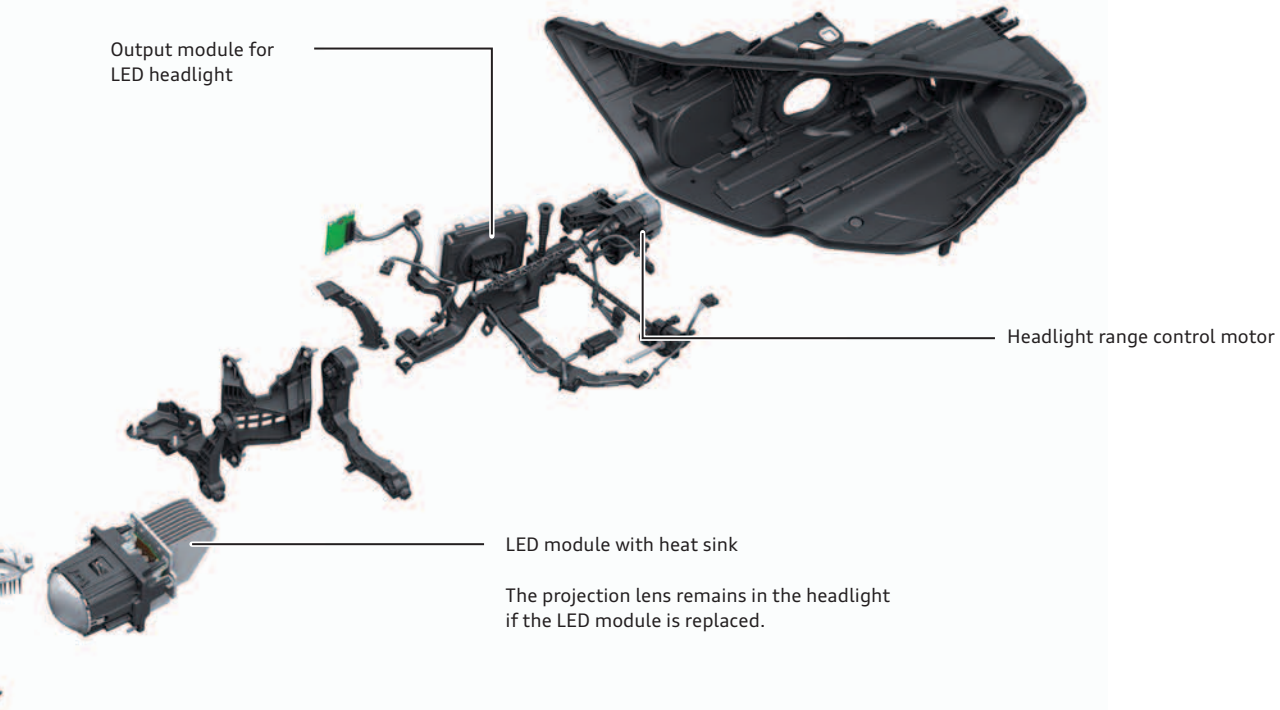
Turn signals during the day:
On the ECE[1] version, the daytime running light is dimmed to marker light level when the turn signal is activated.
On the SAE[2] version, the daytime running lights are switched off during the turn signal procedure.

Turn signals at night:
On both the ECE[1] and SAE[2] versions, the marker light remains active according to the legal requirements for the North American market.

[1] ECE = for the European market
[2] SAE = for the North American market

The smart matrix LED headlight has a one-row matrix main beam. According to the traffic situation detected, 7 LEDs can be switched off individually to avoid dazzling vehicles ahead or oncoming vehicles.

The dipped beam is generated by 8 LEDs. On this headlight version, all lighting functions are performed by LEDs.



670_058

Adjusting headlights for driving on other side of road

It is not necessary to adjust the headlights. The legal requirements are met without additional measures.

Equipment

The Audi A6 (type 4A) with smart matrix LED headlights is fitted with a headlight washer system as standard.

Headlight range adjustment

The smart matrix LED headlights are equipped with automatic dynamic headlight range adjustment.

Service

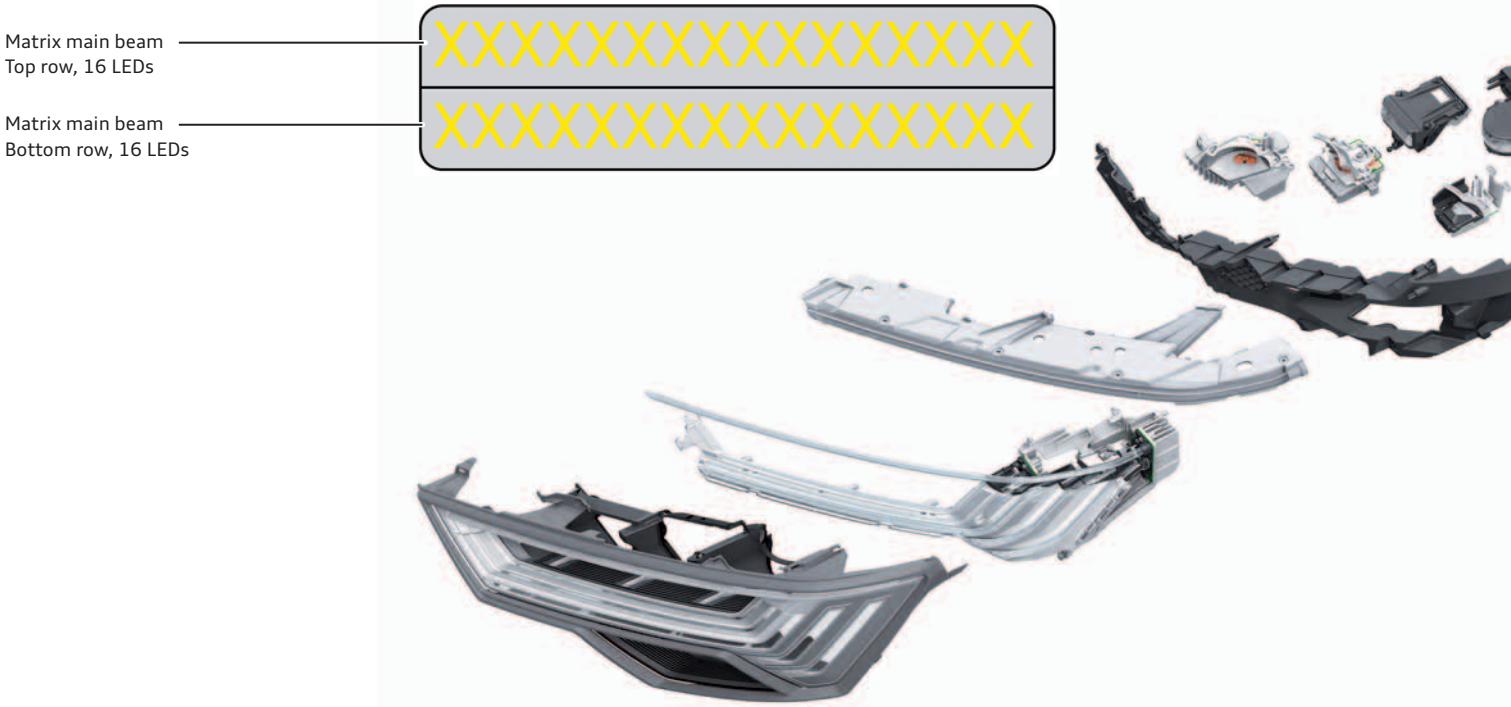
The control unit fitted to the outside of the headlight housing, the LED module (one assembly group for the dipped beam and one assembly group for the main beam) and the headlight range control motor can be renewed in the event of a defect. The LED module and the control motor can only be renewed on the ECE[1)] version.
In the event of damage to the upper and inner headlight attachments, repair tabs can be attached to the headlight housing.

It is very important to keep the inside of the headlight as clean as possible when renewing components in the inside of the headlight. It is also recommended to use the ESD workplace VAS 6613 to prevent electrostatic discharge.
Wear gloves and avoid touching components to protect the parts of the optical system relevant to lighting. Renewing the LED modules is a very delicate procedure and requires precise skill from the mechanic.

HD matrix LED headlights (PR No.: 8IT + 8G5)

Available as ECE[1] and SAE[2] version.
The illustration shows the left headlight in the ECE[1] version.

670_059



Lighting functions

- Dynamic daytime running light
- Dynamic marker light
- Dipped beam
- Matrix beam main beam
- Dynamic turn signal
- All-weather light
- Turning light
- Motorway light
- Cornering light
- Intersection light (in combination with navigation system)
- Side marker light (SAE only[2], not illustrated)

Special features of the lighting functions

Turn signals during the day:
On the ECE[1] version, the daytime running light is dimmed to marker light level when the turn signal is activated.
On the SAE[2] version, the daytime running lights are switched off during the turn signal procedure.

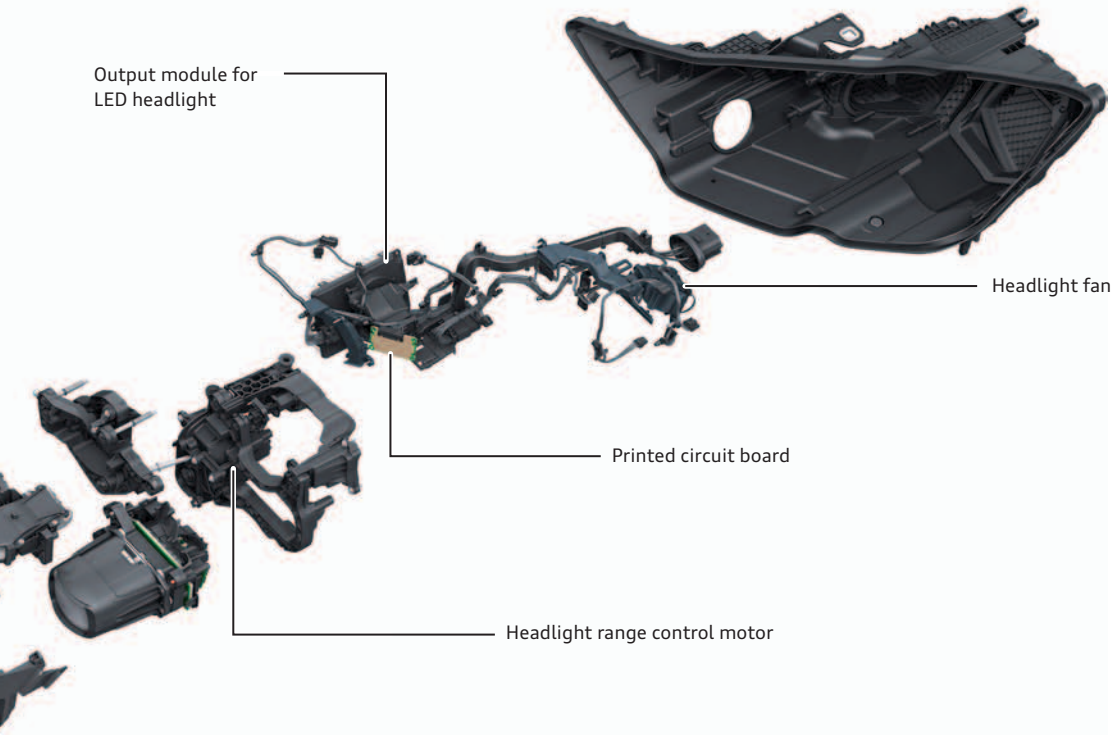
Turn signals at night:
The marker light remains active on both the ECE[1] and SAE[2] versions.

The turn signal is dynamic. The marker light and daytime running light are also dynamic and are activated at different moments as part of the “coming/leaving home” function.

[1] ECE = for the European market
[2] SAE = for the North American market

The Audi designation for the two-row matrix headlights first introduced in the Audi A8 (type 4N) is HD (high definition) matrix LED headlights, or matrix 2.0. In this system, the matrix main beam is generated by two rows of LEDs containing 16 LEDs each. With 64 LEDs in the two headlights, it is therefore possible to achieve a very finely graded reduction in the light to avoid dazzling other road users.

Because of its complex construction, the HD matrix LED headlight is the heaviest of the three headlight versions available for the Audi A6 (type 4A).



670_060

Adjusting headlights for driving on other side of road

It is not necessary to adjust the headlights. The legal requirements are met without additional measures.

Equipment

The Audi A6 (type 4A) with HD matrix LED headlights is fitted with a headlight washer system as standard.

Headlight range adjustment

The HD matrix LED headlights are equipped with automatic dynamic headlight range adjustment.

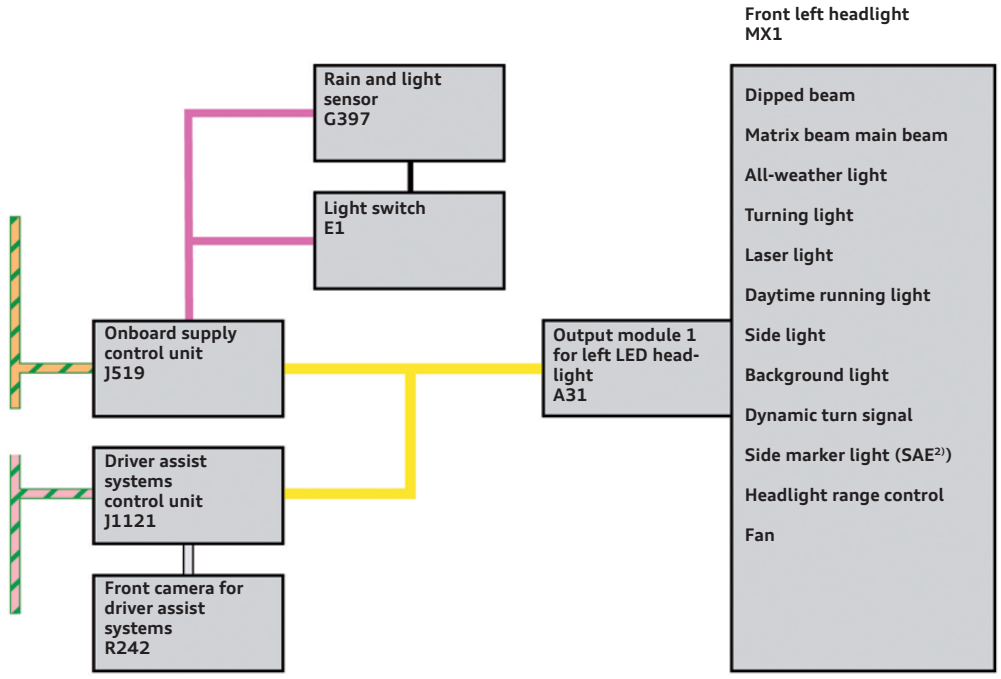
Service

The control unit fitted on the outside of the headlight housing, the printed circuit board, the fan, and the headlight range control motor can be renewed in the event of a defect.
In the event of damage to the upper and inner headlight attachments, repair tabs can be attached to the headlight housing.

It is very important to keep the inside of the headlight as clean as possible when renewing components in the inside of the headlight. It is also recommended to use the ESD workplace VAS 6613 to prevent electrostatic discharge.
Wear gloves and avoid touching components to protect the parts of the optical system relevant to lighting. Renewing the printed circuit board and the fan is a very delicate procedure and requires precise skill from the mechanic.

Activation of matrix LED headlights

Illustration for left headlight



670_061

Key:

- Convenience CAN 2
- FlexRay
- Sub-bus systems
- LVDS
- LIN bus

Activation

The onboard supply control unit J519 communicates with output module 1 for left/right LED headlight (A31/A27) via a sub-bus system.
These output modules activate all lighting functions, the headlight range control motors and, on the matrix headlights, the fan(s).

The control units are capable of self-diagnosis and can be accessed via diagnostic addresses 00D6/00D7.
The illustration shows an example of the communication paths and the components involved. The activation process inside the headlight is not relevant for repairs and therefore not shown specifically.

Main beam assist

Together with the front camera for driver assist systems R242, the driver assist systems control unit J1121 is responsible for the main beam assist function. If the camera detects oncoming vehicles or vehicles ahead, it passes this information on to the driver assist systems control unit J1121.

J1121 calculates which LEDs in the matrix headlights need to be switched off to avoid dazzling other road users. This information is sent to the output modules via the sub-bus system.
On the LED headlights, only two conditions are possible: “main beams on” or “main beams off”.

2) SAE = for the North American market

Calibrating matrix LED headlights

Calibration of the matrix headlights is always required after the following work:

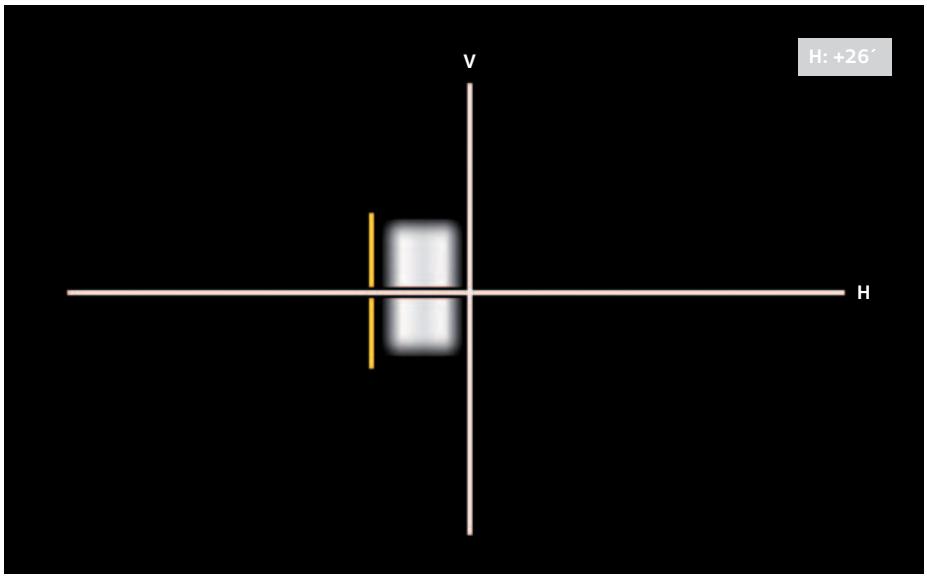
- Headlight position was changed (removed/installed, securing bolts loosened).
- Headlights were adjusted.
- Running gear control unit J775 was recalibrated or renewed.
- Driver assist systems control unit J1121 was replaced.
- Rear left vehicle level sender G76, rear right vehicle level sender G77, front left vehicle level sender G78 or front right vehicle level sender G289 has been renewed.
- The event memory contains the entry "No or incorrect basic setting / adaption".

Aligning reference segment

As with the first generation of the matrix LED headlight, the reference segment is measured using the headlight adjustment unit VAS 621 001 as the first step of the calibration process. The deviation value is then sent to the driver assist systems control unit J1121 with the help of the vehicle diagnostic tester. The yellow line on the image shows which edge the reference segment is being aligned to. In this example, a horizontal deviation of +26 minutes has been determined.

When the dipped beams are adjusted, the height of the matrix beam main beam module is also corrected due to the inner layout of the HD matrix LED headlight. When the matrix beam main beams are then calibrated, it is sufficient to determine the horizontal deviation of the reference segment. This means that the calibration procedure for the one-row smart matrix and the two-row HD matrix LED headlight is the same.

The illustration shows the reference segment of the left matrix LED headlight



670_062

Note
Up-to-date service literature must be used for all checking, repair and adjustment work.

Tail lights

General description

The rear of the Audi A6 (type 4A) is lit using a total of four tail lights. A tail light is installed in the left/right side panel.

Two further tail lights are housed in the rear lid. Only LED lights are used.

Versions

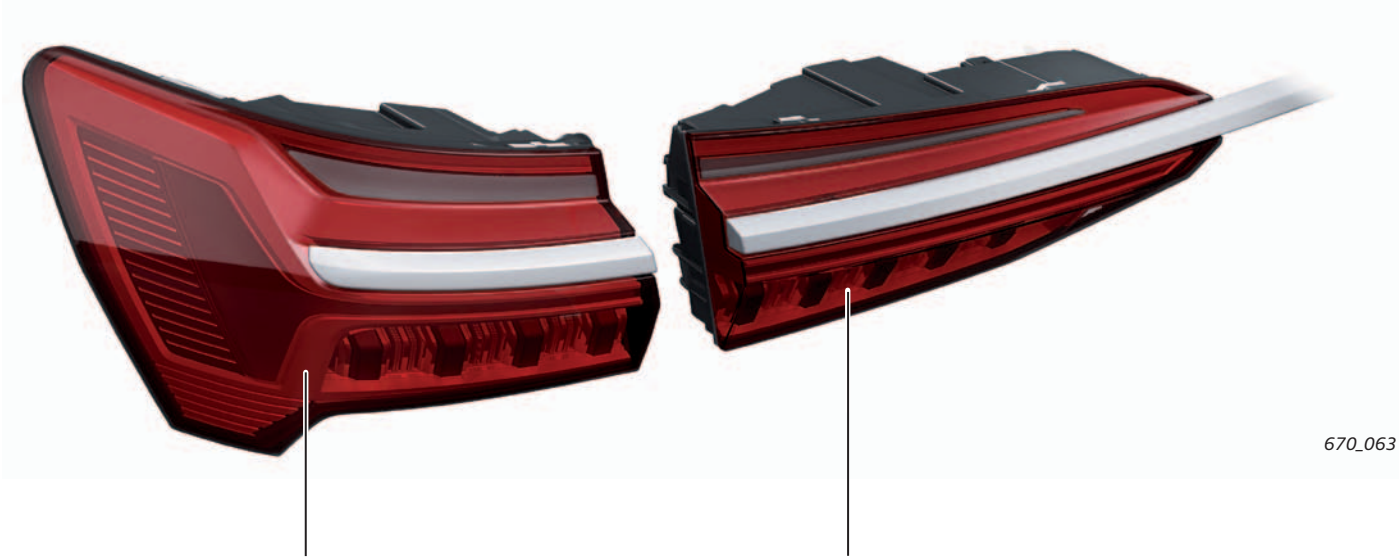
The tail lights appear in the following principal versions:

- LED tail lights (low)
- LED tail lights (mid) with dynamic turn signals
- LED tail lights (high) with dynamic turn signals and dynamic tail lights

PR No. 8SK (ECE[1)] only)
PR No: 8SP (ECE[1)] and SAE[2)])

PR No: 8SQ (ECE[1)] and SAE[2)])

The illustration shows the 8SQ tail lights in the ECE[1)] version.



The tail light versions are geometrically identical. The design varies between the ECE[1)] and SAE[2)] versions. There are differences in the functions and the activation of the tail lights.
The highest equipment version (PR no. 8SQ) is equipped with dynamic turn signals and dynamic tail lights.

Dynamic tail light means that:
The tail lights are lit up gradually when terminal 15 is activated. The tail light LEDs are activated at different moments as part of the “coming/leaving home” function.

Activation

The tail lights are activated by the convenience system central control unit J393.
On the 8SQ version, the tail lights are connected to J393 via a LIN data wire in addition to the discrete wires.

On this tail light version, the dynamic turn signal and dynamic tail light commands are sent via the LIN data wire.

1) ECE = for the European market
2) SAE = for the North American market

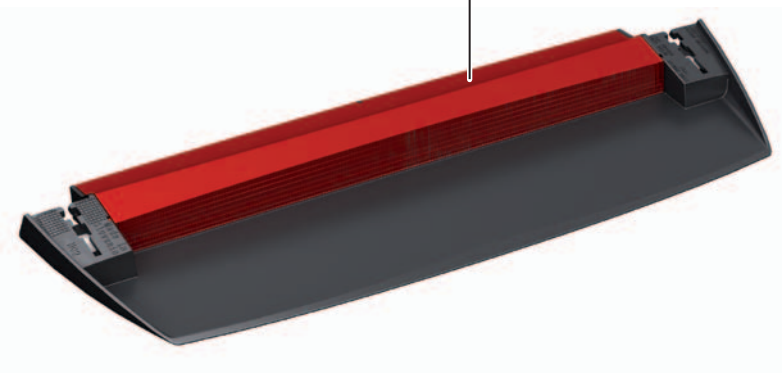
High-level brake lights

Audi A6 Saloon

On the Saloon, the high-level brake light is located inside the vehicle behind the rear window. 18 LEDs with a power output of 3.2 W support the brake light function. In the event of a fault, the high-level brake light must be renewed as a complete unit.

If the Audi A6 Saloon is fitted with privacy glass, 18 LEDs with a power output of 8.7 W are used to compensate for the light absorbed by the tinted glass.

The image shows the high-level brake light on a vehicle with standard glass.
The glass panel is transparent rather than red on vehicles with privacy glass.



670_064

Audi A6 Avant

On the Avant, the high-level brake light is integrated in the rear spoiler. The 18 LEDs have a power output of 1.8 W.

In the event of a fault, the high-level brake light must be renewed as a complete unit after the rear spoiler has been renewed.

670_065

Window washer system

Adaptive wipers with integrated washer jets (wet wiper arm), PR no. 9PF

General description

As on the Audi A8 (type 4N) and the Audi A7 (type 4K), two different window washer systems are available for the Audi A6 (type 4A). There is a window washer system with washer jets in the bonnet and, as an option, the adaptive wipers with integrated washer jets. This system is often referred to as a wet wiper arm system. In this equipment version, the washer jets are integrated in the wiper arms and fitted both above and below the wiper blades. The jet tubes in each wiper arm are fitted with a heater.

The washer fluid is sprayed onto the glass as required directly next to the wiper blade. Compared to the standard window washer system, this produces an improved cleaning effect while reducing washer fluid consumption. In addition, water is not sprayed over a large area of the windscreen, meaning that a clear view is maintained during the washing procedure for the benefit for road safety.
Vehicles with the optional wet wiper arm system use a newly developed control unit; the windscreen washer pump control unit J1100.

Washer jets active above wiper blade

670_066

Washer jets active below wiper blade

670_067

Reference
A detailed description of the wet wiper arm system can be found in self-study programme 664 "Audi A8 (type 4N) Electrics and electronics".

Wet wiper arm on Audi A6 Avant

Audi A6 Avant vehicles are also fitted with a rear window wiper and a rear window washer system.
If the customer chooses the adaptive wipers with integrated washer jets, the rear window wiper is also provided as a wet wiper arm. However, the washer jets on the rear window wiper arm are only fitted on one side of the arm.

The rear window washer system is operated via the wiper lever in the usual way. If the wiper lever is operated, the rear window washer pump is activated and transports washer fluid to the washer jets in the wiper arm. If the Audi A6 Avant is also equipped with a reversing camera, this is always also cleaned in addition to the rear window.

670_068

Washer fluid pumps

The headlight washer system pump V11 is a mono pump and cleans the headlights and the camera for night vision system R212 at the same time.
Depending on the vehicle's equipment, the washer pump V5 and the rear window washer pump V13 may be mono washer pumps or dual washer pumps.

The following table provides an overview of the versions and tasks of pumps V5 and V13 in relation to the vehicle equipment.

Equipment	V5	V13	V5 connection 1	V5 connection 2	V13 connection 1	V13 connection 2
Window washer system	Mono	–	Washer jets	–	–	–
Window washer system + reversing camera + rear window washer system	Dual	–	Washer jets	Revers. camera + rear window washer system	–	–
Window washer system + laser scanner	Mono	Mono	Washer jets	–	Laser scanner	–
Window washer system + reversing camera + rear window washer system + laser scanner	Mono	Dual	Washer jets	–	Laser scanner	Reversing camera + rear window washer system
Wet wiper arm	Dual	–	Wet wiper arm (downwards)	Wet wiper arm (upwards)	–	–
Wet wiper arm + reversing camera + rear window washer system	Dual	Mono	Wet wiper arm (downwards)	Wet wiper arm (upwards)	Revers. camera + rear window washer system	–
Wet wiper arm + laser scanner	Dual	Mono	Wet wiper arm (downwards)	Wet wiper arm (upwards)	Laser scanner	–
Wet wiper arm + reversing camera + laser scanner + rear window washer system	Dual	Dual	Wet wiper arm (downwards)	Wet wiper arm (upwards)	Laser scanner	Reversing camera + rear window washer system

Convenience electronics on Audi A6 and Audi A6 Avant

The Audi A6 (type 4A) offers various convenience functions. The majority of them were introduced with the Audi A8 (type 4N).

- Interior mirror:
  The optional automatic anti-dazzle interior mirror has no frame; it is not possible to switch the automatic anti-dazzle function on/off with this mirror version.
- Rear lid with electric open/close function
- Locking systems:
  All vehicles are equipped with remote control keys; the convenience key with sensor-controlled rear lid or the Audi connect key are available as optional extras.
  Safelock is only activated by the anti-theft alarm system via country-specific coding. Safelock is not optional equipment and cannot be selected separately by the customer.
- Garage door opener with GPS support (when the vehicle nears the stored location, a corresponding message appears to trigger the procedure for sending a signal).
- Electric hinged tow coupling
- Seating comfort:
  Optional electrically adjustable seats or individual contour seats;
  Front seats with memory function;
  Front seat and outer rear seat heating;
  Seat ventilation and seat massage for front seats only
- Electric steering column adjustment
- Analogue instrument cluster or optional Audi virtual cockpit
- Head-up display (as optional equipment)

670_032

670_033

Instrument cluster

Two different instrument clusters are used for the Audi A6 (type 4A):

- The standard analogue TOP instrument cluster
- The optional Audi virtual cockpit

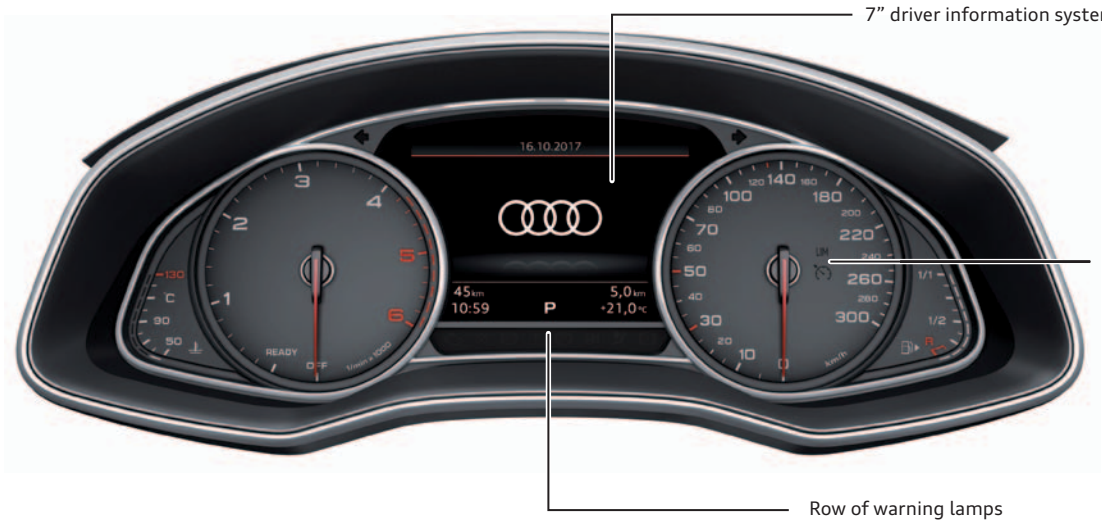
The driver information system in the analogue instrument cluster is a high-resolution 7” colour display. The following can be displayed:

- Speed (digital speedometer)
- Time
- Mileage
- Outside temperature
- Tank warning with remaining range
- Gear-change indicator in manual mode
- Current radio station or music track
- Radio and media lists
- Telephone menu
- Information from the navigation system and messages from the driver assist systems (if fitted)

The information provided by the on-board computer’s short-term and long-term memory includes average and current fuel consumption, remaining range, average speed, driving time and distance covered.
The integrated efficiency program helps the driver to drive economically with overviews of consumption data and economy tips, including the rest recommendation.

The well-known Audi virtual cockpit is an innovative, fully digital instrument cluster with the flexibility to display the relevant information according to the driver’s requirements and as needed. The same content can be displayed. The Audi connect services, for example, can also be displayed.
The VIEW button on the multi-function steering wheel allows the driver to switch between two different-sized versions of the round instruments. The display with small instruments allows large, clear graphics to be displayed by the on-board computer and the MMI. It is possible to display the navigation map as a 3D terrain model on the high-resolution 12.3” Full HD colour display.

Analogue instrument cluster



670_020

Audi virtual cockpit

670_021

Central locking

Audi convenience key

The central locking system in the Audi A6 (type 4A) corresponds to the system in the Audi A7 (type 4K).

Unlocking the vehicle with the Audi convenience key:

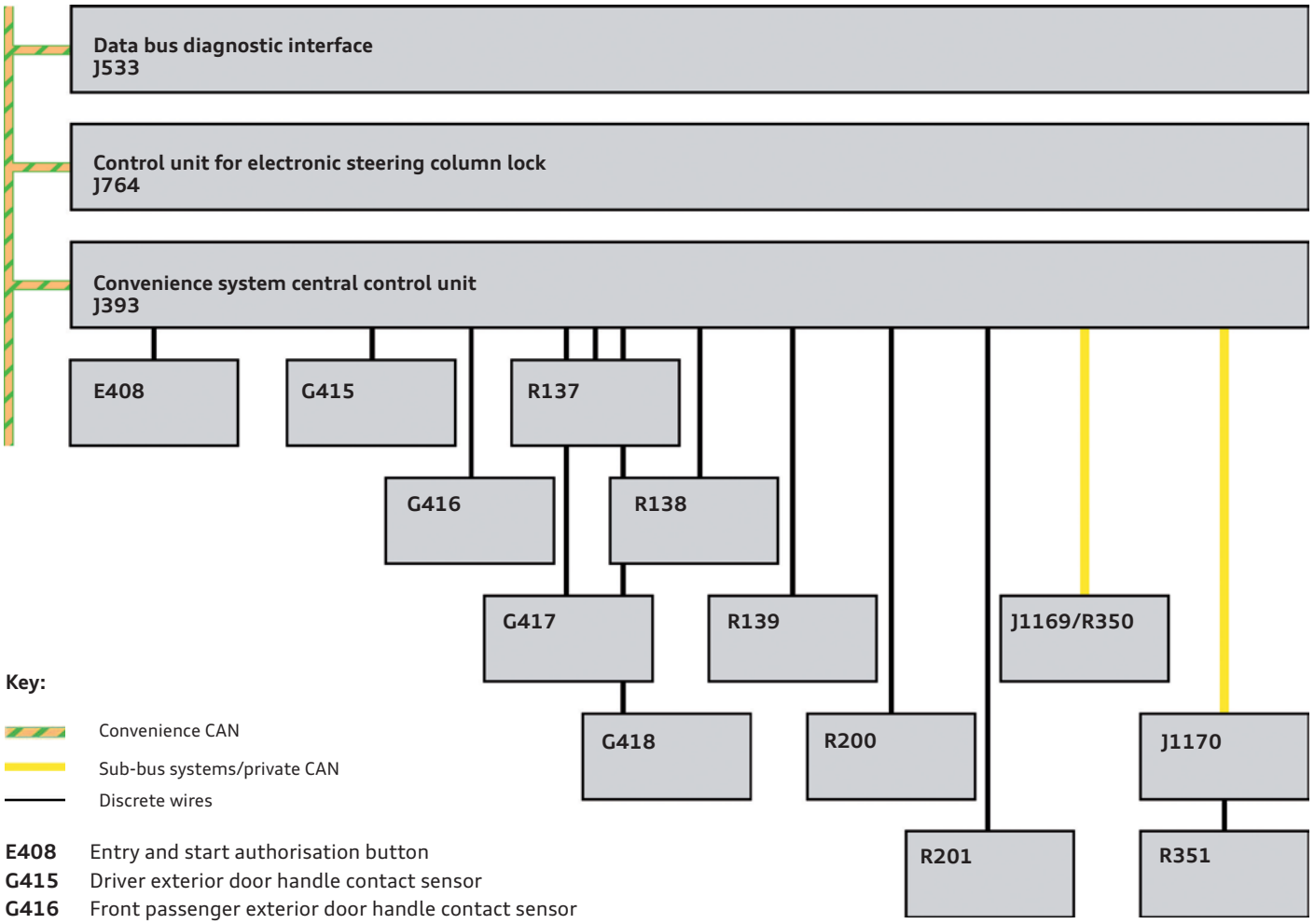
A vehicle key must be within the detection area of the vehicle door. If someone reaches into the door handle, the corresponding exterior door handle contact sensor (e.g. driver exterior door handle contact sensor G415) reports this to the convenience system central control unit J393.
J393 interrogates the vehicle key. This transmits its data back to the central locking system aerial, which is on the printed circuit board of J393. If the key is detected as an authorised vehicle key, the convenience system central control unit J393 transmits a command to the door control units to unlock the doors via the convenience CAN bus.

Locking the vehicle with the Audi convenience key:

A coded vehicle key must also be in the detection area when the vehicle is being locked. If the driver presses the locking sensor on the exterior door handle (e.g. driver exterior door handle contact sensor G415), this signal is transmitted to the convenience system central control unit J393 via the CAN bus. This queries whether there is actually an authorised key in the detection area. After the key has successfully transmitted its data to J393 via a radio signal, J393 sends the locking command to the corresponding door control units.

Vehicles equipped with the Audi connect key (PR No. 2F1) are automatically also equipped with the convenience key (PR No. 4I3). The entry and start authorisation procedure is performed via a smartphone which works as a digital vehicle key. The approval process of the convenience system central control unit J393 works in the same way as for an approved remote control key.

Central locking system diagram for Audi A6 (type 4A)

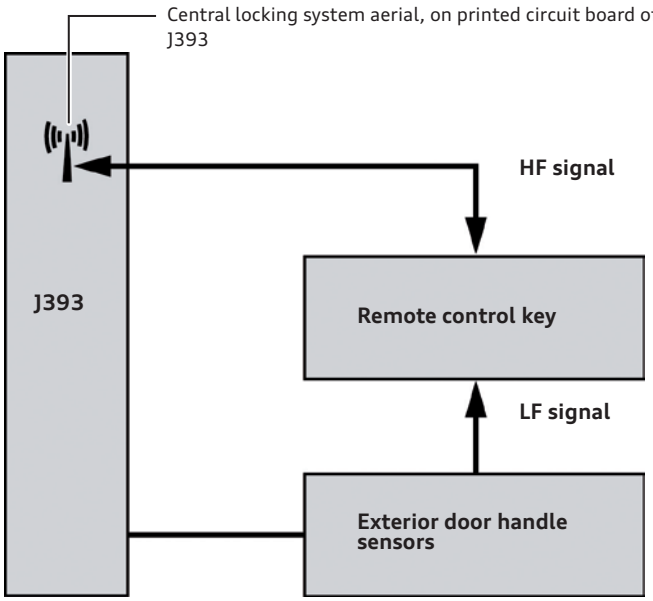


670_028

E408 Entry and start authorisation button
G415 Driver exterior door handle contact sensor
G416 Front passenger exterior door handle contact sensor
G417 Contact sensor for rear left exterior door handle
G418 Contact sensor for rear right exterior door handle
J1169 Near field communication control unit
J1170 Near field communication control unit 2
R137 Luggage compartment aerial for entry and start system
R138 Interior aerial 1 for entry and start system
R139 Interior aerial 2 for entry and start system
R200 Left aerial for entry and start authorisation
R201 Right aerial for entry and start authorisation
R350 Near field communication aerial
R351 Near field communication aerial 2

As soon as the central locking system is woken by a capacitive proximity sensor, a query signal is transmitted to the remote control key in the low frequency (LF) range.
The remote control key decodes the low frequency signal and transmits its coding of the high frequency (HF) signal to the central locking system reception aerial and thereby to the convenience system central control unit J393.
If the data received are correct/if an authorised vehicle key is detected, J393 gives the unlocking command to the corresponding door control unit.

Block and schematic diagram of transmission frequencies for central locking system



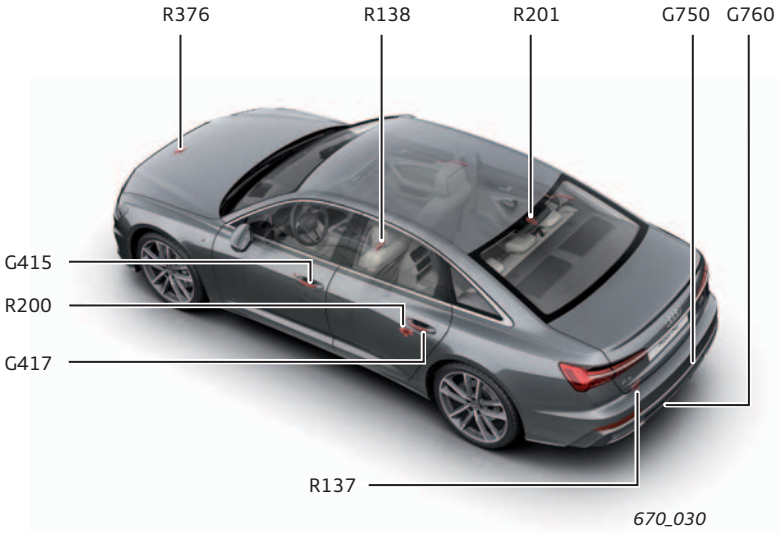
670_029

Front aerial for entry and start authorisation R376

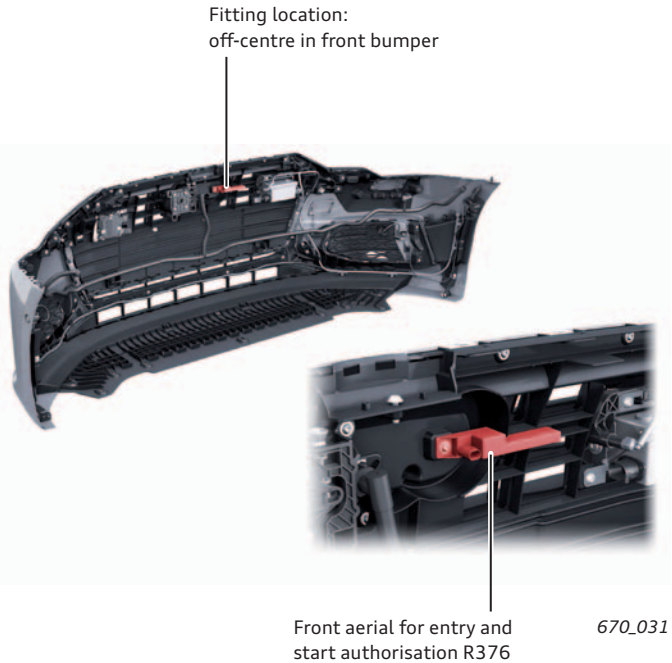
Audi has fitted the entry and start authorisation aerial R376 inside the vehicle since the Audi A8 (type 4N). It is fitted at the front of the front bumper.

The R376 aerial rounds off the remote control key's communication with the vehicle. R376 is needed to ensure that communication in the front area of the vehicle is possible — the key needs to be able to determine its position in relation to the vehicle.

The entry and start authorisation aerial R376 is already active and can be read out via the vehicle diagnostic tester if necessary. Once the Audi garage pilot and the Audi parking pilot are available, the driver will, with the help of the R376 aerial, be able to have the vehicle park itself when he/she is standing in the front detection area of the vehicle with the vehicle key, for example.



670_030



670_031

Key:

G415	Driver exterior door handle contact sensor
G417	Contact sensor for rear left exterior door handle
G750	Rear lid power opening sender
G760	Rear lid power opening sender 2
R137	Luggage compartment aerial for entry and start system
R138	Interior aerial 1 for entry and start system
R200	Left aerial for entry and start authorisation
R201	Right aerial for entry and start authorisation
R376	Front aerial for entry and start authorisation

Convenience system central control unit J393

The convenience system central control unit J393 has a 4N0 part number, thereby showing its close relation to the Audi A8 (type 4N).
However, the fitting location has changed. On the Audi A6 (type 4A), J393 is fitted in the underbody of the luggage compartment, immediately behind the rear seat backrests.
J393 is part of a control unit rack.

As the base carrier, the control unit rack comes in two different versions. Depending on the vehicle's equipment, a small base carrier or the larger one shown in the illustration is used.

The control units fixed inside include:

- Relay and fuse carrier SR4
- Trailer detector control unit J345
- Convenience system central control unit J393
- A 12 Volt power distributor
- Emergency call module control unit and communication unit J949
- Aerial amplifier for mobile telephone (compensor) R86
- Remote control receiver for auxiliary heater R64
- Heated windscreen control unit J505
- Differential lock control unit J187

Fitting location

670_044

Interior lighting

There are again three different interior lighting packages available for the Audi A6 (type 4A):

- Standard interior lighting QQ0
- Ambient lighting package QQ1
- Contour ambient lighting package QQ2

The basic lighting package includes all the important lighting functions:

- Both LED roof modules (front and rear, capacitive lights)
- Make-up lights
- Entry lights (front and rear)
- Illuminated interior door handles (front and rear)
- Illuminated centre console storage compartment
- Glove box light
- Footwell lights (front and rear)
- Two luggage compartment lights

The ambient lighting package creates a special atmosphere and improves orientation in darkness in addition to the standard interior lighting:

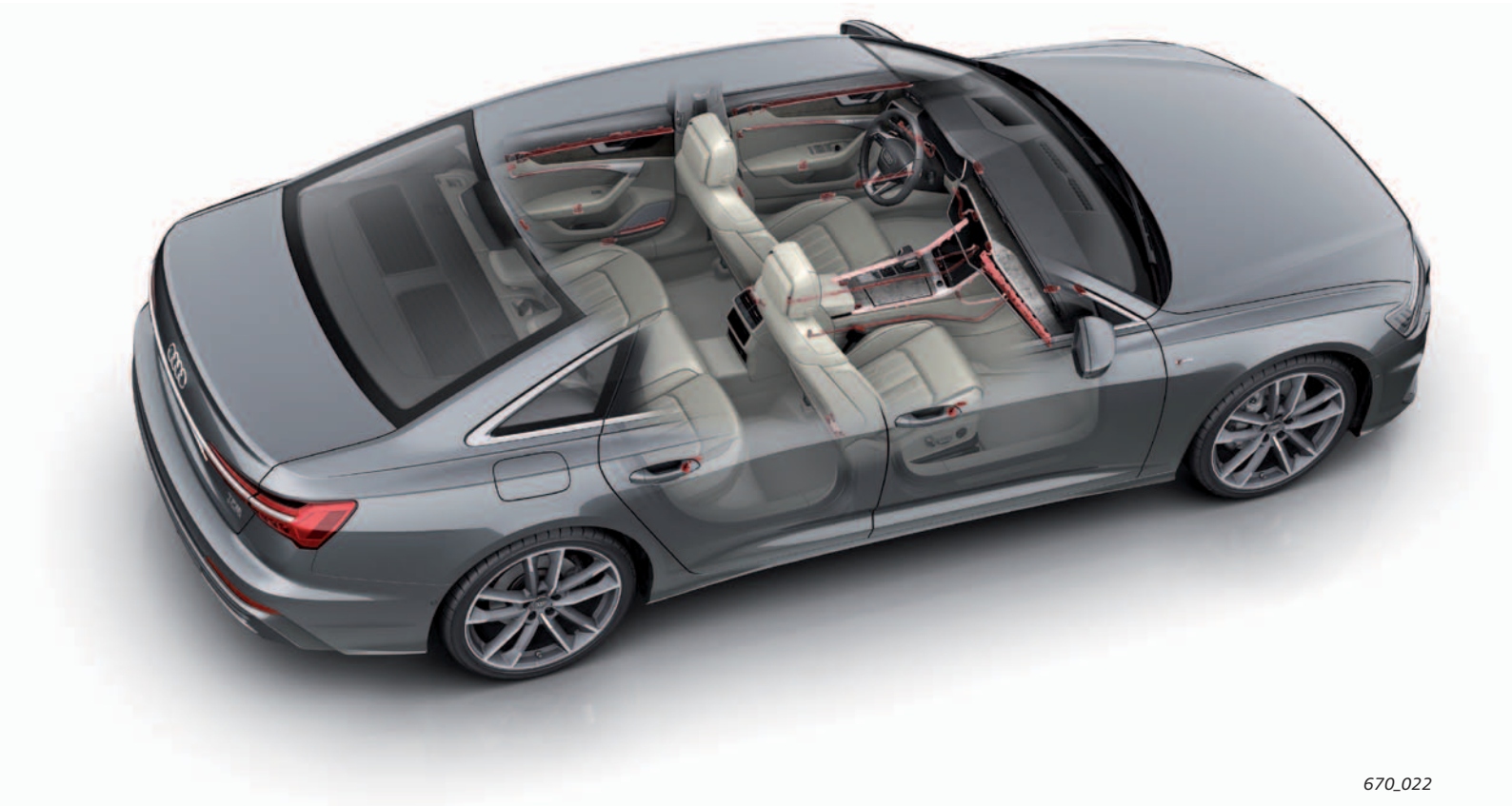
- Ambient door panel lighting for doors (front/rear)
- Surround lighting from exterior door handles (front/rear)
- Ambient lighting in dash panel

All the lights in the PR number packages QQ0 and QQ1 are white LEDs.

Most of the lighting in the QQ0 and QQ1 lighting packages is used with the contour ambient lighting package. However, there are some differences compared to the ambient lighting package QQ1:

- Door pockets (front/rear), colour changed
- Door contour lighting (front/rear), colour changed
- Ambient door panel lighting for doors (front/rear), colour changed
- Ambient lighting for front centre console, colour changed
- Contour lighting for front centre console, colour changed
- Contour lighting with illuminated quattro badge or illuminated Audi rings (on front-wheel drive vehicles) in the dash panel on the passenger side, colour changed
- Ambient lighting for dash panel, colour changed

Six pre-defined colour profiles are available with the contour ambient lighting package. An additional interactive and individual colour profile is controlled by the Audi drive select modes. A large number of colours are available with the individual colour profile. The colour adjustments are made separately for contour and ambient lighting.



670_022

Light strips from the ambient/contour ambient lighting packages are used in the inner doors, the dash panel and the centre console.

Air conditioning

The new technical features which were introduced with the Audi A8 (type 4N) are continued in the Audi A6 (type 4A). This self-study programme will give you an overview of the air conditioning systems in the Audi A6 (type 4A). Detailed information about fitting locations and functions along with images can be found in self-study programme 665; Audi A8 (type 4N) “New features of the air conditioning system and introduction of refrigerant R744”. The Audi A6 (type 4A) has, in addition to the newly introduced fragrance diffuser and air ionisation system, a 2-zone, a 3-zone and a 4-zone air conditioner. Depending on the equipment version, different operating units may be used in the rear cabin.

Overview

Fragrance diffuser system

As with the Audi A8 (type 4N), the fragrance diffuser system with two different fragrance types is offered for the Audi A6 (type 4A). The fragrances are kept in cylindrical vials in the function unit for fragrance diffuser system GX43. A small blower guides the fragrance from the vial into the outer front air outlets. In addition to the fragrance type, four levels of intensity can be selected.

Air ionisation system

An air ionisation system is used in the Audi A6 (type 4A) to improve the air quality. The air ionisation system works by negatively charging a limited number of air particles. They are distributed in the vehicle interior via the side and front air outlets. These anions neutralise the dust and similar very small particles that they attract.

Back massage

A back massage function is offered for the front seats of the Audi A6 (type 4A).

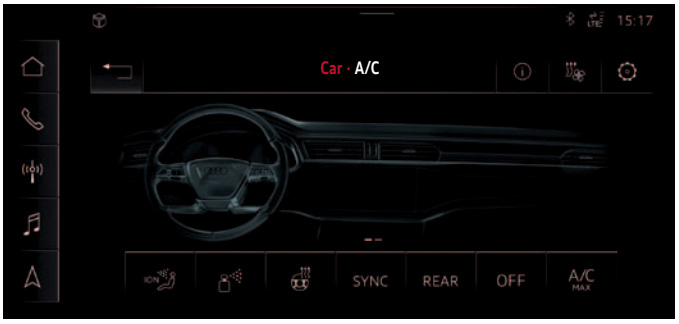
The following seven massage programmes can be selected.

- Wave
- Pulse
- Stretch
- Rest
- Shoulder
- Activation
- Revitalisation

Air conditioner controls in front of vehicle

As was already the case with the Audi A8 (type 4N), there is no longer a Climatronic control unit J255 on the Audi A6 (type 4A). There is therefore no longer a separate air conditioner control unit. The system is operated via two touch displays. The air conditioner controls are now implemented in the onboard supply control unit J519. The communication between the onboard supply control unit J519 and the air conditioner components involved is achieved via the LIN bus system.
The main new feature regarding the look and feel of the operation are the two displays. The upper MMI display and the lower touch display are both fitted centrally in the dash panel and the centre console. The air conditioner functions in the top MMI display can be accessed via the car menu.

Overview of MMI display (air conditioner operation)



670_041

The MMI display can be used, depending on the equipment fitted, to select the following functions and their settings:

- Ionisation
- Perfume
- Steering wheel heating
- Synchronisation for driver/passenger side
- Air conditioning for rear passengers/for rear
- Auxiliary air conditioning
- Air conditioning (A/C MAX, A/C OFF, A/C eco)

Air conditioner controls in rear of vehicle

Depending on the equipment version, two different operating units may be available in the rear.

- 2-zone air conditioning:
  No rear operating unit (only a knurled wheel to open and close the vents)
- 3-zone air conditioning
  Rear operating unit with digital temperature display and buttons for seat heating
- 4-zone air conditioning
  Rear touch operating unit including air conditioner regulation and seat heating, permanently fitted in the centre console

3-zone air conditioning

The operating and display unit for rear air conditioning system E265 is offered as the operating unit in the rear.
The seat heating can be set on this operating unit in addition to the temperature and the blower speed.

670_042

4-zone air conditioning

The optional operating and display unit for rear air conditioning system E265 is equipped with a sensory surface. It can therefore be operated by touch.

The following settings can be made:

- Temperature
- Blower speed
- Air distribution
- Automatic A/C
- A/C on/off
- Seat heating

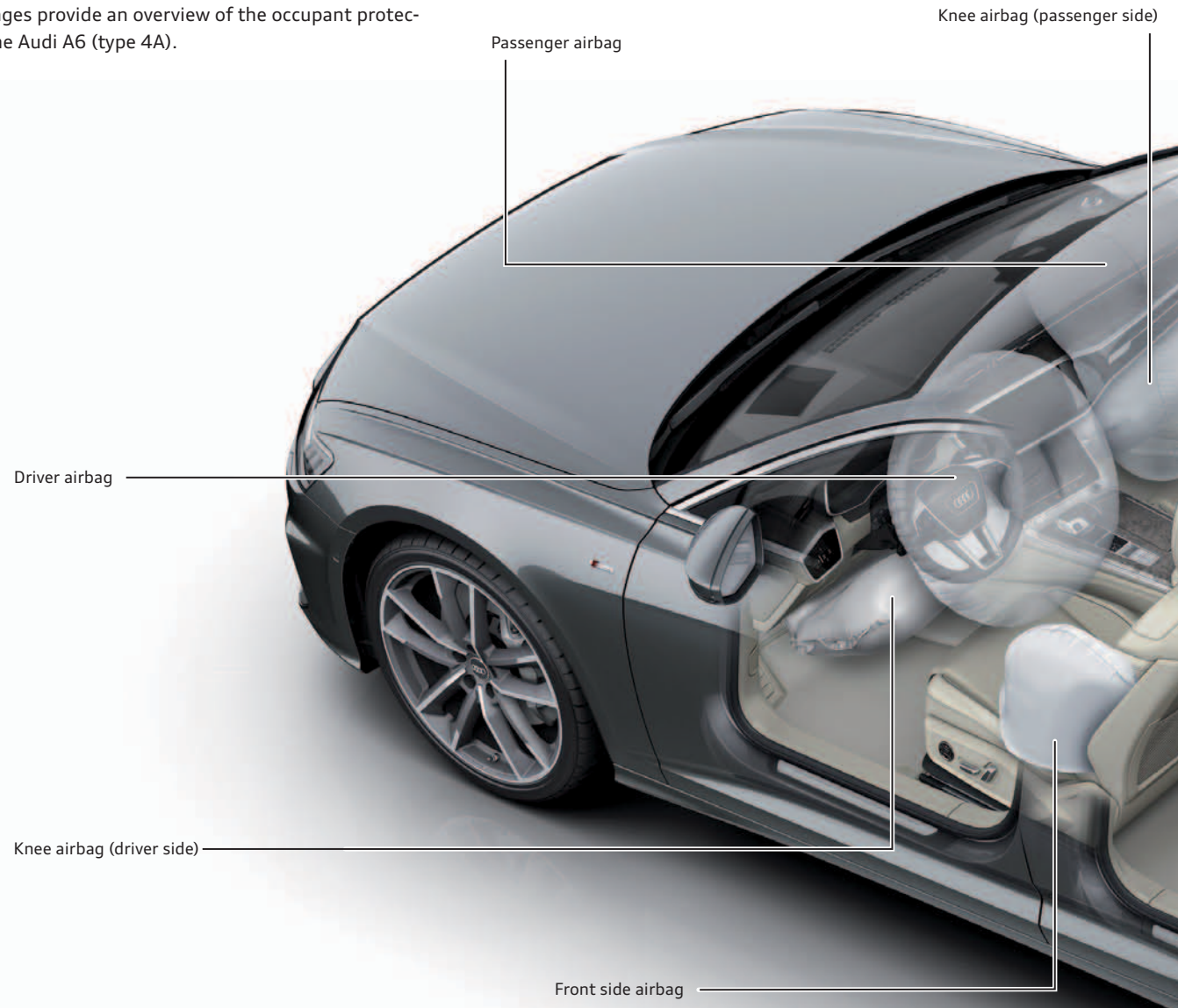
670_043

Safety and driver assist systems

Passive safety

The following pages provide an overview of the occupant protection system in the Audi A6 (type 4A).

Airbags in vehicle



Components

Depending on country version and vehicle equipment, the passive occupant and pedestrian protection system in the Audi A6 (type 4A) may be comprised of the following components:

- Airbag control unit
- Adaptive driver airbag
- Adaptive passenger airbag (two-stage passenger airbag)
- Front side airbags
- Side airbags for seat row 2
- Curtain airbags
- Knee airbags
- Crash sensors for front airbags
- Crash sensors for side impact detection in doors
- Crash sensors for side impact detection in C-pillars
- Crash sensor for pedestrian protection system (centre) (acceleration sensor)
- Crash sensors for pedestrian protection system (left and right) (pressure sensors)
- Front belt retractors with pyrotechnic belt tensioners
- Front belt retractors with electric belt tensioners
- Front belt retractors with switchable belt force limiters
- Belt retractors for seat row 2 with pyrotechnic belt tensioners for driver and passenger side
- Belt retractors for seat row 2 with electric belt tensioners for driver and passenger side
- Front lap belt tensioners for driver and passenger sides
- Seat belt warning for all seats
- Seat-occupied recognition system in passenger seat
- Seat-occupied recognition system for seat row 2
- Key-operated switch to deactivate airbag on front passenger side
- Front passenger airbag warning lamp (OFF and ON)
- Seat position detection for driver and passenger
- Trigger for pedestrian protection system
- Battery isolator, 12 Volt electrical system
- Battery isolator, 48 Volt sub-system
- Battery isolator, high-voltage system

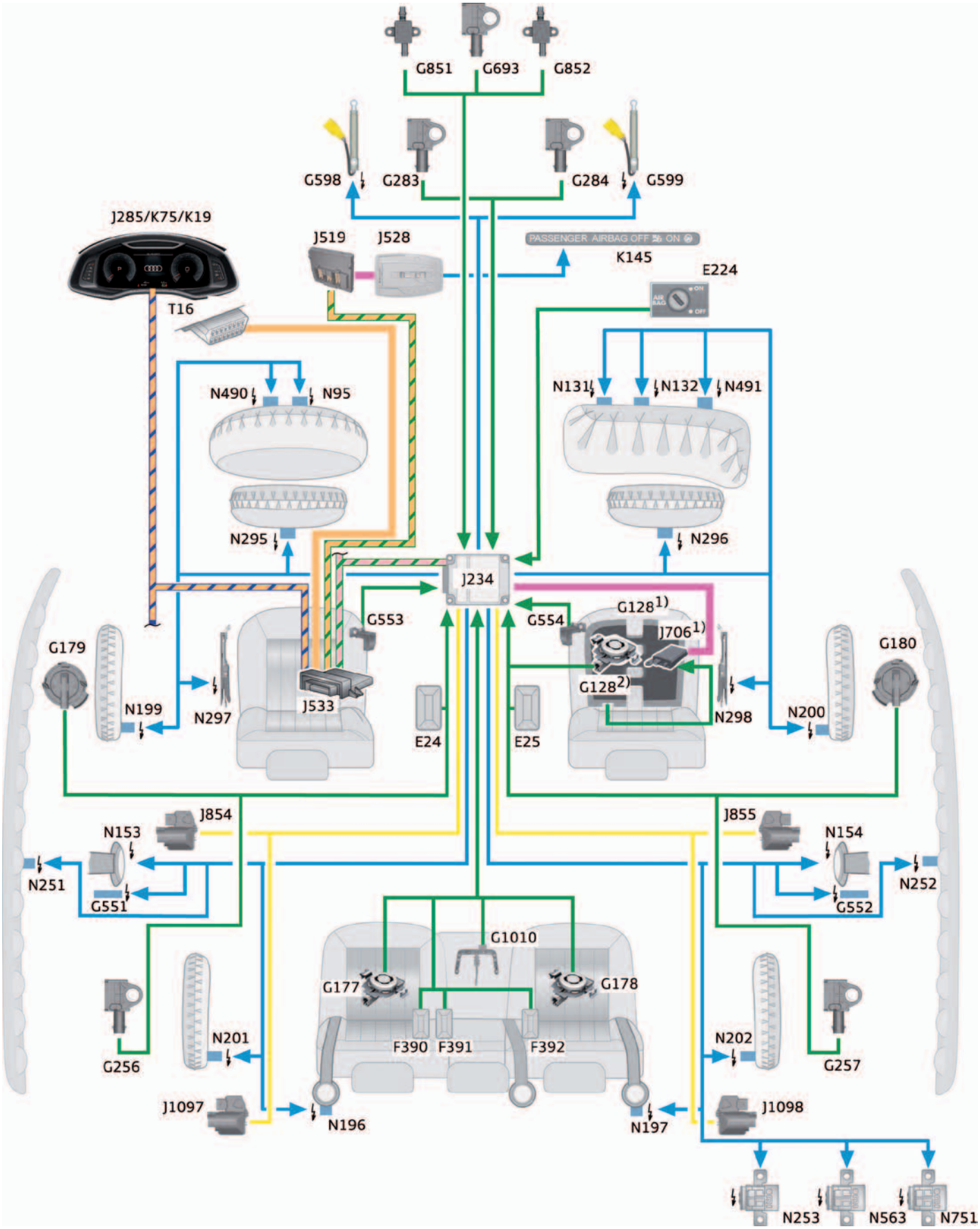
Reference
For further information on the airbag control unit J234 and Audi pre sense, please refer to self-study programme 662 “Audi A8 (type 4N).

670_037

Note
The images in the “Passive safety” chapter are schematic diagrams and are provided to aid understanding.

System overview

The system overview shows components which depend on the market and the vehicle equipment.



670_026

Additional equipment

Equipment may vary due to the different demands and legal requirements that are made of vehicle manufacturers in the markets.

Key to diagram on Seite 72:

E24 Driver side belt switch
E25 Front passenger side belt switch
E224 Key operated switch to deactivate airbag on front passenger side

F390 Belt switch for seat row 2, driver side
F391 Belt switch for seat row 2, middle
F392 Belt switch for seat row 2, passenger side

G128 Seat occupied sensor, front passenger side
G177 Rear seat occupied sensor on driver side
G178 Rear seat occupied sensor on passenger side
G179 Side airbag crash sensor on driver side
G180 Side airbag crash sensor on front passenger side
G256 Rear side airbag crash sensor on driver side
G257 Rear side airbag crash sensor on passenger side
G283 Front airbag crash sensor for driver side
G284 Front airbag crash sensor for front passenger side
G551 Driver side belt force limiter
G552 Front passenger side belt force limiter
G553 Driver side seat position sensor
G554 Front passenger side seat position sensor
G598 Trigger 1 for pedestrian protection
G599 Trigger 2 for pedestrian protection
G693 Centre crash sensor for pedestrian protection
G851 Driver side crash sensor 2 for pedestrian protection
G852 Front passenger side crash sensor 2 for pedestrian protection
G1010 Rear seat occupied sensor, centre

J234 Airbag control unit
J285 Control unit in dash panel insert
J519 Onboard supply control unit
J528 Roof electronics control unit
J533 Data bus diagnostic interface (gateway)
J706 Seat occupied recognition control unit
J854 Control unit for front left belt tensioner
J855 Control unit for front right belt tensioner
J1097 Control unit for rear left belt tensioner
J1098 Control unit for rear right belt tensioner

K19 Seat belt warning system warning lamp
K75 Airbag warning lamp
K145 Warning lamp for airbag deactivated on front passenger side (both ON and OFF status of passenger airbag is indicated)

N95 Airbag igniter on driver side
N131 Airbag igniter 1 on front passenger side
N132 Airbag igniter 2 on front passenger side
N153 Driver seat belt tensioner igniter 1
N154 Front passenger seat belt tensioner igniter 1
N196 Rear belt tensioner igniter on driver side
N197 Rear belt tensioner igniter on passenger side
N199 Side airbag igniter on driver side
N200 Side airbag igniter on front passenger side
N201 Rear side airbag igniter on driver side
N202 Rear side airbag igniter on passenger side
N251 Driver side curtain airbag igniter
N252 Front passenger side curtain airbag igniter
N253 Battery isolation igniter
N295 Driver side knee airbag igniter
N296 Front passenger side knee airbag igniter
N297 Igniter for driver side seat belt tensioner 2 (lap belt tensioner)
N297 Igniter for front passenger side seat belt tensioner 2 (lap belt tensioner)
N490 Igniter for exhaust valve for driver airbag
N491 Igniter for exhaust valve for front passenger airbag
N563 High-voltage battery isolation igniter
N751 Battery isolation igniter, 48 V

T16 16-pin connector, diagnostic connection

Wiring colours:

- Diagnostics CAN
- Dash panel insert CAN
- Sub-bus system
- FlexRay
- LIN bus
- Convenience CAN 2
- Input signal
- Output signal

Connection for seat occupied sensor, front passenger side G128

The connection for the seat occupied sensor, front passenger side G128 varies depending on market version.

[1)]Vehicles for the North American region (NAR):
The seat occupied sensor, front passenger side G128 is connected to the seat occupied recognition control unit J706 via a discrete wire. The control unit communicates with the airbag control unit J234 via a LIN bus wire.

[2)]Vehicles for rest of world (ROW):
The seat occupied sensor, front passenger side G128 is connected directly to the airbag control unit J234 via a discrete wire. A seat occupied recognition control unit J706 is not fitted.

Driver assist systems

Introduction

What the Audi A6 (type 4A) can offer in driver assist systems is pretty impressive! The Audi A6 (type 4A) offers the same range of driver assist systems as the Audi A8 (type 4N). A wider range of driver assist systems has never been offered in any other Audi model.

The introduction to this topic includes short descriptions of the five most important innovations in the Audi A6 (type 4A). All of these innovations made their début in the Audi A8 (type 4N), which was introduced at the end of 2017. They have now all been introduced for the Audi A6 (type 4A). The innovations concern new hardware which continues to pave the way for autonomous driving, a new and innovative operating concept, and new driver assist systems.

Further information on all the new features can be found on the following pages and more detailed information is available in self-study programme 668 “Audi A8 (type 4N) - Driver assistance systems”.

Top driver assist system innovations in the Audi A6 (type 4A)

Driver assist systems control unit J1121

The J1121 control unit is the first step towards reducing the number of control units for driver assist systems. With an eye on the major vision of autonomous driving, Audi is gradually moving away from a decentralised approach with several individual control units to an approach with a powerful central computer. There are four versions of the J1121 control unit for the launch of the Audi A6 (type 4A). The version installed depends on the driver assist systems in the vehicle.

Control unit for laser distance control J1122

The Audi A6 (type 4A) is no longer fitted with two long range radar sensors to implement the longitudinal regulation functions of the adaptive cruise assist. They are replaced with a combination of a radar sensor and a laser scanner. The laser scanner is fitted at the front of the vehicle, has a scanning angle of approx 145° and can detect objects up to 80 m away. A significant strength of the laser scanner is that its measurement precision is not dependent on how far away an object is.

Profile master for driver assist systems

The profile master is a new operating concept that specifies the activation conditions for the different driver assist systems. A total of eight driver assist systems participate in the profile master system. The customer can choose between three profiles: maximum, individual and basic. The maximum setting switches all participating systems on. With the individual setting, the customer decides which systems to activate and with basic, a maximum of two permanently specified systems are switched on.

Intersection assist

The intersection assist helps the driver to avoid collisions with road users crossing the vehicle’s path. The intersection assist works between speeds of 0 km/h to 30 km/h. However, a brake application is only made at speeds of up to 10 km/h. The intersection assist is very similar to the rear cross-traffic assist. The main difference is that the intersection assist performs its task in front of and not behind the vehicle.

Lane departure warning and adaptive cruise assist

The two “new” assist systems in the Audi A6 (type 4A) (“lane departure warning” and “adaptive cruise assist”) have been made from the existing Audi adaptive cruise control, Audi active lane assist and traffic jam assist systems. The lane departure warning warns the driver if there is a risk of inadvertently leaving the current lane. However, the adaptive cruise assist offers the customer combined longitudinal and lateral guidance for the vehicle at speeds between 0 km/h and 250 km/h.

Driver assist systems control unit J1121

Introduction

The Audi A6 (type 4A) is the third Audi model in which the driver assist systems control unit J1121 is fitted; the first was the Audi A8 (type 4N). In contrast to the Audi A8 (type 4N), the J1121 control unit in the Audi A6 (type 4A) is not standard equipment worldwide. In the Euro NCAP countries, Canada, the USA, and China, every Audi A6 (type 4A) will have a J1121 control unit. This is because Audi pre sense front, which requires a J1121 control unit for its functions, has been specified as standard equipment in these markets.

The J1121 control unit is the first step towards centralising the control units for driver assist systems. With an eye on the major vision of autonomous driving, Audi is gradually moving away from a decentralised approach with several individual control units to an approach with a powerful central control unit.

With the introduction of the J1121 control unit, the front camera for driver assist systems R242 has lost its status as the master control unit for various driver assist systems. In the Audi A6 (type 4A), the front camera still captures the area in front of the vehicle. However, the images from the camera are processed in the J1121 control unit. This control unit is now the master control unit for all driver assist systems for which calculations were previously performed in the front camera R242.

These include the following driver assist systems:

- Main beam assist
- Camera-based traffic sign recognition
- Lateral vehicle guidance (lane departure warning and lane guidance by the adaptive cruise assist)
- Emergency assist

The J1121 control unit remains the master control unit for the following driver assist systems:

- Surround view cameras (there is no longer a separate control unit for overhead view camera J928)
- Intersection assist (introduced in the Audi A8 (type 4N))

Versions of the J1121 control unit

As with the launch of the Audi A8 (type 4N), there are four different versions of the J1121 control unit for the launch of the Audi A6 (type 4A). These are control unit versions A0, A, B and C. The precise control unit version fitted depends on which driver assist systems are chosen by the customer when the vehicle is configured.

Control unit version A0/A/B *670_118*

Control unit version C *670_119*

The J1121 control unit in the Audi A6 (type 4A) has the same part number as the J1121 control unit in the Audi A8 (type 4N): 4N0.907.107. The control unit versions can only be differentiated by the index letters following the part number.

Profile master for driver assist systems

A new operating concept for switching the different driver assist systems on and off was introduced for the first time in the Audi A8 (type 4N): the profile master for driver assist systems.
The aim when the concept was under development was not to increase the number of controls, but to reduce it. This is intended to keep the operation of the various driver assist systems simple for the customer, despite the increasing number of systems. The profile master is now being introduced in the Audi A6 (type 4A).

Some of the driver assist systems offered in the Audi A6 (type 4A) can be switched on and off in the profile master for driver assist systems. Other driver assist systems which the driver switches on and off specifically while the vehicle is moving continue to use the classic controls. These include, for example, the parking aid, the park assist and the adaptive cruise assist.

Overview of all driver assist systems participating in the profile master system

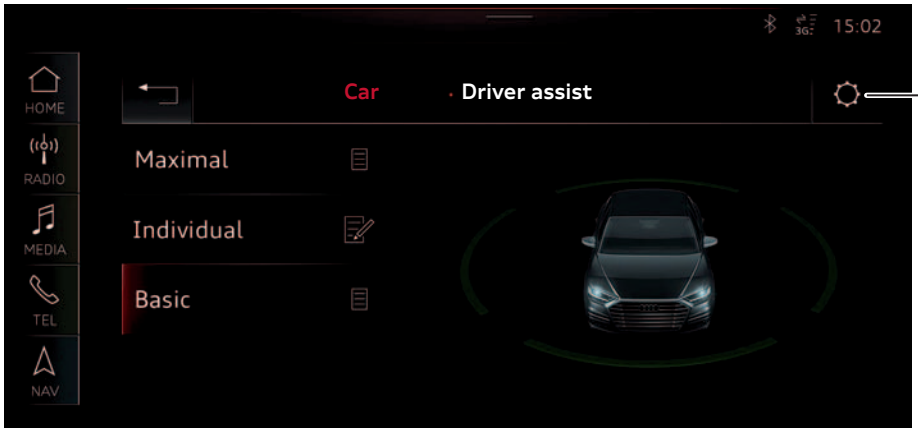
- Lane change warning
- Emergency assist
- Rest recommendation
- Exit warning system
- Night vision assist
- Distance warning
- Intersection assist
- Audi pre sense

The three profiles for the profile master for driver assist systems

- Maximum:
  All systems in the vehicle participating in the profile master system are switched on.

- Individual:
  The customer can specify which individual driver assist systems are switched on.

- Basic:
  Only two systems are switched on: Audi pre sense and the emergency assist. If neither system is fitted, the “Basic” profile is replaced with the “All off” profile.



This sprocket symbol allows all the driver assist systems fitted in the vehicle to be configured. This does not only apply to the systems participating in the profile master system.

670_120

Calling up the profile master for driver assist systems

The customer can call up the profile master for driver assist systems in two different ways:

- By selecting the basic function “Car” and then “Driver assist systems” after pressing the home button.
- By pressing the profile master button, which is located in a row of buttons in the centre console.

The profile master disappears from the display again after 5 seconds if the second method is used and if no touch input was detected on the upper touch display in that time.

670_121

Profile master button

Lane departure warning

Description of function

The lane departure warning on the Audi A6 (type 4A) is an independent system. It was first introduced in the Audi A8 (type 4N). This function was previously known as Audi active lane assist with the steering input set to “late”. As the lane departure warning is considered to be an active safety system, it is fitted as standard in the Euro NCAP countries and thereby plays a part in achieving the 5 star rating in this area. In other countries, it is offered as optional equipment.

The lane departure warning warns the driver if the vehicle is at risk of leaving its current lane without switching on the corresponding turn signal. If the turn signal is not activated, the system assumes that the driver does not intend to leave the lane.

The lane departure warning can be given in three different ways:

- By steering input from the system towards the middle of the lane
- By a steering wheel vibration (this warning can be switched off on the MMI)
- By colouring the lane demarcation line red in the function displays

The lane departure warning is switched on and off via a virtual button on the lower touch display. If the lane departure warning is switched off, this can be seen via a red bar above the function’s symbol. If the lane departure warning is switched off, this only ever applies for one terminal 15 cycle. It is active again the next time the ignition is switched on, regardless of whether it was on or off when the ignition was switched off.

Lane departure warning switched on

670_122

Lane departure warning switched off

670_123

Lane departure warning - optical warning

In the two images below, the optical warning “vehicle is at risk of leaving the lane towards the right” is shown. The image below on the left shows the warning as it can be seen in the driver assist view of the on-board computer; the image on the right shows how it appears in the speedometer.

670_124

670_125

Master control unit

The master control unit for the lane departure warning is the driver assist systems control unit J1121. Version A0 of the J1121 control unit is sufficient for this function.

Note
The steering assist button on the end of the turn signal lever is not relevant to the lane departure warning. It is only used to activate and deactivate the lane guidance system of the adaptive cruise assist.

Adaptive cruise assist

Description of function

The adaptive cruise assist was introduced for the first time in the Audi A8 (type 4N) and is now being offered with identical functions in the Audi A6 (type 4A). The adaptive cruise assist offers combined longitudinal and lateral guidance at speeds between 0 km/h and 250 km/h. Longitudinal guidance refers to accelerating and braking and lateral guidance refers to steering the vehicle. Because the longitudinal and lateral guidance has been merged in the adaptive cruise assist, the driver assist systems “Audi adaptive cruise control (ACC)” and “Audi active lane assist (AALA)” can no longer be ordered for the Audi A6 (type 4A).

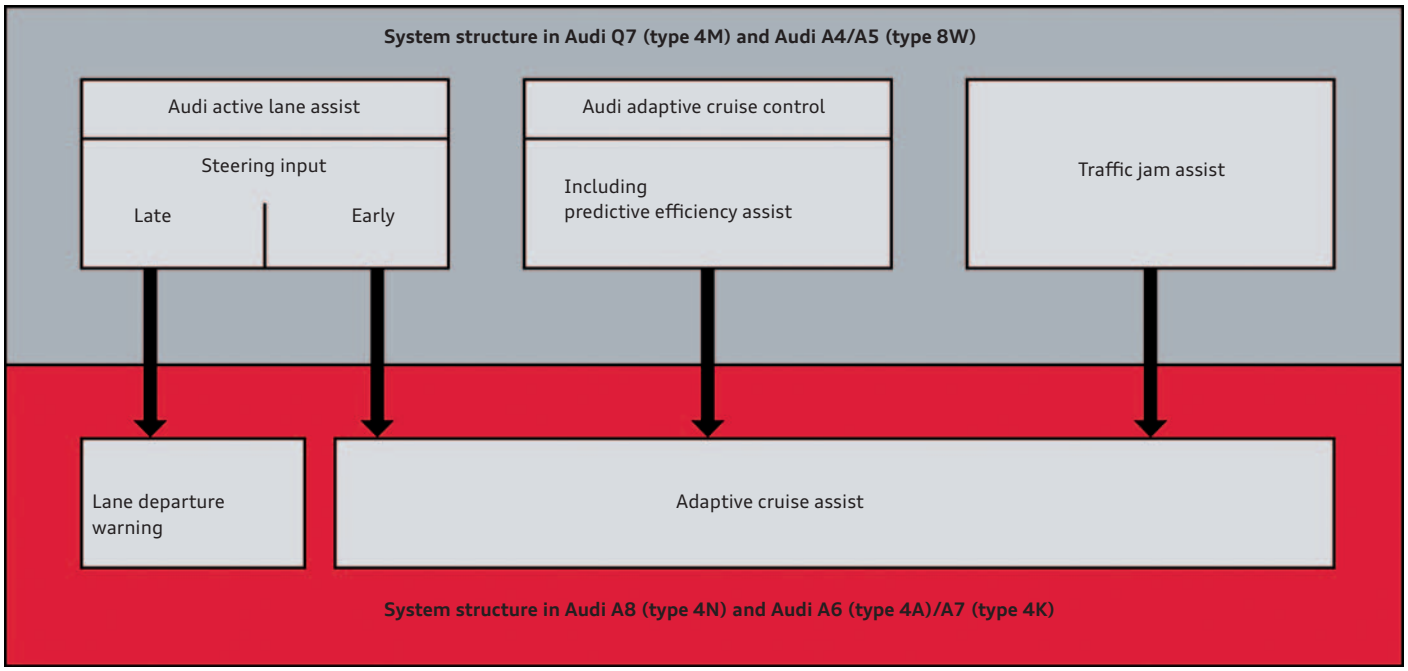
The section of the Audi active lane assist with “early” steering input, the so-called “lane guidance”, has been integrated into the adaptive cruise assist. The section with “late” steering input has become an independent system with the new designation “lane departure warning”.

The lane guidance can be switched off on the adaptive cruise assist so that only longitudinal guidance remains active. If lane guidance is switched off, the vehicle behaves as it would previously have done when driving with adaptive cruise control. However, it is not possible to deactivate longitudinal guidance on the adaptive cruise assist when lane guidance is active at the same time.

Restructuring of the longitudinal and side regulating systems

Audi has fundamentally restructured the functions of the Audi adaptive cruise control and the Audi active lane assist for the introduction of the new Audi C and D segment models. This has created the lane departure warning and the adaptive cruise assist.

This restructuring is shown by the diagram below. It is a comparison of the systems in the Audi Q7 (type 4M) and Audi A4/A5 (type 8W) with those in the Audi A8 (type 4N) and Audi A6 (type 4A)/A7 (type 4K).



670_126

Displays and operation

There have been changes to the function symbols and displays for the vehicle side guidance systems. If lane guidance is active in the adaptive cruise assist, this is shown by green triangles on the left and right of the vehicle. If two white triangles appear, lane guidance is switched on but not active. If no triangles are visible, lane guidance is switched off.

670_127

670_128

The adaptive cruise assist is activated via the operating lever previously used for ACC. This operating lever can be used to set the desired speed and distance, as with ACC.

The steering assist button on the end of the turn signal lever is only used to switch lane guidance on and off. The lane departure warning has received its own on/off button. This is located in the virtual row of buttons on the lower touch display.

670_129

ACC operating lever

670_130

Turn signal lever with steering assist button.

Hardware and sensors

Both a long range radar sensor and a laser scanner are fitted on the Audi A6 (type 4A) to implement the longitudinal regulation functions of the adaptive cruise assist. The combination of two different types of sensor for the longitudinal regulation functions was implemented for the first time in the Audi A8 (type 4N). Combining the strengths of two types of sensor means that the longitudinal regulation functions perform better than they would if two sensors of the same type were used.

670_131

Long range radar sensor

670_132

Laser scanner

Master control unit

The master control unit assigned to the entire adaptive cruise assist function is the adaptive cruise control unit J428. However, the adaptive cruise assist's basic functions (longitudinal and side regulating function) are implemented in different control units.

The master for longitudinal regulation functions is the adaptive cruise control unit J428 and the master for side regulation functions is the driver assist systems control unit J1121.

Control unit for laser distance control J1122

The laser scanner first introduced for the Audi A8 (type 4N) is also fitted on the Audi A6 (type 4A). The sensor unit from the Audi A8 (type 4N) and Audi A7 (type 4K) is used. The location of the two washer jets on both sides of the laser unit corresponds to the Audi A8 (type 4N).

As on the Audi A7 (type 4K), the laser scanner is located in the bumper next to the Audi rings on the right side (as seen in direction of travel).
Its servicing needs (including adjustment) are also identical to the A8/A7 models.

670_134

Control unit for laser distance control J1122

Adaptive cruise control unit J428

As on the Audi A8 (type 4N) and the Audi A7 (type 4K), only one radar unit is fitted on the Audi A6 (type 4A). The laser scanner takes over the functions previously provided by the second radar unit. The fourth-generation system used in the Audi A6 has the same layout and works in the same way as the system in the Audi A8 (type 4N) and Audi A7 (type 4K); it is also serviced in the same manner.

The radar unit is fitted on the left-side of the vehicle (as seen in direction of travel) in the front bumper next to the Audi rings. For design reasons, the sensor unit has been fitted with a trim cover which is optically similar to the radome of the laser scanner.
The adaptive cruise control unit J428 also communicates via FlexRay channel B in the Audi A6 (type 4A).

670_133

Adaptive cruise control unit J428

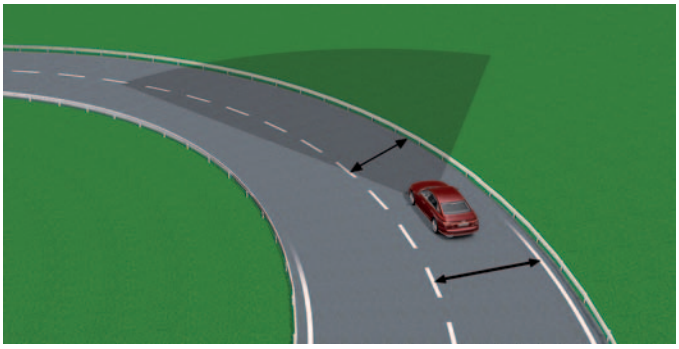
Reference
For further information on the radar sensor and the laser scanner, please refer to self-study programme 668 “Audi A8 (type 4N) Driver assistance systems.”

New lane guidance features

With the introduction of the adaptive cruise assist, the lane guidance is, for the first time, available to customers right up until the vehicle is stationary. This of course only applies if all the requirements for the lane guidance have been met. With Audi active lane assist, it is only available at 65 km/h and above.
Because of the lowering of the activation speed to 0 km/h, Audi endeavoured to find further objects/structures which could also be used to facilitate a lane guidance system. The Audi active lane assist only allowed lane guidance on the basis of road markings.

The following objects/structures can be used for lane guidance at low speeds:

- An Armco barrier following the course of the road.
- A transition from the road to the area surrounding the road which offers sufficient contrast.
- A kerb following the course of the road.
- Vehicle(s) ahead.



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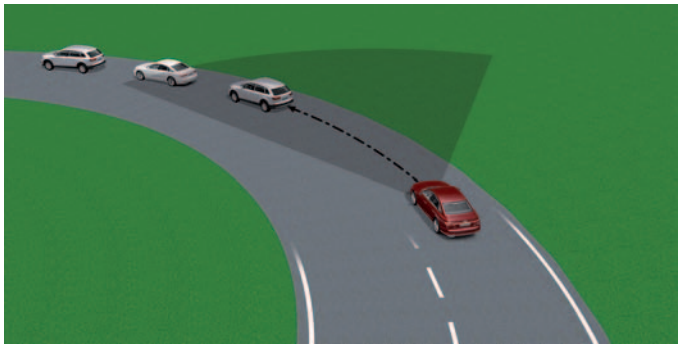
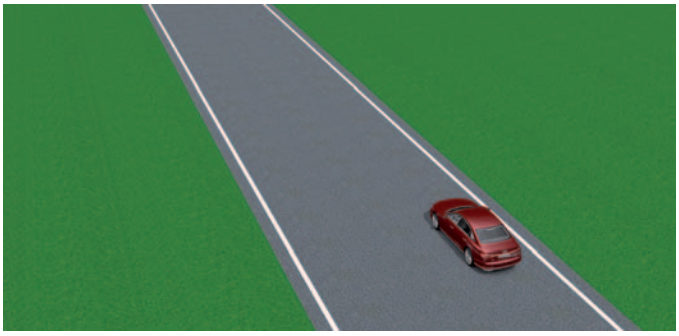


670_137

Roads without a central reservation

The system still assumes that the road has two lanes if its width exceeds a defined minimum. If this is assumed, lane guidance can be implemented on the basis of the detected right lane marking and a virtual centre line. Calculating the progression of the virtual centre line is the job of the J1121 control unit. As an alternative to the right lane marking, lane guidance can also, at lower speeds, be performed using one of the structures specified above.



670_138

New predictive efficiency assist features

The predictive efficiency assist was offered for the first time in 2015 in the Audi Q7 (type 4M). In the Audi Q7, it is a subordinate function to the Audi adaptive cruise control (ACC). It gives the option for the vehicle's longitudinal guidance not only to regulate to a speed set by the driver, but also to adapt that speed automatically to the speed limits detected by the camera-based traffic sign recognition system. In addition, it is possible to adjust the vehicle's speed for an upcoming corner as well as to reduce the vehicle's speed before a roundabout which will then be driven through. The focus of the function is a predictive driving style focused on fuel saving via longitudinal regulation.

On the Audi A6 (type 4A), the predictive efficiency assist can also adjust the speed when the vehicle is approaching an intersection with stop signs and all other requirements for this have been met. In this case, the system automatically reduces the vehicle's speed to 15 km/h. Continuing to brake the vehicle remains the responsibility of the driver. As with the adaptive cruise assist, the entire predictive efficiency assist function is a driver assist system. The driver alone remains responsible for controlling the vehicle at all times.

Camera-based traffic sign recognition

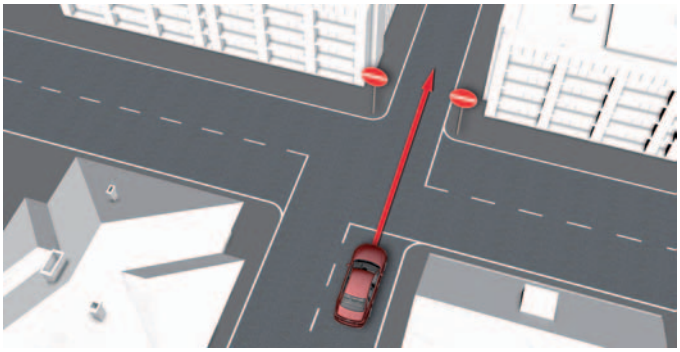
Description of function

The third generation of the camera-based traffic sign recognition introduced for the first time in the Audi A8 (type 4N) is offered for the Audi A6 (type 4A). Among other things, the 3rd generation differs from the 2nd generation in that it includes a no entry warning which helps the driver to avoid unintentionally driving the wrong way down, for example, a motorway. This new function informs the driver of the current danger situation via the instrument cluster display. However, it is not actively included in the vehicle guidance function.

No entry warning

The no entry warning is activated if the camera-based traffic sign recognition's image processing software detects one of the following two situations:

Situation 1: The vehicle passes a no entry sign on the left and right of the road it is currently travelling on.



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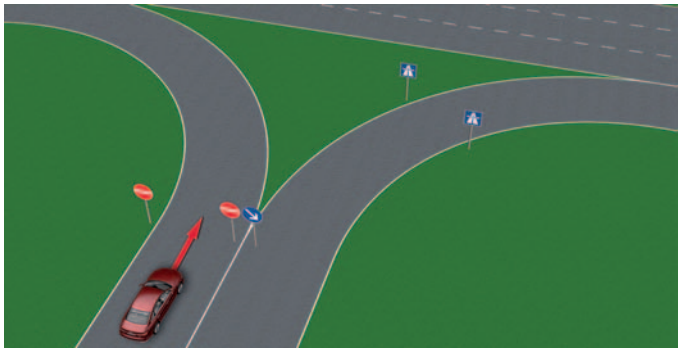
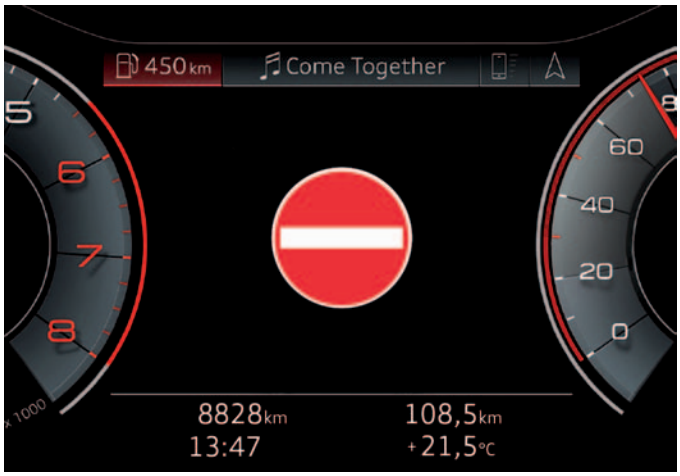
Situation 2: The vehicle passes a combination of a no entry sign and a round blue sign with a white arrow on the wrong side.



670_140



670_141

Active no entry warning

An active no entry warning is ended if:

- the system detects a manoeuvre in which the vehicle turns around
  or
- reverse gear is engaged
  or
- traffic signs are detected to the left of the vehicle or on both sides of the road with applicable speed limits or no overtaking signs.

Master control unit

The master control unit for the camera-based traffic sign recognition is the driver assist systems control unit J1121. At least control unit version A is required for this system.

Note
Detecting a second no entry sign, as shown in image 670_140, is not a requirement for activating the warning.

Emergency assist

Description of function

The emergency assist was introduced by Audi for the first time in the Audi Q2 in 2016. This emergency assist was enhanced in many areas for introduction in the Audi A8 (type 4N) and is now integrated in the driver assist systems control unit J1121. This version of the emergency assist is now being offered for the Audi A6 (type 4A).

The emergency assist is designed for situations in which the driver is affected by a medical emergency and is therefore no longer able to drive the vehicle.

The job of the emergency assist in this situation is to assume longitudinal and lateral guidance of the vehicle and then to brake the vehicle to a controlled stop in its lane. If the vehicle is approaching another road user too fast, the vehicle is braked more forcefully in an attempt to avoid an impending collision. If a collision can no longer be avoided, the system attempts to reduce the severity of the collision.

The emergency assist activates itself if the system does not detect any driver activity in a specified period of time. The driver activity is established from his/her steering behaviour and the longitudinal guidance the vehicle is receiving: active acceleration and braking.

When the emergency assist is active, a sequence of measures is set in motion in the vehicle. These have been implemented to protect the driver and to keep the risk of collision as low as possible.

The following measures are initiated during the braking procedure:

- Activation of the hazard warning lights to warn other road users.
- Full tensioning of the seat belt during the process of braking to a final standstill.
- Automatic closure of the windows and the panoramic sunroof.

Once the vehicle has come to a stop, the following measures are initiated.

- Transmission position “P” is selected
- Vehicle doors are unlocked
- Interior lighting is switched on
- An emergency call is made

The second main job of the emergency assist is to take various measures to attempt to get an inactive driver to reassume the task of driving the vehicle. It could be the case that the driver is simply distracted and is no longer assuming the task of driving the vehicle as a result, even though he/she would have no problem doing so.

To do this, the system takes the following measures before and also during the braking procedure:

- Displaying text notifications in the instrument cluster
- Emitting acoustic signals
- Triggering a brake jolt
- Triggering a strong emergency brake jolt
- Jerking the driver's seat belt
- Muting the infotainment system’s audio output

If the driver is able to reassume the task of driving the vehicle, he/she can do so in the following ways:

- actively taking over the steering again
  or
- pressing the brake pedal
  or
- pressing the accelerator pedal

If the emergency assist detects that the driver is once again active, it deactivates itself and ends its longitudinal and lateral guidance. The emergency assist can be activated more than once in a terminal 15 cycle. This applies to both the Audi A6 (type 4A) and the Audi A8 (type 4N) but is one of the differences to the emergency assist in the Audi Q2.

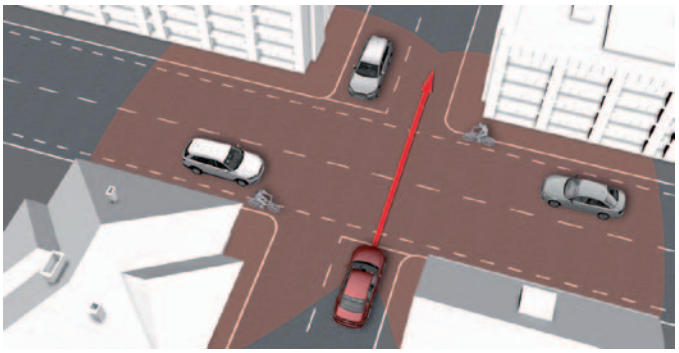
Intersection assist

Description of function

The intersection assist is a driver assist system that was offered for the first time in the Audi A8 (type 4N) and is now also available in the Audi A6 (type 4A). It helps the driver to avoid collisions with road users crossing the vehicle's path. These road users can be normal vehicles, buses or lorries, but also cyclists or motorbike riders. If a cyclist or motorbike rider is detected by the system, the same warnings are given as with a vehicle.

The intersection assist, for example, provides assistance in the following traffic situation:

The red vehicle (equipped with the intersection assist) is standing at an intersection and wishes to drive straight across it. To do so, the driver needs to pay attention to the traffic coming from both the left and right on the main road. On both sides, the crossing traffic consists of a car and a bicycle. If the driver of the red vehicle were now to move off, the intersection assist would activate and would, depending on the current estimation of the danger level, warn the driver or apply the brakes.



670_142

The intersection assist works between speeds of 0 km/h to 30 km/h. However, a brake application is only made at speeds of max. 10 km/h.

The intersection assist is very similar to the rear cross-traffic assist, which was offered for the first time in the Audi Q7 (type 4M). It corresponds to a front cross-traffic assist, but Audi has decided to call it the intersection assist.

Sensors

The vehicle requires two additional radar sensors for the intersection assist. These are located on the front left and right sides behind the front bumper. The front radar sensors are very similar to the two rear radar sensors.

In service, they are referred to as:

- Front left radar sensor control unit for object detection J1088 and
- Front right radar sensor control unit for object detection J1089.

Master control unit

The master control unit for the intersection assist is the driver assist systems control unit J1121. At least control unit version B is required if the intersection assist is fitted in the vehicle.

Surround view cameras

As in the past, the surround view cameras are offered as optional equipment in the Audi A6 (type 4A). The surround view cameras are now in their third generation; this generation was introduced for the first time in the Audi A8 (type 4N).

The first two generations of the surround view cameras required a separate control unit; the control unit for overhead view camera J928. The software for the 3rd generation surround view camera function is now integrated in the driver assist systems control unit J1121 along with the software for other driver assist systems. The surround view cameras require a J1121 control unit of version C.

All four surround view cameras transmit their images to the J1121 control unit via screened LVDS wires. The control unit then generates the vehicle view desired by the customer from the camera images. The vehicle view is transmitted to the control unit 1 for information electronics J794 via two screened LVDS wiring pairs as a Full HD image. The image is shown on the upper touch display.

If the vehicle has both the parking system plus and the surround view cameras as optional equipment, 6th generation ultrasonic sensors are used to meet the requirements of the surround view camera system. The data from these ultrasonic sensors can only be read by the J1121 control unit (version C). In this case, the J1121 control unit is the master control unit for the surround view cameras and also the parking system plus.

If the vehicle has the parking system plus but not the surround view cameras as optional equipment, 5th generation ultrasonic sensors are used. The data from these can only be read by the onboard supply control unit J519. In this case, the onboard supply control unit J519 is the master control unit for the parking system plus. The customer can also order the park assist in this configuration. On the Audi A6 (type 4A), the master control unit for the park assist is always the onboard supply control unit J519.

Assist systems for parking				Ultrasonic sensors		Master control unit
Parking system plus	Park assist	Reversing camera	Surround view cameras	5th generation	6th generation	Master control unit for systems
X	-	-	-	X	-	J519
X	X	-	-	X	-	J519
X	-	X	-	X	-	J519
X	X	X	-	X	-	J519
X	-	-	X	-	X	J1121

Possible combinations of different assist systems for parking at the launch of the Audi A6 (type 4A).

The installation positions of the surround view camera in the exterior mirrors have been changed to extend their range. They are located further outwards in the exterior mirrors of the Audi A6 (type 4A) and no longer “look” vertically downwards, but are tilted outwards. This allows the side detection area to be enlarged, which allows the area around the vehicle to be detected better.

With the third generation of the surround view cameras, two more two dimensional vehicle views are available:

- simultaneous view of the front left and front right wheels and
- simultaneous view of the rear left and rear right wheels

A three dimensional view of the vehicle is available to customers for the first time with the third generation surround view cameras. The viewing angle of the vehicle is not specified by the system, but can be freely chosen by the customer via the touchscreen. It is still possible to choose between three different preset viewing angles via three virtual buttons in the row of buttons.

Infotainment and Audi connect

Introduction and overview of versions

The Audi A6/A6 Avant (type 4A) features the MIB2+ version of the modular infotainment matrix infotainment system.
Customers can choose between three MMI versions:
MMI radio plus, MMI navigation and MMI navigation plus.

All three versions are based on the 2+ High version of the modular infotainment matrix; MIB2+ High for short.

The MMI navigation and MMI navigation plus versions may be equipped with Audi connect, depending on the country. However, they differ regarding the services available.
The licence period is three years after the vehicle's first registration. It can be renewed after this time has elapsed.

Depending on the country, the following Audi connect infotainment services may be available with MMI navigation:

- Navigation data update (4 times per year online or via SD card via myAudi portal)
- Online routing
- Individual news
- Online traffic information
- Twitter
- Weather
- Fuel prices
- Parking information
- Travel information
- Destination entry via myAudi app

MMI navigation plus may, depending on the country, have the following additional Audi connect infotainment services:

- Connected radio (no licence period limits, but separate data package required)
- Google Earth
- Google POI search via speech control
- 3D city models
- Messages (text message dictation) and e-mail
- Traffic sign information
- Hazard alerts

If the vehicle is equipped with Audi connect vehicle-related services (IW3), the following services may be available, depending on the country:

- Audi emergency call (licence period: 10 years)
- Online roadside assistance (licence period: 10 years)
- Audi service request (licence period: 10 years)
- Vehicle status report (e.g. mileage, fuel tank level, etc.) (licence period: 3 years)
- Remote locking/unlocking (licence period: 3 years)
- Parking position (licence period: 3 years)

[1] EL0 for markets without Audi connect
[2] IT1 means a three-year Audi connect licence without an Audi connect SIM card
IT3 means a three-year Audi connect licence with an Audi connect SIM card
[3] Depending on country, emergency call only (IW1) or emergency call and service (IW3)
[4] The Audi connect data module becomes a full telephone module with SAP
[5] For markets in which no storage compartment with interface for mobile telephone (smartphone connection to exterior aerial) is offered
[6] If digital radio (QV3) and TV tuner (QV1) are ordered together, the PR no. is QU1.
If digital radio (QV3) and TV tuner with CI card reader (Q0A) are ordered together, the PR no. is Q0B.
[7] IW3 compulsory/licence period: 3 years
[8] Convenience key compulsory (4F2/4I3)
[9] IW3 compulsory/licence period: 1 year

Reference
For further information on MIB2+, please refer to self-study programme 666 "Audi A8 (type 4N) - Infotainment and Audi connect" and Audi Training Online.

MMI radio plus (I8E + 7Q0)	MMI navigation (I8V + 7UG)	MMI navigation plus (I8T + 7UG)
		
8.8” touch display with 1280 x 720 pixels	8.8” touch display with 1280 x 720 pixels	10.1” touch display with 1540 x 720 pixels
8.6” touch display with 1280 x 660 pixels	8.6” touch display with 1280 x 660 pixels	8.6” touch display with 1280 x 660 pixels
	3D navigation system on SSD (7UG)	3D navigation system on SSD (7UG)
7” display in instrument cluster with driver information system (9S7)	7” display in instrument cluster with driver information system (9S7)	Audi virtual cockpit (9S8)
AM/FM radio	AM/FM radio	AM/FM radio Connected radio (Internet radio)
		Satellite radio for North America (Sirius) (QV3)
Audi music interface with 2 USB sockets and 1 SDXC card reader (UF7)	Audi music interface with 2 USB sockets, 1 SDXC card reader and, depending on country, 1 SIM card reader (UF7)	Audi music interface with 2 USB sockets, 1 SDXC card reader and, depending on country, 1 SIM card reader (UF7)
Basic sound system (8RM)	Basic sound system (8RM)	Audi sound system (9VD)
Bluetooth interface (9ZX)	Bluetooth interface (9ZX)	Bluetooth interface (9ZX)
	UMTS/LTE data module (EL3)[1)] including Audi connect (IT1/IT3)[2)]	UMTS/LTE data module (EL3)[1)] including Audi connect (IT1/IT3)[2)]
Emergency call & Audi connect vehicle-related services (IW3)[3)]	Emergency call & Audi connect vehicle-related services (IW3)[3)]	Emergency call & Audi connect vehicle-related services (IW3)[3)]
Optional equipment		
Single DVD drive (7D5)	Single DVD drive (7D5)	Single DVD drive (7D5)
Audi music interface in rear with 2 USB sockets (UF8)	Audi music interface in rear with 2 USB sockets (UF8)	Audi music interface in rear with 2 USB sockets (UF8)
	Audi smartphone interface (IU1)	Audi smartphone interface (IU1)
Audi phone box including wireless charging (9ZE)	Audi phone box including wireless charging (9ZE)	Audi phone box including wireless charging (9ZE)[4)]
Audi phone box light (for wireless charging only) (9ZV)[5)]	Audi phone box light (for wireless charging only) (9ZV)[5)]	Audi phone box, light (for wireless charging only) (9ZV)[4), 5)]
Audi sound system (9VD)	Audi sound system (9VD)	
	Bang & Olufsen Premium Sound System with 3D sound (9VS)	Bang & Olufsen Premium Sound System with 3D sound (9VS)
	Bang & Olufsen Advanced Sound Syst em with 3D sound (8RF)	Bang & Olufsen Advanced Sound System with 3D sound (8RF)
DAB digital radio (QV3)	DAB digital radio (QV3)	DAB digital radio (QV3)[6)]
		TV tuner (QV1/Q0A)[6)]
		Audi connect key (2F1)[7, 8)]
		Audi vehicle tracking system (7I1/for use with driver card 7I2)[9)]
Vehicle tracking system notification (7AL)[7)]	Vehicle tracking system notification (7AL)[7)]	Vehicle tracking system notification (7AL)[7)]
Preparation for Rear Seat Entertainment (9WQ)	Preparation for Rear Seat Entertainment (9WQ)	Preparation for Rear Seat Entertainment (9WQ)

Sound

The following sound systems are available for the Audi A6/A6 Avant (type 4A):

- Basic sound system (8RM)
- Audi sound system (9VD)
- Bang & Olufsen Premium Sound System with 3D sound (9VS)
- Bang & Olufsen Advanced Sound System with 3D sound (8RF)

These can be combined with the MMI versions on offer in different ways (refer to the overview of versions on page 87).

The basic sound system (8RM) has a total power output of 80 W and the Audi sound system (9VD) has a total power output of 180 W.

With MMI navigation and above, the customer can choose between two Bang & Olufsen Sound systems as optional equipment: “Premium” (9VS) and “Advanced” (8RF).

The Bang & Olufsen Premium Sound System (9VS) provides the customer with a 15-channel sound system. It can reach a total power output of 705 W.

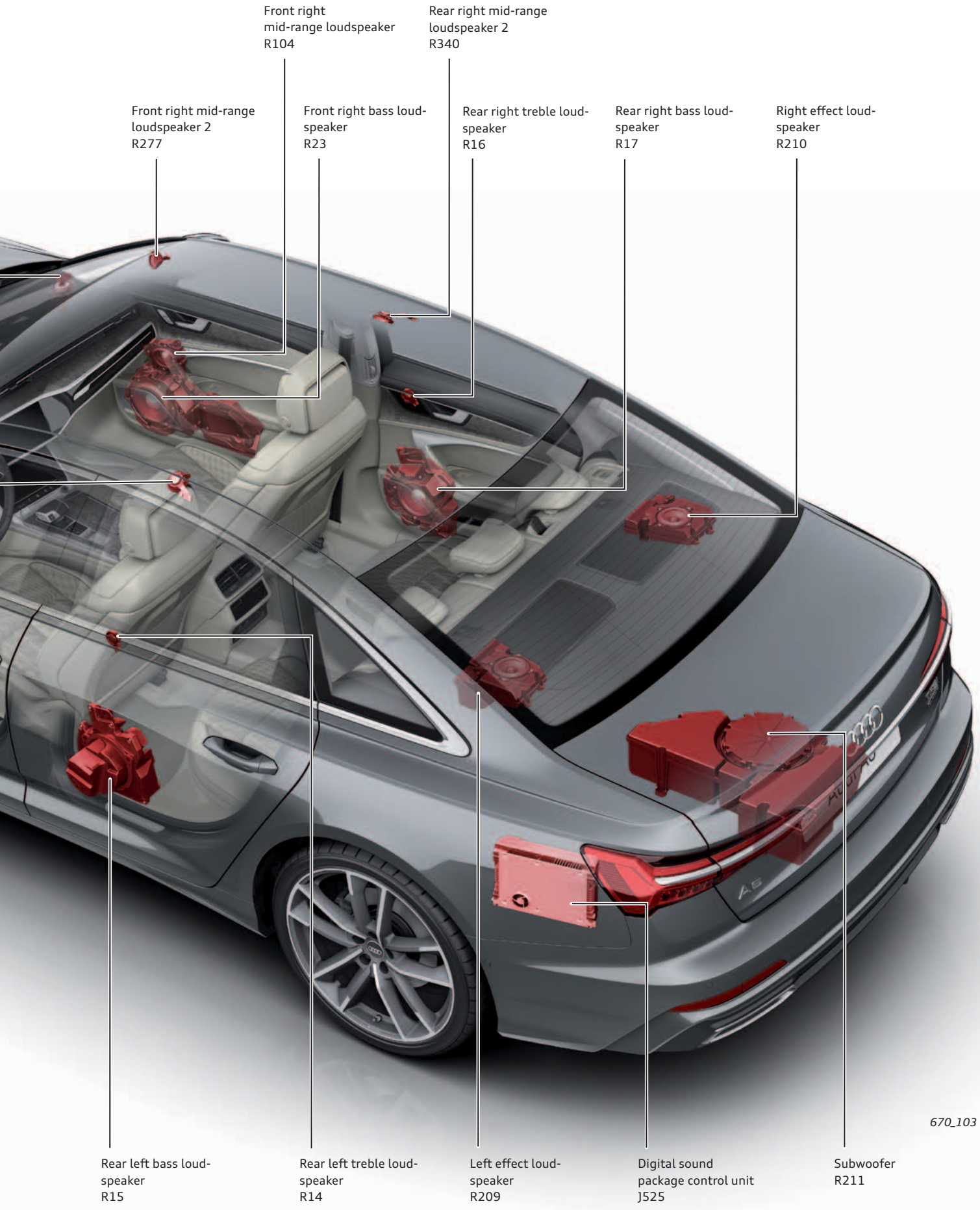
The premium sound system requires two loudspeakers to generate the 3D sound. They are fitted in the A-pillars.

Bang & Olufsen Advanced Sound System with 3D sound (8RF)

The best sound quality experience for customers is provided by the Bang & Olufsen Advanced Sound System. This system has 19 channels and reaches a total power output of 1820 W.

The Bang & Olufsen Advanced Sound System requires four loud-speakers to generate the 3D sound. Two of these are in the A-pil-lars and two are in the headliner in front of the handle.

On the Bang & Olufsen Advanced Sound System, the two treble loudspeakers in the dash panel are retractable, as previously.



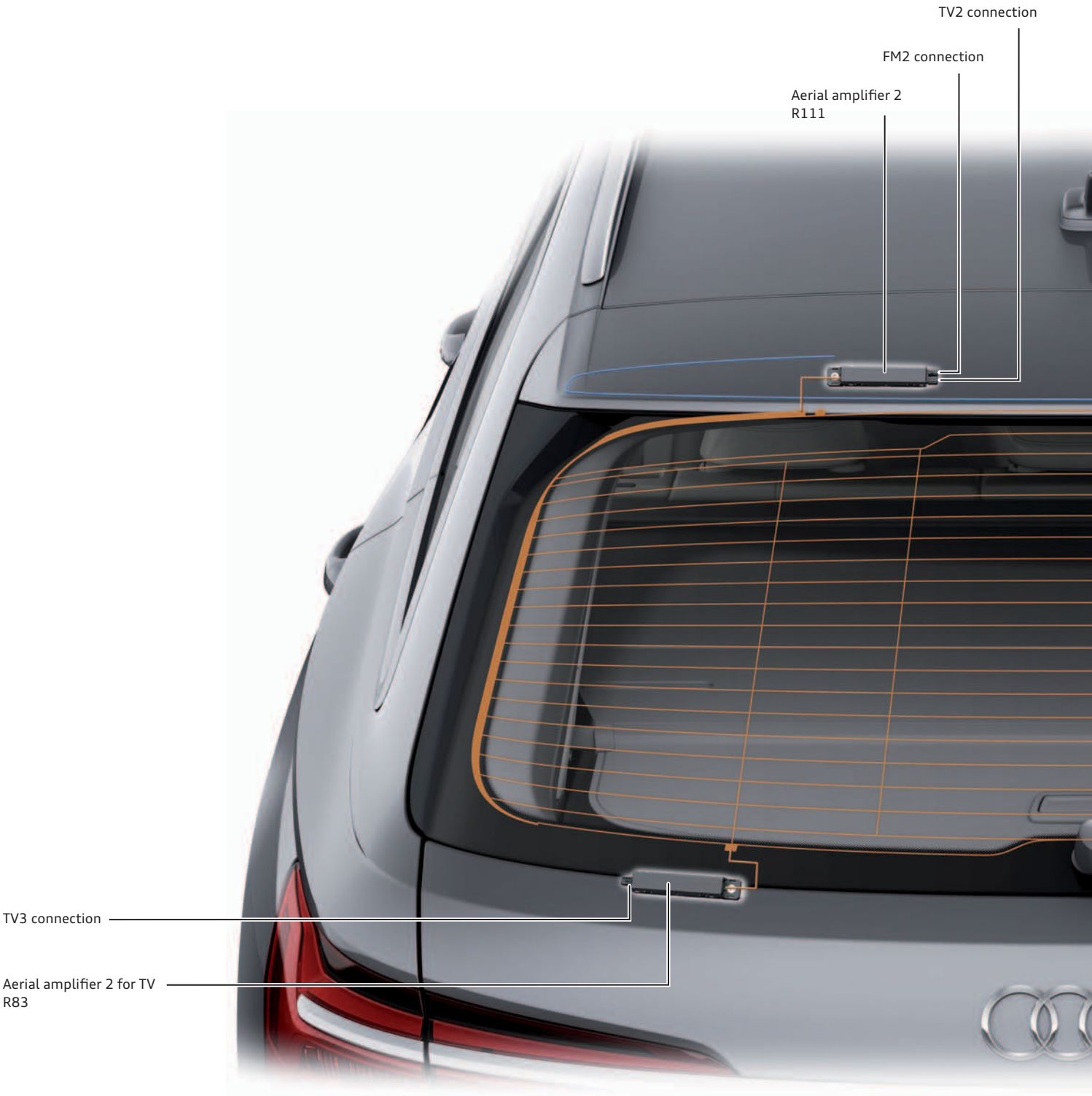
Reference
For further information on the Bang & Olufsen Advanced Sound System with 3D sound (8RF) in the Audi A6 Avant, please refer to self-study programme 669 "Audi A7 (type 4K) - Infotainment and Audi connect" and Audi Training Online.

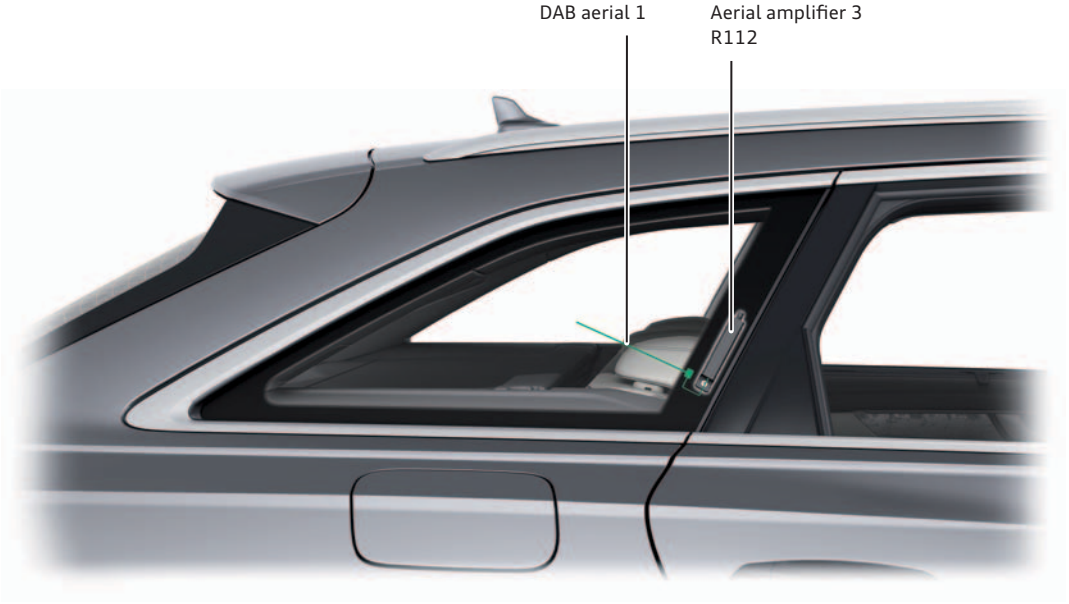
Aerials (Avant)

The aerials for radio and TV reception are located in the rear window of the Audi A6 (type 4A). On the Audi A6 Avant, they are also in the rear spoiler and the rear right side window.

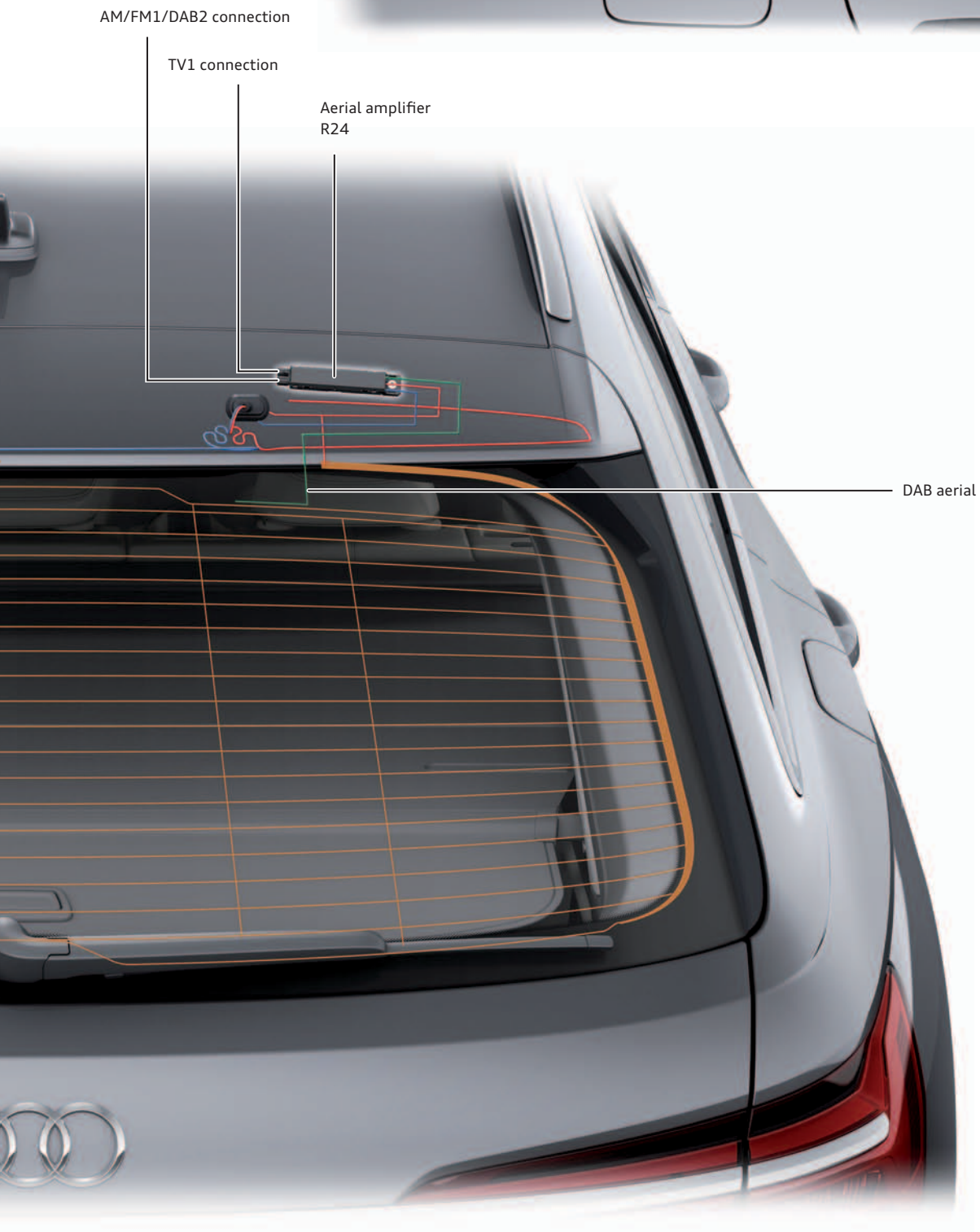
Depending on the equipment, the Audi A6 may be fitted with up to four aerial amplifiers. Their positions vary depending on whether the vehicle is a Saloon or Avant model.

Depending on the country of delivery, the equipment on offer may vary. The image below shows the maximum specification.



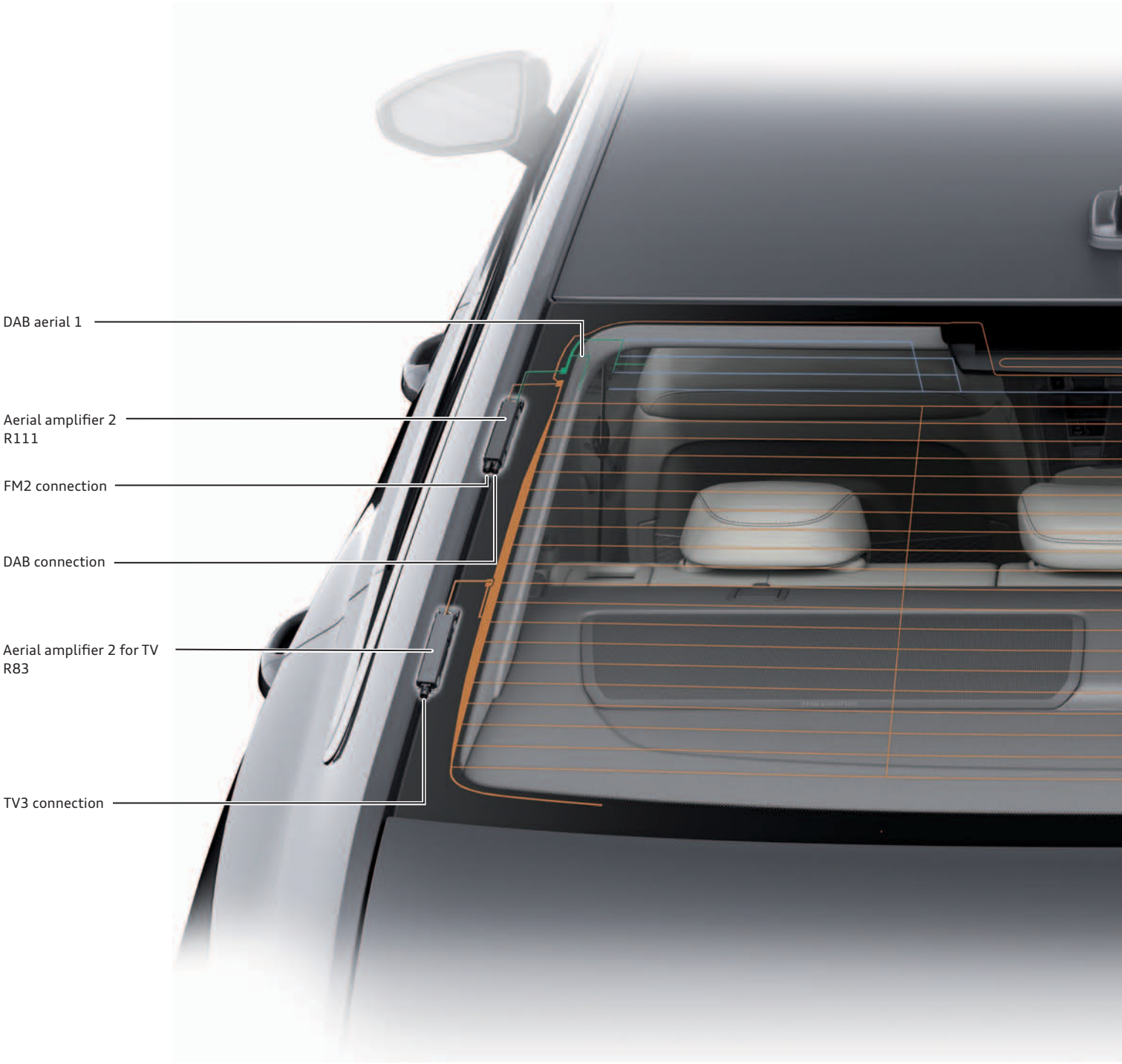


670_105

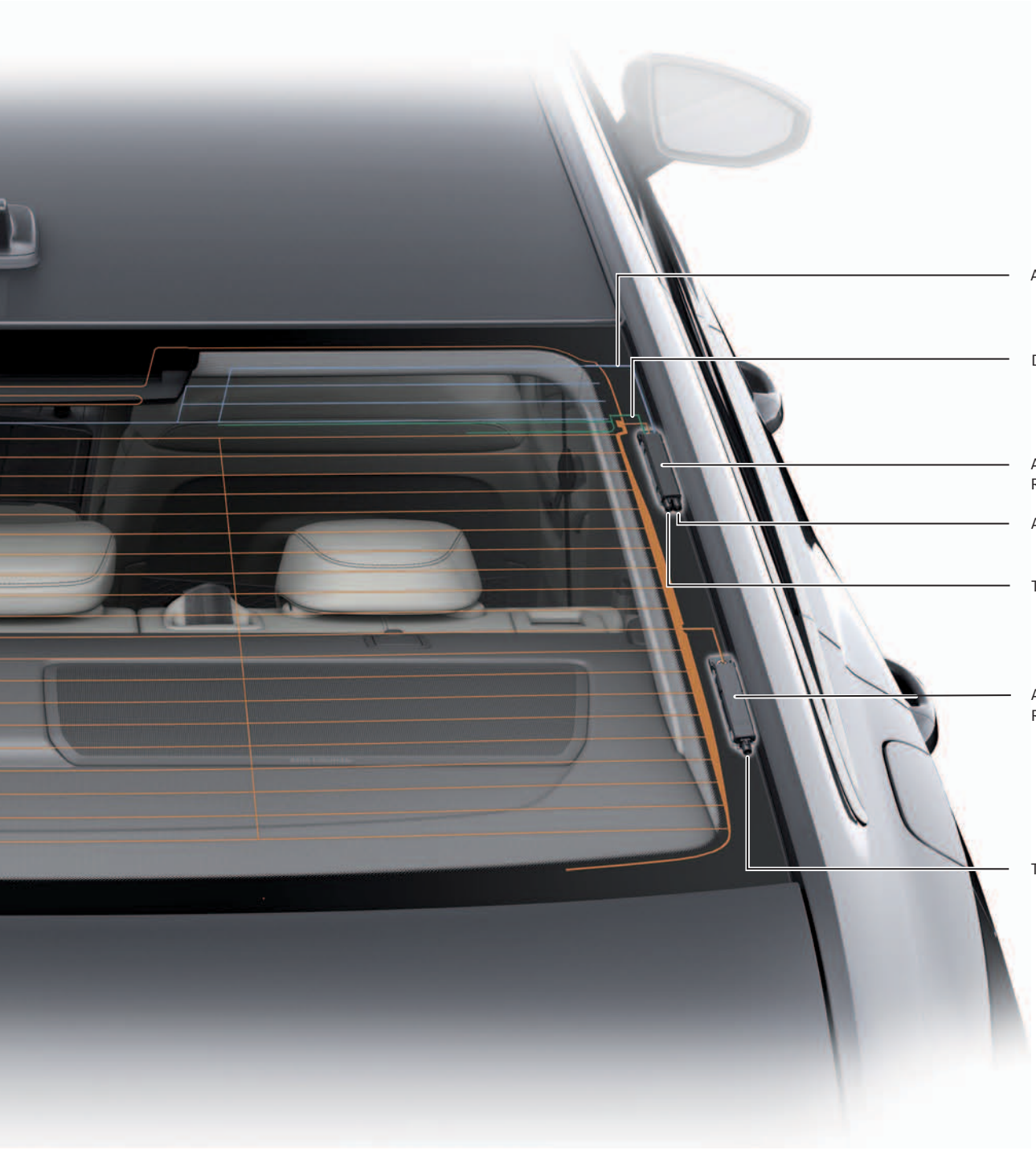


670_104

Aerials (Saloon)



Reference
For further information on the Audi A6/A6 Avant roof aerial, please refer to self-study programme 666 "Audi A8 (type 4N) Infotainment and Audi connect".



670_106

Reference
For further information on the mobile phone aerials in the Audi A6/A6 Avant, please refer to self-study programme 669 "Audi A7 (type 4K)".

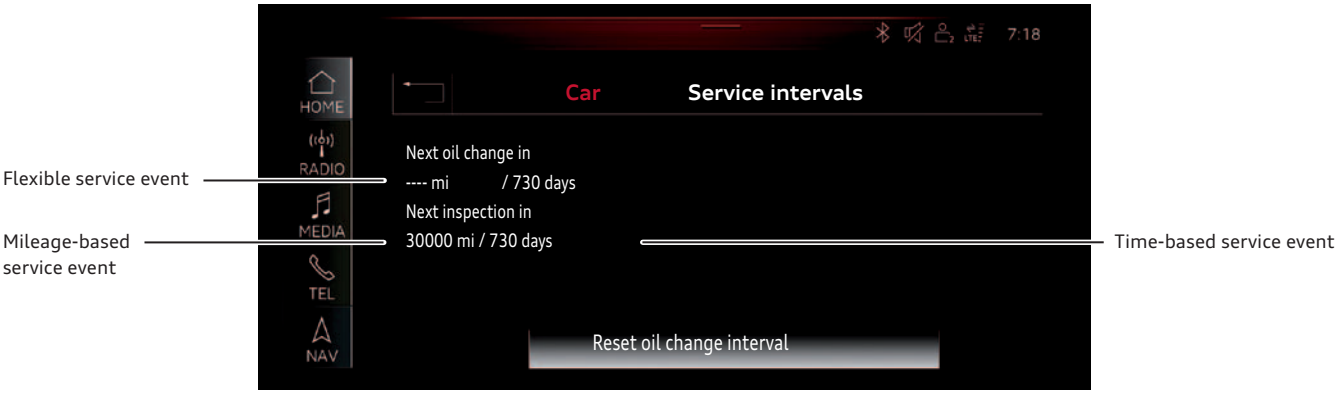
Inspection and maintenance

Service interval display

The following service intervals are displayed:

- Oil change service
- Mileage-based service events
- Time-based service events

Example of the service interval display on the MMI display of the Audi A6 (type 4A):



670_027

On new vehicles, the next oil change due field is initially blank.

An interval calculated on the basis of the driving style and engine load can only be displayed after about 500 km has been driven.

The value displayed in the mileage-based service events field is 30,000 km for new vehicles and is counted down in 100 km blocks. The value displayed in the time-based service events field is 730 days (2 years) for new vehicles and is updated on a daily basis once the vehicle has a total mileage of about 500 km.

Resetting the service interval display

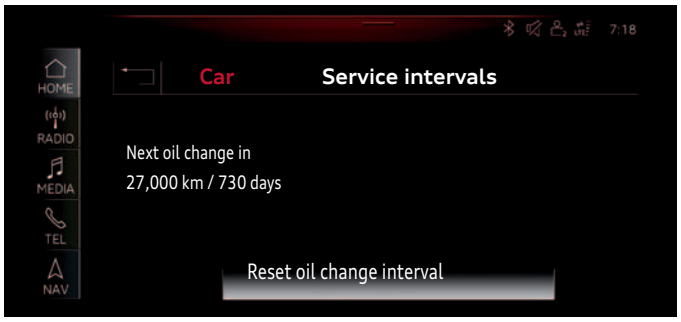
It is very important to use the vehicle diagnostic tester to reset the service interval display after a service event.

The following is then displayed in the service interval display:

Oil change (flexible service event for markets with service interval extension)

After resetting, the mileage last reached is displayed. A new, updated display is shown after a distance of about 500 km has been covered.

The “days” display is set to 730 days immediately.



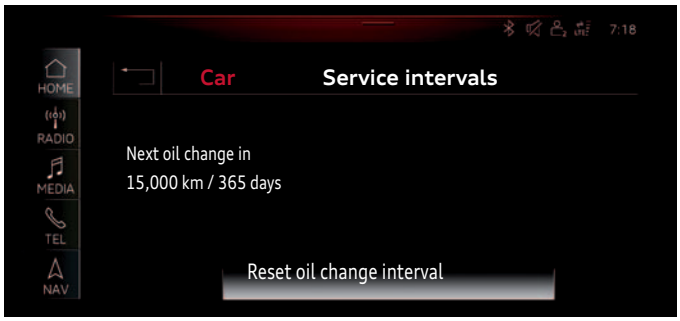
Example:
Oil change is due at 27,000 km.

670_027

Oil change (fixed interval - depends on market)

After resetting, the mileage last reached is displayed. A new, updated display is shown after a distance of about 500 km has been covered.

The “days” display is set to 365 days immediately.

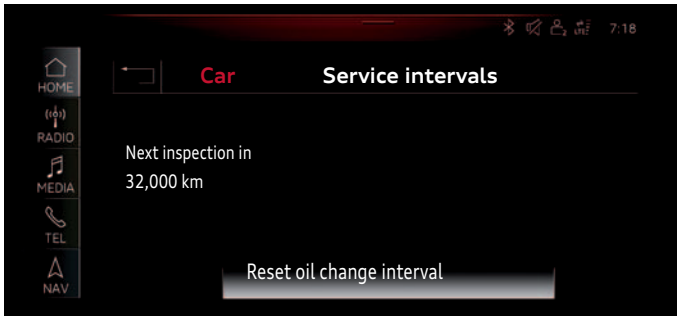


670_027

Mileage-based service event

As the mileage-based service event is always at a fixed mileage, multiples of 30,000 km are displayed here (30,000, 60,000, 90,000 ... km).

This display may vary if the inspection is not performed in 30,000 km cycles.



Example:
The inspection has been performed at 28,000 km (2,000 km “early”).

670_027

Note
It is not permitted to “miss out” service events.
Refer to the relevant service literature.

Time-based service event

The time-based service event is always set to another two years (730 days).

Resetting oil change interval manually

The oil change interval can be reset manually in the MMI.
In markets with service interval extension, the oil change interval is then set to a fixed interval.

Note
The information provided in the up-to-date service literature applies.
Maintenance intervals are displayed when the maintenance tables are created.

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