Service Training



The 2009 Audi A4
Vehicle Introduction

Self-Study Program 991803

Audi of America, LLC.

Service Training

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

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

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

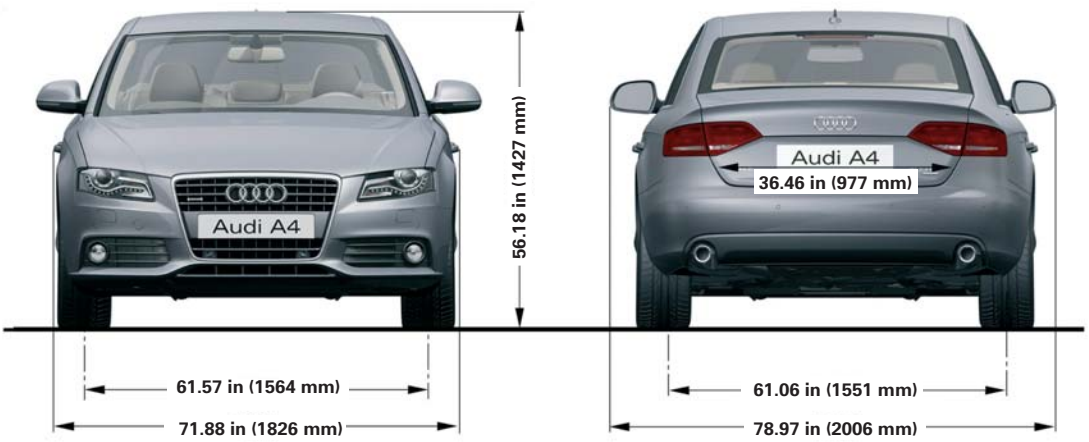
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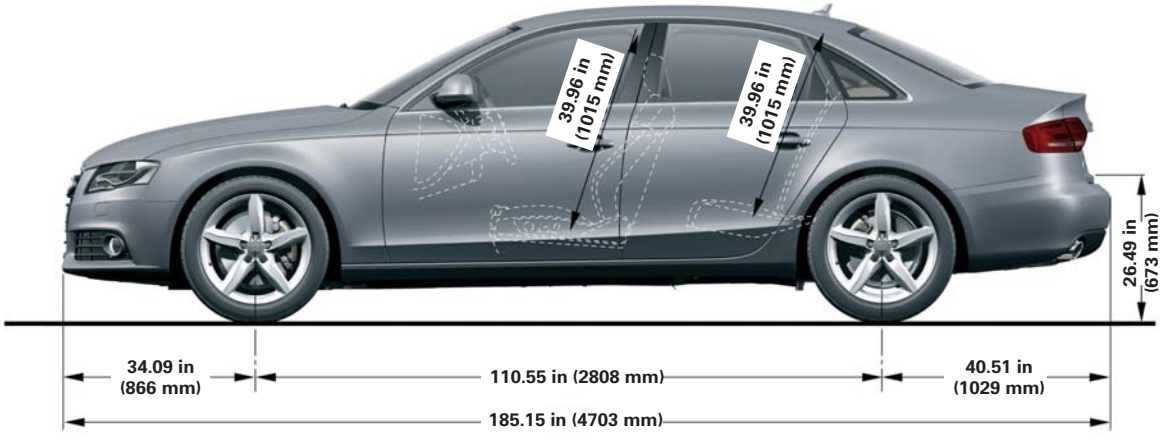


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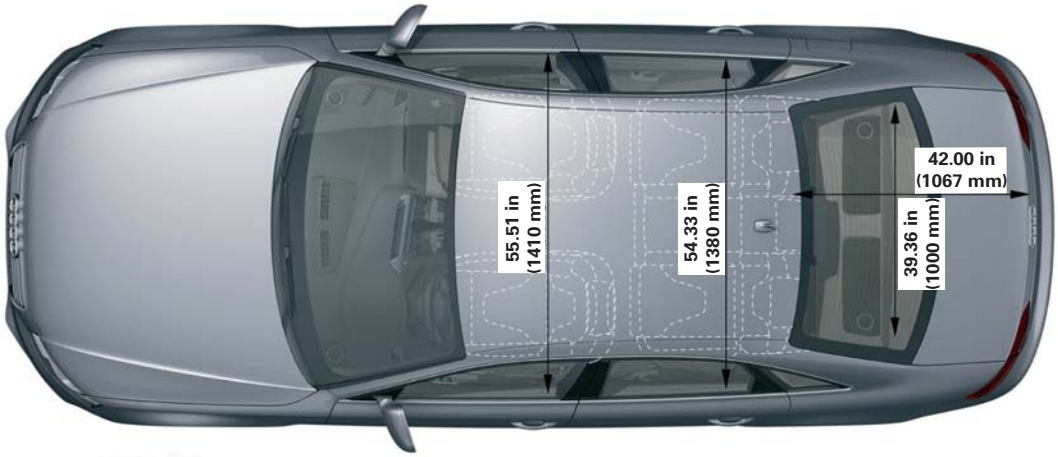


Dimensions





* maximum headroom



	Length	185.15 in (4703 mm)	Front inner width	55.51 in (1410 mm)
	Width	71.88 in (1826 mm)	Rear inner width	54.33 in (1380 mm)
	Height	5618 in (1427)	Front headroom	39.96 in (1015 mm)
	Front track width	61.57 in (1564 mm)	Rear headroom	37.48 in (952 mm)
	Rear track width	61.06 in (1551 mm)	Through-loading width	39.96 in (1000 mm)
	Wheelbase	110.55 in (2808 mm)	Loading sill height	26.49 in (673 mm)
	Trailer load	1653.4 lb (750 kg) / 4188.7 lb (1900 kg)	Luggage capacity	16.95 cu ft (480 l)
	Kerb weight	3218.7 lb (1460 kg)	Tank capacity	18.49 gal (70 l)
	Max. allowable gross weight	4431.2 lb (2010 kg)	Drag coefficient	0.27 cw

Body materials

In body construction, lightweight build and rigidity of the overall structure are key factors. The most recent innovation in this area is known as ultra high strength hot-formed steel, which was used for the first time in multiple applications on the Audi A5/S5 and now used in the 2009 A4. The required joining techniques were modified accordingly.



Soft deep-drawn steel
High-strength steel
Higher-strength steel
Ultra high-strength steel
Hot-formed (die-quenched) steel
Aluminium



System Overview

The Technical Development Team of Audi AG was tasked with designing a high-quality occupant protection system. Compliance with current legislation and consumer protection tests is only one of the many safety requirements.

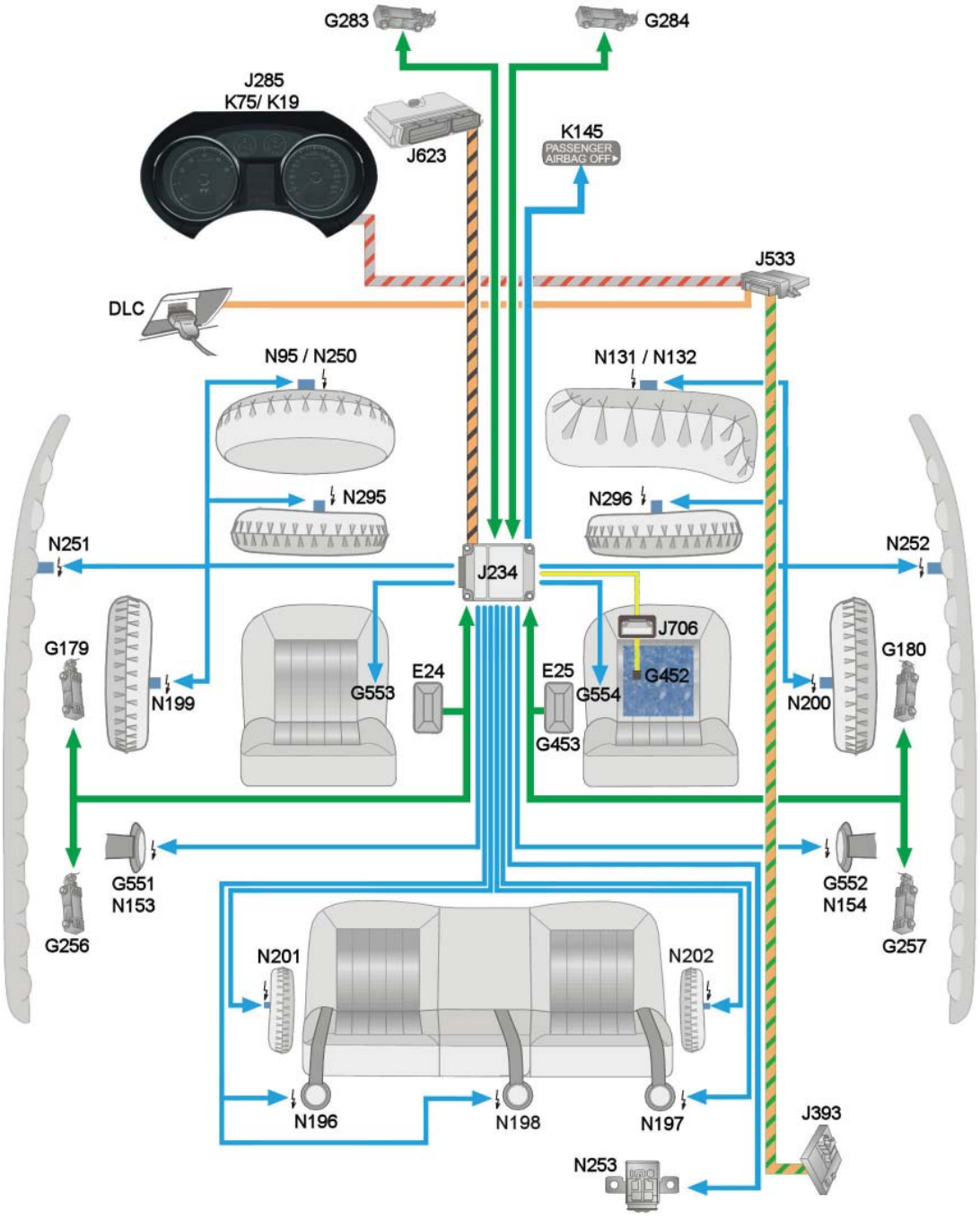
In addition, analyses of actual accidents in road traffic were included into the development process. Audi's own requirements presented additional challenges to the development team.

The occupant protection system on the 2009 Audi A4 is comprised of the following components and systems:

- Airbag Control Module.
- Driver's Airbag (Two-Stage, Adaptive).
- Front Passenger's Airbag (Adaptive).
- Front Side Airbags.
- Driver and Front Passenger Knee Airbags.
- Sideguard Protection.
- Front Crash Sensors.
- Side Impact Crash Sensors (in Doors).
- Side Impact Crash Sensors (in 'C' Pillars).
- Front Pyrotechnic Safety Belts (with Pyrotechnic Belt Force Limiters).
- Battery Interrupt Igniter.
- Safety belt Reminder for Driver and Front Passenger.
- Safety belt Switch, Driver and Front Passenger Side.
- Passive Occupant Detection System (PODS).
- Driver and Front Passenger Seat Position Detection.
- Backguard Front Seat Design.

Legend

DLC Data Link Connector
E24 Driver's Safety Belt Switch
E25 Front Passenger's Safety Belt Switch
G179 Driver's Side Airbag Crash Sensor
G180 Front Passenger's Side Airbag Crash Sensor
G256 Rear Side Airbag Crash Sensor (on driver's side)
G257 Rear Side Airbag Crash Sensor (on front passenger's side)
G283 Driver's Front Airbag Crash Sensor
G284 Front Passenger's Front Airbag Crash Sensor
G452 Seat Occupied Recognition Pressure Sensor
G453 Seat Occupied Recognition Safety Belt Force Sensor
G551 Driver's Belt Force Limiter
G552 Front Passenger's Belt Force Limiter
G553 Driver's Seat Position Sensor
G554 Front Passenger's Seat Position Sensor
J234 Airbag Control Module
J285 Instrument Cluster Control Module
J393 Comfort System Central Control Module
J533 Data Bus On Board Diagnostic Interface
J623 Engine Control Module
J706 Seat Occupied Recognition Control Module
K19 Safety Belt Warning Lamp
K75 Airbag Malfunction Indicator Lamp
K145 Front Passenger's Airbag Disabled Indicator Lamp
N95 Driver's Airbag Igniter
N131 Front Passenger's Airbag Igniter 1
N132 Front Passenger's Airbag Igniter 2
N153 Driver's Safety Belt Tensioner Igniter 1
N154 Front Passenger's Safety Belt Tensioner Igniter 1
N196 Rear Safety Belt (driver's side) Tensioner Igniter
N197 Rear Safety Belt (front passenger's side) Tensioner Igniter
N198 Center Rear Seat Belt Tensioner Igniter
N199 Driver's Side Airbag Igniter
N200 Front Passenger's Side Airbag Igniter
N201 Rear Passenger Side Airbag (Driver side) Igniter
N202 Rear Passenger Side Airbag (front Passenger side) Igniter
N250 Driver's Airbag Igniter 2
N251 Driver's Head Curtain Airbag Igniter
N252 Front Passenger's Head Curtain Airbag Igniter
N253 Battery Interrupt Igniter
N295 Driver's Knee Airbag Igniter
N296 Front Passenger's Knee Airbag Igniter


G283
G284
J285
K75/ K19
J623
K145
PASSENGER AIRBAG OFF
J533
DLC
N95 / N250
N131 / N132
N295
N296
N251
J234
N252
G179
N199
G553
E24
E25
G554
J706
G452
G453
N200
G180
G551
N153
G552
N154
G256
G257
N201
N202
N196
N198
N197
J393
N253

Airbag Control Module J234

The Airbag Control Module communicates on the Powertrain CAN bus to exchange data with other control modules.

Airbag Control Module J234 has the following tasks:

- Evaluation of all Input Information.

- Defined Deployment of the Belt Tensioners, Airbags, and Battery Disconnect.

- Defined Deployment of the Second Airbag Stage.

- Control of the Adaptive Front Passenger Front Airbag.

- Belt Force Limiter Control.

- Safety Belt Reminder Control

- Continuous Monitoring of the Complete Airbag System

- Independent Energy Supply via Capacitor for a defined Period of Time (up to 200ms).

- Fault Indication via Failure Warning Lamp.

- Storage of Fault and Crash Information.

- Indication of a Collision Event to Other System Components via the Powertrain CAN Bus.

It is located between the front seats below the center console.

Airbag Control Modules can only be replaced using the VAS Scan Tool via “Guided Fault Finding” or “Guide Functions.”

Side airbags

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

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

Side Guard Protection®

The Sideguard Protection® on the A4 extends from the ‘A’ pillar to the ‘D’ pillar, covering almost the entire side window area.

Inertia-reel safety belts

The inertia-reel safety belts on all 2009 Audi A4 models world-wide are equipped with band tensioners for the driver and front passenger. The front inertia-reel safety belts also have a dual-stage belt force limiter.

Driver’s Seat Position Sensor G553
Front Passenger’s Seat Position Sensor G554

The driver and front passenger seats of the A4 are equipped with Hall-type seat position sensors. Based on sensor input, Airbag Control Module J234 determines whether the seats are located in the front third or the rear two thirds of the seat adjustment range. The Airbag Control Module uses this information to adaptively activate the belt force limiter and front airbags to the correct timing. If the seat is in the front third of the adjustment range, the Airbag Control Module can activate igniter 2 of the adaptive airbag earlier than if the seat was in the rear two thirds of the adjustment range.

Battery Interrupt Igniter N253

Battery Interrupt Igniter N253 disconnects the vehicle battery from the starter and alternator in the event of a collision.

Use is made of a pyrotechnic component, which is activated by the Airbag Control Module upon deployment of the airbag in an accident of high severity.

In the event of a rear collision, only the belt tensioners and the Battery Interrupt Igniter are activated. If the pyrotechnic propellant charge is ignited, the resultant gas pressure displaces the bolt of a piston and disconnects the two terminals.

After activation, the Battery Interrupt Igniter must be replaced.

Reference

For detailed information about the airbags, safety belt tensioners and seat position sensor, please refer to SSP 997703 “The 2008 Audi A5/S5 - Vehicle Introduction”.

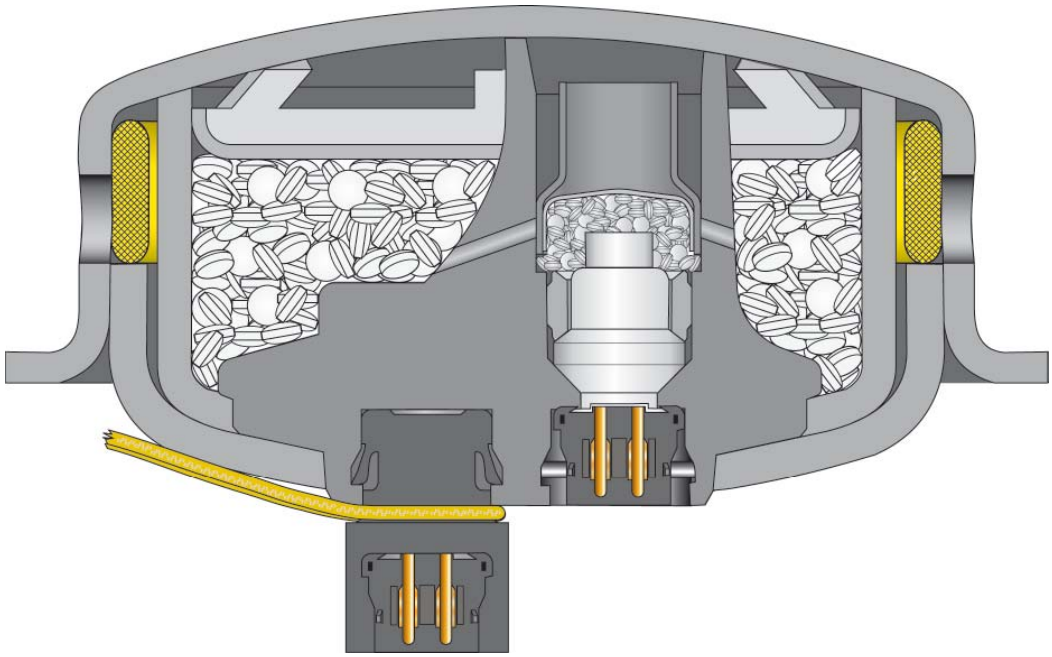
Driver's Airbag Igniter N95
Driver's Airbag Igniter 2 N250

All 2009 A4 models distributed world wide are equipped with an adaptive driver airbag as standard equipment.

It is a single stage solid fuel generator with an additional igniter.

Airbag Control Module J234 activates Igniter 1 which in turn ignites the ignition charge.

The actual propellant charge is subsequently ignited via nozzle ports. When the gas pressure produced by combustion of the propellant charge exceeds a predetermined value, the gas generator housing changes shape, thereby providing a clear path to the airbag via the inner housing and the metal filter. The airbag unfolds and is inflated.



An additional igniter - Driver's Airbag Igniter 2 N250 - is located on the back of the airbag outside the gas generator. A cord which seals an additional discharge port is wound around this igniter.



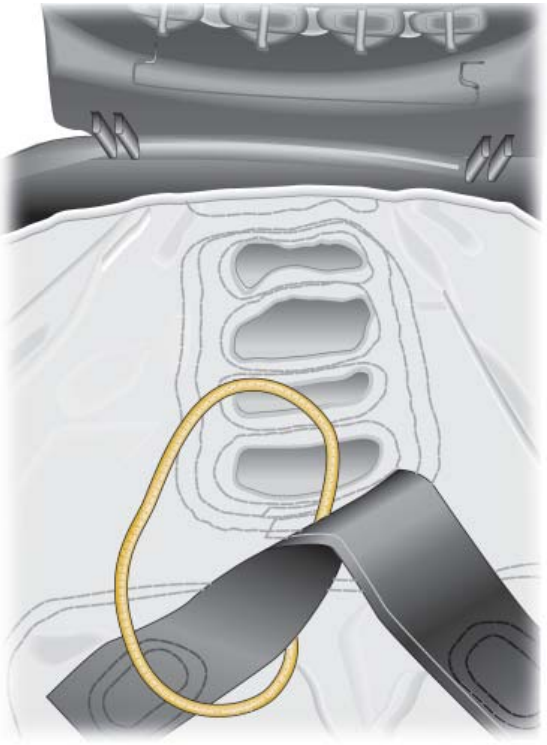
The discharge port is kept sealed as long as the cord is held in place by the igniter.



Airbag Control Module J234 ignites Driver's Airbag Igniter 2 N250 after evaluating the severity of the crash event and the driver's seat position. The igniter housing ruptures and the cord is released.

The volume of the airbag increases by approximately 0.14 cu ft (4 liter), and the additional discharge port is opened. This discharge port allows more gas to escape from the airbag. The airbag is "adapted" to suit the occupants.

Depending on the model, the gas generators of the driver's airbag module are mounted in a rubber ring. This helps keep steering wheel vibrations to a minimum.

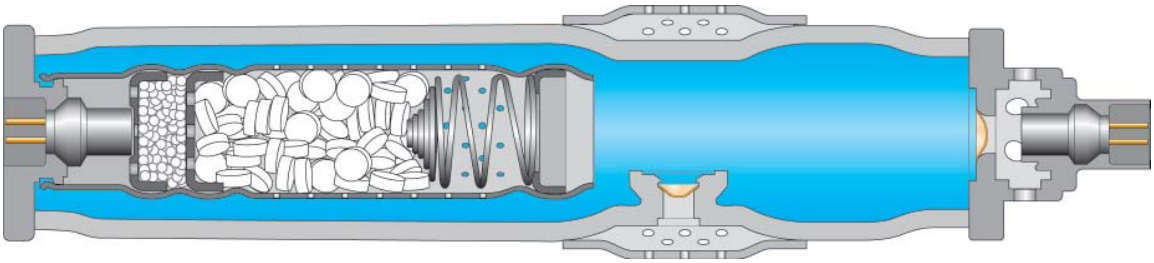


Front passenger side airbag igniter 1 N131
Front passenger side airbag igniter 2 N132

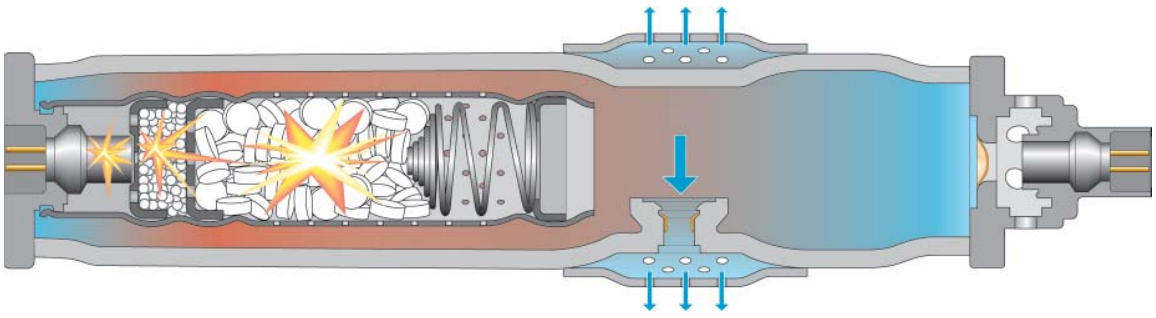
Like the driver airbag, the front passenger airbag is equipped with an adaptive gas generator. It is a single-stage hybrid gas generator with a second discharge port.

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

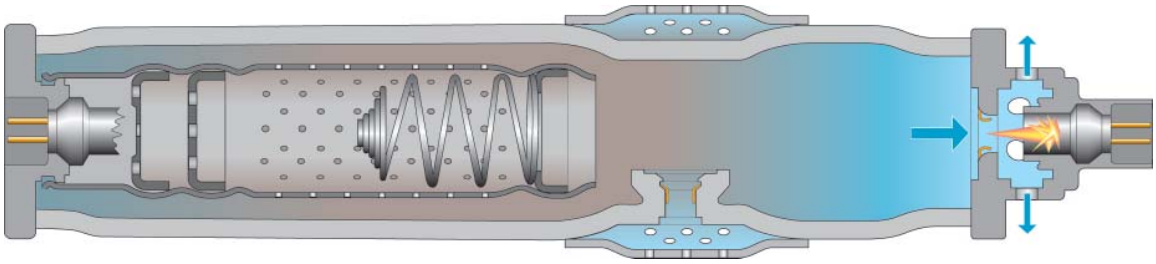
The pyrotechnic propellant charge is integrated in the pressurized gas bottle. The gas (95% argon and 5% helium) is kept at a pressure of approximately 5081 psi (400 bar.)



The ignition charge fired by igniter 1 ignites the actual propellant charge. This causes the pressure inside the pressurised gas bottle to increase until rupture disc 1 bursts. The gas mixture inflates and unfolds the airbag.

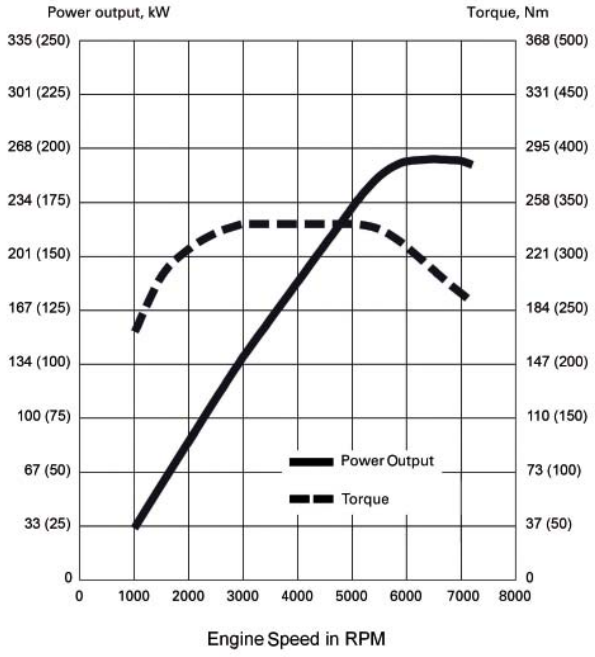


After a defined time period has elapsed, the airbag control module J234 activates igniter 2. A targeted pressure pulse from igniter 2 causes rupture disc 2 to burst. Some of the remaining gas discharged from the pressurised gas bottle now dissipates into the atmosphere and no longer into the airbag.



3.2 L V6 FSI with Audi Valve Lift System

Technical Features





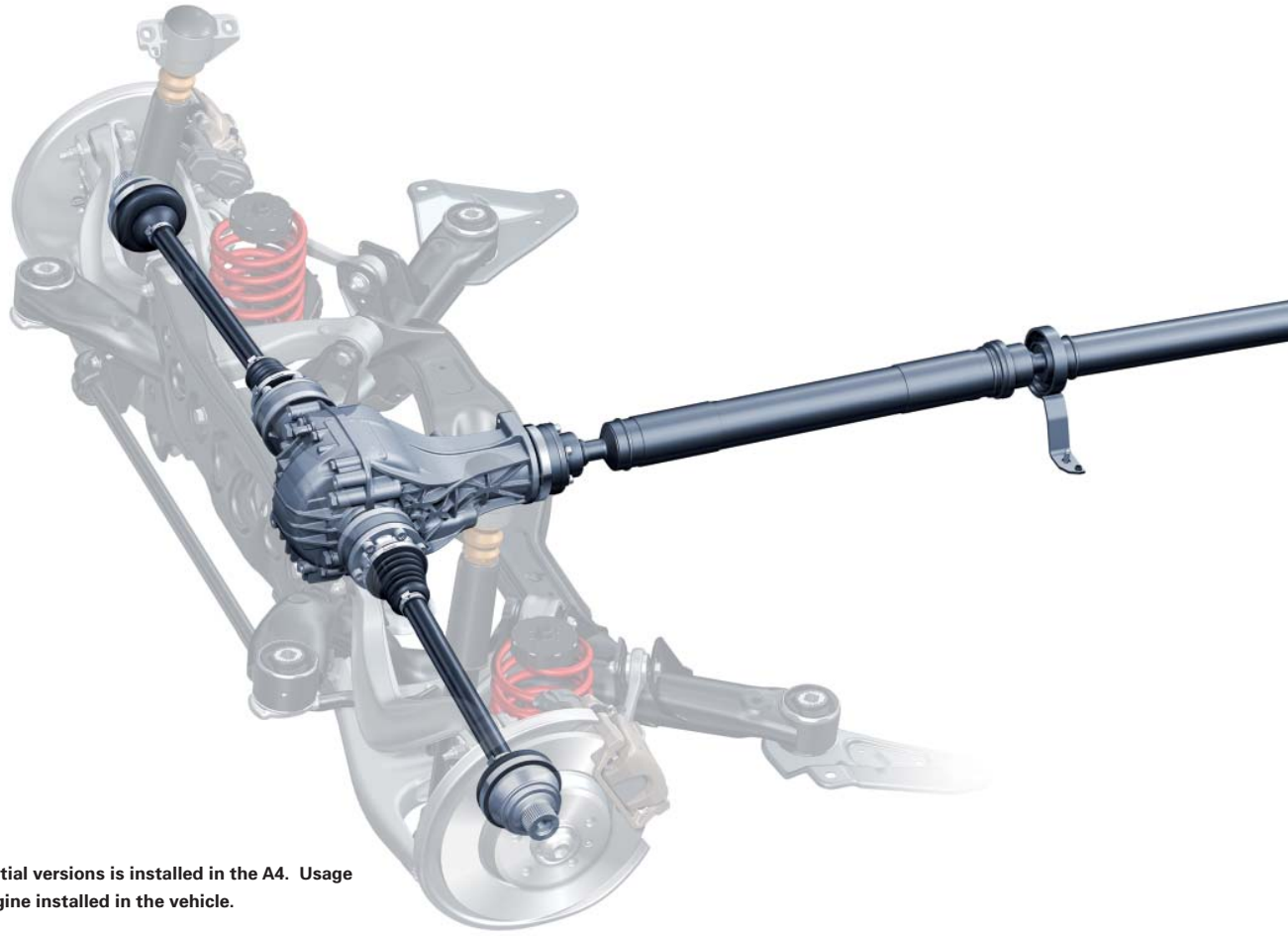
Note

The 2009 Audi A4 is also available with a 2.0 L FSI Engine with Audi Valve Lift System The information for this engine was not available at the time of publishing and will be covered in SSP 993803.

Specifications

Engine ID Letters	CALA
Type	V6 90° V angle
Displacement	195 cu in (3197 cm3)
Power	265 hp (195 kW) at 6500 rpm
Torque	243 lb ft (330 Nm) at 3250-5000 rpm
Number of Valves Per Cylinder	4
Bore	3.3 in (84.5 mm)
Stroke in Inches	3.6 (92.8 mm)
Compression	12.5:1
Ignition Sequence	1-4-3-6-2-5
Engine Management	Simos 8.2
Recommended Fuel Grade	Unleaded Super, 95 RON
Emission Standard	LEV II/EU 4

New features of the drivetrain system

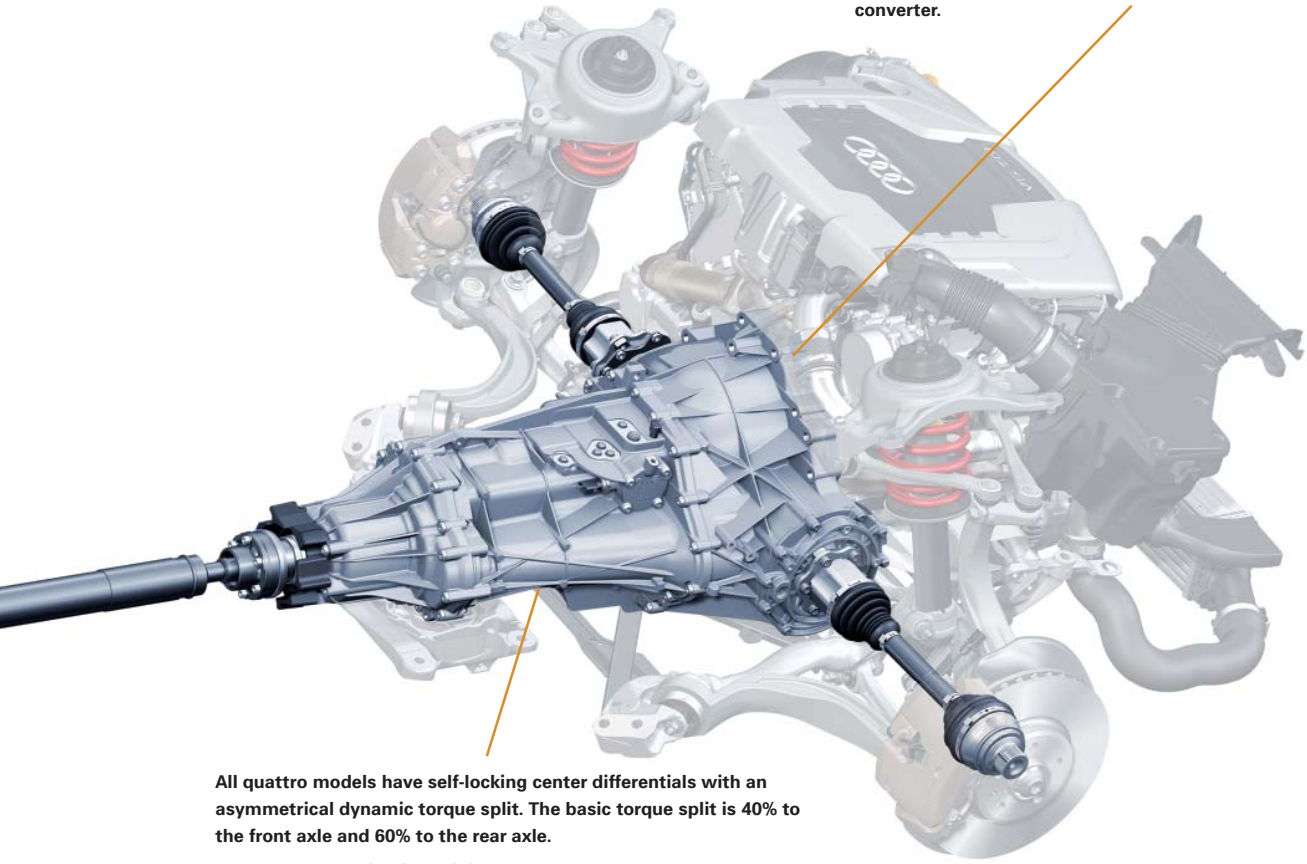


One of two differential versions is installed in the A4. Usage depends on the engine installed in the vehicle.

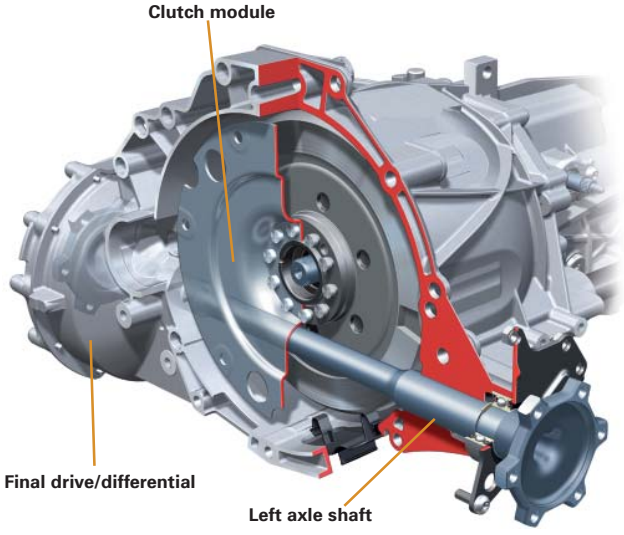
Reference

The engine/transmission configurations of the 2009 A4 are the same as those of the A5/S5. You can find out more information about this and clutch module in Self-Study Program 997703 "The 2008 Audi A5/S5 - Vehicle Introduction".

New engine/transmission configuration with front axle differential mounted forward of the clutch or automatic transmission torque converter.



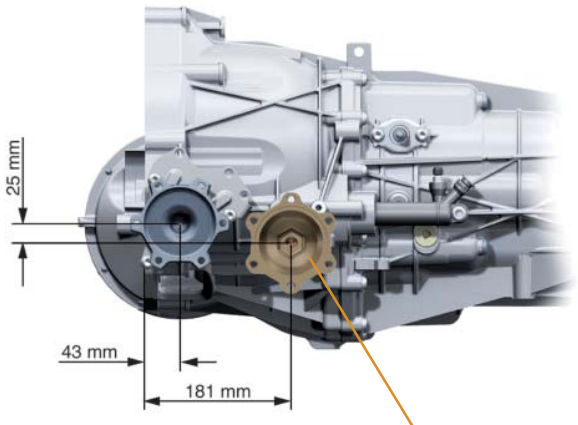
All quattro models have self-locking center differentials with an asymmetrical dynamic torque split. The basic torque split is 40% to the front axle and 60% to the rear axle.



The new engine/transmission configuration was made possible by shifting the differential in front of the clutch (manual transmission versions) or in front of the torque converter (automatic transmission versions).

This, in turn, means that the transmisssions for the B8 series had to be redesigned. The result is a completely new generation of manual and automatic transmissions.

In the new-generation transmissions, the distance between the engine/transmission flange and the center of the axle shaft has been reduced to 43 mm (this was previously 181 mm in manual transmissions, for example). In addition, the axle shaft is now approx. 25 mm higher in order to create space for the new position of the steering gear.



Comparison - A4/B7 Flange shaft of 0A3 transmission

Power transmission

The new engine/transmission configuration

In addition to meeting ecological and economical requirements, the development of the new Audi A4 was focused on meeting the following objectives:

A - improved pedestrian safety,

B - extension of the wheelbase,

C - optimization of axle load distribution

D - and implementation of a short front body overhang

These objectives were met by modifying the layout of the engine/transmission assembly in relation to the front axle.

The illustration below shows a comparison of the drivetrain configuration on the Audi A4 (B7 series) and the new engine/transmission configuration on the Audi A4 (B8 series). For this purpose, the vehicle contours of both series have been superimposed on the common front wheel center point (= same front axle position).

Explanation of the development objectives

A - The larger the distance between the hood and engine, the larger the crumple zone. This is a key requirement for the improvement of pedestrian safety.

B - Extending the wheelbase increases ride comfort and creates more space inside the vehicle.

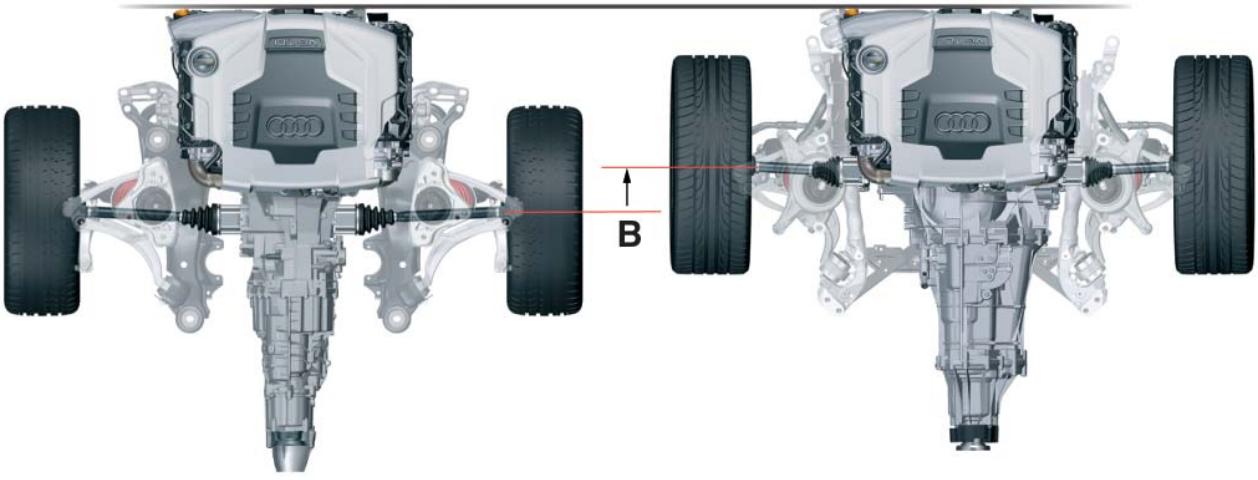
C - Moving the entire drive unit backwards (relative to the center of the axle) optimizes the axle load distribution and improves driving dynamics.

D - The new engine-transmission configuration makes possible a shorter front overhang, which is beneficial from a design viewpoint.

A4/B7 = 2008 Model Year

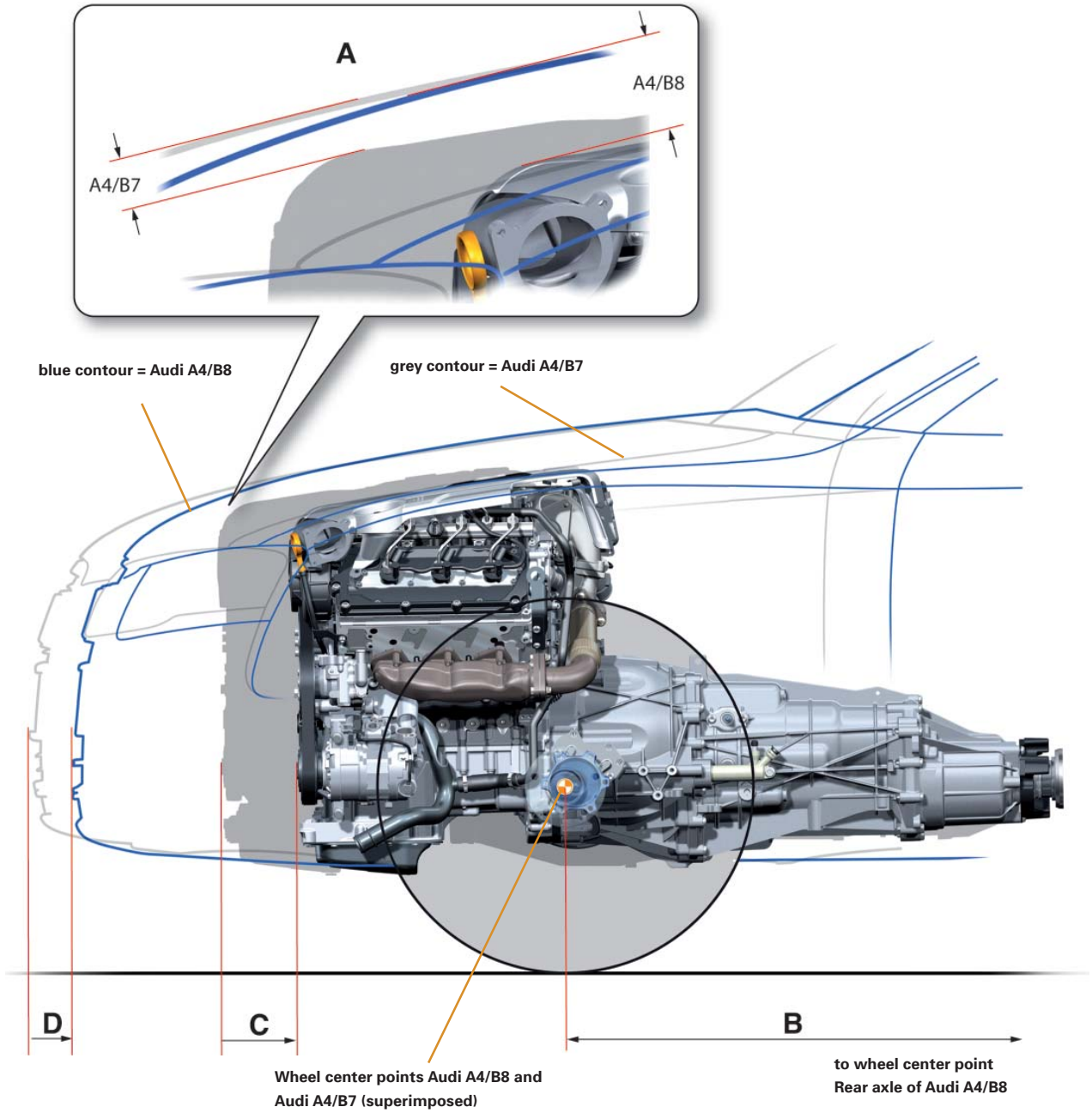
A4/B8 = 2009 Model Year

Comparison of the axle positions (wheel center point) with the same engine-transmission configuration



Explanation:

Model series	Model	Type	from model year
B7	Audi A4	8E	2001
B8	Audi A4	8K	2009
B8	Audi A5/S5	8T	2009



The new transmission generation

Manual Transmissions

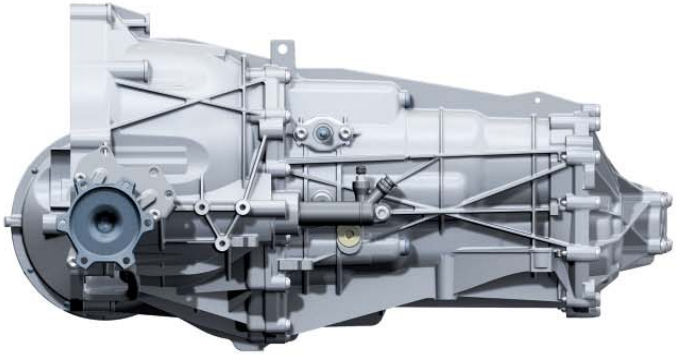
New-generation 6-speed manual transmissions are used on all 2009 Audi A4 models. The main feature of these new generation transmissions is the previously mentioned relocation of the differential and the clutch module. At the start of production of the 2009 Audi A4, the 0B1 and 0B2 transmissions will be added to the 0B4 transmission first used on the Audi A5/S5. The 0B3 transmission will be launched at a slightly later date.



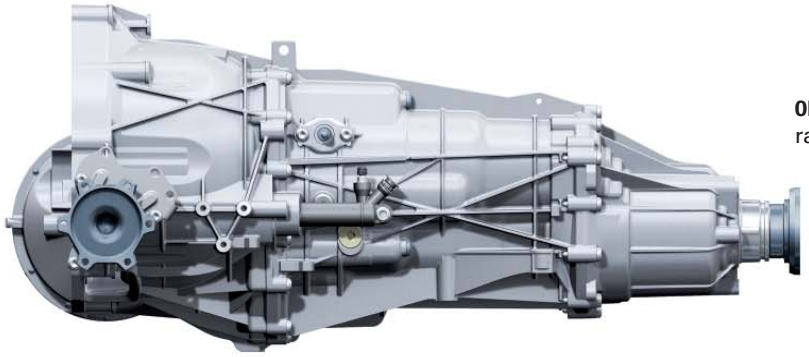
0B1 - for front-wheel drive and all engines rated for up to 258 lb ft (350 Nm)



0B2 – for quattro drive and all engines rated for up to 258 lb ft (350 Nm)



0B3 – for front-wheel drive and all engines rated for over 258 lb ft (350 Nm)

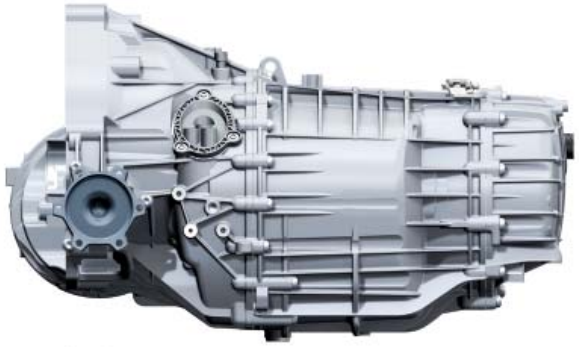


0B4 – for quattro drive and all engines rated for over 258 lb ft (350 Nm)

Automatic transmission

All vehicles with automatic transmission and front-wheel drive will be equipped with multitronic 0AW.

Vehicles with quattro drive feature the new six-speed automatic transmission 0B6.



0AW – for front-wheel drive and all engines rated for up to 295 lb ft (400 Nm)



0B6 – for quattro drive and all engines rated for up to 428 lb ft (580 Nm)

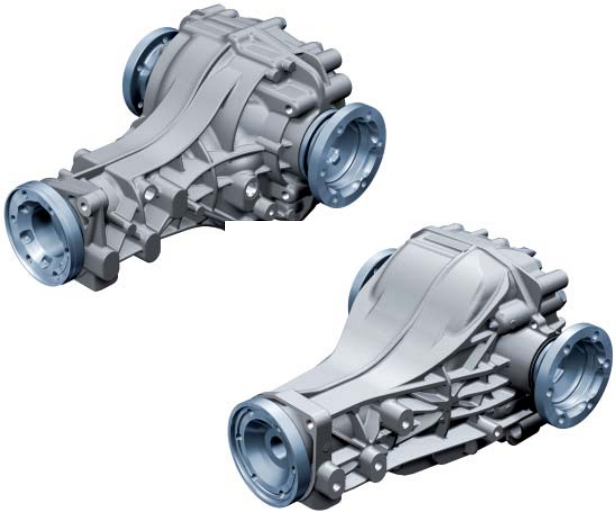
Final drive (real axle drive)

Two new final drives (0BD and 0BC) have been introduced for the 2009 A4 models.. Final drive 0BD has the same basic design as final drives 08V, while final drive 0BC has the same basic design as the 0AR. The new final drives differ from the previous final drives (08V and 0AR) in the following respects:

– Various modifications have been made to the housing and housing cover due to the modified engine/transmission mounting

– The input flange shaft (connection to driveshaft) has been modified to accommodate the new sealing and assembly concept

Final drives 0BD and 0BC have identical connecting dimensions. Where compatible with regard to torque capacity and reduction ratio, they are interchangeable.



0BD – for engines rated for up to approximately 295 lb ft (400 Nm). Development/manufacturer – ZF (Gotha)

0BC – for engines rated for up to approximately 442 lb ft (600 Nm). Development/manufacturer – Audi/VW-Kassel plant

quattro drive

Installing the driveshaft

A new sealing and assembly concept has been adopted for the 2009 A4 quattro.

The changes are:

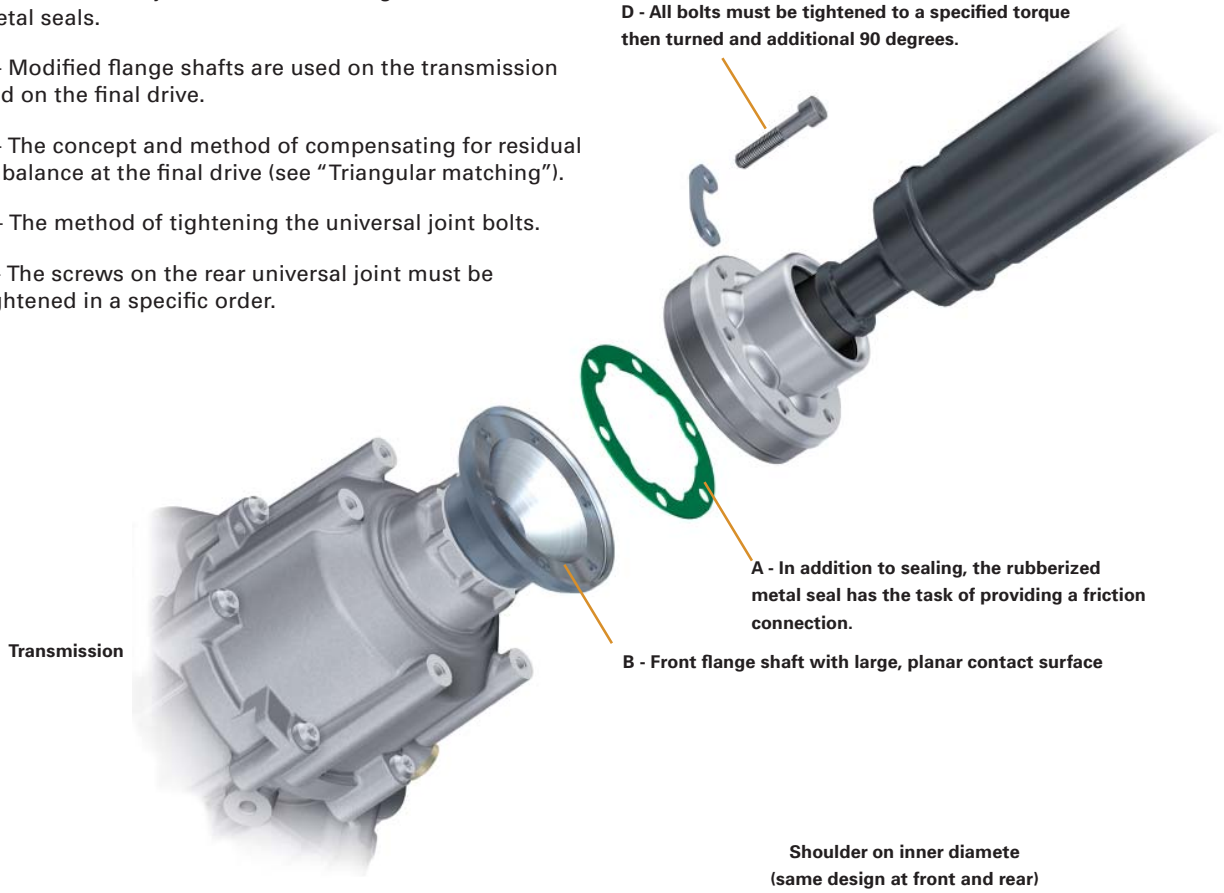
A - The universal joints are sealed using rubberized metal seals.

B - Modified flange shafts are used on the transmission and on the final drive.

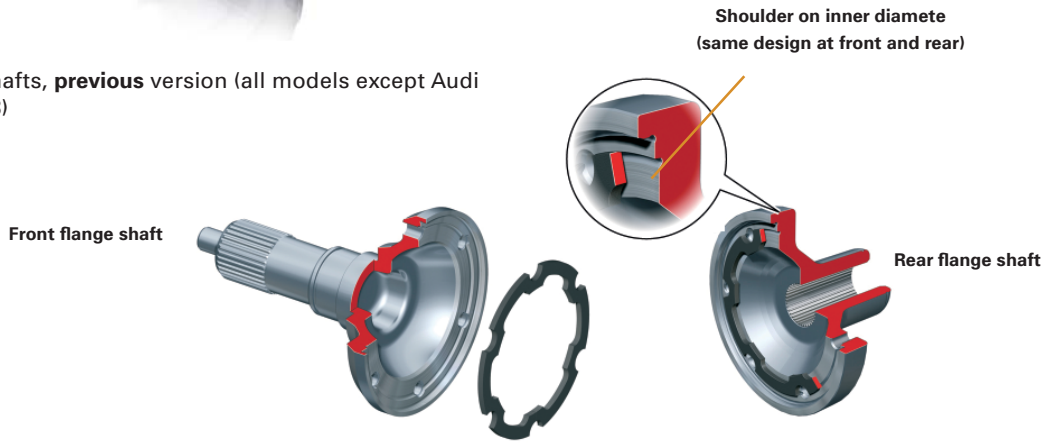
C - The concept and method of compensating for residual imbalance at the final drive (see “Triangular matching”).

D - The method of tightening the universal joint bolts.

E - The screws on the rear universal joint must be tightened in a specific order.



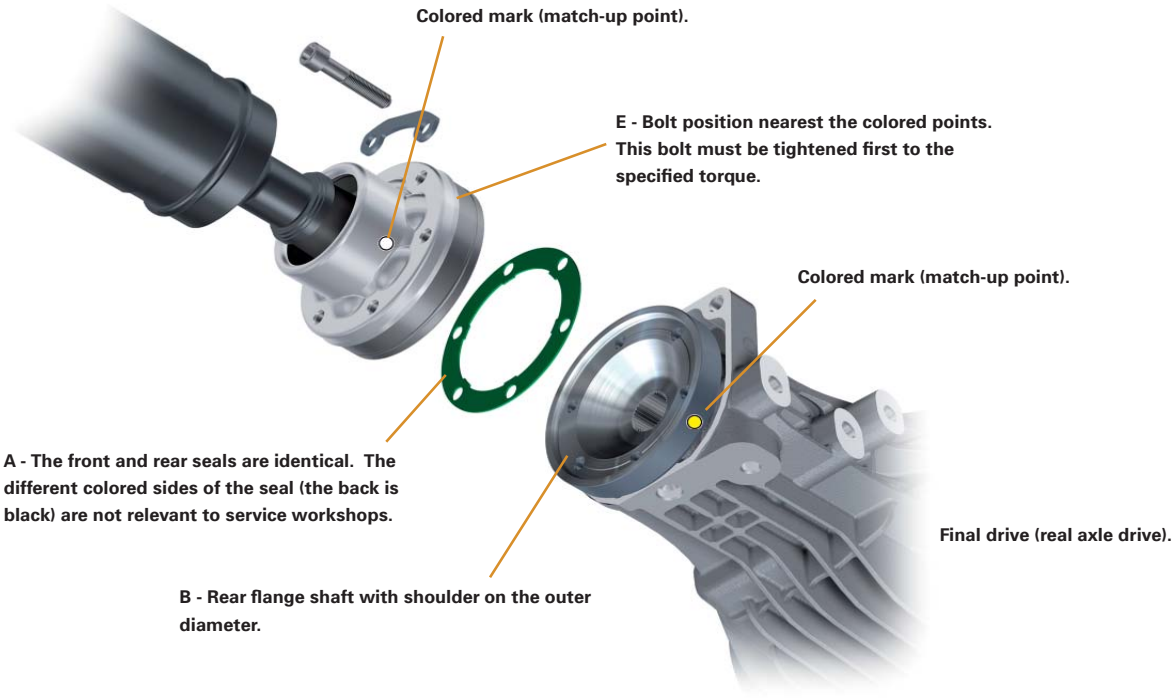
Flange shafts, **previous** version (all models except Audi A4/A5 -B8)



With the previous sealing and assembly concept, the rubber seal only had the task of sealing the joint. When installing the driveshaft, the rubber seal is compressed until the joint comes into contact with the flange. A friction connection is made directly between the joint and the flange shaft.

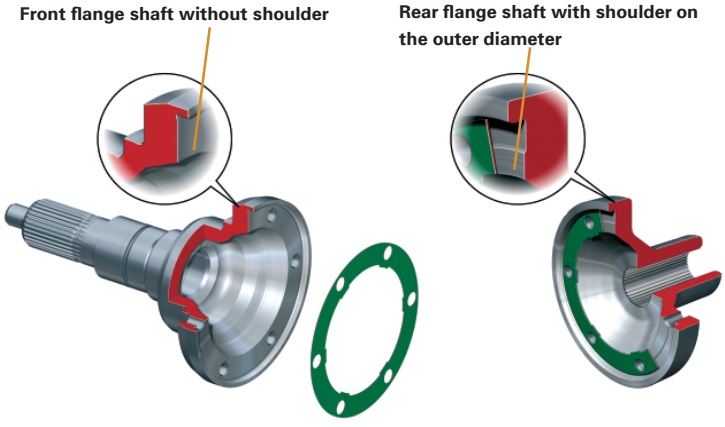
Installing the driveshaft on the final drive:

1. The hole pattern of the driveshaft joint and the axle flange must be joined together in such a way that the colored marks align. They must not be rotated by more than 30° relative to one another.
2. The bolt nearest the colored mark must be tightened first to the specified torque.
3. The remaining bolts are then tightened all round.
Follow the instructions given in ElsaWeb



Flange shafts (**new** type)
(Audi A4/A5 -B8)

In the new sealing and assembly concept, the seal is a component part of the bolt connection and participates directly in the power transmission process. This means that engine power is transmitted through the seal face.



Note

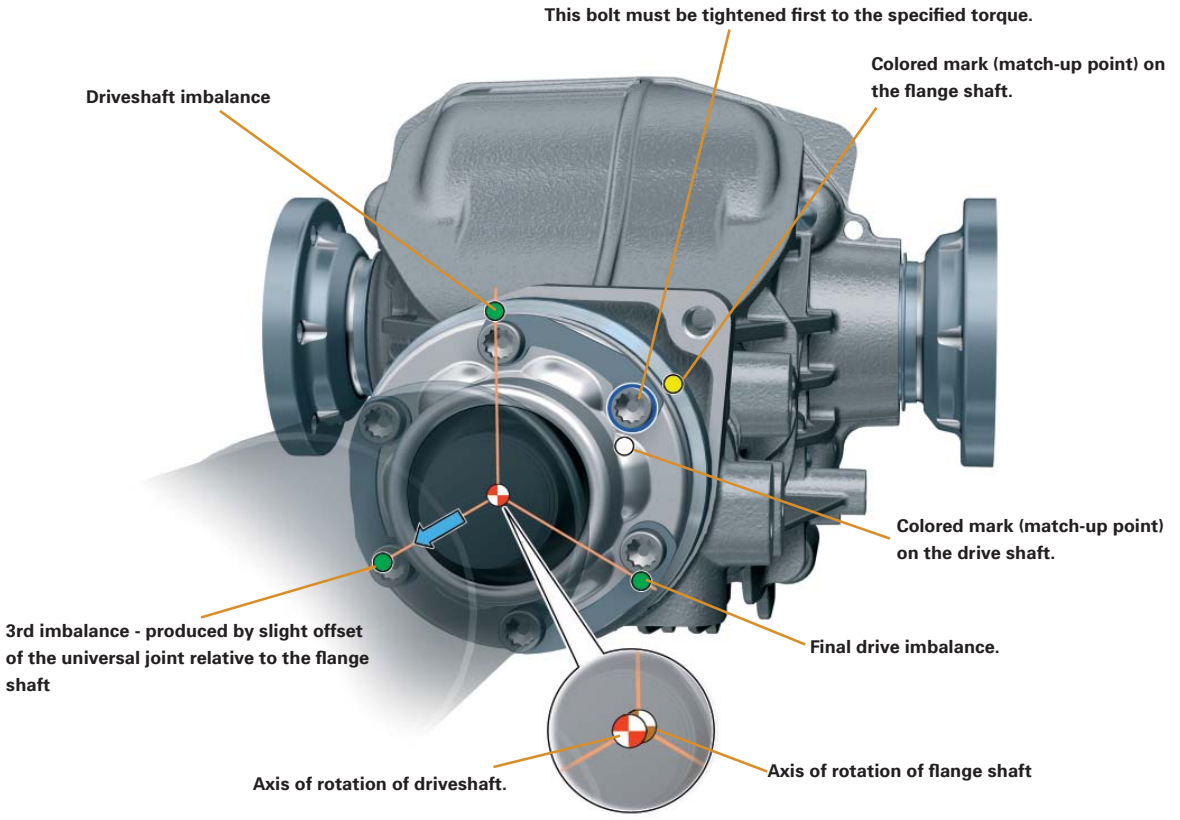
When installing the driveshaft, do not use the earlier style rubber seal under any circumstances! The rubber seal cannot transmit traction forces, and will be destroyed. The bolts will loosen and the driveshaft could become completely detached while driving! The new style rubberized metal seal may be reused several times provided that the rubber coating is not damaged.

Triangular matching

In models prior to the B8, the residual imbalance of the driveshaft and final drive were compensated for by opposing the respective imbalances at an angle of 180° during assembly. In earlier model year vehicles, this method is sufficient to compensate for the overall residual imbalance. During installation, it is only necessary to make sure that the colored marks on the drive shaft joint and on the flange shaft of the final drive align.

This method is no longer sufficient for the new B8 series, since better balancing of residual imbalances is necessary due to the use of lightweight design and the engine-transmission mounting configuration.

A new assembly method, known as “triangular matching“, is used for the B8 series. With this new method, three imbalances are arranged at angle of 120 degrees to one another.



Notes on triangular matching

The white colored dot on the driveshaft joint is positioned with an offset of 60° clockwise relative to the residual imbalance of the driveshaft.

The yellow colored dot of the final drive is positioned with an offset of 60° counter-clockwise relative to the residual imbalance of the final drive.

If both colored dots align when the driveshaft is fitted to the final drive, the two imbalances are at an angle 120° relative to one another.

Tightening the bolt nearest the colored dots tilts the joint and moves it exactly to the opposite side.

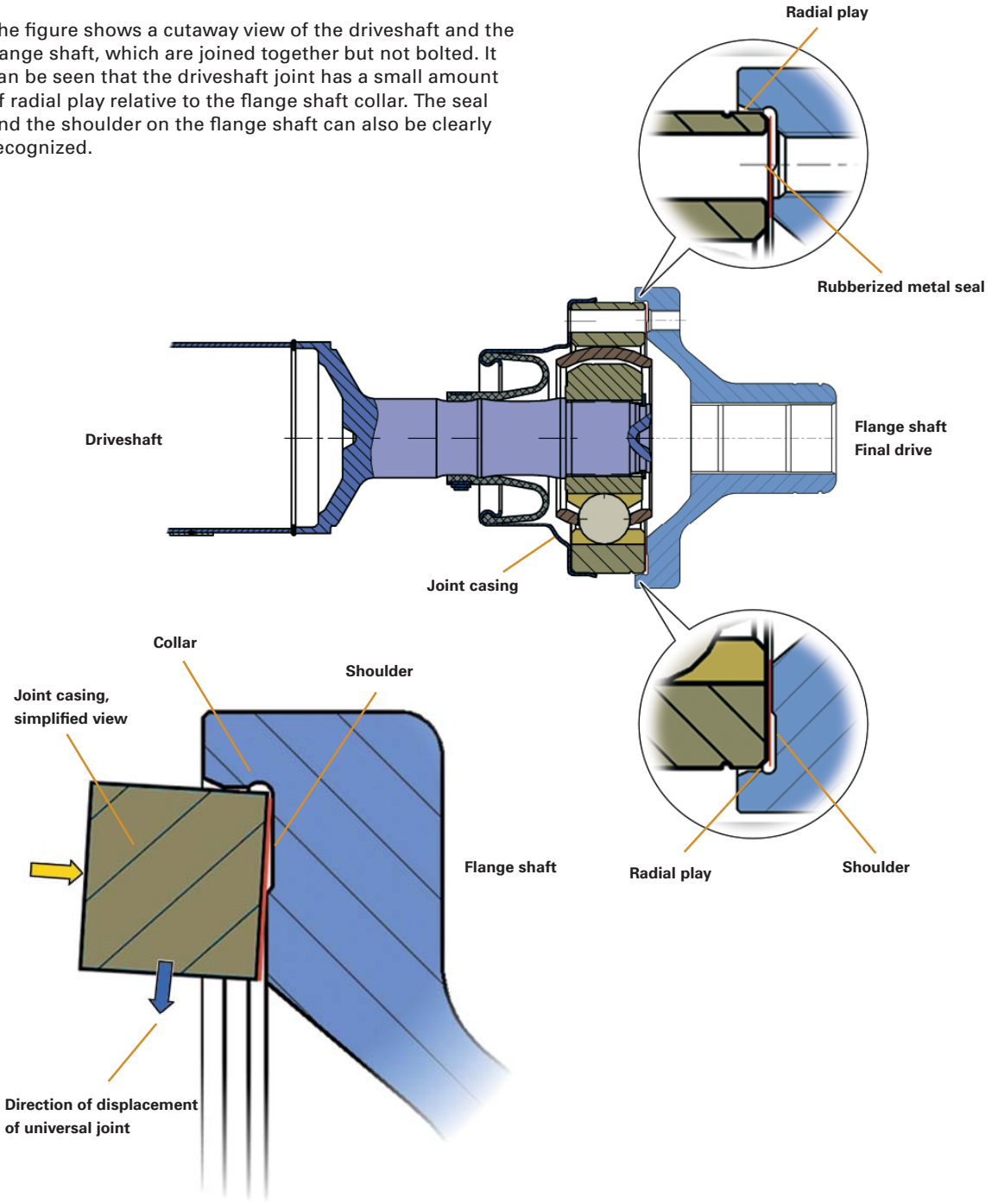
This means that the joint is slightly offset relative to the axis of rotation. This produces an “artificial” 3rd imbalance, which in turn is positioned at an angle of 120° to the other two imbalances.

The imbalances are now arranged in an isosceles triangle configuration, hence the term “triangular matching”.

Triangular matching provides better residual imbalance compensation and thereby minimizes the overall residual imbalance.

Notes on the displacement of the driveshaft joint

The figure shows a cutaway view of the driveshaft and the flange shaft, which are joined together but not bolted. It can be seen that the driveshaft joint has a small amount of radial play relative to the flange shaft collar. The seal and the shoulder on the flange shaft can also be clearly recognized.



How it works:

The joint has been replaced by a geometrically more simple part to allow better representation of its function. Tightening the first bolt to the specified torque automatically tilts the joint towards the shoulder. The joint rests against the flange shaft collar and displaces it exactly to the opposite side. The effect of this is described on the previous page. When the remaining bolts are tightened, the joint returns to its position facing the flange shaft.

New features for vehicles with automatic transmissions

Audi drive select

A new feature of the 2009 Audi A4 series is the optional Audi drive select system, which allows different vehicle set-ups to be configured by the driver.

The sport program of the automatic transmission can be set in the DYNAMIC driving mode. Vehicles with the "Audi drive select" package no longer have selector lever position "S" (sport setting). Vehicles without Audi drive select still have a shift gate with the selector lever position "S" for selecting the sport program.



Gear selector mechanism

The gear selector mechanism shown here was previously phased into the Audi A6 from model year 2006, and is now also featured on the new A4.

The key features are:

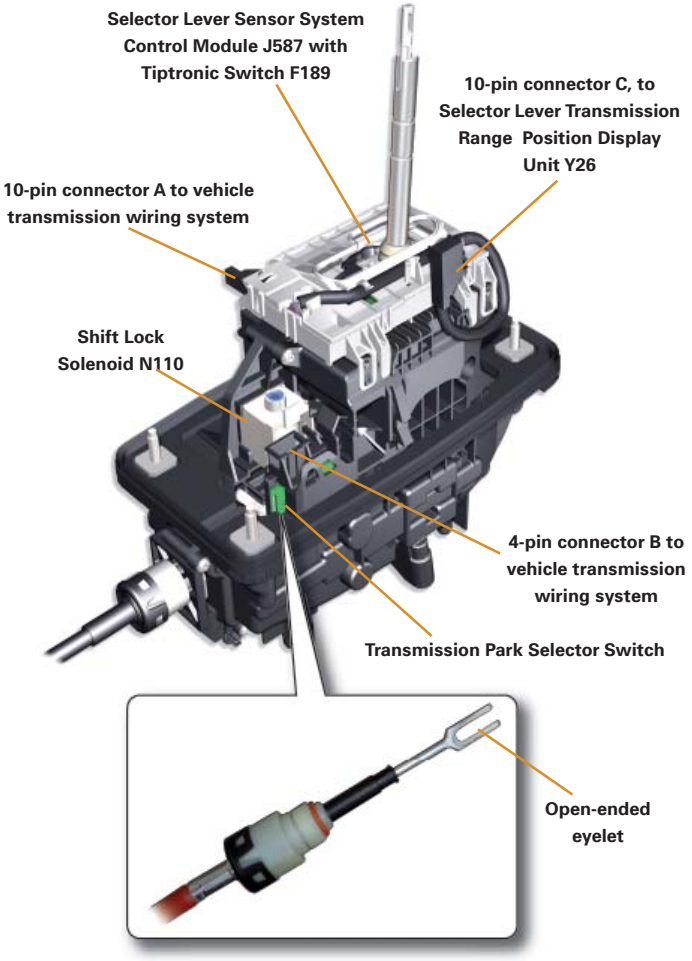
– Longitudinally split housing (disassembly is not necessary for routine repair work).

– Transmission Park Selector Switch F305 and the Shift Lock Solenoid N110 are combined as a unit, which can easily be removed without disassembly of the selector mechanism.

– Easy removal, installation and setting of the selector lever cable.

Selector lever cable with open-ended eyelet

No extensive work is required when removing and installing the cable pull. The selector lever cable can be set easily at the open-ended eyelet, which is accessible from the inside of the vehicle.



Ignition key removal lock

The 2009 A4 now also features the electrical ignition key removal lock system already in use on the A3, A5/S5, A6, and A8 models. Again, Transmission Park Selector Switch F305 provides the information for enabling the ignition key.

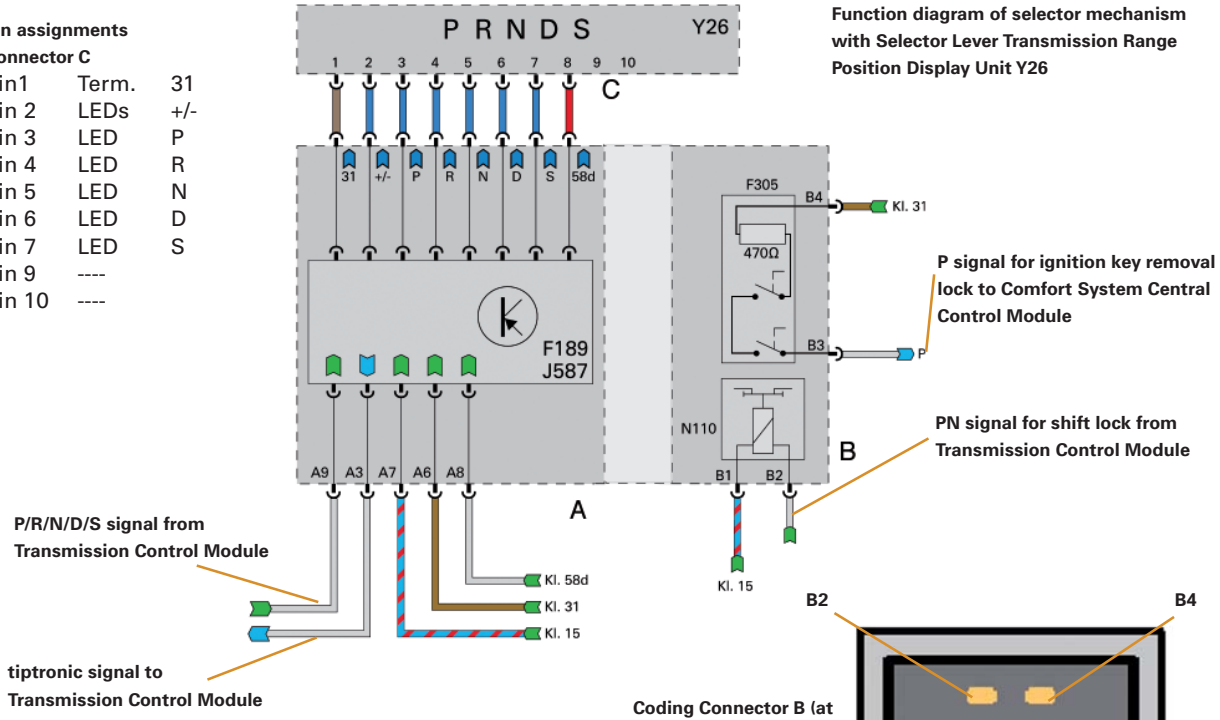
Reference

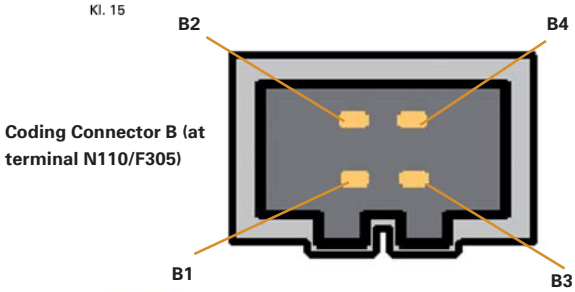
For further information about the ignition key removal lock, refer to Self-Study Program 998703, "The 2008 Audi A5/S5 Convenience Electronics" and for further information about the Selector Lever Sensor System Control Module J587, the P/R/N/D/S signal and the tiptronic signal, refer to Self-Study Program 951703, "The Audi 09D Automatic Transmission".

Selector Lever Sensor System Control Module J587

Pin assignments
Connector C

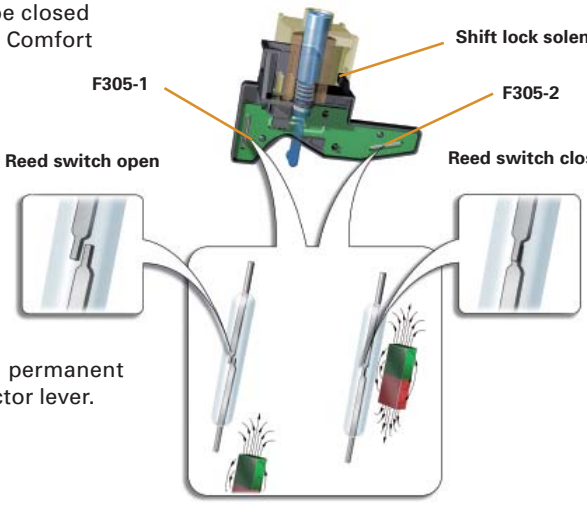
Pin1	Term.	31
Pin 2	LEDs	+/-
Pin 3	LED	P
Pin 4	LED	R
Pin 5	LED	N
Pin 6	LED	D
Pin 7	LED	S
Pin 9	----	
Pin 10	----	





Transmission Park Selector Switch F305

Switch F305 has two reed switches, which are connected in series with a resistor. Both switches must be closed to permit a ground signal to be applied to the Comfort System Central Control Module J393.



The reed switches are actuated by an external permanent magnet located at the 'P' position of the selector lever.

Shift locks (Park lock and Park/Neutral lock)

A basic distinction is made between two types of shift lock: the P/N lock, which is engaged during vehicle operation and when the ignition is “on”, and the P lock which is engaged when the selector lever is in the “P” position and the ignition key is removed from the ignition lock. The locking mechanisms are designed so that locking is possible when Shift Lock Solenoid N110 is energized (position ‘N’) and de-energized (position ‘P’.)

Shift lock “P”and P signal for ignition key removal lock

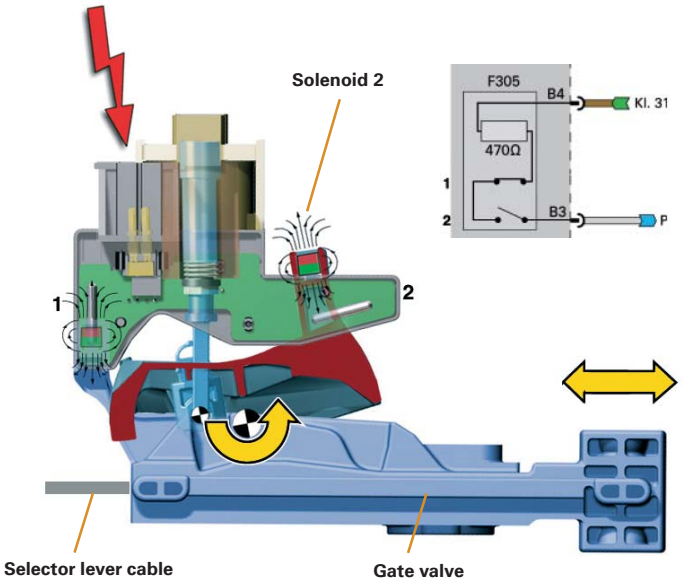
When the selector lever is moved into position “P”, the permanent magnet 1 of the gate is positioned in fr ont of Reed switch 1 (switch closed). As soon as the locking lever is in its basic setting (N110 not activated), permanent magnet 2 is positioned in front of Reed switch 2. Both switches are now closed and supply the signal for enabling the ignition key removal lock (P signal to Comfort System Central Control Module J393.)

– Selector lever position “P “

– Brake applied

– N110 energized

– Gate or selector lever released

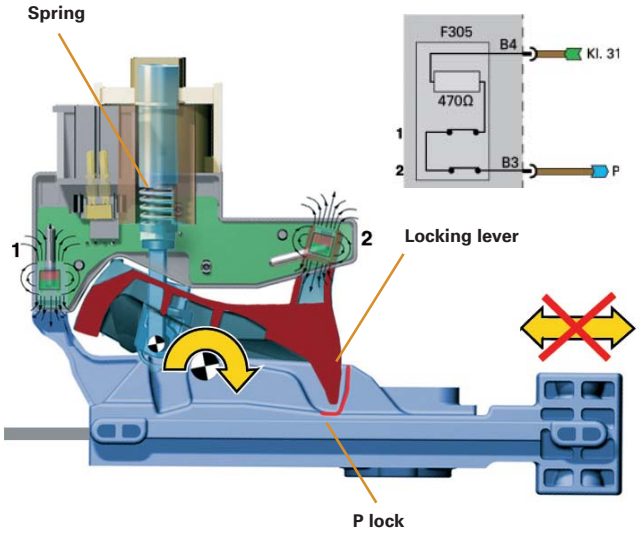


– Selector lever position “P “

– Brake not applied

– N110 de-energized

– Gate or selector lever locked



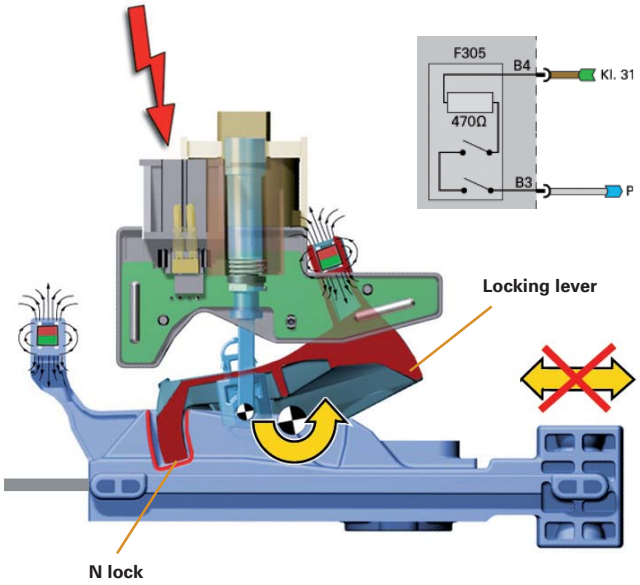
Shift lock “N”

– Selector lever position “N”

– Brake not applied

– N110 energized

– Gate or selector lever locked

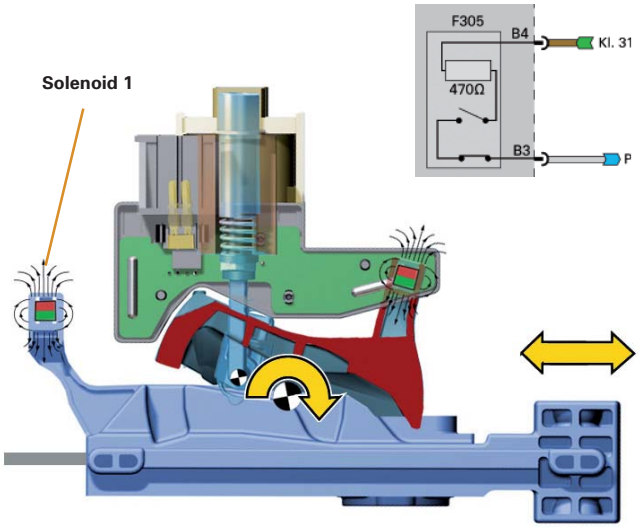


– Selector lever position “N”

– Brake applied

– N110 de-energized

– Gate or selector lever released



Note

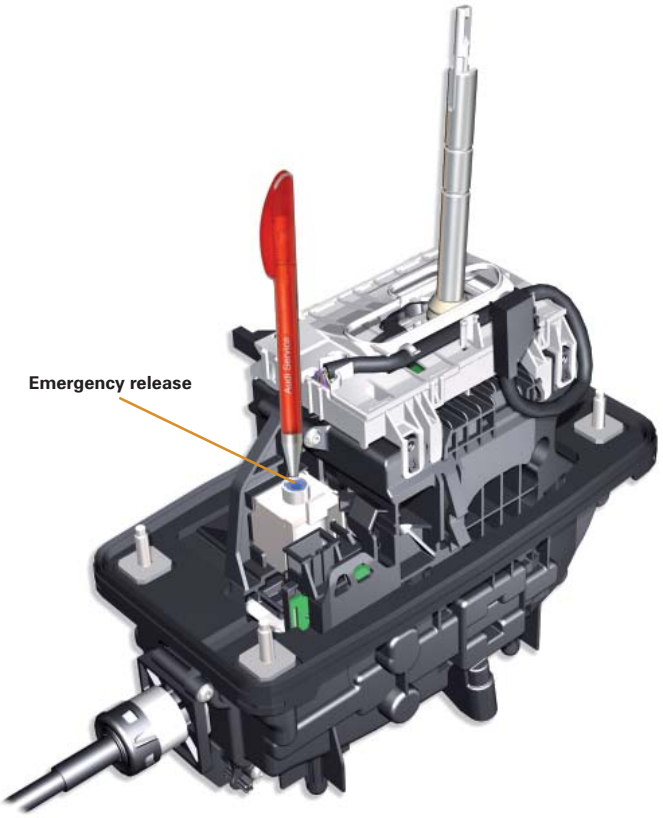
Switch F305 can easily be checked using the VAS Scan Tool or ohmmeter. If F305 is faulty, it can, as mentioned already, easily be replaced.
However, please note the following: If the distance between the permanent magnet and its Reed switch is too large, or if a permanent magnet is missing - for example, because it has dropped out of its mounting - F305 will be unable to generate a shift signal. In such a case, the selector lever mechanism must be replaced.

Emergency release

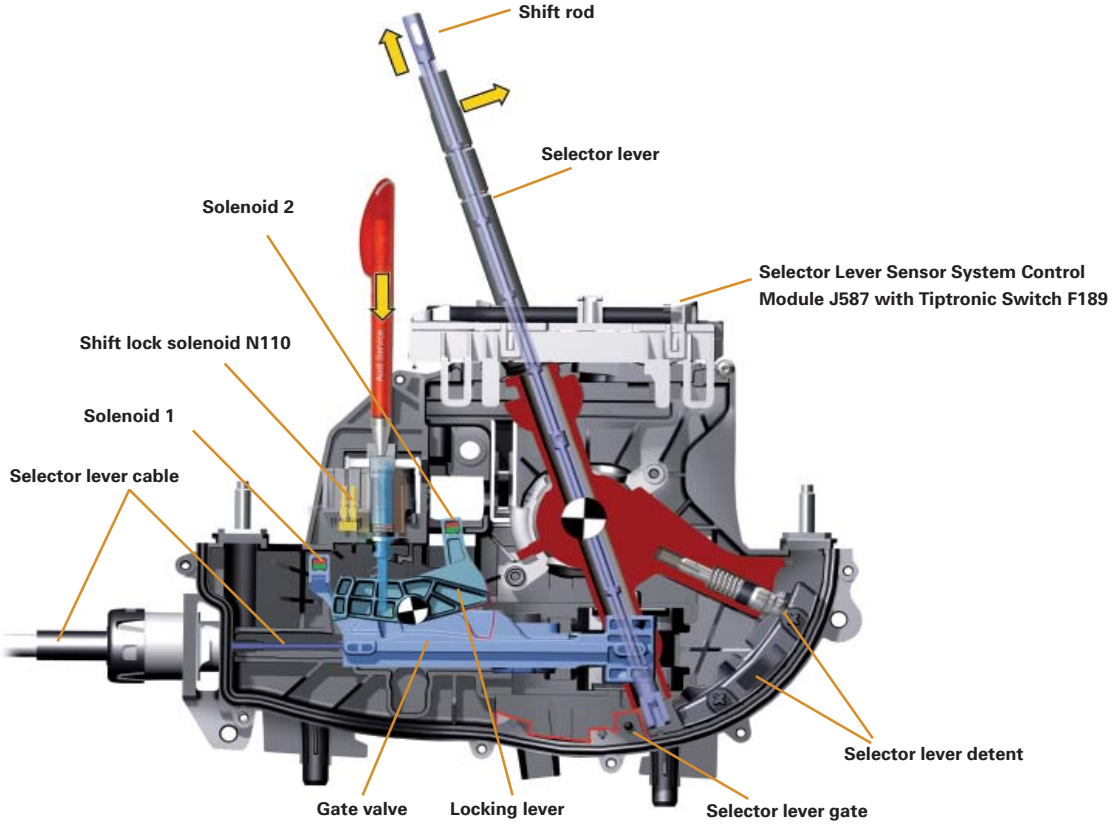
Due to the fact that the P-lock is only released when solenoid N110 is activated , the selector lever stays locked in position “P” in the event of a malfunction such as a dead battery or defective Shift Lock Solenoid N110.

In order to move the vehicle in such an event, an emergency release procedure must be performed. The emergency release mechanism can be accessed by removing the ashtray insert and the trim clip behind it.

Solenoid N110 can be actuated with an aid (for example, a ball-point pen), and the locking lever released. At the same time, the button on the selector lever must be pressed and the selector lever pulled back.



Actuation of the emergency release



Overview

Three alternative suspension systems are available on the 2009 Audi A4.

Standard suspension 1BA represents the basic version. A sports suspension (1BE) is optional. The sports suspension has a .78 in (20 mm) lower ride height than the standard suspension. Different springs, shock absorbers and anti-roll bars are used.

A suspension system with electronic damping control (1BL) is available as a third variant. This suspension has the same ride height as the sports suspension. quattro GmbH offers an S-Line sports suspension with the designation 1BV.



Axles

The front and rear axle components have been adopted from the Audi A5, except for the springs, shock absorbers and anti-roll bars. Track widths are slightly smaller than on the 2009 Audi A4 due to the larger offset depths of the wheels.

Reference

For further information about the design and function of the suspension system, refer to Self-Study Program 997703, "The 2008 Audi A5/S5 Running Gear".

Brake system

The brake, ESP and EPB systems are identical to those of the Audi A5.



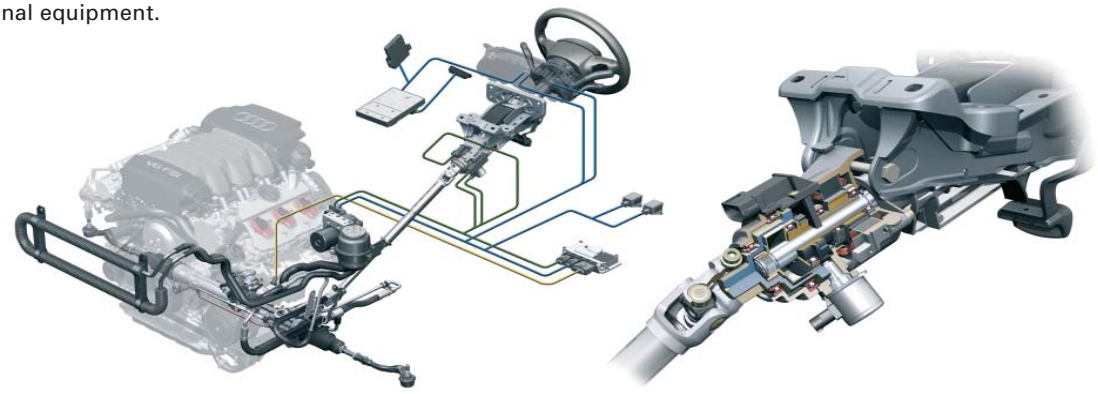
Steering system

The hydraulic power steering system with a mechanically adjustable steering column has been adopted from the Audi A5.



Dynamic steering

A newly developed Dynamic Steering System is available as optional equipment.



Reference

For further information regarding the design and function of the dynamic steering system, refer to Self-Study Program 992803, “Audi Dynamic Steering”.

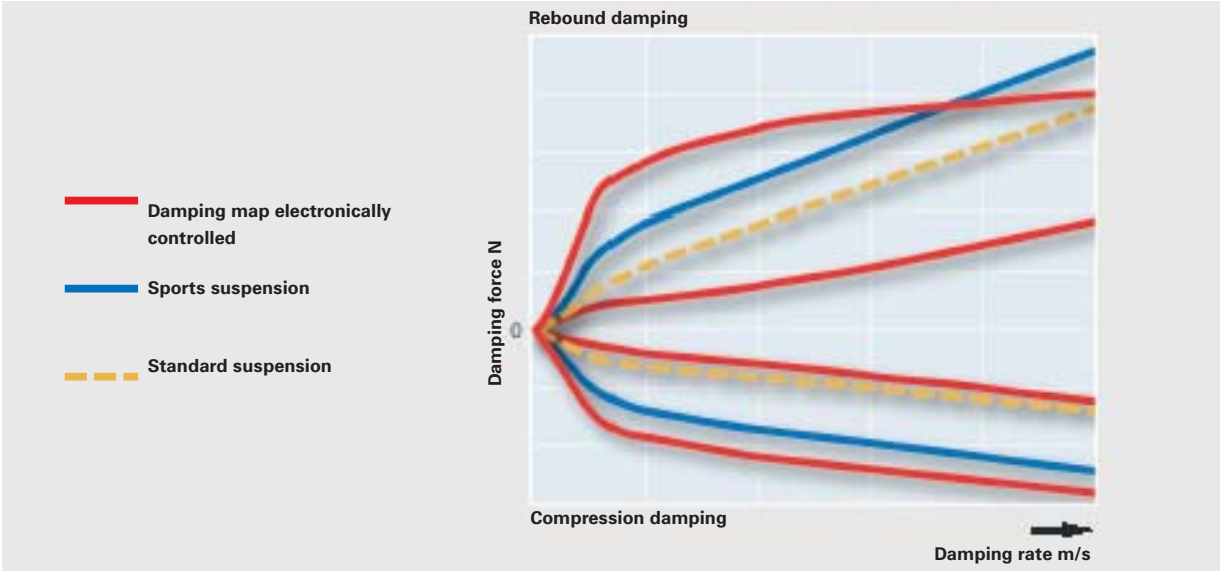
Electronic damping control

Electronic damping control system 1BL is available for the 2009 Audi A4 in combination with Audi Drive Select. This suspension variant is based on sports suspension 1BE.

A suspension system with conventional non-controlled shock absorbers always represents a compromise. Generally speaking, sportiness, high driving dynamics and comfort are all conflicting requirements. The 1BL system achieves the optimum balance between these objectives.

The different characteristics of the shock absorbers are shown in the diagram. Suspension systems fitted with conventional damping components have a fixed damping force to damping rate ratio.

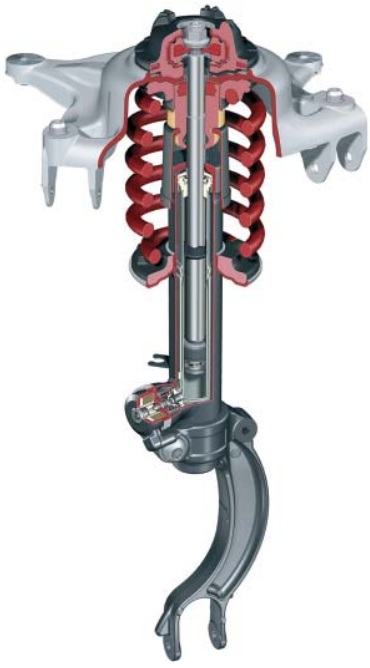
The advantage of controlled dampers is that the damping force can be varied over a broad range. The rebound and compression damping adjustment range lies between the red limiting characteristics.



The driver can choose from the following three different damping characteristics:

– The COMFORT setting provides a damping control characteristic for comfortable ride.
– The DYNAMIC setting provides a damping control characteristic for sporty driving.
– The AUTO setting provides balanced damping control.

The controlled shock absorbers have the same design and functional principle as the shock absorbers on the Audi Q7 with adaptive air suspension.



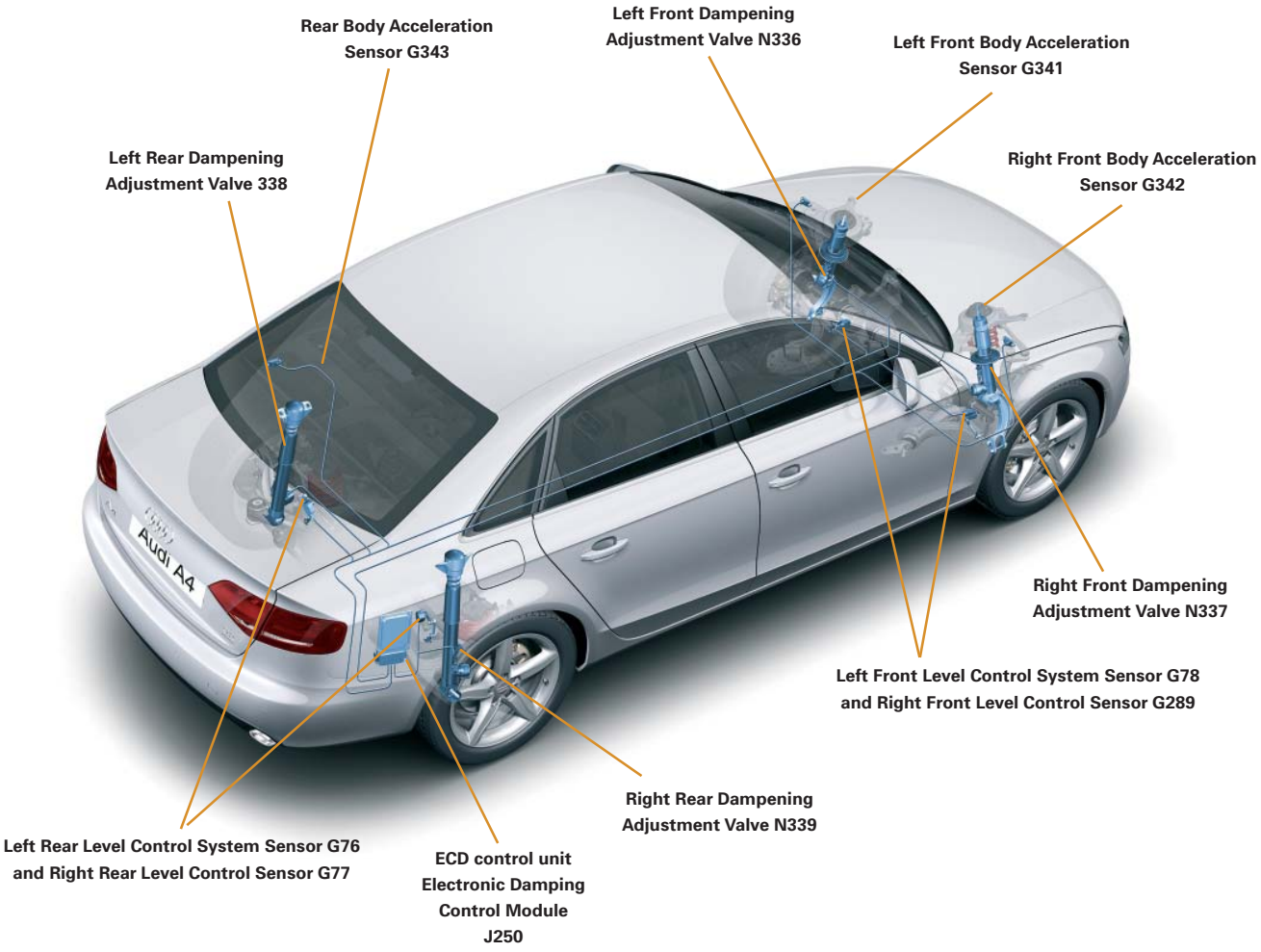
Reference

For further information regarding controlled shock absorbers, refer to Self-Study Program 992603, "The Audi Q7 Running Gear".

Suspension

Electronic Damping Control Module J250 determines the vehicle dynamics on the basis of various measured data. It receives data for road speed, transverse acceleration and steering angle from the ABS Control Module J104. The measured data generated by the vehicle level sender is used to determine the acceleration values of the unsprung masses (axle components and wheels).

The three body acceleration senders measure the acceleration of the vehicle body. The control module uses this measured value to calculate the activation current for each shock absorber in the form of a Pulse Width Modulated (PWM) signal.



Note

After replacing the control module or a vehicle level sender, it is necessary to re-adapt standard suspension position. The procedure is the same as for vehicles with adaptive air suspension.

Adaptive cruise control (acc)

The system is identical in design and functional principle to that of the Audi A6. The difference to the Audi A6 is the eccentric installation position at the front right. In addition, the radar sensor is installed in an open position, i.e. it is not covered by an ornamental grille.



Note

The radar sensor is set using existing special tools VAS 6190, VAS 6430 and VAS 6041 + VAS 6041/1A.

Tire pressure monitoring

An direct measuring tire pressure monitoring system is used on the 2009 Audi A4. Its functional principle is identical to that of the current Audi TT.

Reference

For further information regarding the low tire pressure indicator, refer to Self-Study Program 993703, “The 2008 Audi TT Running Gear”.

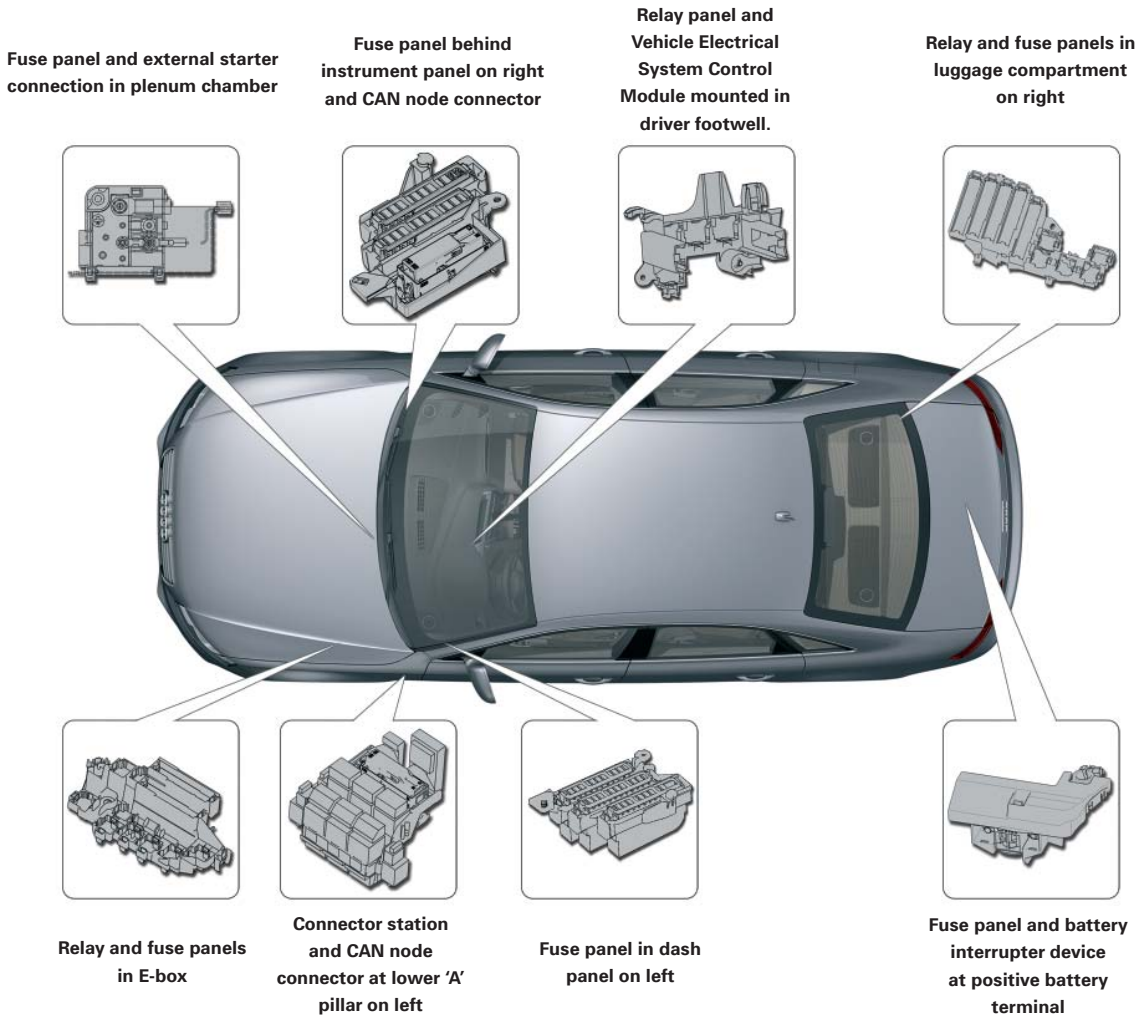
Fuses and relays

The electrical system of the 2009 Audi A4 has been adopted from the 2008 Audi A5/S5. This applies to the installation locations of the fuse/relay panels, CAN node connectors and control modules.

The design and function of the Gateway, battery monitoring, alternator and external starter connection were also adopted from the A5/S5.

Reference

For further information refer to Self-Study Program 99A703, "The 2008 Audi A5/S5 Networking".



Several switches, sensors and control modules have been added for the 2009 A4:

– Rear Door Control Modules J388 and J389*
– Right and Left Front Seat Ventilation Control Modules J799 and J800**
– Charisma Switch Module E592**
– ESP Sensor Moule -2- G536**
– Electronic Damping Control Module J250**
– Directional Stabilization Assistance Control Module J759**
– Active Steering Control Module J792**

* only installed on the 2009 A4
** dependent on vehicle option level, also used on the Audi A5

Outside lights

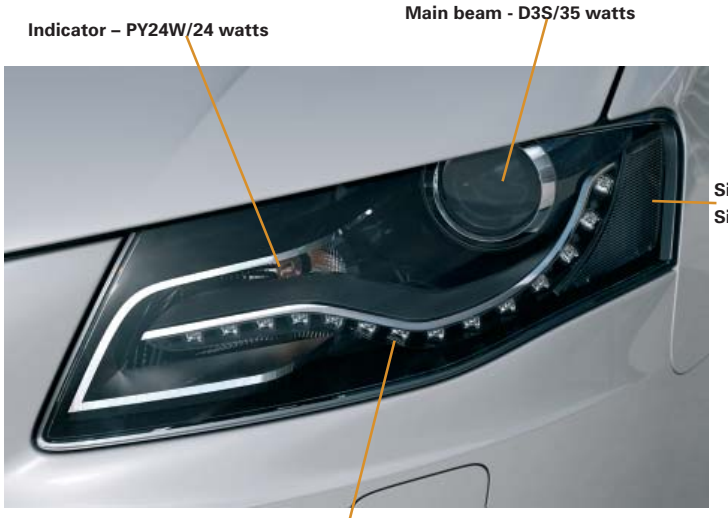
As with the Audi A5, three headlight versions are available on the 2009 Audi A4:

– Halogen headlight
– Bi-xenon headlight
– Bi-xenon headlight with adaptive light (dynamic cornering light)

Lamp configuration for the halogen headlight version



Lamp configuration for the bi-xenon version and in the bi-xenon version with adaptive lighting



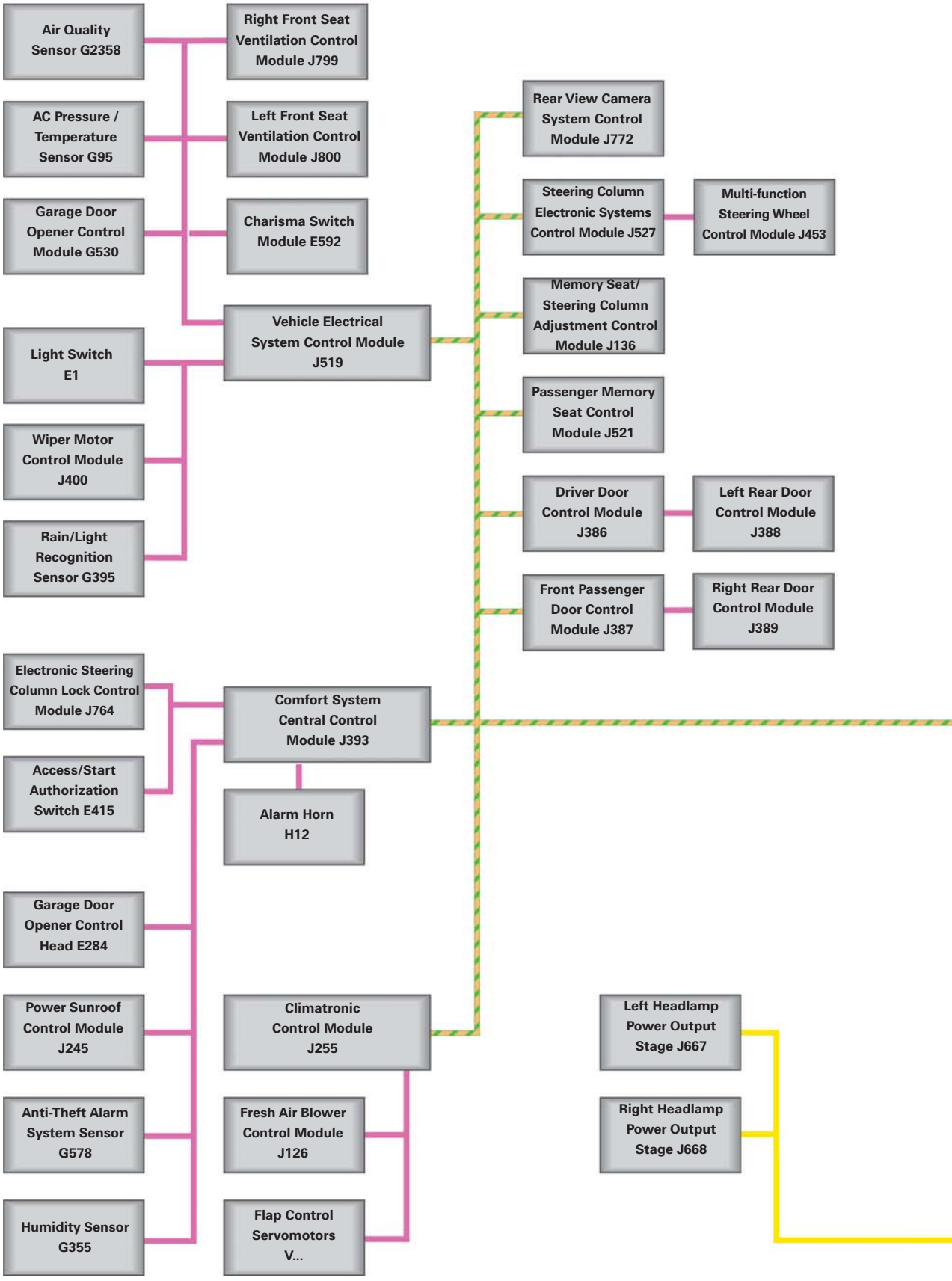
* ECE (for the European market)
** SAE version (for the North American market)

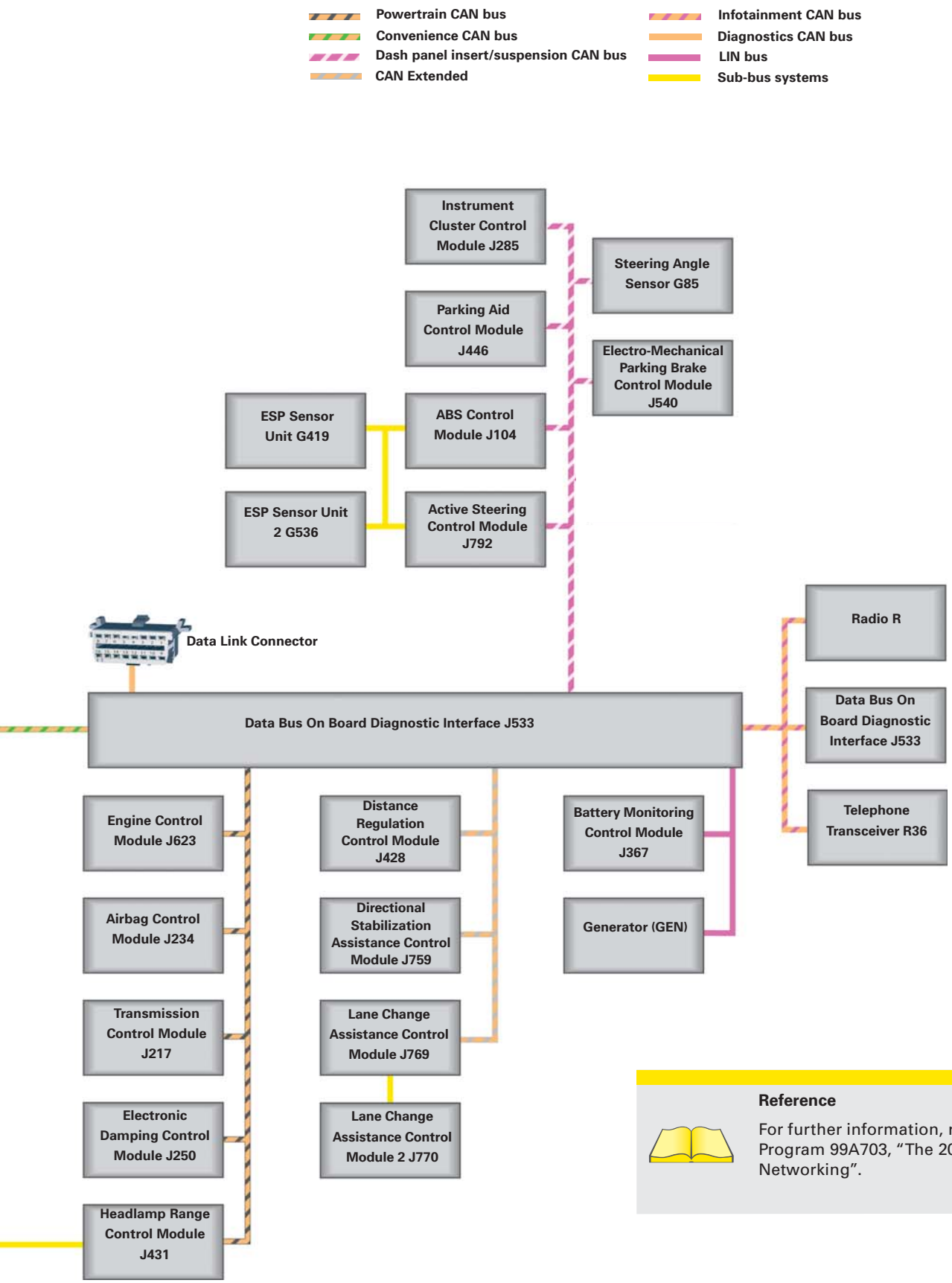
The fog lights, side indicator lamps and tail lights are identical to those on the Audi A5.

Reference

For further information regarding the configuration of the lamps, the bulbs used and the light bulb replacement, refer to Self-Study Program 99A703, "The 2008 Audi A5/S5 Networking".

Networking - vehicles with infotainment CAN bus

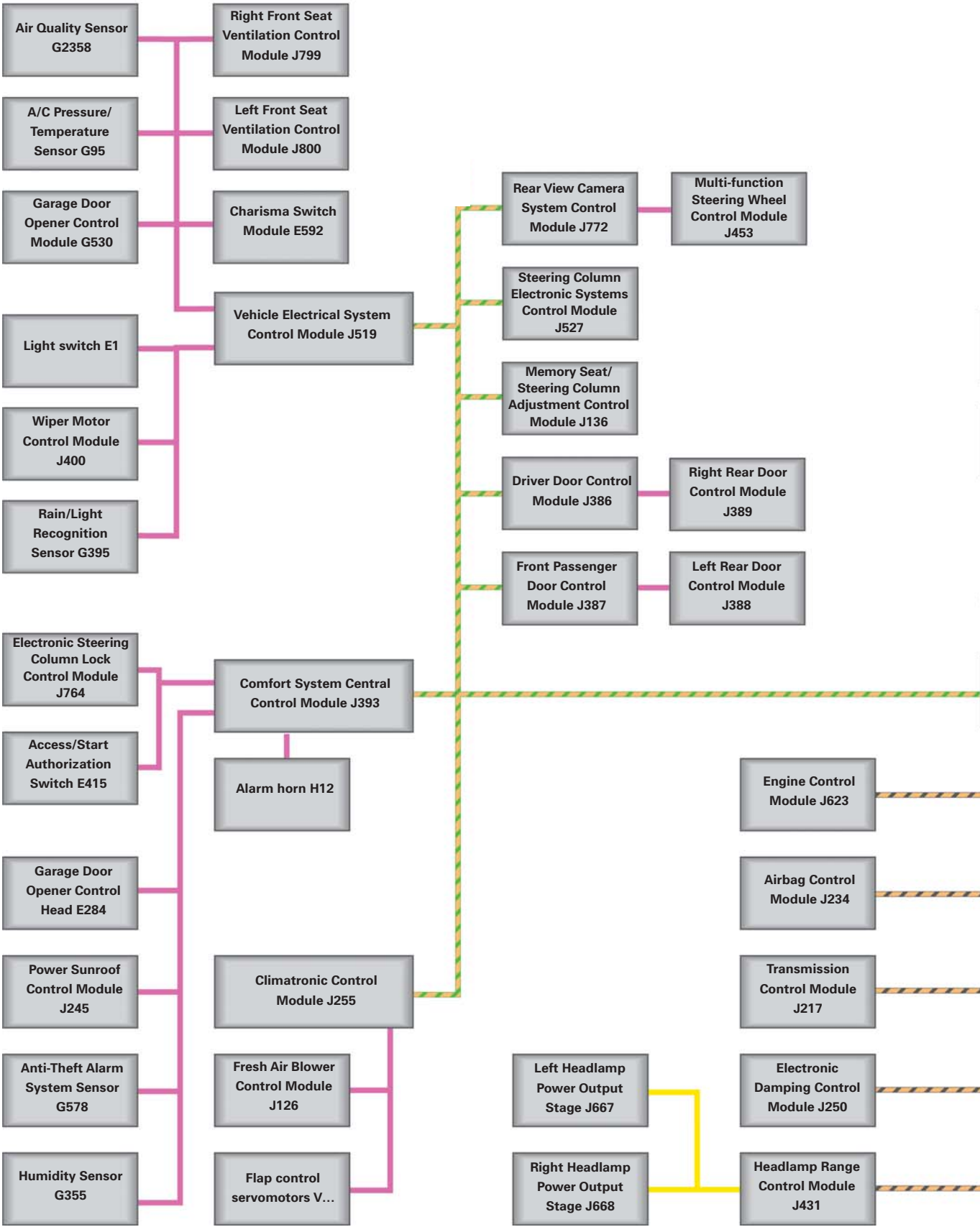


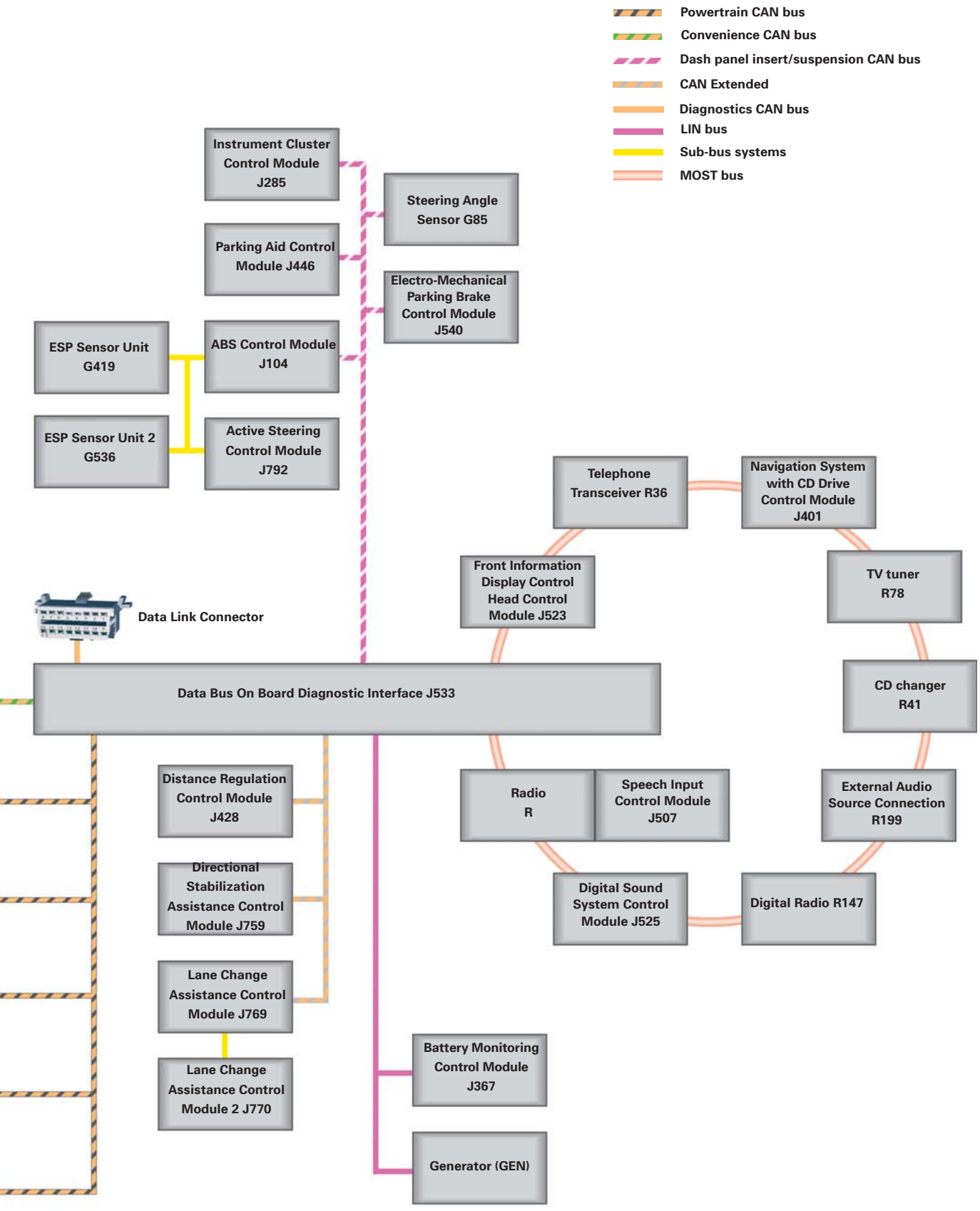


Reference

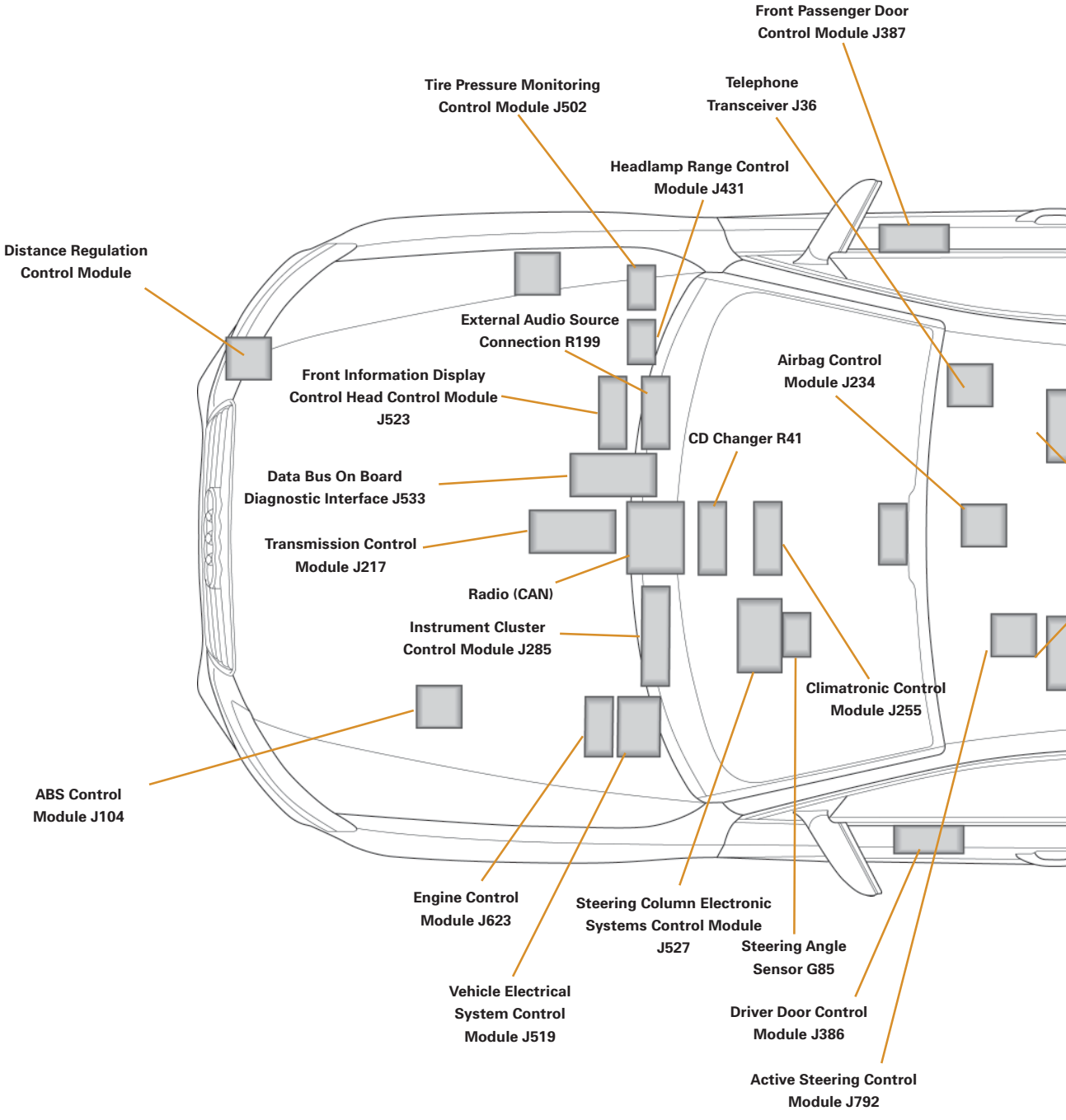
For further information, refer to Self-Study Program 99A703, “The 2008 Audi A5/S5 Networking”.

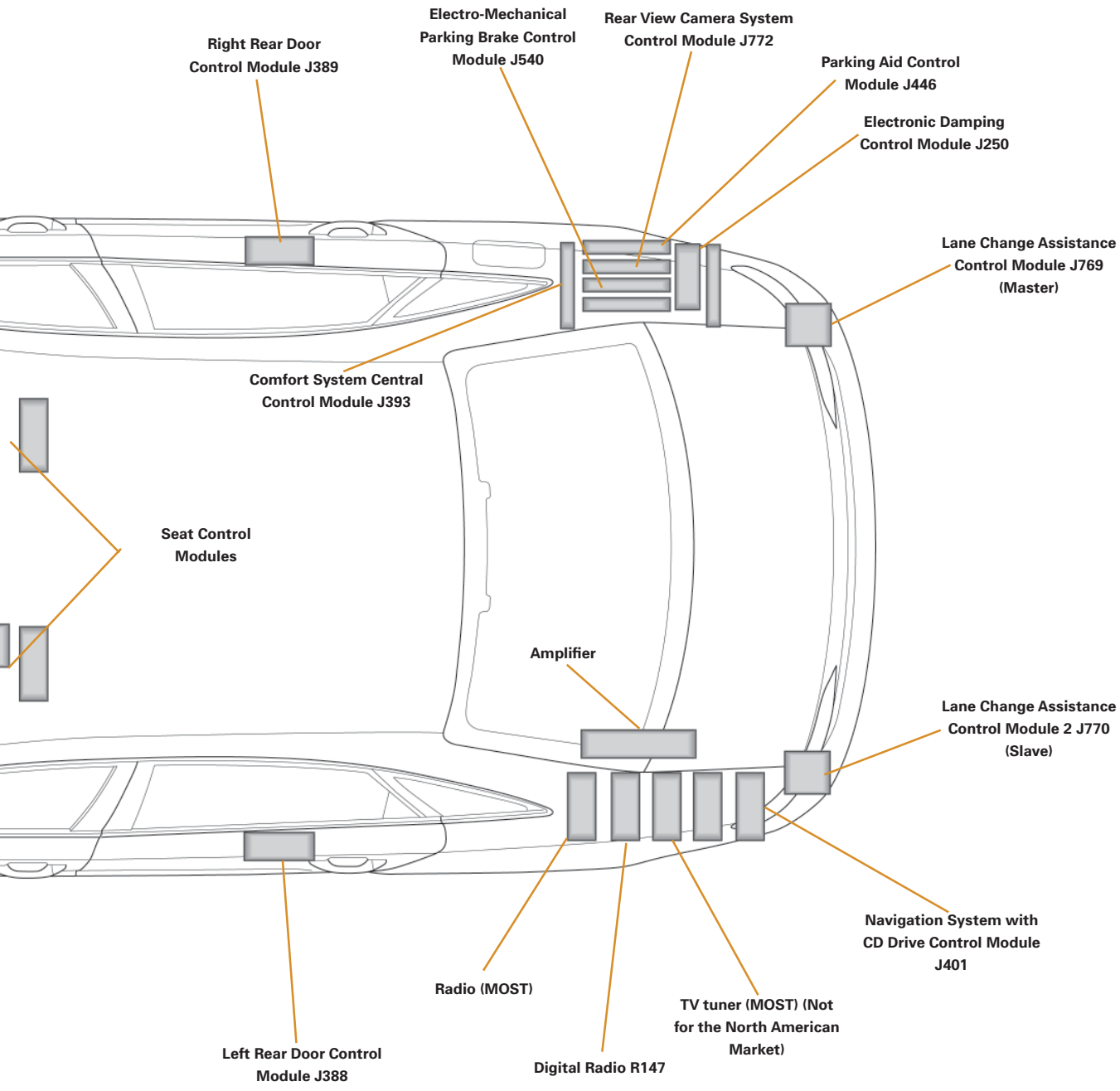
Networking – vehicles with MOST bus




Powertrain CAN bus
Convenience CAN bus
Dash panel insert/suspension CAN bus
CAN Extended
Diagnostics CAN bus
LIN bus
Sub-bus systems
MOST bus
Instrument Cluster Control Module J285
Steering Angle Sensor G85
Parking Aid Control Module J446
Electro-Mechanical Parking Brake Control Module J540
ESP Sensor Unit G419
ABS Control Module J104
ESP Sensor Unit 2 G536
Active Steering Control Module J792
Telephone Transceiver R36
Navigation System with CD Drive Control Module J401
Front Information Display Control Head Control Module J523
TV tuner R78
Data Link Connector
Data Bus On Board Diagnostic Interface J533
CD changer R41
Distance Regulation Control Module J428
Radio R
Speech Input Control Module J507
External Audio Source Connection R199
Directional Stabilization Assistance Control Module J759
Digital Sound System Control Module J525
Digital Radio R147
Lane Change Assistance Control Module J769
Lane Change Assistance Control Module 2 J770
Battery Monitoring Control Module J367
Generator (GEN)

Installation overview - control units




Right Rear Door Control Module J389
Electro-Mechanical Parking Brake Control Module J540
Rear View Camera System Control Module J772
Parking Aid Control Module J446
Electronic Damping Control Module J250
Lane Change Assistance Control Module J769 (Master)
Comfort System Central Control Module J393
Seat Control Modules
Amplifier
Lane Change Assistance Control Module 2 J770 (Slave)
Navigation System with CD Drive Control Module J401
Radio (MOST)
TV tuner (MOST) (Not for the North American Market)
Digital Radio R147
Left Rear Door Control Module J388

Audi drive select



The 2009 Audi A4 can be optionally equipped with the innovative Audi drive select system.

The advantage of the Audi drive select system is that the characteristics of multiple components (for example, the engine, automatic transmission, the damping control and the Servotronic) can be adjusted at the touch of a single button. This means that completely personalized vehicle characteristics can be obtained.

The characteristics of these systems are controlled electronically, and can be adjusted from comfortable to sporty.

Audi drive select is also referred to as “Charisma”, both in the sales and service literature. The core element of the system is the Charisma Switch Module E592, which imports the driver input and supplies this information to Vehicle Electrical System Control Module J519.

Vehicle with radio only

If the vehicle is equipped with a radio only, the Charisma switch module E592 is located behind the transmission selector lever. The COMFORT, AUTO and DYNAMIC settings can be selected by pressing the up/down arrow buttons.

The selected setting is illuminated in bright red. If the DYNAMIC setting is selected by pressing the right-hand control button, the left-hand control button must be pressed to change the setting.



Vehicles with MMI

In vehicles with MMI, the switch module is located about the A/C controls. Besides the COMFORT, AUTO and DYNAMIC settings, the switch module has an additional INDIVIDUAL setting. The four settings can be selected in a circular pattern using the control buttons.

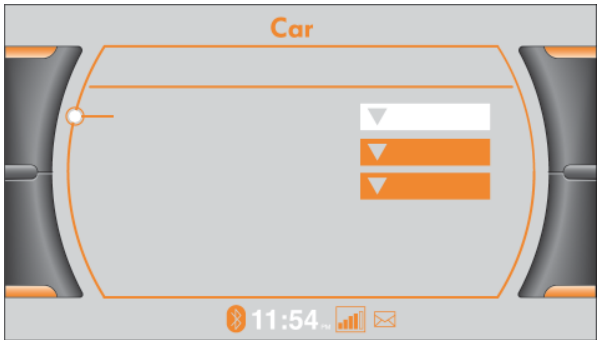
Both switch module versions allow settings to be changed both when the vehicle is stationary and while driving. To activate the change of setting for the engine, too, the accelerator pedal must be briefly depressed. If the ignition is switched “off”, the AUTO setting is selected by default after re-starting.



INDIVIDUAL settings on the MMI

The INDIVIDUAL setting options can be configured in the “CAR” menu on the MMI screen. The engine and transmission are a grouped together, as are the Servotronic and the dynamic steering system. The damping control system comprises the third group.

The individual settings for these three groups are assigned to the ignition key in use automatically when the ignition is switched off.



Electrical system

Audi drive select is, by default, in AUTO mode after the engine is started. This is a balanced operating mode, which is equally suitable for all driving situations and conditions.

The AUTO mode is, however, by no means an inflexible driving program. The automatic gearbox still uses the dynamic shift program, which adapts the shift points to the driver's profile, while the damping control system adjusts the stiffness of the shock absorbers depending on the driving situation.

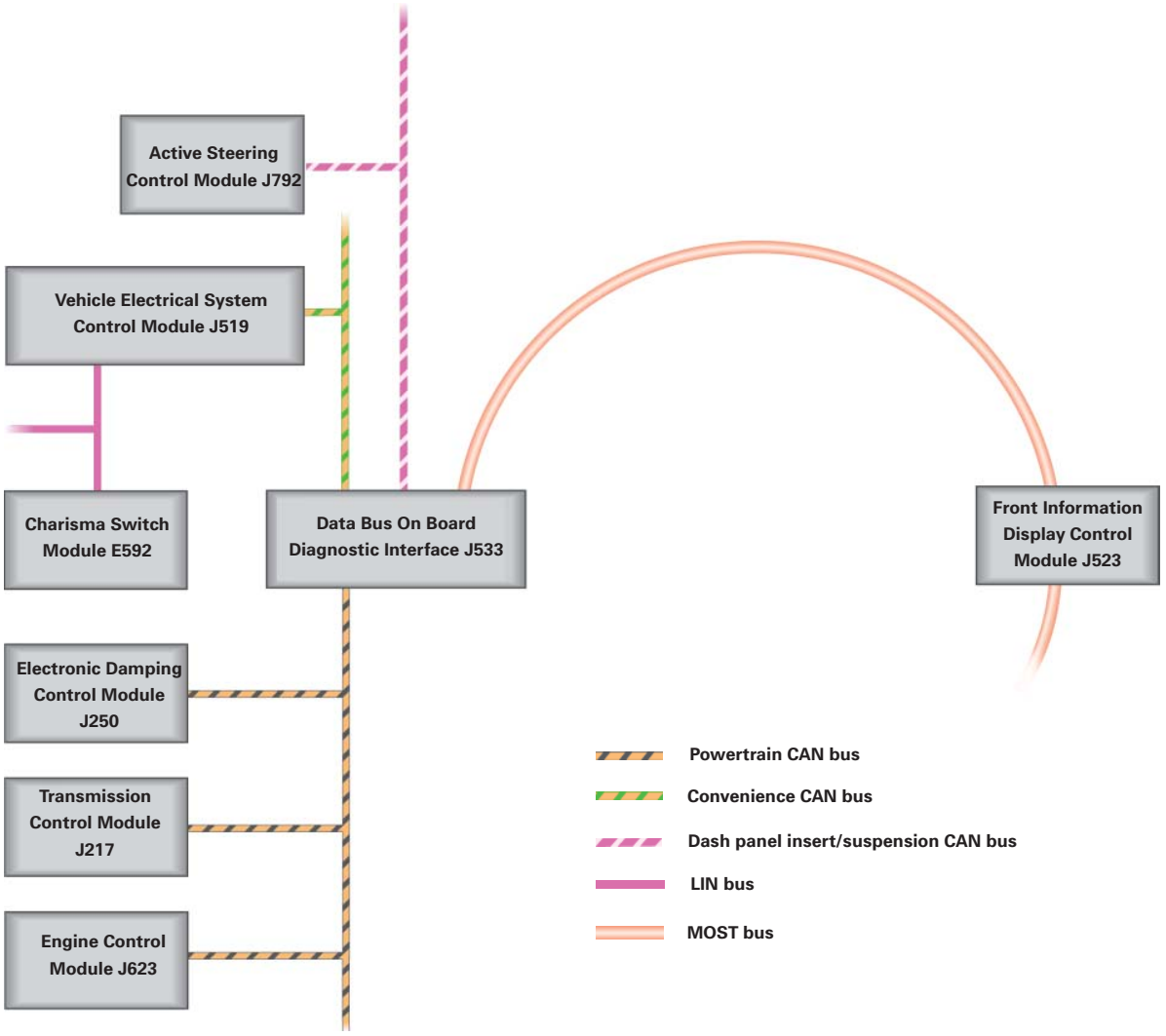
When AUTO mode is selected, neither the most comfortable characteristic nor the most sporty characteristic is obtained.

The COMFORT mode provides a markedly comfortable set-up, and is ideal for relaxed longdistance driving. The damping control characteristic is softer, and the steering has an easier action and is less direct. The engine and automatic transmission reactions are otherwise identical to those in selector lever position "D".

The DYNAMIC mode is suited to sporty driving on windy roads. The damping control system permits, on average, higher damping forces, and the steering is firmer and more direct. The engine has more instantaneous response to accelerator pedal inputs, and the transmission uses the shift program otherwise available in selector lever position "S".

	COMFORT	AUTO	DYNAMIC
Engine 	normal	normal	'Sport' mode
Automatic transmission 	normal same as in selector lever position "D"	normal same as in selector lever position "D"	'Sport' program
Servotronic 	easy action	normal	firm
Dynamic Steering 	comfortable & indirect	normal	sporty & direct
Damping Control 	comfortable & soft	normal	sporty & firm

Distributed functions



Vehicle Electrical System Control Module J519 plays a central function in the Audi drive select system. J519 is connected via LIN bus to Charisma Switch Module E592 and imports the selected switch position. The settings selected for the INDIVIDUAL mode in the CAR menu of the MMI are signalled to Data Bus On Board Diagnostic Interface J533 (Gateway).

This information is used to generate an activation current for the Servotronic valve. At the same time, a command is sent to J533 via the Convenience CAN bus.

J533 sends this command to the Instrument Cluster/ suspension CAN, and to the Powertrain CAN bus for the control modules participating in Audi drive select.

The function as well as the switch position of the Charisma switch module can be checked in the Measuring Value Blocks using the VAS Scan Tool. Most participating control modules store measurement data which can be used to check whether the information has been received from the Vehicle Electrical System Control Module J519 and implemented.

Infotainment Overview

The symphony radio with MMI operating control logic and integrated SAT tuner is available on the 2009 A4.

Optional is MMI with Audi Navigation Plus.

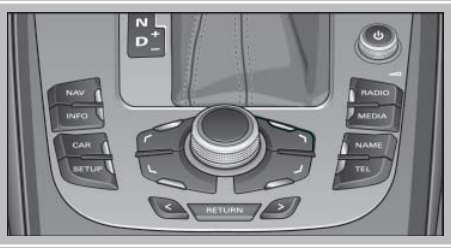
Symphony Radio


Standard Equipment
Separate Display Screen (6.5”) at Top of Center Stack. MMI Control Logic.
AM/FM/CD/SAT Radio with Channel Preset Capability. SAT Tuner Integrated in Radio.
Digital AM/FM Tuner in Combination with Dual Diversity Antenna System (Phase Diversity.)
In-Dash Six-Disc CD Changer (MP3/WMA Capable.)
SD/MMC Memory Card Reader
CD Changer (MP3/WMA) in Radio
RDS (Radio Data System) Displays Radio Station Call Letters and Other Information.
“Autostore” AS Function, Automatically Selects Six AM and Six FM Strongest Station Signals.
GALA (Graduated Audio Level Adjustment) Varies Volume Based on Vehicle Speed.
Audi Sound System: 180 Watts, 10-Speaker Sound System.
Options
Mobile Phone Adaptor on the Infotainment CAN Bus
Sirius Satellite Radio
Bang & Olufsen Sound System 14 Speakers in Combination with a 10-Channel Amplifier on the Infotainment CAN Bus

The optional MMI with Audi Navigation Plus is similar to the system used in the Audi A6.

All components of this MMI system are inter-connected via the MOST optical data bus.

MMI with Audi Navigation Plus


Standard Equipment
Same as Symphony Radio Including:
Separate Display Screen (7") at Top of Center Stack. Full Color, Map-Based Navigation Screen.
MMI Control Logic at the Base of the Center Console, Below Gear Shift.
One Disc DVD to Cover all US Including Hawaii (excluding Alaska) and Canada
GALA (Graduated Audio Level Adjustment) Varies Volume Based on Vehicle Speed.
Changer (MP3/WMA) in Dash Panel
Five Language Settings and Voice Guidance (English/French/Spanish are customer selectable.)
Audi Sound System: 180 Watts, 10-Speaker
Options
Mobile Phone Adaptor on MOST Data Bus
Bluetooth Car Phone
Sirius
Bang & Olufsen Sound System 14 Speakers in Combination with a 10-Channel Amplifier on the MOST Data Bus

Symphony Radios with MMI Operating Logic

Operation

The symphony radio features a separate external display with a central rotary/push-button control knob.

The controls and operating logic were adapted from the highly praised MMI system.

Symphony Radio
6.5″ Color Display (External)


6.5″ External Display
MMI Operating Logic
2-DIN Housing
Can be Operated Via Optional Multifunction Steering Wheel
Radio Information Displayed in the Driver Information System
Five Language Settings and Voice Guidance (English/French/Spanish are Customer Selectable.)
Radio
Two Tuners FM/AM
Dynamically Updated Station List
FM Tuner with Phase Diversity Switching
RDS (Radio Data System)
TP Memory Function
Digital Radio (Integrated)
Integrated SAT Tuner for Optional Sirius Service
CD / SD
Integrated 6-Disc CD Changer for Audio CDs and MP3 and WMA CDs, CD Text Capable
Integrated SD/MMC Card Reader
Audio Data Readable in MP3 and WMA Formats
Playlists Readable in M3U and PLS Formats
Telephone
Mute Function for Hands-Free Telephone Via CAN or Mute Pin
Speaker Control Module for Hands-Free Telephone

MMI with Audi Navigation Plus
6.5" Color Display (External)


Telephone (With Optional Audi Mobile Phone Adaptor)
Reception Level and Roaming Symbol Display.
"Accept Call", "Refuse Call" and "Hang Up" Functions
Telephone Number Entry Via Speller
Dialling of a Telephone Number Stored in the Phonebook of the Mobile Phone
Bluetooth Symbol Appears on the Status Bar if the Mobile Phone is Connected via Bluetooth to the Mobile Phone Adaptor.
Telephone Setup Support
Air Conditioning
Indication of Settings on the Radio Display Panel when Making Adjustments With the Air Conditioning Controls
CAR
CAR Menu Including Driver Assist
Service
Diagnostics Via CAN
Transport Mode (Reduced Power Demand)
Anti-Theft Device Via Component Protection Function
External Amplifier for Audi Sound System with GALA
Default Sound Setting Based on Body Type Code (in Combination With Integrated Amplifier)
Options
Universal Mobile Telephone Adaptor
External Sound Amplifier Connectivity for Bang & Olufsen Sound System
Versions
Standard With Integrated SAT Tuner for Optional Sirius Service

Dual Tuner with Phase Diversity

A dual FM tuner with phase diversity is used with the symphony radio. These radios were first used on the 2008 Audi TT. They are notable for their good reception and high noise immunity.

The FM station list in all radios is updated dynamically while driving. As with vehicles with MMI, the currently receivable stations are displayed.



Updating the Station List

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

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

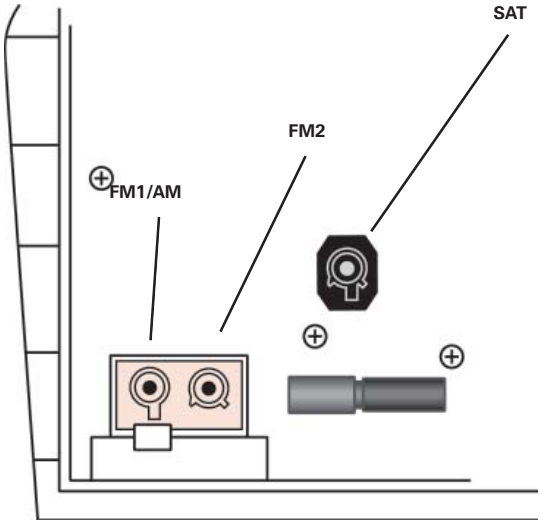
RDS Radio Text

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



Digital Radio

A digital satellite tuner is available. The digital satellite tuner is integrated into the symphony radio and receives signals from the service provider Sirius.

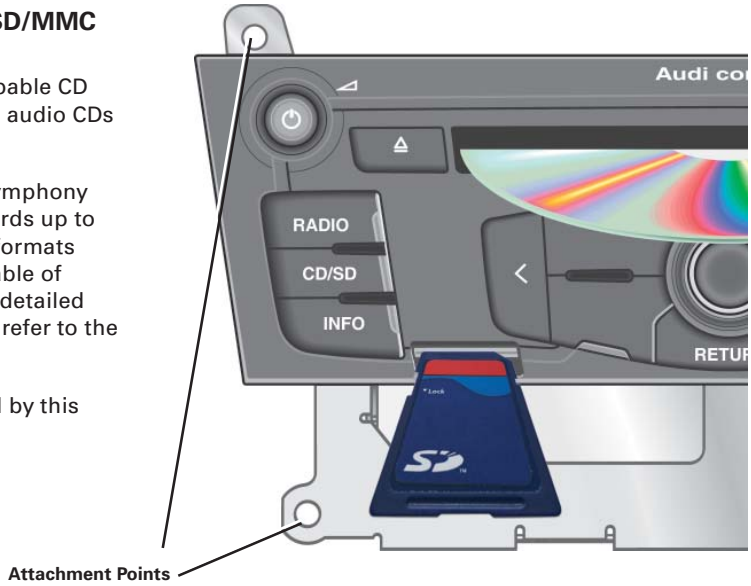


MP3 Capable CD Drive and Integrated SD/MMC Card Reader

The symphony radio has an MP3 and WMA capable CD drive. This drive can be used to play back both audio CDs and MP3 and WMA files from data CDs.

An SD/MMC card reader is integrated in the symphony radio and is capable of supporting memory cards up to 4 GB. It can play audio data in MP3 and WMA formats with fixed and variable bit rates. They are capable of reading playlists in M3U and PLS formats. For detailed information on the supported formats, please refer to the radio operating manual.

Note: SD HC cards are currently not supported by this system.



Housing Mechanism and Installation in the Vehicle

The radio housing is the same size as a 2-DIN radio; however, the front panel is slightly larger than that of a 1-DIN radio. The lower half of the radio housing is covered by the air conditioning control module when installed. The radios are attached to the instrument panel by four screws.

Before removing the radio, the air outlets above the radio as well as the air conditioning control module must be removed. The attaching screws can then be undone and the radio removed.

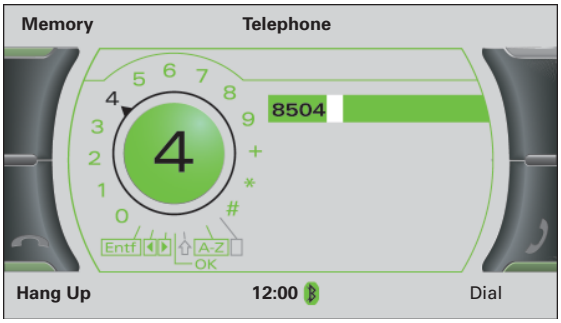
This solution simplifies precision fitting and improves the anti-theft protection of the radio.

Telephone Operation

The symphony radio can be used to operate the RNS-E system, the standard mobile phone adaptor.

Information is exchanged between the radio R and the Telephone Transceiver R36 via the infotainment CAN bus. This system has the same functions as the RNS-E system.

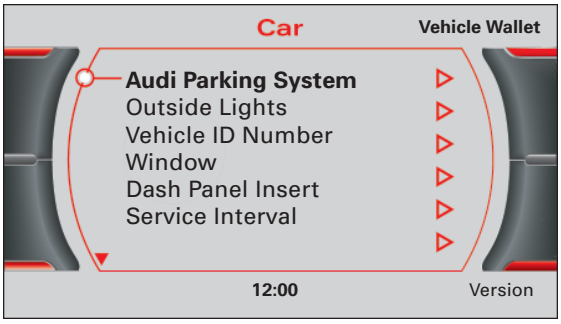
The Telephone Transceiver R36 has the same functions as the previous control module for vehicles with infotainment CAN bus. Hands-free sets by mobile phone manufacturers cannot be operated with the radio.



Car

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

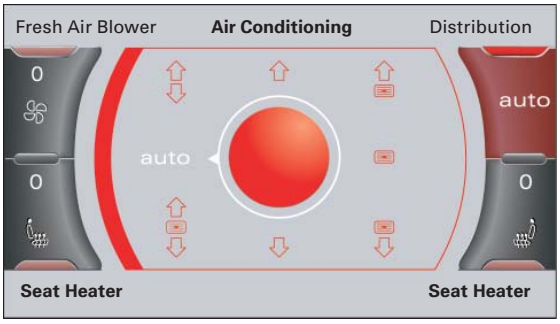
The desired setting can be made with the rotary/pushbutton control on the radio. The setting information is then sent from the radio back via the infotainment CAN bus and Data Bus On Board Diagnostic Interface to the relevant control module. The selected CAR settings are stored only in the relevant control module and not in the radio.



Air Conditioning Display

The radio display serves also to display the air conditioning settings.

If the air conditioning settings are changed, a display similar to that of the MMI is shown in the radio display panel. As with the MMI, all air-conditioning adjustments can be made with the air conditioning controls.



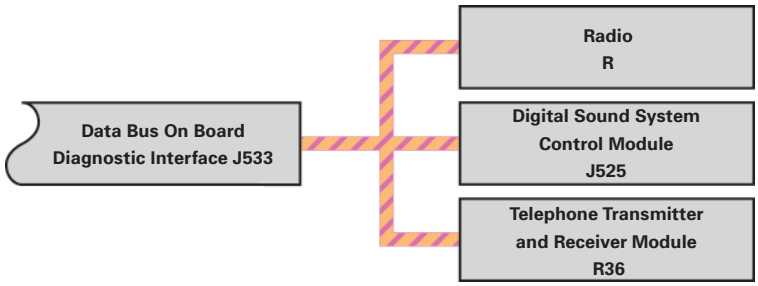
Service and Communication with the Vehicle

On the symphony radio, all data and diagnostic information are exchanged via the infotainment CAN bus.

This includes the following:

– Terminal Control System (Terminal 15, NO Contact).
– Display Dimming, Vehicle Speed Signal, Engine Speed.
– Control Module Communication for CAR Settings.
– Communication with Telephone Transceiver R36.
– Communication with the Instrument Cluster (DIS) and Multifunction Steering Wheel
– Anti-Theft Protection: The Radio No Longer Has a 4-Digit PIN Code and Have to Be Activated Online Like the Infotainment Control Modules of the MMI Systems.
– Communication with the Digital Sound Package Control Module J525:
  Amplifier OFF/ON.
  Noise Compensation and Surround Mode.

CAN Networking of the Data Bus On Board Diagnostic Interface J533



Audio Signal Output

If an external audio amplifier is installed on the vehicle (Audi Sound System, Bang-Olufsen sound system), the output level in the radio is code-switched, which means an external audio amplifier can be connected to the plug-in contacts for the speakers after recoding.

Sound Systems

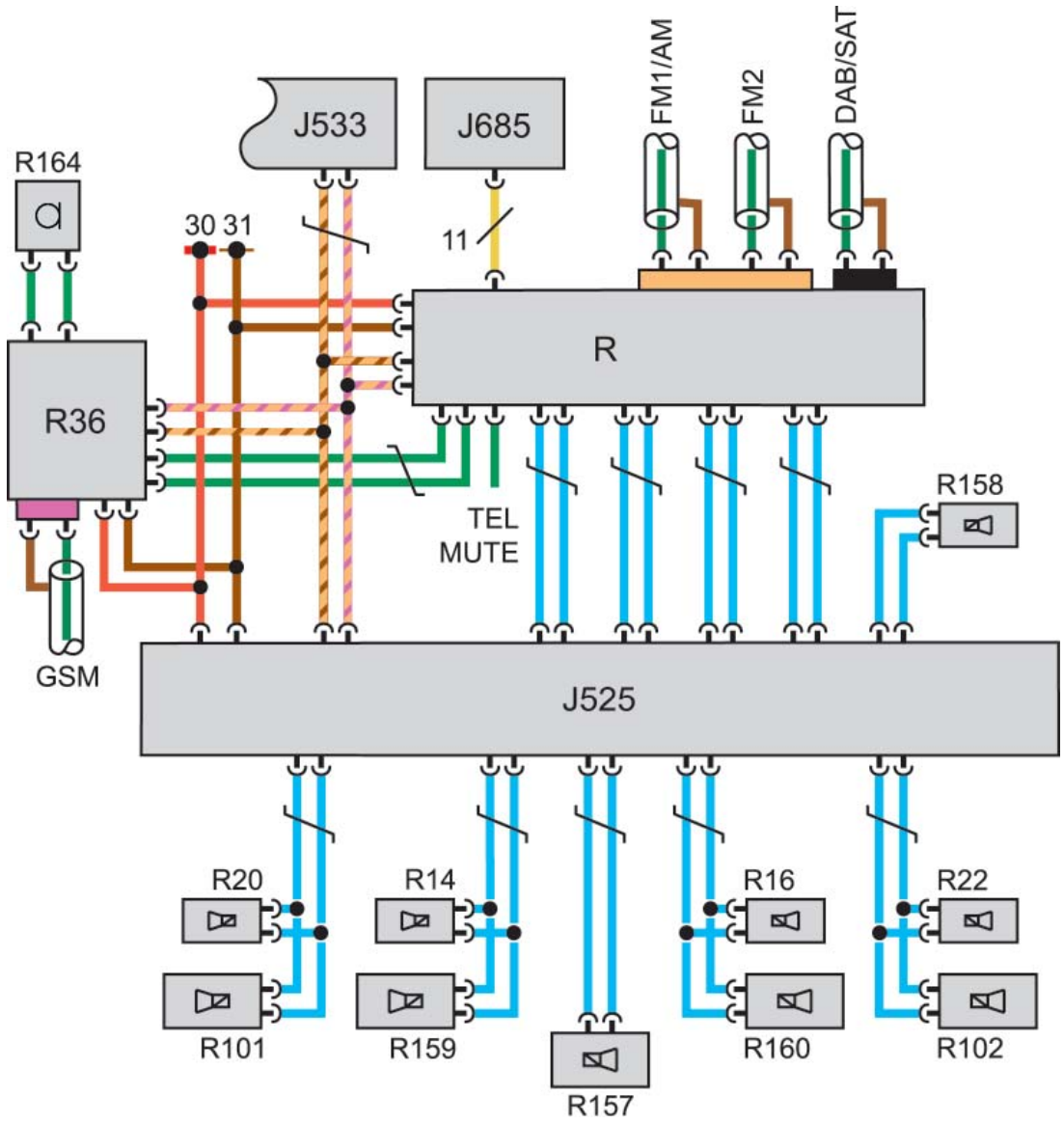
Overview

	Audi Sound System	Bang & Olufsen Sound System
Symphony Radio	180 Watt Six-Channel Amplifier in the Luggage Compartment at the Rear Left 10-Speaker System (2 in each front door; 2 in each rear side panel; 1 center fill speaker in instrument panel; 1 subwoofer in parcel shelf.)	505 Watt Six-Channel Amplifier in the Luggage Compartment at the Rear Left 14 Speakers (1 center, 4 Midrange in instrument panel; two tweeters in door sail panels; 2 woofers in doors; 2 tweeters in rear side panels; 2 mid-bass in rear side panels; 2 surround speakers; and 1 subwoofer in rear parcel shelf.) System also has Surround Sound Reproductions, Dynamic Noise Compensation.
	Data Transfer via Infotainment CAN Bus, Audio Signal Transfer Cross Twisted Copper lead	
MMI, MMI with Audi Navigation Plus	10-Speaker System (2 in each front door; 2 in each rear side panel; 1 center fill speaker in instrument panel; 1 subwoofer in parcel shelf.)	14 Speakers (1 center, 4 midrange in instrument panel; two tweeters in door sail panels; 2 woofers in doors; 2 tweeters in rear side panels; 2 mid-bass in rear side panels; 2 surround speakers; and 1 Subwoofer in rear parcel shelf.) System also has Surround Sound Reproductions, Dynamic Noise Compensation.
	Data and Audio Signal Transfer via Optical MOST Bus	

Audi Sound System for the Symphony Radios

A separate six-channel amplifier is installed in the luggage compartment at the rear left. The amplifier communicates with the other Infotainment control modules via the Infotainment CAN bus. The 180-watt amplifier drives a total of 10 speakers.

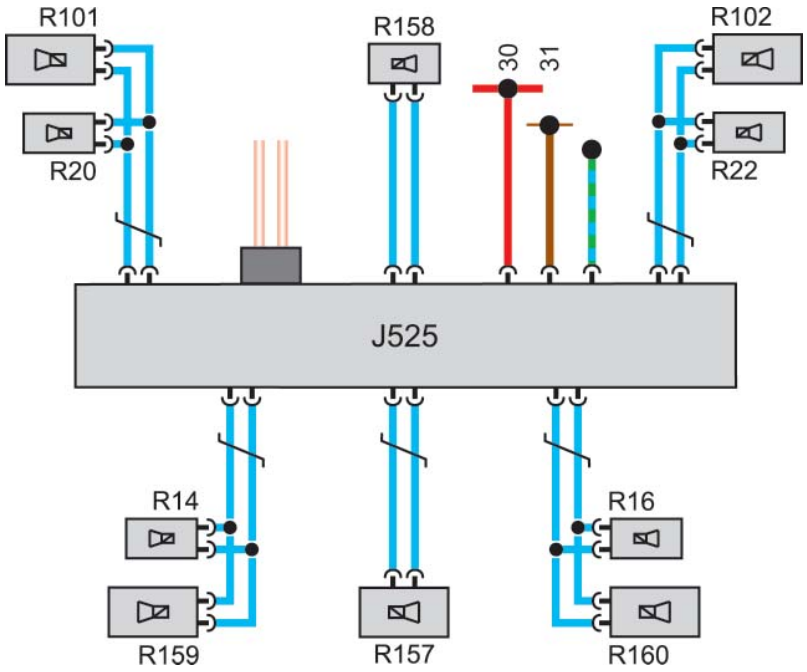
A subwoofer is installed in the rear shelf and a center speaker on the instrument panel, each of which is supplied by a separate amplifier channel. The amplifier is diagnosed using the VAS Scan Tool via Address Word 47.



Audi Sound System for MMI with Audi Navigation Plus

A separate six-channel amplifier is installed in the luggage compartment at the rear left. The amplifier communicates with the other infotainment control modules via the MOST bus. The 180-watt amplifier supplies a total of 10 speakers.

A subwoofer is installed in the rear shelf and a center speaker in the instrument cluster, each of which is supplied by a separate amplifier channel. The amplifier is diagnosed using the Scan Tool via Address Word 47.



Legend for all Function Diagrams

J533	Data Bus On Board Diagnostic Interface
J525	Digital Sound System Control Module
R	Radio
R14	Left Rear Treble Speaker
R16	Right Rear Treble Speaker
R20	Left Front Treble Speaker
R21	Left Front Bass Speaker
R22	Right Front Treble Speaker
R23	Right Front Bass Speaker
R36	Telephone Transceiver
R74	Inside Microphone
R103	Left Front Midrange Speaker
R104	Right Front Midrange Speaker
R105	Left Rear Midrange Speaker
R106	Right Rear Midrange Speaker
R157	Subwoofer (on rear parcel shelf)
R158	Center Mid/High Range Speaker
R159	Left Rear Mid/Low Range Speaker
R160	Right Rear Mid/Low Range Speaker
R164	Microphone Unit (in front roof module)

Infotainment CAN bus
CAN display
Input signal
Output signal
Terminal 30
Terminal 31
Sub-bus system
Most bus
Bidirectional

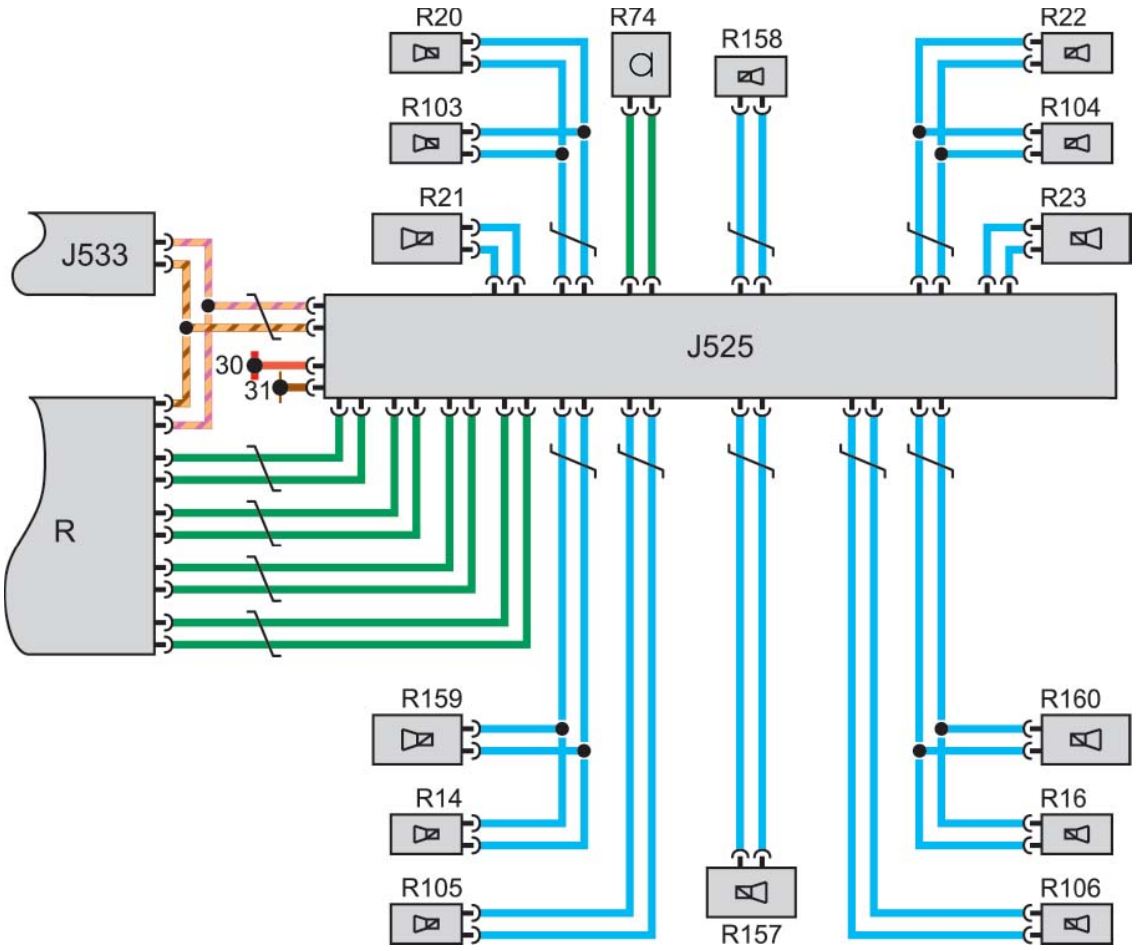
Bang & Olufsen Sound System for Symphony Radios

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

- A Three-Way Front Speaker System (6 Speakers Through 4 Channels).
- A Two-Way Rear Speaker System (4 Speakers Through 2 Channels).
- A Center Speaker in the Instrument Panel.
- A Subwoofer in the Rear Shelf.
- Two Surround Speakers in the Rear Shelf.

The surround effect can be deactivated in the sound setup menu of the radio. An ambient noise measuring microphone is connected to the amplifier allowing the amplifier to optimally adapt the output volume to the driving noise level.

Alternatively, the operator can set the GALA level in 7 steps or deactivate it completely in the radios. The amplifier is diagnosed using the VAS Scan Tool via Address Word 47.



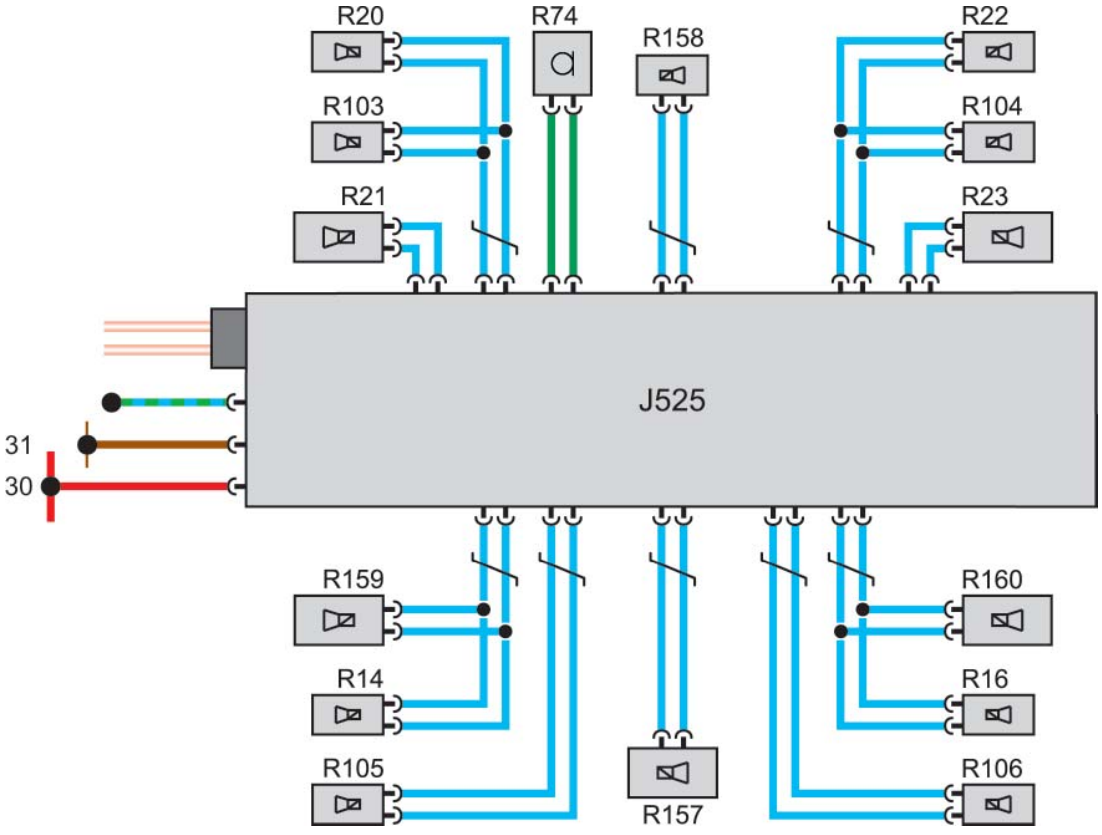
Bang & Olufsen Sound System for MMI with Audi Navigation Plus

A separate six-channel amplifier is installed in the luggage compartment at the rear left. The amplifier communicates with the other Infotainment control modules via the MOST bus. The 505-watt amplifier in the Bang & Olufsen sound system supplies:

- A Three-Way Front Speaker System (6 Speakers Through 4 Channels).
- A Two-Way Rear Speaker System (4 Speakers Through 2 Channels).
- A Center Speaker in the Instrument Panel.
- A Subwoofer in the Rear Shelf.
- Two Surround Speakers in the Rear Shelf.

The surround effect can be can be set in the sound setup menu of the MMI. An ambient noise measuring microphone is connected to the amplifier allowing the amplifier to optimally adapt the output volume to the driving noise level.

If this is not desired by the user, the function can be deactivated in the sound setup menu under GALA. If a vehicle with MMI is equipped with a speech dialogue system, a second microphone is connected to the amplifier. The amplifier is diagnosed using the VAS Scan Tool via Address Word 47.



Service

For the first time, the equalizer settings for various vehicle specifications (leather/fabric, engine variant) are no longer stored completely in the amplifier.

If the amplifier is coded in the workshop using the Scan Tool, it downloads the relevant equalizer settings to the amplifier from a central data server. This means the latest settings will always be installed on the amplifier.

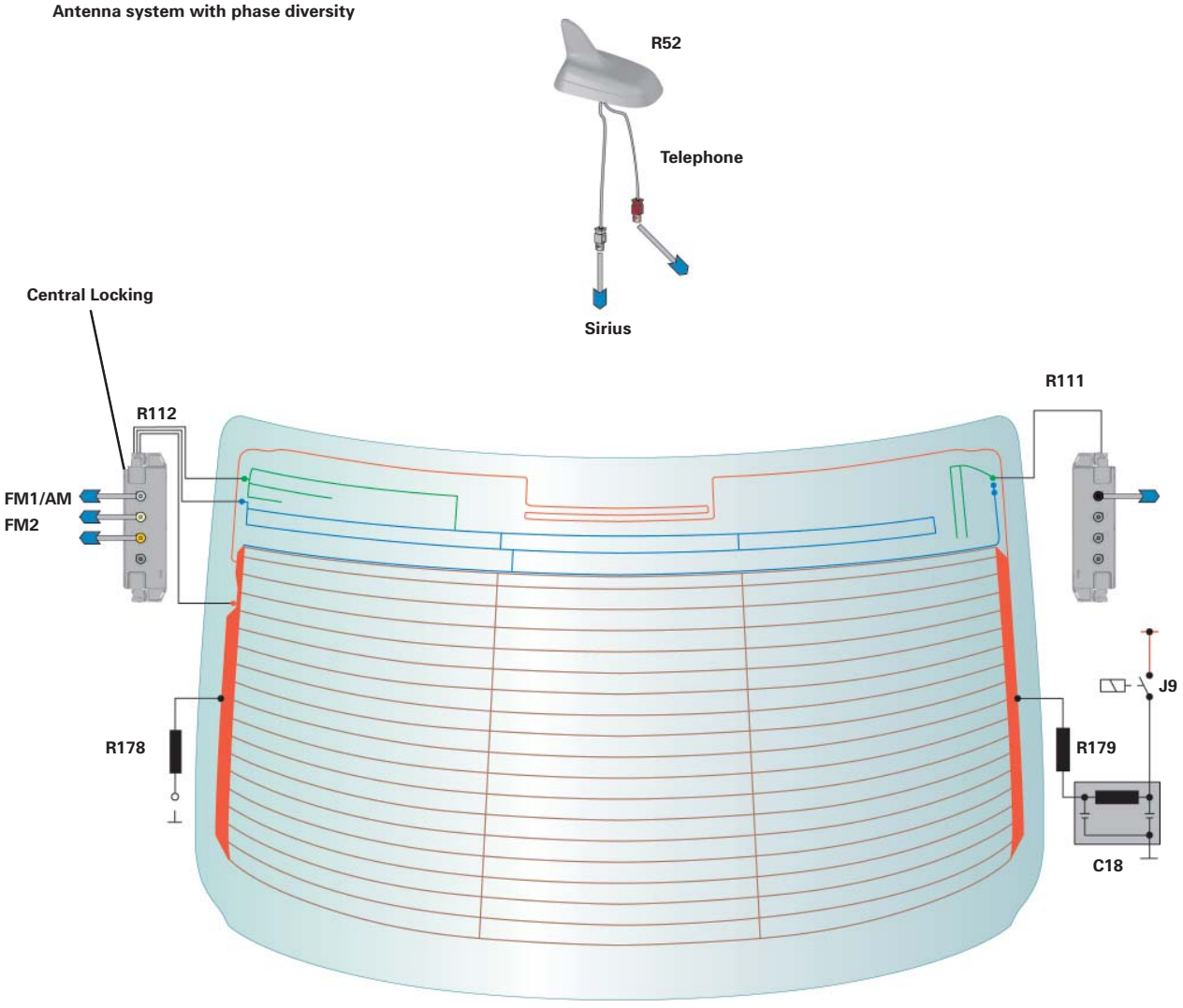
Antennas

Most of the radio antennas on the 2009 Audi A4 are integrated in the rear window. Only the navigation, telephone and digital satellite radio antennas are integrated in the roof antenna module. The amplifiers for the various systems are integrated at the left and right C-pillars.

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

Because of the different radio tuner principles, various FM antenna systems are installed depending on the tuner. Symphony radios use a phase diversity type system. Vehicles with MMI with Audi Navigation Plus use a switched diversity system.

Antenna system with phase diversity



Overview

The customer can choose between two different automatic air conditioning system versions for the 2009 Audi A4:

– Single-zone deluxe automatic air conditioning system
– Three-zone deluxe automatic air conditioning system

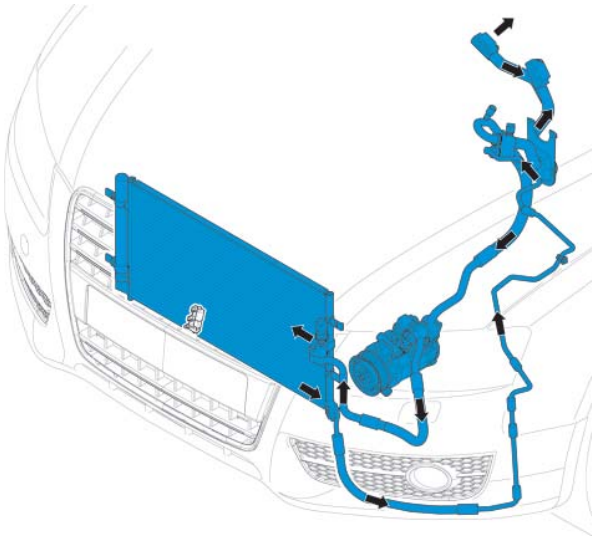
Both systems are automatic air conditioning systems. They can be distinguished at first glance by their different air conditioning control. The single-zone automatic air conditioning system is the standard version.

Controls, single zone air conditioning system



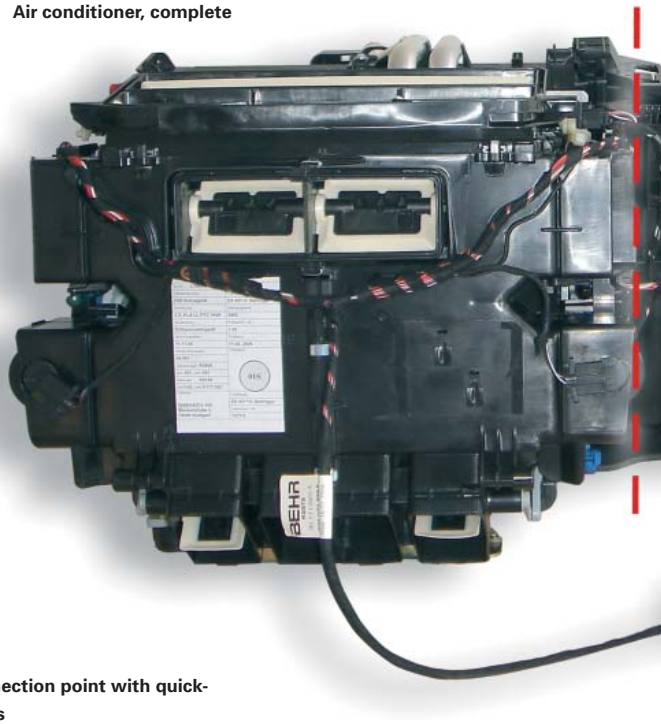
Controls, three-zone air conditioning system

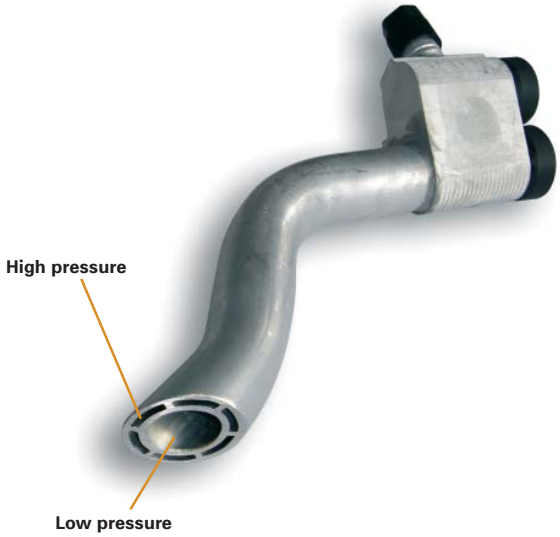




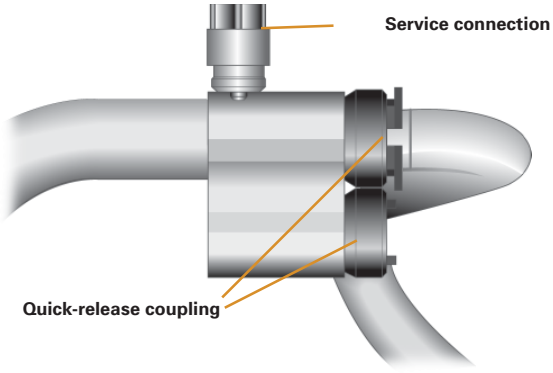
Coaxial line (low and high pressure lines combined in a single line)

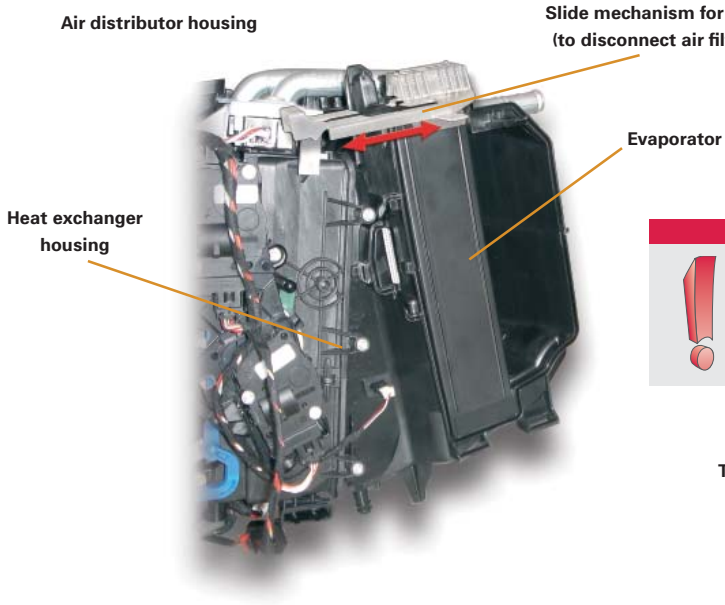
Air conditioner, complete





Coaxial line connection point with quick-release couplings

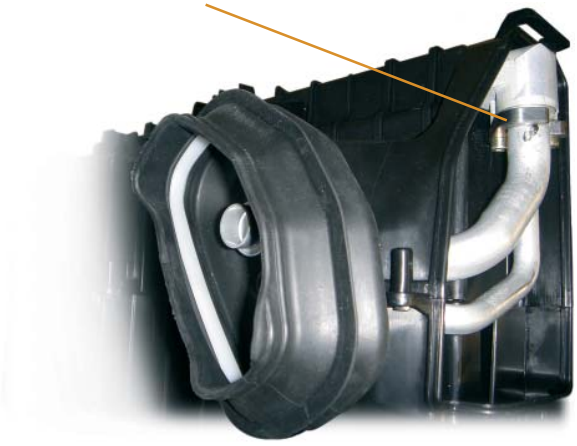




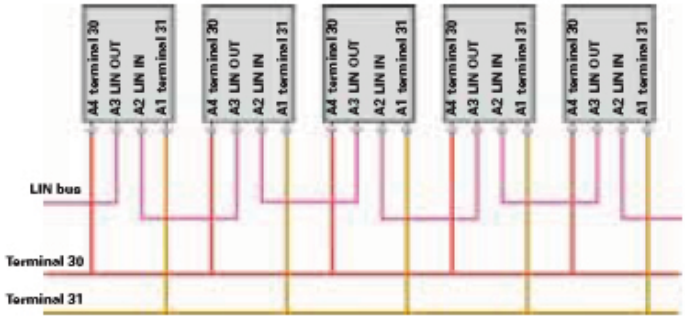
Note

The original evaporator (comprised of welded tubes) must be cut off when making repairs.





The LIN bus series circuit of the flap servomotors



409_053

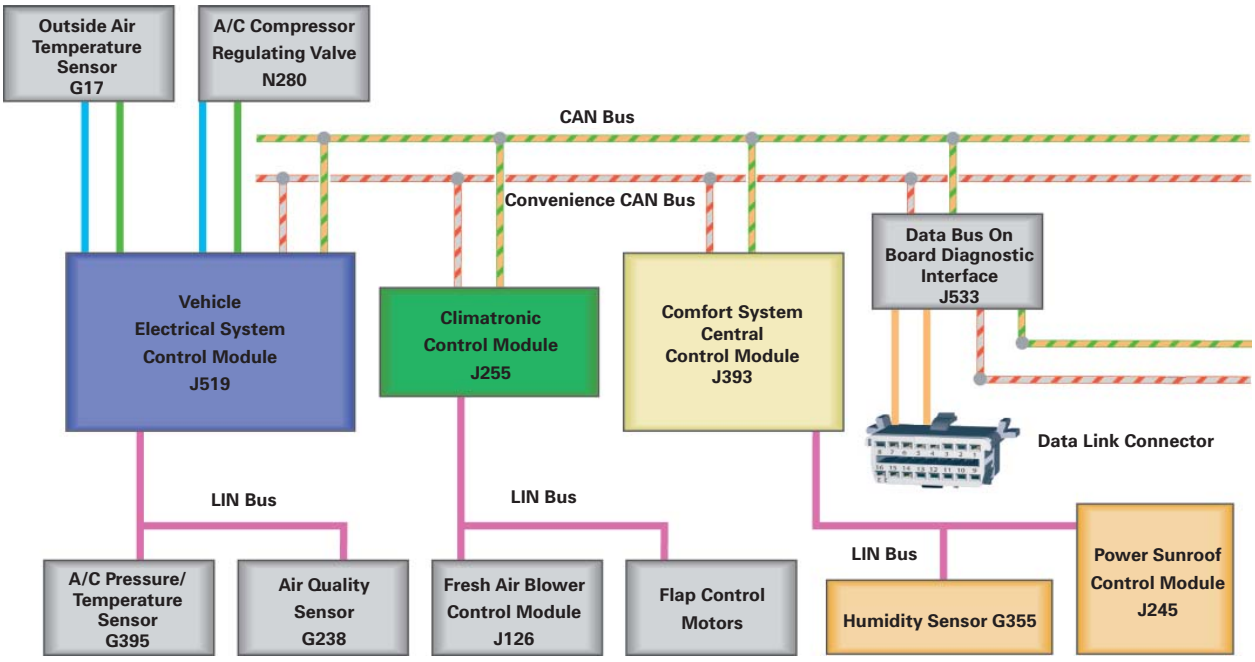
Reference

For further information, refer to Self-Study Program 997703, "The 2008 Audi A5/S5 Vehicle Introduction".

Automatic Air Conditioning System - Electric Components

Not all sensor signals of the A/C system are sent directly to Climatronic Control Module J255. For example, the values of A/C Pressure/Temperature Sensor G395 and Windshield Moisture/Temperature Sensor G458 are processed in Electrical System Control Module J519 or Comfort System Central Control Module J393.

Participating control modules provide their data to Climatronic Control Module J255 via the CAN network.



Sensors and Actuators

Outside Temperature G17

Only one temperature sensor is used to measure the outside temperature. Outside Temperature Sensor G17 is located in the front section of the vehicle behind the bumper, directly in front of the condenser.

Vehicle Electrical System Control Module J519 provides the value from G17 via the CAN-bus to Instrument Cluster Control Module J285 and Climatronic Control Module J285.

If Outside Temperature Sensor G17 fails, the ECON function of the A/C system is activated; the ECON LED lights and indicates the A/C compressor is not running and that the automatic air conditioning system is deactivated.

Air Quality Sensor G238

Climatronic Control Module J255 uses the signal from Air Quality Sensor G238 for the automatic recirculation function of the A/C system.

If the sensor should fail, the auto-recirculation function will not work.

Humidity Sensor G355

The purpose of Humidity Sensor G355 and Windshield Moisture/Temperature Sensor G458 is to prevent misting of the windshield. These sensors measure the air water content and temperature directly in front of the windshield. G355 works by means of a capacitive thin film sensor.

It functions in much the same way as a plate condenser. The measured capacitance indicates the degree of humidity. The sensor electronics convert the measured capacitance to a voltage.

A/C Pressure/Temperature Sensor G395

A/C Pressure/temperature Sensor G395 interchanges data by LIN bus signal with Electrical System Control Module J519. The data is transferred to the Climatronic Control Module J255 by CAN bus.

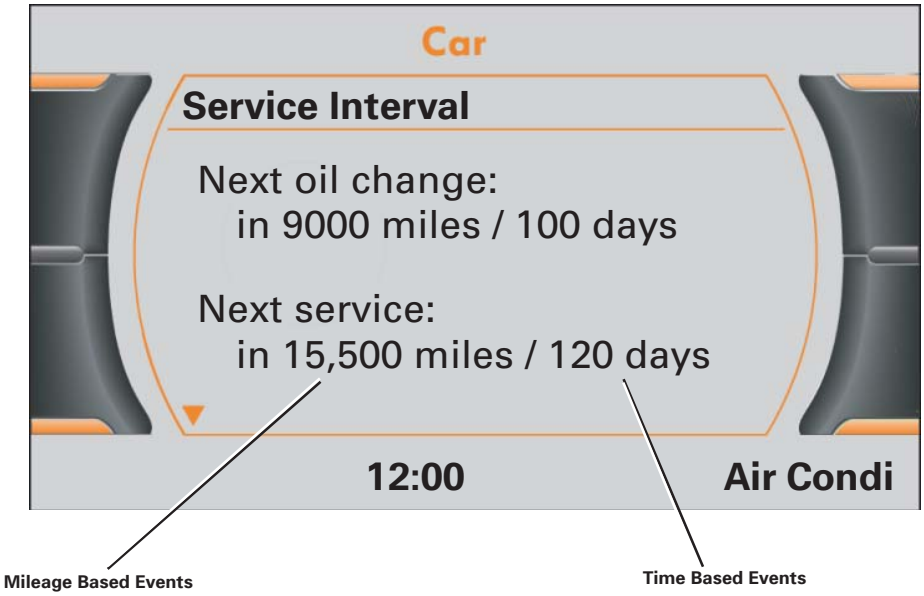
The measured value is currently not evaluated, but can nevertheless be read out in the Measuring Value Blocks.

Service Interval Display

The Service Interval Display indicates to the customer when the oil change is due.

This is indicated to the customer via the Driver Information System in the instrument cluster.

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



Note

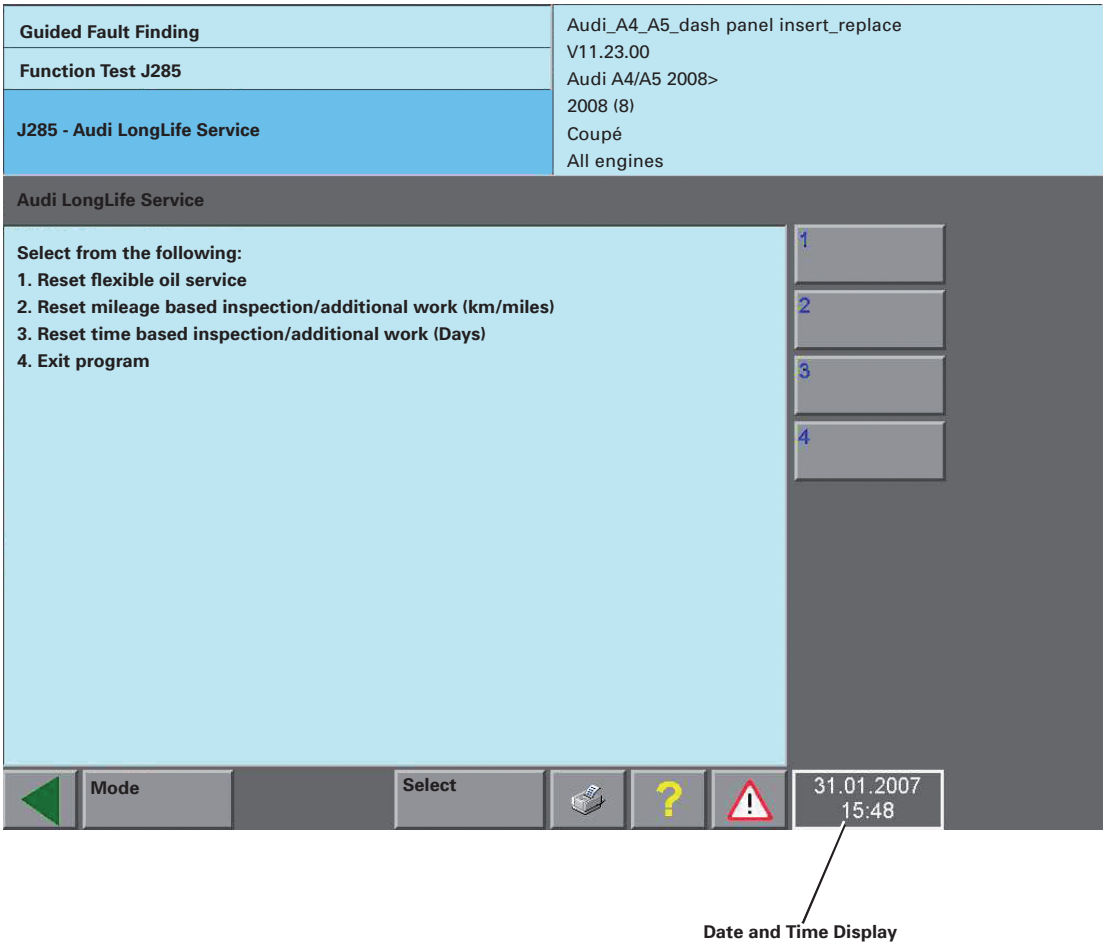
Because the time and mileage based service events are now indicated, the chance of the customer missing these events is reduced. The requirement for this is that the Service Interval Display is reset correctly.

Resetting the Service Interval Display

The Service Interval Display is reset using the VAS Scan Tool in Guided Functions or Guided Fault Finding. An essential requirement here is the data to be entered into the maintenance table by the technician.

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

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



Audi Intelligent Key

The Audi Intelligent Key stores vehicle service data on a rewritable memory chip integrated in the key. Actual vehicle information is written at pre-defined intervals to a rewritable memory chip integrated in the key.

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

A facility has also been provided which allows various service systems (ElsaWeb) to read in this data directly.

Audi Intelligent Key Reader



Stored Information

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

– Last-Saved Date and Time.
– Mileage at Last-Saved Date.
– Current Service Interval Status.
– Transponder ID.



Reference

For further information about the Audi Intelligent Key, please refer to SSP 998703 "The 2008 Audi A5/S5 - Convenience Electronics".

Self-Study Programs

The following self-study programs have been prepared for the 2009 Audi A4:

– SSP 409 Audi A4 ‘08

– SSP 402 Dynamic Steering System.



SSP 409 Audi A4 ‘08

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

SSP 402 Dynamic Steering System.

– Steering pump
– Dynamic steering system control unit
– Dynamic steering lock
– Actuator:



Knowledge Assessment

An on-line Knowledge Assessment (exam) is available for this SSP.

The Knowledge Assessment may or may not be required for Certification.

You can find this Knowledge Assessment at:

www.accessaudi.com

From the accessaudi.com homepage:

- Click on the “ACADEMY” Tab
- Click on the “Academy Site” Link
- Click on the ”CRC Certification” Link

For assistance, please call:

Audi Academy

Learning Management Center Headquarters

1-877-AUDI-LMC (283-4562)

(8:00 a.m. to 8:00 p.m. EST)

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