The 2005 Audi A6
Electrical Systems

Audi Academy

SELF-STUDY PROGRAM
COURSE NUMBER 994403

Audi of America, Inc.
Service Training
Printed in U.S.A.
Printed 06/2004
Course Number 994403

Always check Technical Bulletins and the Audi Worldwide Repair Information System for information that may supersede any information included in this booklet.

Contents

Self-Study Program for the 2005 Audi A6

The 2005 Audi A6

– Introduction to the vehicle
– Body technology
– Passenger protection
– Air conditioning

Course Number: 991403

The 2005 Audi A6 Engine and Transmissions

– 3.2 V6 FSI
– 4.2 V8
– 3.0 V6 TDI Common Rail
– Automatic transmissions
– Manual transmissions

Course Number: 992403

The 2005 Audi A6 Running Gear

– Front axle technology
– Rear axle technology
– Steering system
– ESP
– Electromechanical parking

Course Number: 993403

The 2005 Audi A6 Electrical System

– Networking
– Bus topologies
– Convenience electronics
– Infotainment

Course Number: 994403

The Self-Study Program provides information on the fundamentals of the design and function of new vehicle models, new vehicle components or new technologies.

Reference

Note

The Self-Study Program is not a Workshop Manual! Specified values serve only to make the information easier to understand and relate to the software version that was valid at the time the Self-Study Program (SSP) was created.

For maintenance and repair work, please make sure to use the current technical documentation.

The Audi A6 - the Most Progressive Vehicle Takes the Lead

The new Audi A6 - the most progressive vehicle takes the lead.

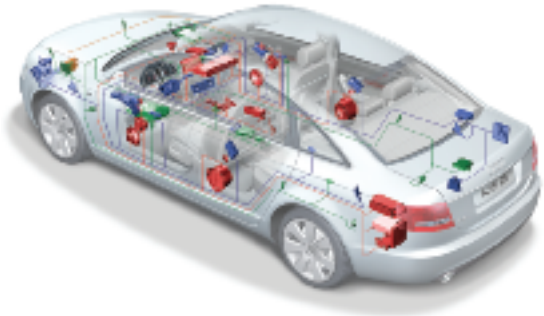
The new Audi A6 has everything that is needed to become the Number One model in the top of its class

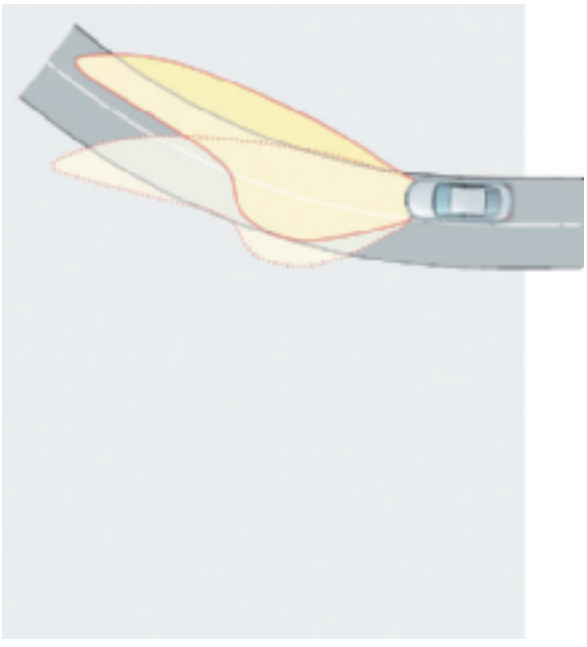
The new Audi A6 consistently adopts the highly networked electronic architecture, which is already used in the Audi A8L. Overall, new technologies allow the A6 to match up with its "model" vehicle, the Audi A8L. Features, which were previously reserved for luxury vehicles, are now also available in the top-class segment.

It combines many different, attractive components to form one unit.. Design and performance go hand-in-hand. The new Audi A6 will take over as the most progressive vehicle.

In combination with these diverse capabilities, the underlying technology has, of course, been enhanced considerably. The use of the most modern network technologies, such as CAN, LIN, MOST and Bluetooth, and the related distributed vehicle functions signals the arrival of a new generation of vehicle electrical systems in this class.

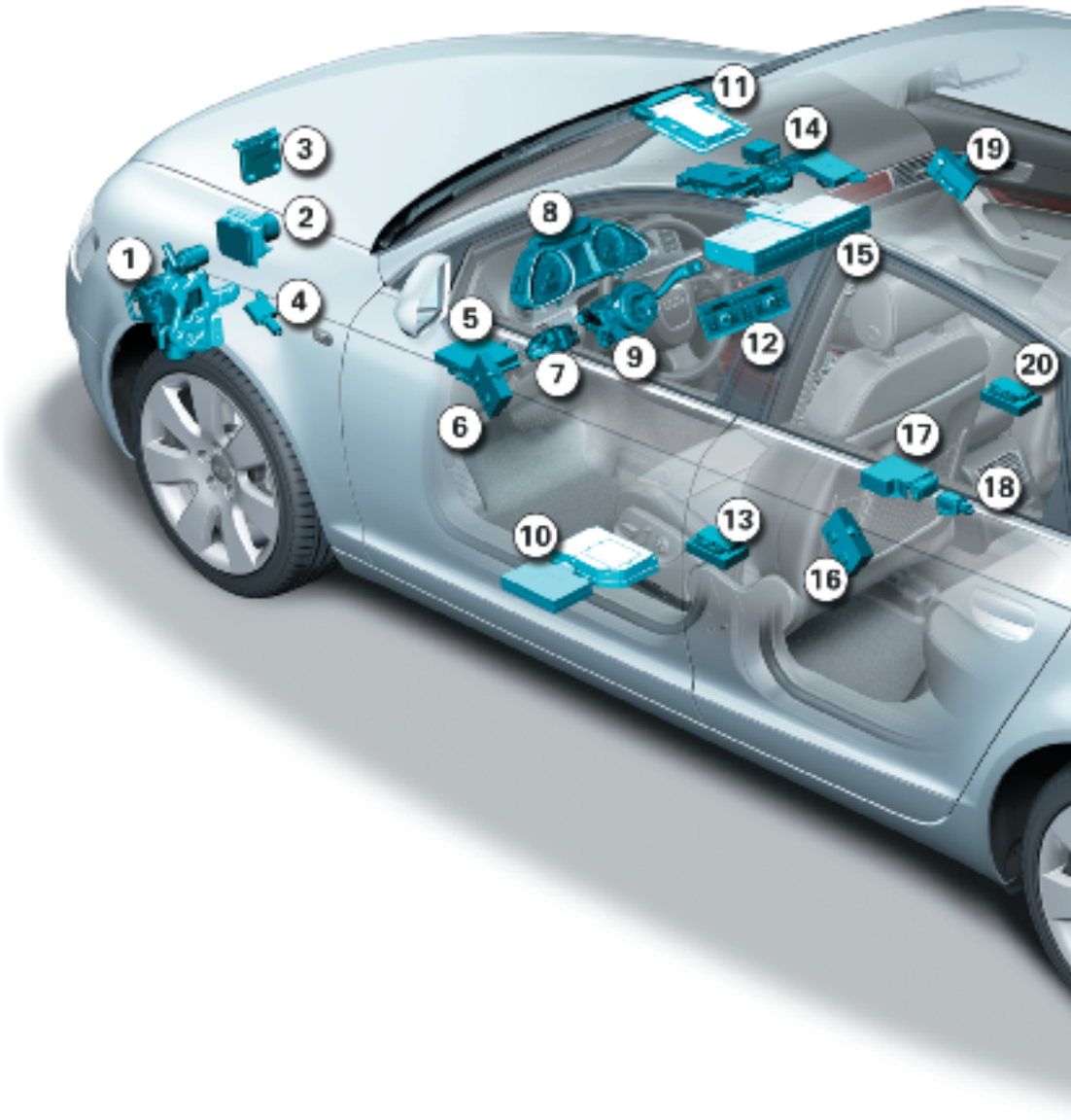
Some of these are safety-related features, such as the combined Rain/Light Recognition Sensor G397 or the adaptive headlight system. Features previously found on only the A8L premium luxury sedan, such as the MMI operating system and advanced mobile phone communications, are now available on the new A6 sedan.





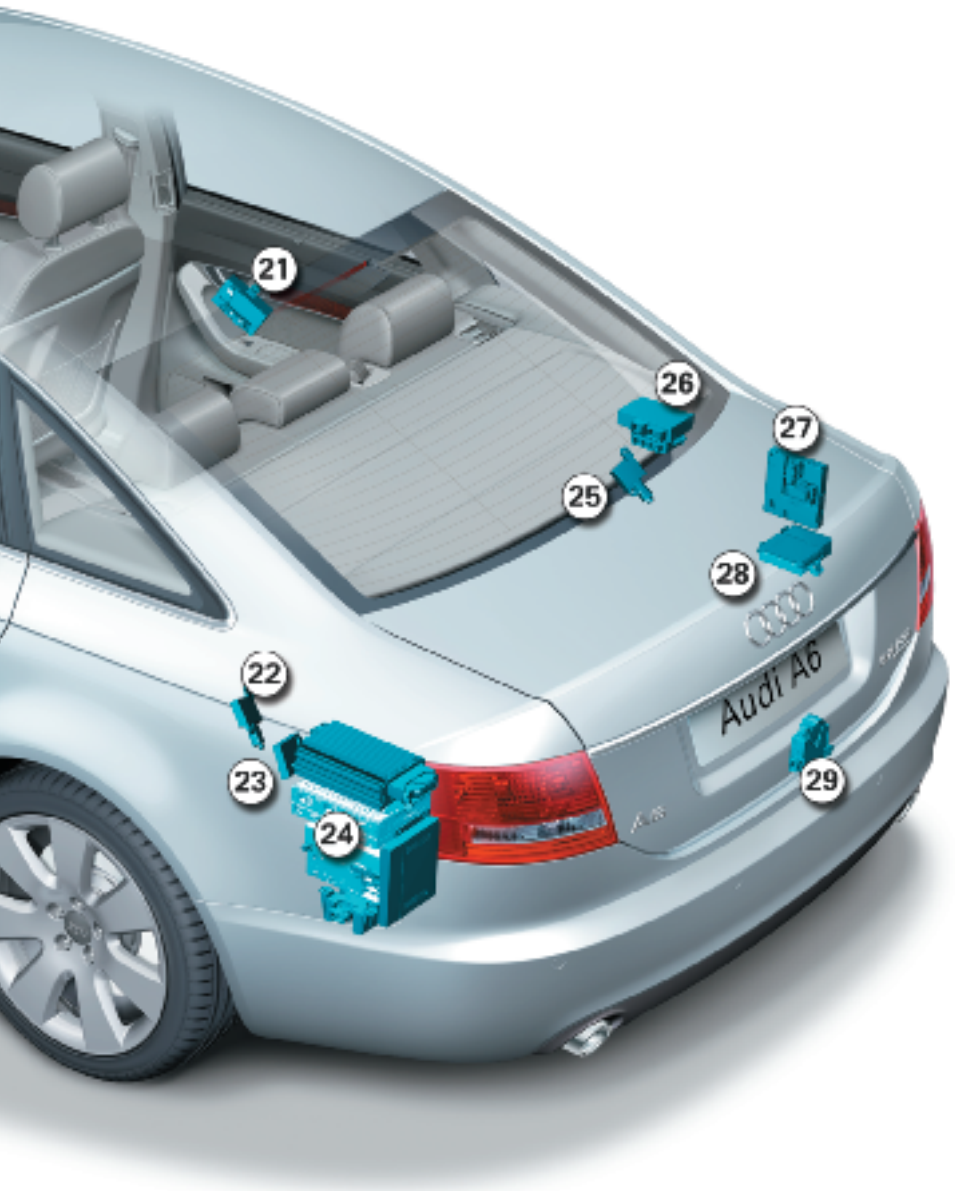
Overview

Control Module Locations



Legend

1	J364	Control module for auxiliary heater
2	J104	ABS Control Module
3	J428	Control module for distance regulation
4	G431	Left Front Tire Pressure Monitoring Transmitter
5	J519	Vehicle Electrical system control module
6	J386	Door control module, driver side
7	J518	Access/Start Control Module
8	J285	Control module with indicator unit in instrument panel insert
9	J527	Steering Column Electronic Systems Control Module
10	J526	Telephone/Telematics Control Module
11	J623	Engine Control Module (ECM)
12	J255	Climatronic Control Module
13	J136	Memory Seat/Steering Column Adjustment Control Module
14	J197	Level Control System Control Module
	J431	Headlight Range Control Module
	J502	Tire Pressure Monitoring Control Module
	J520	Vehicle Electrical System Control Module 2
	J523	Front Information Display Control Head Control Module
	J533	Data Bus On Board Diagnostic Interface
	J723	Keyless Access Authorization Antenna Reader
15	R41	CD Changer Unit
	R92	CD-ROM Drive



16	J388	Door control module, rear, left
17	J234	Airbag control module
18	G202	Sender for Rotation Rate
19	J387	Door control module, passenger side
20	J521	Passenger Memory Seat Control Module
21	R64	Door control module, rear, right
22	G433	Left Rear Tire Pressure Monitoring Transmitter (in wheel housing)
23	R64	Auxiliary heater Radio Receiver
24	J401	Control module for navigation with CD-mechanism
	J507	Speech Input Control Module
	J525	Digital Sound System Control Module
	R	Radio
	R78	TV Tuner
	R147	Digital Radio (D4B)
25	G434	Right Rear Tire Pressure Monitoring Transmitter
26	J4466	Control module for parking aid
	J345	Control module for towing sensor
27	J393	Central control module for comfort system
28	J540	Electronic Parking Brake Control Module
29	J644	Energy Management Control Module

Data Bus Topology

Control module with indicator unit in instrument panel insert (01317) J285

16-pin connector T16

Control Module for distance regulation J428

Data Bus On Board Diagnostic Interface J533

NO_x Sensor Control Module J583

Engine Control Module J623

Sender for rotation rate G202

ABS Control Module J104

Seat Occupied Recognition Control Module J706

Airbag Control Module J234

Transmission Control Module J217

Left Headlight Power Output Stage J667

Right Headlight Power Output Stage J668

Headlight Range Control Module J437

Electronic Parking Brake Control Module J540

Level Control System Module J197

Steering Angle Sensor G85

Steering Column Electronic System Control Module J527

Control Module For Multi-function Steering Wheel J453

Door Control Module, driver side J386

Door Control Module, passenger side J387

Door Control Module, Rear, Left J388

Door Control Module, Rear, Right J389

Memory Seat/ Steering Column Adjustment Control Module J136

Passenger Memory Seat Control Module J521

Control Module for Towing Sensor J345

Energy Management Control Module J644

Control Module For Auxiliary Heater J364

Control Module for parking aid J446

Vehicle Electrical System Control Module J520

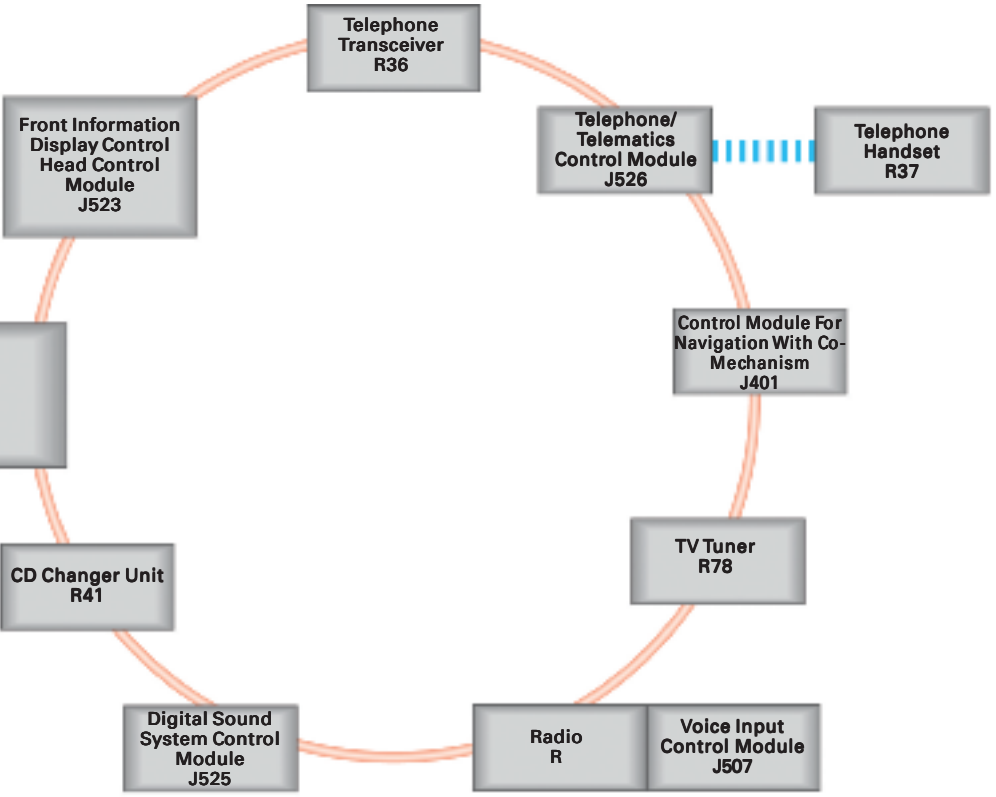
Access/Start Control Module J518

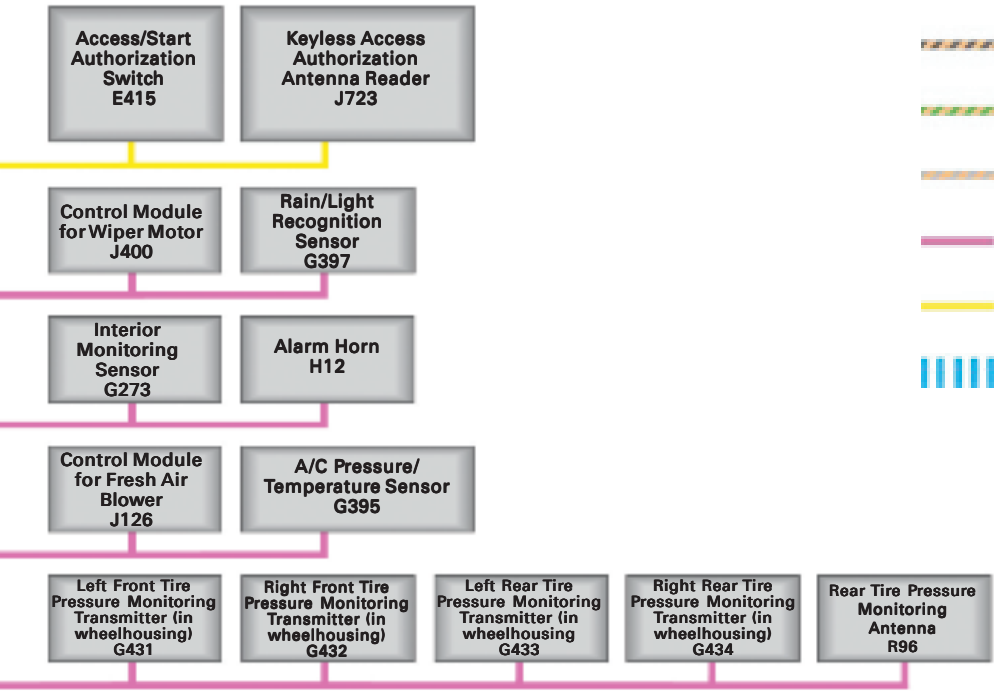
Vehicle Electrical System Control Module J519

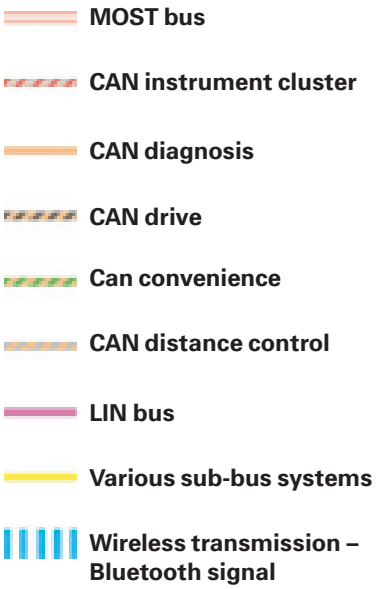
Central Control Unit for comfort system J393

Climatronic Control Module J255

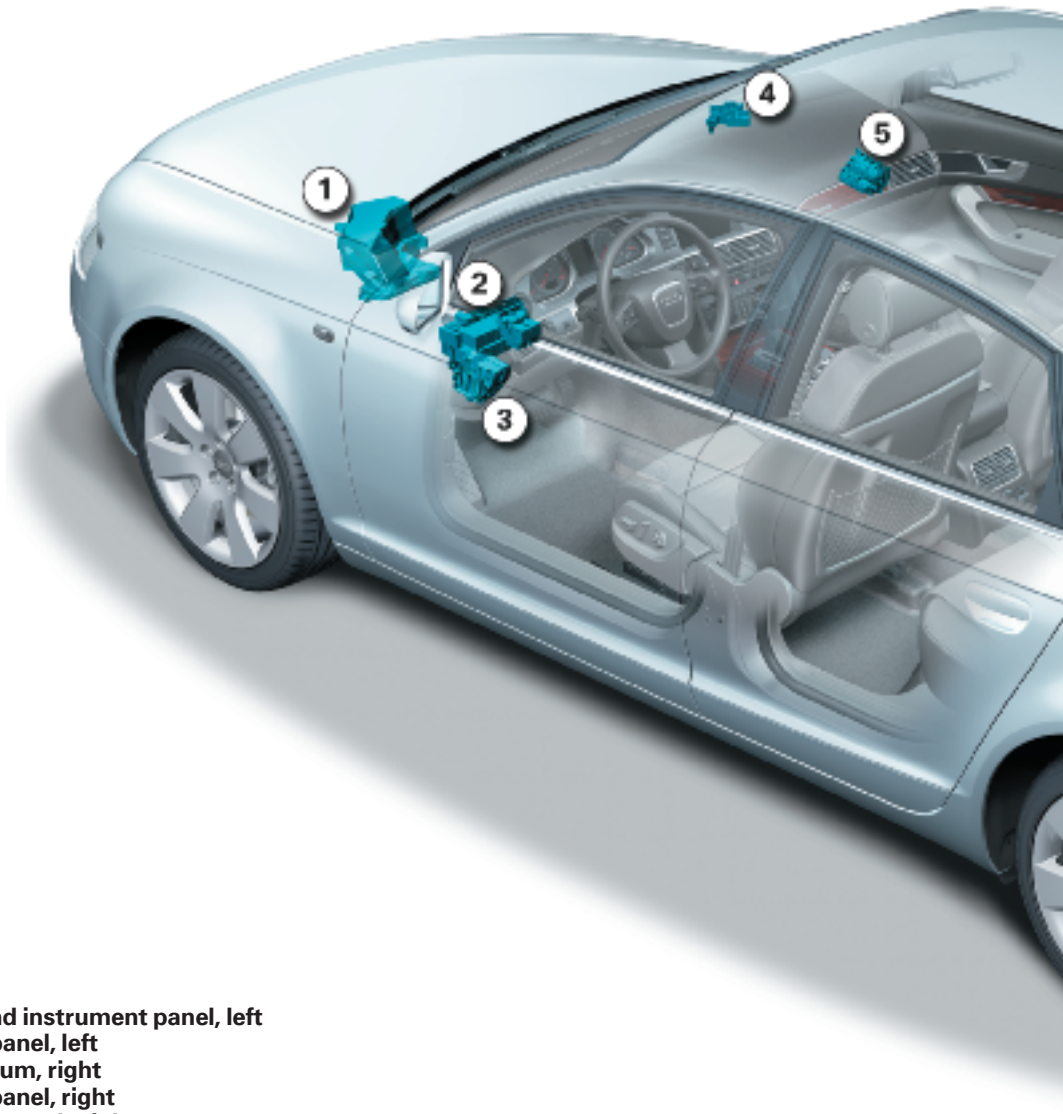
Tire Pressure Monitoring Control Module J502


Telephone Transceiver R36
Front Information Display Control Head Control Module J523
Telephone/ Telematics Control Module J526
Telephone Handset R37
Control Module For Navigation With Co-Mechanism J401
TV Tuner R78
CD Changer Unit R41
Digital Sound System Control Module J525
Radio R
Voice Input Control Module J507


Access/Start Authorization Switch E415
Keyless Access Authorization Antenna Reader J723
Control Module for Wiper Motor J400
Rain/Light Recognition Sensor G397
Interior Monitoring Sensor G273
Alarm Horn H12
Control Module for Fresh Air Blower J126
A/C Pressure/ Temperature Sensor G395
Left Front Tire Pressure Monitoring Transmitter (in wheelhousing) G431
Right Front Tire Pressure Monitoring Transmitter (in wheelhousing) G432
Left Rear Tire Pressure Monitoring Transmitter (in wheelhousing G433
Right Rear Tire Pressure Monitoring Transmitter (in wheelhousing) G434
Rear Tire Pressure Monitoring Antenna R96


MOST bus
CAN instrument cluster
CAN diagnosis
CAN drive
Can convenience
CAN distance control
LIN bus
Various sub-bus systems
Wireless transmission – Bluetooth signal

Installation Positions of Fuses and Relays

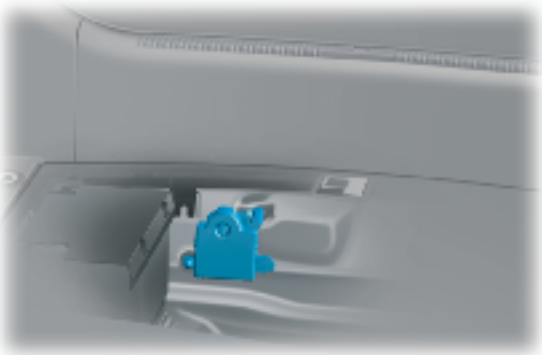


Legend

1 E box in air plenum, left
2 Relay and fuse holder behind instrument panel, left
3 Fuse holder in instrument panel, left
4 Main fuse carrier in air plenum, right
5 Fuse holder in instrument panel, right
6 Relay and fuse holder in the trunk, right


6
Audi A6

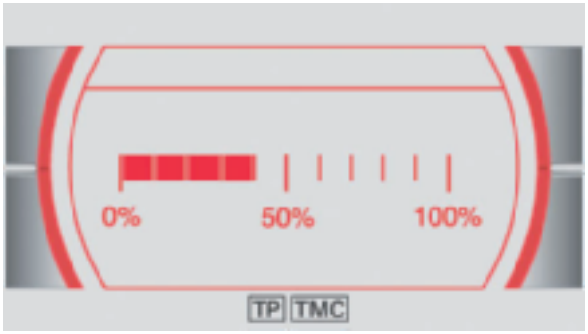
Energy Management Control Module J644



Located in trunk, right rear.

The Energy Management Control Module is mounted in the trunk near the battery. The Control Module constantly monitors the battery. It checks the State of Charge (SOC), starting capability, and regulates the optimum alternator charging voltage with the engine running. It can apply load shedding and increase idling speed. To reduce the closed circuit current with the engine OFF, the Control Module deactivates loads over the CAN Bus which prevents excessive battery discharge.

This control module has been adapted for use in the 2005 Audi A6, with revised software, which shows the battery condition rather than the battery charge level in the MMI display.



Battery Condition

The battery condition indicates how efficient the battery is. The efficiency is determined from the battery charge level and the ability to start.

Advantages of the management system are:

- The cut-off stages can be allocated directly to the battery condition.
- The messages in the control module with indicator unit in instrument panel insert J285 always appear for the same battery condition reading.
- A 100% display indicates that no cut-off stage will be set the next time the engine is switched off.

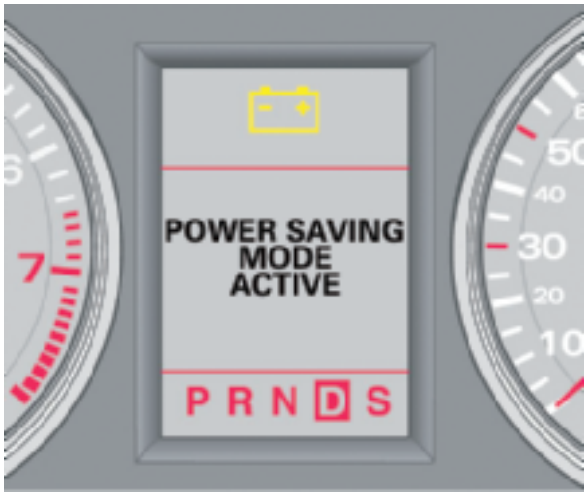
Reference

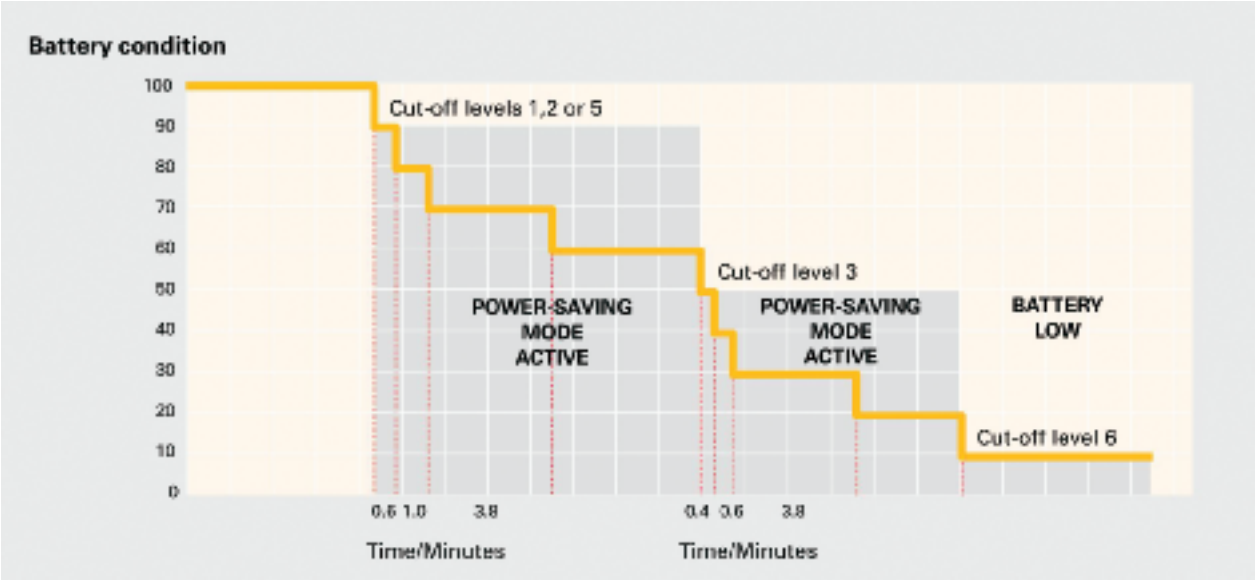
The basic functions of Energy Management Control Module J644 are described in the SSP 999303, A8L Electrical Components.

Steady Battery Discharge

The battery condition is 100% when the battery is charged.

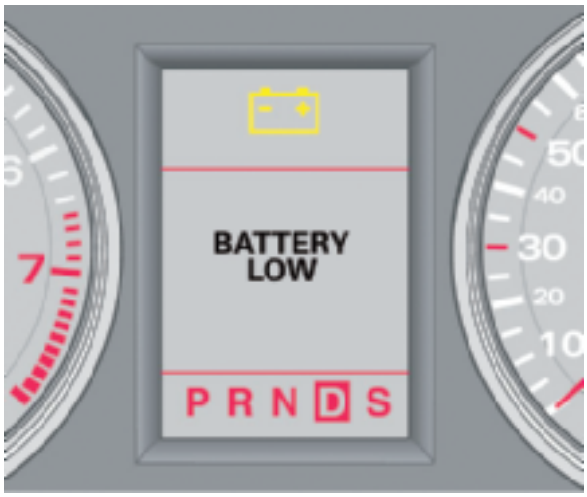
As soon as cut-off level 1 is activated, the MMI "Battery condition" display drops to 90% and then goes down to 60% in steps. If cut-off level 1, 2 or 5 is set when the display reads 90%, the message "Power-saving mode active" appears for a short time on the control module with indicator unit in instrument panel insert J285. In addition, the battery symbol in the instrument panel insert indicates power-saving mode for the entire load switch-off duration.





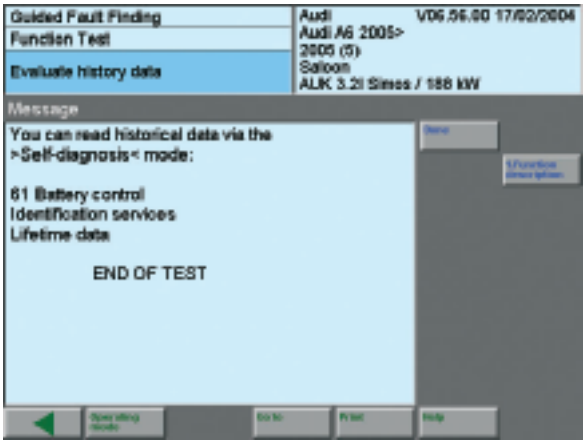
As soon as cut-off level 3 is activated, the "Battery condition" display drops to 50% and then goes down to 20% in steps.

If the battery condition drops to 10%, cut-off level 6 is active. In cut-off level 6, the message "BATTERY LOW" appears in the central control module with indicator unit in instrument panel insert J285 after the ignition is switched on.



History Data

The scan tool can be used to read out data from the Energy Management Control Module J644, which makes it much easier to analyze the on-board power supply and the battery.



Open-circuit Voltage History

If the battery open-circuit voltage is less than the threshold values of 12.5 volts, 12.2 volts and 11.5 volts, an entry is written to the history data. The last four entries can always be read.

Voltage Measurement Starts When All of the Following Occurs:

- CAN Convenience is in Sleep mode
- Terminal 15 is switched off for at least 2 hours
- The vehicle's power consumption is < 100 mA

Voltage Measurement Ends When Any One of the Following Occurs:

- Voltage increases
- Current increases
- Control module triggers Sleep mode
- Control module detects a new battery

Closed-circuit Current History

If the closed-circuit current exceeds the threshold value of 50 mA, an entry is written to the history data. The last ten entries can be read.

Current Measurement Starts When the Following Conditions are Met:

- CAN Convenience is in Sleep mode
- terminal 15 is switched off for at least 2 hours
- the vehicle's power consumption is > 50 mA

Current measurement ends when any one of the following occurs:

- Current decreases
- Control module triggers Sleep mode

Breakdown Analysis

If the Energy Management Control Module J644 detects the status "Cannot start vehicle," an entry is written to the history data.

Cut-off Level History

Data for the last 15 cut-off levels is stored

Battery Change History

Data for the last three battery changes is stored.

Power Balance History - Driving (= Engine On)

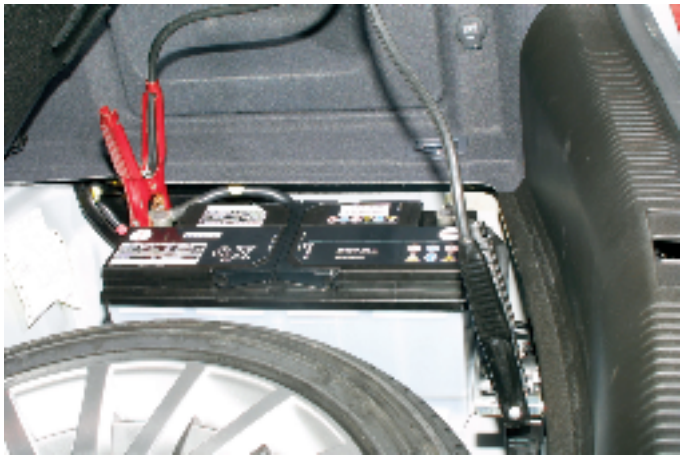
The power balance and duration of the last five journeys are logged.

Power Balance History - Idle (= Engine Off)

The power balance and duration of the last five idle times are logged. Other data is not relevant for Customer Service.

Battery Charging

When charging the battery, the battery charger must be connected to the battery positive terminal and the negative terminal at the external starting pin. The battery should always be recharged in the vehicle, which enables the Energy Management Control Module to include the charging current into the battery value calculations. When working on the vehicle with the ignition on and the engine off, always connect a battery maintainer. If a battery maintainer is not used, some functions may be deactivated because of excessive current draw. The charger must supply at least a 30A stabilized current.



Note

Do not rapid-charge the battery in the vehicle. Use the slow charge setting.

Note

When charging the battery, follow the manufacturers' instructions on the battery and the charging equipment.

Battery Replacement

When a battery is replaced, the new battery must be adapted by the diagnosis tester. The menu item "Battery manager encoding" is provided in the Guided Fault-Finding routine in the list of systems with self-diagnosis capability in the battery manager. The battery serial number has to be entered for encoding. This is marked on the battery.

Jump Starting

For jump starting, the starter cable ground is to be connected to the external starting lug and the positive cable to the external starting lug.

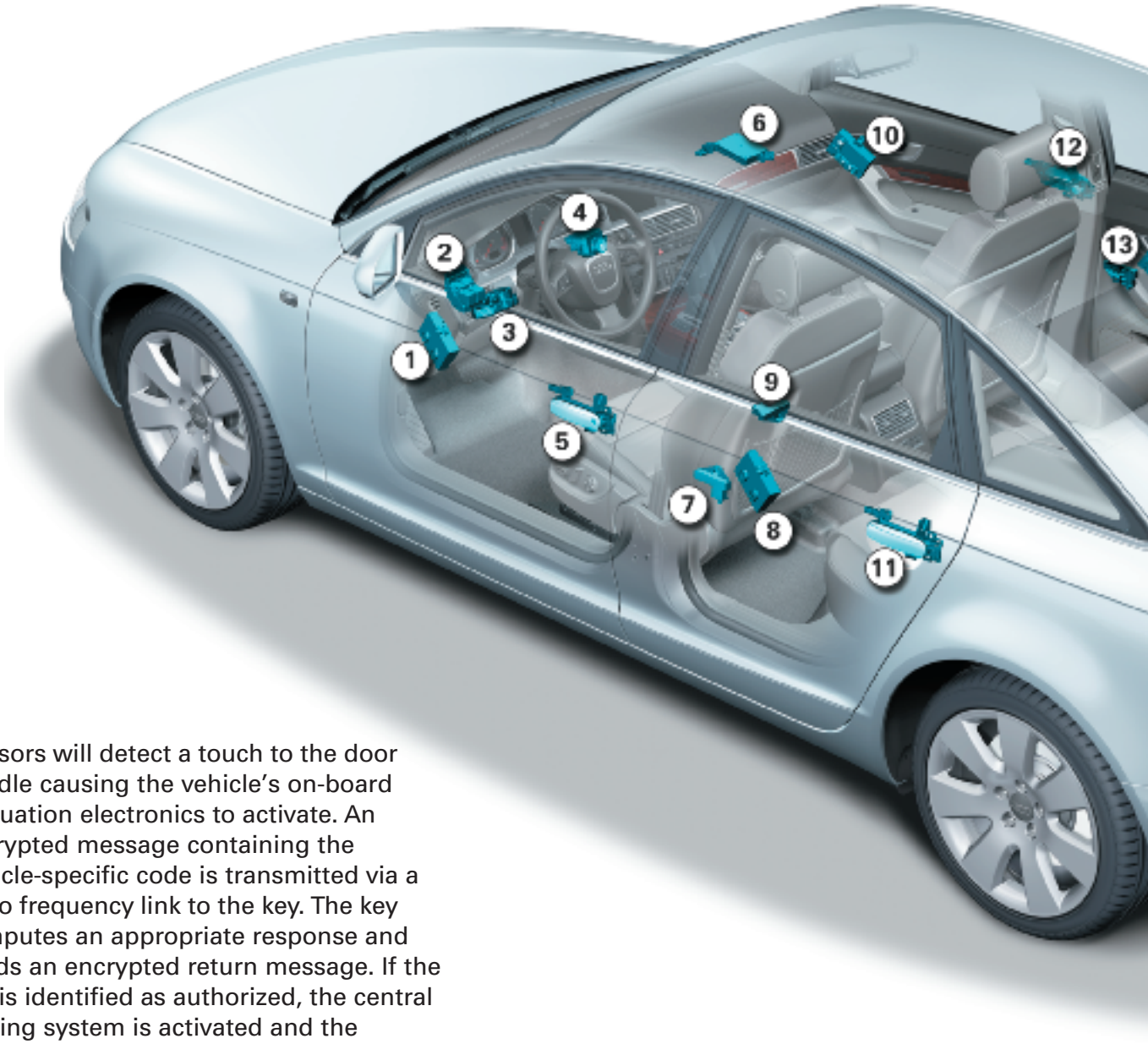
Advanced Key System

System Overview

The Advanced Key system was introduced with the 2003 Audi A8L (in Europe) and has been fundamentally revised for the 2005 Audi A6.

The most important new feature is that the Access/Start Authorization Control Module J518 has been combined with the actuator for steering column locking.

To activate a function, an authorized key must be within range of the door from a point of operation outside the vehicle. Intelligent sensors detect a three-dimensional zone in a radius of approximately 5 ft. (1.5 m).



Sensors will detect a touch to the door handle causing the vehicle's on-board evaluation electronics to activate. An encrypted message containing the vehicle-specific code is transmitted via a radio frequency link to the key. The key computes an appropriate response and sends an encrypted return message. If the key is identified as authorized, the central locking system is activated and the vehicle unlocked.

Advanced Key System

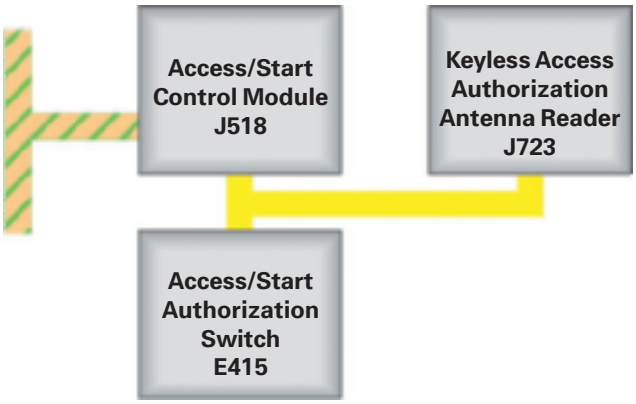
1 J386 Door Control Module, Driver Side
2 J519 Vehicle Electrical System Control Module
3 J518 Access/Start Control Module
4 E415 Access/Start Authorization Switch
5 E369 Driver's Outside Door Handle Central Locking Button
6 J723 Keyless Access Authorization Antenna Reader
7 R134 Left Access/Start Authorization Antenna
8 J388 Door Control Module, Rear, Left
9 R138 Interior Access/Start Authorization Antenna 1
10 J387 Door Control Module, Passenger Side
11 E371 Left Rear Outside Door Handle Central Locking Button
12 E370 Front Passenger's Outside Door Handle Central Locking Button
13 R135 Right Access/Start Authorization Antenna
14 J389 Door Control Module, Rear, Right
15 R47 Central Locking And Anti-theft Alarm System Antenna
16 E372 Right Rear Outside Door Handle Central Locking Button
F275 Right Rear Door Handle Switch
G418 Right Rear Outside Door Handle Touch Sensor
17 R137 Luggage Compartment Access/Start Authorization Antenna

To start the vehicle, an authorized key must be inside the vehicle. The selector lever must be placed in 'P' or 'N' and the footbrake must be pressed down.

When the start button is pushed, an encrypted signal containing vehicle-specific information is transmitted to the key. If an authorized key is inside the vehicle, it computes and returns the proper response signal. The electronic steering lock releases, the ignition is activated, and the Immobilizer releases the Engine Control Module to start the vehicle. Pressing the stop button cuts the ignition and the engine stops.

The presence of an authorized key is continually monitored while the engine is running by means of interior mounted antennae.

The vehicle can also be started and stopped by turning the key in the electronic ignition lock.



Division of Functions

System control is broken down into three basic modules:

- Access/Start Control Module J518
- Keyless Access Authorization Antenna Reader J723
- Access/Start Authorization Switch E415

All three components communicate with each other over a local single-wire bus.

The control Access/Start Control Module J518 is the master of the system and a participant on the CAN convenience bus. The same control module is installed for all system versions.

The Keyless Access Authorization Antenna Reader J723 is only installed with the Advanced Key option. It serves as the interface between the antennae, sensors and the Access/Start Control Module J518.

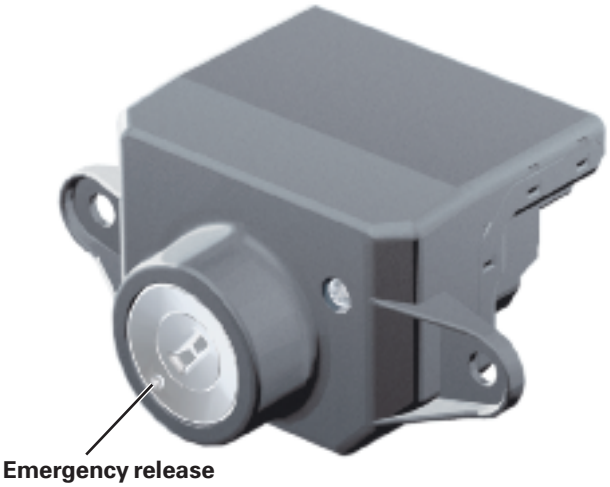
The Access/Start Authorization Switch E415 is installed in various versions, depending on the transmission, radio frequency of the central locking system and the Advanced Key option. An evaluation electronic device is also

Access/Start Authorization Switch E415

Versions

The switch Access/Start Authorization Switch is available in the following versions:

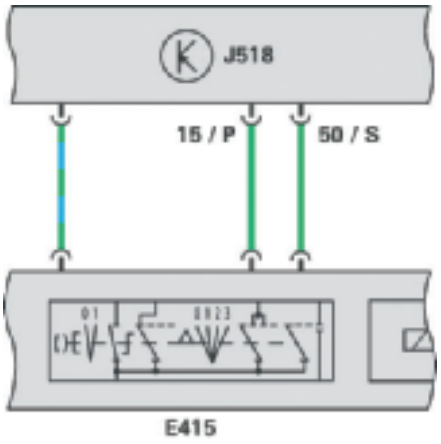
- With and without Advanced Key function
- With and without Ignition Switch Key Lock Solenoid N376
- For radio frequencies of 315 MHz
- 433 MHz or 868 MHz (depending on the country use.)

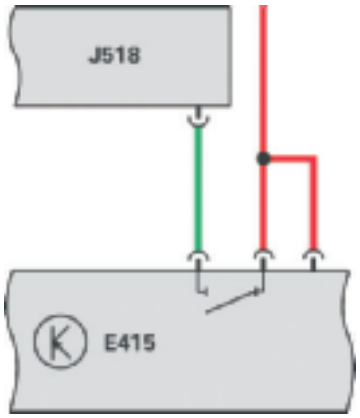


Functions

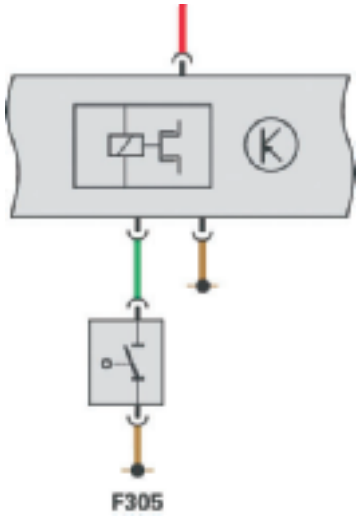
The Access/Start Authorization Switch E415 performs other functions apart from the ignition switch function. They are:

- Evaluation of the key position of the ignition switch:
  The ignition switch evaluates the ignition key position using four switches. The switch information is transferred to the Access/Start Control Module J518 in binary code via the local bus and also for monitoring purposes, via two lines. The lock barrel in the ignition switch is not coded mechanically, which means that the turning movement can be performed with any 2004 Audi A6 key.
- Safety circuit for the steering lock of the Access/Start Control Module J518:
  In addition to opening the switches in Access/Start Control Module J518, the voltage supply to the electromechanical steering lock motor is interrupted by the Access/Start Authorization Switch E415 to prevent the steering column from locking. When terminal 15 is switched on, no power is supplied to Access/Start Control Module J518.



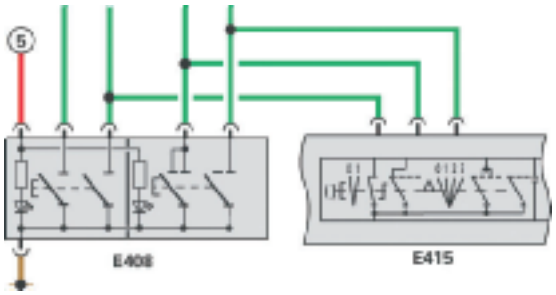


Advanced Key System

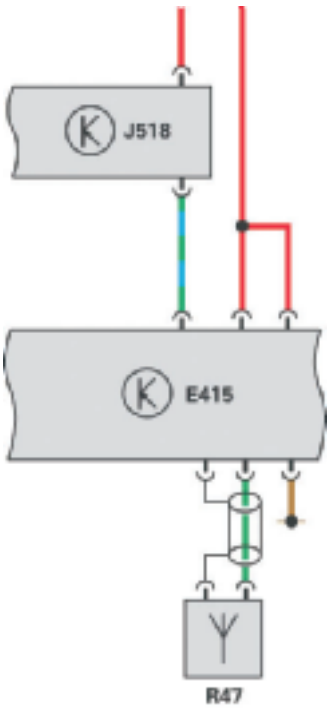


– Reading in position P of the automatic transmission from the Transmission Park Selector Switch F305:
The signal is used to activate the integrated, magnetic ignition key anti-removal lock. If the vehicle battery is discharged, the key can be removed by pressing the mechanical emergency release.

– Reading in the information from Access/Start Authorization Button E408 (only for vehicles with Advanced Key):
For safety reasons, the Access/Start Authorization Switch E415 evaluates the positions of the Access/Start Authorization Button E408.



– Reading in the information from the Central Locking and Anti-theft Alarm System Antenna R47:
The Access/Start Authorization Switch E415 passes the data, which the vehicle key sends via remote control, on to Access/Start Control Module J518. The control module evaluates the data.



– Reading in the signal from the Brake Light Switch F (only for vehicles with Advanced Key):
To start the vehicle using the Access/Start Authorization Button E408, the brake pedal must be actuated.

– Exchanging data with the key using the integrated read coil:
If a key is inserted into the Access/Start Authorization Switch E415 (= S contact on), the electronics system stimulates the key via the read coil. The key then sends the key identification into the switch via the transponder and the read coil. This sends the information to the Access/Start Control Module J518.

Access/Start Control Module J518

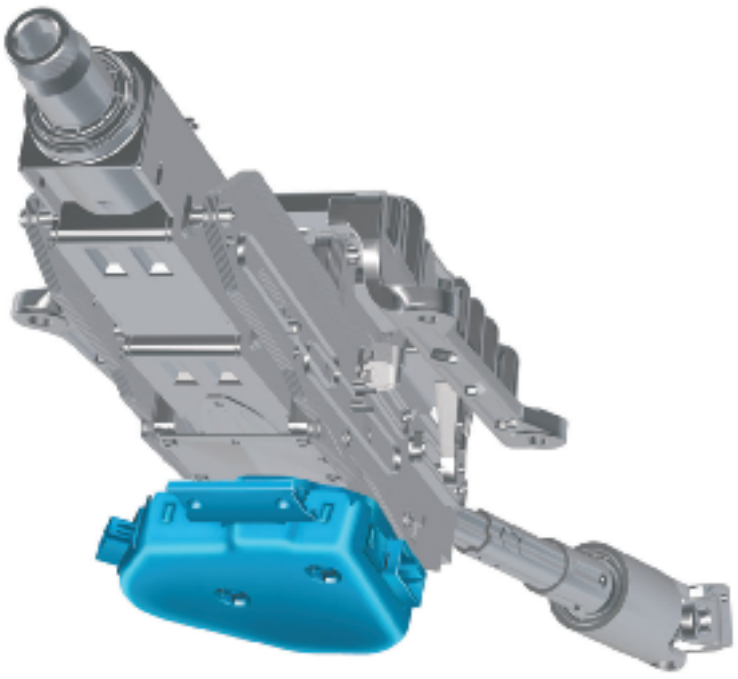
The electromechanical steering column lock was integrated into the Access/Start Control Module J518.

Functions

– Terminal control:
The Access/Start Control Module J518 puts the information about terminal 15, 75x, 50, S and P on the CAN Convenience Bus.
The control module also activates the relays for terminal 15 and 75x and passes the start request signal on to the Engine Control Module J623.

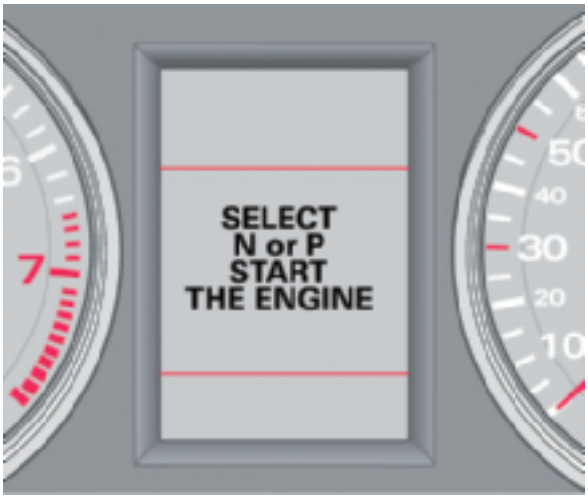
– Locking the steering column:
The motor and gears for locking the steering column are integrated into the Access/Start Control Module J518.
The position of the lock is checked using two integrated micro switches.
Terminal 15 is only switched on after the steering is unlocked fully.

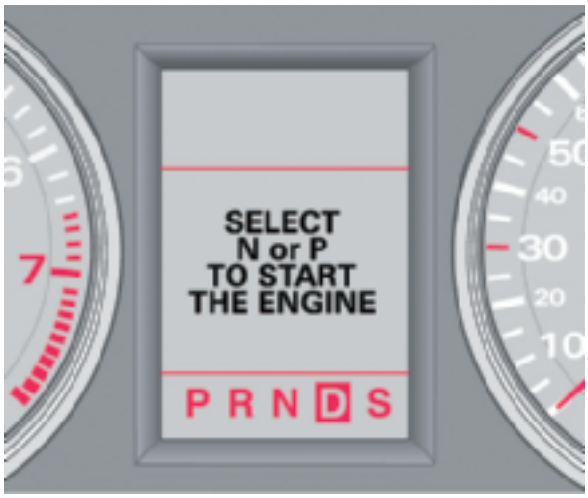
– Immobilizer and component protection:
The control module is the master for these functions.



– CAN Communication:
The Access/Start Control Module J518 is a participant on the CAN Convenience Bus. Data exchange between all the components of the Access/Start Authorization System is performed via this control module. It is also the diagnosis interface for the components involved. All data, for example, code, immobilizer data, etc., is stored in the Access/Start Control Module J518.

– Reading in the P/N signal from the Transmission Control Module (TCM) J217:
The signal is used to activate the displays relating to engine start in the control module with Indicator Unit in Instrument Panel Insert J285.

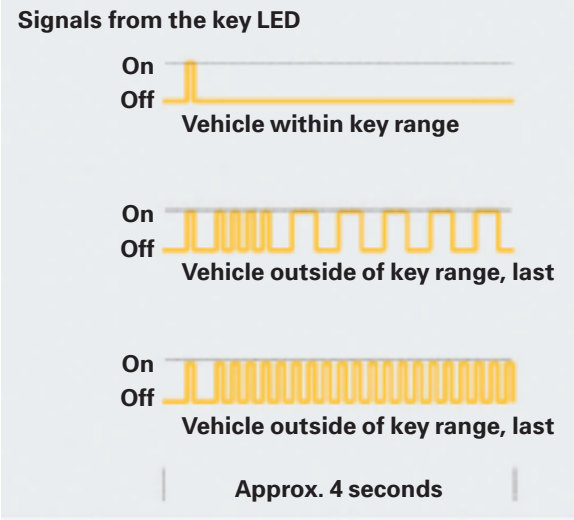




Vehicle Key

The key is mechanically coded for the lock cylinder in the driver's door and the tailgate/ trunk lid. The transponder function is integrated into the electronics and works without a battery. An integrated battery powers the electronics for the radio remote control and Advanced Key functions.

There is now a bi-directional data exchange between the radio-control key and the Access/Start Control Module J518 via the Central Locking and Anti-theft Alarm System Antenna R47. This is used to transfer the status of the central locking system into the key. If a button is pressed while the key is outside of the function range, the LED integrated in the key shows the lock status of the vehicle. The lock status displayed is always the status, which was achieved using this key when central locking was last actuated. If the vehicle is opened or locked in the interim period using a second key, it does not change the lock status display of the first key.

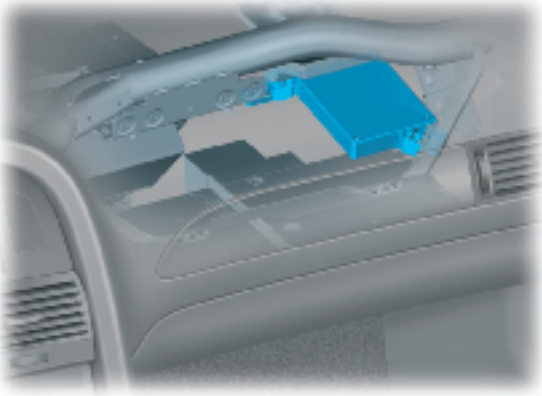


In addition, the radio frequency is changed from 433 MHz to 868 MHz for the first time in many countries. This radio frequency is ideal for data communication between vehicle keys and the Access/ Start Control Module J518.

Since this frequency can only be used for very short transmission pulses, any interference from long-term radio transmitters, such as baby phones, wireless headsets, etc. is eliminated.

Note

The radio frequency for vehicles in the North American market is 433 MHz.



Keyless Access Authorization Antenna Reader J723

Keyless Access Authorized Antenna reader J723 is installed together with the Advanced Key option.

It is located at the right of the instrument panel, behind the glove compartment.

It evaluates the signals from the outer door handle sensors and then activates the Access/Start Authorization Antennae R134/135/136/137/138.

Outside Door Handle Touch Sensors G415/416/417/418

The capacitor-based operating Outside Door Handle Touch Sensors detect any contact on the handle and send a signal shortly afterwards to the Keyless Access Authorization Antenna Reader J723.

The Keyless Access Authorization unit evaluates the signal and then sends a query to the vehicle key via the Access/ Start Authorization Antennae R134/135/ 136/137/138.

The sensors switch off approximately 80 hours after the vehicle has been locked or after 20 actuations without an authorized key in proximity.

Access/Start Authorization Antennae R134/135/136/ 137/138

Four transmitting antennae are distributed in the vehicle and are used by for radio communication with the vehicle key. The antennae transmit on a frequency of 24.5 kHZ. The location of the vehicle key is determined by the field strength of the individual antennae.

The antennae are located in the:

– Rear doors
– Center console
– Rear bumper

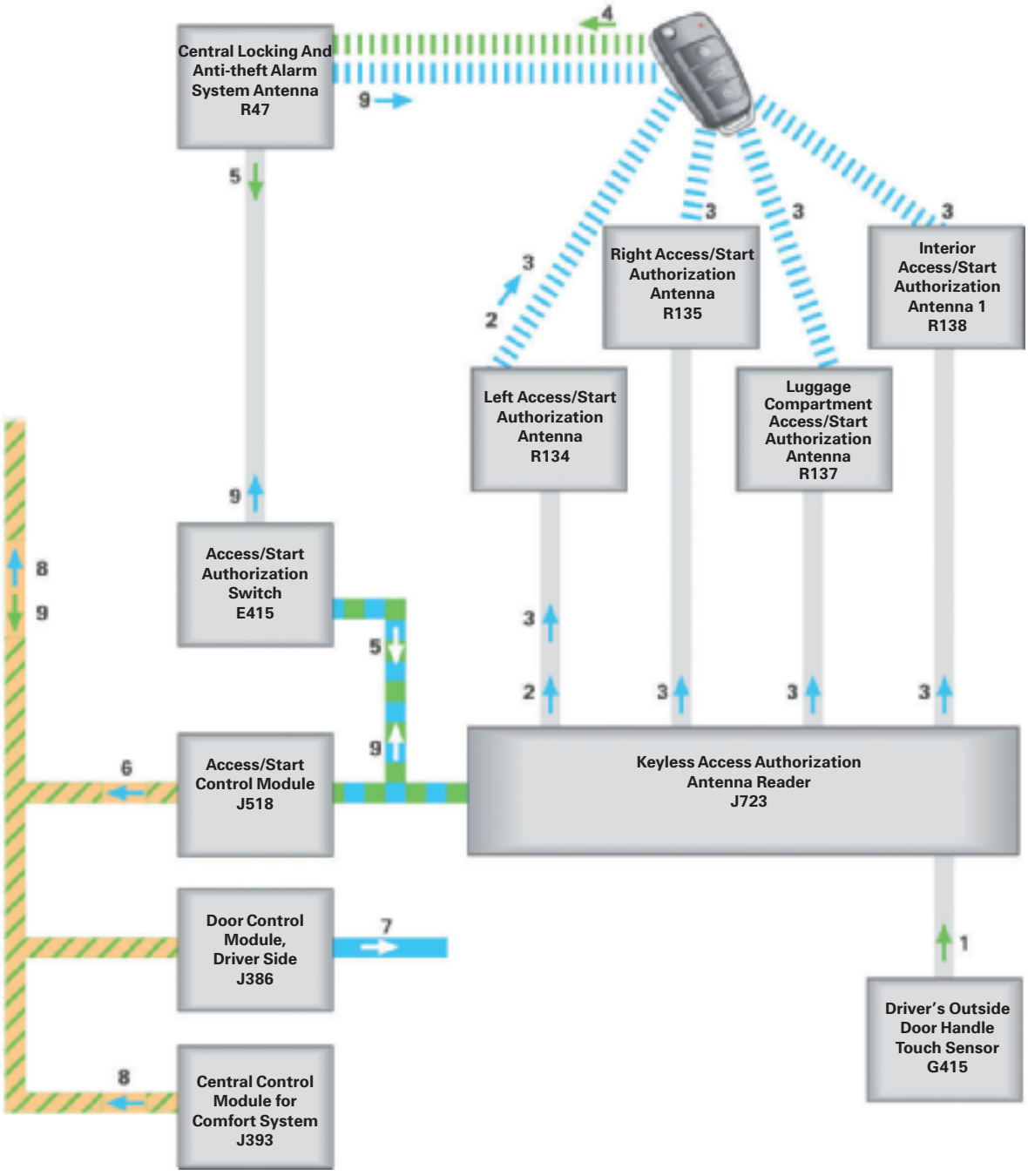
Access/Start Authorization Button E408

The START button is a two-stage design. The first stage switches on the ignition. The second stage starts the engine.

For safety reasons, use is made of a dual-action STOP button with two simultaneously actuated NO contacts.

Pressing the STOP button switches off the ignition if the automatic transmission selector lever is set to ‘P’ or ‘N’. Pressing the button for more than two seconds deactivates the S-contact.

Opening the Vehicle



1 The driver puts his hand into the finger well of the door handle. The Driver's Outside Door Handle Touch Sensor G415 sends the information "Finger in finger well" to the Keyless Access Authorization Antenna Reader J723.

2 The Keyless Access Authorization unit sends an alarm signal to the vehicle key via the Left Access/Start Authorization Antenna R134.

3 The Keyless Access Authorization unit sends a signal to the vehicle key via all the Access/Start Authorization Antennae R134/135/136/137/138.

4 Based on the signals, the vehicle key determines the position on the vehicle and sends information to the Central Locking and Anti-theft Alarm System Antenna R47.

5 The Central Locking and Anti-theft Alarm System Antenna R47 receives the information. The information is forwarded by the Access/Start Authorization Switch E415 to the Access/Start Control Module J518, where it is evaluated.

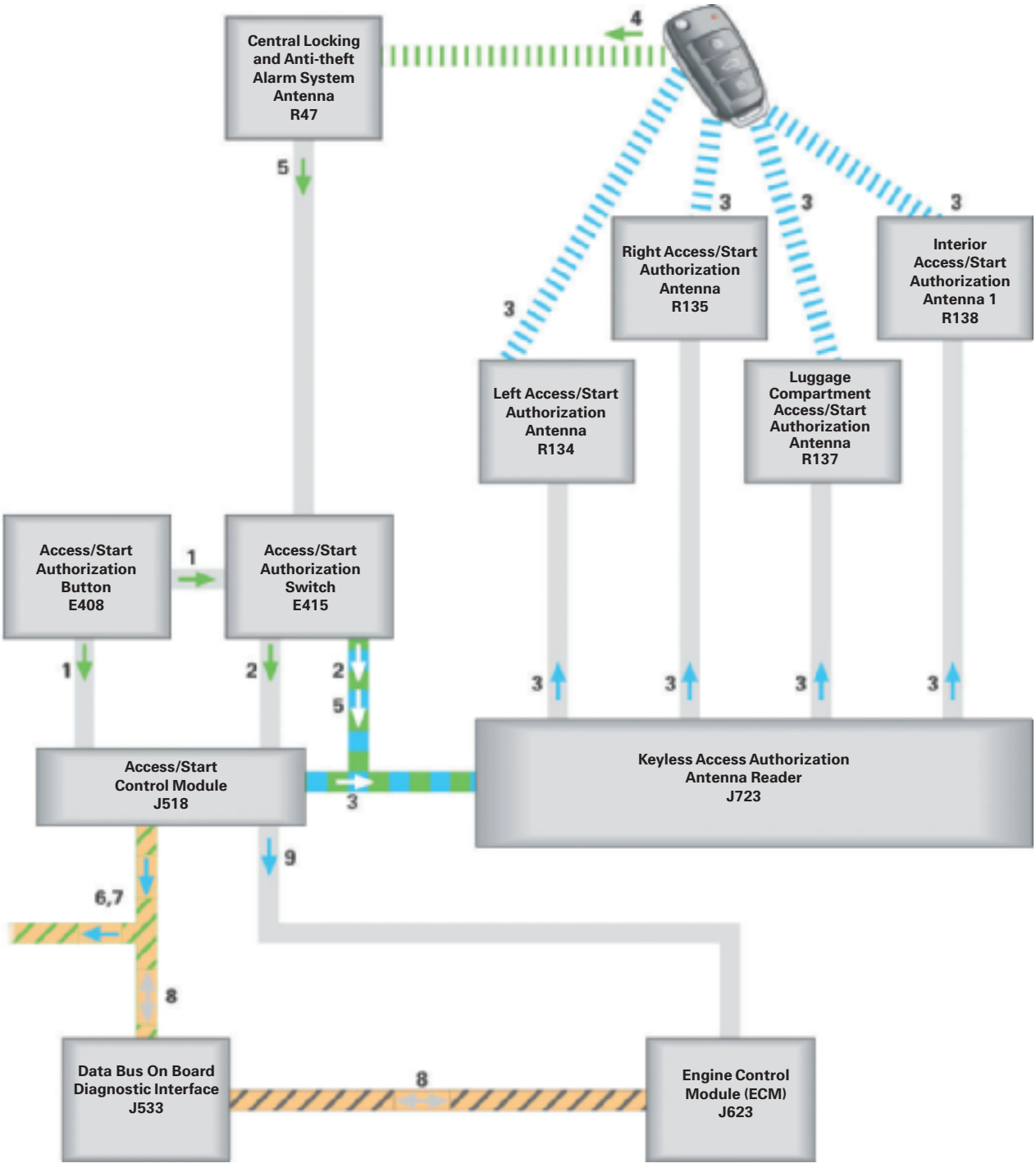
6 The Access/Start Control Module J518 sends the information "Opening vehicle" on to the Central Control Module for Comfort System J393 and to the door control module, whose door handle initiated the key query.

7 The door control module, which received the instruction from Access/Start Control Module J518, activates the lock unit, which unlocks the door.

8 The Central Control Module for Comfort System J393 sends the information "Opening vehicle - Advanced Key" to CAN Convenience.

9 The normal unlocking process takes place. This involves disarming, unlocking, acknowledgment flashing and switching on of the interior light. In addition to acknowledgment flashing, the Access/Start Control Module J518 also sends the lock status to the vehicle key via the Access/Start Authorization Switch E415 and the Central Locking and Anti-theft Alarm System Antenna R47.

Start the Vehicle Using Access/Start Authorization Button E408



1 The driver presses the Access/Start Authorization Button E408 down fully. The button sends the information about "Ignition on" and "Engine start" both to the Access/Start Authorization Switch E415 and to the Access/Start Control Module J518.

2 The Access/Start Authorization Switch E415 passes the information from the button on to the Access/Start Control Module J518 via the data lead. The two button information messages are compared there.

3 The Access/Start Control Module J518 sends a key query to the Keyless Access Authorization Antenna Reader J723.
The Keyless Access Authorization unit sends a signal to the vehicle key via all the Access/Start Authorization Antennae R134/135/136/137/138.

4 Based on the signals, the vehicle key determines the position in the vehicle and sends its information to the antenna for Central Locking and Anti-theft Alarm System Antenna R47.

5 The Central Locking and Anti-theft Alarm System Antenna R47 receives the information. The Access/Start Authorization Switch E415 passes the information on to the Access/Start Control Module J518, which then evaluates it.

6 Based on the key evaluation, the S contact is sent to the CAN Convenience bus and the steering column is unlocked.

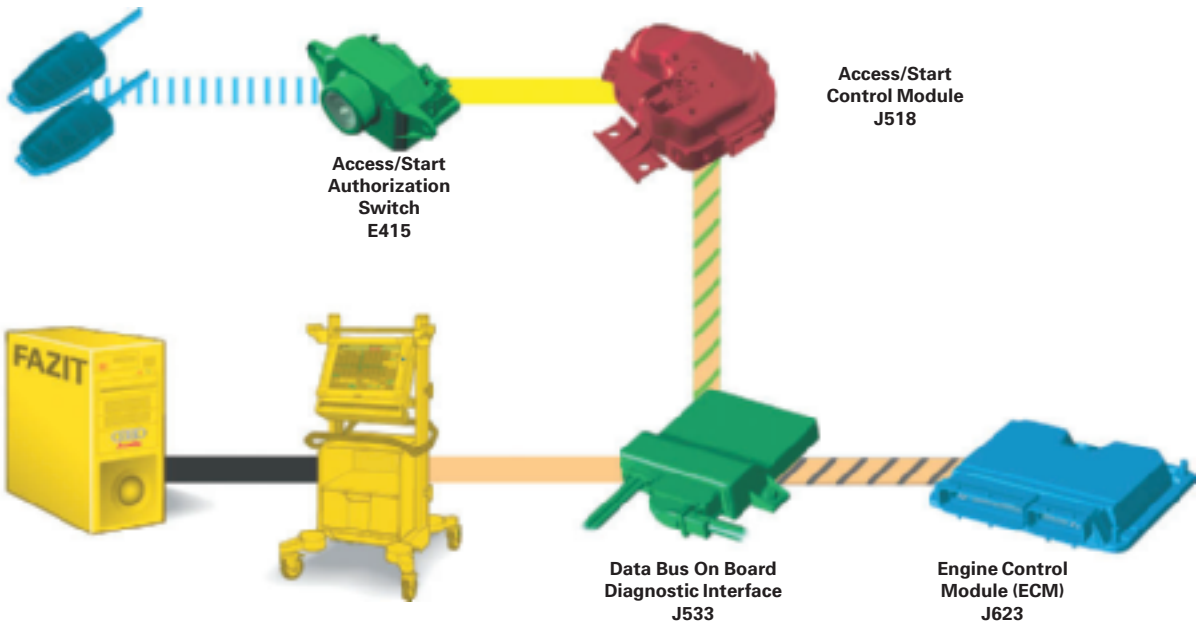
7 As soon as the steering column is fully unlocked, terminal 15 is switched on.

8 Once terminal 15 has been switched on, data is exchanged between the Engine Control Module (ECM) J623 and the Access/Start Control Module J518 via the CAN bus. The immobilizer is then deactivated.

9 The Access/Start Control Module J518 sends the "Start request" signal to the Engine Control Module J623. The Engine Control Module J623 checks whether the clutch is depressed or whether P or N is selected in the case of an automatic gearbox and then performs the fully automatic engine start.

Immobilizer and Component Protection

Immobilizer 4



The Immobilizer 4 technology is used in the 2005 Audi A6.

This means that all components must be "adapted" on-line, as is already the case with the 2004 and 2005 Audi A8L.

The following components are integrated into the Immobilizer System:

- Access/Start Control Module J518
- Engine Control Module J623
- Vehicle keys

Control unit, which is not integrated into the immobilizer

Control unit, which is integrated into the immobilizer

Master control unit

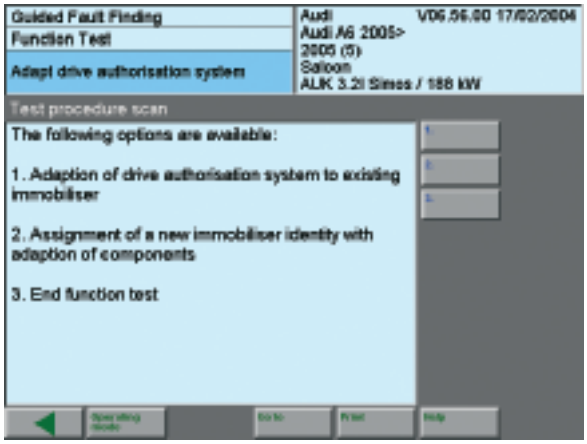
PC/mainframe

New Identity

As is already the case with the 2004-2005 Audi A8L, if an Access/Start Control Module J518 is stolen, (for safety reasons) it is no longer necessary to also replace the remaining control modules which are integrated in the Immobilizer System.

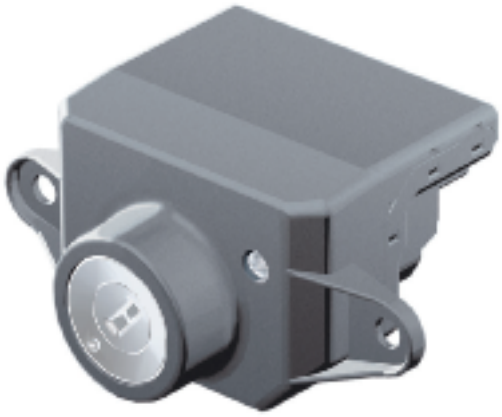
In this case, the "New Identity" function must be used for the Access/Start Control Module J518 and the Engine Control Module J623.

It is only a matter of installing a new lock set before using the "New Identity" function.



Access/Start Authorization Switch E415

The Access/Start Authorization Switch E415 reads in the key code in electronic form only. The key mechanical coding is not an evaluated signal. The ignition switch is not part of the lock set for this reason.

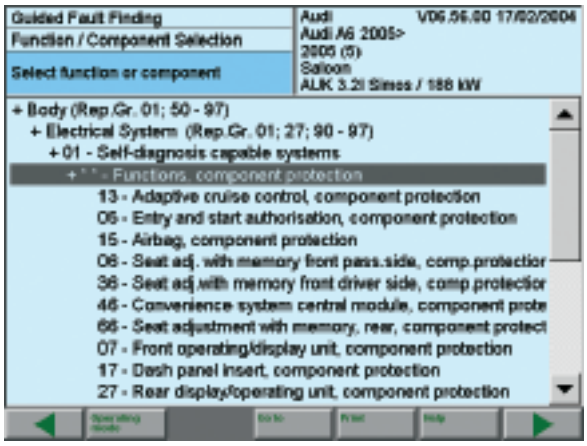


Component Protection

The Convenience and Infotainment control modules are also integrated within the "Component protection" safety system (Geko).

As a result, these control modules must be adapted to the specific vehicle once they have been installed.

The Data Bus On Board Diagnostic Interface J533 is integrated into the "Component protection" function for the first time.



Access/Start Authorization

Function Diagram

Legend

① Terminal 50 (to starter B)
② CAN Convenience High
③ CAN Convenience Low
④ P/N signal from control unit for automatic transmission J217**
⑤ Terminal 58s (lighting)*
⑥ Signal from brake light switch F*

E369 Driver's Outside Door Handle Central Locking Button
E370 Front Passenger's Outside Door Handle Central Locking Button
E371 Left Rear Outside Door Handle Central Locking Button
E372 Right Rear Outside Door Handle Central Locking Button

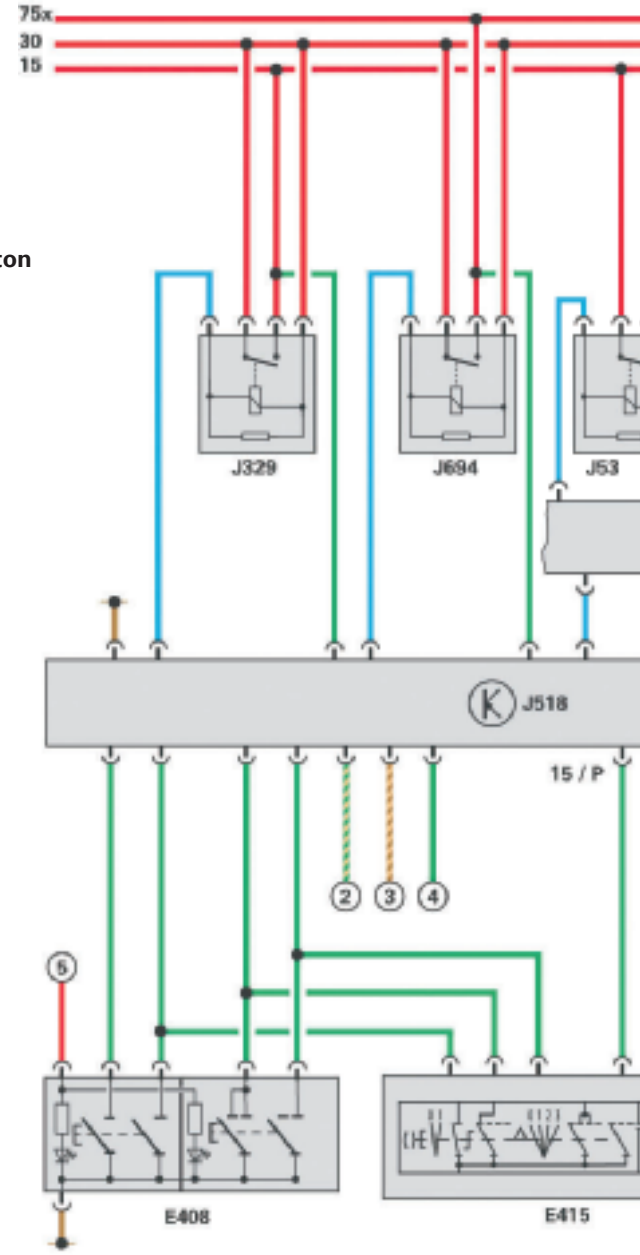
E408 Access/Start Authorization Button
E415 Access/Start Authorization Switch

F272 Driver's Door Handle Switch
F273 Passengers' Door Handle Switch
F274 Left Rear Door Handle Switch
F305 Transmission Park Selector Switch

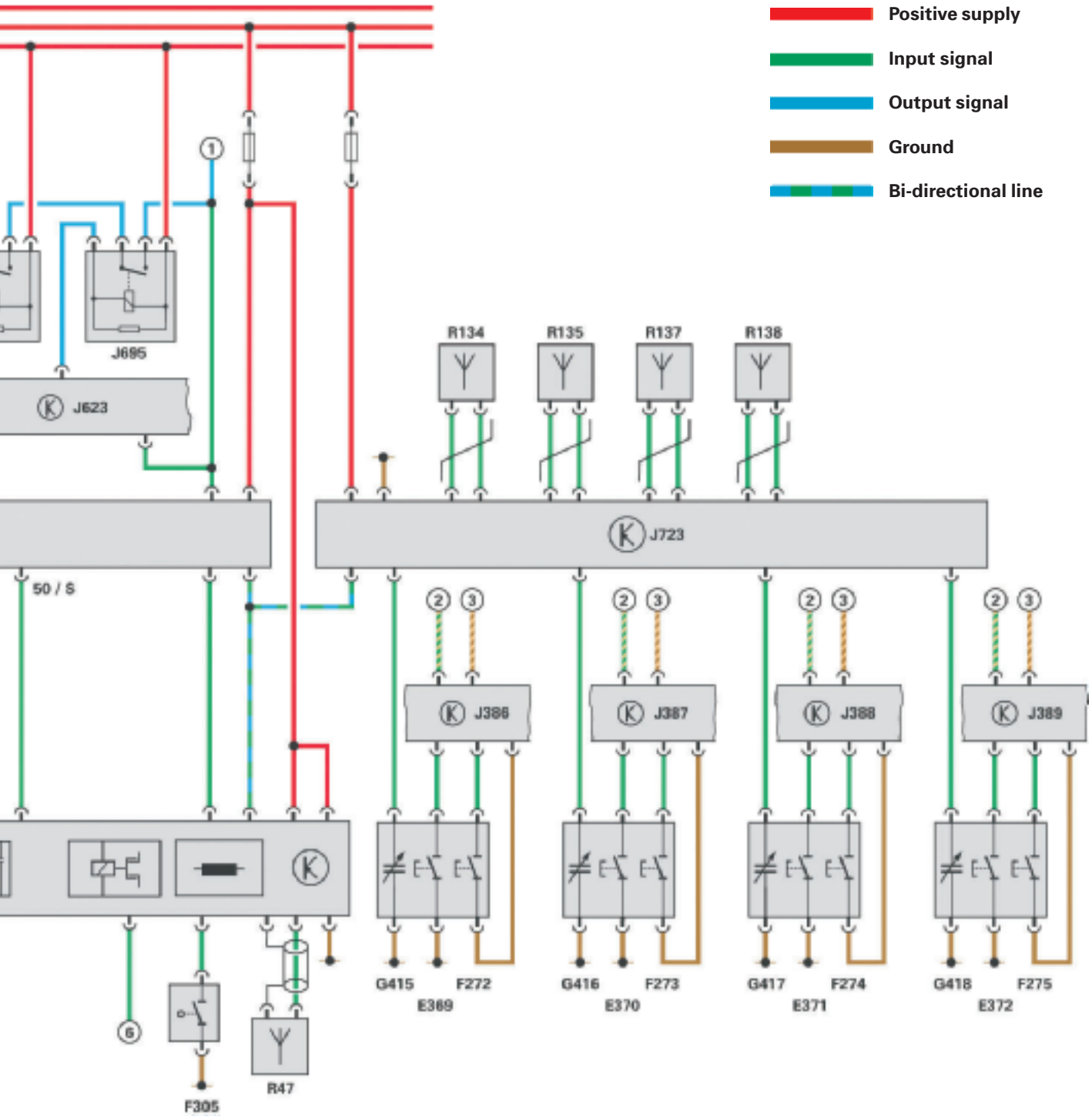
G415 Driver's Outside Door Handle Touch Sensor
G416 Passenger's Outside Door Handle Touch Sensor
G417 Left Rear Outside Door Handle Touch Sensor
G418 Right Rear Outside Door Handle Touch Sensor

J53 Starter Relay
J329 Voltage Supply Terminal 15 (B+) Relay
J386 Door Control Module, Driver Side
J387 Door Control Module, Passenger Side
J388 Door Control Module, Rear, Left
J389 Door Control Module, Rear, Right
J518 Access/Start Control Module
J623 Engine Control Module (ECM)
J694 Power Supply Relay (Terminal 75x)
J695 Starter Relay 2
J723 Keyless Access Authorization Antenna Reader

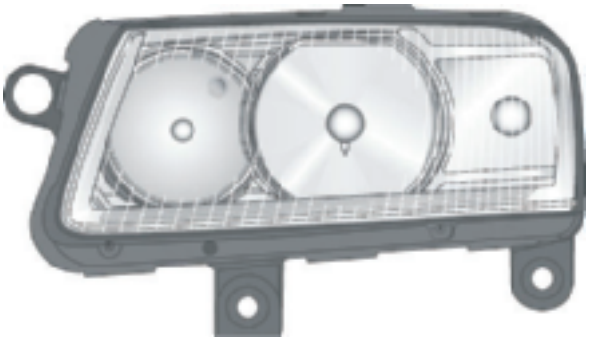
R47 Central Locking And Anti-theft Alarm System Antenna
R134 Left Access/Start Authorization Antenna
R135 Right Access/Start Authorization Antenna
R137 Luggage Compartment Access/Start Authorization Antenna
R138 Interior Access/Start Authorization Antenna 1



* Only for vehicles with Advanced Key
** Only for vehicles with automatic transmission


Positive supply
Input signal
Output signal
Ground
Bi-directional line
J695
J623
R134
R135
R137
R138
J723
50 / 8
J386
J387
J388
J389
G415
F272
E369
G416
F273
E370
G417
F274
E371
G418
F275
E372
F305
R47

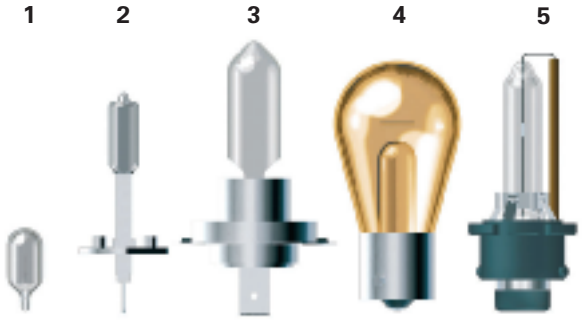
External Lights



Front Headlights

Three different front headlights are available in the 2005 Audi A6 depending on model variation.

- Halogen headlights
- Bi-xenon headlights
- Bi-xenon with Adaptive Light Function



1 W5W lamp
2 H1 lamp
3 H7 lamp
4 PY21W lamp
5 D2S lamp

Halogen Headlights

Halogen headlights are standard equipment. The following lamps are used in the halogen systems:

- W5W lamp for parking light
- H1 lamp for high beam headlight and headlight flasher
- H7 lamp for low beam headlight and dimmed as a daytime driving light
- PY21W bulb, which is orange in color, as the direction indicator lamp

The daytime driving light in the halogen system is market dependent. It is active when terminal 15 is switched on and the parking light or low beam headlight is off.

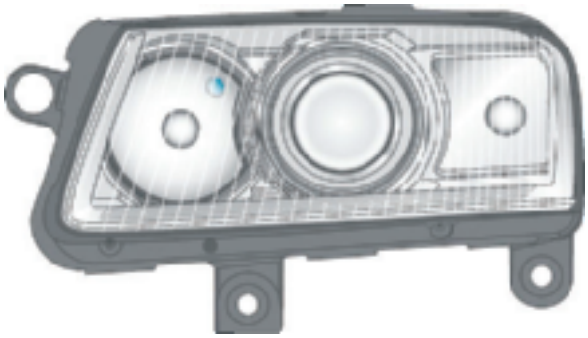
Both of the following country-specific variants exist:

- The daytime driving light is part of the fog lights for Canada
- 3457NA flasher lamps are used for the North American market

Bi-xenon Headlights

The following lamps are fitted in the bi-xenon system:

- A blue W5W lamp for the parking light.
- Thus, the color of the parking light corresponds to the xenon light.
- A D2S lamp for high beam headlight, headlight flasher and low beam headlight. The covers for low beam also are activated for high beam and headlight flasher operation.
- A P21W lamp for the daytime driving light. This comes on dimmed to 90%.
- A PY21W bulb coated with a reflecting layer of silver is used as the direction indicator lamp. Only long life lamps are used. A super-long life lamp is used as the daytime driving light.



The following country-specific variants exist:

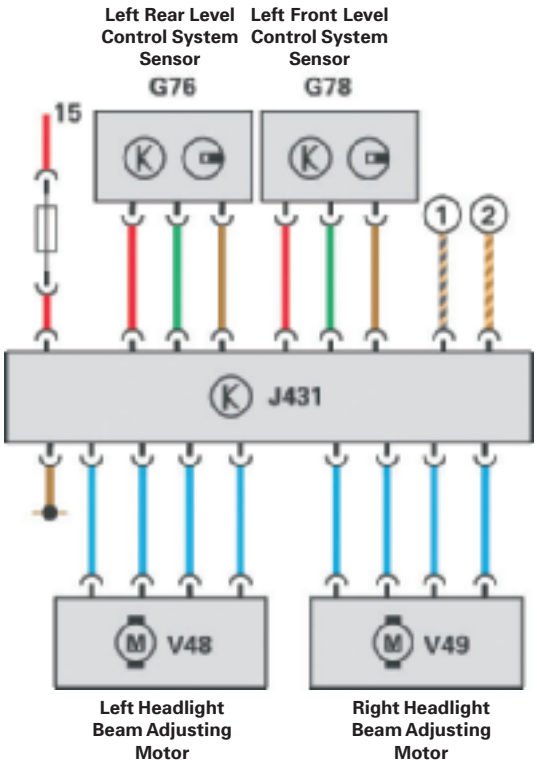
- No daytime driving lamp is fitted for Japan
- 3457NA flasher lamps are used for the North American market

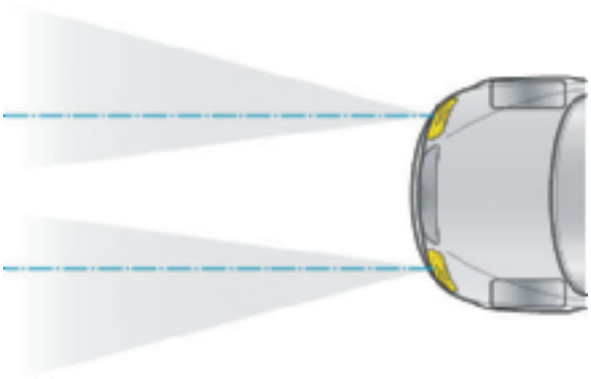
The headlights are changed between right-hand and left-hand drive by a lever on the projection module.

A dynamic headlight range control system is installed for bi-xenon headlights.

The dynamic headlight range control system uses the Level Control System Sensors G78/77/78. They send the information about the vehicle level to the Headlight Range Control Module J431 in a pulse width-modulated signal.

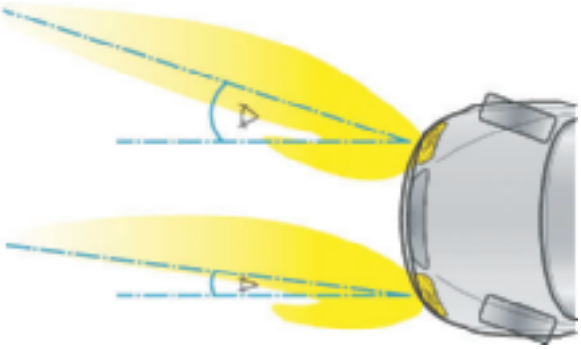
The same Level Control System Sensors G78/77/78 are used on both the front and rear axle.





Adaptive Light

The adaptive light works as a dynamic corner-sensitive headlight. With the dynamic cornering headlight, an integrated Headlight Beam Adjusting Motor V48/49 pivots the Headlight Range Control Module J431 horizontally. The headlight lenses and the bracket do not turn. The pivot angle is approx. 15° on the inner curve side and 7.5° on the outer curve side.



The various pivot angles have advantages in that they provide better lighting for corner routes.

In this case, the inner-curve module pivots in twice as much as the outer-curve module.

This achieves the maximum possible illumination width with homogeneous light distribution.

No Pivoting When Vehicle is Stationary

The Headlight Range Control Module J431 is not pivoted at driving speeds of less than 4 mph (6 km/h).

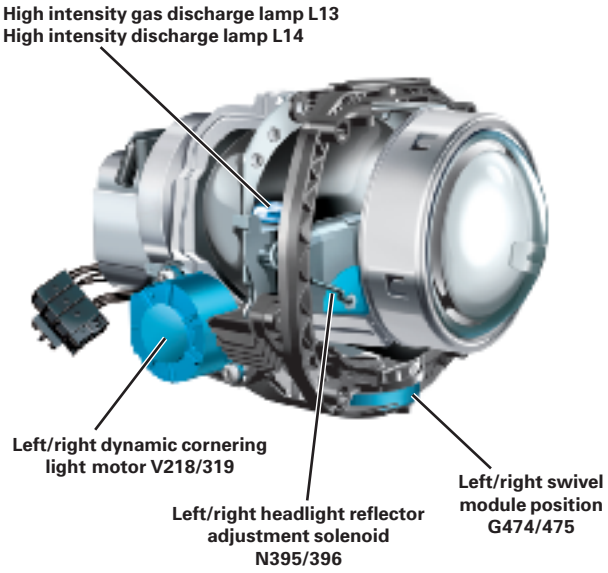
At speeds of more than 6.2 mph (10 km/h), the pivot angle essentially depends on the steering wheel angle.

This complies with the legal requirement that the headlights must not be pivoted when the vehicle is stationary. At the same time, a slight transition to headlight pivoting occurs during acceleration from idle when the steering lock remains constant.

Internal Structure

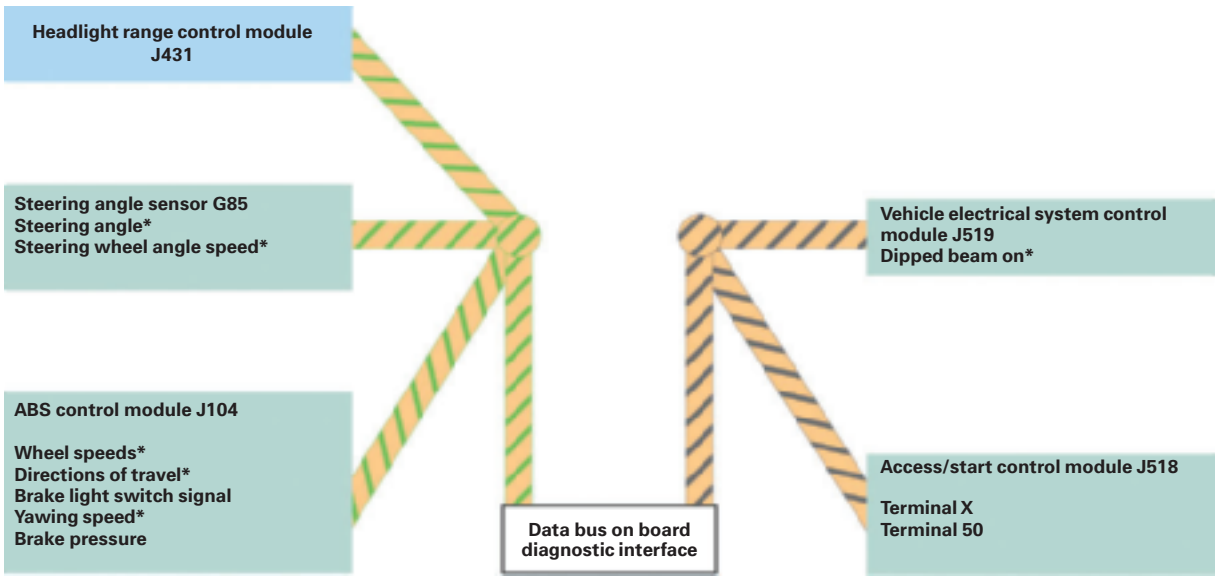
The pivot angle is monitored by an inductive pickup in the pivot module. The value is evaluated immediately in the relevant power module for headlights as a pulse width-modulated signal. If the motor or pickup does not function, the power module sends an error message to the Headlight Range Control Module J431. This is communicated to the driver in the control module with Indicator Unit in Instrument Panel Insert J285.

The same lamps that are used in the bi-xenon headlight are also used in the adaptive light headlight.



CAN Communication

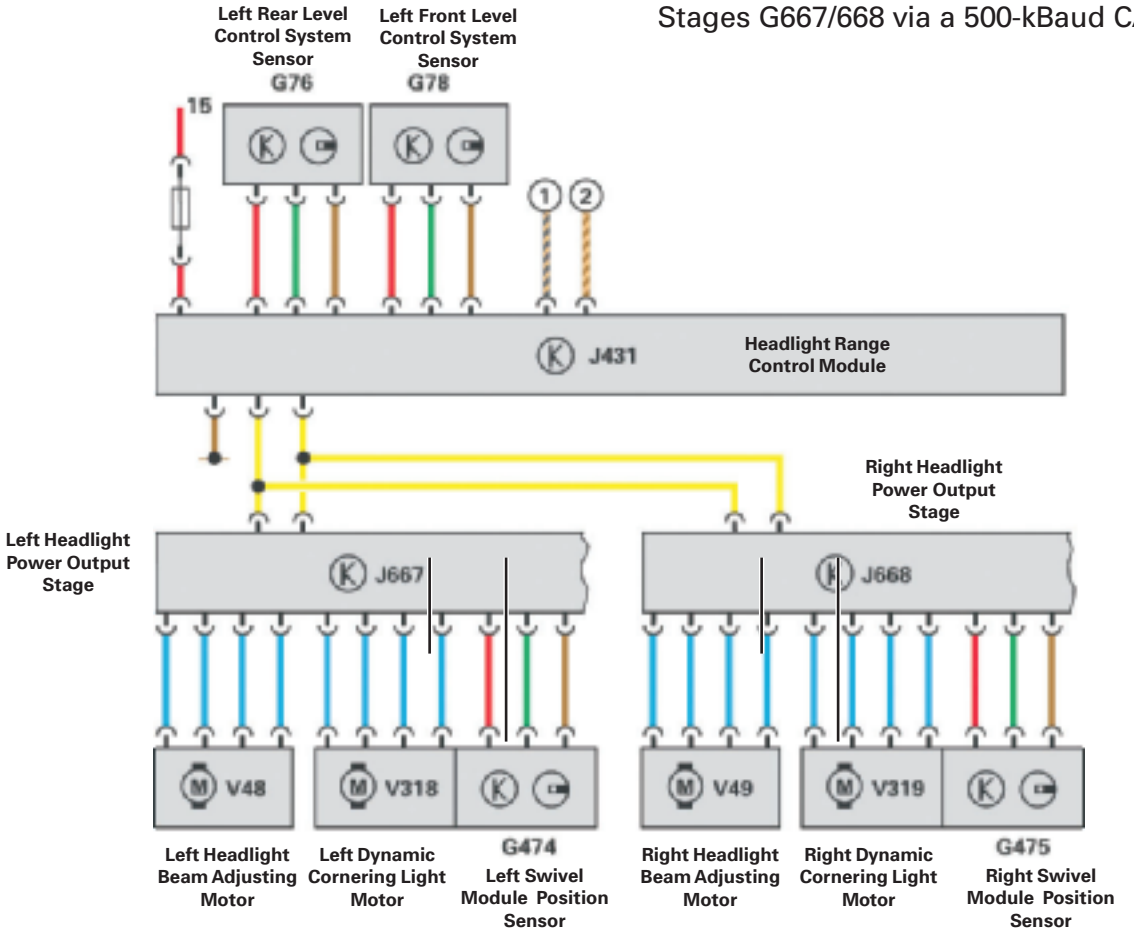
The values marked with (*) are used as input variables in calculating the pivot angle. All other input variables are only needed for dynamic headlight range control.



Signal and Data Exchange

The same sensors that are used for dynamic headlight range control for bi-xenon headlights are also used as Level Control System Sensors G76/77/78.

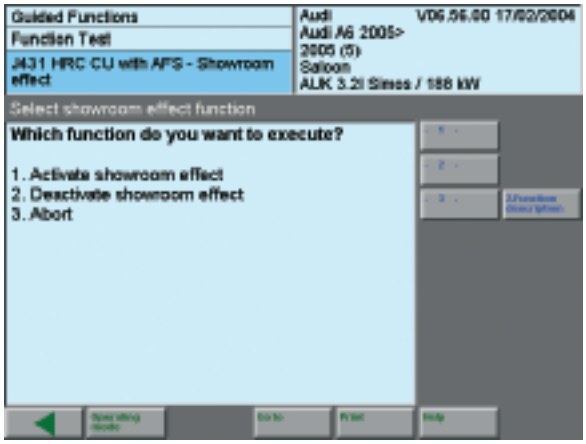
They send a pulse width-modulated signal to the Headlight Range Control Module J431. Data is exchanged between the Headlight Range Control Module J431 and the Left/Right Headlight Power Output Stages G667/668 via a 500-kBaud CAN.



Show Room Function

The Show Room function can be used to pivot the headlights by moving the steering wheel (even when the vehicle is stationary) for presentation. The function can be adapted using the Scan Tool after accessing the Headlight Range Control Module J431.

If the vehicle is then driven at more than 18.6 mph (30 km/h), the function is permanently disabled. At any time, the function can be switched on again using the diagnosis tester.



Back Lights

Depending on equipment variations and country requirements, different tail lights are used in the 2005 Audi A6.

This is differentiated into the following:

– Basic variant ECE (Economic Commission for Europe)
– High variant ECE
– North American variant

Basic Variant ECE

The tail light in the basic variant only uses lamps with a 15-mm bayonet socket for the lights. There are three sections for tail light activation. To ensure that the different-sized sections look from the outside to be equally illuminated, the central control module for comfort system J393 activates each lamp with a different dimming ratio, through a pulse width modulated signal.

The two inner lamps in each back light also are used as the brake light.

The outer lamp functions as the "rear fog light." If the rear fog light is on, only the inner lamp is active as the brake light.

High Variant ECE

If bi-xenon headlights are fitted as the front headlights, High variant ECE back lights are installed.

The external feature of the high back lights is the use of LEDs for the brake light.

The LEDs, which are fixed in the reflector housing, are activated by two contacts from the lamp bracket.

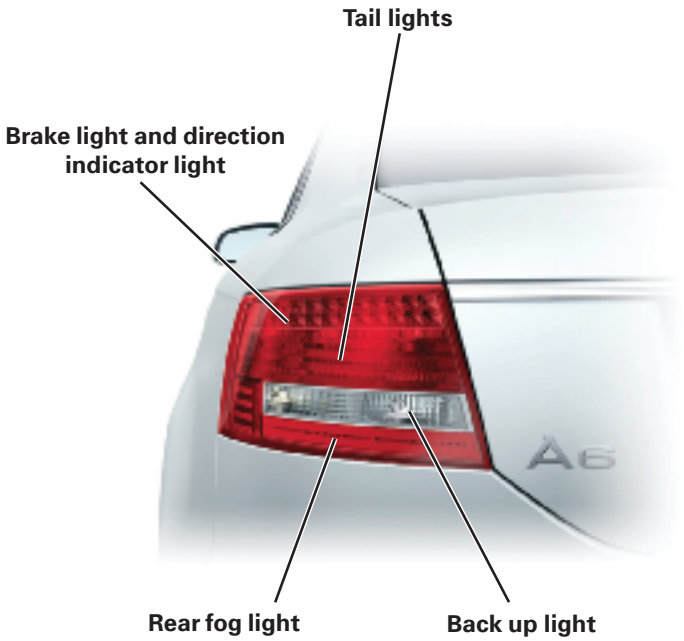
The rear fog light is located at the bottom of the back light. Here, the lamp on the driver's side is used as the rear fog light, while the lamp on the passenger's side serves as the back up light. This means that the same lamp bracket can be used for both the high back light and the basic back light.

North American Variant

The back lights for the North American market have standard LED units. The LED units are used for the indicator and brake light function.

The three sections underneath are for the tail light lamps.

The back lights have two rear fog lights and two back-up lights.



LED Unit Diagnosis

The failure of an LED is detected by the electronics in the lamp housing. All LEDs are then switched off so that the central control module for comfort system J393 can set the relevant DTC.

Control Module with Indicator Unit in Instrument Panel Insert J285

The control module with Indicator Unit In Instrument Panel Insert J285 is available in two variants.

The High-Line variant with color display only comes in vehicles with adaptive cruise control. A gateway is integrated into the instrument panel insert.

The handy position of the rotary light switch has meant that the indicator lights for low beam headlight, fog light and rear fog light could also be fitted directly into the rotary light switch.

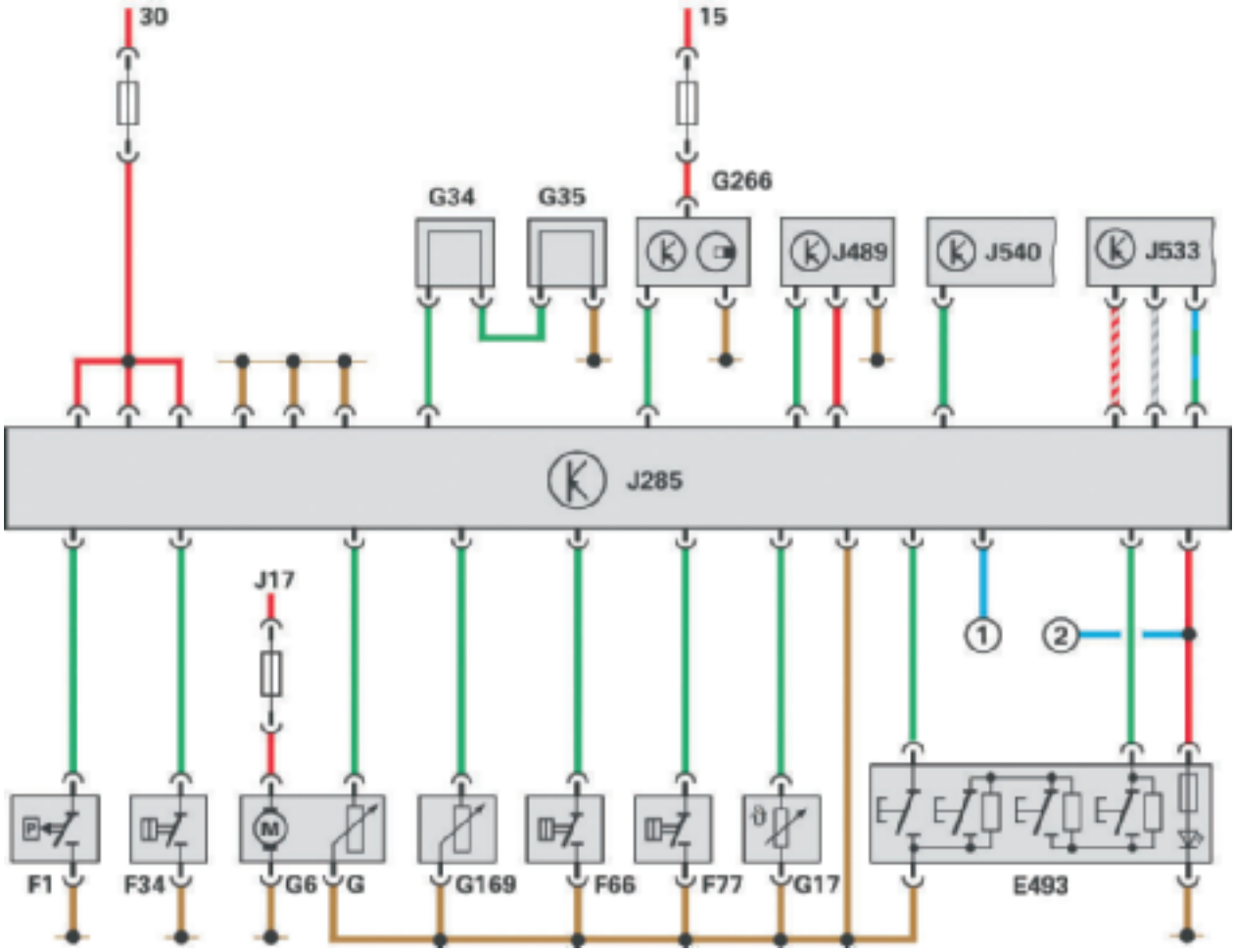
Likewise, the buttons for instrument lighting, the auto-check system and the daily mileage counter are now positioned to the right, next to the instrument panel insert, of the Instrument Cluster Operation Button E493.

Lamp Failure

If an exterior lamp fails, a symbol appears in the central display indicating which lamp has failed. If you now press the Check button, the failed lamp is also described by a text message in the central display.

Outside Temperature Indicator

The instrument cluster evaluates both the Outside Air Temperature Sensor G17 and the outside temperature signal from the Climatronic Control Module J255. The lower of the two values is displayed.



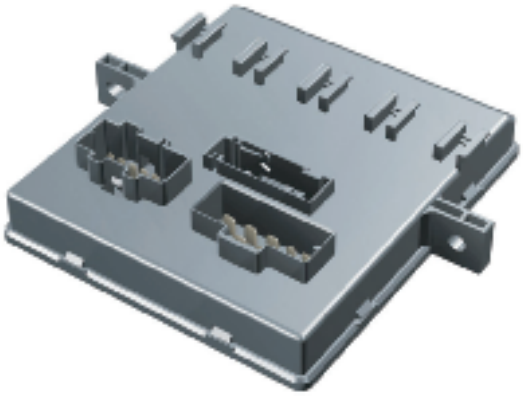
E493	Instrument Cluster Operation Button
F1	Oil Pressure Switch
F34	Brake Fluid Level Warning Switch
F66	Engine Coolant Level Warning Switch
F77	Windshield Washer Fluid Level Warning Switch
G	Sender For Fuel Gauge
G6	Fuel Pump
G17	Outside Air Temperature Sensor
G34	Left Front Brake Pad Wear Sensor
G35	Right Front Brake Pad Wear Sensor
G169	Fuel Level Sensor 2
G266	Oil Level Thermal Sensor
J17	Fuel Pump (Fp) Relay
J285	Control Module With Indicator Unit In Instrument Panel Insert
J489	Radio Frequency Controlled Clock Receiver
J533	Data Bus On Board Diagnostic Interface
J540	Electronic Parking Brake Control Module

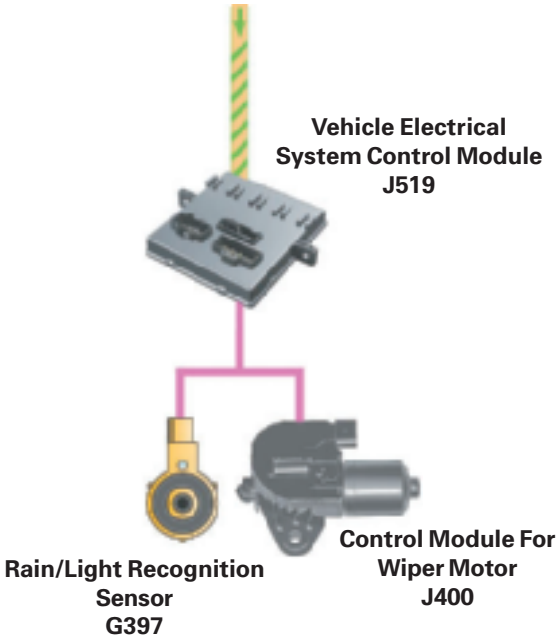
Vehicle Electrical System Control Module J519

Functions

The main function of the Vehicle Electrical System Control Module J519 is to read switch information and activate power outputs.

The Vehicle Electrical System Control Module J519 was used in the 2004 Audi A8L and has been adapted to new functionality in the 2005 Audi A6.





Master Functions

The following master functions are implemented in the Vehicle Electrical System Control Module J519.

- External lighting control
- LIN master for the Control Module for Wiper Motor J400
- LIN master for the Rain/Light Recognition Sensor G397 (For details on its function, see Sensor Rain/Light Recognition Sensor G397.)

Stand-by Master Function

If the Central Control Module for Comfort System J393 fails, the Vehicle Electrical System Control Module J519 takes over the stand-by master function. It sends the information for direction indicators to the CAN bus.

Reference

Further information on this can be found in the SSP 996303, Distributed Functions.

Emergency Function

The software for the Vehicle Electrical System Control Module J519 can be used to implement emergency functions. If a fault is detected in the rotary light switch or if there is an open circuit in the wire to the rotary light switch, the Vehicle Electrical System Control Module J519 switches on the driving light.

Other Functions

In addition to the master functions, the following functions are also available in the Vehicle Electrical System Control Module J519:

- Steering column adjustment
- Footwell lighting
- Selector lever lighting
- Direction indicator control, front and side
- Horn activation
- Windshield washer pump activation
- Steering column memory

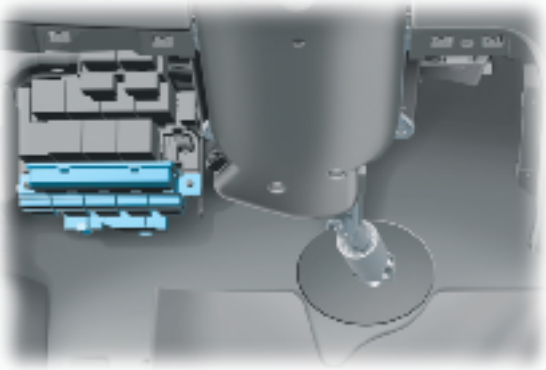
Versions

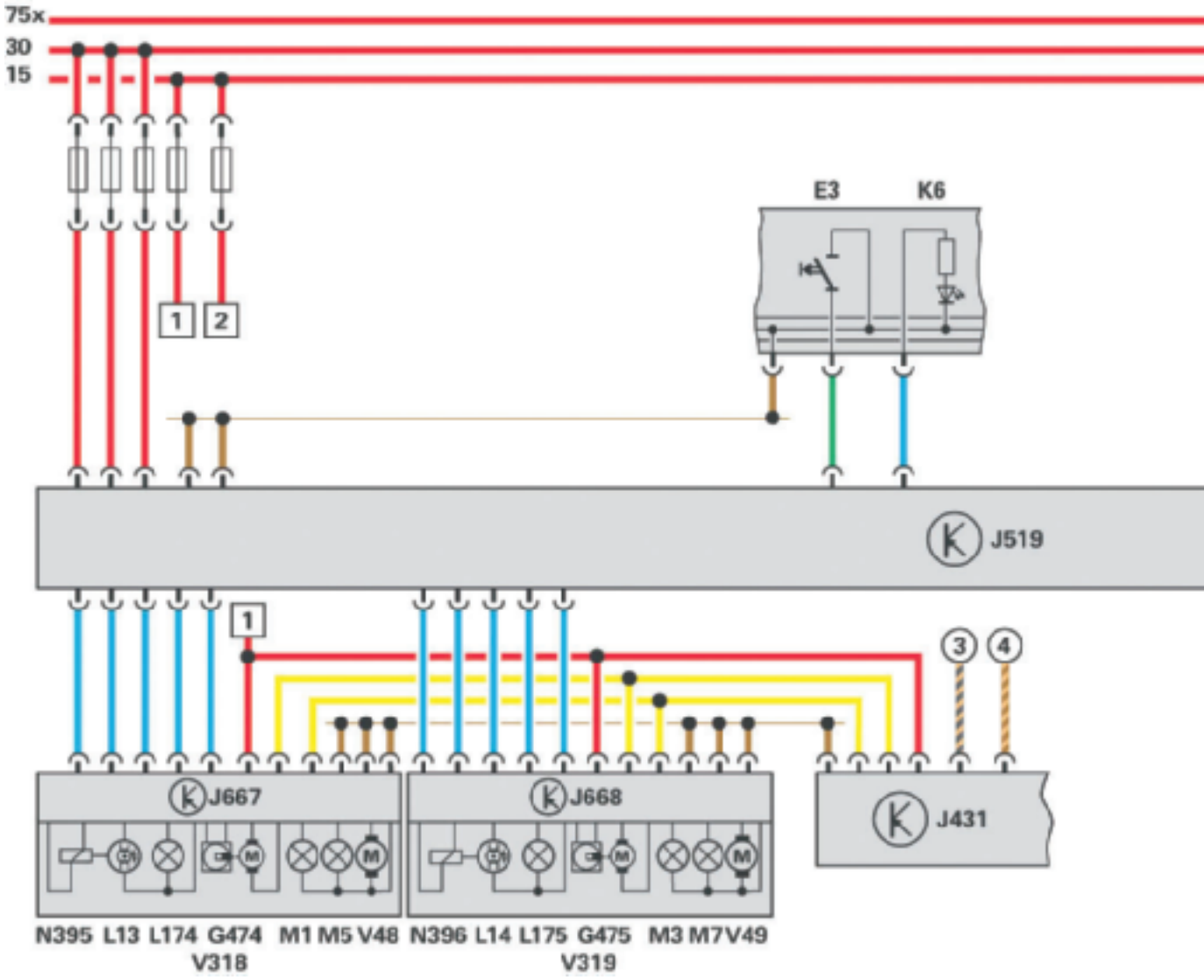
There are three functional versions of the Vehicle Electrical System Control Module. Not all versions are available in the North American market. The versions are:

- Low-Line version (with no electric steering column adjustment, no xenon, no daytime driving lights)
- Mid-Line version (with no electric steering column adjustment, with xenon and daytime driving lights)
- High-Line version (with electric steering column adjustment, xenon and daytime driving lights)

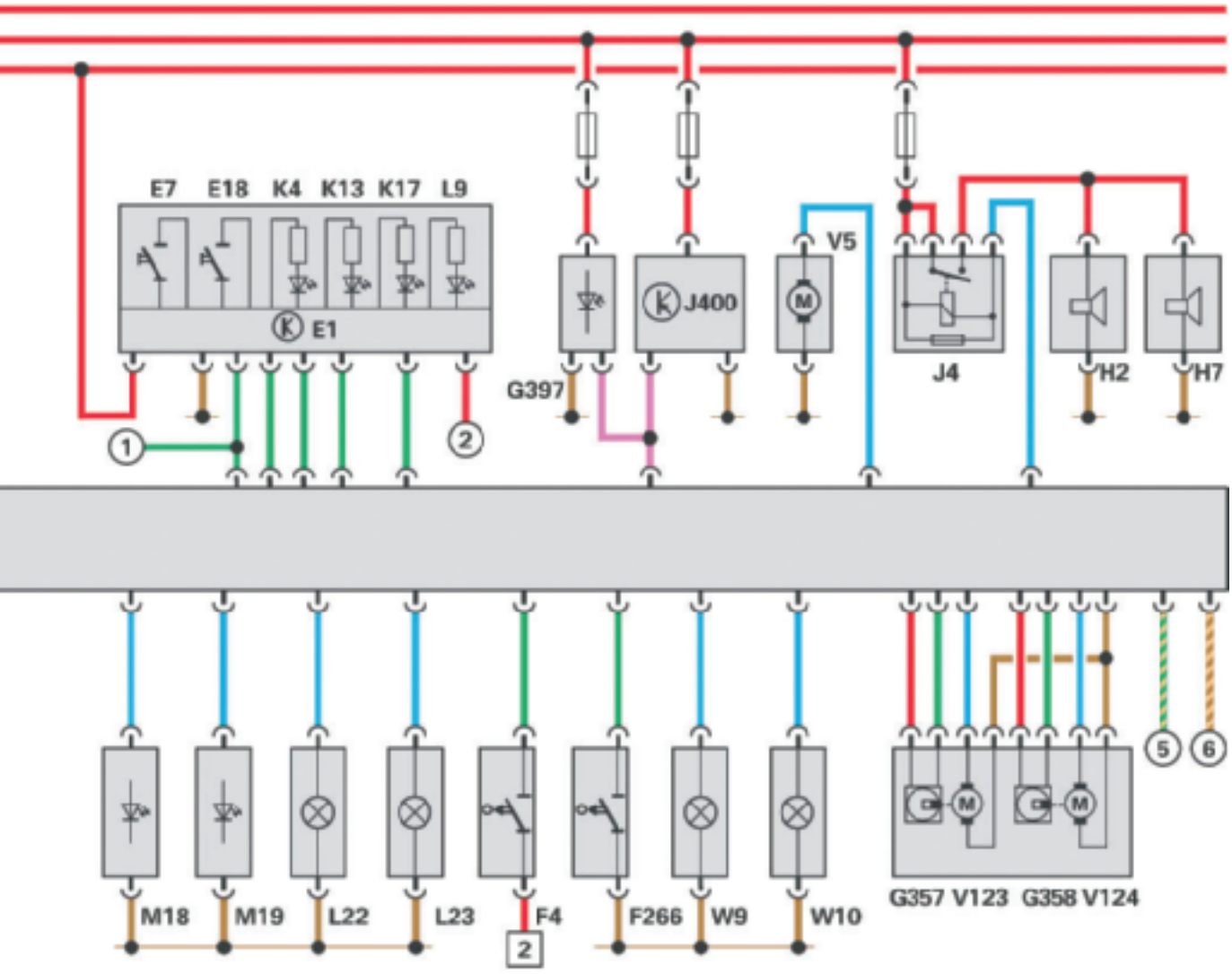
Installation Position

The Vehicle Electrical System Control Module J519 installed on the left behind the instrument panel. To access the Vehicle Electrical System Control Module J519, remove the footwell cover.





E1	Light Switch
E3	Emergency Flasher Switch
E7	Fog Light Switch
E18	Rear Fog Light Switch
F4	Back-up Light Switch
F266	Front Hood Switch
G357	Steering Column Vertical Adjustment Sensor
G358	Steering Column Axial Adjustment Sensor
G397	Rain/Light Recognition Sensor
G474	Left Swivel Module Position Sensor
G475	Right Swivel Module Position Sensor
H2	High Tone Horn
H7	Low Tone Horn
J4	Horn Relay
J400	Control Module For Wiper Motor
J431	Headlight Range Control Module
J519	Vehicle Electrical System Control Module
J667	Left Headlight Power Output Stage
J668	Right Headlight Power Output Stage
K4	Park Light Indicator Light
K6	Indicator Light For Emergency Flosher System
K13	Rear Fog Light Indicator Light
K17	Fog Light Indicator Light
L9	Headlight Switch Light
L13	High Intensity Gas Discharge Lamp
L14	High Intensity Discharge Lamp
L22	Left Front Fog Light



L23	Right Front Fog Light
L174	Left Daytime Running Light (DRL) Lamp
L175	Right Daytime Running Light (DRL) Lamp
M1	Left Parking Light
M2	Right Parking Light
M5	Left Front Turn Signal Light
M7	Right Front Turn Signal Light
M18	Left, Side Turn Signal Light
M19	Right, Side Turn Signal Light
N395	Left Headlight Reflector Adjustment Solenoid
N396	Right Headlight Reflector Adjustment Solenoid
V5	Windshield Washer Pump
V48	Left Headlight Beam Adjusting Motor
V49	Right Headlight Beam Adjusting Motor
V48	Left Headlight Beam Adjusting Motor
V49	Right Headlight Beam Adjusting Motor
V123	Motor For Steering Column Adjustment, Vertical
V124	Motor For Steering Column Adjustment, Axial
V318	Left Dynamic Cornering Light Motor
V319	Right Dynamic Cornering Light Motor
W9	Left Footwell Light
W10	Right Footwell Light

System overview

The Vehicle Electrical System Control Module J519 evaluates the following input signals:

- Steering Column Vertical Adjustment Sensor G357
- Steering Column Axial Adjustment Sensor G358
- Hood Switch for Anti-theft Warning System
- Rotary Light Switch
- Hazard Warning Button
- Switch for Back Up Light (Manual Transmission)
- Rain/Light Recognition Sensor G397 (via LIN bus)

The Vehicle Electrical System Control Module J519 controls the following loads:

- Front Direction Indicator Lights, left and right
- Side Direction Indicator Lights, left and right
- Left/Right Parking Lights M1/3
- Left/Right Low Beam Headlights M29/31
- Left/Right High Beam Headlights M30/32
- Left/Right Front Fog Lights L22/23
- Relay for Headlight Cleaning System
- Windshield Washer Pump V5
- Control Module For Wiper Motor (via LIN bus)
- Supply, Terminal 58
- Left/Right Footwell Lights W9/10
- Relay for Dual-pitch Horn
- Steering Column Vertical/Axial Adjustment G357/358
- Selector Lever Lighting
- Indicator Light For Emergency Flasher System K6
- Left/Right Headlight Reflector Adjustment Solenoids N395/396

Diagnosis

Basic settings

After either of the Vehicle Electrical System Control Module J519, the steering column or the Steering Column Adjustment Switch E167 is replaced, a basic setting for the axial and vertical positions must be done for the steering column.

Output Check Diagnosis

An Output Check Diagnosis can be used to carry out the following tests:

- Indicator light for emergency flasher system K6
- Left Parking Light Ml
- Right Parking Light M3
- Left Low Beam Headlight M29
- Right Low Beam Headlight M31
- Left High Beam Headlight M30
- Right High Beam Headlight M32
- Left Front Fog Light L22
- Right Front Fog Light L23
- Left Daytime Running Light (DRL) Lamp L174
- Right Daytime Running Light (DRL) Lamp L175
- Direction indicator lights, left
- Direction indicator lights, right
- Left Footwell Light W9
- Right Footwell Light W10
- Wiper, top turning position
- Wiper, bottom turning position
- Windshield Washer Pump V5
- Relay for dual-pitch horn
- Terminal 58

Coding

Using the Scan Tool, the Vehicle Electrical System Control Module J519 can be coded for the functions:

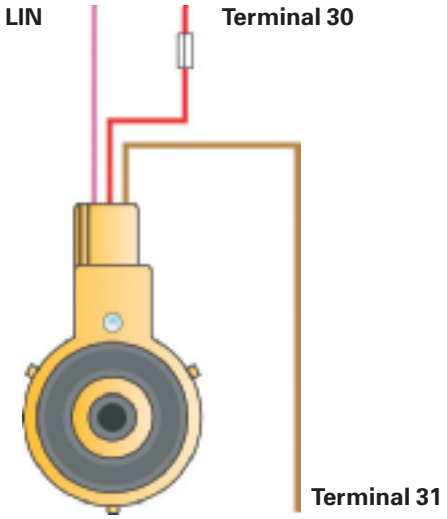
- Daytime driving light
- Driving light assistant
- Headlight type
- Footwell lighting
- Country versions

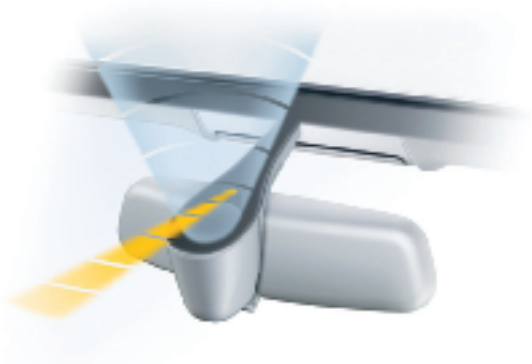
Note

The Output Check Diagnosis can be performed either sequentially or selectively .

Rain/Light Recognition Sensor G397

A combined Rain/Light Recognition Sensor G397 is used for the first time in the 2005 Audi A6. The Rain/Light Recognition Sensor G397 includes a light-control assistant function, which relieves the driver of having to switch the driving light on manually. It also has a wiper control function, which operates depending on the amount of moisture on the front windshield. The development here was to integrate these functions in a compact housing.





The Rain/Light Recognition Sensor G397 is connected as a LIN slave to the Vehicle Electrical System Control Module J519.

Installation Position

The Rain/Light Recognition Sensor G397 is located on the windshield in the attachment base of the interior mirror.

Tasks of the Light Sensor

Depending on the amount of light, the following functions are implemented:

– Switch the driving light on and off automatically
– Activate the Coming Home/Leaving Home function
– Day/night detection for rain sensor

Activation-on Conditions

The Rain/Light Recognition Sensor G397 supplies the Vehicle Electrical System Control Module J519 with information for switching on the driving light in the following situations:

- Dawn/dusk

- Darkness

- Entering/traveling through tunnels

- Traveling through forests

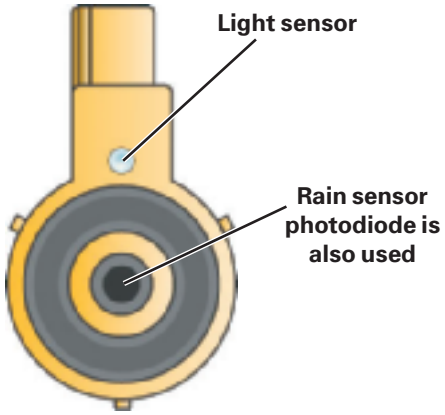
Note

Allowances are made for disruptive influences, such as external light, dirt, vibrations or smears caused by wiper blades.

Function of the Light Sensor

To detect certain ambient conditions, such as tree-lined avenues or routes through tunnels, the Rain/Light Recognition Sensor G397 registers the light intensity in two areas, the global field and the fore-field.

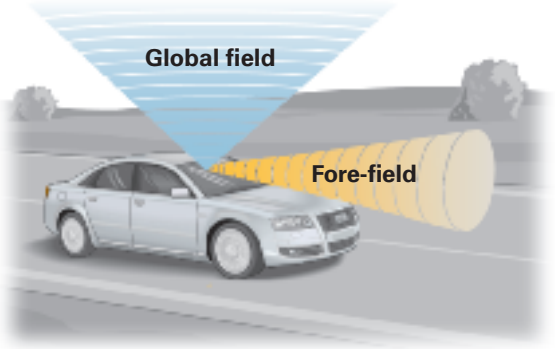
The global field describes the direct brightness on the vehicle, while the fore-field describes the lighting conditions in the section of the road lying ahead of the vehicle. This is activated using the "Auto" setting on the rotary light switch.



Tasks of the Rain Sensor

The following functions are implemented, depending on the amount of water on the windshield:

- Switching the wiper on and off automatically at seven different speeds
- Activating the driving light when it is raining



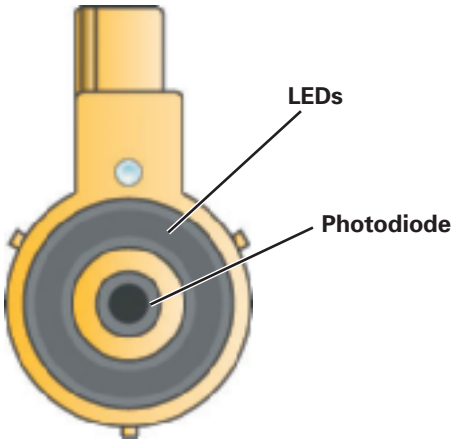
Activation

Positioning the wiper switch to the "Intermittent" setting activates the Rain/Light Recognition Sensor G397. The driver can then set four sensitivity ranges using the regulator for windshield wiper intermittent operation.

A reference wiper function (wiper action when the Rain/Light Recognition Sensor G397 is activated) is no longer necessary with this system. This means that the wiper switch can always remain at the "Intermittent" setting. For safety reasons, the rain sensor operation is only activated in this case when a driving speed of more than 9.9 mph (16 km/h) is reached, or when the sensitivity on the regulator for windshield wiper intermittent operation is changed.

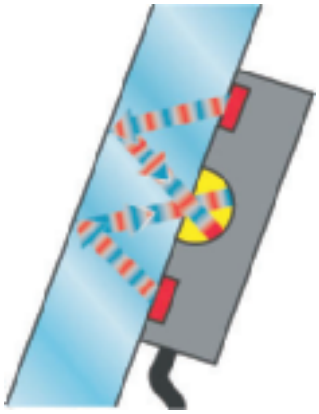
Note

Manually switched wiper intervals have priority over Rain/Light Recognition Sensor G397 functions

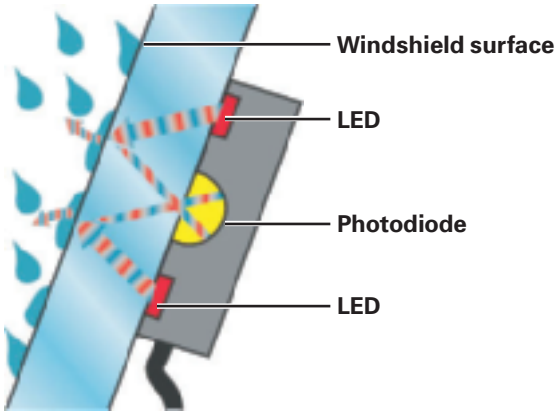


Function of the Rain Sensor

The Rain/Light Recognition Sensor G397 uses the physical light refraction principle to register the amount of moisture on the windshield. The circular LEDs integrated in the Rain/Light Recognition Sensor G397 emit infrared light through the windshield from within the interior of the vehicle.



If the windshield is dry, the infrared light is reflected on the surface of the glass. Thus, the photodiode integrated in the center of the sensor records a high light intensity.



If the windshield is covered with moisture, the optical properties on the surface of the glass change. Light now emerges from the windshield surface through the light refraction caused by water drops. As a result, less light is reflected back and the photodiode records a lower light intensity (light dispersion principle).

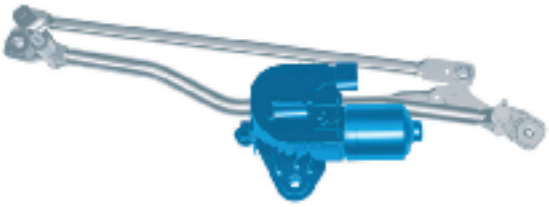
Diagnosis

The Vehicle Electrical System Control Module J519 is used for diagnostic procedures on the Rain/Light Recognition Sensor G397.

Control Module for Wiper Motor J400

The Control Module for Wiper Motor J400 was redesigned for use in the new 2005 Audi A6. The control module and wiper motor are integrated into one housing.

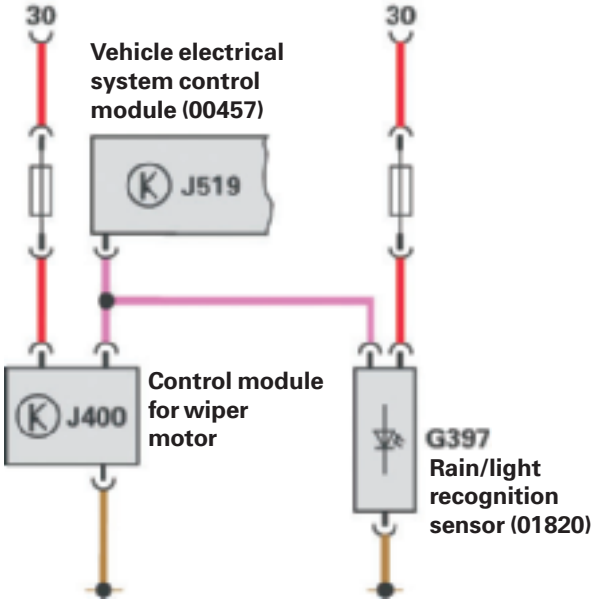
It is linked to the Vehicle Electrical System Control Module J519 as a LIN-slave control module.



Functions

The Control Module for Wiper Motor J400 performs the following functions:

- Intermittent stages (four)
- One-touch wiping
- Wiper function stage 1
- Wiper function stage 2
- Wipe over again 5 seconds after the last wash-and-wipe action (at vehicle speed greater than 3.1 mph (5 km/h) only)
- Rain sensor function (See Rain/Light Recognition Sensor G397.)
- Service setting
- Alternating parking position



Function Diagram

G397 Rain/Light Recognition Sensor

J400 Control Module for Wiper Motor

J519 Vehicle Electrical System Control Module

Note

The Vehicle Electrical System Control Module J519 now activates the Windshield Washer Pump V5.

Reference

For further information on the Control Module for Wiper Motor J400, please refer to SSP 999303, A8L/ Electrical Components.

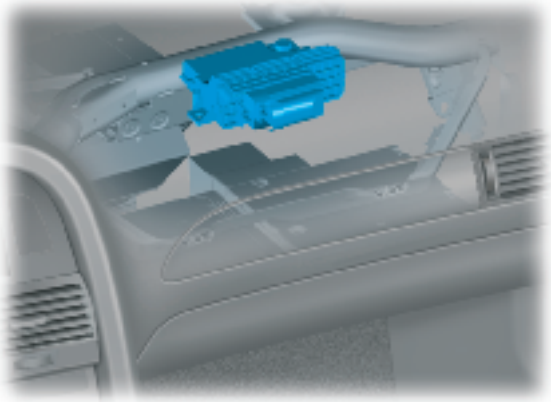
Vehicle Electrical System Control Module 2 J520

Due to the range of functions on the 2005 Audi A6, an additional Vehicle Electrical System Control Module is needed.

Functions

Vehicle Electrical System Control Module 2 J520 includes the following functions:

- Activates the Servotronic Solenoid Valve N119
- Sliding roof convenience opening/ closing
- Speed signal for sliding roof
- Tilt sensor for anti-theft warning system
- Glove compartment release



Installation Position

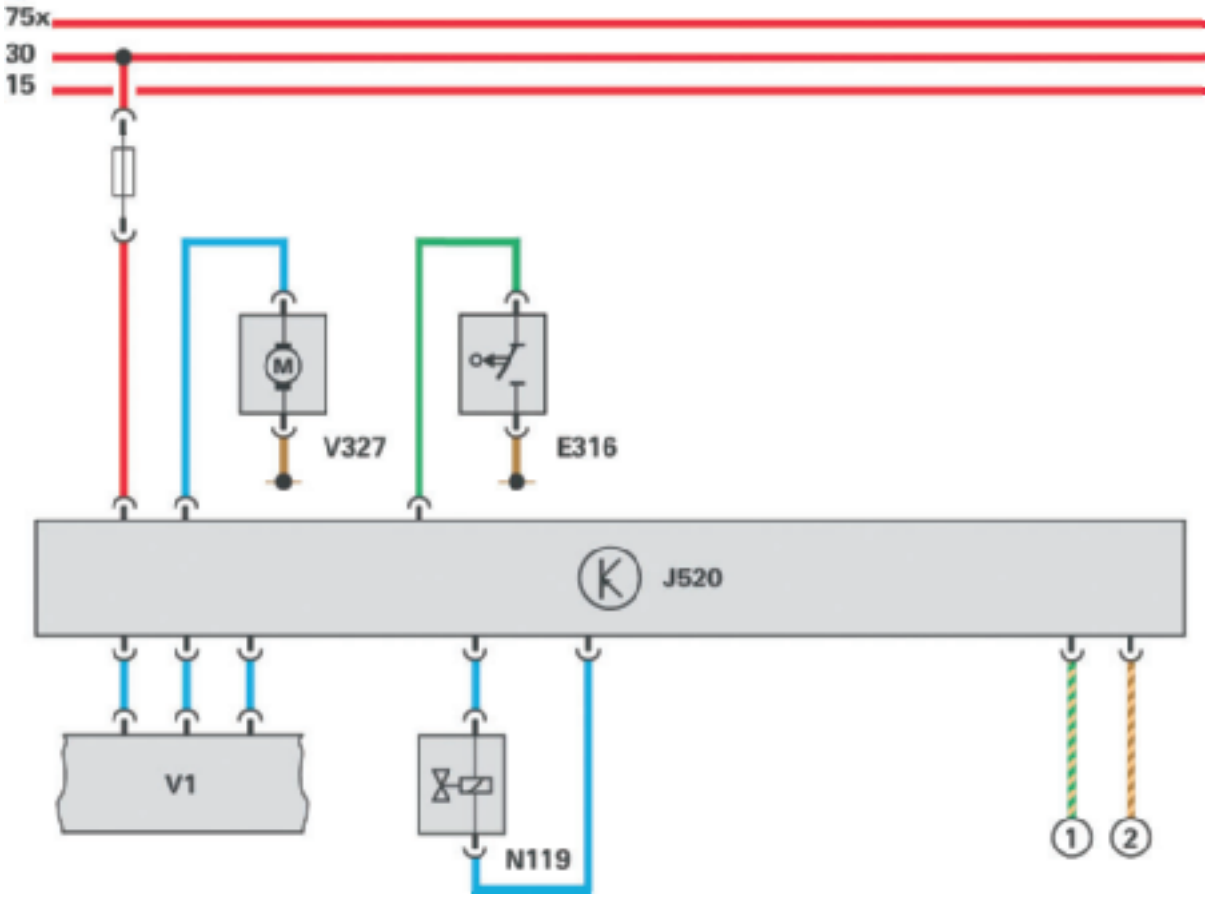
Vehicle Electrical System Control Module 2 J520 is located behind the glove compartment, in the module carrier, on the passenger's side.

Versions

Depending on the vehicle equipment, two different versions of Vehicle Electrical System Control Module 2 J520 are available.

- Low version
  (only includes glove compartment release and Servotronic function only)
- High version
  (also with sliding roof/anti-theft warning system)

Function Diagram



Legend

E316	Glove Compartment Button
J520	Vehicle Electrical System Control Module 2
N119	Servotronic Solenoid Valve
V1	Sunroof Motor
V327	Glovebox Unlock Motor

Additional signals

①	CAN Convenience High
②	CAN Convenience Low

Tilt Sensor For Anti-theft Warning

System

In the new 2005 Audi A6, the tilt sensor for the anti-theft warning system is integrated directly into the Vehicle Electrical System Control Module 2 J520. The fluid-filled sensor registers changes in the vehicle tilt, both transversely and longitudinally. This helps to prevent triggering the warning system as a result of shaking through viscous fluid and electronic delay. The current tilt values can be read out using measured-value blocks.

Note

The tilt sensor function can be switched off using a button in the driver's door panel.

Reference

For further information on the tilt sensor function, please refer to the SSP 254, Audi A4'01 - Technology.

Diagnosis

– Measuring-Value Blocks
Measured-value blocks are available for the following functions:

- ► Servotronic
- ► Sliding roof
- ► Tilt angle

– Output Check Diagnosis
Output checks can be carried out for the following functions, depending on the version:

- ► Glove compartment release
- ► Servotronic valve
- ► Sliding roof activation (This can be measured using a multimeter on the Vehicle Electrical System Control Module J519. However, the sliding roof does not open if the Central Control Module for Comfort System J393 does not release it.)

– Coding
The High-Line version of Vehicle Electrical System Control Module 2 J520 must be coded for the following functions:

- ► Tilt sensor (with or without)
- ► Sliding roof (with or without)

Central Control Module for Comfort System J393

The Central Control Module for Comfort System J393, used in the 2005 Audi A6 is similar in function to the Audi A8L. The tasks and functions have been adapted according to the requirements.

The Central Control Module for Comfort System J393 is a participant on the CAN Convenience data bus.

Master Functions

The master functions of the central control module for comfort system J393 are as follows:

- Direction indicator master
- Central locking master
- Interior lighting master
- LIN master for Alarm Horn 1-112 and Interior Monitoring Sensor G273

Other Functions

In addition to the master functions, other functions are also available in central control module for comfort system J393. The power outputs integrated in the central control module for comfort system J393 activate the following loads:

- Rear lights
- Rear sun blind
- Rear window heating
- Rear footwell lights
- Trunk light
- Tailgate/trunk lid release

Versions

Two versions of the central control module for comfort system J393 are available:

- Basic
- High-Line (with rear sun blind/anti-theft warning system/light package for ambient lighting/area lighting)

Installation Position

The central control module for comfort system J393 is installed above the battery in the rear right of the trunk.

System overview

The Central Control Module for Comfort System J393 receives the following input signals:

- Tailgate/Trunk Lid "soft touch"
- Tailgate/Trunk Lid Locking Cylinder closed
- Brake Light Switch F
- Brake light signal from ABS Control Module J104
- Garage Door Opener (adaptation flashing)
- Crash input
- Tailgate/Trunk Lid Contact
- Tank Plug Lock Detection (USA)
- Alarm Horn H12 (via LIN bus)
- Interior Monitoring Sensor G273 (via LIN bus)

The Central Control Module for Comfort System J393 activates the following loads:

- Rear Footwell Lights, left and right
- Trunk light
- Rear Window Shade Motor V91
- Motor Fuel Tank Lid Unlock V155
- Decklid Central Locking System Motor V53
- Interior Lighting Roof Module
- Passenger Compartment Light
- Alarm Horn H12 (via UN bus)
- High-level Brake Light (LED)
- Tail Light, left and right
- Brake Light, left and right
- Back Up Light, right
- Rear Fog Light, left
- Number Plate Light
- Heated Rear Window Z1
- Rear Direction Indicator Light, left and right
- Level Control System Control Module J197

Interior Lighting Control

Standard Equipment Function

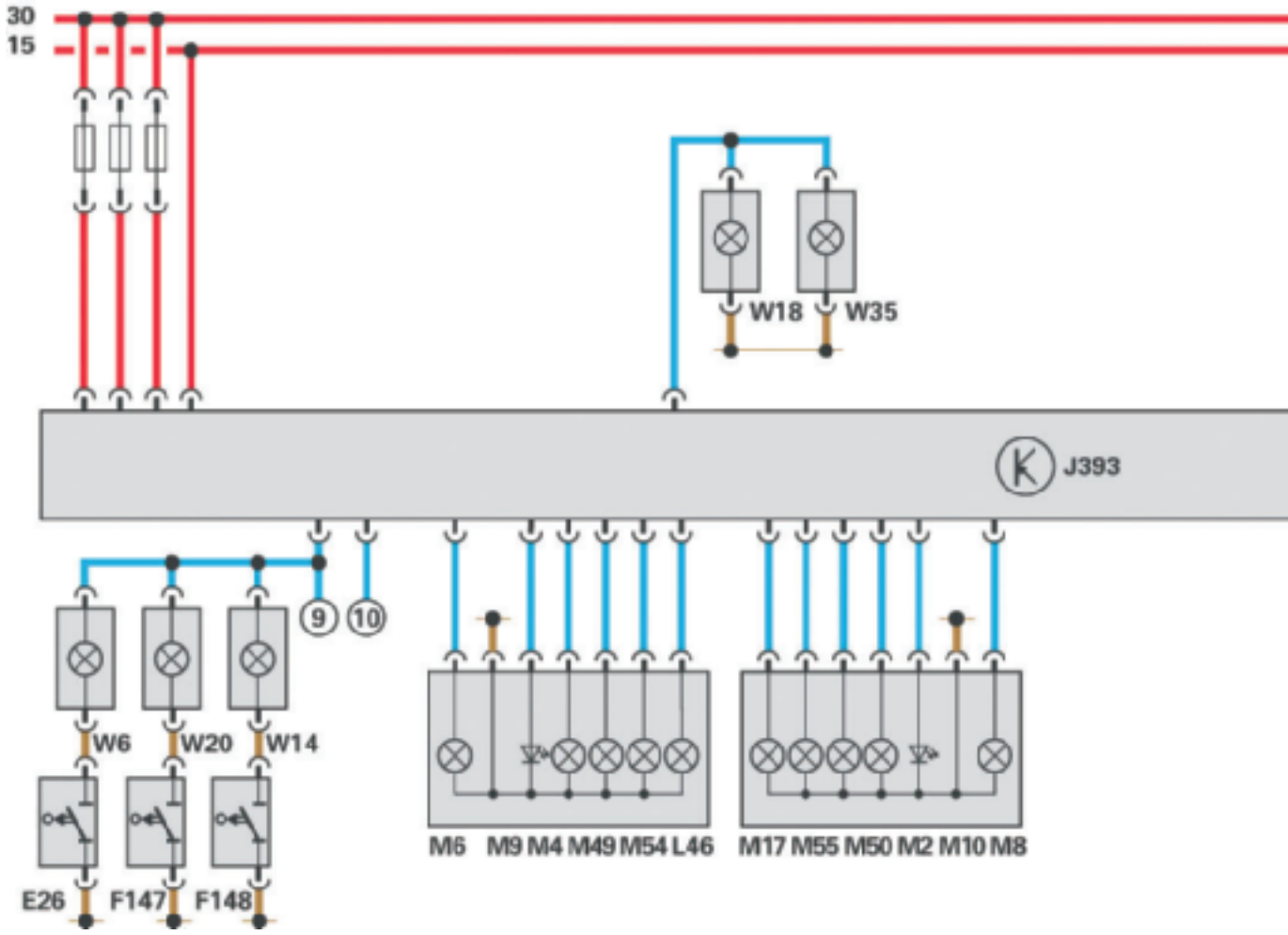
The standard function includes activating the inside light in the headliner, the front footwell lights, the glove compartment light and the trunk light. The Central Control Module for Comfort System J393 activates the inside light in the headliner, the trunk light and the glove compartment light directly via its own outputs and inputs. The Vehicle Electrical System Control Module J519 activates the front footwell lights via CAN messages from the Central Control Module for Comfort System J393.

Additional Equipment Function (Light Package)

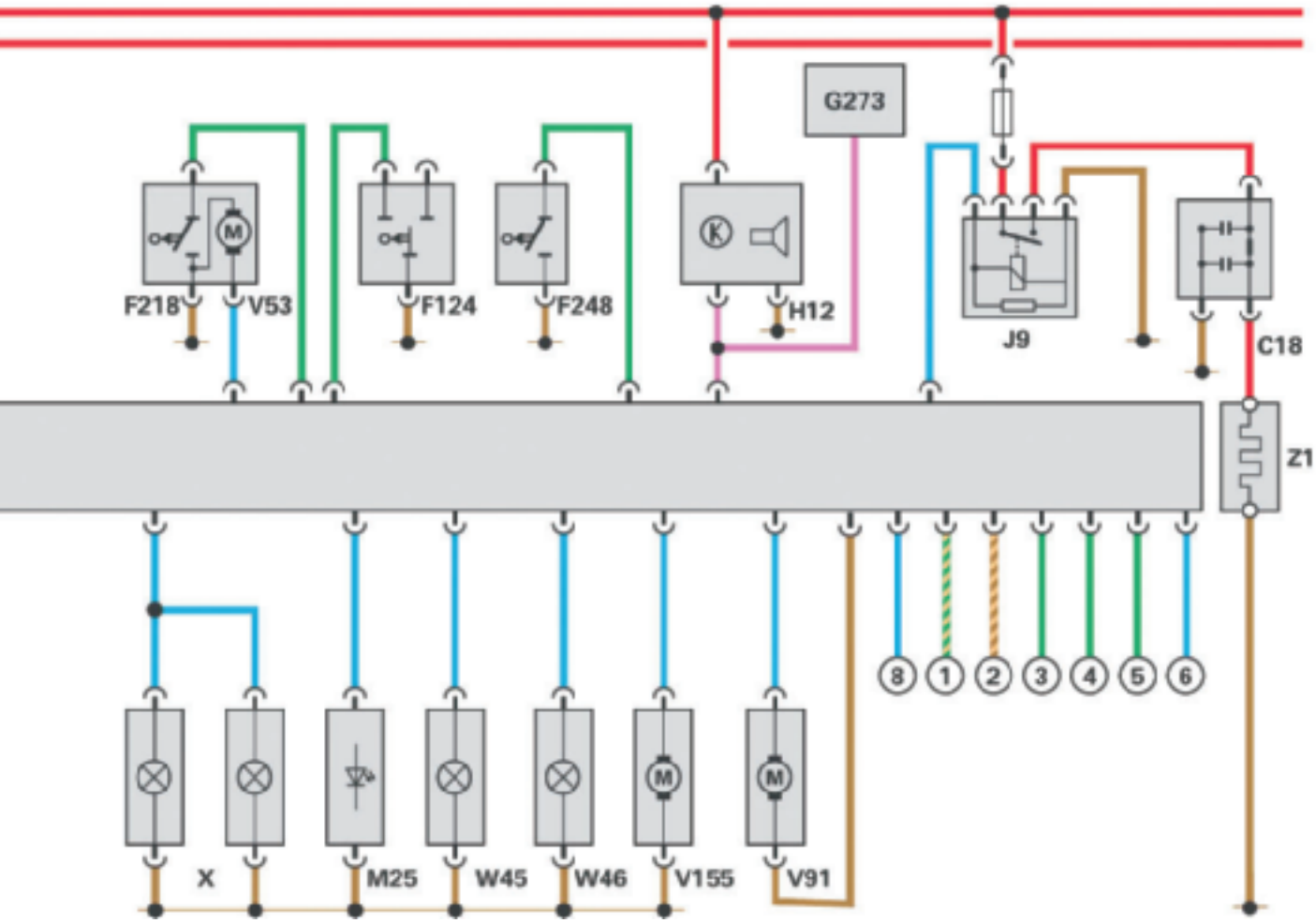
The light package additional equipment also includes a door contour light in every door as well as footwell lights (front and rear), which are based on LED technology.

The door contour lighting is activated by the door control module, which receives the CAN messages for this from the Central Control Module For Comfort System J393.

Function Diagram



C18	Windshield Antenna Suppression Filter
E26	Glove Compartment Light Switch
F124	Trunk Lock/Alarm/Central Locking Switch
F147	Left Make-up Mirror Light Switch
F148	Right Make-up Mirror Light Switch
F218	Switch For Central Locking, Trunk Lid
F248	Rear Lid Lock Cylinder Unlock Button
G273	Interior Monitoring Sensor
H12	Alarm Horn
J9	Rear Window Defogger Relay
J393	Central Control Module For Comfort System
L46	Left Rear Fog Light
M2	Right Tail Light
M4	Left Tail Light
M6	Left Rear Turn Signal Light
M8	Right Rear Turn Signal Light
M9	Left Brake Light
M10	Right Brake Light
M17	Right Back-up Light
M25	High-mount Brake Light
M49	Left Tail Light Lamp 2
M50	Right Tail Light Lamp 2
M54	Right Tail Light Lamp 3
M55	Left Tail Light Lamp 3



V53	Decklid Central Locking System Motor
V91	Rear Window Shade Motor
V155	Motor For Fuel Tank Lid Unlock
W6	Glove Compartment Light
W14	Right Make-up Mirror Light
W18	Left Luggage Compartment Light
W20	Left Make-up Mirror Light
W35	Luggage Compartment Light, Right
W45	Left Rear Footwell Light
W46	Right Rear Footwell Light
X	License Plate Light
21	Heated Rear Window

③	Brake Light Switch F
④	ESP brake signal from ABS Control Module J104
⑤	Crash signal from Airbag Control Module J234
⑥	"Doors OPEN" signal to Level Control System control Module
⑦	"Adaptation flashing" signal from Garage Door Opener Control Module J530
⑧	"Release" signal to Sunroof Motor
⑨ & ⑩	"Interior light" activation signal to Interior Light, Front

Diagnosis

The Central Control Module for Comfort System J393 has the usual diagnostic functions such as read DTC memory, read Measuring Value Blocks, Adaptation, Coding, as well as selective and sequential Output Check Diagnosis at its disposal.

Output Check Diagnosis

The selective Output Check Diagnosis test initiated by the Scan Tool can be used to check the following actuators:

- Warning light for central locking - SAFE- K133 (in door rim)
- Lock central locking signal (once)
- Activate safe locking for doors (once)
- Unlock central locking signal
- Lock filler flap
- Unlock filler flap
- Left Brake Light M9
- Right Brake Light M10
- High-mount Brake Light M25
- Lamps for tail light, left
- Left Parking Light Lamp M43
- Lamps for tail light, right
- Right Parking Light Lamp M44
- Left Back-Up Light M16
- Right Back-Up Light M17
- Left Rear Turn Signal Light M6
- Right Rear Turn Signal Light M8
- Left Rear Fog Light L46
- Right Rear Fog Light L47
- License Plate Light X
- Luggage Compartment Light W3
- Left Rear Footwell Light W45
- Right Rear Footwell Light W46
- Activation of rear lid remote unlocking (rotary latch opens, closing aid moves up)
- Motor for rear sun blind (rear sun blind moves in both directions)
- Signal for rear window heater activation
- Interior lighting

Coding

This diagnostic option can be used to perform coding for these functions:

- Anti-theft warning system
- Central locking (normal/selective) Tilt sensor
- Passenger compartment sensor
- Convenience function via radio
- Right-hand traffic
- Avant detection
- Rear sun blind
- Acknowledgement of anti-theft warning system horn
- Rest of World/USA
- Light package
- Fuel Filler Cap lock detection
- Equipment (Basic/High-Line)
- Sliding roof
- Multi-function control module (taxi/ emergency doctor/fire brigade, installed/not installed)

Note

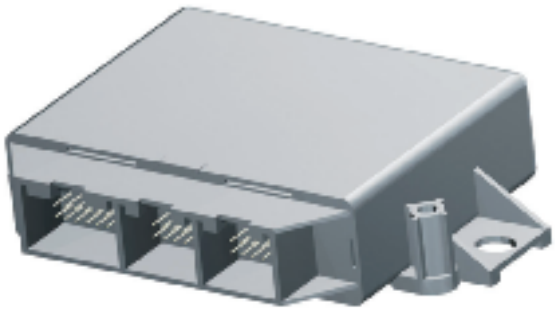
In addition to the selective Output Diagnosis test, the diagnosis software also includes the option of a sequential Output Diagnosis Check.

Control Module for Parking Aid J446

For use in the 2005 Audi A6, a 4-channel system with sensors on the rear bumper and an 8-channel system with sensors on the front and rear bumpers are available.

Versions

The Control Module for Parking Aid J446 will be available as 4-channel system and 8-channel system versions. Only the 4-channel version is available on the 2005 Audi A6 for the North American market.



Installation Position

The Control Module for Parking Aid J446 is installed above the right wheel housing in the trunk. It is secured in a frame under the Control Module for Towing Sensor J345.

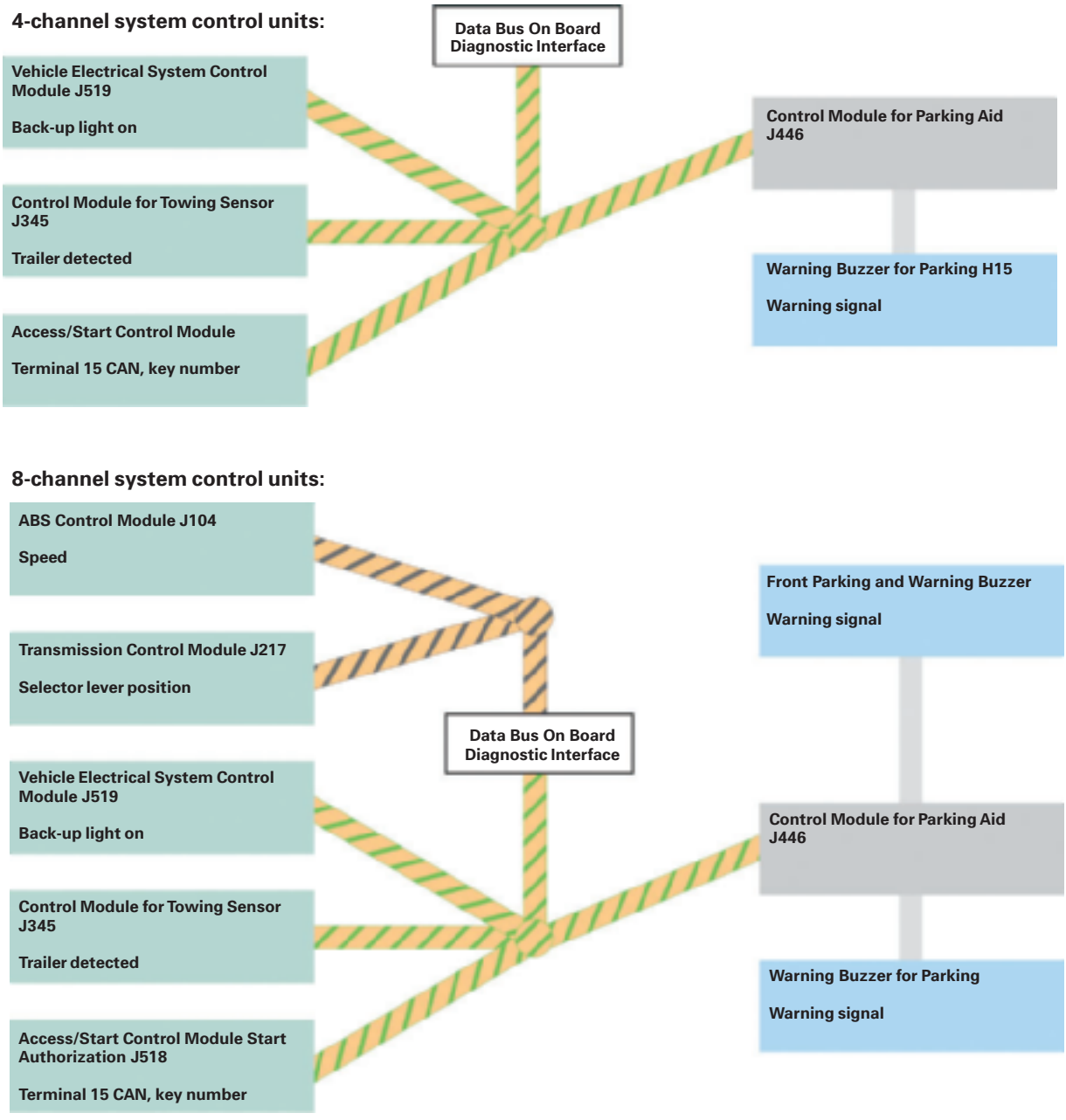
Function

Four ultrasound converters integrated into the front bumper (8-channel system only) and four ultrasound converters integrated into the rear bumper monitors the area around the vehicle. The acoustic message comes from a tone generator in the front area of the vehicle and a tone generator in the back area of the vehicle (only at the back for the 4-channel system). A parking aid switch can be used to activate or deactivate the parking aid manually (8-channel system only). The MMI allows the customer to adjust the volume and frequency of the acoustic output for the parking aid.

If the Control Module for Towing Sensor J345 reports the presence of a trailer on the vehicle via the CAN bus, the four sensors in the rear bumper are switched off. However, the front area of the vehicle is still monitored.

Input and output signals

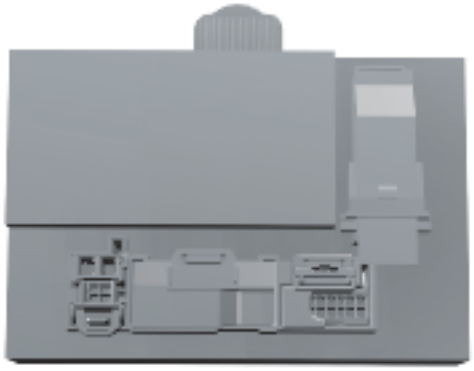
The Control Module for Parking Aid J446 requires CAN bus messages from various control modules.



Door Control Modules J386/387/388/389

The door control modules J386/387/388/389 have a similar functionality to those used in the 2004 Audi A8L.

In the 2005 Audi A6, the door control modules are now separate from the window motors.



Stand-by Master Function

As in the Audi A8 '03, if the Central Control Module for Comfort System J393 fails, the Door Control Module, Driver Side J386 controls central locking. If there is no communication between the Door Control Module, Driver Side J386 and the Central Control Module for Comfort System J393, the other door control modules J387/388/389, evaluate the information from the Door Control Module, Driver Side J386 directly. In this case, it is no longer possible to open the vehicle with the radio remote key or by using the Advanced Key System.

Diagnosis

The Address Words 42, 52, 62 and 72 "Door electronics" offer diagnostic options such as Measuring Value Blocks, Coding or the selective/sequential Output Check Diagnosis. (The selective actuator test is used for the targeted activation of actuators.)

Versions

Low-Line and High-Line versions of the door control modules J386/387/388/389 are used.

The High-Line version includes the following functions:

- Advanced Key
- Memory switch block
- Ambient lighting
- Area lighting
- Folding mirrors
- Automatic anti-dazzle mirror
- Electric child-lock

Installation position of door control module, driver side (01331) J386

System Overview

The Door Control Modules J386/387/388/389 receive the following input signals:

- Power Windows Switch
- Internal Locking Switch
- Actuating Elements for Central Locking Actuating Elements for Central Locking (Safe Mode)
- Outer Door Handle Switch (optional)
- Central Locking Button for Outer Door Handle
- Luggage Compartment Release Switch E164
- Switch for Remote/Fuel Tank Door E204
- Child-Safety Button E318
- Mirror Selector Switch E48
- Mirror Adjustment Switch E43
- Switch for Mirror Adjustment with Fold-Away Function E168
- Switch for Alarm System Off E217 (optional)
- Switch for Passenger Compartment Monitoring (optional) E183

Additional signals for Front Door Control Modules J386/387

- Operator Unit for Memory
- Mirror Position sensor

Additional loads for Door Control Module, Driver Side J386

- Contact switch for lock cylinder, driver side F241

The Door Control Modules J386/387/388/389 activate the following loads:

- Central Locking Motors
- Central Locking Motors (Safe Mode)
- Door Warning Lights
- Entry Lights
- Lighting for Inside Door Handle
- Ambient Lighting for Doors (optional)

Additional loads for Rear Doors

- Lamp for Rear Ashtray Light

Additional loads for Front Door Control Modules J386/387

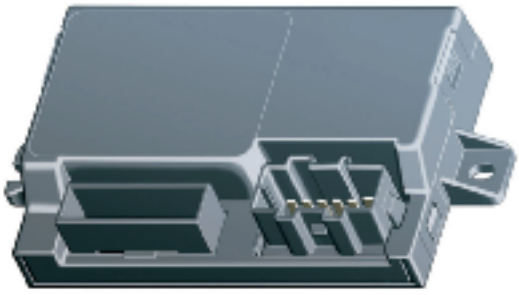
- Mirror Adjustment Motors
- Mirror Folding Motors
- Heated Door Mirrors
- Automatic Ant-dazzle Mirror
- Entry Light in Door Mirror, Driver's Side and Passenger's Side

Additional loads for Door Control Module, Driver Side J386

- Lock Status LED for Passenger's Door
- Indicator Light for Safe Central Locking
- Indicator Light for Tilt Sensor K188 (optional)
- Interior Monitoring Off Indicator Lamp K162 (optional)
- Indicator Light for Memory SET

Memory Seat/Steering Column Adjustment Control Module J136 and Passenger Memory Seat Control Module J521

The Memory Seat/Steering Column Adjustment Control Module J136 and Passenger Memory Seat Control Module J521 can be used to set up to 8 individual seat positions for an electrically adjustable seat. The seat positions can be stored in memory and can be set again, if necessary, using the memory keypad or by entering a radio code.



Installation Position

The Memory Seat/Steering Column Adjustment Control Module J136 and Passenger Memory Seat Control Module J521 are located in the floor area under the driver's and passenger's seat.

Assigning a PIN code in the connecting plug, the Memory Seat/Steering Column Adjustment Control Module J136 and Passenger Memory Seat Control Module J521 can be used.

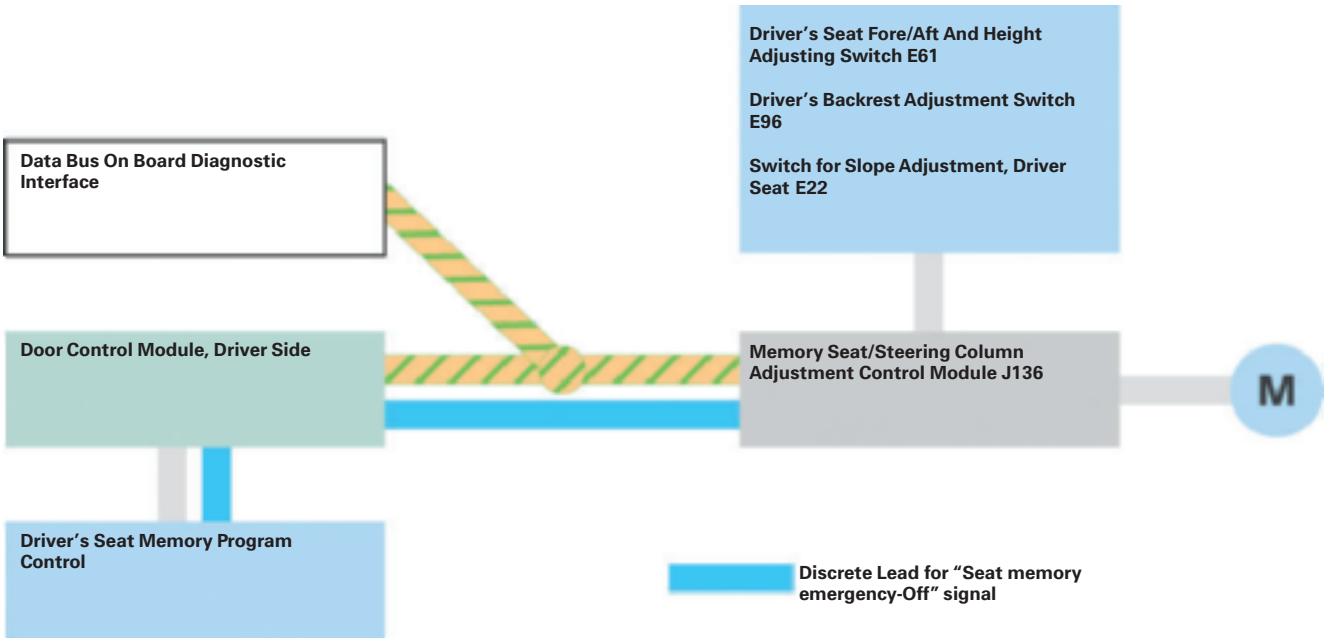
Thus, the unlearned/uncoded Memory Seat/Steering Column Adjustment Control Module J136 and Passenger Memory Seat Control Module J521 are coded automatically for either the driver's seat or passenger's seat installation position - depending on the pin – when it is first connected to the seat. This operation can only be performed once, but can be released again by means of the diagnostic function (in the Conditioning Menu item).

Diagnosis

The following diagnostic functions are available under the address words 36 Seat adjustment, driver's side and 06 Seat adjustment, passenger's side:

– Read Measuring Value Blocks
– Coding
– Output Check Convenience Electronics Convenience Electronics
– Adaptation

Input and Output Signals (Driver's Seat)



Function

The Memory Seat/Steering Column Adjustment Control Module J136 and Passenger Memory Seat Control Module J521 powers the positioning motors in the seat directly using its load outputs. The position detection function of the positioning motors is implemented using Hall sensors. The Door Control Module, Driver Side J386 reads in switch information from the Driver's Seat Memory Program Control E97 as voltage-coded information and sends this via CAN Convenience to the Memory Seat/Steering Column Adjustment Control Module J136. The Memory Seat/Steering Column Adjustment Control Module J136 reads in information from the Driver's Seat Fore/Aft and Height Adjusting Switch E61, the Driver's Backrest Adjustment Switch E96 and the Switch for Slope Adjustment, Driver Seat E222 directly. The Door Control Module, Driver Side J386 reads in the button information "Seat memory emergency-Off" and supplies this discretely as well as in the form of a CAN Convenience message to the Memory Seat/Steering Column Adjustment Control Module J136. Comfort functions, such as seat symmetry positioning and comfort side view as well as radio code allocation to a memory location, are implemented using settings in the Multimedia Interface (MMI).

Seat Symmetry Positioning

The "Symmetry positioning, driver's seat/ passenger's seat" option can be used to move the passenger's seat into a symmetrical position in relation to the driver's seat. The MMI sends a corresponding instruction to the Memory Seat/Steering Column Adjustment Control Module J136 via the CAN Convenience bus.

The Memory Seat/Steering Column Adjustment Control Module J136 then sends the current seat position and a control instruction to the Passenger Memory Seat Control Module J521, which moves its motors accordingly.

Memory Retrieval

The stored memory settings can be retrieved using the personal button memory.

Personal Button Memory

Settings are retrieved and stored using the memory buttons in the door panel. These memory settings can also be adapted to the radio-remote key.

Comfort Side View

The "Comfort side view" option moves the passenger's seat into a position that hides the vehicle's B-pillar, thereby ensuring that the driver has the best possible view out of the vehicle.

The function can be selected via the MMI, where the signal is transmitted in the same way as for the "Seat symmetry positioning" function.

Multimedia Interface (MMI)

Equipment Versions

The MMI operating concept is now also integrated as standard in the new 2005 Audi A6. Data is transferred between the individual Infotainment control units via MOST bus technology. The process is technically identical to the Infotainment system in the current Audi A8L. Driver-relevant functions, such as on-board computer or navigation, are displayed in the Control Module with Indicator Unit in Instrument Panel Insert J285. Selected functions for the telephone, radio and CD control and volume control can be operated using the multi-function steering wheel.

Several versions of the Front Information Display Control Head Control Module J523, the master control module in the optical Infotainment bus, are installed in the 2005 Audi A6, depending on the optional equipment selected. The Basic, Basic Plus and Basic Navigation versions have the same hardware platform, which is expanded to include the required optional extras. The MMI High version, uses the same hardware as the current Audi A8L Furthermore, the Data Bus On Board Diagnostic Interface J533, which assures communication with the other networked components in the vehicle, is connected to the MOST bus.

Display elements in the optimum field of vision

Separation of display and operation
- **Optimum readability**
- **Optimum ease of operation**

Operating elements within primary reach

Note

Information on the MOST bus can be found in SSP 971303, New Data Bus Systems.

Reference

For information on the Infotainment system with optical data transfer, please refer to the SSP 993303, Infotainment

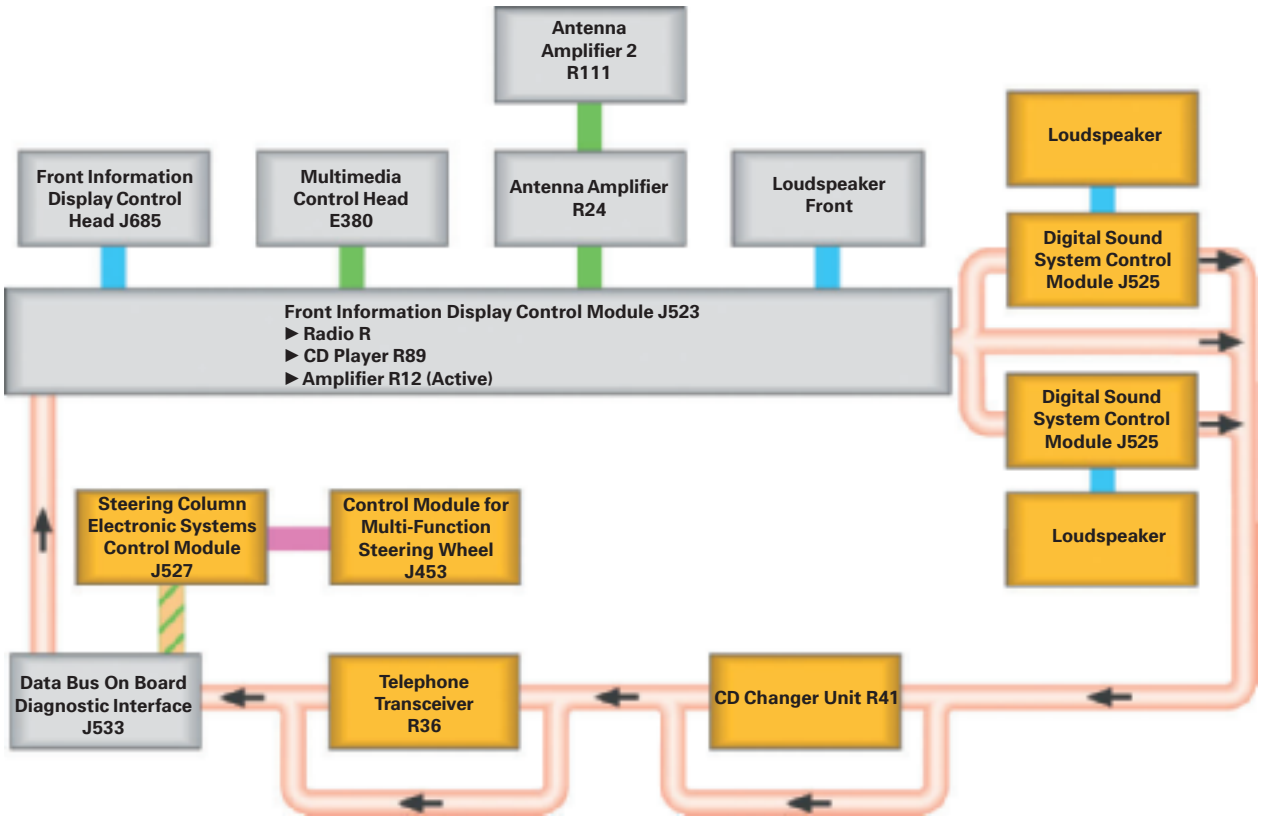
MMI Basic (Not used in the North American Market.)

Standard equipment in the European 2005 Audi A6 includes MMI Basic with the MMI operating concept, a 7" Front Information Display Control Head (J685) in the instrument panel insert as well as an integrated, analog radio tuner and 4x diversity antenna, CD drive and a 2x20-watt amplifier.

In the MMI Basic version, the loudspeakers integrated into the front doors are antenna connected directly to the Front Information Display Control Head Control Module J523.

If the Standard Sound System or BOSE option is installed, this internal amplifier is deactivated via coding. The loudspeakers are then connected to the relevant Digital Sound System Control Module J525.

Depending on the market in question, a satellite radio receiver or a receiver for terrestrially emitted, but digitally coded transmissions, will then be available



Legend

The orange symbols represent the possible optional equipment. If a relevant option is missing, simply follow the route indicated by arrows to close the MOST ring.

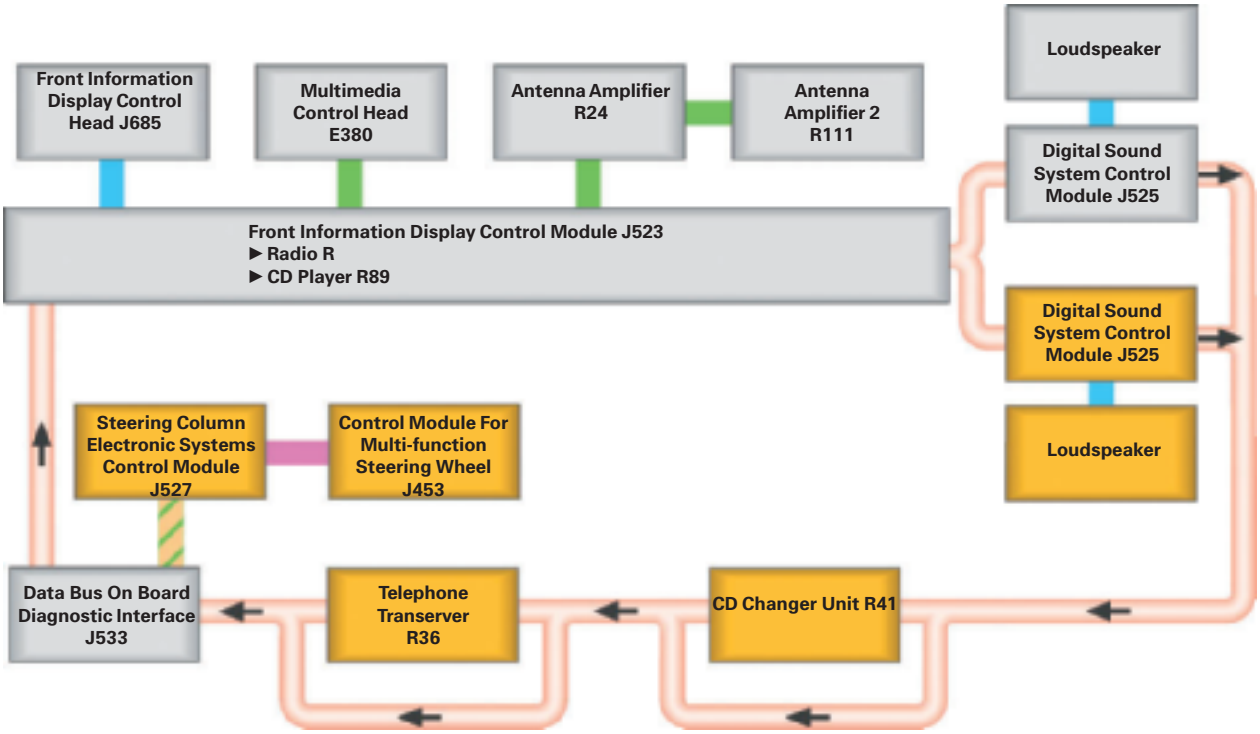
MMI Basic Plus (Not for the North American Market)

As an option, the MMI Basic system can be equipped with additional functions for the radio and sound field in the form of a "Plus" version. This includes a TP Memo function, which enables the recording of traffic announcements for a duration of eight minutes in total.

A programmable recording period can be used to provide up-to-date traffic announcements before starting a journey.

Stored traffic messages are automatically deleted after six hours to ensure that they are always up-to-date.

Instead of the integrated amplifier, the standard sound system with its own Digital Sound System Control Module J525 will be used as standard as of this MMI version. The internal amplifier can be deactivated via coding in this and later MMI versions.



Legend

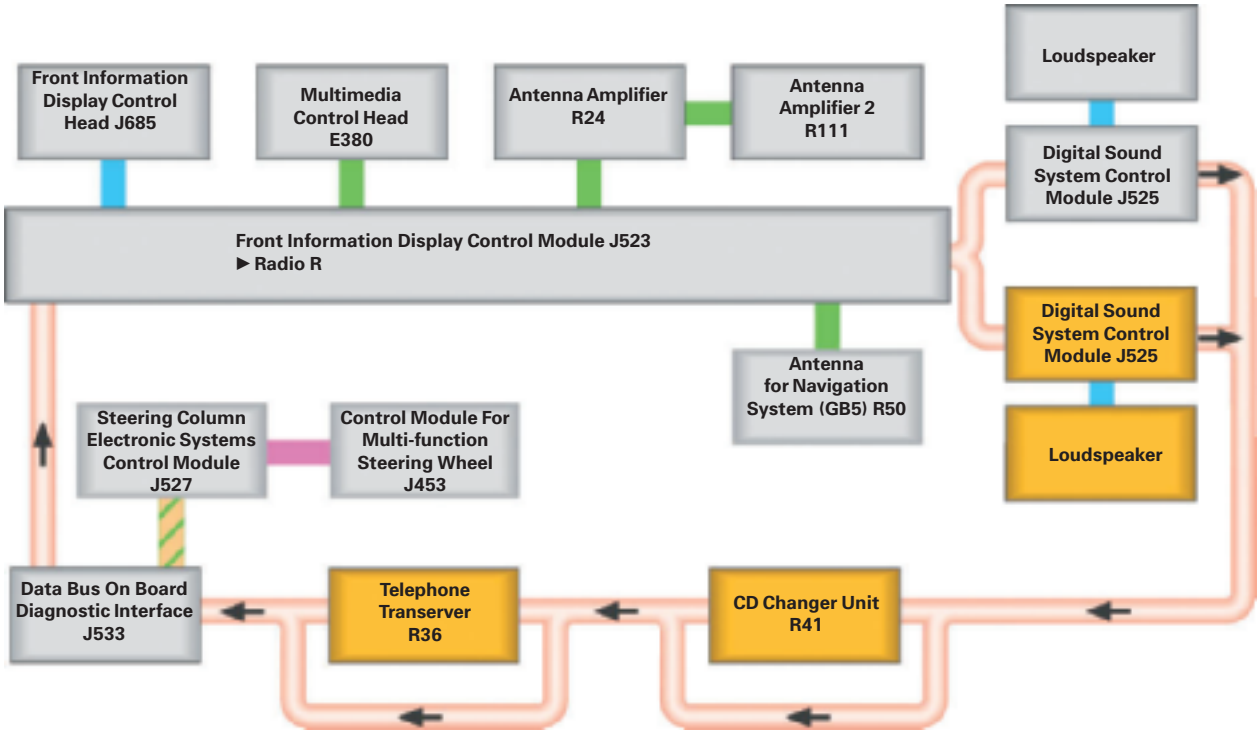
The orange symbols represent the possible optional equipment. If a relevant option is missing, simply follow the route indicated by arrows to close the MOST ring.

MMI Basic Navigation (Not for the North American Market)

The MMI Basic Plus is available with a basic navigation function. In this application, a navigation module is integrated into the Front Information Display Control Head Control Module J523. Optical route guidance is provided on the central display in the instrument cluster. The destination is entered using the MMI operating system with its central knob/pushbutton.

Audible directions for route guidance are also output via the sound system.

The data required for navigation is read in via the integrated CD drive.



Legend

The orange symbols represent the possible optional equipment. If a relevant option is missing, simply follow the route indicated by arrows to close the MOST ring.

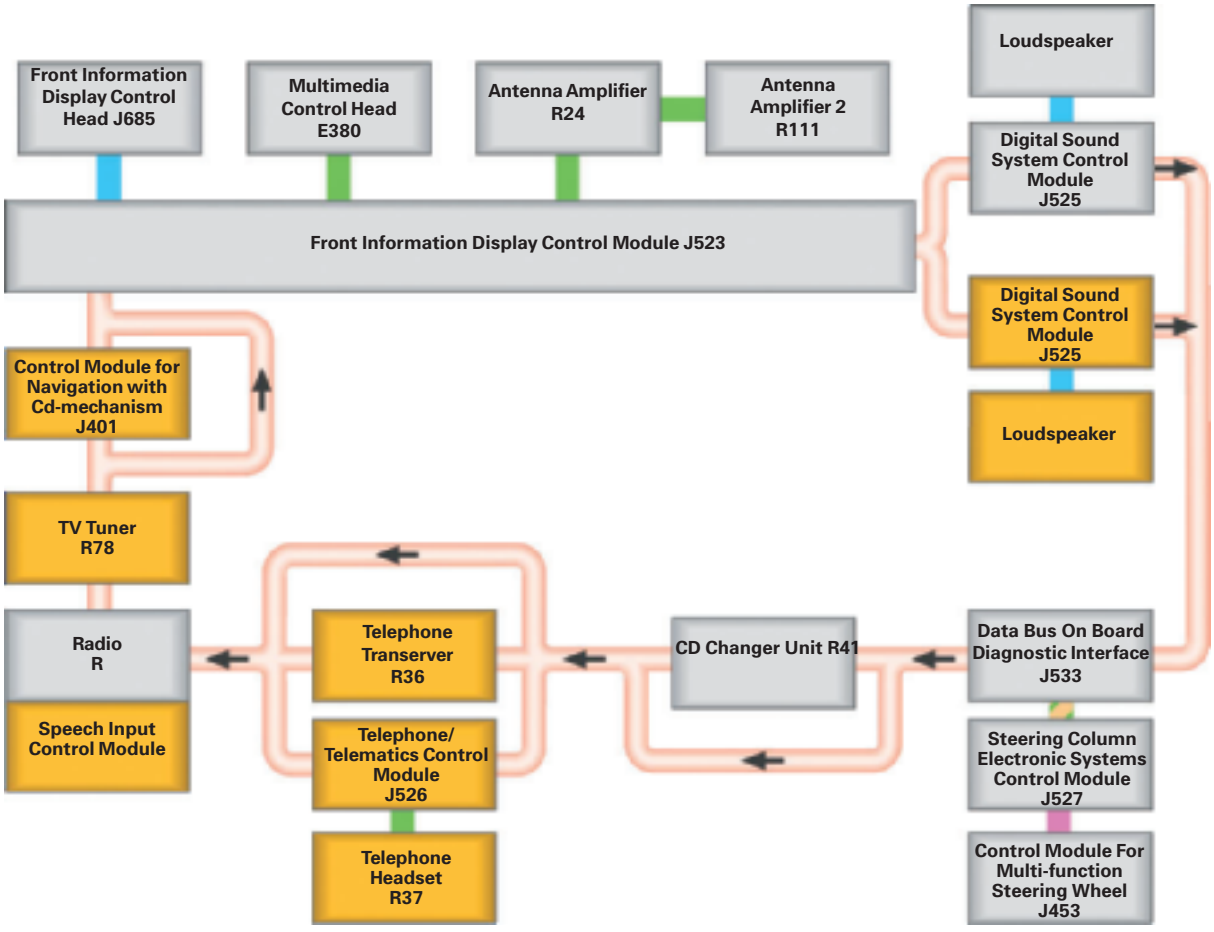
MMI High

The MMI High comes with the 7" color display. It includes an RDS dual-tuner, the standard sound system and a 6x CD changer in the glove compartment. As an optional extra, this MMI version is also available with DVD navigation, as well as the voice operator system with the Speech Input Control Module J507 as a plug-in module of the Radio R.

Only in this MMI version can drivers choose between the fixed telephone module and the mobile baseplate.

Reference

Information on the DVD-based navigation system can be found in SSP 993303, Infotainment.



Legend

The orange symbols represent the possible optional equipment. If a relevant option is missing, simply follow the route indicated by arrows to close the MOST ring.

Function Overview and Menu Structure of the MMI

■ **Radio main menu**
- – Dynamic transmitter list

► Memory
- – Memory list

► Band
- – FM (ultra-shortwave)
- – MW (medium wave)
- – LW (long wave)
- – DAB* (Digital Radio)

► Sound
- – <See Setup — Softkey sound.>

► Manual
- – Manual forward
- – Search forward
- – Save transmitter
- – Play transmitter
- – Search back
- – Manual back

■ **CD/TV main menu**
- – CD title
- – TV transmitter

► Changer
- – CD list

► Source
- – CD
- – TV
- – External AV source

► Sound
- – <See Setup sound.>

► Manual
- – Forward
- – Back
- – One title back
- – One title forward
- – Title mix
- – Play title
- – Name CD

■ **Address Book main menu**
- – Find entry
- – View list
- – New entry
- – Delete address book

■ **Telephone main menu**
- – Enter PIN
- – Telephone menu

► Memory
- – Address book
- – Numbers dialed
- – Calls received
- – Missed calls
- – SIM card number
- – Save current number

► SMS
- - New SMS
- - Templates
- - SMS input
- - SMS output
- - SMS memory
- - Delete all read SMS
- - Delete all SMS

► Dial

► Hang up

■ **Radio setup**
- – Traffic program
- – Regional setting
- – Transmitter reception
- – Transmitter display
- – Alternative frequency
- – PTY filter
- – Delete last transmitter

■ **CD/TV setup**

— **CD**
- – Repeat
- – Show CD text

— **TV**
- – Brightness
- – Contrast
- – Color
- – Picture format
- – TV standard

■ **Telephone setup**
- – Telephone settings
- – Call options
- – Security settings
- – Mailbox
- – Call divert
- – Network selection

Legend

■ **Hardkey**
► Softkey
— **Sub-menu**
– Function
* available later

Note

Not all features shown will be available for the North American Market.

■ **Navigation**
— **<Single-destination mode>**
– Country
– City/Postal code
– Street
– Special dest.
– Route guidance Start
— **<Route map mode>**
– Z-destination 1...3
– Destination

► Memory
– Last destinations
– Top special dest.
– Destination from address book
– Save current dest.
– Save route
– Load route

► Route
– Route criteria
– Distance list
– Route with stop-off destinations
– Route without stop-off destinations
– Block route from here

► Map
– Zoom
– Map menu

► Nav Info
– Destination
– Location
– GPS dates

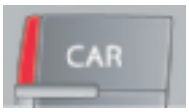
■ **Navigation setup**
– Map colors
– Alignment
– Junction zoom
– Map type
– Map contents
– Audible directions
– Demo mode
– Delete last destinations
– Manual location
– Version information

■ **Info main menu**
– TMC message list

► TP memo
— **Message retrieval**

► Sources
– <Radio source>
– <Telephone source*>

■ **Info setup**
– TP memo timer
– TMC display filter



■ **Car main menu**

► User
– User 1 - 4
– User management

► On-board manual
– Short Guide
– Driver's Manual
– Audi MMI

► Maintenance

► Maintenance
– Ambient lighting
– Acoustic Parking System
– External lighting
– Battery charge level
– Vehicle registration number
– Windows
– Instrument cluster
– Tire pressure control system
– Windshield wiper
– Seat adjustment
– Mirror adjustment
– Central locking

■ **Setup main menu**
– Radio setup

► Settings
– Menu language
– Units of measure
– Time setting
– System sounds
– Voice operation
– Factory setting

► Sound
– Balance
– Fader
– Treble
– Base
– Subwoofer
— **DSP**
– Standard
– BOSE
– Volume settings
- Navigation instructions
- Traffic program broadcast
- Voice dialog system
- Telephone volume

► Display
– Brightness

Note

Not all features shown will be available for the North American Market.

Legend

■ **Hardkey**
► Softkey
— **Sub-menu**
– Function

* available later

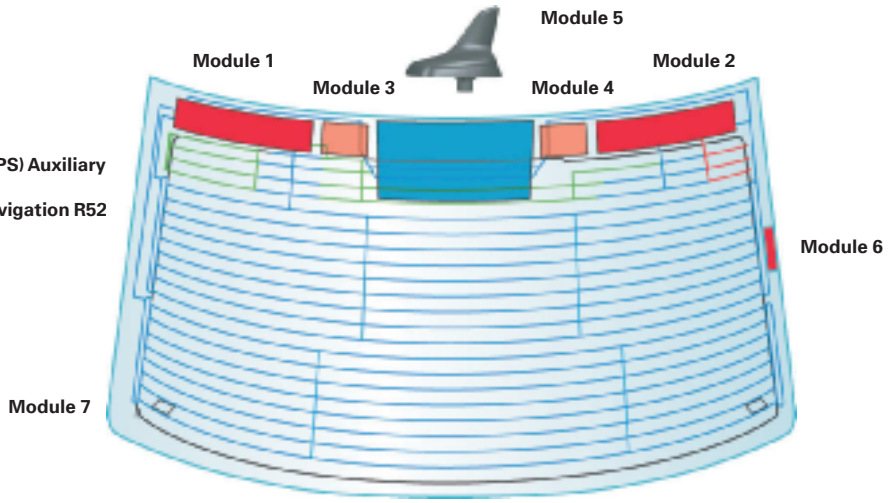
Antenna Systems

The antenna system of the 2005 Audi A6 is integrated as a module in the top area of the rear window.

The modules found in the illustration are responsible for the various systems, for example, remote central locking, radio, TV or the radio receiver for the auxiliary heater. Only the modules that are required for the requested optional extras are installed.

The illustration shows the relevant modules for the available vehicle equipment. These are indicated for the various, worldwide country versions. The modules "DAB" and "SDARS" relate to the digital radio systems, which will be available later and are based on either a satellite-controlled system (SDARS) or a terrestrial system (DAB).

Module 1: Antenna Amplifier R24
Module 2: Antenna Amplifier 2 R111
Module 3: Antenna For Navigation R50
Module 4: Telephone/Navigation System (GPS) Auxiliary Help and output signals
Module 5: Antenna For Radio/Telephone/Navigation R52
Module 6: Block Circuit
Module 7: Telepass Antenna



Installed Antenna Modules for Possible Vehicle Equipment

Module	Designation	Available in market version
1	Radio AM/FM	ECE
1	Radio AM/FM - Diversity	ECE/US
1	Radio AM/FM - Div/TV	ECE/US
1	Radio AM/FM - Div/TV	Japan
2	Remote central locking	ECE/US
4	Remote control for auxiliary heater	ECE
2	Remote locking/TV	ECE/US
2	Remote locking/TV/DAB	ECE
2	Remote central locking/TV	Japan
3	Navigation	RoW (Rest of World)
4	Mobile phone-US	US
5	Telephone ECE	ECE
5	Telephone (fixed or mobile)/Navigation	ECE
5	Telephone/Navigation	US
5	Satellite radio	US
7	Block circuit	
8	Telepass	Italy

Front Information Display Control Head Control Module J523

If the 2005 Audi A6 with the MMI versions Basic, Basic Plus or Basic Navigation is ordered, the functionality like sound system or a CD-based navigation module are integrated into the Front Information Display Control Head Control Module J523.

The Front Information Display Control head Control Module J523 is located in the glove compartment in the Basic, Basic Plus,, and Basic Navigation equipped versions.

In the "High" version MMI system, Front Information Display Control Head Control Module J523 is located behind Front Information Display Control Head J685.

Note

MMI versions Basic, Basic Plus, or Basic Navigation will not be available in the North American market

	MMI Basic	MMI Basic Plus	MMI Basic Navigation
1-DIN housing	X	X	X
Interface MOST	X	X	X
Power supply	X	X	X
AM/FM tuner for ECE and North America	X	X	X
CD drive	X	X	X
2x20-watt drivers	X		
ZF output for antenna diversity	X	X	X
Traffic program recording (8 minutes)		X	X
Integrated GPS receiver			X
Navigation computer with memory			X
Voice output for navigation			X

The Front Information Display Control Head Control Module J523 includes an enhanced TP recording system in the Basic Plus and Basic Navigation versions. This is a programmable traffic program recording function, which is possible via the MMI operating system. The TP Recording feature is not available in all markets.

Two different start times can be set. The traffic broadcasts that are received are recorded for a duration of 2 hours from the relevant start time.

This setting remains unchanged until the timer function is switched off or the programmed times are changed. A memory with a recording capacity of 8 minutes is available for the recording. When the memory is full, the oldest messages are overwritten.

The CD-based navigation function is integrated as an optional module in the Front Information Display Control Head Control Module J523. If this equipment is installed, the vehicle comes with the Antenna for Navigation Systems (GPS) R50, which is located in the top area of the rear window. This antenna delivers the GPS signal. If the mobile baseplate was also ordered, the vehicle has a roof antenna (antenna for radio, telephone, navigation R52), which supplies the GSM and GPS signal. All other input signals are only supplied by networking the relevant control modules. Playback of the stored messages can also be controlled via the MMI. It is possible to select here whether to play the entire sequence or only one particular message.

Functional Features of the Basic Navigation Function:

- Position-finding through interactive destination entry/selection
- Interactive journey planner/ management with stop-off destinations
- Selection of route options
- Route guidance (acoustic and optical via arrows in control module with indicator unit in instrument panel insert J285)
- Dynamic route guidance via RDS TMC and online data
- Audible navigation directions via Digital Sound System Control Module J525
- Storage and management of destinations
- Output of position data to the CAN bus (for example: for Audi telematics)
- Search for imported destinations from the address book

Navigation input signals from the vehicle network:

Distance signal from ABS Control Module J104, signal from back up light switch

Output signals to the vehicle network:

GPS time including date, voice output to the Digital Sound System Control Module J525

Front Information Display Control Head Control Module J523

Although functional modules are integrated into the Front Information Display Control Head Control Module J523, the related address words for diagnosis with the Scan Tool are retained.

The Front Information Display Control Head Control Module J523 does not support the Basic Setting and Output Check Diagnosis functions. The Front Information Display Control Head Control Module J523 can be flashed using the integrated CD drive.

Overview of the address words of the modules in the Front Information Display Control Head Control Module, used in the Scan Tool

	Front Information Display control Head Control Module J523	Amplifier, 2x20-watt	Radio R	CD-ROM Drive R92	Control Module for Navigation with CD-Mechanism J401
Address word	07	47	56	0E	37

Overview of the available diagnostic functions for each module

Overview of the Available Diagnostic Functions for Each Module	Front Information Display Control Head Control Module J523	Amplifier, 2x20-watt	Radio R	CD-ROM Drive R92	Control Module for Navigation with CD-Mechanism J401
Control Module Identification			X		
Measured-value Blocks			X		
Basic Setting					
Output Check Diagnosis					
Coding	X	X			
Adaptation	X			X	X
Flash programming			X		
Read fault memory			X		
Erase fault memory			X		

Overview of the Measuring Value Blocks available for the individual modules

Module	Designation
General Measuring Value Blocks for all modules	► General: Battery positive voltage, terminal status ► MOST: Address, MOST FOT temperature, optical lowering ► Status of ring break diagnosis line ► Control module identification: Serial number, flash date, hardware and software version
Front Information Display Control Control Module J523	► Multimedia Control Head E380: Status of main buttons, status of knobs/push buttons, volume head controller status ► Display: LCD display temperature ► Signals: Terminal 58D, terminal 58S
Integrated Amplifier, 2x20-watt	► Status of input signals, status of mute lead, speed (GALA), temperature
Radio R	► Remote-feed antenna: Open circuit, OK, short circuit ► Remote-feed ZF output: Open circuit, OK, short circuit ► Transmitter receive-level (0... 100 BmV)
CD-ROM Drive R92	► CD status: Button status (play, stop, etc.), eject button status, status of functions (repeat, scan, etc.)
Control Module for Navigation with CD-Mechanism J401	► Route info: Speed, direction of travel ► GPS: Satellites received, status of remote-feed GPS antenna OK, short circuit, open circuit ► GPS FIX: GPS information on satellite reception and position-finding ► Drive: Status of CD drive, incorrect or no navigation CD inserted, load eject error, CD drive overheating ► Status of navigation CD ► Longitude corrected: Arc degree, arc minute, arc second ► Latitude corrected: Degree of longitude, minute of longitude, second of longitude ► Height and angle of direction corrected: Height in meters, angle of direction in degrees ► GPS date: Day, month, year or “invalid” if there is not GPS reception ► GPS time: Hour, minute, second or “invalid” if there is not GPS reception ► Front axle distance pulses, status ► GPS level 1: Satellite ID with best and second-best reception ► GPS level 2: Satellite ID with third-best reception

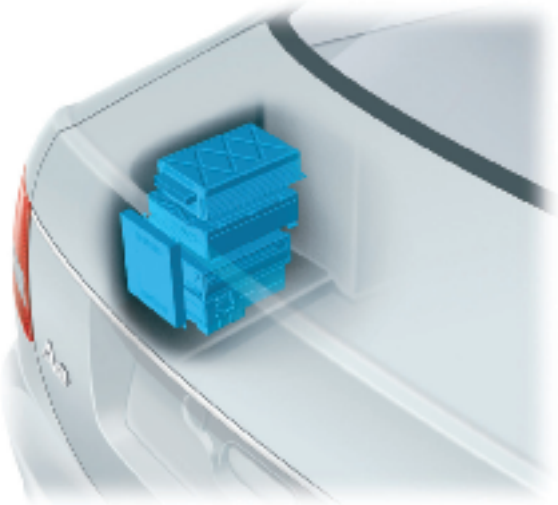
Coding Variants of the Front Information Display Control Head Control Module J523

Versions: Basic, Basic Plus, and Basic Navigation

Decimal Place	Description
1	Country version: D, GB, USA, F, E, 1, P
2	Equipment: ACC, Internal light package. Acoustic parking system, front
3	Equipment: Acoustic parking system, rear, Tire pressure control system, Air suspension
4	Equipment: Seat memory, front/rear, Left-hand drive
5	Equipment: Standard sound system installation. Body variant. Leather equipment
6	Equipment: On-board computer
7	Reserved

Infotainment Control Module Holder

The control modules responsible for Infotainment are mainly stored in a compact holder behind the left wheel cut-out in the trunk. Only the Front Information Display Control Head Control Module J523 is installed in the instrument panel, either in a visible position in the glove compartment (Basic version) or behind the glove compartment (High version). The Telephone Amplifier R86, is located in the rear right wheel well.



Reference

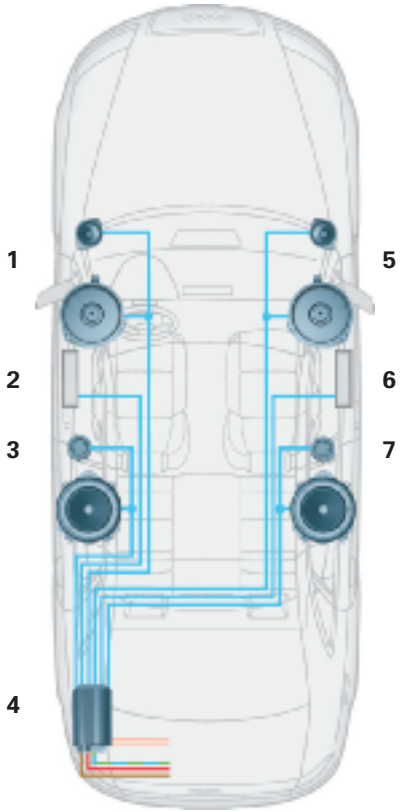
Please refer to the relevant Repair Manual for details of the exact individual installation positions.

Two radio systems will be available for the 2005 Audi A6. The standard equipment radio will have an external 7-channel DSP amplifier. The Digital Sound System Control Module J525, which is integrated with the MOST bus.

It controls the three-way systems in the front doors, the two subwoofers in the front doors, the 2-way systems in the back doors, and the center loudspeaker in the instrument panel.

An optional audio package will feature the Bose Premium Surround Sound system with noise compensating AudioPilot.

A central subwoofer is no longer installed in the rear trunk compartment. The bass frequencies, which cannot be localized for the human ear, are amplified by the two tuners in the front doors and are used to round off the audio pattern in the interior of the vehicle



1 **Left Front Midrange Speaker R26**
2 **Bass speaker, left front R21**
3 **Treble speaker, left rear R14 and Left Rear Mid/Low Range Loudspeaker R159**
4 **Digital Sound System Control Module J525**
5 **Right Front Midrange Speaker R27**
6 **Bass speaker, right front R23**
7 **Treble speaker, right rear R16 and Right Rear Mid/Low Range Loudspeaker R160**

Standard Sound System Diagnosis

The diagnosis process is affected via Address Word 47. However, the separate Digital Sound System Control Module, J525, is now addressed. In addition to reading the Measuring Value Blocks and the Fault Memory for all loudspeaker channels involved, selective Output Checks are also available. The Digital Sound System Control Module J525 participates in component protection. (Geko)

Measuring Value Block	Designation
01	General: Battery positive voltage, terminal status
02	MOST: MOST address, FOT temperature, optical lowering (0 dB, -3 dB)
03	Status of ring break diagnosis line
04	System: Analog/digital unit temperatures in amplifier, fan speed
05	Microphone: voltage readings at microphone inputs
50	Control unit identification: Year of manufacture, manufacturer code
51	Control unit identification: Serial number

Available Output Checks

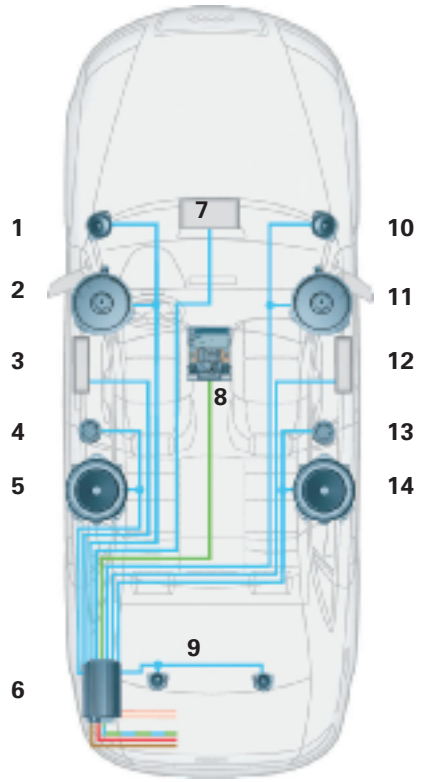
No.	Designation	Actuator	
		Sequential	Selective
1	Left front midrange speaker	X	X
2	Right front midrange speaker	X	X
3	Treble speaker, left rear (00876)	X	X
4	Left rear mid/low range loudspeaker	X	X
5	Treble speaker, right rear (00877)	X	X
6	Right rear mid/low range loudspeaker	X	X
9	Bass speaker, left front (00870)	X	X
10	Bass speaker, right front (00871)	X	X

BOSE Premium Surround Sound System

The 2005 Audi A6 has the Bose Premium Surround Sound System optionally available equipment. It will come equipped with Audio Pilot.

The division of the subwoofers integrated in the front doors means that the 7-channel DSP Bose amplifier must provide an additional output for the second subwoofer driver in the right front door. A line-out output from the amplifier is used for this purpose. The output signal feeds an external 100-watt driver.

With the introduction of the Avant model, a new Bose amplifier will be introduced. In the news system, all eight drivers for the Bose system will be integrated in the amplifier.



1 Treble speaker, left front R20
2 Left Front Midrange Speaker R103
3 Bass speaker, left front R21
4 Treble speaker, right front R14
5 Left Rear Mid/Low Range Loudspeaker R159
6 Digital Sound System Control Module J525
7 Center Mid/High Range Loudspeaker R158
8 Microphone Unit (in front roof module) R164
9 Loudspeaker (in parcel shelf) R150
10 Treble speaker, right front R22
11 Right Front Midrange Speaker R104
12 Bass speaker, right front R23
13 Treble speaker, right rear R16
14 Right Rear Mid/Low Range Loudspeaker R160

BOSE sound system diagnosis

Diagnosis of the BOSE sound system is also performed using the Address Word 47 in the Scan Tool.

A basic setting is not required.

The available output checks can be performed either selectively or sequentially.

The AudioPilot microphone, which is integrated into the BOSE sound system, can be used to absorb the acoustic pressure produced during the loudspeaker actuator tests and display this on the Scan Tool as a voltage signal. If a voice operating system is installed, the microphone for this is also included in the test. The technician then must compare this voltage reading with a default reading set at the factory and evaluate the completed test as either OK or Not OK.

Note

Always note the exact part numbers when replacing components of the BOSE sound system!

Bose Sound System Diagnosis

Address Word 47

Measuring Value Block	Designation	
	01	General: Battery positive voltage
	02	MOST: MOST address, FOT temperature
	03	Status of ring break diagnosis line
	04	System: Analog/digital unit temperatures in amplifier, fan speed
	05	Microphone: Microphone voltage(s) for AudioPilot microphone and optical microphone for voice operating system
	50	Control unit identification: Manufacturer code
	51	Control unit identification: Serial number

Available Output Check Diagnosis

No.		Designation	Actuator	
			Sequential	Selective
1	R21	Bass speaker, left front (00870)	X	X
2	R23	Bass speaker, right front (00871)	X	X
3	R20	Treble speaker, left front (00874)	X	X
4	R22	Treble speaker, right front (00871)	X	X
5	R14	Treble speaker, left rear (00876)	X	X
6	R16	Treble speaker, right rear (00877)	X	X
7	R103	Left front midrange speaker (00419)	X	X
8	R104	Right front midrange speaker (00420)	X	X
9	R158	Center mid/high range loudspeaker	X	X
10	R150	Loudspeaker (in parcel shelf)	X	X
11	R159	Left rear mid/low range loudspeaker	X	X
12	R160	Right rear mid/low range loudspeaker	X	X
13		Fan in control module		X
14	J525	Self-test for digital sound system module		X

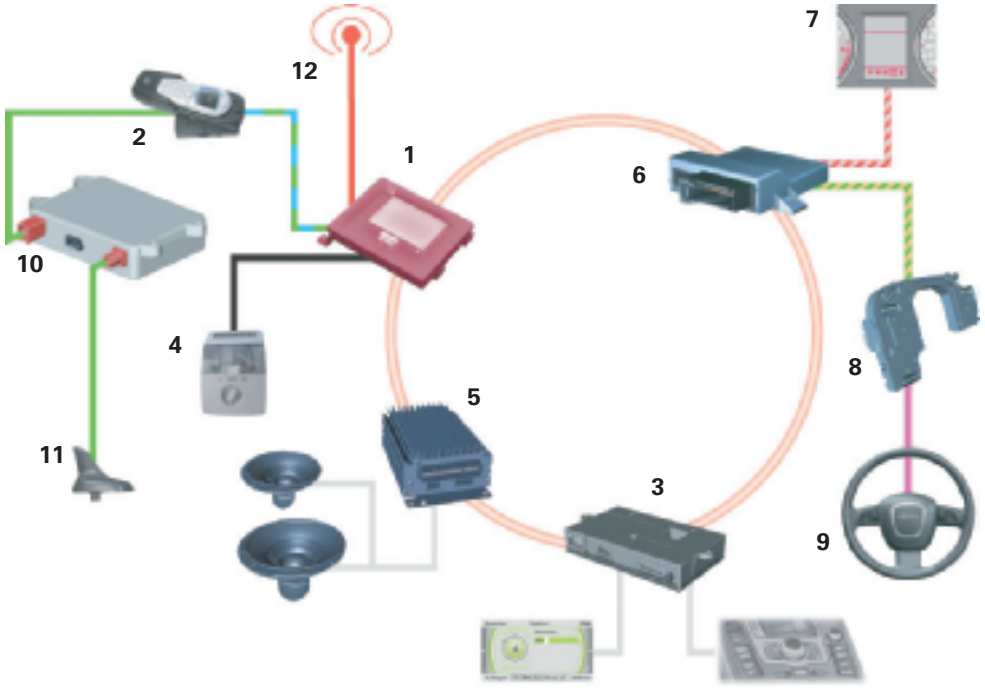
Cell Phone Preparation

Cell phone preparation will be offered as standard equipment in the 2005 Audi A6.

It includes a customer “Cradle” that will now be compatible with cell phones using Bluetooth technology. However, you may also use call phones that don’t have the Bluetooth capability.

The dealer-installed cell phone “cradle” has similar functionality to the system in the 2003 Audi A8L but has been incorporated into the MOST Infotainment data bus.

Using the cell phone while it is mounted in the “cradle” allows the phone to be charged and takes advantage of the vehicle antenna system located in the rear window.



1 Telephone Transceiver R36
2 Telephone Baseplate
3 Front Information Display Control Head Control Module
4 Left Front Microphone R140
5 Digital Sound System Control Module J525 Basic or BOSE Sound System
6 Data Bus On Board Diagnostic Interface J533
7 Control Module With Indicator Unit in Instrument Panel Insert J285
8 Steering Column Electronic Systems Control Module J527
9 Control Module For Multi-function Steering Wheel J453
10 Telephone Amplifier (Compensator) R86
11 Antenna for Navigation System (GPS) R50
12 Bluetooth Antenna R152

The baseplate (cradle) is operated via the MMI in the "TEL" menu. The Telephone Baseplate R126, is required for whichever type of cell phone is to be used. It is connected to the Telephone Transceiver and receiver R36 via a contact panel.

The Telephone Transceiver R36 is fitted as standard with a Bluetooth module. Bluetooth functionality is always available, even if a mobile phone holder is not connected. The phonebook stored on the mobile phone SIM card is read into the memory of the Telephone Transceiver R36 whenever the mobile phone is inserted.

Voice Operation

Cell phones can be voice-operated using the Control Unit in the Steering Wheel E221. The handsfree volume can also be set using the multi-function steering wheel and names or telephone numbers can be dialed in the phonebook. The Control Unit in Steering Wheel E221 passes the data signals for this on to the Electronic System Control Module J527 as LIN signals. This control module converts the data into CAN messages and transfers these messages to the Data Bus On Board Diagnostic Interface J533 on CAN Convenience. Here, the digital data messages are converted into MOST data records and are passed to the Telephone Transceiver R36 via the MOST ring. The adapter set always includes a Push-to-talk button (PTT), which enables voice operation even without the multi-function steering wheel option. This button is included on every available mobile phone adapter.

The PTT button has different functions, depending on the MMI used:

- MMI High: Accept/Hang-up
- MMI Basic/Basic Plus/Basic Navigation:
  Accept/Hang-up
  Activate internal voice operation of the Telephone Transceiver R36

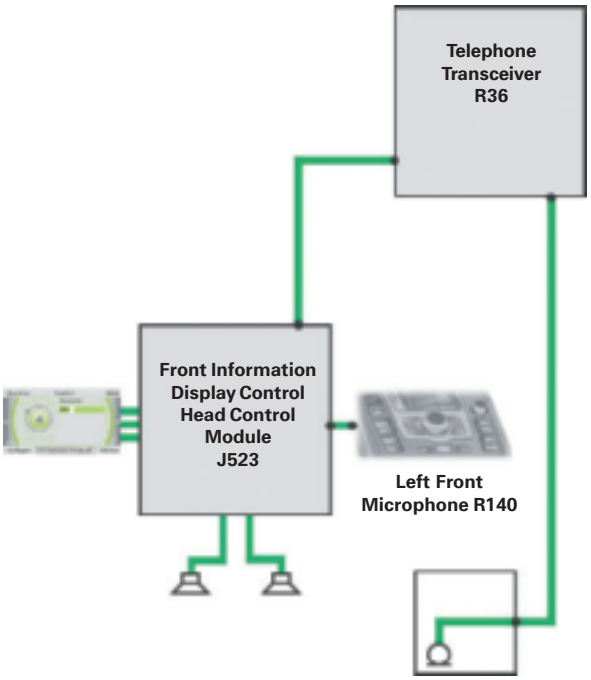
Voice operation in the MMI High version is implemented via the optional Speech Input Control Module J507.

Handsfree Operation

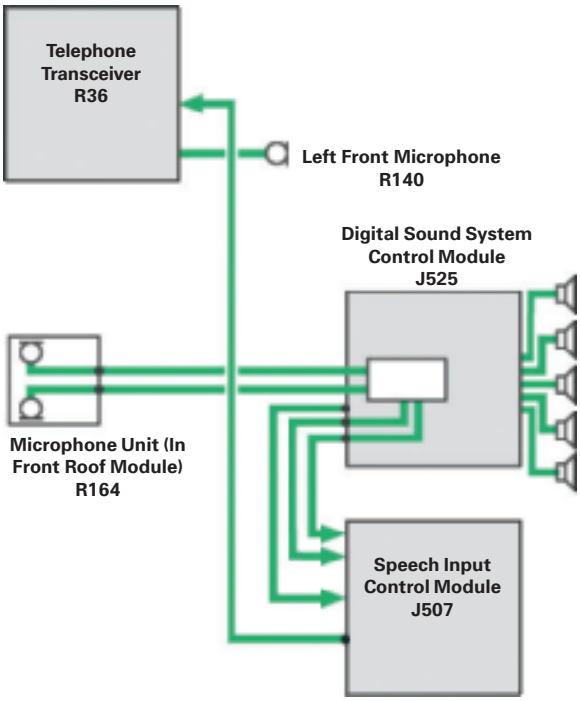
The Telephone Transceiver R36 sends the signals for handsfree operation (Voice, Phone Mute, etc.) via the MOST Infotainment bus to the relevant sound system, which is either integrated into the Front Information Display Control Head Control Module J523 or the independent Digital Sound System Control Module J525. Here, the digital data is converted into analog data and is output on the loudspeaker.

Echo and Noise Compensation

The Telephone Transceiver R36 has a DSP-based echo compensation system. If the optional voice operating system is also ordered, the echo and noise compensation function of the Speech Input Control Module J507 is used. This results in an improved handsfree quality, even for the passenger.



Microphone arrangement in the MMI versions Basic, Basic Plus and Basic Navigation



Microphone arrangement in the MMI High version

Mobile Baseplate (Cradle) Diagnosis

The mobile baseplate (cradle) is diagnosed using the Address Word 77 in the Scan Tool. A selective or sequential Output Check can be performed to check the output of the audio signal to the relevant sound system, radio mute operation, and whether or not a switched-on phone was detected.

Measuring Value Blocks

Measuring Value block	Designation
01	General: Battery positive voltage
02	MOST: MOST address, FOT temperature
03	Status of ring break diagnosis line
05	Input signals: PTT< Mobile inserted, Mobile switched on, Communication active
10	Reception field strength of the mobile phone
11	Status of external antenna for mobile baseplate
14	Currently connected Bluetooth devices
19	Microphone: Microphone voltage, microphone power consumption
20	Number of bonded (Known) bluetooth devices
48	Cut-off level of energy management control module J644
80	Control unit identification: Manufacturer codes
81	Control unit identification: Serial number
130	Status of Bluetooth antenna

Output Check Diagnosis

The output checks listed in the table can be activated using the Guided Fault-Finding function of the Scan Tool. Most of these can be activated selectively.

Possible Output Checks

No.	Designation	Actuator	
		Sequential	Selective
1	"Phone on" signal	X	X
2	Audio lead adapter set		X
3	Communication lead to adapter set		X

Mobile Baseplate (Cradle) Adaptation

Adaptation channel	Designation
128	Basic audio volume
129	Mobile after-run time, from 30 seconds to 30 minutes in seven intervals
130	Reference channel wait time for synchronization with audio components
131	Microphone-sensitivity
133	Bluetooth on/off
134	Bluetooth: Handsfree operation only with mobile phone inserted
135	Change bluetooth PIN
136	Beep Delay value: Time gap between pressing button and acknowledgement beep

Notes

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)

Audi of America, Inc.
3800 Hamlin Road
Auburn Hills, MI 48326