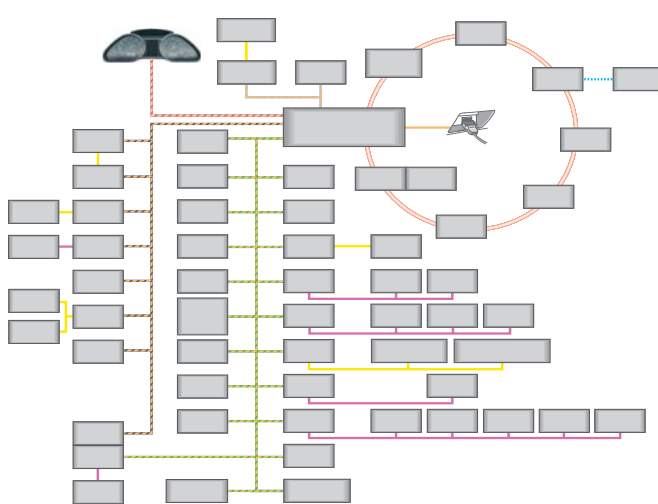




The Audi Q7 Electrical System

Self-Study Program 994603

Audi of America, Inc.
Service Training
Printed in U.S.A.
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Overview 1

Fuses and relays.....	3
Overview of control modules installation	4
Networking	6

Control Modules 9

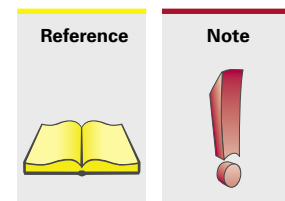
Data Bus On Board Diagnostic Interface J533	9
Instrument Cluster Control Module J285	10
Vehicle Electrical System Control Module J519.....	12
Battery and energy management	14
Battery	22
Generator	24
Front exterior lights	28
Rear exterior lights	29
Vehicle Electrical System Control Module 2 J520	31
Access/Start Control Module J518	32
Door control modules	37
Memory Seat/Steering Column Adjustment Control Modules J136 and J521 ..	38
Comfort System Central Control Module J393	41
Comfort System Central Control Module 2 J773	44
Panorama Sunroof	47
Rear Lid Control Module J605 and Rear Lid Control Module 2 J756	53

Self-Study Programs for the Audi Q7 55

The self-study program provides introductory information regarding the design and function of new models, automotive components or technologies.

The self-study program is not a Repair Manual!
All values given are intended as a guideline only and refer to the software version valid at the time of publication of the SSP.

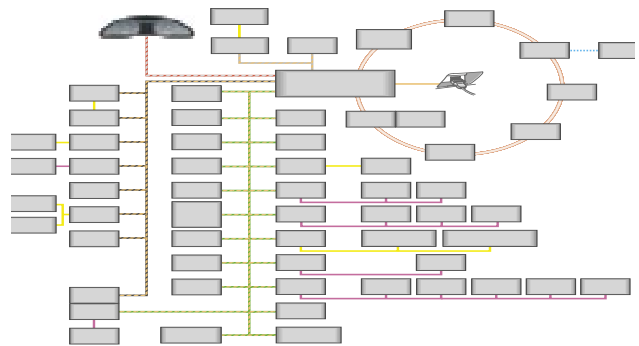
For maintenance and repair work, always refer to the current technical literature.



Electrical System Innovations

The number of electronic control modules has rapidly increased in recent years. Most innovations are made possible by increasingly powerful electronics. Without this development, many comfort features of the vehicle that are taken for granted would have been impossible to implement.

To offer customers this variety of functions and equipment options, various electronic control modules are required throughout the Audi Q7. The control modules do not function as separate, independent units; they are linked via powerful bus systems. Depending on the amount of data to be exchanged, the MOST bus, an optical data bus, a CAN bus or a LIN bus is used. Data is also exchanged across the various bus systems. A separate control module provides the interface between the various systems. Therefore, each control module efficiently receives information and vehicle operating variables that it requires to function.



364_006

This Self-Study Program provides you with the network topology of the Audi Q7 and gives you an overview of the location of each electronic component in the vehicle. You will be given service-relevant information on the control modules, learn their installation location, and become familiar with the tasks of the individual control modules. This program provides a quick and efficient means to obtain a comprehensive understanding of the electronics in the Audi Q7.



364_029

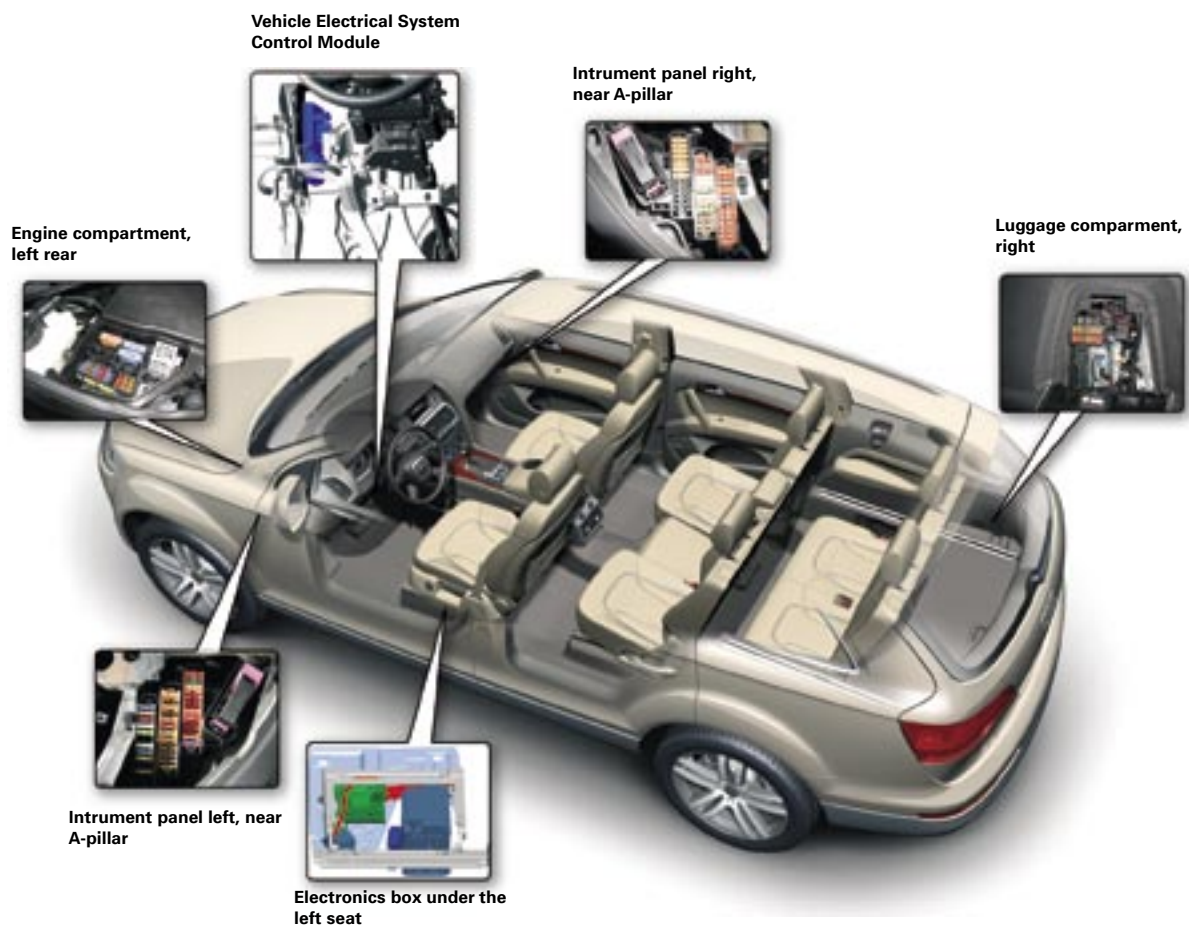
Overview

Fuses and relays

Fuse and electrical boxes

In the new Audi Q7, the fuse and relay holders are located in the following areas:

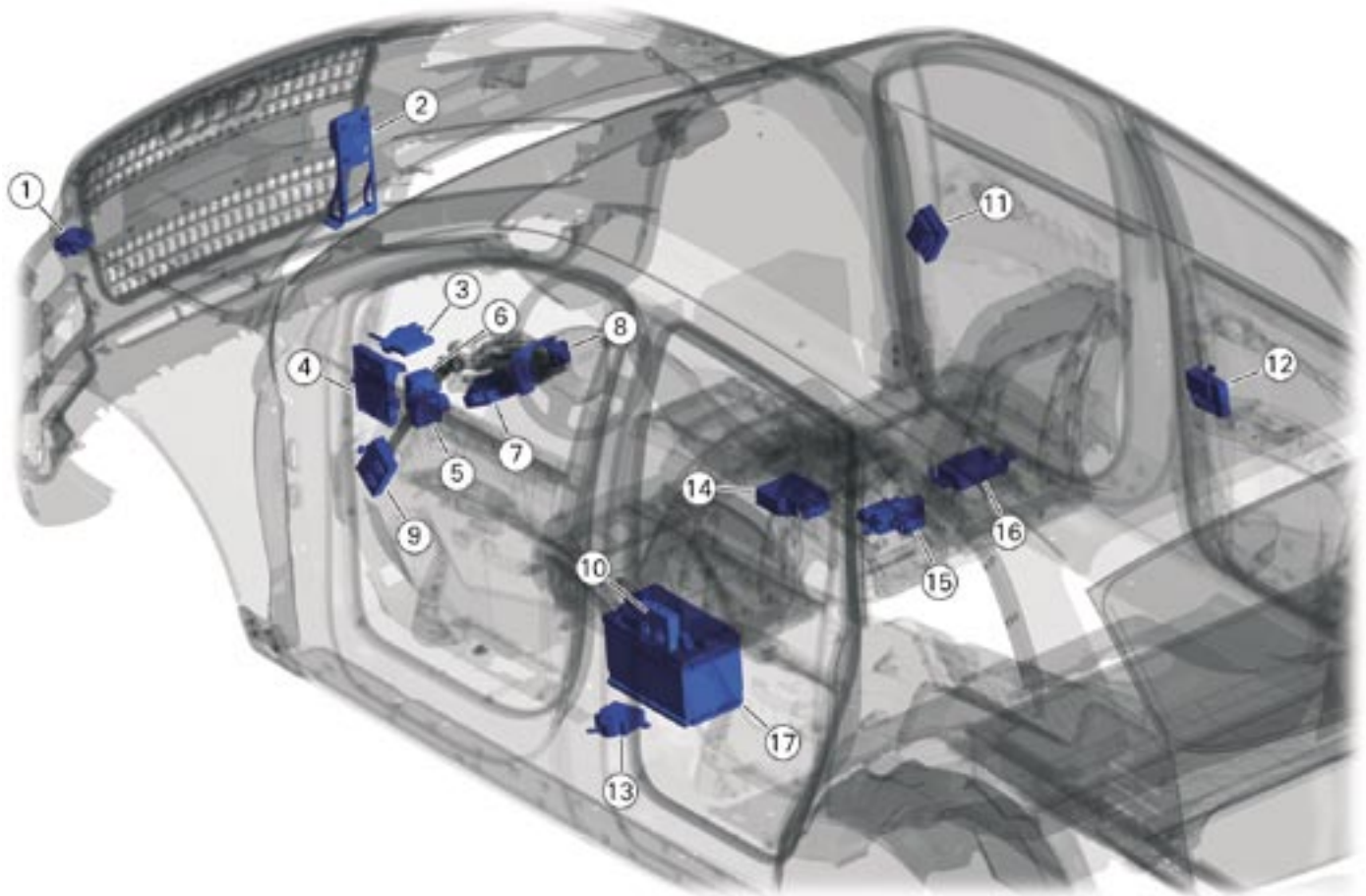
- Instrument panel, left and right, near the A pillar
- Engine compartment, left rear
- Vehicle Electrical System Control Module
- Electronics box under the left seat
- Luggage compartment, right



361_094

Overview

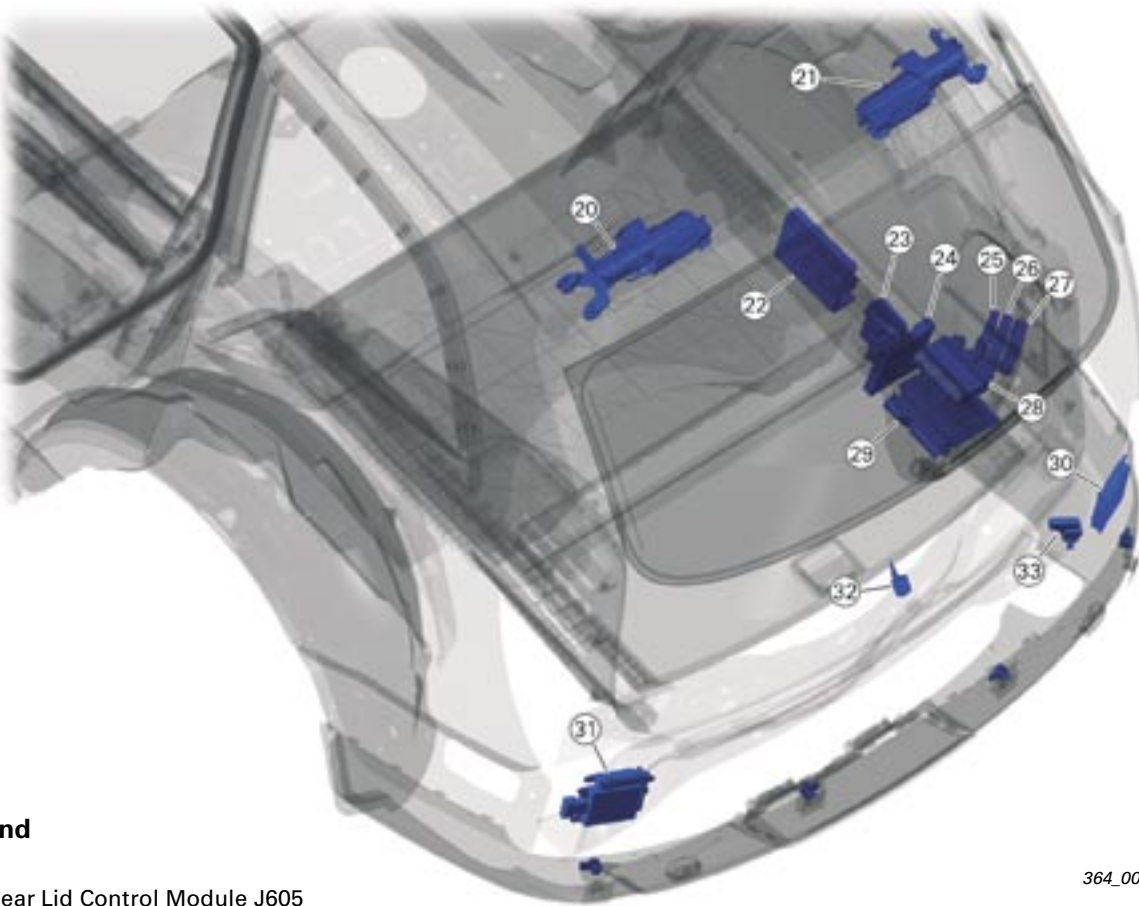
Overview of Control Module Installation



Legend

364_004

- 1 Garage Door Opener Control Module J530
- 2 Distance Regulation Control Module J428
- 3 Data Bus On Board Diagnostic Interface J533
- 4 Vehicle Electrical System Control Module J519
- 5 Headlight Range Control Module J431
- 6 Tire Pressure Monitoring Control Module J502
- 7 Access/start Control Module J518
- 8 Steering Column Electronic Systems Control Module J527
- 9 Driver's Door Control Module J386
- 10 Left Rear Door Control Module J388
- 11 Front Passenger's Door Control Module J387
- 12 Right Rear Door Control Module J389
- 13 Energy Management Control Module J644
- 14 Airbag Control Module J234
- 15 Vehicle Electrical System Control Module 2 J520
- 16 Passenger Memory Seat Control Module J521
- 17 Battery A



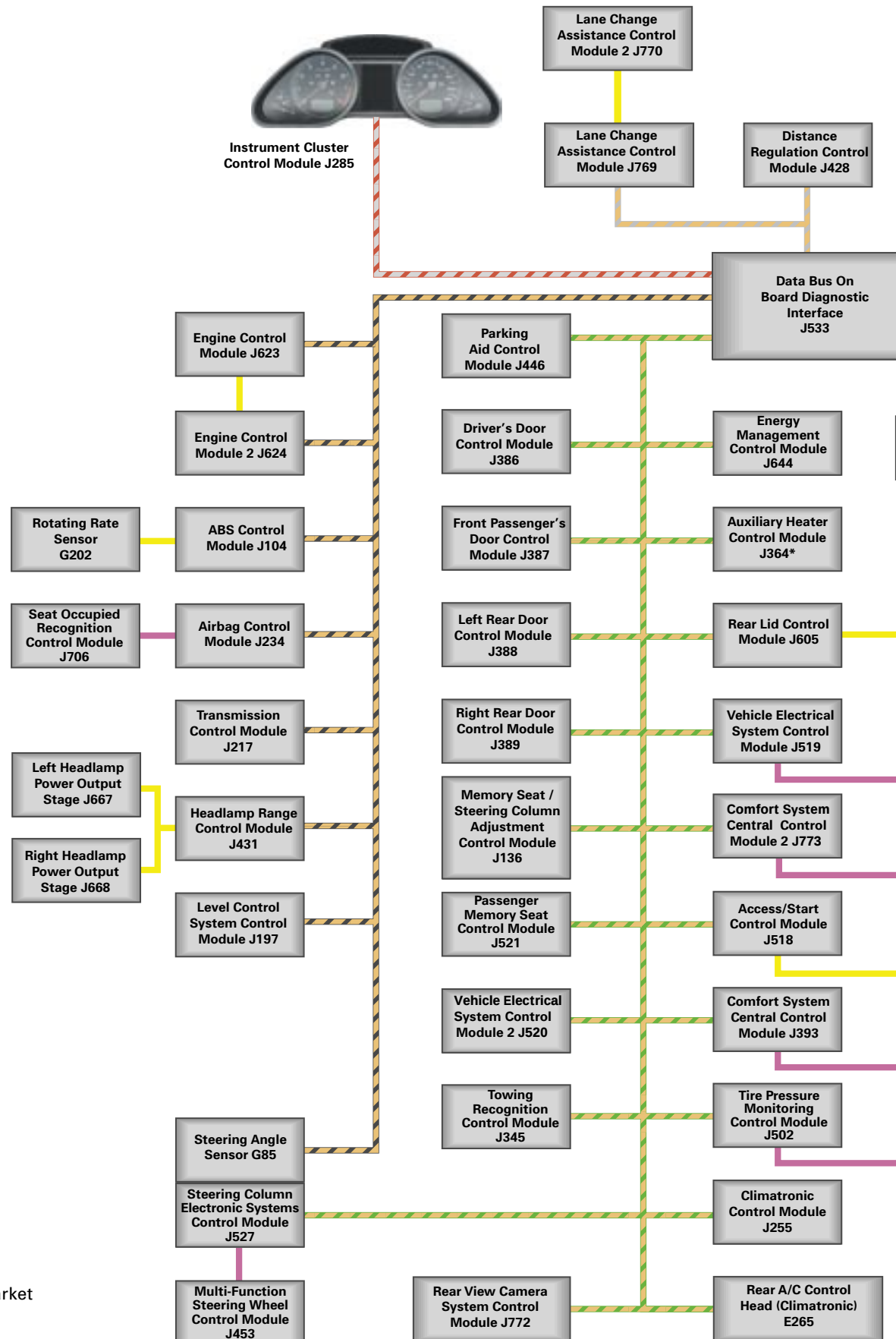
Legend

- 20 Rear Lid Control Module J605
- 21 Rear Lid Control Module 2 J756
- 22 Rear View Camera System Control Module J772
- 23 Comfort System Central Control Module 2 J773
- 24 Comfort System Central Control Module J393
- 26 Keyless Access Authorization Antenna Reader J723
- 27 Parking Aid Control Module J446
- 28 Towing Recognition Control Module J345
- 29 Level Control System Control Module J197
- 30 Lane Change Assistance Control Module J769
- 31 Lane Change Assistance Control Module 2 J770
- 32 Rear View Camera R189

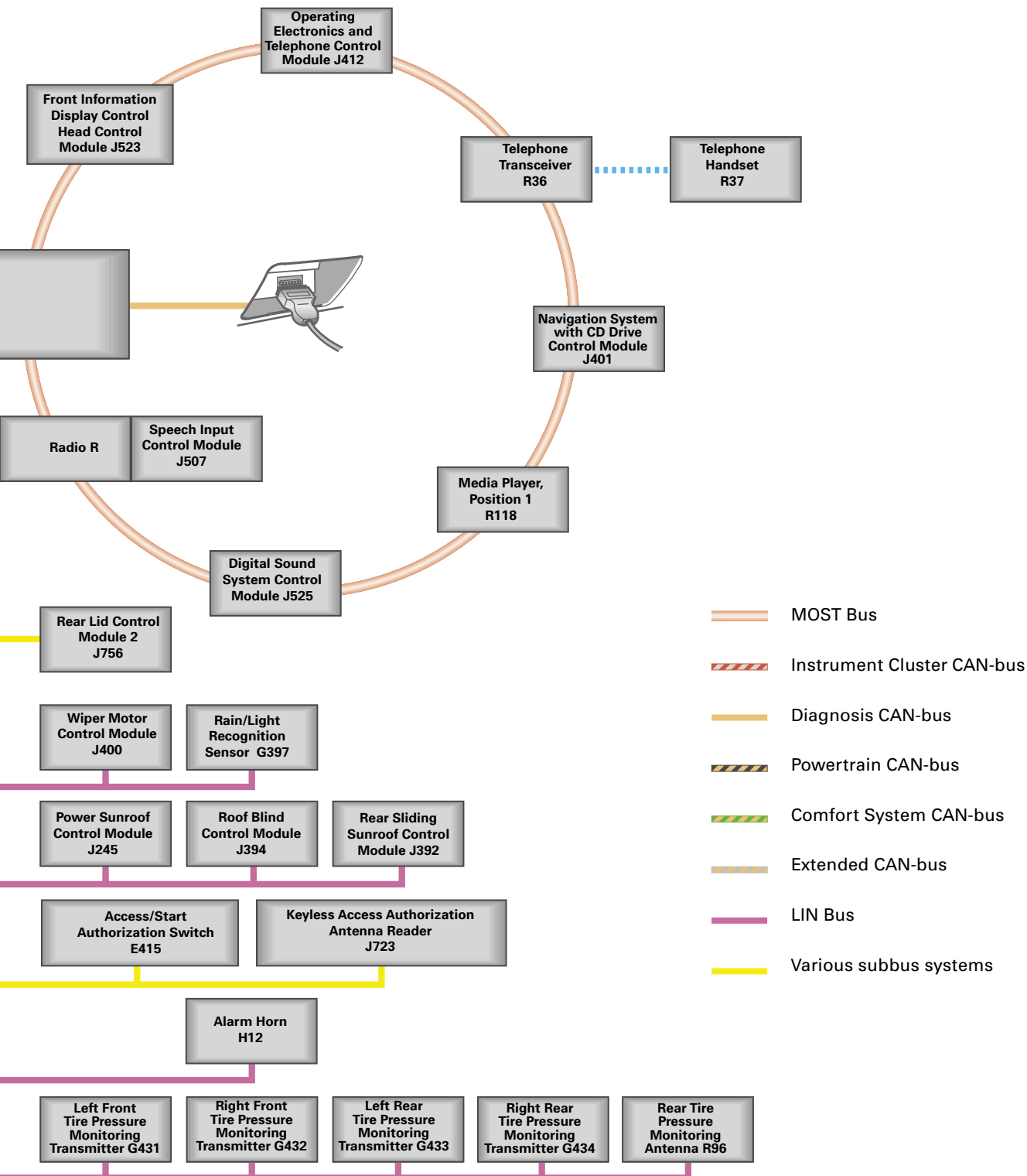
364_005

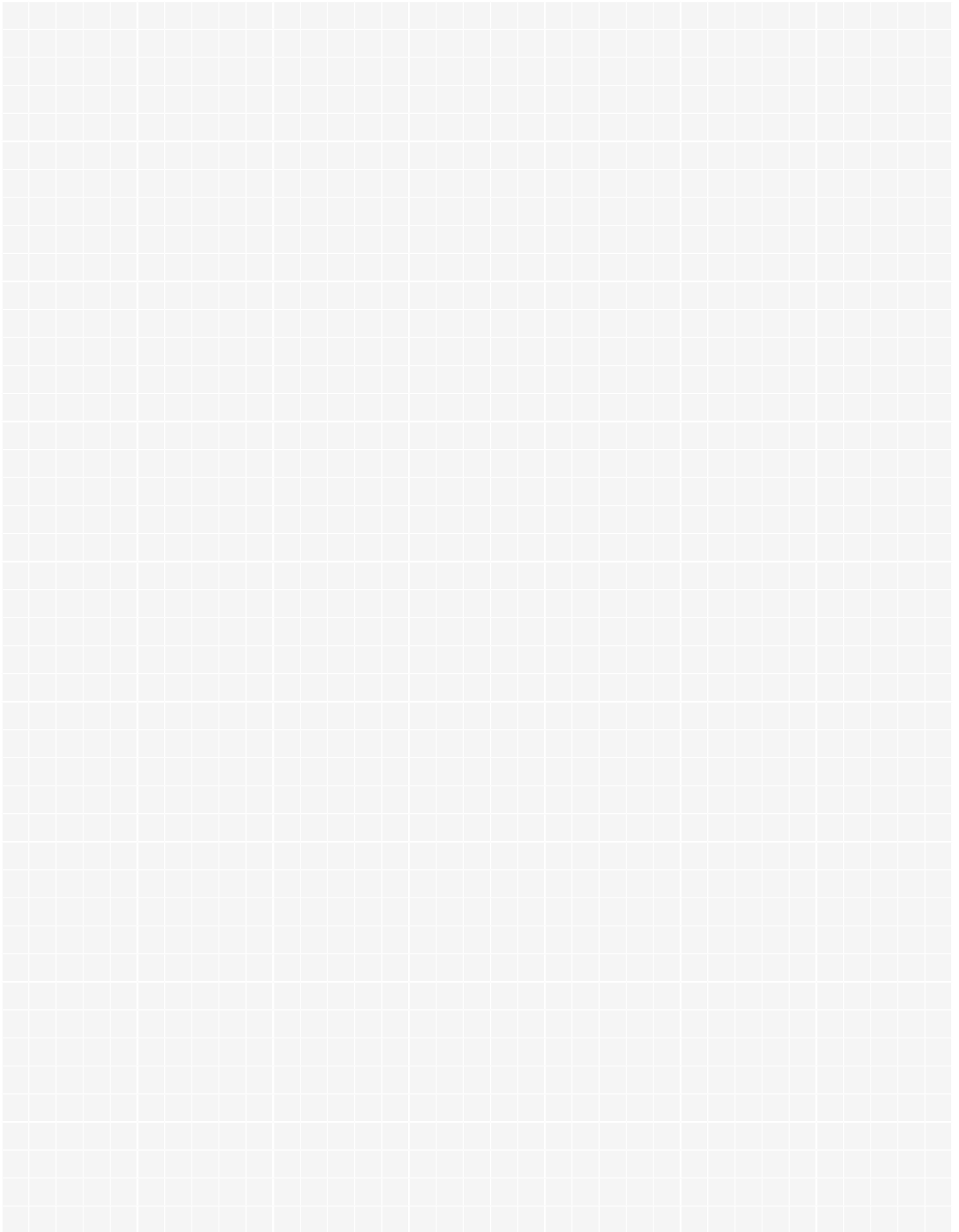
Overview

Networking



* Not for the American market





Data Bus On Board Diagnostic Interface J533

Changes when compared to the 2005 Audi A6

The Data Bus On Board Diagnostic Interface of the Audi Q7 has more powerful hardware and a new processor. This upgrade was necessary due to the increasing number of messages that have to be routed between the various bus systems.

Master functions

- Terminal 15 - for the Powertrain CAN-bus
- Sleep and wake-up mode of the data bus systems
- Ring break diagnosis of the MOST bus
- Gateway Installation List



364_007

Variants

Two different versions of the Audi Q7 Data Bus On Board Diagnostic Interface are available. Their part numbers differ only by the index. The difference between the two variants is the availability of a CAN-bus extended connection. This connection is required when Adaptive Cruise Control (ACC) or a lane change assistance system (Audi Side Assist) is installed in the vehicle.

Installation location

The Data Bus On Board Diagnostic Interface J533 is attached to a mounting bracket behind the instrument cluster on the left side.



364_008

Instrument Cluster Control Module J285



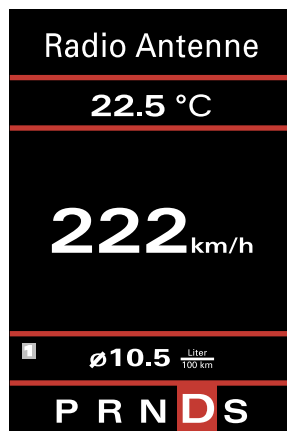
364_009

Instrument Cluster Control Module J285 is similar to the cluster used in the 2005 Audi A6. It has been functionally adapted to the new features of the Audi Q7.

A new feature in the instrument cluster is the pneumatic suspension level indicator. This indicator appears in the center display when an automatic level change is performed. This occurs for example when a speed threshold is exceeded and the lift mode is exited, resulting in a lower suspension level. The driver can however permanently display the level indicator, by clicking the reset button of the Driver Information System to the corresponding level.

The Audi Q7 does not have an electromechanical parking brake; it has a foot operated mechanical parking brake. A switch mounted on the actuating lever is monitored by the Instrument Cluster Control Module J285. When the switch is actuated, the ground is connected and the corresponding warning light is activated in the instrument cluster.

Another new feature has been implemented in the Driver Information System. The driver can digitally display the current vehicle speed. To do so, the reset button of the Driver Information System must be pressed until the corresponding level is reached.



364_010

Inputs

- Oil pressure switch
- Oil temperature and oil level sensor
- Radio controlled clock signal
- Brake lining wear indicator wire
- Fuel gauge sensor 1 and fuel gauge sensor 2
- Low washer fluid indicator switch
- Low brake fluid indicator switch
- Parking brake applied identification switch
- Outside temperature sensor
- Auto-check button
- Terminal 30
- Terminal 31

Outputs

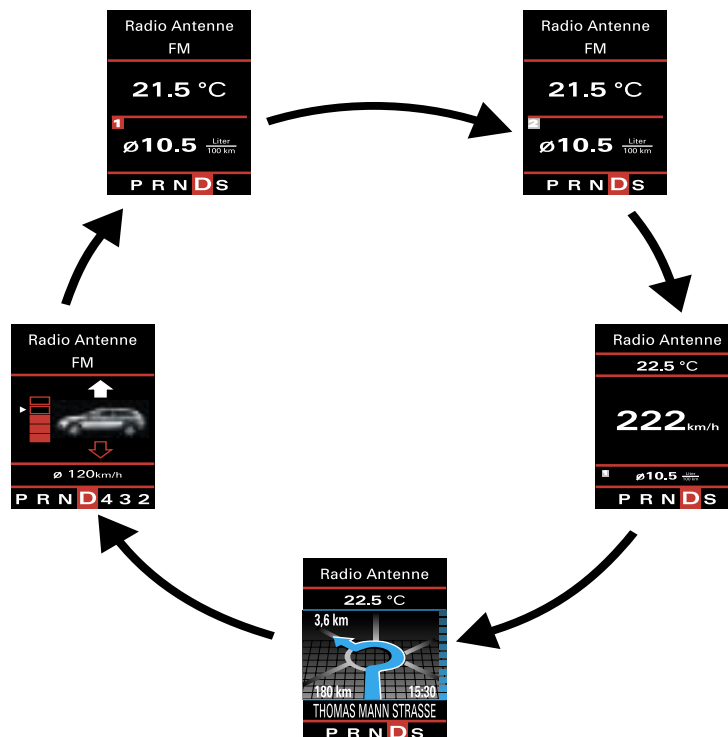
- Radio controlled clock power supply
- Terminal 58d (display lighting)
- Terminal 58s (switch lighting)

Variants

Two versions of the Instrument Cluster are used in the Audi Q7 depending on whether the vehicle has Adaptive Cruise Control or not.

Inputs and outputs

- CAN-bus lines of the Instrument Cluster CAN-bus
- Wake-up line between Onboard Diagnostic Interface J533 and the instrument cluster when the ignition is switched off ("terminal 15 off")

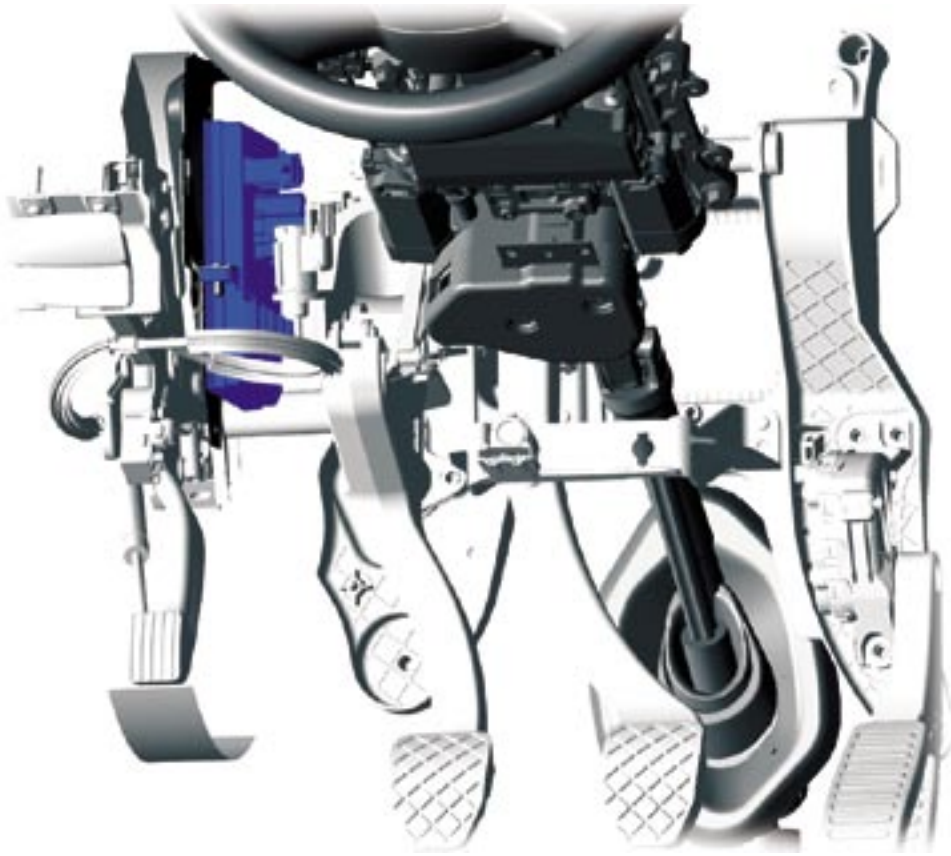


Control Modules

Vehicle Electrical System Control Module J519

Installation location

The Vehicle Electrical System Control Module J519 is installed at the front left side of the passenger compartment, on the control module bracket next to the steering column.



364_013

Reference



For more information on this component, please refer to the Self-Study Programs:
996303 - Distributions functions,
999303 - A8L Electrical Components and
994403 - The 2005 Audi A6 Electrical Systems.

Master functions

- Exterior light control
- Coming home / leaving home
- LIN master for Wiper Motor Control Module J400
- LIN master for Rain/Light Recognition Sensor G397

Replacement master function

In case of failure of the Comfort System Central Control Module J393, the Vehicle Electrical System Control Module J519 takes over the master function. It sends the turn signal information to the CAN-bus.

Additional functions

- Voltage-encoded reading of the Light Switch E1
- Side marker light control in the Light Switch E1
- Electrical steering column adjustment
- Activation of footwell lighting for the driver and front passenger's side. The type of lighting (LED or conventional bulb) can be encoded in the Vehicle Electrical System Control Module.
- Selector Gate light activation
- Daytime Running lights activation
- Front and Side Turn Signals activation
- Horn activation
- Activation of Windshield and Rear Window Washer Pump V59
- Headlight Washer System activation
- Activation of Rear Window Wiper Motor V12
- Steering Column Adjustment Memory
- Easy Entry Steering Column Adjustment

Emergency functions

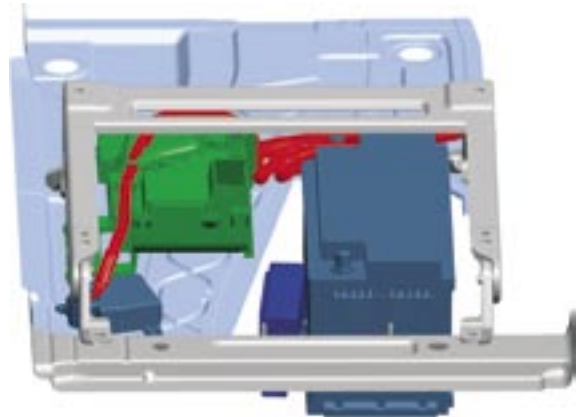
If a fault in the Light Switch E1 or an open circuit in the wire to the Light Switch E1 is detected, the Vehicle Electrical System Control Module automatically turns the lights on continuously. If the light control is faulty, the lights are switched on continuously by the Vehicle Electrical System Control Module J519.

Control Modules

Battery and energy management

Installation location

The Energy Management Control Module J644 is installed below the left seat next to the battery case.



Energy Management Control Module J644

364_014

Quick Idle Current Measurement

Quick Idle Current Measurement can be performed in the Guided Fault Finding or Guided Functions modes, under "61 Battery Control – Idle Current Measurement with the Energy Management Control Module J644."

The Energy Management System measures the idle current in approximately 15 minutes. If the idle current is high, a fault finding program can be started directly from this test program.

Reference



For more information about energy management, please refer to the Self-Study Programs:
999303 - A8L Electrical Components and
994403 - The 2005 Audi A6 Electrical Systems.

Evaluation of history data

The history data contains recorded information about the onboard power supply.



Reference

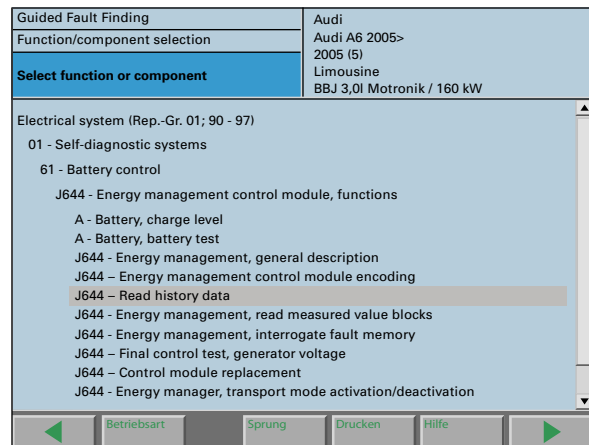
For more information, please refer to the Self-Study Program: 994403 - The 2005 Audi A6 Electrical System.

Data records

The data can be read with the Guided Fault Finding or Guided Functions under "61-Battery control."

The following data records are available:

- Idle voltage history
- Idle current history
- Critical energy balance
- Power-down level history
- Battery change history
- Energy balance of the last 5 trips
- Energy balance of the last 5 downtimes
- Date/time programming in the instrument cluster



326_123

Structure of data records

Idle voltage history

In the idle voltage history, the battery voltages that fall below the following values can be read:

- 12.5 V
- 12.2 V
- 11.5 V

The last 4 entries, also called "time stamp", are displayed.

Display on the Scan Tool

Idle voltage less than 12.5 V: 46 hours
Idle voltage less than 12.2 V: 18 hours
Idle voltage less than 11.5 V: 9 hours

Display of the entire duration of voltage that fall below each voltage threshold

Idle voltage history (raw data) =

2005-06-28, 10:12:00 * 0005 * 001 **
2005-06-14, 12:45:00 * 0001 * 001 **
2005-05-24, 10:26:00 * 0004 * 001**
2005-05-17, 11:08:00 * 0002 * 001* 00046***

Last four values for idle voltage < 12.5 V
The most current value is at the top in this group.

2005-06-24, 11:12:00 * 0004 * 001 **
2005-05-16, 10:36:00 * 0002 * 001 **
2005-04-20, 12:56:00 * 0003 * 001**
2005-04-12, 16:03:00 * 0002 * 001* 00018***

Last four values for idle voltage < 12.5 V
The most current value is at the top in this group.

2005-06-28, 10:12:00 * 0002 * 001 **
2005-06-17, 18:49:00 * 0003 * 001 **
2005-05-20, 11:16:00 * 0001 * 001**
2005-04-22, 13:18:00 * 0002 * 001* 00009***

Last four values for idle voltage < 12.5 V
The most current value is at the top in this group.

Structure of data record

2005-06-28 , 10:12:00 * 0005 * 001 * 0012 **

2005-06-28	Date: year, month, day	Time stamp
10:12:00	Time: hours, minutes, seconds	
0005	Time in hours during which the voltage falls below the corresponding threshold, e.g. 12.5 V	
001	Battery number	
0012	Total hours voltage falls below the threshold.	
This total can be higher than the total of the last 4 entries since all instances where the voltage falls below the corresponding voltage threshold are counted for the installed battery.		

Extended durations with voltage below 12.2 V and 11.5 V are particularly critical. Below these voltages, the battery is unable to regenerate. The battery can then be damaged by long periods of downtime. If extended durations with voltage below 12.2 V and 11.5 V are identified, the battery must be tested.

The data is recorded under the following conditions:

- Terminal 15 off for at least 2 hours
- Comfort System CAN-bus in sleep mode
- Current draw less than 100 mA

Idle current history

The last 10 entries of the idle current history can be read.

Display on the Scan Tool

A high idle current was measured for a total duration of 136 hours.

Idle current history =

2005-06-27, 11:14:00 * 0001 hours 00.60 A, idle current
 2005-06-20, 13:36:00 * 0001 hours 00.70 A, idle current
 2005-06-18, 19:19:00 * 0004 hours 01.00 A, idle current
 2005-06-10, 14:12:00 * 0002 hours 00.60 A, idle current
 2005-05-30, 11:47:00 * 0003 hours 00.70 A, idle current
 2005-05-29, 12:03:00 * 0002 hours 01.20 A, idle current
 2005-05-21, 10:59:00 * 0005 hours 00.80 A, idle current
 2005-05-14, 16:52:00 * 0001 hours 01.00 A, idle current
 2005-04-20, 11:28:00 * 0004 hours 00.60 A, idle current
 2005-04-18, 10:07:00 * 0002 hours 00.70 A, idle current

The last 10 entries are displayed.

A high idle current was measured for a total duration of 136 hours:

The total duration of high idle current is indicated.

This value can be higher than the total of the last 10 entries since all instances of high idle current for the installed battery are counted. This entry is not required for the analysis. The evaluation of the last 10 entries is important.

2005-06-27, 11:14:00 * 00 hours 00, 60A, idle current

2005-06-27	Date: year, month, day	Time stamp
11:14:00	Time: hours, minutes, seconds	
00 hours	Time in hours during which the current was above the corresponding threshold	
00, 60A, idle current	Battery number	

The evaluation of extended events during which the idle current was exceeded is important. If 0 or 1 is displayed for the duration of the deviation, it means that the duration of the deviation is less than or equal to one hour.

High idle current can be caused by:

- The customer, when electrical equipment such as power supply units or vehicle refrigerators are plugged into the cigarette lighter supplied by terminal 30.
- The vehicle in the event of a fault.

If the vehicle has an excessively high idle current as a result of an awake bus system, no entry is made in the history data under "idle current history" since the data recording conditions are not met (the comfort system CAN-bus must be in sleep mode).

The recording conditions are:

- Terminal 15 off for at least 2 hours
- Comfort System CAN-bus in sleep mode
- Current draw greater than 50 mA

The 50 mA current threshold consists of the following elements:

- 25 mA max. allowable idle current
- 25 mA for possible charging of the anti-theft alarm sound system

When a test of the Quick Idle Current Measurement function is performed, 70 mA is output as the maximum permissible idle current. The difference results from an additional tolerance of 20 mA.

Control Modules

Critical energy balance

This data record is written only when the vehicle is in an energy critical state (failure risk). The data record is written when the Energy Management Control Module recognizes the state "vehicle cannot be started". The most current data record is displayed at all times.

Display on the Scan Tool

The data record is written only when the vehicle is in an energy critical state (failure risk).

00.05 A, average idle current	
19.75 A, average total current	
-10.73 A, current at time of history data entry	
17%, battery charge level	
03 mOhm, battery internal resistance	
+0118 Ah, energy throughput	
-00067 Ah, energy balance	
009624 km, mileage	
2005-06-13, 23:24:47 date and time	
Hazard warning off	Light status
Side marker light off	
Low beam off	
Fog lights off	
High beam off	
07.1 hours, terminal 15 on	Vehicle status
07.1 hours, data bus awake	
007.1 hours, last downtime	
00 number of data busses on/off cycles	
01 number of terminal 15 on/off cycles	
01 number of failure entries in the history data	
002 number of installed (replaced) batteries in the vehicle	

The data record is output in plain text. This makes the evaluation easier.

The "average total current" is the value from "Engine off" up to the "limit of startability". Therefore, it indicates the average current until an entry is made.

The "current at time of history data entry" indicates the current level at the moment the entry was made or at the moment the failure risk was detected.

The "battery charge level" is displayed at the time of triggering.

The "battery internal resistance" is displayed at the time of triggering. The battery internal resistance should always be less than approximately 10 mOhm. If the internal resistance is higher, the battery should be tested. It should be noted that the battery internal resistance rises quickly when charge level drops below 15-20%. When the battery is fully discharged, values up to 99 mOhm can be displayed.

Regarding the energy throughput, a battery can be expected to deliver approximately 60 x its rated capacity over its useful lifetime.

The energy balance is the battery input and output current balance. If more current flows from the battery than to the battery, the value is negative. If the battery is fully charged, 0 is displayed for the energy balance. As this value is constructed from an integration of the current values, it loses its relevance as the battery ages.

The light status and vehicle status can be used to identify if an electrical device was switched on or if the ignition was on at the time of the recording, i.e., at the failure risk.

The "number of failure entries" indicates how frequently the Energy Management Control Module has determined an energy critical balance that could cause starting problems.

The history data must be read quickly when there are problems. If a new "failure risk" is triggered by frequent ignition on/off cycles or short trips, the previous energy critical balance data will be overwritten by new data. This means that the data at the time of the complaint is overwritten and hence lost, which makes troubleshooting more difficult.

Display on the Scan Tool when no failure risk exists

There is no entry. The vehicle is not in a critical energy situation.

Power-down level history

The data of the last 15 power-down levels is entered in the power down level history

Display on the Scan Tool

Meaning of the data in the power-down level history:

Example:

2*2*-12.50*30*2003-10-31-10:10:25*0-0-0-0-0*06.5**

2 = power-down level 2 was set
 2 = reason the power-down level was triggered (2 = low battery level)
 -12.50 = average total current in Amp during the set power-down level
 30 = battery charge level (SOC = state of charge)
 2003-10-31 = date
 10:10:25 = time
 0 = hazard warning lights off (1 = hazard warning lights on)
 0 = parking light off (1 = parking light on)
 0 = side marker light off (1 = side marker light on)
 0 = low beam off (1 = low beam on)
 0 = fog lights off (1 = fog lights on)
 0 = high beams off (1 = high beams on)
 06.5 = duration of terminal 15 on in hours (engine was off during this time)

Power-down level history =

2*0*-04.57*77*2005-06-23, 14:02:19*0-0-0-0-0*03.1**

...
 ...
 ...

The last 15 entries are displayed

5*2*-10.76*21*2005-06-11, 10:38:45*0-0-0-0-0*06.7**

The data record is output in plain text. This makes evaluation easier.

Triggering reasons

- 0 = Current-related
- 1 = Charge level too low and/or battery internal resistance too high and/or capacitive loss Qv too high
- 2 = Starting-critical battery voltage at present discharge current
- 3 = 1 and 2 simultaneously
- 4 = Charge level < 30%
- 5 = 1 and 4 simultaneously
- 6 = 2 and 4 simultaneously
- 7 = 1, 2 and 4 simultaneously

Power-down levels are also entered in the fault memory. The difference with the history data is that the first activation of a power-down level is recorded in the fault memory in the 2003 Audi A8L and the 2005 Audi A6. In the Audi Q7, only the reference "energy management active" is entered when any power-down level is activated. The most recent value is always output in the history data.

Control Modules

Battery replacement history

The data from the 3 last battery replacements is saved in the battery replacement history. The entry in the history data is made when the battery energy management is encoded. It is therefore very important for the Energy Management Control Module J644 to be encoded only when a new battery is actually installed. Encoding deletes all history data. Once the history data is deleted, it will not be possible to perform a reliable test of the battery with the VAS 5051, among other things, since this test uses the history data.

Display on the Scan Tool

The battery replacement history contains a maximum of three data lines.

The evaluation of the data produced the following results:

Original battery serial number:
1401270070

2005-06-24, 12:03:17 date and time of the battery removal.

-00050 Ah, energy balance of the removed battery
-240 Ah, energy throughput of the removed battery

Additional data

The following information can be read with the "Additional data" button:

- Energy balance of the last 5 trips
- Energy balance of the last 5 downtimes
- Time programming in the instrument cluster

Energy balance of the last 5 trips

The energy balance and duration of the last 5 trips are logged.

Display on the Scan Tool

Energy balance of the last 5 trips =

+003.5 Ah, energy balance, trip duration in hours 000.7
+010.3 Ah, energy balance, trip duration in hours 002.3
+008.2 Ah, energy balance, trip duration in hours 001.2
+003.5 Ah, energy balance, trip duration in hours 000.5
+001.3 Ah, energy balance, trip duration in hours 001.2

Negative energy balances mean that the battery was discharged during the trip.

Reasons:

- Short trips
- Many powered-on electrical devices
- Low battery charge

In Audi vehicles, the generators are always designed in such a way that the battery can be discharged during a trip only under very poor operating conditions. This means that when there is a negative energy balance for a long time, the generator must be tested for proper function.

Energy balance of the last 5 downtimes

The energy balance and duration of the last 5 downtimes are logged.

Display on the Scan Tool

- 007.1 Ah, energy balance, downtime in hours: 034.0
- 009.5 Ah, energy balance, downtime in hours: 063.6
- 000.4 Ah, energy balance, downtime in hours: 001.2
- 002.1 Ah, energy balance, downtime in hours: 003.7
- 010.3 Ah, energy balance, downtime in hours: 004.3

A negative energy balance means that many powered on electrical devices were still on after the engine was switched off.

This data is very helpful when there is no data in the idle current history. It allows to figure out if the battery was loaded or discharged after the engine was switched off.

Data on the date/time programming in the instrument cluster

Display on the Scan Tool

Data for date/time programming in the instrument cluster:

The data record shows when and how frequently the date/time display in the instrument cluster was changed. In addition, you can check if the time was set correctly in vehicles without a radio controlled clock.

Number of date/time resets in the instrument cluster: 15

Each successive line consists of a pair of timestamps. The first timestamp of the pair shows the time in the instrument cluster before the reset. The second timestamp shows the time after the reset.

Reasons for a reset are:

1st reason: battery was disconnected
2nd reason: very low battery voltage

2005-06-29, 16:12:00*2005-06-30, 13:00:00
2005-05-01, 13:09:20*2005-05-01, 16:30:00
2005-04-03, 10:22:14*2005-04-03, 12:13:00
2005-02-11, 11:34:00*2005-02-13, 14:05:00
2005-02-01, 12:54:00*2005-02-01, 13:30:00

This data can be used to validate the time in the history log. The most recent value is always written in the top line of the history data. The date and the time of the Energy Management Control Module J644 are written according to this recent value. The date and time are provided by the instrument cluster on the Data Bus systems. If the date and time are incorrectly set, an old date may be written for a new entry.

Battery

The battery is located below the left seat to save space. Direct access to the battery is not necessary to charge it and to check its charge level. The battery is charged or outside current is applied through two jump start bolts in the engine compartment. The state of the battery is checked by the Energy Management Control Module J644. When the battery needs to be replaced or in order to check the acid level (for example during a service check), the seat can easily be folded up after removing two screws.

The choice of battery is based on the following items:

- Engine
- Equipment
- Country

Battery test

The battery can now be tested using Scan Tool VAS 5051b via the Energy Management Control Module J644. This test can be started in the Guided Fault Finding or Guided Functions mode under "61 battery control - A battery, test".

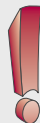
The Energy Management Control Module calculates the battery state from the various measured values and the history data, and displays the following possible results:

- Battery OK
- Charge battery
- Replace battery

The advantages of this new test method are the followings:

- The battery does not have to be charged before the test.
- The battery does not have to be disconnected from the onboard power supply.
- The battery does not have to be removed.

The acid level in the battery can be checked by conventional visual inspection.



Note

At the time of publication of this Self-Study Program, the Warranty policy for testing the vehicle battery has not been finalized. Please check the latest Repair Manual, Technical Bulletins and Service Circulars for the most up-to-date information.

Battery replacement

When replacing the vehicle battery, the Energy Management Control Module J644 must be encoded. This is necessary to provide the Energy Management System with information on the battery (size, manufacturer, reconditioning). Only then will the Energy Management System operate with maximum efficiency and accuracy.

The Energy Management Control module J644 should only be encoded when replacing a battery. Otherwise, faults will be produced in the vehicle since the battery state cannot be correctly assessed, and important history data is lost that is required for testing the battery with the VAS Scan Tool, among other things.

Maintenance charge

A battery maintainer must be connected to the jump start bolts on the left of the engine compartment while the vehicle is being serviced or during showroom use.

Disconnecting the vehicle battery

The seat does not have to be folded up to disconnect the battery ground cable. The battery ground cable can be disconnected as needed at the ground connection provided in front of the left seat.



Jump Start Bolt - plus

Jump Start Bolt - minus

364_016

Cover in front of the left seat



364_017

Ground Connection

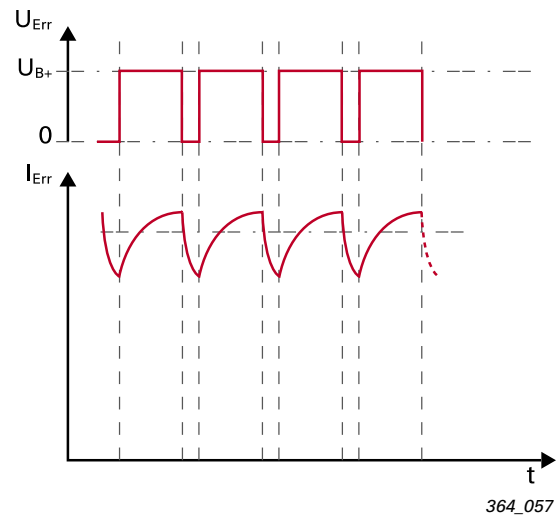
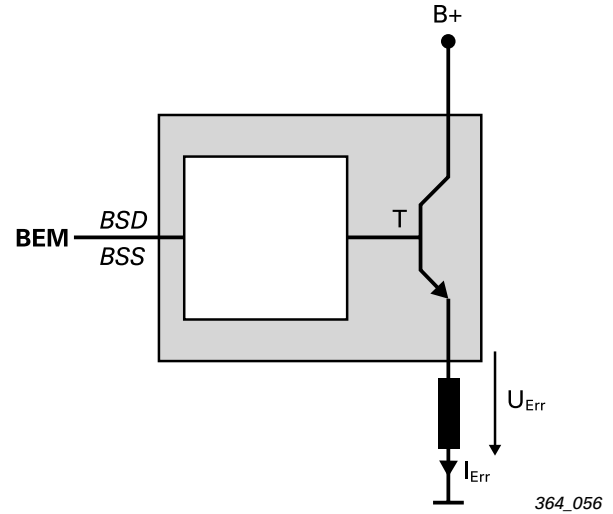


364_018

Generator

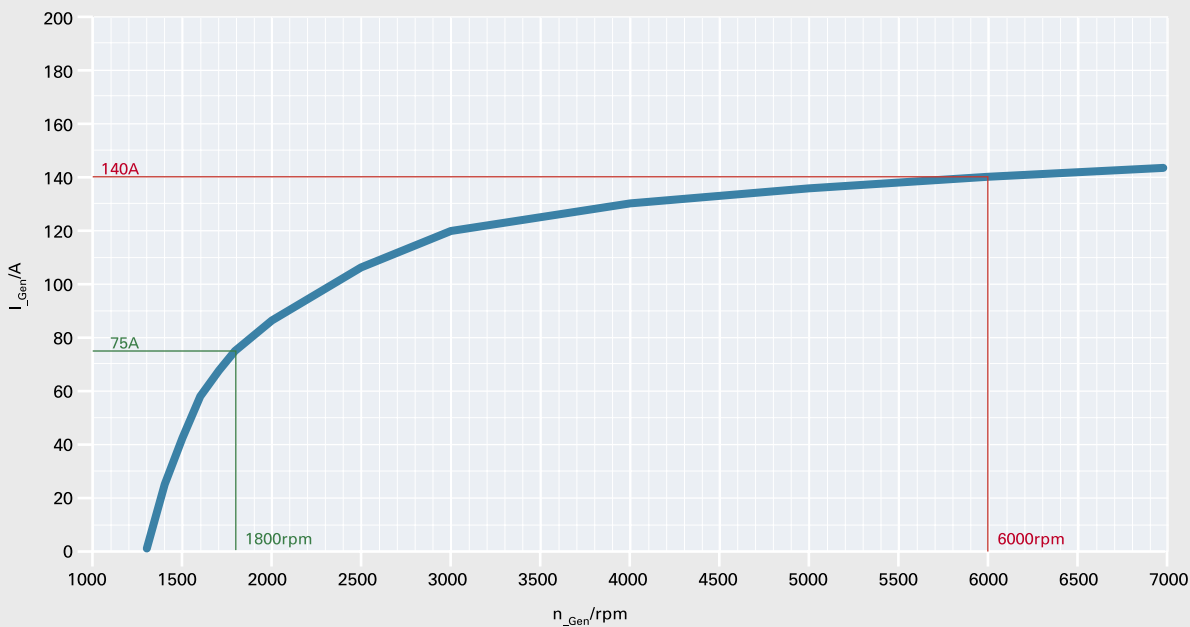
Operating principle of the generator regulator

The excitation voltage, and therefore the excitation current, determine the current output of the generator. The transistor T switches the voltage applied to the terminal B+ of the field coil, at a frequency of approximately 150 Hz. The resulting excitation current I_{Err} or $I_{Err_effective}$, varying from 0 A to 8 A max., is directly proportional to the generator output current.



Generator characteristic

The diagram below provides a qualitative overview of the relationship between speed and current output under full generator load, i.e. the characteristic shows the maximum possible value of the current output for each speed.



Special attention is normally given to two operating points. One point is at 1800 rpm (corresponding to idle speed, green lines) and the other one is the nominal point at 6000 rpm (red lines).

In the case of a 140 A generator for example, this value always refers to the nominal point at 6000 rpm. Some nameplates display values such as 75-140 A. In this case, the first value indicates the maximum possible output current at 1800 rpm, i.e., 75 A, and the second value indicates the nominal point (140 A at 6000 rpm).



Note

- The characteristic data always refers to operation at room temperature.
- Speed always indicates the generator speed and not the engine speed.

The following generators are used in the Audi Q7:

Manufacturer	Generator data	Generator type	I_max @ 1800 rpm	I_max @ 6000 rpm
Valeo	100-150 A	TG16	100 A	150 A
Valeo	105-180 A	TG17	105 A	180 A
Hitachi	140-210 A	HTC 190A	140 A	210 A

Generator warning light

The warning light indicates a fault in the generator or a malfunction in the vehicle electrical system.

The generator sends status messages to the Energy Management Control Module J644. These status messages are the basis for activating the warning light. The information for activating the warning light is sent by the Energy Management Control Module J644 to the Comfort System CAN-bus and transferred to the Instrument Cluster CAN-bus via the Data Bus On Board Diagnostic Interface (gateway) J533. The Instrument Cluster Control Module J285 reads this information from the Instrument Cluster CAN-bus and activates the warning light.

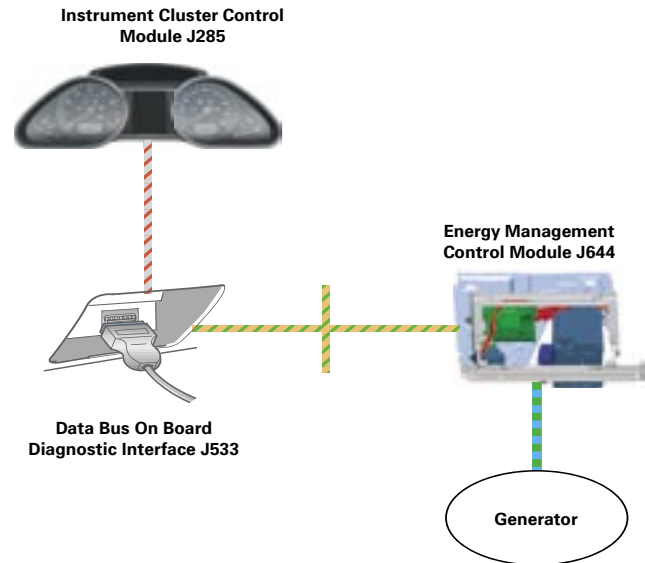
The warning light is activated if any of the following faults is detected:

- The engine is running, and there is a mechanical fault in the generator for at least 10 seconds.
- An electrical fault is present on the generator.

Both faults trigger fault memory entries in the Energy Management Control Module J644.

The warning light is not activated:

- When there is no communication between the Energy Management Control Module J644 and the Instrument Cluster Control Module J285.



364_059

The generator or generator regulator can send 3 fault statuses to the Energy Management Control Module via the bit-synchronous interface:

- Mechanical fault
- Electrical fault
- High temperature fault

Generator test

The following tests are required for diagnosis of the regulator:

- Nominal voltage
- Undervoltage
- Overvoltage

The voltages are ideally measured directly at the generator B+ terminal. If the measuring is not accessible, the voltage can also be measured at the jump start bolts.

Nominal voltage

The generator regulator must output at least 14.3 volts.

Under voltage

The generator voltage should not be below 13 volts. A generator output of 13.0 volts is permitted at low speed with electrical equipment switched on.

Over voltage

The generator voltage may not be higher than 15.5 volts at high speed with few electrical devices switched on.

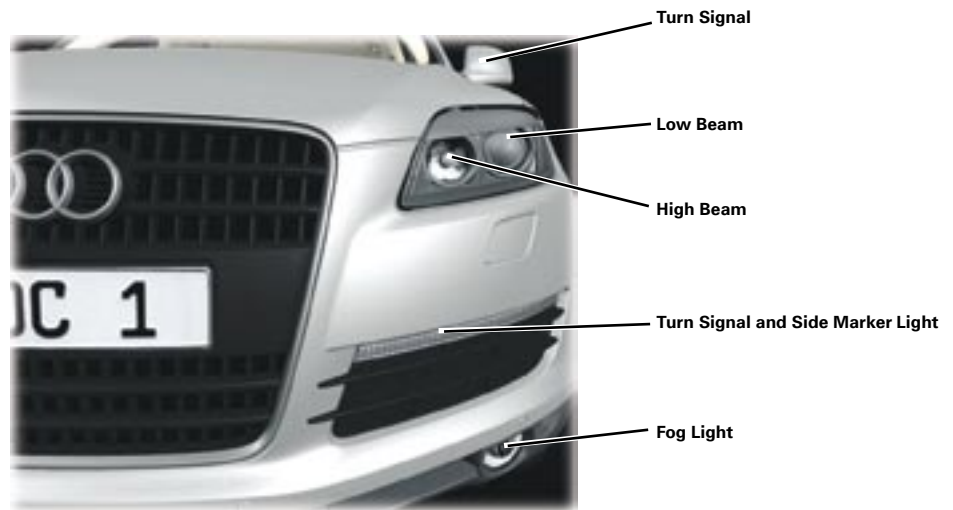
The followings indicate of a faulty generator diode:

- Loud noise from the generator.
- Very high ripples when measuring harmonics with a DSO.

Control Modules

Front exterior lights

Front light arrangement



364_020

Headlight slide system

The headlights can be removed without disassembling the bumper. This makes it easier to replace bulbs in the shop. For more information on bulb replacement, refer to the Audi Q7 Owner's Manual.



364_062



364_063

The headlights can be pulled forward and out after unlocking them and disconnecting their electrical wiring. Please follow the current repair instructions.

Replacing the bulbs

Almost all bulbs can be replaced with the vehicle tool kit. Additional information on replacing the bulbs can be found in the Audi Q7 Owner's Manual. The following cannot be replaced by the vehicle owner: Xenon light, turn signal light in the mirror, high-level brake light.

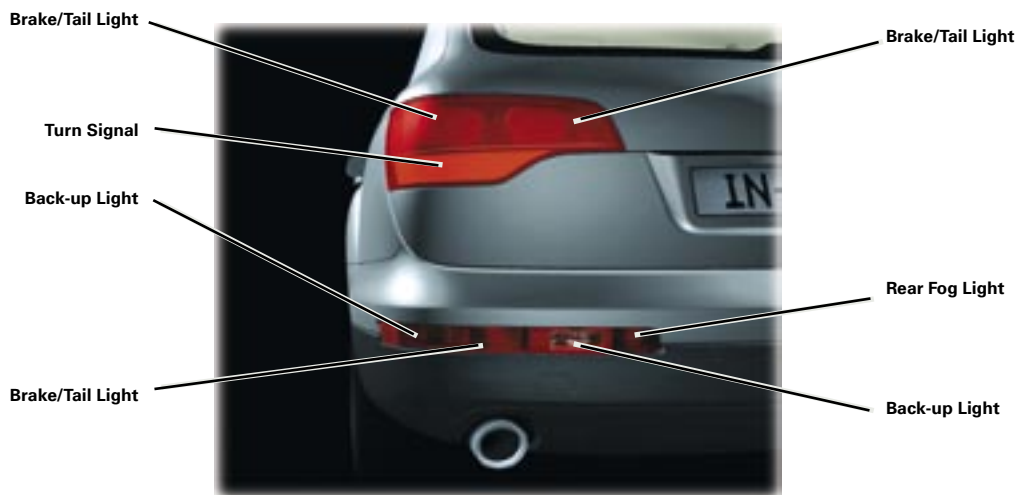


364_064

Rear exterior lights

Rear light arrangement

The main rear lights are completely integrated in the tailgate. Since the rear lights swing upward when the tailgate is opened, additional fixed rear lights are required in the bumper. When the tailgate is opened, the additional rear lights take over. The brake/tail lights (two on each side of the vehicle) and the turn signals are integrated in the rear lights. The additional brake/tail lights and the additional turn signals are installed in the additional rear lights in the bumper. Furthermore, the back-up lights and the rear fog lights are installed there as well.



364_021

Variants

There are country-specific variants for the rear lights:

- ECE (e.g. Europe)
- SAE (e.g. North America)

Rear lights activation

Activation by the Comfort System Central Control Module J393

- Brake lights
- Tail lights
- Turn signals

Activation by the Comfort System Central Control Module 2 J773

- Rear fog lights
- Back-up lights
- Side markers (North America)

Control Modules

Rear lights switch-over

Switch-over when opening the tailgate

When the tailgate is opened, the brake/tail lights and the turn signals are switched from the rear lights in the tailgate to the additional rear lights in the bumper. The rear lights on the tailgate are then switched off. When the tail gate is closed, the lights switch back to the rear lights in the tailgate. The additional rear lights in the bumper are then deactivated.

Switch-over in case of light failure

When the turn signal on one side of the vehicle fails, or when both lights of the combined brake/tail lights fail, the lights switch over to the lights in the bumper. This means that only the defective side is switched. When there is a switch-over, a message appears in the instrument cluster. If the lights switch to the additional rear lights in the bumper due to a failure of the main rear lights, a new attempt is made to turn on the rear lights in the tailgate at the next cycle of terminal 15.

Rear light switch-over sequence

The Comfort System Central Control Module J393 receives sensor information from the Comfort System Central Control Module 2 J773 for switching the lights when the tailgate opens. The Rear Lid Closed Sensor 1 G525 and Rear Lid Closed Sensor 2 G526 are connected to the Comfort System Central Control Module 2 J773. If the Comfort System Central Control Module 2 J773 receives the information that the tailgate is opened, this information is sent via the Comfort System CAN-bus to the Comfort System Central Control Module J393. The Comfort System Central Control Module J393 then switches over from the rear lights in the tailgate to the additional rear lights in the bumper.

Information regarding the sensors G525 and G526 can be found in the Comfort System Central Control Module 2 J773 section in this self-study program.

The Comfort System Central Control Module is equipped with cold light and hot light monitoring. This allows it to detect the failure of the brake/tail lights and of the turn signals. If a failure is identified on one side of the vehicle, the system switches over to the additional rear lights.

Light bulb replacement

All light bulbs can be replaced with the vehicle tool kit. The light bulbs are accessible through four covers in the tailgate.



364_022

Vehicle Electrical System Control Module 2 J520

Functions

- Reading of the Glove Compartment Button E316
- Activation of the Glovebox Unlock Motor V327
- Activation of the Servotronic Solenoid Valve N119
- Providing the road speed signal, comfort opening and comfort closing signals to the sunroof via a discrete wire
- Transfer of the measured values from the inclination sensor integrated in the control module to the CAN-bus

Variants

There are two variants of the Vehicle Electrical System Control Module 2 J520.

The basic variant controls the functions of the Glovebox Unlock Motor and activates the Servotronic Solenoid Valve.

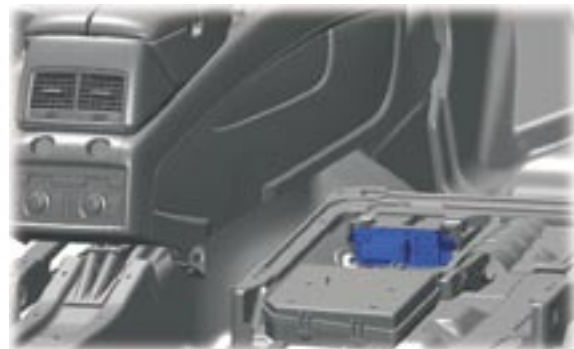
The highline variant also controls the sunroof functions. In addition, an inclination sensor is installed in the control module, and provides inclination measurement to the antitheft alarm system.

Installation location

The Vehicle Electrical System Control Module 2 is located below the right front seat, as shown in the picture.



364_023



364_024

Access/Start Control Module J518

- With Keyless Access Authorization Antenna Reader J723
- Access/Start Authorization Switch E415 and
- Access/Start Authorization Button

The Access/Start Authorization System is essentially the same as that of the 2005 Audi A6.

The installation location of the Keyless Access Authorization Antenna Reader J723 has been changed. In the Audi Q7, it is located in the rear right of the vehicle.

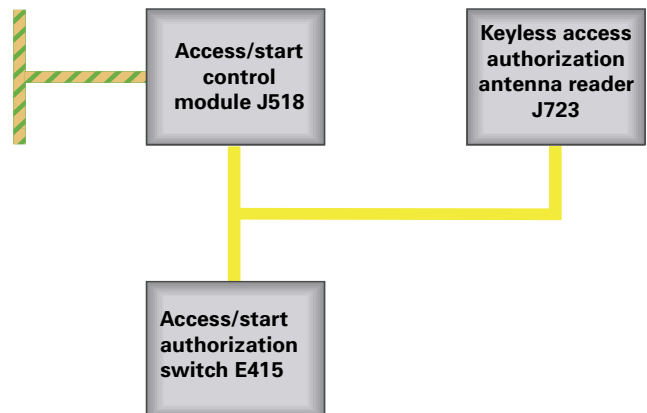
System overview

Three components of the Access/Start Authorization System communicate via a local single-wire bus.

These are:

- The Access/Start Control Module J518
- The Access/Start Authorization Switch E415 and
- The Keyless Access Authorization Antenna Reader J723 (only installed in combination with Advanced Key)

The Access/Start Control Module J518 is the system master and represents the interface with the outside. The Access/Start Control Module J518 participates in the Comfort System CAN-bus.



364_025

Variants

Depending on the vehicle target market and equipment, the Access/Start Authorization System is subject to various requirements. The resulting range of options is covered by the various Access/Start Authorization Switches E415. The variations are determined by the following vehicle characteristics:

- With or without Advanced Key
- With automatic or manual transmission (due to the ignition key removal lock)
- Radio frequency of the vehicle key (315 MHz, 433 MHz or 868 MHz). Vehicles in the North American market only use the 315 Mhz key.

There is only one design of the Access/Start Control Module J518 and the Keyless Access Authorization Antenna Reader J723.

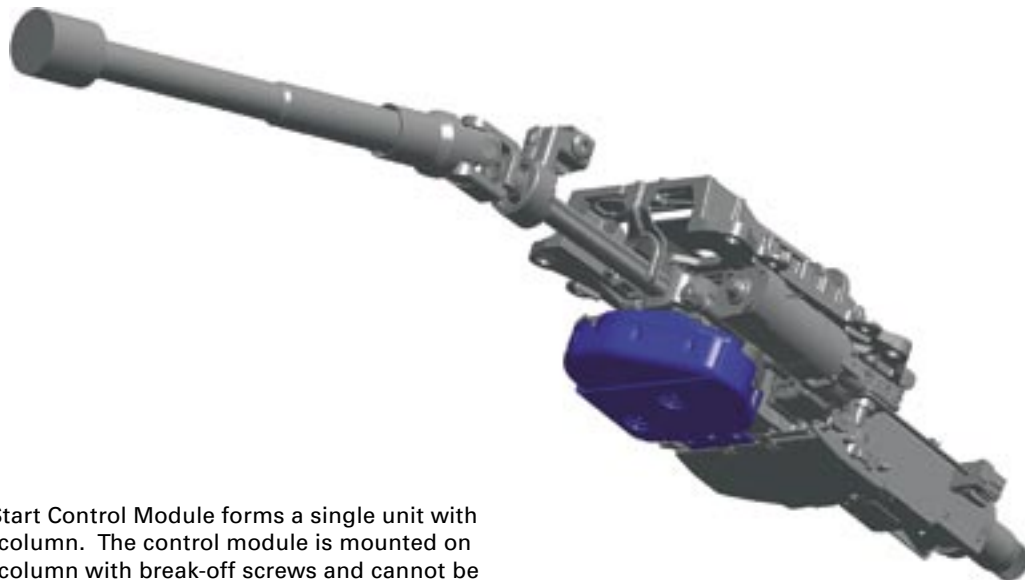


Reference

For more information on the Access/Start Authorization System, please refer to the SSP 994403 - The 2005 Audi A6 Electrical System.

Tasks of the Access/Start Control Module J518

- Providing the bus connection of the system to the outside. Part of the Comfort System CAN-bus.
- Communicating with the other components of the Access/Start Authorization System via a local single-wire bus.
- Reading the ignition key position in the Access/Start Authorization Switch E415 through 2 discrete connections and the single-wire bus.
- Reading the position of the Access/Start Authorization Button E408 (only installed in combination with the Advanced Key).
- Activating the terminal relay for terminal 15 and terminal 75x.
- Requesting the Engine Control Module to start the engine.
- Activating the Steering Column Locking and Unlocking Motor.
- Reading the Selector Lever current position P or N from the Transmission Control Module J217.
- Enabling release for "Vehicle Opening".
- Diagnostic interface for all the components of the Access/Start Authorization System.
- Master of the Immobilizer IV vehicle function.



The Access/Start Control Module forms a single unit with the steering column. The control module is mounted on the steering column with break-off screws and cannot be individually replaced. If the Access/Start Control Module needs to be replaced, the steering column must also be replaced.

364_026

Tasks of the Access/Start Authorization Switch E415

The Access/Start Authorization Switch E415 is not mechanically encoded. It can therefore be turned with any key. The key identification is purely electronic.

Access/Start Authorization Switch E415 has the following functions:

- Assessing the key position in the ignition switch with 4 microswitches.
- Transmitting the current ignition key position to the Access/Start Control Module through a single-wire bus and 2 discrete connections.
- For safety reasons, the Access/Start Authorization Switch can also disconnect the power supply to the steering column lock (to prevent automatic locking).
- Reading the Transmission Park Selector Switch F305 (only in vehicles with automatic transmission).
- Controlling the integrated ignition key removal lock.
- Reading the Access/Start Authorization Button E408 (only in vehicles with Advanced Key).
- Reading the signal from the Central Locking and Anti-theft Alarm System Antenna R47.
- Transmitting the data received from the remote-control key to the Access/Start Control Module.
- Reading the signal from the Brake Light Switch F (only for vehicles with Advanced Key).
- Transmitting electrical energy to the inserted ignition key via a sensor coil so that it can send its key identification.
- Transmitting the received key identification to the Access/Start Control Module J518 through the single-wire bus.
- Communicating with the other components of the Access/Start Authorization System through a local single-wire bus.



364_027

Control Modules

Tasks of the Keyless Access Authorization Antenna Reader J723

(The Keyless Access Authorization Antenna Reader J723 is only available in combination with the Advanced Key)

- Assessing the signals from the four proximity sensors in the doors.
- Activating the Access/Start Authorization Antennas R134 - R138.
- Communicating with the other components of the Access/Start Authorization System through a local single-wire bus.



364_028

Keyless Access Authorization Antenna
Reader J723



364_029

Installation location of the Keyless Access
Authorization Antenna Reader J723

Tasks of the Access/Start Authorization Button E408

(The button is installed only in combination with the Advanced Key)

- For reasons of security, provides the current position of the Access/Start Authorization Button to the control module and the Access/Start Authorization Switch.

Reference

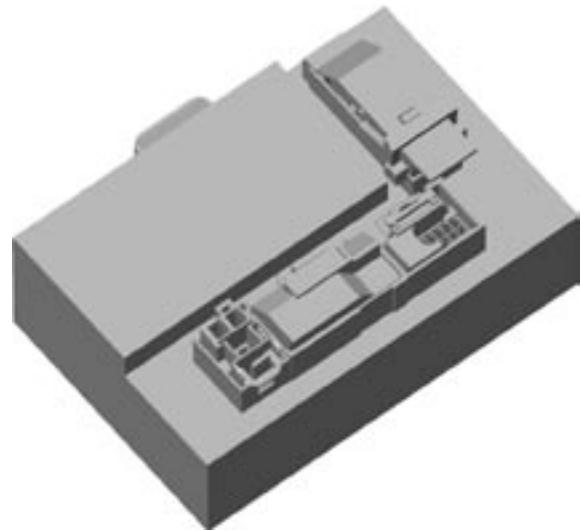


For more information on the functions of the Access/Start Authorization Switch, please refer to SSP 994403 - the 2005 Audi A6 Electrical System.

Door control modules

J386	Driver's Door Control Module
J387	Front Passenger's Door Control Module
J388	Left Rear Door Control Module
J389	Right Rear Door Control Module

The Door Control Modules for the Audi Q7 have been adopted from the 2005 Audi A6. Therefore, the control module and the window regulator motor are again installed as separate units.



364_030

Alternate Master Function

If the Comfort System Central Control Module J393 fails, the Driver's Door Control Module acts as a replacement Master for the Central Locking System. In this case, the Remote Control Door Opening and the Advanced Key functions are not available. The doors of the vehicle must be mechanically opened and closed. In this case, the other Door Control Modules assess directly the information from the Driver's Door Control Module.

Variants

The Door Control Modules of the Audi Q7 are available in two variants, depending on whether or not the vehicle is equipped with Advanced Key.

The Advanced Key version includes the following features:

- Advanced Key
- Ambient Lighting
- Surrounding Lighting
- Seat Memory
- Mirror Folding
- Automatic Dimming of Exterior Mirror
- Electrical Child Safety Locks

Installation location of the control modules and the window regulator motor



364_031

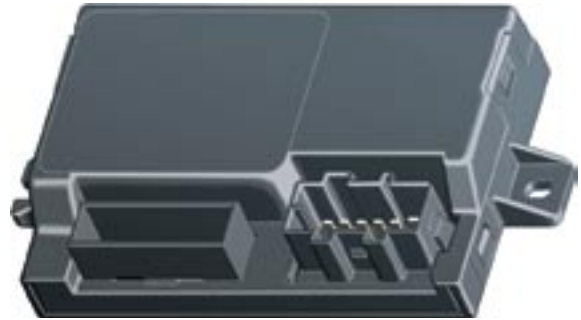
Driver and Passenger Side Seat Adjustment Control Modules

J136 Memory Seat/Steering Column Adjustment Control Module

J521 Passenger Memory Seat Control Module

The Memory Seat Adjustment Control Module is similar to the control module used in the 2005 Audi A6.

The control module can be used as a J136 on the driver side or as a J521 on the passenger side. It recognizes automatically its installation location based on the voltage level on one of the terminal pins. This method is called pin encoding.



Saved settings

364_032

The following settings are saved by pressing the Save button on the driver side memory block or by locking the vehicle with the remote control key:

- Current position of the left and right exterior mirrors
- Current driver seat settings
- Current steering column position (when the electrical steering column adjuster)

The following setting is saved by pressing the Save button on the passenger side memory block:

- Current front passenger seat settings

The driver side control module J136 can store six different settings. Two settings can be saved with the Save button, and four additional settings can be saved with different remote control keys. The passenger side control module can save only two different settings with the Save button; it is not possible to save a setting with a remote control key.

A basic prerequisite for any memory operation is that the memory block ON/OFF switch must be "ON". The position of this switch is read by software by the driver door control module J386 and transmitted to the CAN-bus. The switch position is also sent to the driver door control module through a hardware line and sent from there to the Seat Control Module. There, the hardware line prevents the activation of the motor control, and disables already activated outputs.

Functions

Electrical manual adjustment

In the case of seats with electrical seat adjustment and memory function, the manual adjustment switch signal is received by the seat adjustment control module. The control module in turn activates the 4 adjustment motors and brings the seat to the desired position.

In the case of seats with electrical seat adjustment without a memory function, a control module is not used. The 4 adjustment motors are directly controlled by the manual adjustment switch.

Only terminal 30 is required for adjusting the seats. When the power-down level of the Energy Management Control Module is reached, the seats can no longer be adjusted, or only slightly.

Saving the settings and adjusting the seat using the programming buttons

The described settings are saved by pressing the SET button and then activating one of the two memory buttons. The SET function remains active until the red indicator light in the button goes off. An acoustic signal sounds when the settings have been successfully saved. A prerequisite is again that the ON/OFF switch of the memory block is "ON".

The saved settings can be retrieved as follows:

- With the driver door opened and "terminal 15 off", by pressing briefly one of the two memory buttons to move the mirror, driver seat and steering column or the passenger seat into the saved positions.
- With the driver door closed or "terminal 15 on", by pressing the memory button until the adjustment is complete. The adjustment is interrupted when the memory button is released.

Saving positions and adjusting the positions from memory using a remote-control key

The current mirror, driver seat and steering column positions are saved with a remote-control key as follows:

- The settings are saved after the driver door is closed and the vehicle is locked with the remote-control key.
- After unlocking the vehicle with the remote-control key and opening the driver door, the positions are adjusted to the settings saved with the remote-control key. This function does not include the passenger seat.

For the above-described functions to work properly, two prerequisites are required:

- The menu entry "remote-control key" must be set to "on" in the MMI Car Menu, under "systems", "seat settings", "driver seat".
- The ON/OFF switch of the memory block must be "ON".

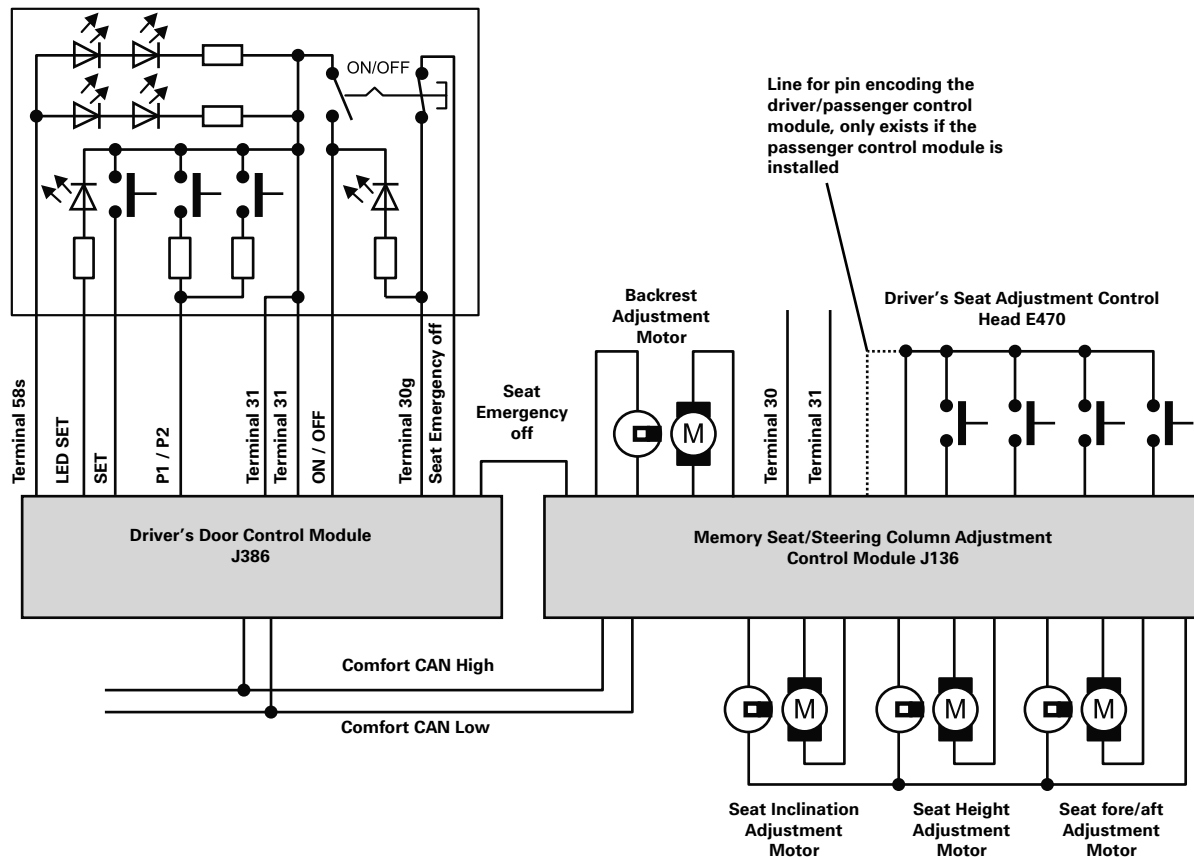
Control Modules

Saving settings and memory adjustments with the Advanced Key

The memory adjustment with the Advanced Key is the same as the memory adjustment with a remote-control key. The only difference is that the vehicle is locked and unlocked using the Advanced Key function.

Block diagram of the seat memory

Driver's Seat Memory Program Control E97



364_033

Reference

For more information, please refer to SSP 994403 - The 2005 Audi A6 Electrical System.



Comfort System Central Control Module J393

The Comfort System Central Control Module J393 is similar to that of the 2005 Audi A6.

The following modifications have been made:

With the introduction of a second Comfort Control Module, the Comfort System Central Control Module 2 J773, a few functions and outputs have been eliminated from the Comfort System Central Control Module J393. They are described below.

The pins that became available in the control module are now used to activate the additional lights since the turn signal, brake and tail light are now installed both in the tailgate and the bumper. The redundant installation was necessary since the lights in the tailgate cannot be seen clearly by the traffic from behind when the tailgate is open.



364_034

Master functions

- Turn signal master
- Central locking master
- Interior lighting master
- LIN master for the LIN bus participant Alarm Horn H12 and Interior Monitoring Sensor G273

Variants

There are two variants of the Comfort System Central Control Module J393 for the Audi Q7: a basic variant, and a Highline variant.

The Highline variant has two additional functions compared to the basic variant:

- Rear footwell lights activation
- Tailgate closing assistance control

Control Modules

Outputs

- Brake and tail light in the bumper, left
- Brake and tail light in the tailgate, outer left
- Brake and tail light in the tailgate, inner left
- Turn signal in the bumper, left
- Turn signal in the tailgate, left
- Brake and tail light in the bumper, right
- Brake and tail light in the tailgate, outer right
- Brake and tail light in the tailgate, inner right
- Turn signal in the bumper, right
- Turn signal in the tailgate, right
- Center brake light
- License plate light
- Trunk light
- Footwell lights, rear left
- Footwell lights, rear right
- Fuel tank lid unlock motor
- Rear window defroster
- Closing assistance motor power supply
- Tailgate lock unlocking motor
- Level Control System Control Module J197 wake-up signal (when a vehicle door has been opened)
- Engine Control Module wake-up signal

Bi-directional lines

- Comfort System CAN-bus high and low CAN-bus lines
- Alarm Horn H12 and Interior Monitoring Sensor G273 LIN bus line

Inputs

- Closing assistance system position feedback microswitch
- Brake light switch
- Soft touch in the tailgate
- Anti-theft alarm system window breakage sensors (left and right side windows and rear window)
- Crash signal from the Airbag Control Module
- Flashing light as confirmation of successful programming of the universal garage door opener
- Brake lights on request from the ABS Control Module J104 due to an ACC braking
- Tailgate closed microswitch

Inputs and outputs of the Comfort System Central Control Module 2 J773

- Side marker, left
- Side marker, right
- Rear fog light, left
- Rear fog light, right
- Back-up light, left
- Back-up light, right
- Interior lights
- LIN bus line to panoramic roof

Installation location

The Comfort System Central Control Module J393 is located at the rear right of the vehicle. It is installed in an upright position and mounted on a control module bracket. The Comfort System Central Control Module 2 J773 is located on the left and mounted on a similar bracket.



364_035

Control Modules

Comfort System Central Control Module 2 J773

The Comfort System Central Control Module 2 J773 is a new control module and is introduced for the first time in the Audi Q7.

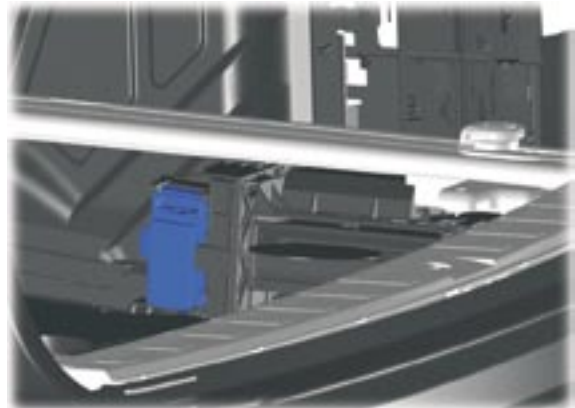
Tasks

The Comfort System Central Control Module 2 J773 has the following tasks:

- Assessing the tailgate closed sensor for the rear light switch-over system.
- Activating the cargo area light or light for the 3rd row of seats (depending on whether 3 or 5 rear seats are installed).
- Activating the back-up lights in the bumper.
- Activating the rear fog lights in the bumper.
- Activating the side markers.
- LIN master for the Panorama Sunroof.

Installation location

The Comfort System Central Control Module 2 J773 is installed in the cargo area on the right underneath the cargo area floor.



364_036

Variants

Min variant

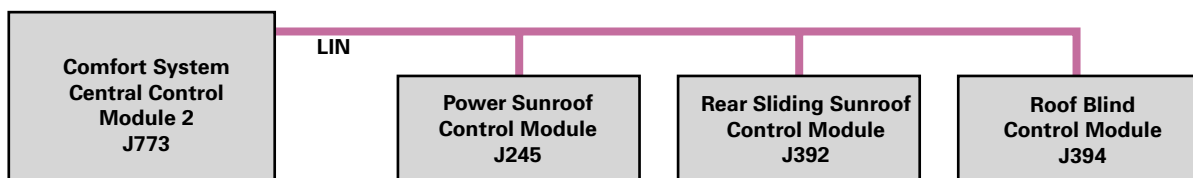
- Standard equipment
- Solid roof
- 3 rear seats

Max variant

- Luxury equipment
- Panorama Sunroof
- 5 rear seats (3rd row)

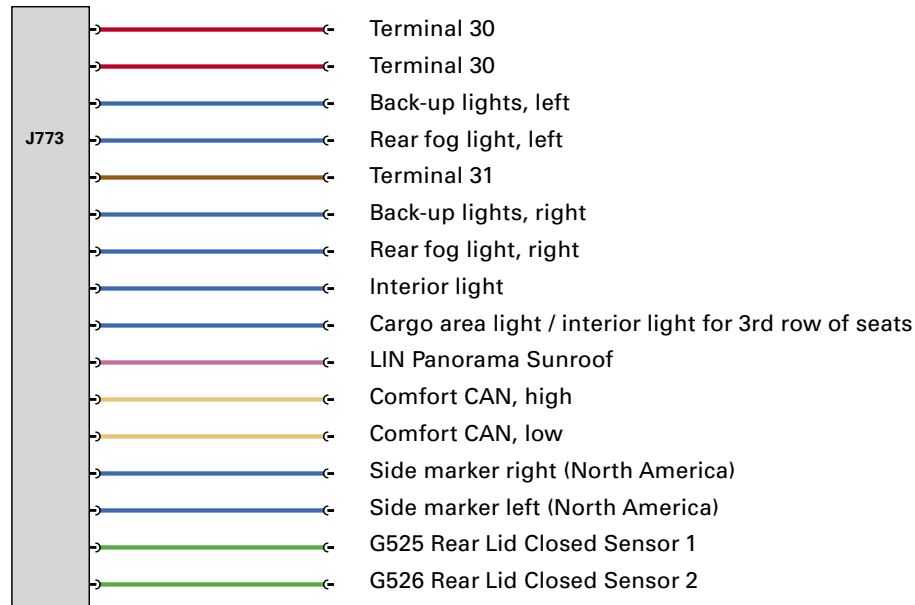
Master functions

The Comfort System Central Control Module 2 J773 is the LIN master for the Panorama Sunroof. As a LIN master, the control module is responsible for the functions and diagnosis of the Panorama Sunroof.



364_058

Function diagram



Assessing the rear lid closed sensors

The two switches G525 Rear Lid Closed Sensor 1 and G526 Rear Lid Closed Sensor 2 are read by the Comfort System Central Control Module 2 J773.

The control module provides the position of the two switches to the Comfort System CAN-bus.

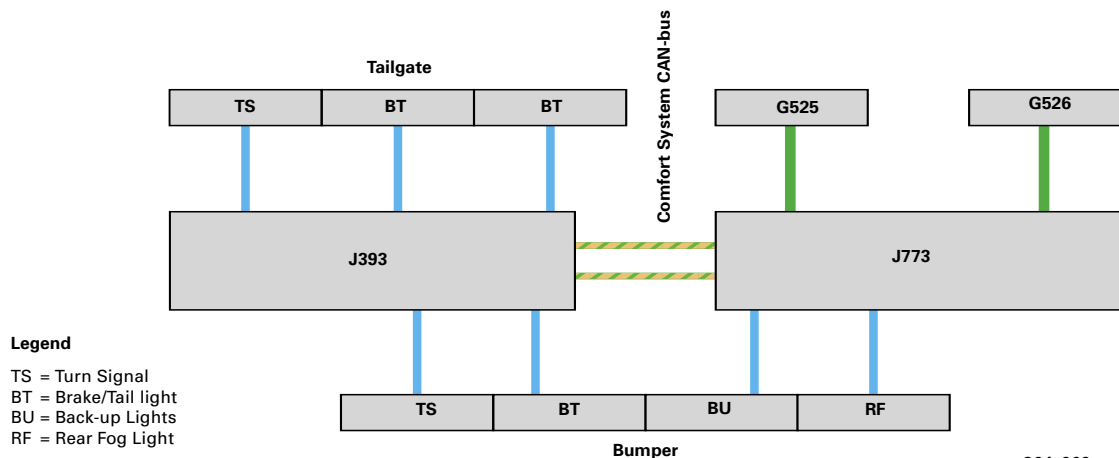
The Comfort System Central Control Module J393 reads the switch information from the Comfort System CAN-bus, and activates the rear lights accordingly.

G525 and G526 switch position "tailgate closed":

- The Comfort System Central Control Module J393 controls the brake/tail lights and turn signals in the main rear lights in the tailgate.
- The brake/tail lights and turn signals in the additional rear lights in the bumper are not activated.

G525 and G526 switch position "tailgate open":

- The Comfort System Central Control Module J393 activates the brake/tail lights and turn signals in the bumper.
- The brake/tail lights and turn signals in the tailgate are not activated.



364_060

Control Modules

Emergency function

If the G525 and G526 switches are faulty, the system switches over from the main rear lights in the tailgate to the additional rear lights in the bumper. This action is not displayed in the instrument cluster. In this case, a new attempt to turn on the main rear lights in the tailgate is made only during the next ignition off/on cycle.

Fault memory entries

The number of fault memory entries for the lights has been reduced. Only one fault memory entry is set for each light assembly. As a result, four fault memory entries are enough to cover the entire rear lighting system. The environmental data of the corresponding fault memory entry can indicate which light of a light assembly is faulty.

Measured value blocks

The Comfort System Central Control Module 2 J773 provides measured value blocks for the following functions:

- Onboard power supply
- Additional rear lights in the bumpers
- Interior light
- Panorama Sunroof
- LIN communication
- Tailgate recognition

Actuator test

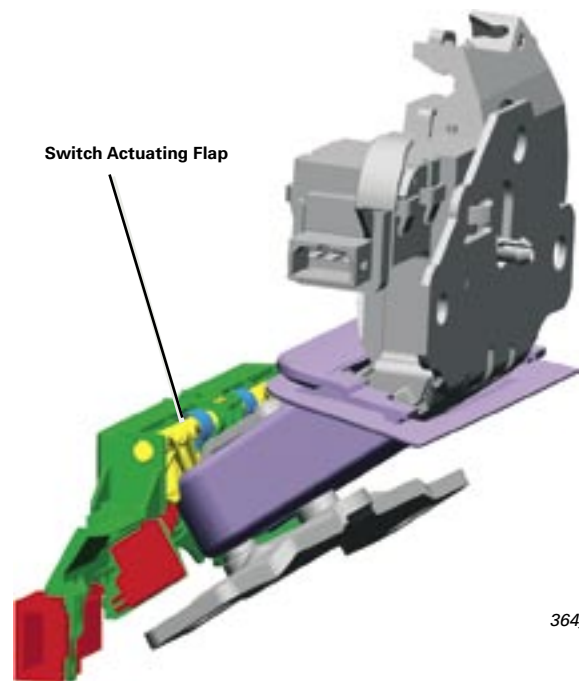
The Comfort System Central Control Module 2 J773 provides Output Check Diagnoses for the following functions:

- Additional rear lights
- Side markers
- Interior lighting
- Panorama Sunroof

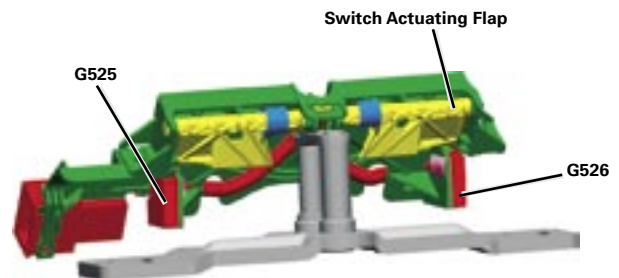
Encoding

The Comfort System Central Control Module 2 J773 requires encoding for the following information:

- Vehicle type
- Panorama Sunroof
- Interior light
- Country
- Panorama Sunroof opening comfort system
- Roller sun blinds opening comfort system
- Roller sun blinds closing comfort system



364_038

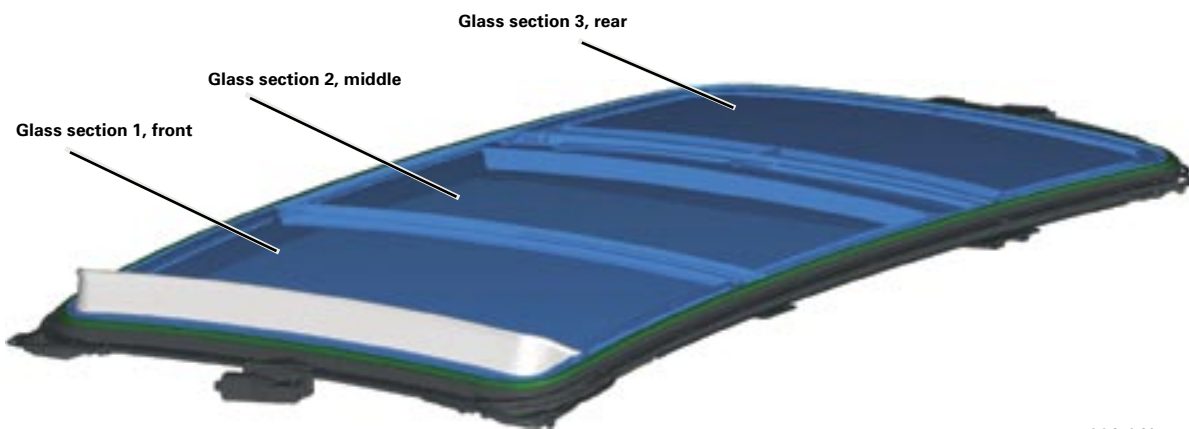


364_039

Panorama Sunroof

Design

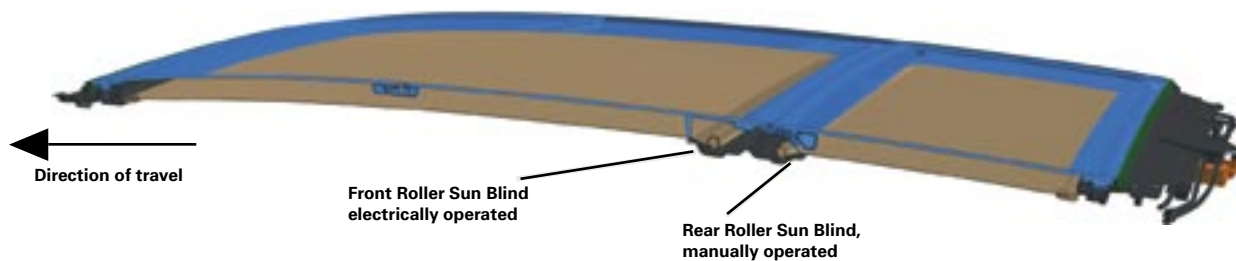
The Panorama Sunroof is a large, 3-section glass sunroof. It extends toward the rear to the third row of seats. The front glass section can be electrically tilted up and opened. The rear glass section can be electrically tilted up. The large sunroof has a sun blind over its entire surface. The sun blind can be electrically operated for the front two sections and manually operated for the rear section.



364_041

Functions

- Glass section 1, front: open and tilt up
- Glass section 2, middle: permanently fixed
- Glass section 3, rear: tilt up



364_042

Control Modules

Glass sunroofs 1 and 3, tilted up



364_043

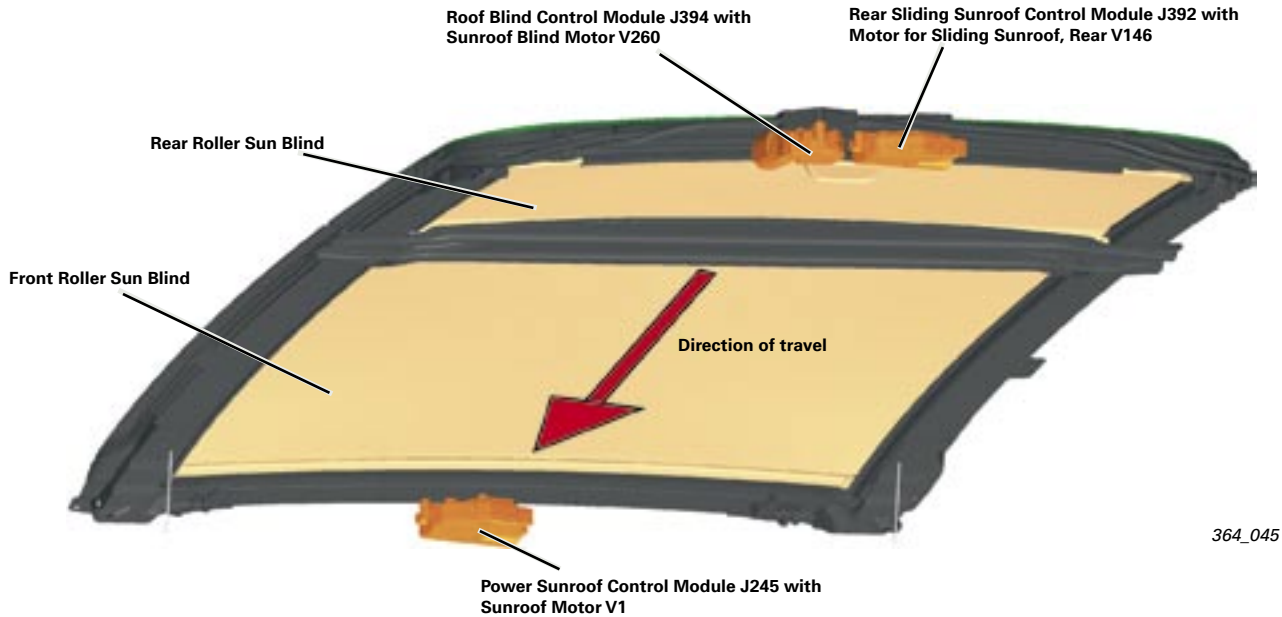
Glass sunroof 1 opened and glass sunroof 3 tilted up



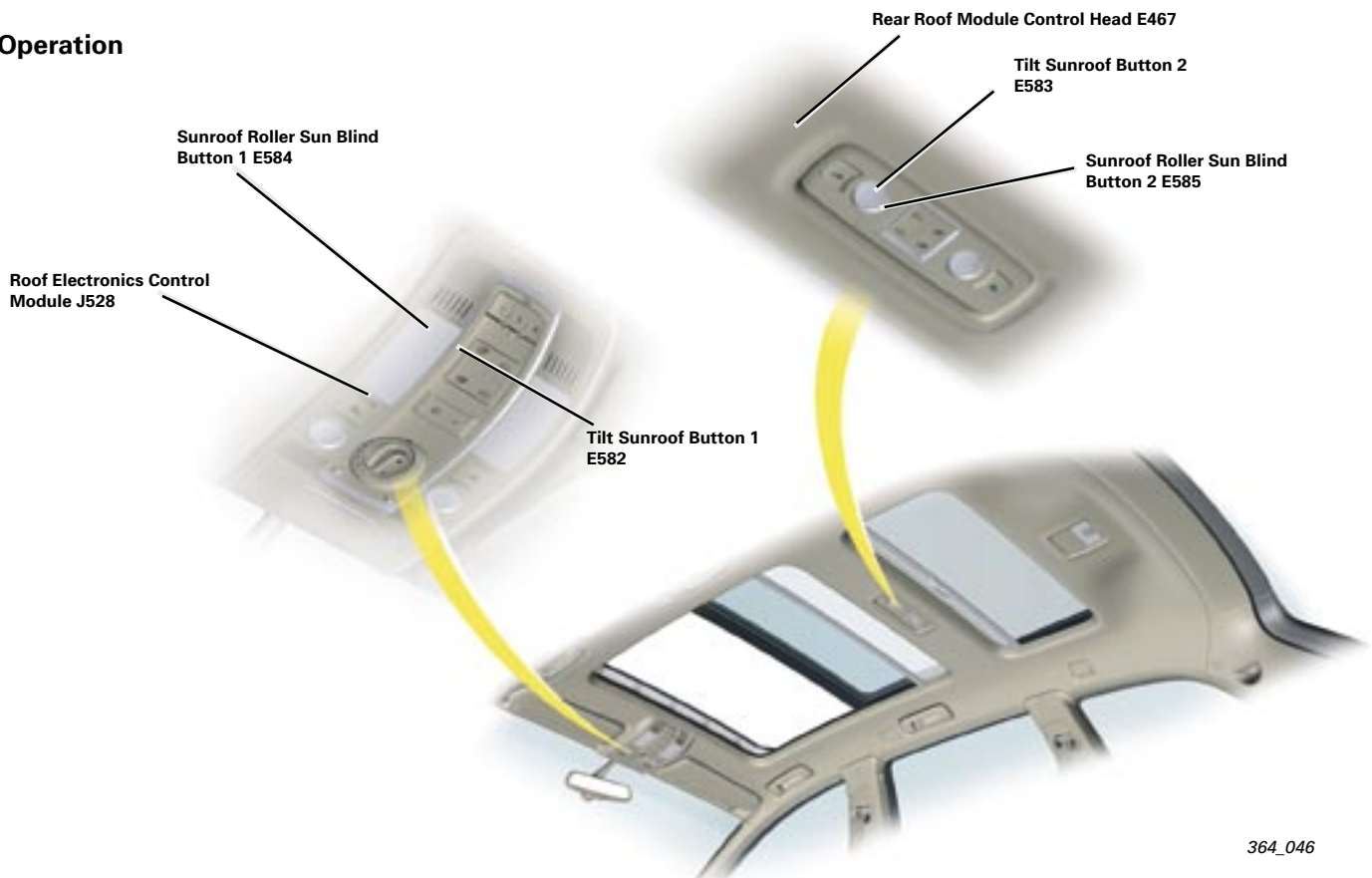
364_044

Sun blinds

The three glass sections are equipped with blinds for protection against direct sunlight. The front sun blinds, for the glass sections 1 and 2, can be electrically operated. The rear sun blind for the glass section 3 can be manually operated.



Operation



Control Modules

The glass section 1 can be operated using the Sunroof Rotary Switch in the Front Roof Module. The glass section 3 can be operated using the Tilt Sunroof Button 1 E582 in the Front Roof Module and the Tilt Sunroof Button 2 E583 in the Rear Roof Module Control Head E467. Briefly pressing the button activates the automatic operation. Holding the button for a longer period of time activates the manual operation.

The front roof section can be tilted by pressing the Rotary Switch, as long as the Rotary Switch is in position 0. To close the tilted-up roof section, the Rotary Switch must be pulled down.

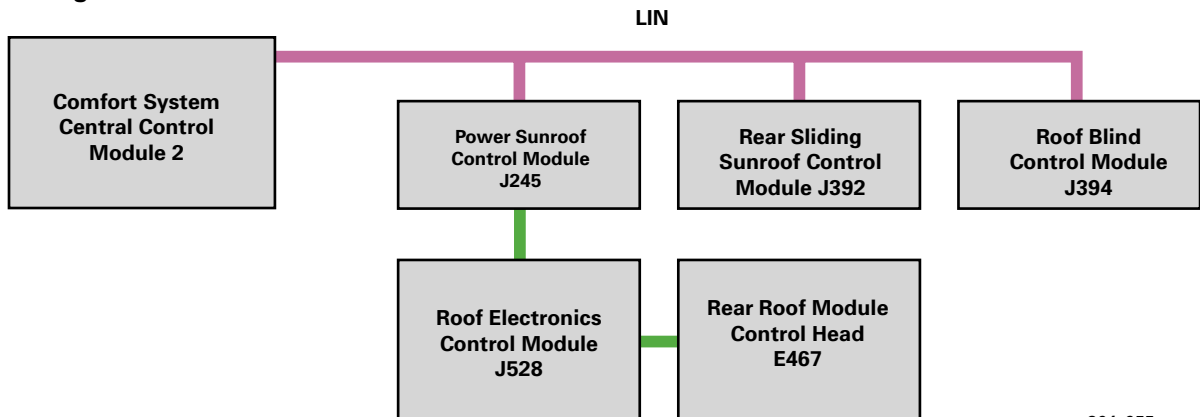
The front sun blind can be operated with the Sunroof Roller Sun Blind Button 1 E584 and with the Sunroof Roller Sun Blind Button 2 E585. Briefly pressing the button activates the automatic operation and holding the button for a longer period of time activates the manual operation.

The Tilt Sunroof Button 2 E583 and the Sunroof Roller Sun Blind Button 2 E585, located in the Rear Roof Module Control Head E467 can be deactivated with the Child Safety Lock. For additional information ,please refer to the Audi Q7 Owner's Manual.



364_069

Function diagram



364_055

Initialization

The initialization of the Panorama Sunroof motors will be lost if the power supply to the motors or control modules is interrupted while the Comfort System CAN-bus is activated. For example, the motor V1 initialization is lost when the Comfort System CAN-bus is not in sleep mode, and the power supply to this motor is disconnected.

Symptoms when initialization is lost

Power Sunroof Control Module J245, with Sunroof Motor V1:

- The roof section 1 can no longer be moved “open” with the Rotary Switch. It can only be closed manually by pulling the button down. The learning cycle is performed immediately after manual closing.

Rear Sliding Sunroof Control Module J392, with Motor for Sliding Sunroof, Rear, V146:

- The red LED in the Tilt Sunroof Button 1 E582 is lit continuously when “Terminal 15 on”. Only manual closing is possible with the close button. The learning cycle is performed immediately after manual closing.

Roof Blind Control Module J394, with Sunroof Blind Motor V260:

- The sunroof blind can no longer be moved “open”. Only manual closing is possible with the close button. The learning cycle is performed immediately after manual closing.

Performing the initialization and learning cycle

Information

The drives initialize themselves when the sunroof or blind is in the “closed” position. The learning cycle is performed immediately after the initialization. During the learning cycle, the drives are adapted to the mechanics of the specific vehicle and their setting is saved. During the learning cycle, the switch must not be released since this would invalidate the learning cycle, and the drive would again be denormalized.

Warning

No pinch protection is active during the learning cycle.

Learning cycle with a denormalized drive

Press and hold the switch for the relevant motor (e.g. Tilt Sunroof Button 1 E582 for the Motor for Sliding Sunroof, Rear, V146) in the “close” position until the roof section — in this case roof section 3 — closes completely, reopens completely, and closes again completely.

If the roof section or the blind is already closed at the start of the initialization, the relevant motor opens slightly the roof or blind, and then closes it completely.

During the learning cycle for roof section 1 and for the blind, the roof section or blind opens 200 mm and then closes completely.

If the control switch is released during the initialization, the initialization will not be accepted. If the close button is pressed for more than 10 seconds when the roof or blind is closed, the respective drive is denormalized and starts immediately the learning cycle.

Learning cycle with a normalized drive

The learning cycle can be triggered only in the “closed” position. If the close button is pressed for more than 10 seconds when the roof or blind is closed, the respective drive is denormalized and starts immediately the learning cycle.

Deactivation of the control switches

If a switch is pressed for more than 60 seconds, it will be deactivated in the direction in which it was pressed. This means that if a switch is pressed towards “open” for more than 60 seconds, the “open” function is deactivated. The deactivation can be reversed by an ignition off/on cycle.

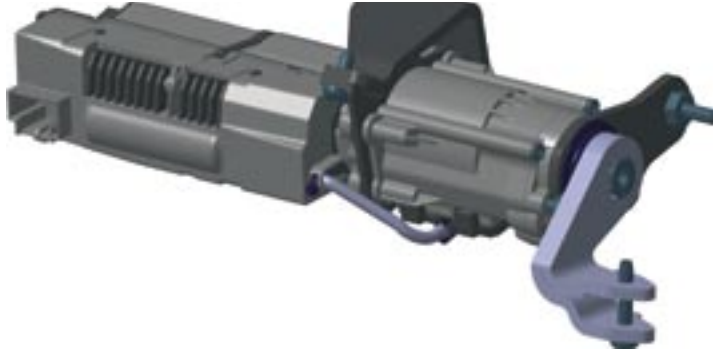
Pinch protection

All three motors have a pinch protection enabled over their entire path of travel.

Emergency closing

If a pinch protection sensor is triggered for a motor, the corresponding roof section or blind can be closed with an emergency function. To perform the emergency closing, the corresponding switch must be manually pressed and held within five seconds after the start of the reversing motion. The corresponding roof section or blind then closes manually without the pinch protection.

Rear Lid Control Module J605 and Rear Lid Control Module 2 J756



364_053

Changes from the 2005 Audi A6

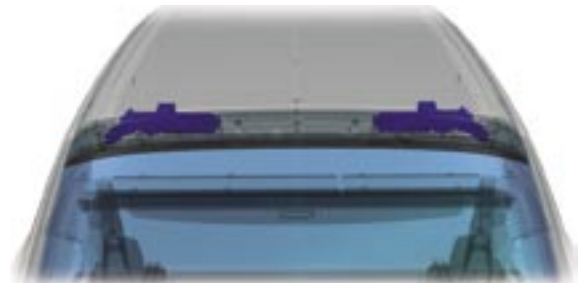
The Rear Lid Control Modules J605 and J756 and drives have been adopted from the Audi A6 Avant. The software was adapted to the Audi Q7 tailgate, which, for example, has a different opening angle than the tailgate of the Audi A6 Avant. The control concept is identical.

Tailgate control system

The Rear Lid Control Module J605 communicates with the Rear Lid Control Module 2 J756 via a single-wire bus manufactured by the system supplier Valeo.

The Rear Lid Control Module J605 participates in the Comfort System CAN-bus and can be accessed through address word 6D with the Scan Tool. The Rear Lid Control Module 2 J756 cannot be separately accessed with the Scan Tool; it transmits its diagnostic information to the Rear Lid Control Module J605.

The tailgate drives and the Rear Lid Control Module form a unit. They share the same part number. The Rear Lid Control Module J605 is always installed on the left side and is the Master Control Module; the Rear Lid Control Module 2 J756 is on the right side and is the Slave Control Module.



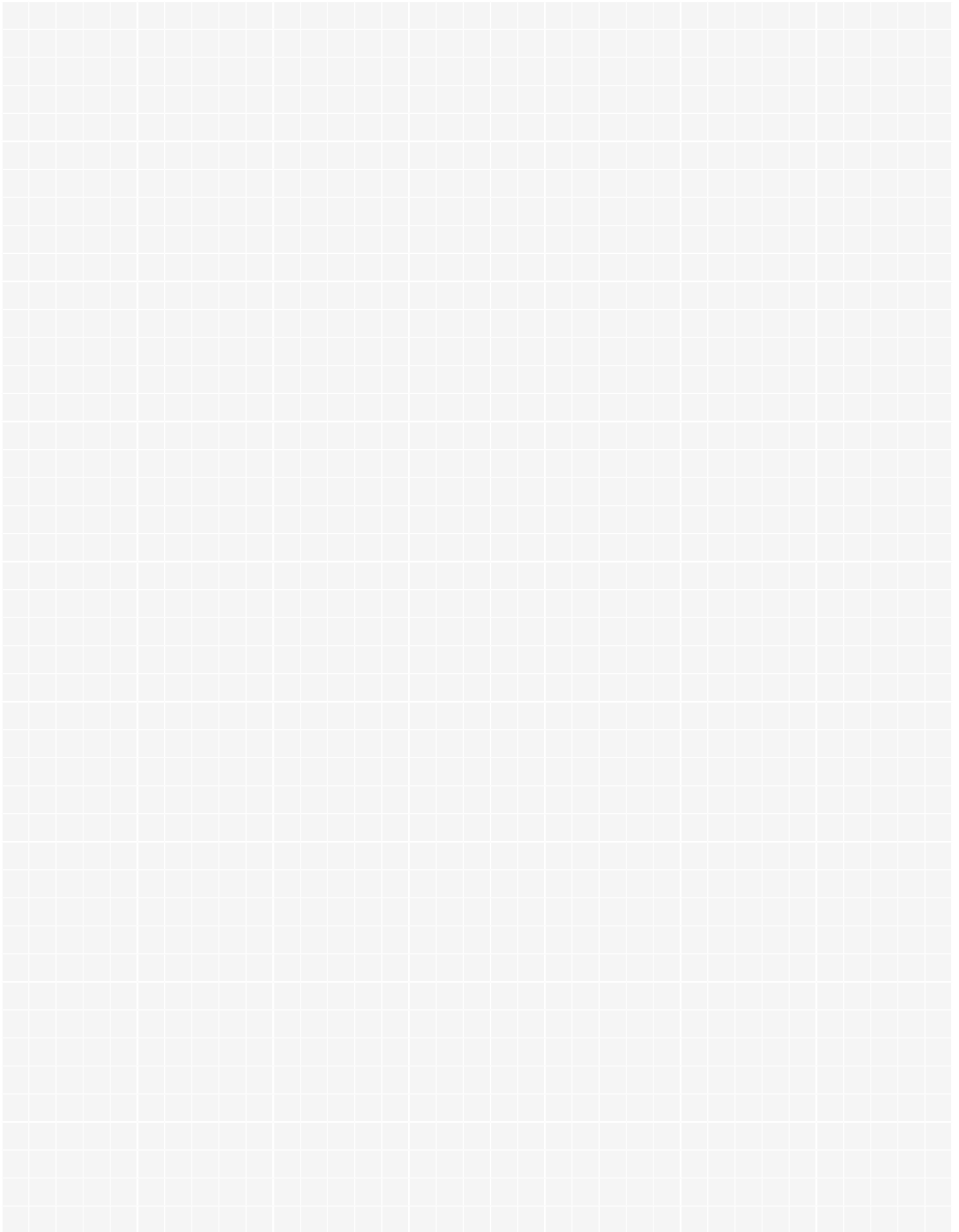
364_054

Installation location of the tailgate drives



Reference

For more information, please refer to the Self-Study Program 995503 - The 2006 Audi A6 Avant.

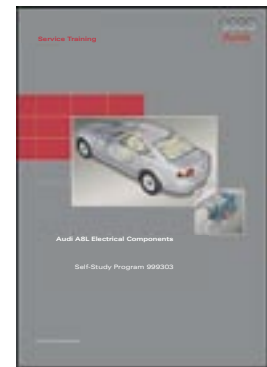


Self-Study Programs for the Audi Q7

SSP 999303 - Audi A8L Electrical Components

- Bus topology
- Control modules

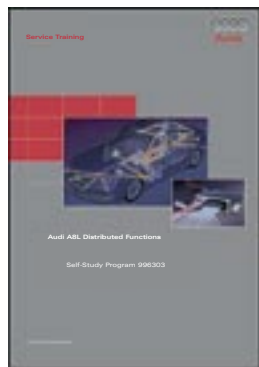
Order number: 000.2811.07.00



SSP 996303 - Audi A8L Distributed Functions

- Bus topology
- Distributed functions

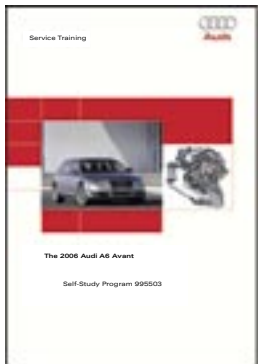
Order number: 000.2811.08.00



SSP 995503 - The 2006 Audi A6 Avant

- Body
- Passenger safety
- Engine
- Running gear
- Electrical system
- Infotainment system
- Comfort electronics

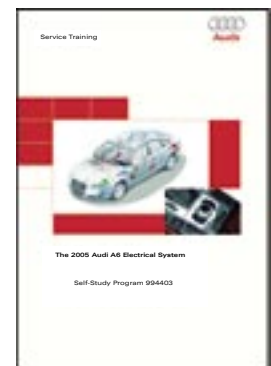
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SSP 994403 - The 2005 Audi A6 Electrical System

- Networking
- Bus topologies
- Comfort electrical systems
- Infotainment

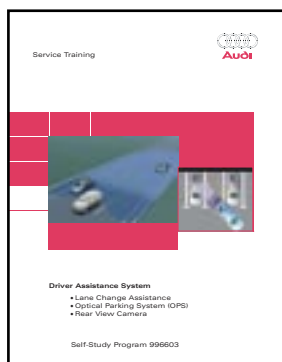
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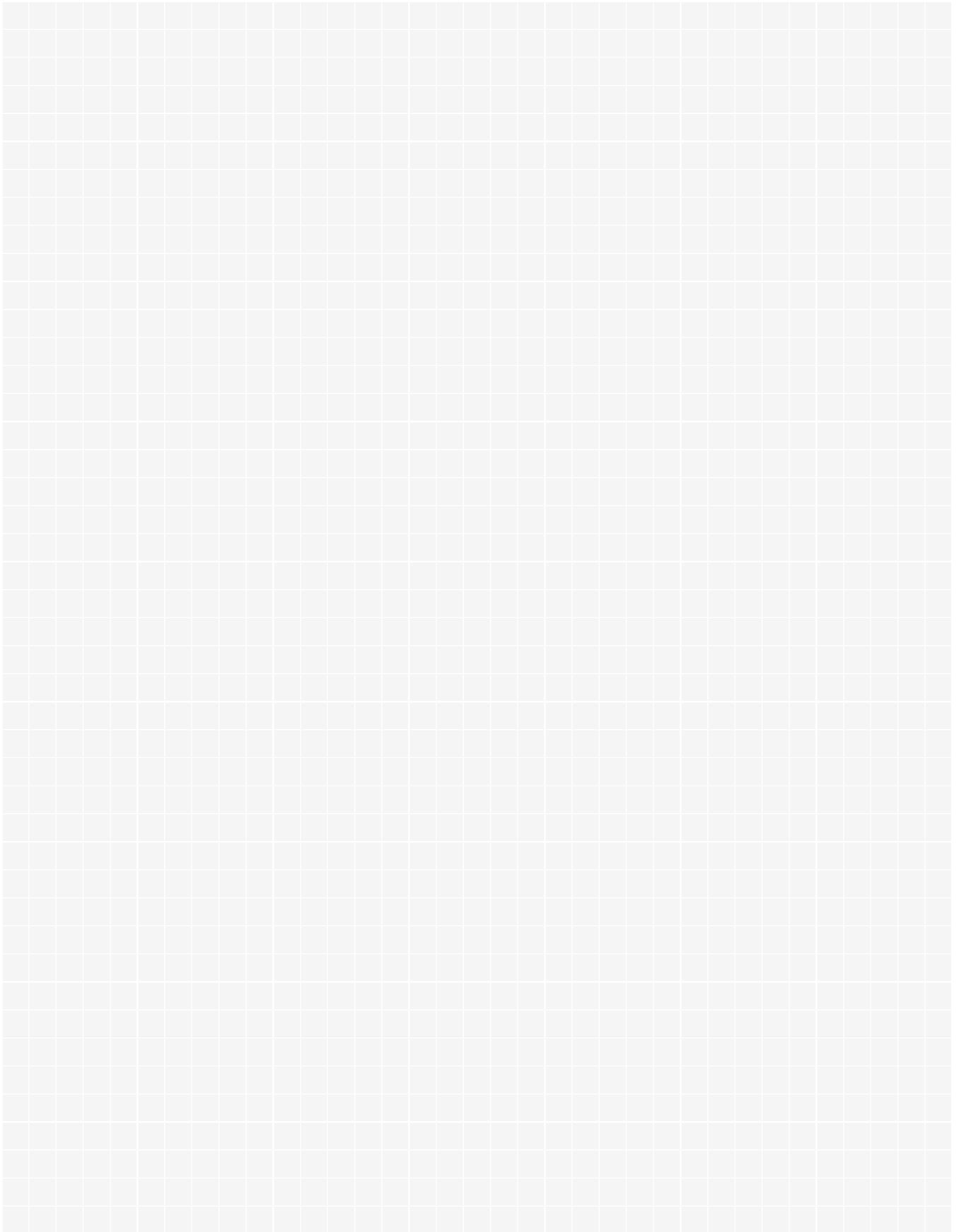


SSP 996603 Driver Assistance Systems

- Lane change assistance (LCA)
- Optical parking system (OPS)
- Rear view camera

Order number: A05.5S00.21.00





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
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