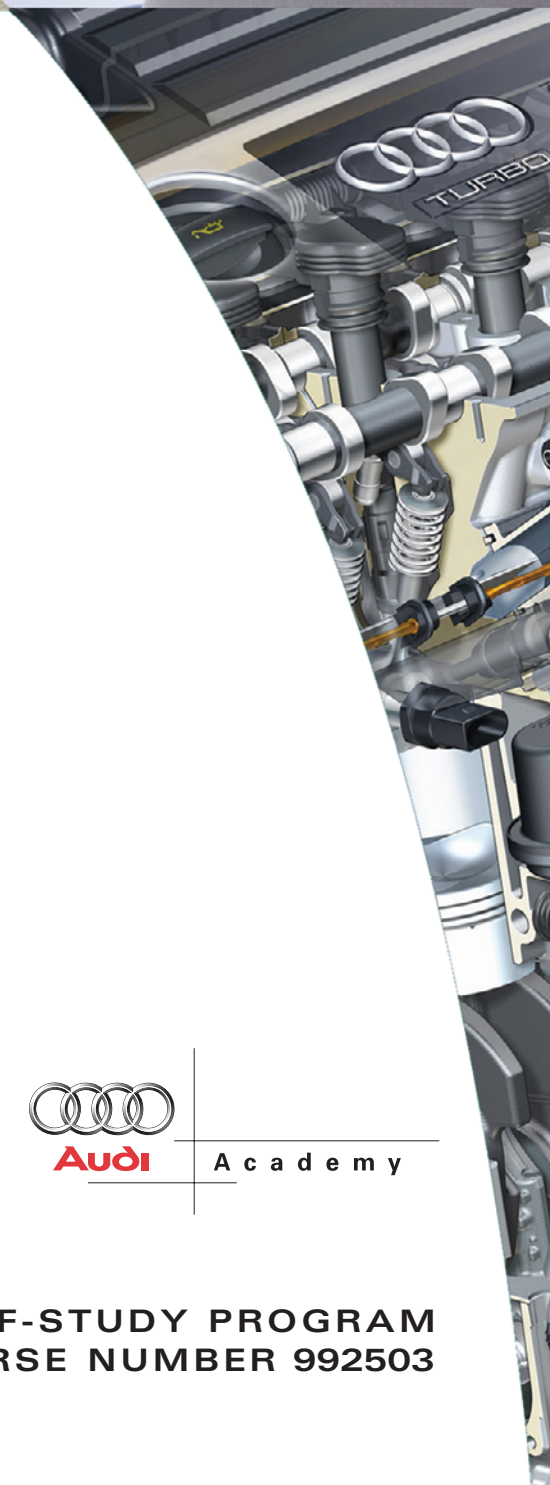




Audi Academy

SELF-STUDY PROGRAM
COURSE NUMBER 992503

Audi of America, Inc.
Service Training
Printed in U.S.A.
Printed 03/2005
Course Number 992503

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Table of Contents

Introduction **1**
Overview, CAN-Bus Topology, Drivetrain CAN-Bus Control Modules, Convenience CAN-Bus Control Modules, Infotainment CAN-Bus Control Modules, Instrument Cluster and Diagnosis CAN-Bus Control Modules, CAN Node Points, LIN Bus

Control Modules **11**
Data Bus On Board Diagnostic Interface (Gateway) J533, Transport Mode, Vehicle Electrical System Control Module J519, Windshield Wiper System, Headlight Washer System, Comfort System Central Control Module J393, Anti-Theft Alarm (ATA), Alarm Horn H12, Inclination-/Anti-Theft Control Module J529, Door Control Modules J386, J387, J388 and J389, Steering Column Electronic Systems Control Module J527, Instrument Cluster Control Module J285

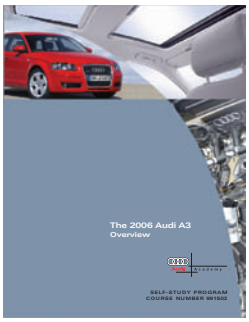
Distributed Functions **38**
Hazard Warning, Left Turn Signal

Infotainment **42**
Sound Systems, Navigation Plus (RNS-E), Antenna Systems

Occupant Protection **48**
Safety Systems, Battery Switch-Off Relay J655, Battery Interrupt Igniter N253

Knowledge Assessment **53**

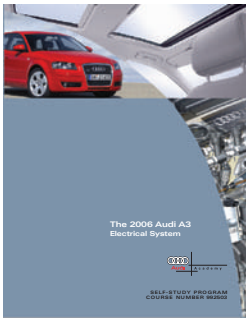
Self-Study Program for the 2006 Audi A3



The 2006 Audi A3 Overview

– Body
– Occupant Protection
– Drivetrains
– HVAC
– Convenience and Infotainment Systems

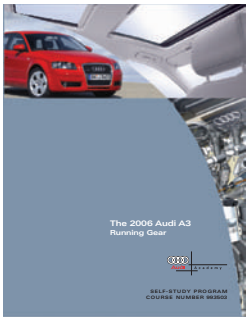
Course Number: 994503



The 2006 Audi A3 Electrical System

– Control Modules
– Distributed Functions
– Infotainment
– Occupant Protection

Course Number: 992503



The 2006 Audi A3 Running Gear

– Front Axle
– Rear Axle
– Steering
– Brake System
– Pedal Assemblies

Course Number: 993503

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

This 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 this Self-Study Program (SSP) was created.

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

Reference



Note



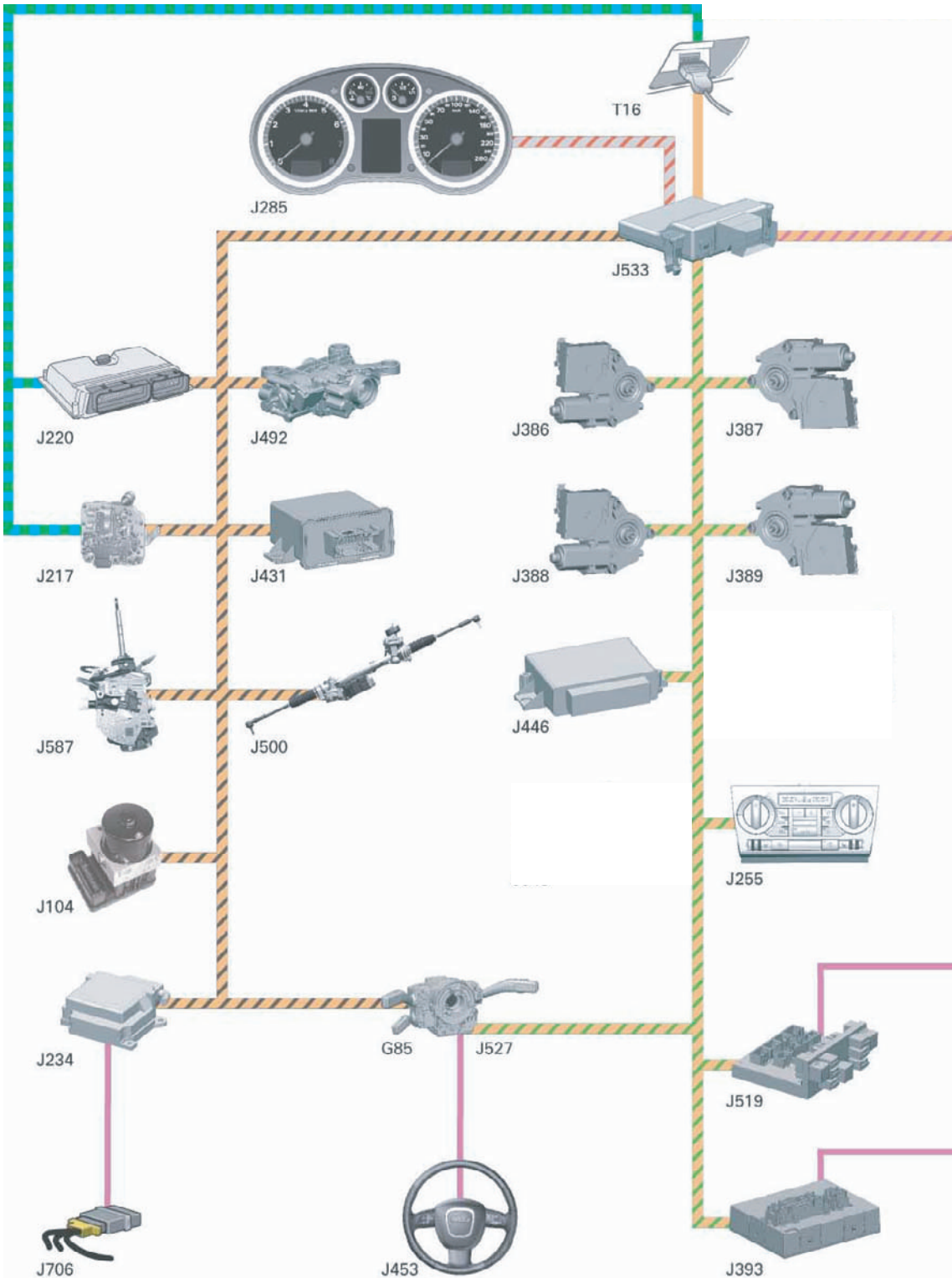
Overview

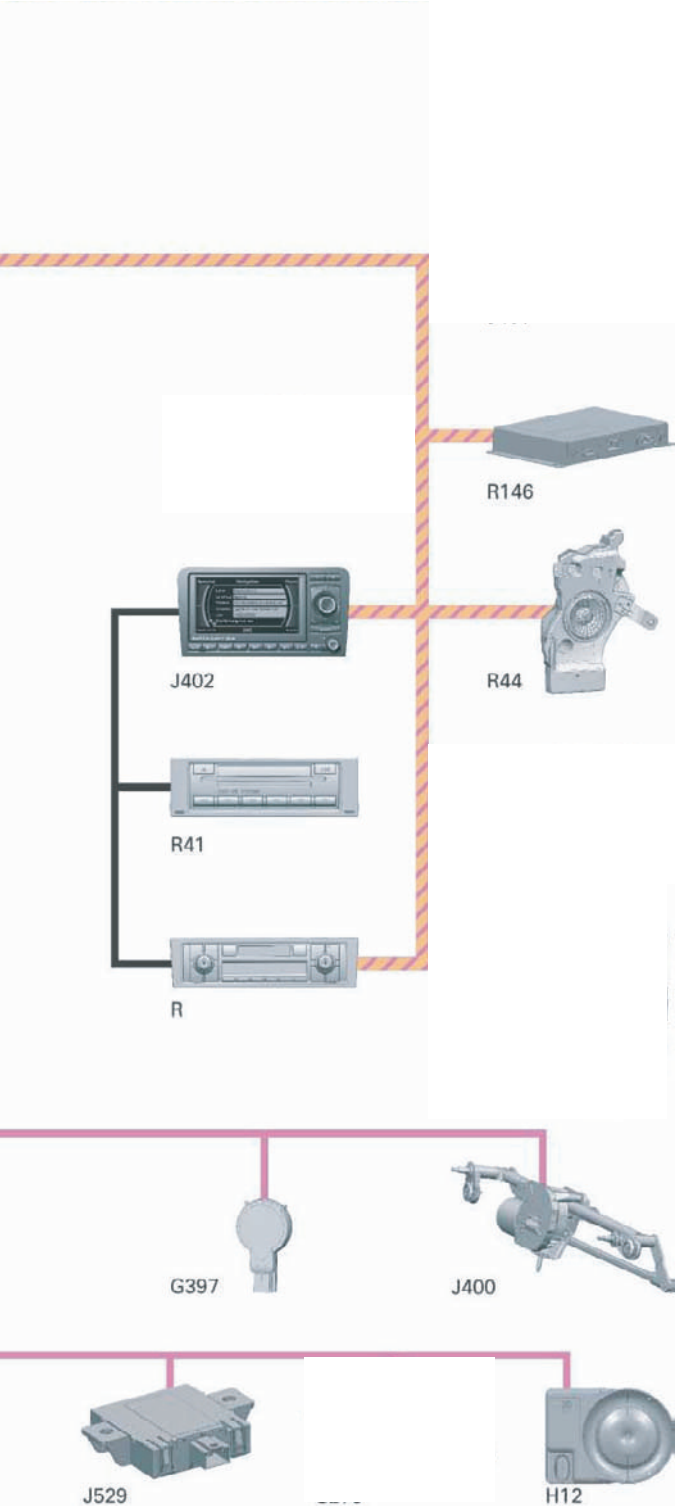
This Self-Study Program covers the 2006 A3's electrical system, including the Controller Area Network (CAN) and various vehicle component systems.

The use of CAN-bus communication for controls and accessories greatly reduces the vehicle wiring. The various CAN systems transmit signals digitally from one control module to another, eliminating the need for a separate wire for each signal.



CAN-Bus Topology





Legend

G85	Steering Angle Sensor
H12	Alarm Horn
J104	ABS Control Module
J217	Transmission Control Module (TCM)
J220	Motronic Engine Control Module (ECM)
J234	Airbag Control Module
J255	Climatronic Control Module
J285	Instrument Cluster Control Module
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
J393	Comfort System Central Control Module
J397	Radiator Fan Afterrun Relay
J400	Wiper Motor Control Module
J402	Operating Electronics, Navigation Control Module
J431	Headlamp Range Control Module
J446	Parking Aid Control Module
J453	Multi-Function Steering Wheel Control Module
J492	All-Wheel Drive Control Module
J500	Power Steering Control Module
J519	Vehicle Electrical System Control Module
J527	Steering Column Electronic Systems Control Module
J529	Inclination-/Anti-Theft Control Module
J533	Data Bus On Board Diagnostic Interface
J587	Selector Lever Sensor System Control Module
J706	Seat Occupied Recognition Control Module
R	Radio
R41	CD Changer
R44	Left Rear Woofer/Amplifier
R146	Satellite Radio
T16	16-Pin Connector

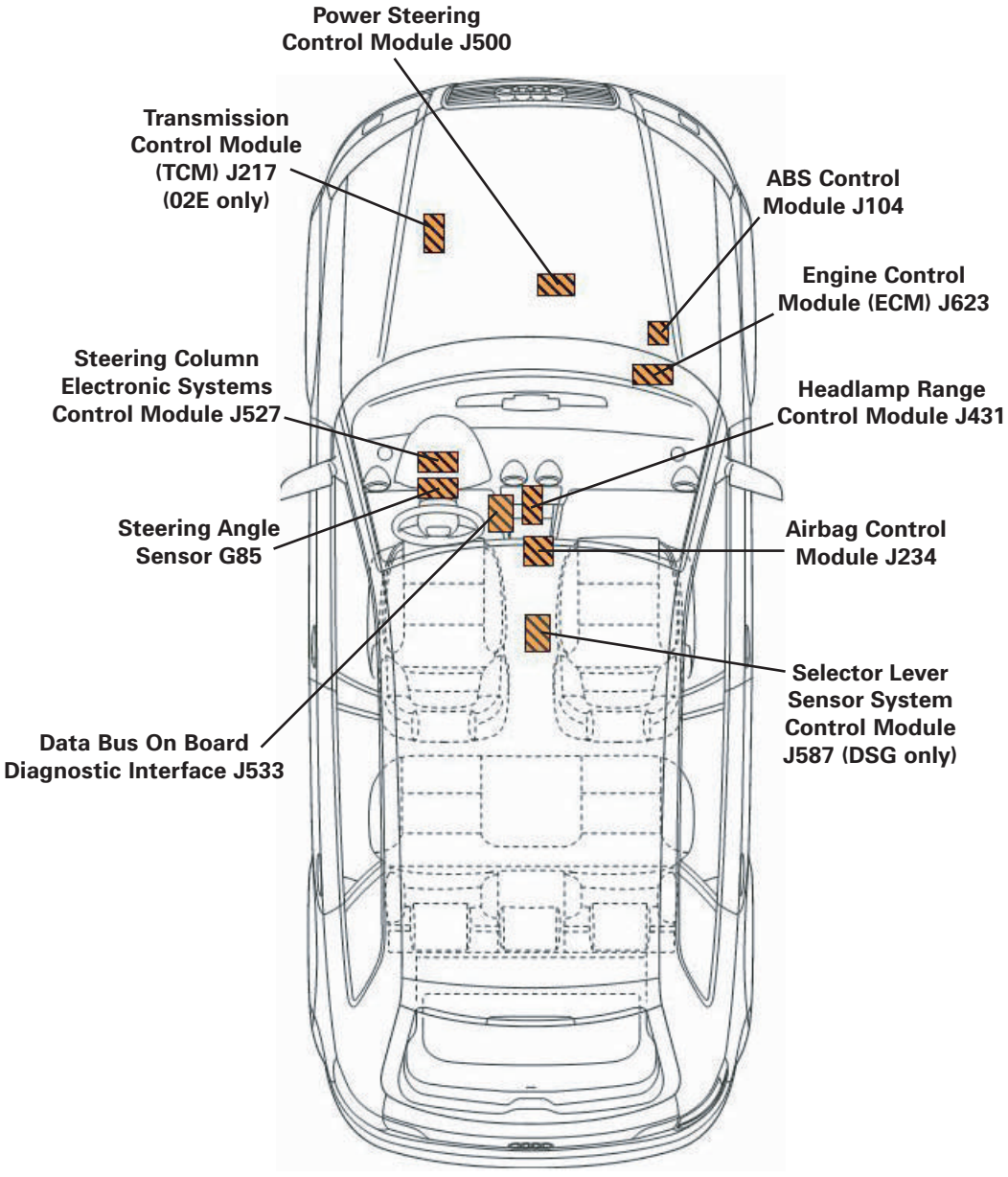
Drivetrain CAN:	500 kbaud
Instrument Cluster CAN:	500 kbaud
Diagnosis CAN:	500 kbaud
Convenience CAN:	100 kbaud
Infotainment CAN:	100 kbaud
LIN	
K-wire	
Panasonic Bus	

Drivetrain CAN-Bus Control Modules

Locations

The illustration below shows the control modules of the Drivetrain CAN and their locations.

The data transfer rate is 500 kbit/s. The data is transferred through the CAN high wire (orange/black) and CAN low wire (orange/brown). To ensure reliable communication without conflict or interference, the CAN wires are twisted together.

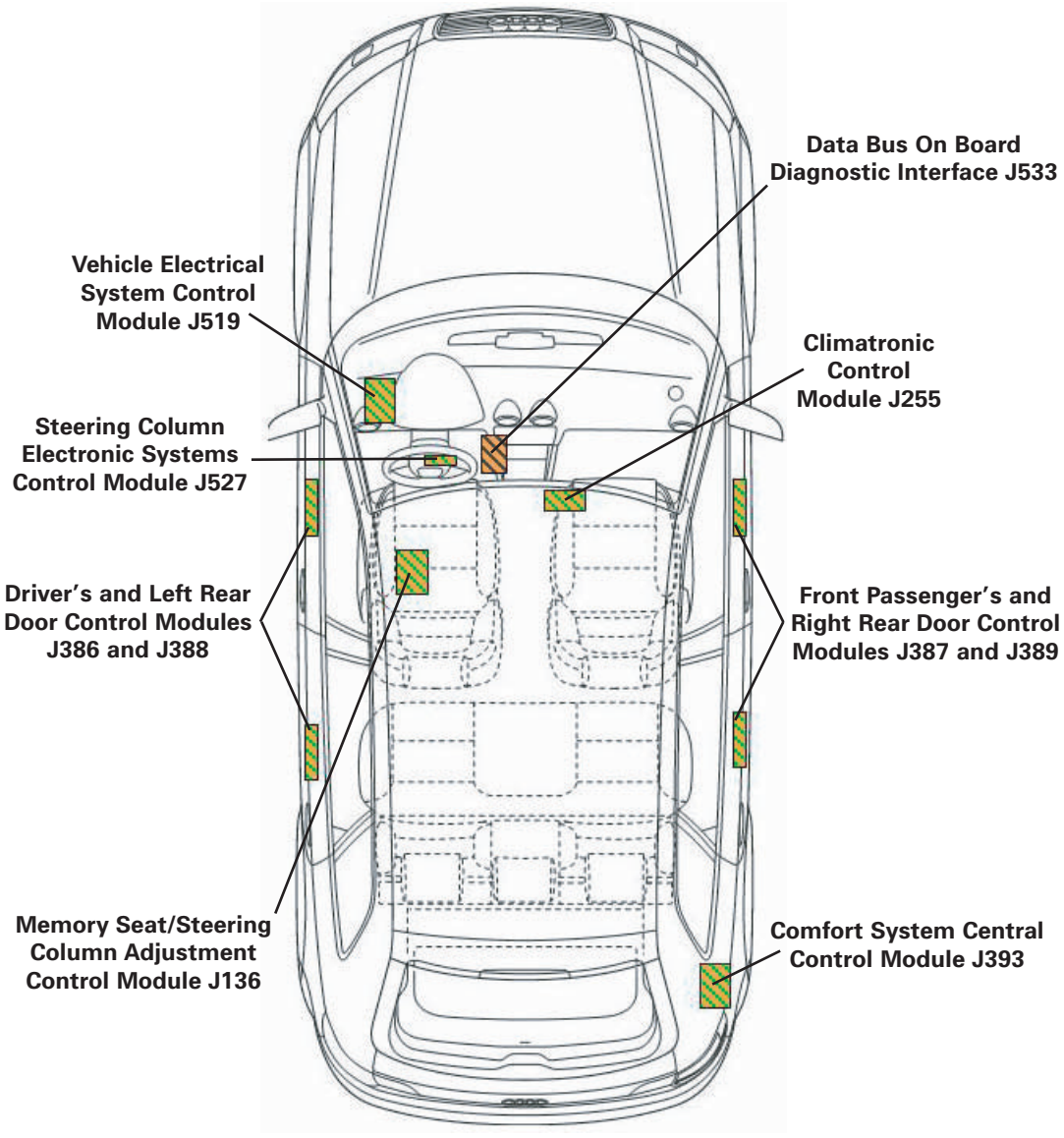


Convenience CAN-Bus Control Modules

Locations

The illustration below shows the control modules of the Convenience CAN and their locations.

The data transfer rate is 100 kbit/s. The data is transferred through the CAN high wire (orange/green) and the CAN low wire (orange/brown). To ensure reliable communication without conflict or interference, the CAN wires are twisted together.

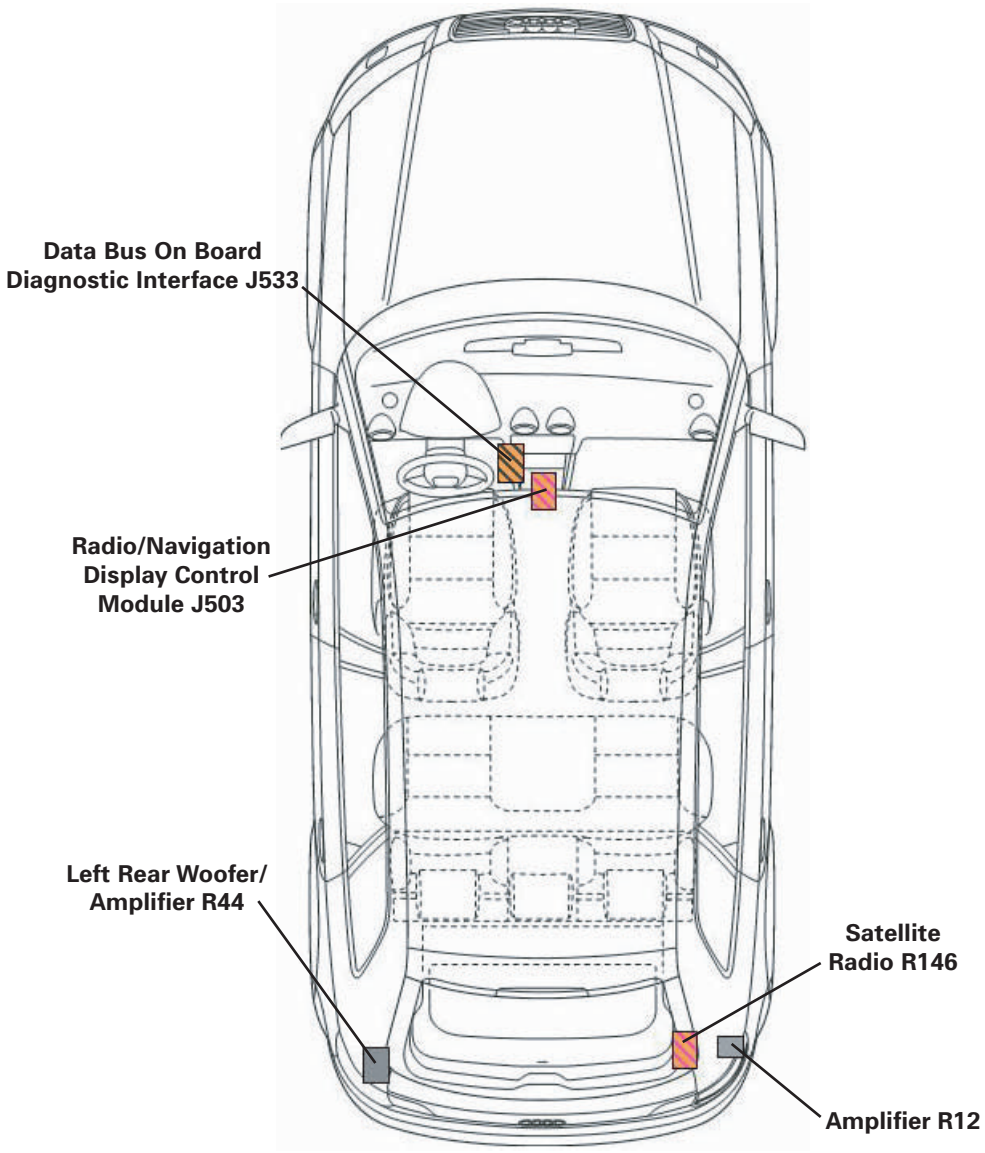


Infotainment CAN-Bus Control Modules

Locations

The illustration below shows the control modules of the Infotainment CAN and their locations.

The Infotainment CAN transfer rate is 100 kbit/s. The data is transferred through the CAN high wire (orange/purple) and the CAN low wire (orange/brown). To ensure reliable communication without conflict or interference, the CAN wires are twisted together.



Instrument Cluster and Diagnosis CAN-Bus Control Modules

Instrument Cluster CAN-Bus

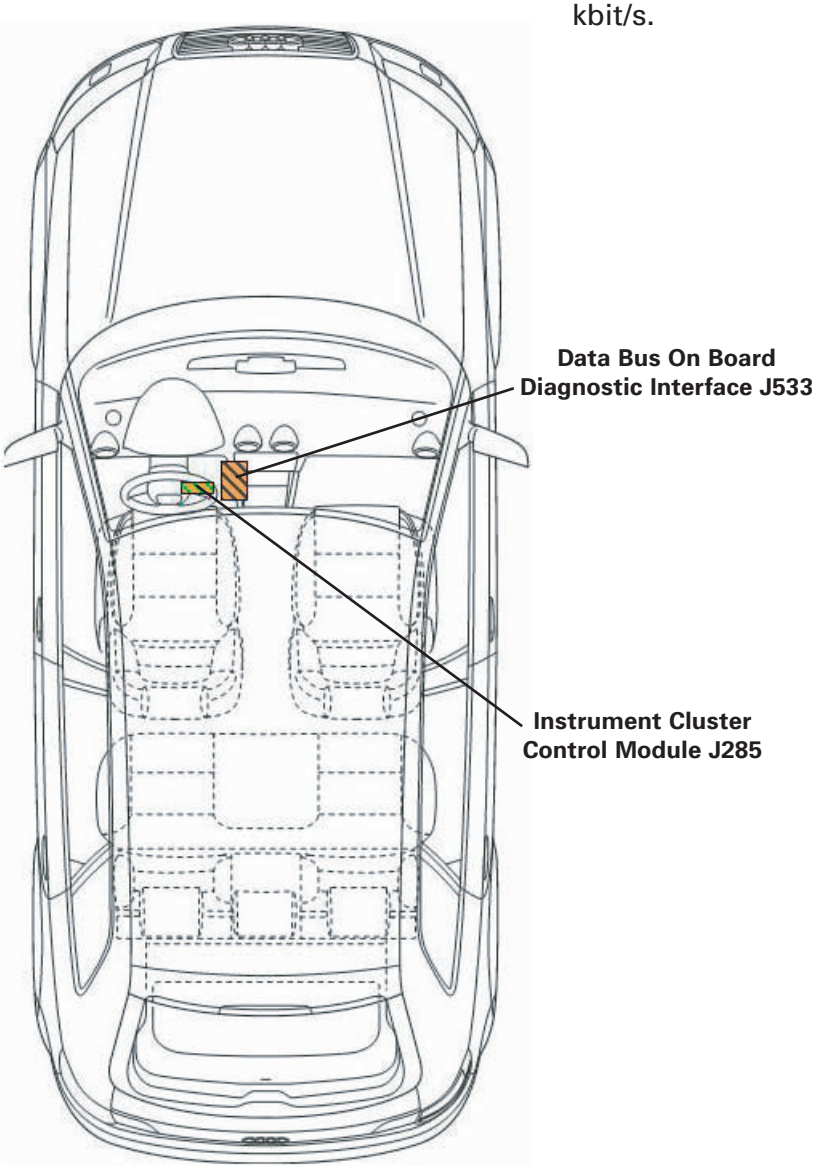
Information is exchanged between Instrument Cluster Control Module J285 and Data Bus On Board Diagnostic Interface J533 through the Instrument Cluster CAN. These are the only control modules in this data bus system.

Diagnosis CAN-Bus

The transfer of data between the VAS 5051/5052 scan tool and Data Bus On Board Diagnostic Interface J533 is through the Diagnosis CAN.

Data Transfer Rate

The transfer rate for both CAN-buses is 500 kbit/s.



CAN Node Points

As in the A4, the CAN node points in the 2006 A3 are located on the A-pillars.

The Drivetrain CAN node point can be found on the driver's side A-pillar facing the left door.

The Convenience CAN and Infotainment CAN node point can be found on the passenger's side A-pillar facing the right door.



Drivetrain CAN Node Point: Left A-Pillar



Convenience CAN and Infotainment CAN Node Points: Right A-Pillar

LIN Bus

The Local Interconnect Networks (LINs) are sub-networks within the topology of the A3's electrical system.

LIN bus systems communicate over a single wire which allows bi-directional communication between the master control module and its slave control modules.

Note

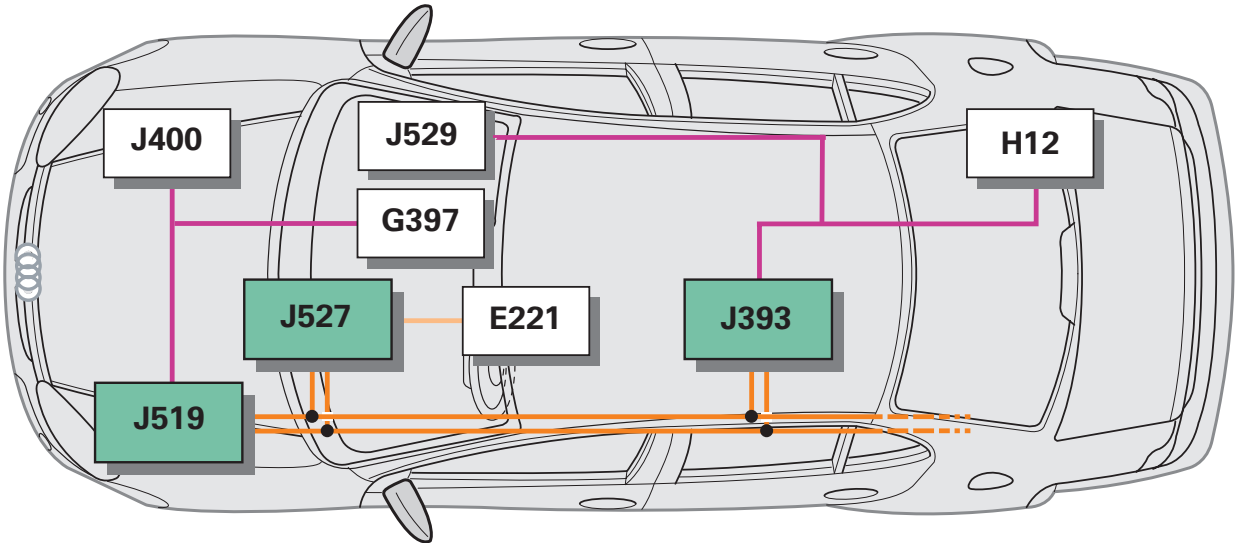
Any coding or basic settings of slave control modules must be done through the master. This is the only way to access the slave control modules via the VAS 5051/5052.

The LIN master control module can be one of several in use on the A3 (J519, J527, and J393). These master control modules interface through the CAN-bus, communicating with and sometimes controlling up to 16 slave control modules through a single wire LIN bus.

Slave control modules supply information to or act on commands from the LIN master control module.

All OBD functions of the slave modules (coding, adaptation, Measuring Value Blocks, and output tests) are also carried out through the master control module.

LIN Bus System



Key

E221 Control Module in Steering Wheel

G397 Rain/Light Recognition Sensor

H12 Alarm Horn

J393 Comfort System Central Control Module

J400 Wiper Motor Control Module

J519 Vehicle Electrical System Control Module

J527 Steering Column Electronic Systems Control Module

J529 Inclination-/Anti-Theft Control Module

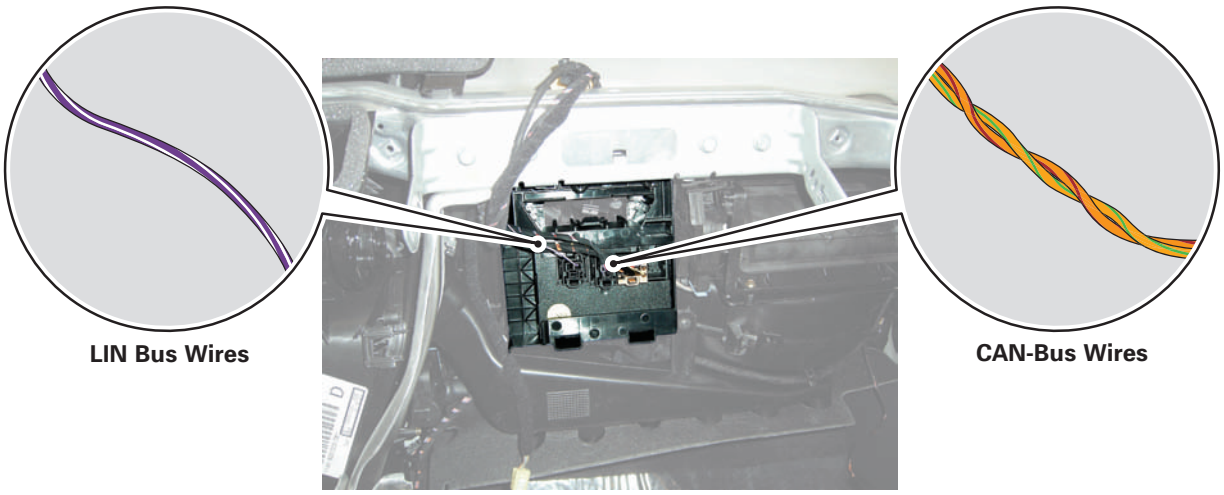
LIN Bus

Windshield Wiper Example

Rain/Light Recognition Sensor G397 senses moisture on the windshield. G397 relays this information through the LIN to Vehicle Electrical System Control Module J519, which sends a command to Wiper Motor Control Module J400 to activate the windshield wipers through the same LIN.

J400 then sends a signal back to J519 that the wipers are ON and at which speed (interval rate). G397 then sends a signal that the windshield is dry to J519, which sends a signal to J400 to stop wiping.

J400 sends a signal back to inform J519 that the wipers are now in park position and are awaiting further commands.

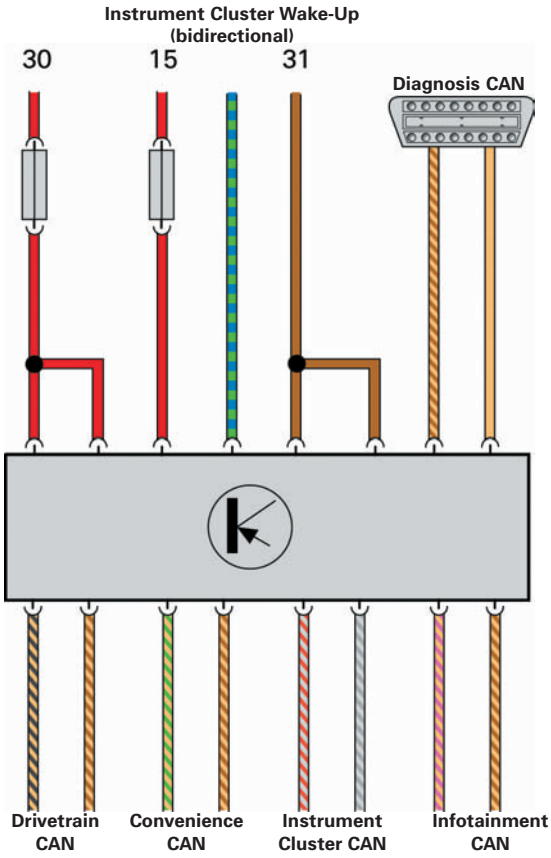


Comfort System Central Control Module J393, Which Often is Used as a LIN Bus Master Control Module

Data Bus On Board Diagnostic Interface (Gateway) J533

Due to the complexity of vehicle functions, large amounts of data must be exchanged between the different CAN-bus networks.

For example, A/C compressor load information on the Convenience CAN at 100 kbs needs to be supplied to the engine control module on the Drivetrain CAN which operates at 500 kbs. J533 enables this interface, acting as a translator to allow communication between the two CANs.



Location

The Gateway is located under the lower dash panel, next to the pedal bracket. It is accessible from the driver's footwell.



J533 Functions

- Acts as an interface between the different CAN-bus systems
- Acts as the interface between the VAS 5051/52 scan tool and the vehicle
- Stores vehicle information (VIN, country code, and engine configuration) which can be referenced by the control modules
- Controls the terminal 15 run-on function
- Allows monitoring of CAN communication through Measuring Value Blocks
- Controls transport mode

Data Bus Sleep and Wake-Up Modes

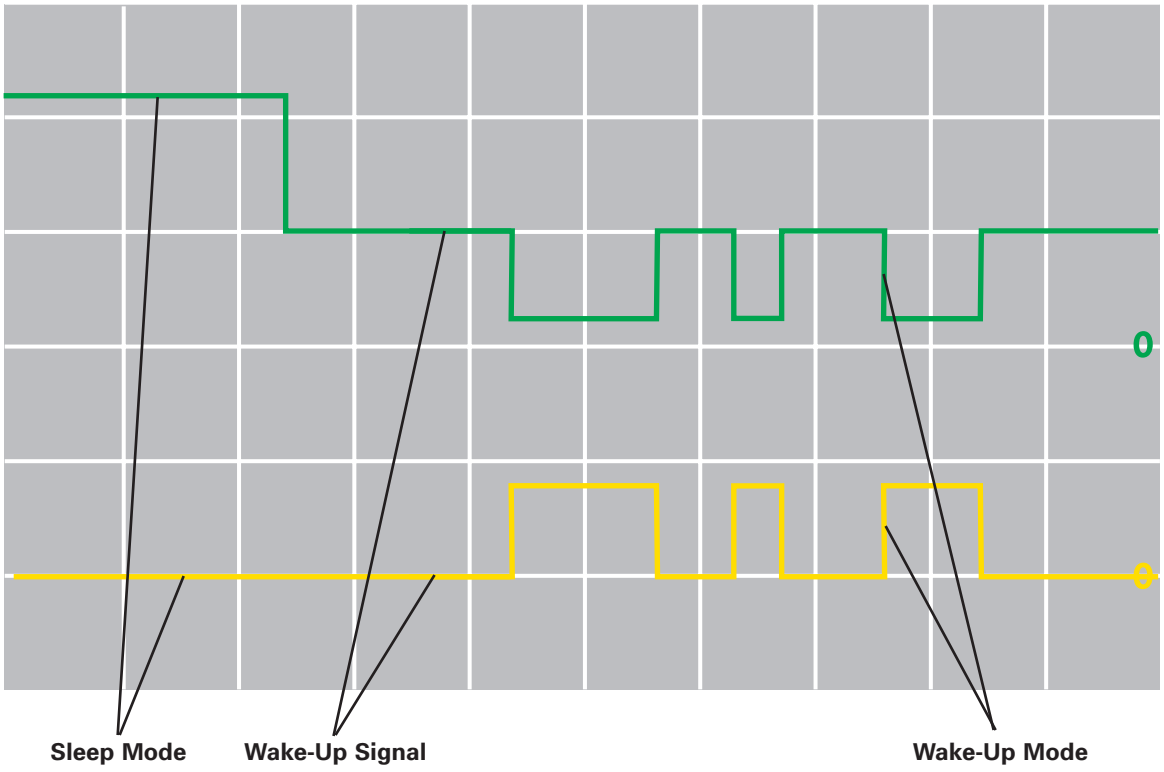
When all of the control modules on the Convenience CAN and Infotainment CAN indicate that they are ready for stand-by, the Gateway control module gives the signal to “sleep.” The voltage level of the low signal is 12 volts and 1 volts for the high signal.

A control module also gives the wake-up signal when the data bus requires activation, such as when the doors are unlocked.

Data Bus On Board Diagnostic Interface J533 monitors the sleep function.

If the Drivetrain CAN does not go into sleep mode, the Convenience CAN and Infotainment CAN will not go into sleep mode.

If the Convenience CAN does not go into sleep mode, the Infotainment CAN will also not go into sleep mode.



Terminal 15 Run-On

Some control modules on the CAN-bus must exchange information when terminal 15 is OFF. When necessary, a message is sent to the CAN-bus to enable the run-on mode. The control modules involved make a connection internally from terminal 30 to terminal 15, allowing them to communicate.

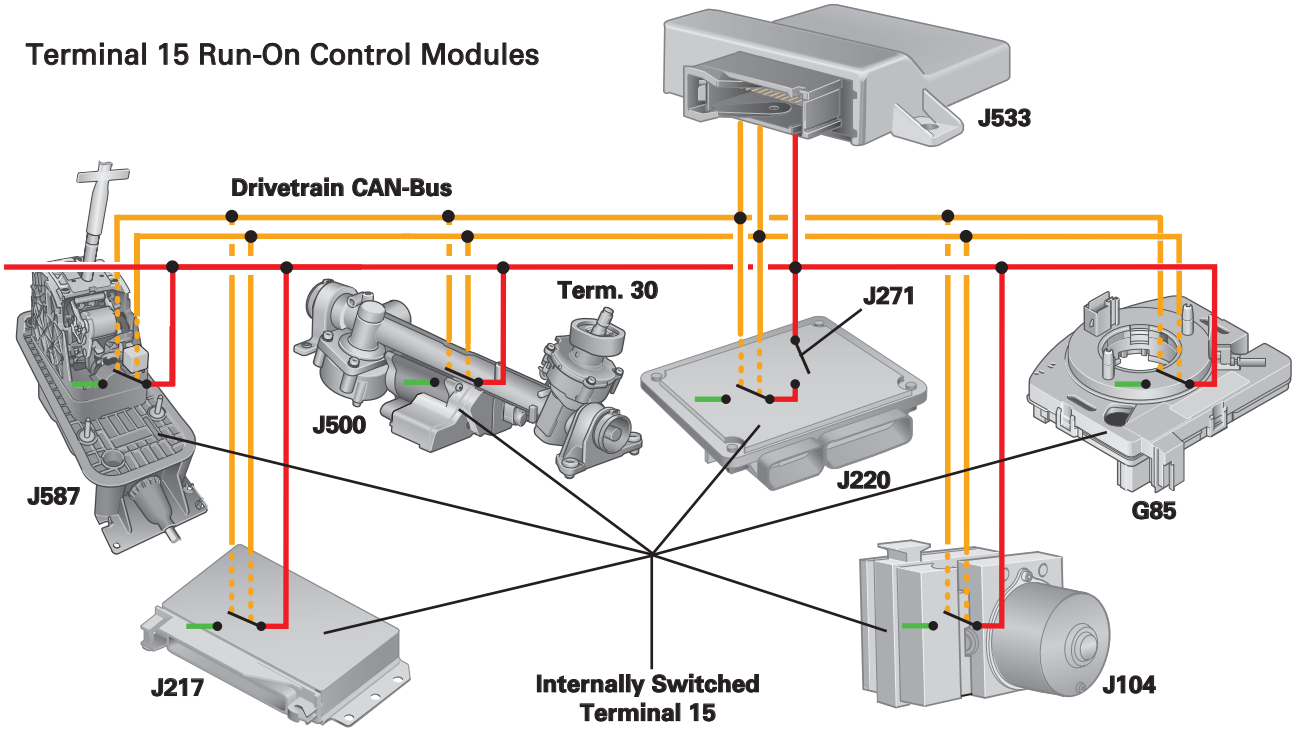
For example, Power Steering Control Module J500 can continue to communicate with other control modules.

The run-on mode can last between 10 seconds and 15 minutes. The run-on length of time depends on the data being transferred. The run-on period ends when J533 sends the sleep command.

Key

G85	Steering Angle Sensor
J104	ABS Control Module
J217	Transmission Control Module (TCM)
J220	Motronic Engine Control Module (ECM)
J271	Motronic Engine Control Module (ECM) Power Supply Relay
J500	Power Steering Control Module
J533	Data Bus On Board Diagnostic Interface
J587	Selector Lever Sensor System Control Module

Terminal 15 Run-On Control Modules



Terminal 15 Continued Operation on Drivetrain CAN

For continued operation of terminal 15, Drivetrain CAN control modules form three groups of CAN users.

Control modules which are able to keep the Drivetrain CAN awake:

- ABS Control Module J104
- Transmission Control Module (TCM) J217
- Power Steering Control Module J500
- Data Bus On Board Diagnostic Interface J533
- Engine Control Module (ECM) J623

Control modules which remain awake until J533 signals readiness for sleep mode, but which are not able to keep the Drivetrain CAN awake themselves:

- Steering Angle Sensor G85
- Selector Lever Sensor System Control Module J587

Control modules with no continued operation function. These are deactivated as soon as the ignition is switched OFF:

- Airbag Control Module J234
- Headlamp Range Control Module J431
- All-Wheel Drive Control Module J492

Transport Mode

J533, Gateway, controls transport mode. During transport to dealerships, power consumption is reduced to protect the battery via transport mode.

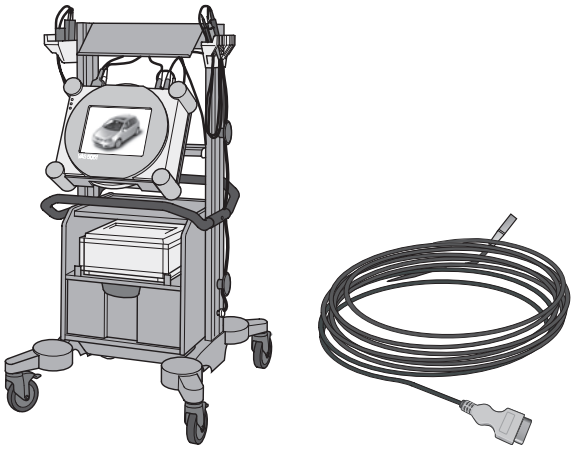
Activating the transport mode isolates the following systems and components:

- Radio
- Radio remote control
- LED indicator in door
- 30 second interior light switch-off delay

The transport mode is switched ON and OFF with the VAS 5051 scan tool.

"Tra" shows in the odometer display of the instrument cluster when transport mode is active.

The transport mode is only available during the vehicle's first 93 miles (150 km). After reaching this mileage, the J533 automatically switches transport mode OFF. Transport mode cannot be turned ON again after 93 miles (150 km) is reached.





Note

Transport mode must be deactivated with the VAS 5051/52 scan tool.

Vehicle Electrical System Control Module J519

Function

J519 controls:

- Exterior lighting
- Charge warning lamp
- Terminal 58s
- Load management
- Terminals 15, 75x, 50 and 30
- Fuel Pump (FP) Relay J17
- Windshield wipers
- Heated rear window
- Horn
- Interior lighting
- Footwell lights (optional)

Activation of Charge Warning Lamp

Terminal L of the alternator is evaluated by J519, which transmits this information to the Convenience CAN. J533 transmits this information to J285, where the charge warning lamp is activated.

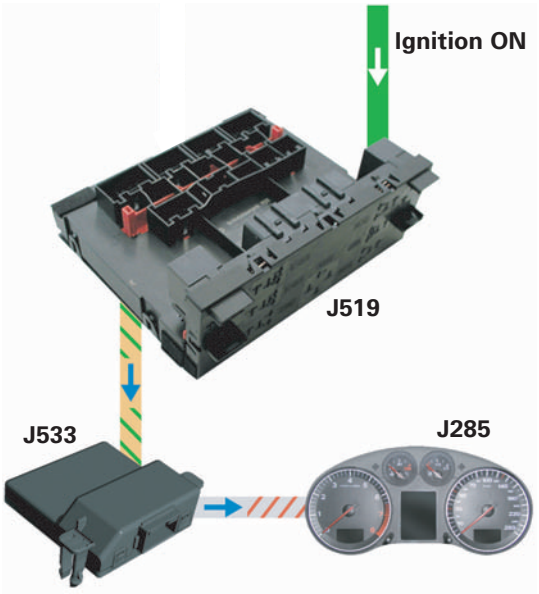
Exterior Lighting Control

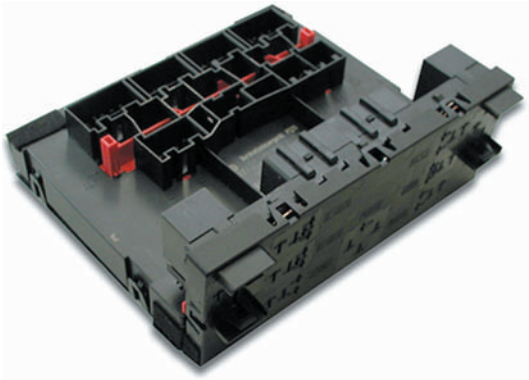
In addition to full software control, J519 is responsible for all exterior lights, such as headlights, reversing lights, number plate lights and turn signal indicators.

The output voltage to the exterior light bulbs is restricted to 13.2V through pulse-width modulation to prevent bulb damage in the event of electrical system over-voltage.

Fuse protection for the exterior lighting is provided by just one fuse each for the bulbs on the left and right sides, with the side light bulbs and the side-mounted turn signal indicators being connected to the fuse on the opposite side.

Failure of the “Right side electrical system” fuse thus leads to failure of the left side light and side-mounted turn signal indicator. In the event of a blown fuse, the vehicle will still have limited lighting on the opposite side.





Brightness Control (terminals 58s and 58d)

In conjunction with J285, J519 regulates the brightness of the display illumination (terminal 58d) and the switch illumination (terminal 58s).

Terminals 58s and 58d have different brightness values.

Whereas values of 6-100% are possible for the switch illumination, only 80-100% can be set for the display illumination.

1 Instrument Panel Illumination Dimmer Switch E20 transmits the potentiometer value through a discrete wire to J519

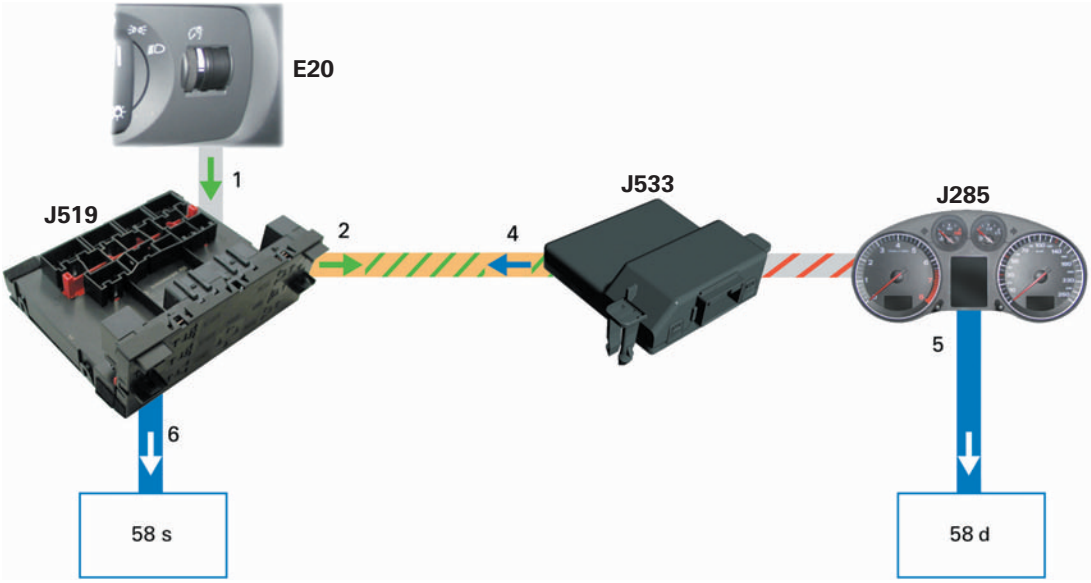
2 J519 transmits the information through the Convenience CAN to J533, then J285

3 J285 uses the potentiometer value and the signal of the internal phototransistor to generate the values for terminals 58d and 58s

4 J285 transmits the information on terminals 58d and 58s back to J519 through J533

5 J519 uses the values for 58d and 58s to illuminate various switches and controls

6 J533 also supplies this information to the Convenience CAN for use by other control modules, such as Climatronic Control Module J255



Load Management

The wide range of electrical equipment may cause the battery and alternator voltage to drop below a permissible level and thus jeopardize proper functioning of vital systems such as ABS or electro-mechanical steering.

J519 is able to boost the electrical system voltage to the necessary extent by increasing idle speed and deactivating heavy-duty loads.

Load Regulation Measures

When the engine is running, idle speed increase (two-stage) may be implemented with a request from J519 to the engine control module through the CAN-bus.

If this fails to achieve an adequate electrical system status, electrical equipment is then deactivated.

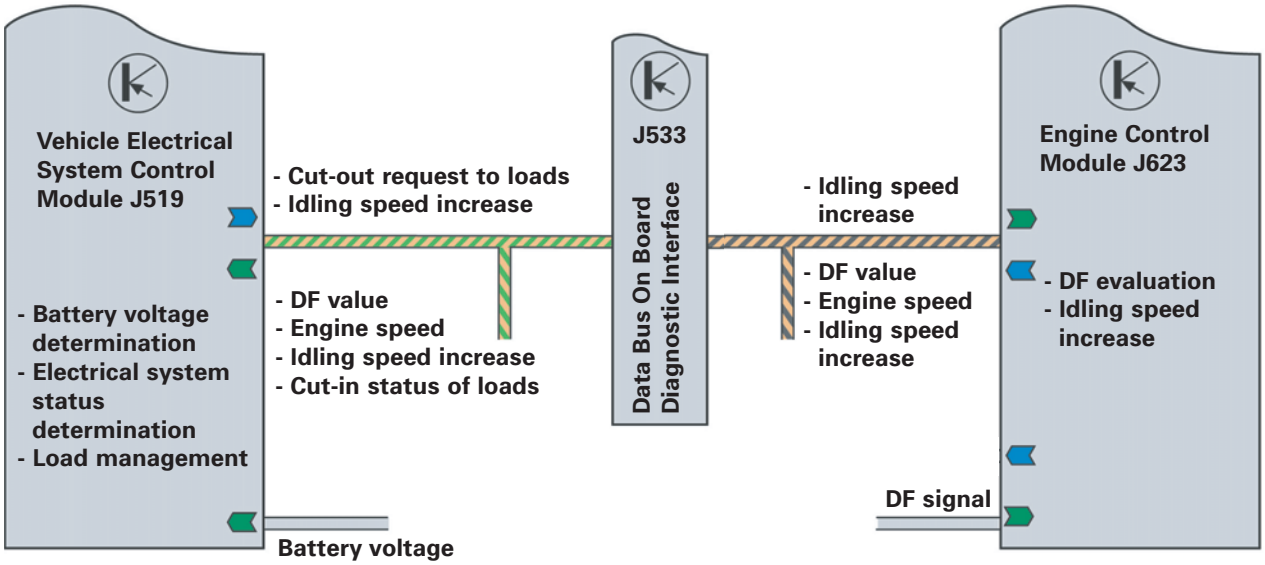
Determination of Load Status

The electrical system situation is established by comparing the electrical system voltage determined to a permissible lower voltage limit.

The electrical system situation is established from the following quantities:

– Battery voltage
– DF signal (alternator capacity utilization)
– Information on activated heavy-duty loads with short cut-in time

In addition, the loads activated by the driver are determined in J519 and the load status then calculated from all these quantities.



Deactivation of Convenience Equipment

In a situation where system voltage is insufficient, J519 can deactivate systems. With ignition ON (with and without engine running), loads are deactivated in the following sequence:

1 Heated Rear Window Z1
2 Heated seats
3 Heated exterior mirrors
4 Footwell illumination, interior door release handle illumination, exit lights, ambient lighting
5 Climatronic Control Module J255

Deactivation is maintained until an adequate electrical system status has been achieved. If the situation improves, equipment is reactivated in reverse order.

In addition, the following are briefly deactivated during ABS braking, or in the case of high electro-mechanical steering current input:

– Heated Rear Window Z1
– Heated seats

With ignition OFF, the following are deactivated:

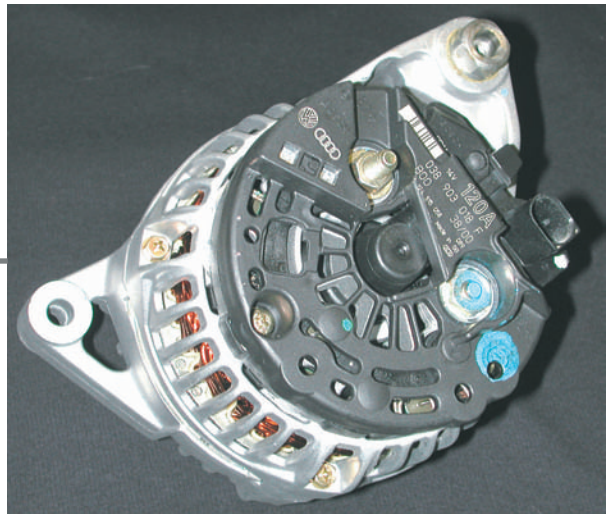
– Footwell illumination
– Interior door release handle illumination
– Exit lights
– Interior lighting
– Leaving Home function

In the event of a crash (signal from Airbag Control Module J234 through CAN to J519), the following loads are deactivated by J519:

– Heated Rear Window Z1
– Heated seats
– Heated exterior mirrors
– Climatronic Control Module J255

Vehicle Electrical System Control Module J519

Alternator

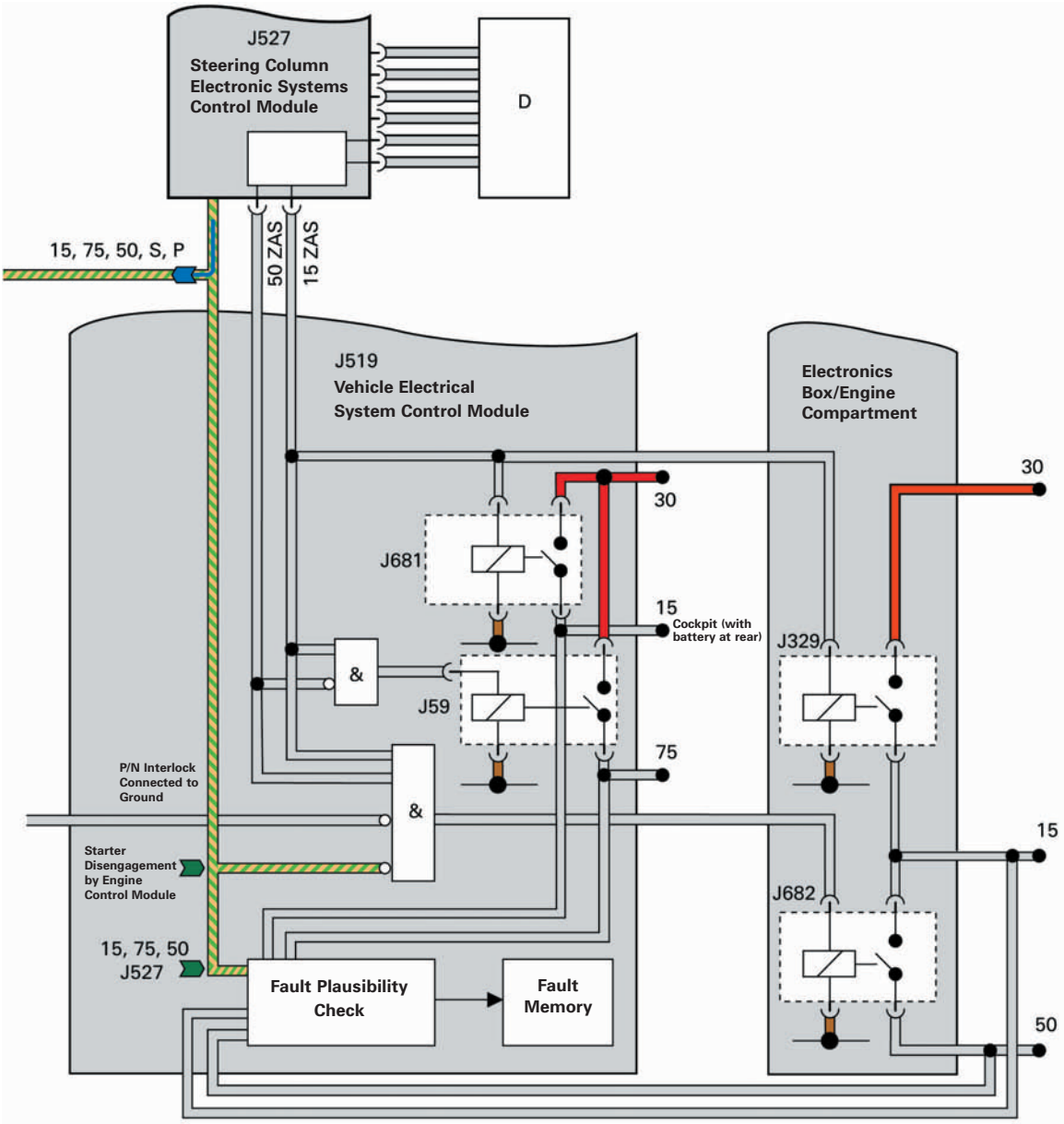


Terminal Control

Steering Column Electronic Systems Control Module J527 passes all terminal signals of the ignition and starter switch to J519 through the Convenience CAN.

Additional discrete wires from J527 supply back-up signals to J519 about terminals 15 and 50.

This information is used to activate the relays for terminal 15 engine compartment, terminal 15 cockpit (vehicles with battery in luggage compartment only), terminal 75 and terminal 50.



Starter Operation

In addition to the ignition and starter switch signals, the following are required for activation of Power Supply (starter) Relay (terminal 50) J682 in engine compartment:

- Automatic transmission P/N signal
- Clutch pedal signal (manual transmission only, in US, otherwise terminal 31)
- CAN information from Engine Control Module J623

J519 initiates the starter. Once Engine Speed Sensor G28 recognizes sufficient engine speed, the request for starter disengagement is sent to J519. The same signal prevents the starter from being engaged once the engine is running.

Terminal 30 (switched)

Terminal 30 supplies the vehicle interior lights with power.

To avoid battery discharge caused by permanent activation of interior lights, terminal 30 is deactivated approximately 30 minutes after terminal 15 OFF in any of the following conditions:

- Interior light is switched ON
- Door is opened
- Tailgate is opened
- Hood is opened

Convenience CAN

Terminal 30

Terminal 31

Discrete wire

D	Ignition/Starter Switch
J59	Load Reduction Relay
J329	Power Supply Relay (terminal 15)
J519	Vehicle Electrical System Control Module
J527	Steering Column Electronic Systems Control Module
J681	Power Supply Relay 2
J682	Power Supply (starter) Relay

Windshield Wiper System

Wiper Operation

The wiper system consists of a single motor with mechanical connections to the wiper arms.

The selected position of Windshield Wiper Switch E is sent to Steering Column Electronic Systems Control Module J527 and relayed through the Convenience CAN to Vehicle Electrical System Control Module J519. The vehicle electrical system control module sends information about the selected wiper position through the LIN bus to Wiper Motor Control Module J400, which controls wiper action.

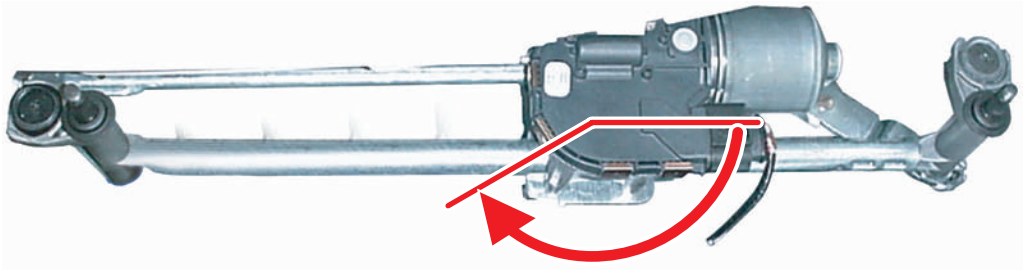
On vehicles with rain and light sensors, the wiper frequency is calculated in the rain sensor mode and sent to the wiper motor control module.

During intermittent operation, wiper movement is speed dependent and varies between 2 and 24 seconds.

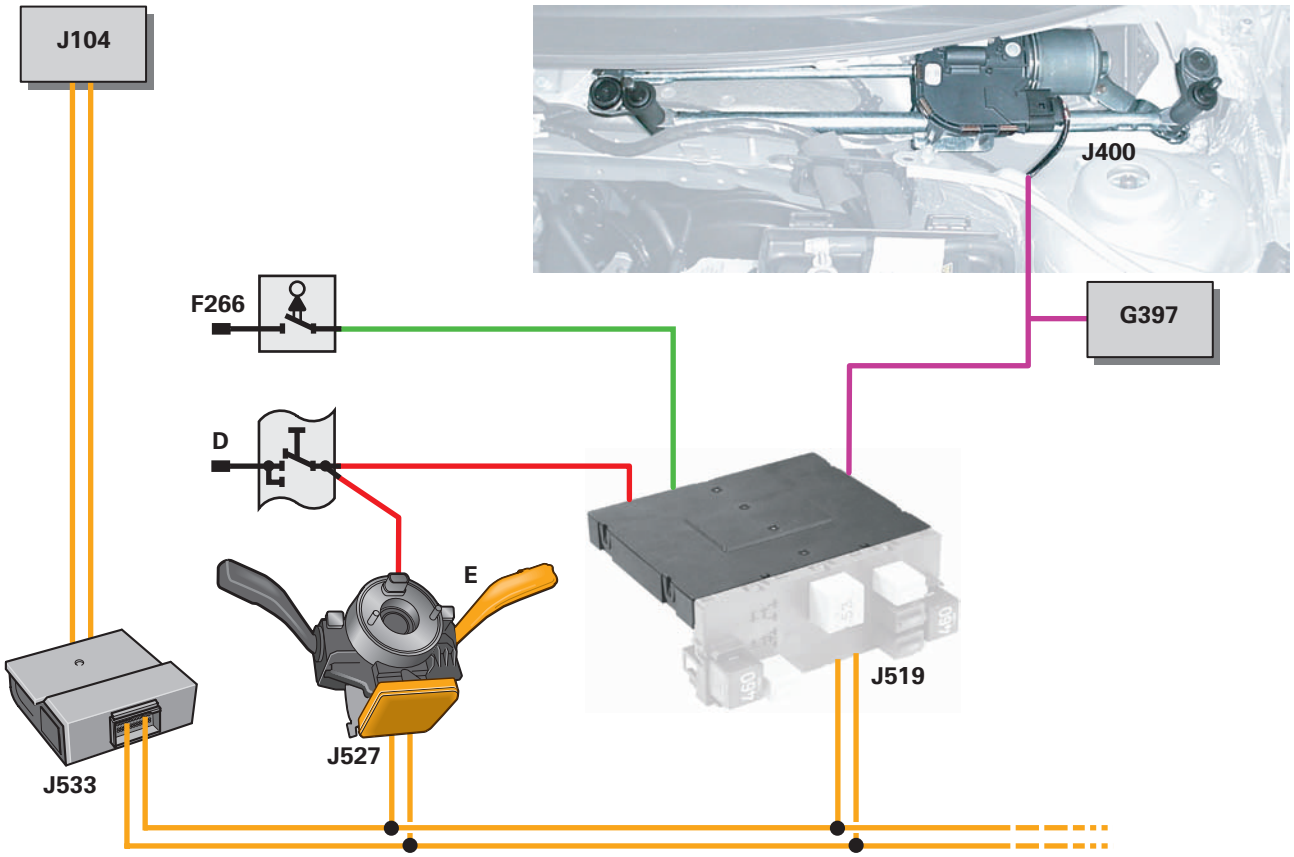
The wiper control system can detect an obstruction and react according to the degree of resistance. The wipers will try to move the obstacle out of the way. If it still has not been removed after the fifth attempt, the wipers will stay in that position. Activation of the wipers after the obstacle has been removed is accomplished by turning the switch ON.

Note

Instead of rotating 360°, the wiper assembly reverses every 150°. This allows a much smaller space for wiper linkage.



Overview of Windshield Wiper System



Legend

D	Ignition/Starter Switch
E	Windshield Wiper Switch
F266	Front Hood Switch
G397	Rain/Light Recognition Sensor
J104	ABS Control Module
J400	Wiper Motor Control Module
J519	Vehicle Electrical System Control Module
J527	Steering Column Electronic Systems Control Module
J533	Data Bus On Board Diagnostic Interface

Service or Winter Position

Moving the wiper switch down one position within 10 seconds of switching OFF the ignition causes the wipers to move up to the service or winter position.

When the wipers are in the service or winter position, the wiper blades can be easily replaced or the wiper arms lifted to prevent the rubber from freezing to the windshield.

The wipers will revert to the rest position when the windshield wiper switch is turned OFF and ON with the ignition ON or if the vehicle reaches a speed of 1.2 mph (2 km/h).

Note

When the vehicle is parked and the hood is open, the wipers will not operate.

Headlight Washer System

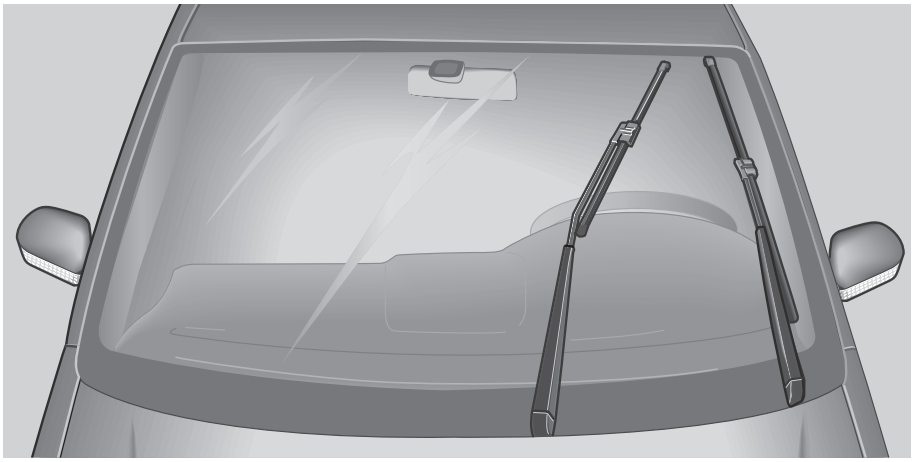
The headlight washer system (with optional Bi-Xenon headlamps) is activated by Vehicle Electrical System Control Module J519 as part of the “wash and wipe” function.

Activation Conditions

- Ignition ON
- Side, low beam or assistant driving lights ON
- Activation of fuel tank door release
- Steering column switch in “wash and wipe” position

Headlight Wash Cycle

- Runs every fourth time the “wash and wipe” function is activated by the control module

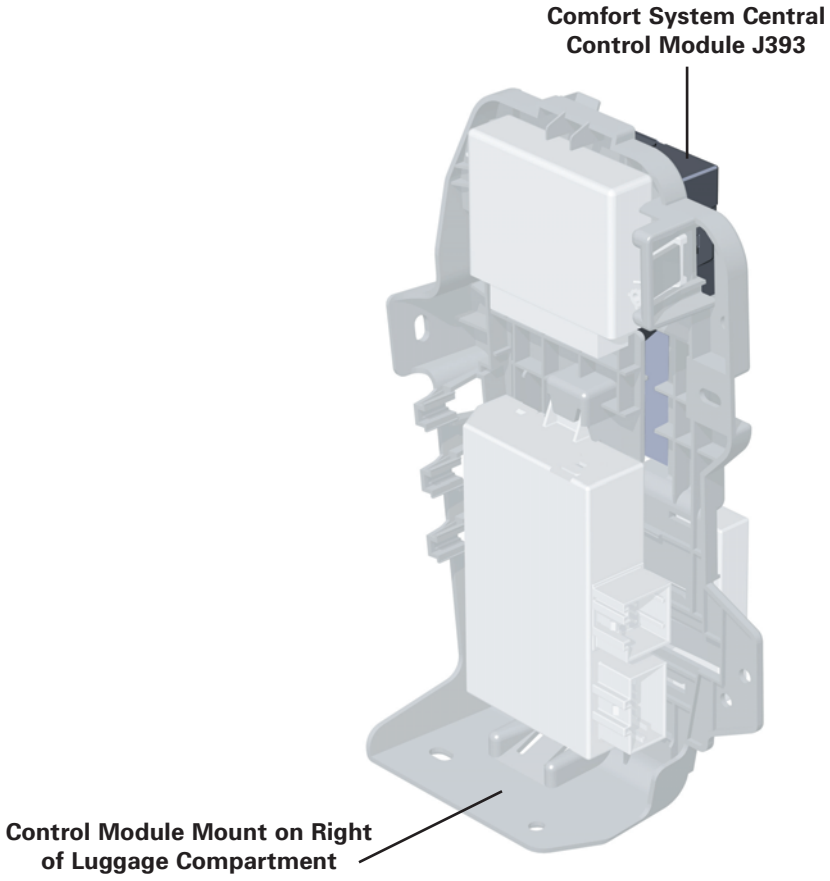


Comfort System Central Control Module J393

J393 is a master control module and connects to Alarm Horn H12 and Inclination-/Anti-Theft Control Module J529 through a LIN bus.

Functions

- Anti-theft master control module
- Central locking control
- Fuel tank door release activation
- Trunk release activation



Anti-Theft Alarm (ATA)

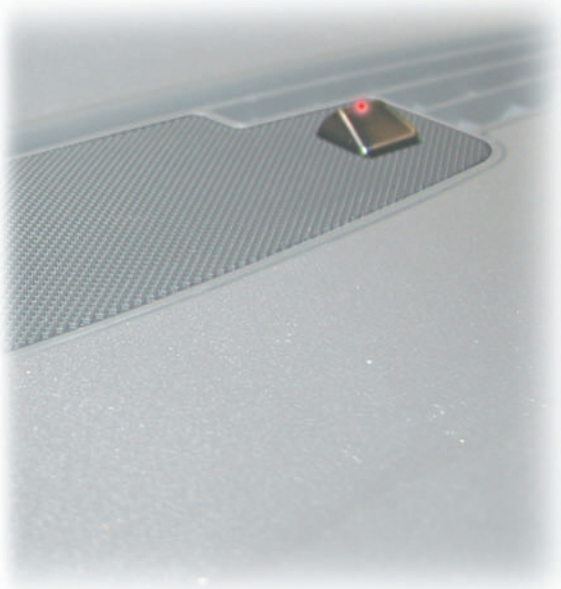
Locking the vehicle always primes the anti-theft alarm.

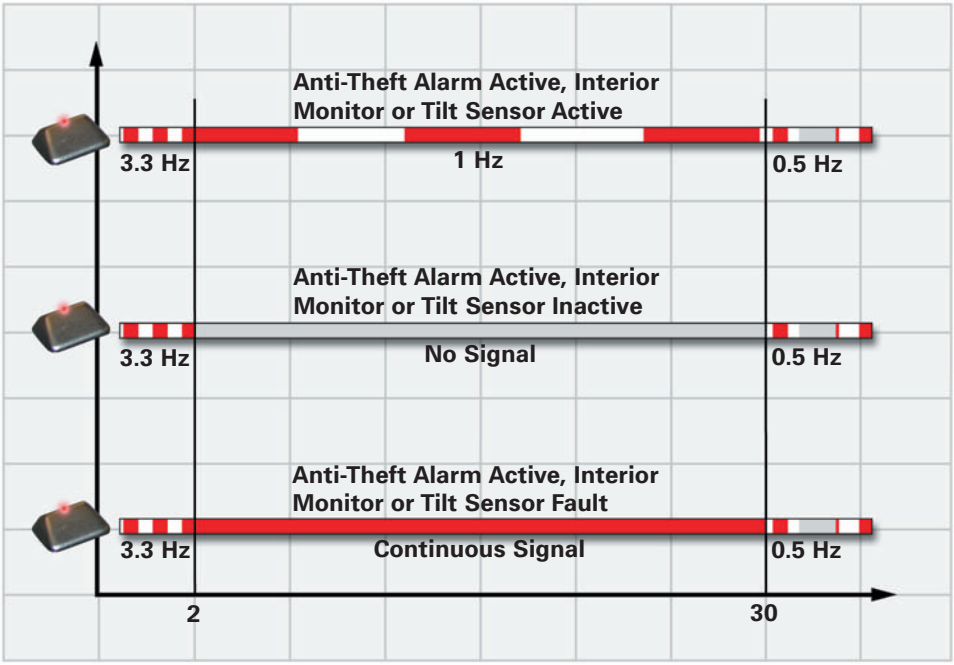
Prerequisites:

- Ignition OFF
- S-contact OFF
- No authorized key signalled by Immobilizer

The corresponding LED is installed in the center of the dash panel next to the air conditioner photosensor.

The LED provides information on the status of the anti-theft alarm in the form of a fixed flashing pulse.





Alarm Horn H12

H12, which is located in the front right wheel housing, monitors and activates J393 through the LIN bus.

Design

H12 has a separate battery which is constantly charged by J519. Its function is to safeguard output of the alarm tone.

An alarm is also triggered in the event of wiring manipulation.

When primed, a signal from J393 is transmitted every 800 milliseconds and acknowledged by H12 through another signal back to J393.

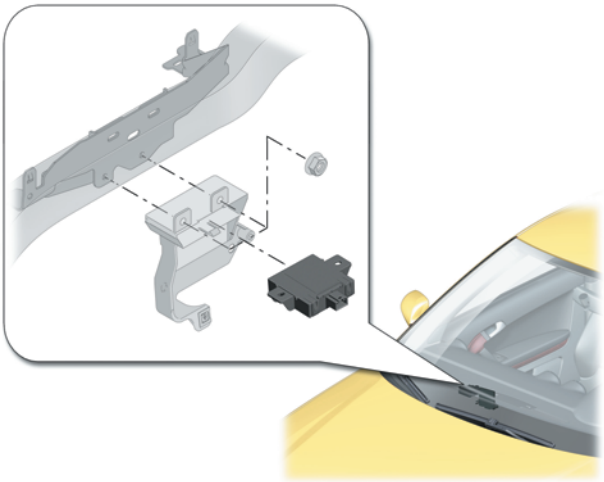
In the absence of alarm horn acknowledgement, or if H12 no longer receives any data, an alarm is triggered in the alarm horn, and J393.



Inclination-/Anti-Theft Control Module J529

J529 is a self-contained control module incorporating a semi-conductor sensor for determining vehicle tilt. It is activated by J393 through the LIN bus.

Upon locking the vehicle, the inclination of the sensor is noted. If the sensor then is moved from this inclination, the alarm is triggered through the LIN bus. This enables the vehicle to be parked on a hill and still be monitored by J529.



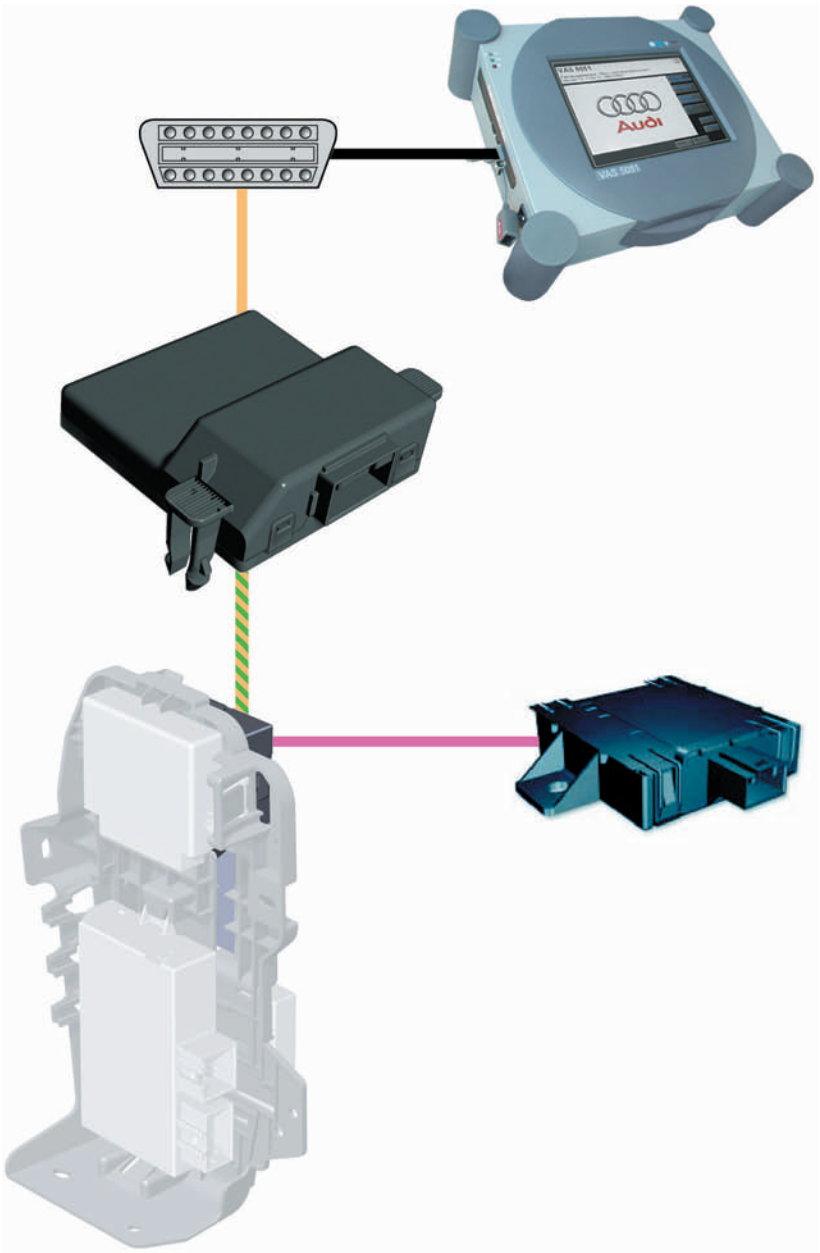
Deactivate Vehicle Inclination Sensor Button E360

J529 can, like the interior monitor, be deactivated before locking the vehicle.



Note

The sensitivity level of J529, a LIN slave control module, can be adjusted by addressing LIN master control module J393 with the VAS 5051/52 scan tool.



Door Control Modules J386, J387, J388 and J389

These control modules control all systems in the door area, including the mirrors. This reduces electrical wiring.

The tasks and functions of Driver's, Front Passenger's, Left Rear, and Right Rear Door Control Modules (J386, J387, J388, and J389) are similar to those in the A6 and A8.

If CAN messages are no longer received by the door control modules from J393, the following emergency functions are implemented:

Note

During service repair, the control modules are only to be replaced together with the window lifter motors.

Emergency Function 1

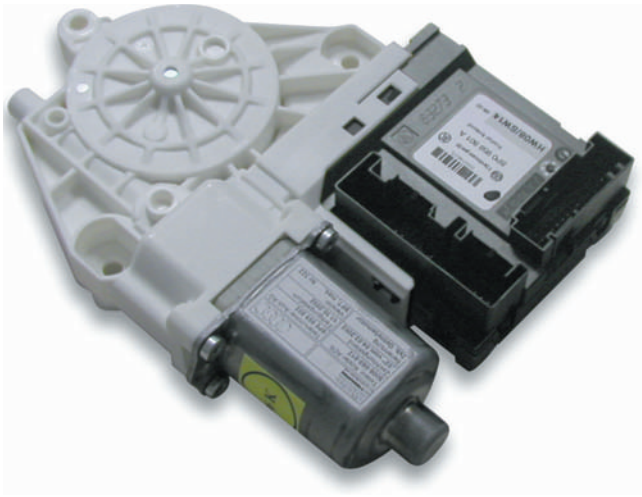
After five missing messages, all door control modules recognize that messages are no longer being transmitted by J393:

- A fault entry is made:
  "No control module communication"
- Driver's Door Control Module J386 assumes control of the central locking system
- All other door control modules react to the messages from J386
- The signals of the lock cylinder at the driver's door and of the lock/unlock button become command signals
  Activation of the lock cylinder takes priority over the button
- The control points for the other doors are deactivated

Emergency Function 2

If the CAN link with the driver's door is interrupted, the vehicle can only be locked manually by way of the lock cylinder.

The lock/unlock button does not function.



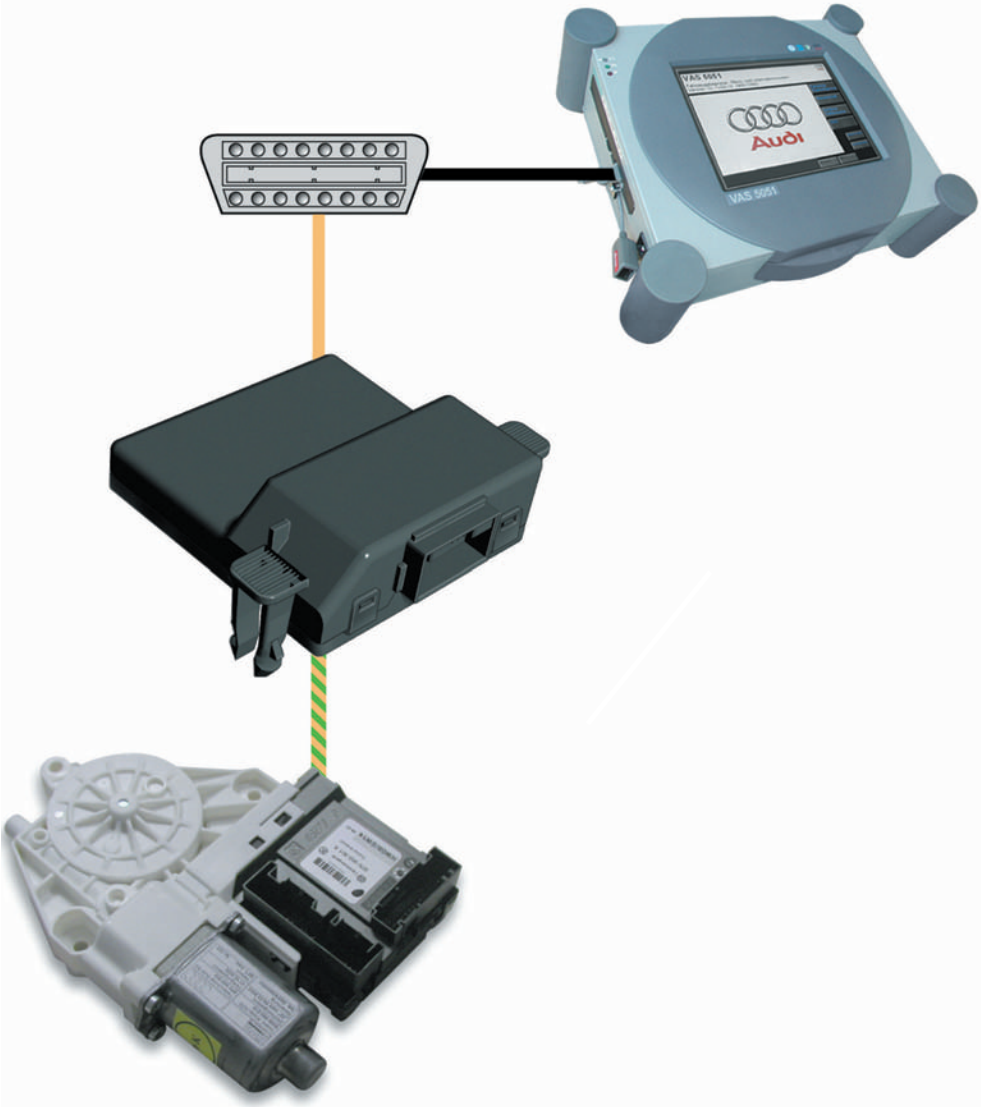
Self-Diagnosis

Door control module self-diagnosis can be selected using the following address words:

- 42 for driver's door electronics
- 52 for front passenger's door electronics
- 62 for left rear door electronics
- 72 for right rear door electronics

Self-diagnosis is implemented through the Diagnosis CAN to the Data Bus On Board Diagnostic Interface J533.

From there it is relayed through the Convenience CAN to the appropriate door control module.



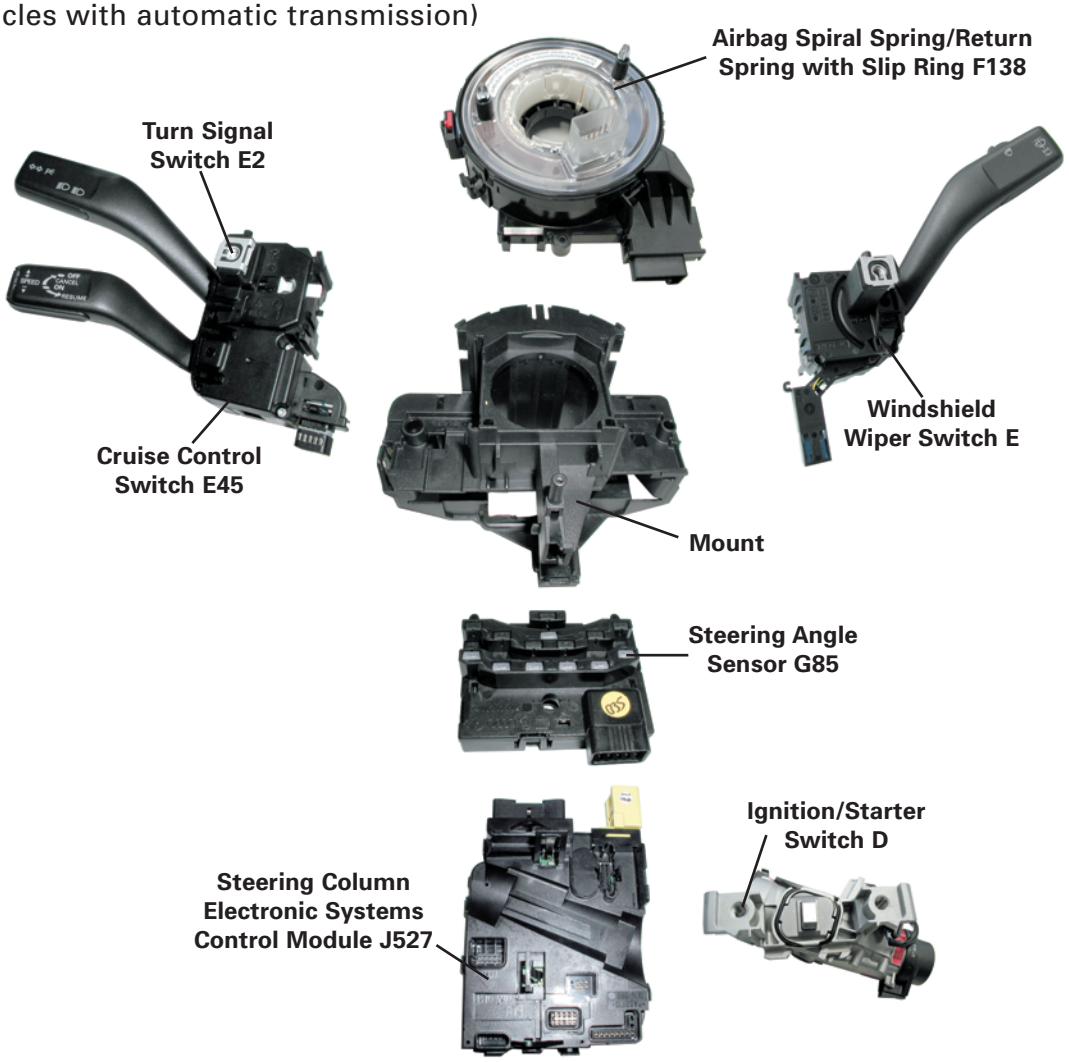
Steering Column Electronic Systems Control Module J527

The design of J527 has been used in previous Audi models. J527 is used on the A3 with some slight modifications:

- Ignition key position
- Mechanical ignition lock with Anti-Theft Immobilizer Reading Coil D2
- J527 for signal conversion and processing of signals from Drivetrain CAN and Convenience CAN
- Equipment-specific control elements
- Coil connector with Steering Angle Sensor G85
- Electric ignition key removal lock (for vehicles with automatic transmission)
- LIN function for connection to Multi-Function Steering Wheel Control Module J453 and Control Module in Steering Wheel E221

Note

All modules of J527 are arranged one above the other. Replacement of individual modules demands extremely careful dismantling of J527. Always refer to the electronic service information when servicing J527.



Function

The task of J527 is to transmit information from operating elements such as turn signal indicators, steering angle, wiper position, and cruise control on the Convenience CAN and Drivetrain CAN.

Self-Diagnosis

J527 self-diagnosis can be selected using address word 16 under “steering wheel electronics.” Communication with J527 occurs through Data Bus On Board Diagnostic Interface J533 and the Convenience CAN.

Instrument Cluster Control Module J285

This control module is designed as two different printed circuit boards (PCB).

The function PCB is attached with the connector to the rear section and accommodates all the function-specific components.

The display PCB contains all illumination LEDs, the stepper motors and the displays together with their output stages.

The link with the vehicle is established by the Instrument Cluster CAN between J285 and the separate Data Bus On Board Diagnostic Interface J533.

The number of J285 wiring connections has been reduced, therefore there is only one connector on the back of the instrument cluster.

The following input signals from external sensors are relayed by means of separate wires to J285:

- Ambient temperature sensor in bumper
- Oil pressure switch
- Washer fluid reservoir (equipment-specific)
- Coolant
- Brake pad
- Brake fluid reservoir
- Tank system
- Multi-function switch for Navigation and menu control (equipment-specific)

This instrument cluster version of J285 features a 64 x 88 pixel center display, and includes the following functions:

- On board computer functions
- Radio display
- Battery warning
- Vehicle speed warning 1 + 2
- Washer fluid warning
- Bulb failure monitoring (front and rear)
- Selection lever indicator



Immobilizer IV Function

The Immobilizer function is integrated into J285.

The available data is stored in the FAZIT data base of Audi AG.

Reusable data can only be called up through this data base.

Immobilizer IV adaptation is to be performed using Guided Fault Finding with the diagnosis tester in online mode.

The Immobilizer warning lamp has been discontinued, with the Immobilizer fault display integrated into the speedometer display.

When matching keys, the number of keys appears on the display.

Connection to the other CAN users can only be established through J533.

The Immobilizer has a separate diagnosis address word.

Self-Diagnosis

J285 self-diagnosis can be selected using address word 17, and the Immobilizer through address word 25.

Measured value blocks, adaptation channels and fault memories are thus handled separately.

The terminal 30 electrical system voltage in J285 is evaluated. If the electrical system voltage drops below 10.5 V, the warning “low battery charge” appears after 20 seconds.

This message is cancelled again once J285 has measured an electrical system voltage in excess of 10.8 V for more than eight seconds.

Pressing the setting button in J285 causes J533 to activate the Convenience CAN.

J527 evaluates the signal from the switch in the wiper stalk.

The signals from the switch are transmitted from J527 on the Convenience CAN to J533 and from there through the Instrument Cluster CAN to J285.





Communication Between J285 and J533

A wake-up wire permits reciprocal waking of J285 and J533.

In contrast to the low-speed Convenience CAN, the high-speed Instrument Cluster CAN cannot be awakened through the CAN wire. To do so, a separate wake-up wire is necessary.

Electrical system voltage is applied to this wire with ignition ON.

This wake-up function is required if, for example, the driver wishes to store a "Vehicle speed warning 2" with the ignition switched OFF and the Instrument Cluster CAN in sleep mode.

The warning threshold is permanently stored in J285.

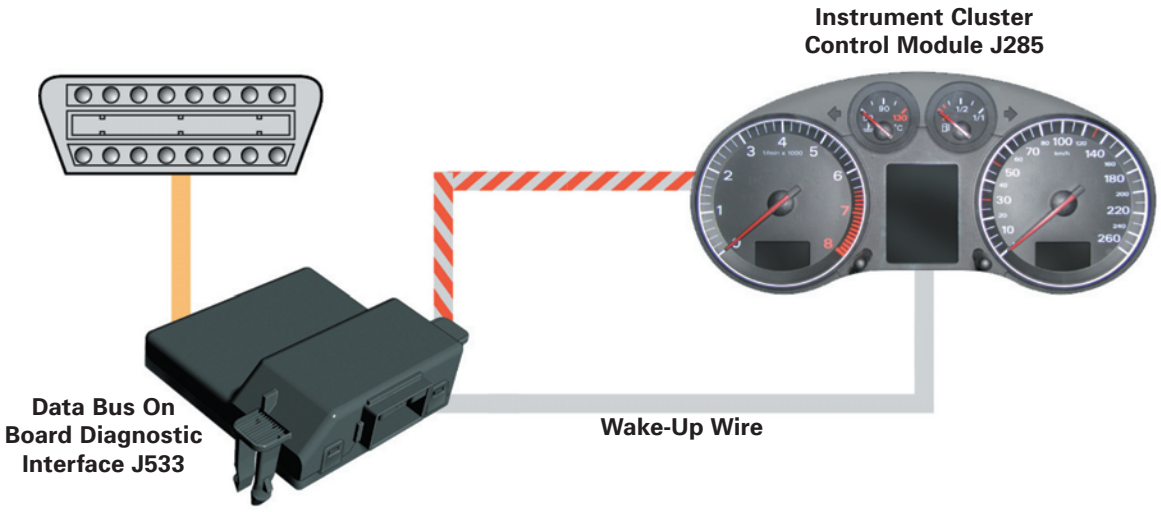
To enable the setting to be made, electrical system voltage is applied to the wake-up wire by J285.

Self-Diagnosis

J285 and J533 diagnosis can be selected through the CAN-bus using the VAS 5051/52 scan tool.

The K-wire is now only used for diagnosis of emission-specific control module.

On service installation of a new J285, the total mileage is copied from the old instrument cluster.



Key

This section on the distributed functions in the 2006 A3 is designed to give insight into the data network in the vehicle and to facilitate understanding of the topography.

Wiring

- Drivetrain CAN
- Instrument Cluster CAN
- Diagnosis CAN
- Convenience CAN
- Infotainment CAN
- LIN Bus
- Bi-Directional Wire
- Discrete Wire
- Follow-Up Function
- Prerequisite

Components and Symbols

(1) A number is used to designate the information sequence described in the corresponding text.

The green circle symbolizes the start of an information sequence.

The green arrow indicates input information.

The blue arrow indicates output information.



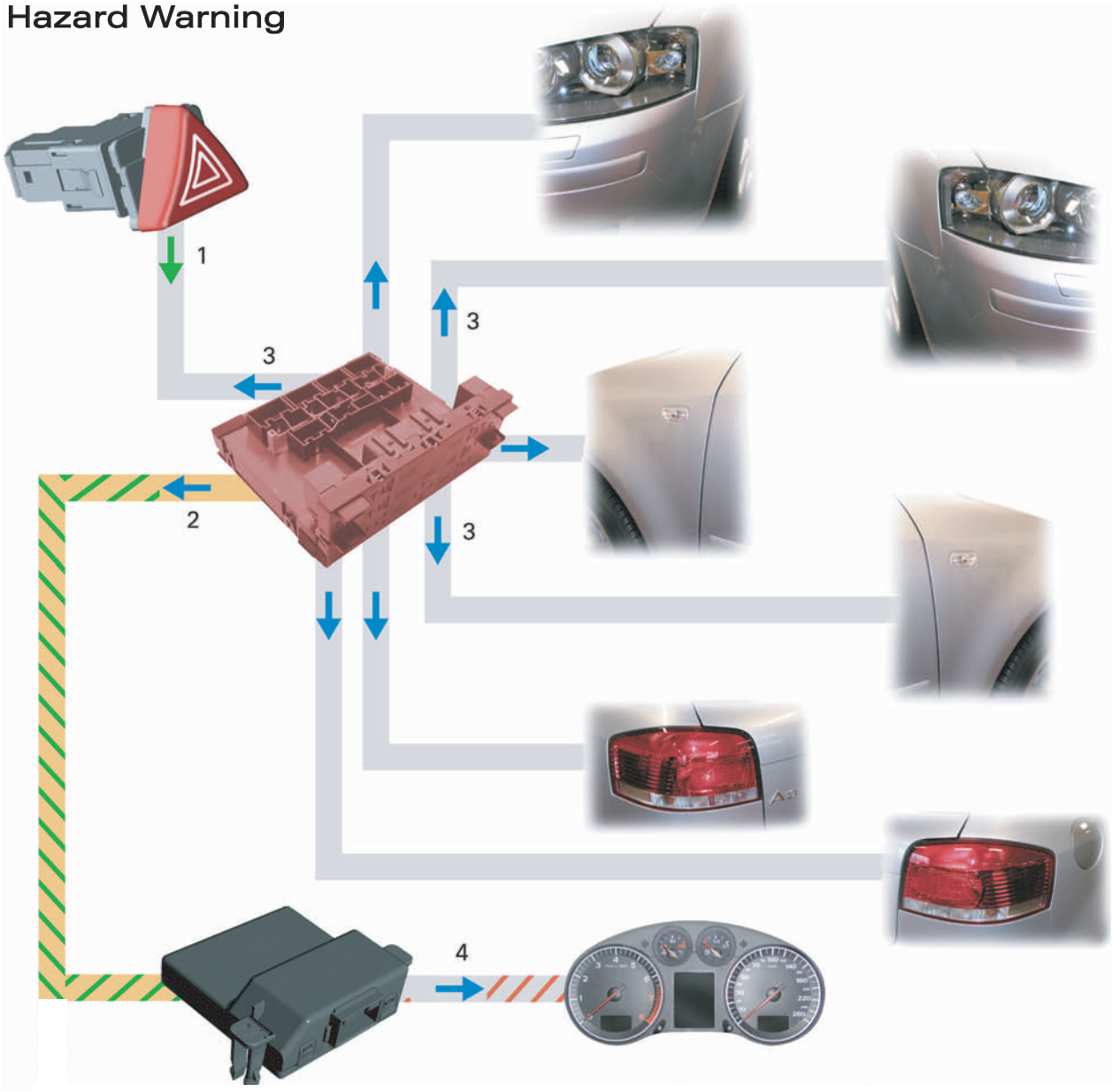
The layout of the individual components such as control modules, switches or control elements as illustrated corresponds to the actual arrangement in the vehicle.

Component designations are explained on the basis of their identifiers in the corresponding text.



Components marked in red indicate the function master within a sequence of operations.

Hazard Warning



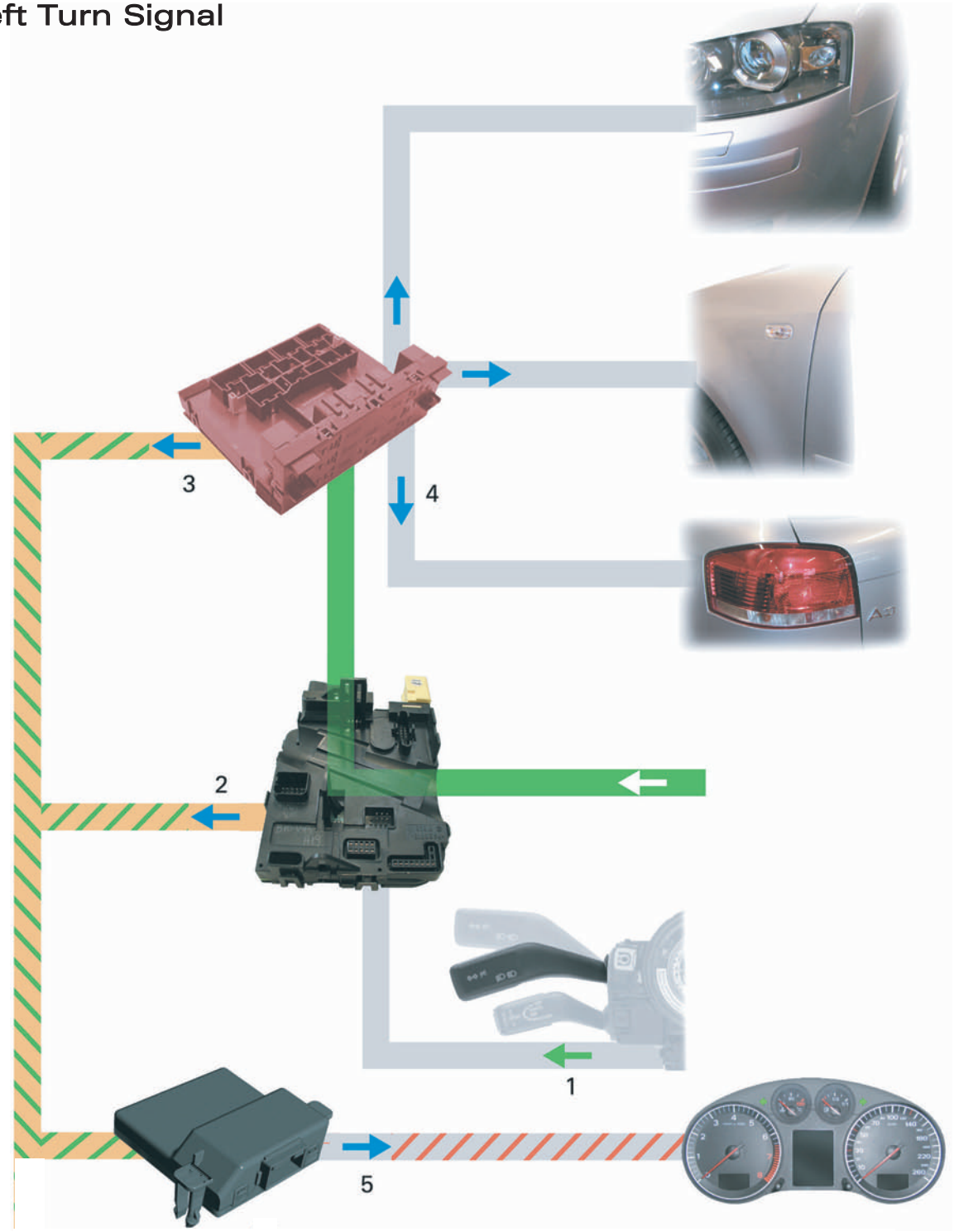
1 The driver activates Emergency Flasher Switch E3. The switch transmits the discrete information “Hazard warning” to J519.

2 J519 stipulates the type of indication and transmits the information “Hazard warning flashing mode” to the Convenience CAN.

3 J519 activates the front M5 and M7, side M17 and M19, and rear M6 and M8 Turn Signal Lamps, as well as the warning lamp in Emergency Flasher Switch E3.

4 J533 transmits the information through the Instrument Cluster CAN to J285, which activates the turn signal indicator lamps.

Left Turn Signal



Prerequisite

Activation of electric ignition/starter switch, causing J519 to switch ignition ON.

Function

1 The driver sets Turn Signal Switch E2 to the left. This transmits a resistance-coded signal to J527.

2 J527 relays the information “Left turn signal” through the Convenience CAN to J519.

3 J519 establishes the priorities and type of indication on the basis of the information received and then transmits the information “Left turn signal” to the Convenience CAN.

4 J519 activates Left Front, Left Side and Left Rear Turn Signal Lamps M5, M18 and M6.

5 J533 passes the CAN information “Left turn signal” to the Instrument Cluster CAN and the warning lamp in the Instrument Cluster, then flashes.

Sound Systems

The Symphony II sound system is available in the 2006 A3.

The front mid-range loudspeakers are fitted into the trim of the two doors and the front treble loudspeakers into the A-pillars.

The rear loudspeakers in the side trim on either side are of coaxial design and cover both the treble and mid-range spectrum.

An additional mid-range/treble loudspeaker is installed in the center of the instrument panel to provide well-balanced acoustics.

One bass loudspeaker is always installed behind the rear left wheel housing.



1 Left Front Treble Speaker R20
2 Right Front Treble Speaker R22
3 Left Front Midrange Speaker R103
4 Right Front Midrange Speaker R104
5 Center Mid/High Range Loudspeaker R158
6 Left Rear Speaker R4
7 Right Rear Speaker R5
8 Left Rear Woofer/Amplifier R44
9 Amplifier R12

Concert Radio

The Concert sound system uses analog technology to provide natural and balanced sound quality for all occupants.

The front channels are amplified directly by the radio.

The rear channels are amplified separately.

For this purpose two radio pre-amplifier outputs are connected to Left Rear Woofer/ Amplifier R44, which incorporates the amplifier output stages for the two rear-channel coaxial loudspeakers as well as for the subwoofer.

Concert sound system diagnosis can be performed through the CAN bus.



Symphony II Radio

The Symphony II radio has the following features:

- Integrated six-CD changer
- Improved ease of operation, including separate sound control in the high, mid and low frequency bands
- Diversity antenna system

The geometry of the rear window results in different magnetic field strengths which can impair the reception (Rx) level in certain situations.



Note

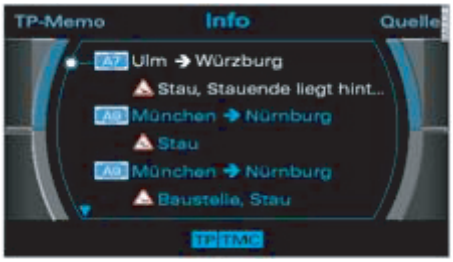
Details on radio diagnosis can be found in VAS 5051 scan tool Guided Fault Finding.

Navigation Plus (RNS-E)

The new Navigation system has the following features:

- AM/FM bands
- Satellite radio prep: XM or Sirius provider capability
- 1 DVD to cover all of US and Canada
- Full color, map-based navigation screen
- MMI Control Logic with similar screen design and font
- SD card inserts to store MP3 data (music) to transfer into radio controls
- GALA (deactivated if equipped with BOSE Audio Pilot)
- LCD screen dimensions: 3 inches vertical, 5.5 inches horizontal, 6.25 inches diagonal







Antenna Systems

The antenna system in the heated rear window of the 2006 A3 is available in two distinct versions:

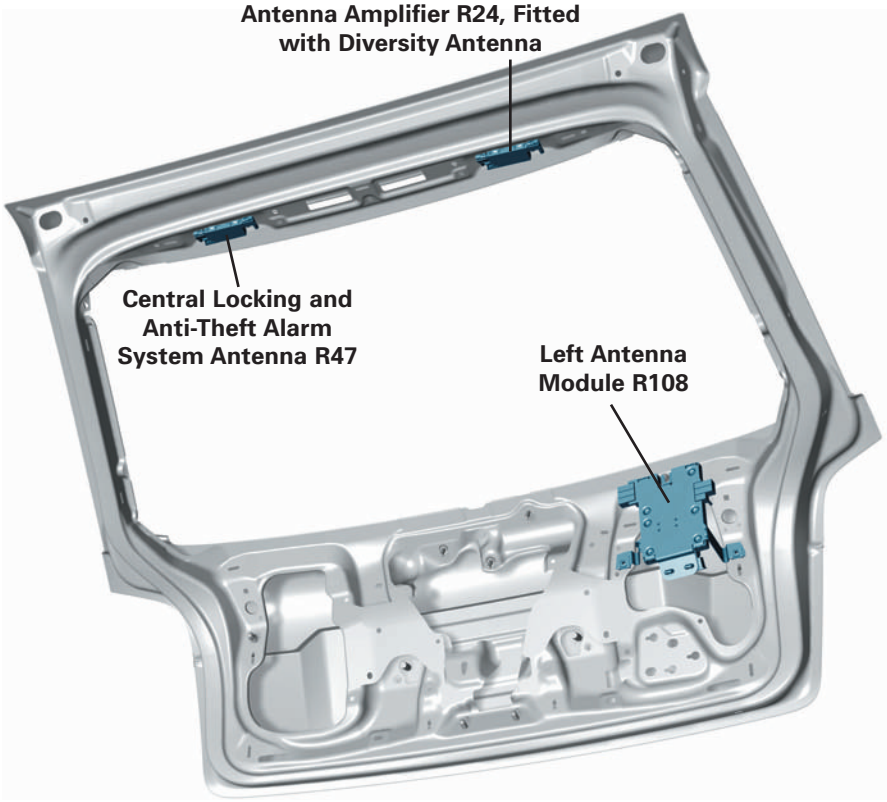
1 With no radio, only the Central Locking and Anti-Theft Alarm System Antenna R47 is fitted at the top of the tailgate

2 For the Concert/Symphony II radio equipment, Antenna Amplifier R24 is integrated into the circuit as diversity antenna switching module in addition to Left Antenna Module R108

The diversity antenna permits a total of four antenna tuning settings.

Left Antenna Module R108 optimizes the antenna tuning by analyzing the IF signal from Radio R.

If the antenna module detects a radio signal of insufficient strength, it selects the next antenna setting in each case, using Antenna Amplifier R24.



Pay attention to correct polarity when replacing the antenna module or Antenna Amplifier R24.

Incorrect component connection can considerably restrict the range of the remote central locking function or seriously impair the diversity antenna.

A good ground connection at the antenna module must also be ensured, otherwise overvoltage may result in damage to the radio system.

The antenna module has no self-diagnosis capability.

In the event of an open circuit in the wiring to Antenna Amplifier R24, it manipulates the HF link to Radio R, thus causing Radio R to generate the fault memory entry.

This means that the message “Control output antenna HF open circuit” may also relate to a fault in Antenna Amplifier R24.

Safety Systems

The safety system in the A3 consists of the following occupant protection components:

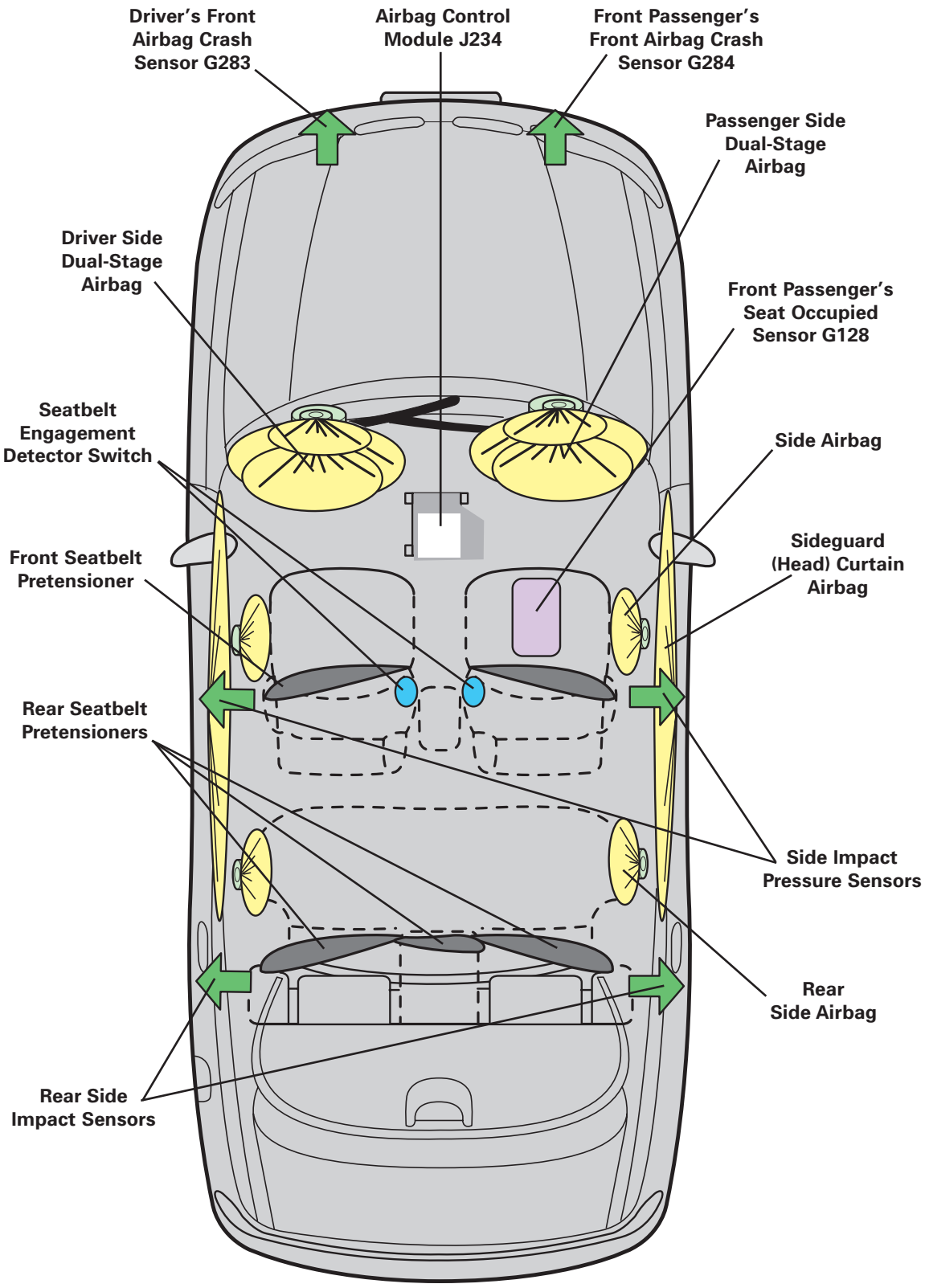
- Airbag control module
- Dual-stage driver and front passenger airbags
- Front side airbags
- Sideguard (head) curtain airbags
- Side impact detection sensors on the C-pillar
- Side impact pressure sensors in the front doors
- Upfront crash sensors for head-on collision detection
- Seatbelt tensioners
- Battery switch-off, only for models with battery in luggage compartment (3.2L only)
- Switches in the front seatbelt buckles
- Seat occupied sensor, front passenger side, for the Passive Occupant Detection System (PODS)
- Active head restraints

The driver's side front seatbelt switch detects if the belt is buckled. On the passenger side, there are two seatbelt switches. One switch detects if the belt is buckled, the other measures the tension on the belt.

Caution

Follow the safety instructions in the electronic repair information before performing any work on the airbag system!




Driver's Front Airbag Crash Sensor G283
Airbag Control Module J234
Front Passenger's Front Airbag Crash Sensor G284
Passenger Side Dual-Stage Airbag
Driver Side Dual-Stage Airbag
Front Passenger's Seat Occupied Sensor G128
Seatbelt Engagement Detector Switch
Side Airbag
Front Seatbelt Pretensioner
Sideguard (Head) Curtain Airbag
Rear Seatbelt Pretensioners
Side Impact Pressure Sensors
Rear Side Airbag
Rear Side Impact Sensors

Battery Switch-Off Relay J655

The function of the battery switch-off relay is to disconnect the starter and alternator wire from the vehicle battery in the event of a crash, and thus avoid the danger of fire in the vehicle due to short circuits.

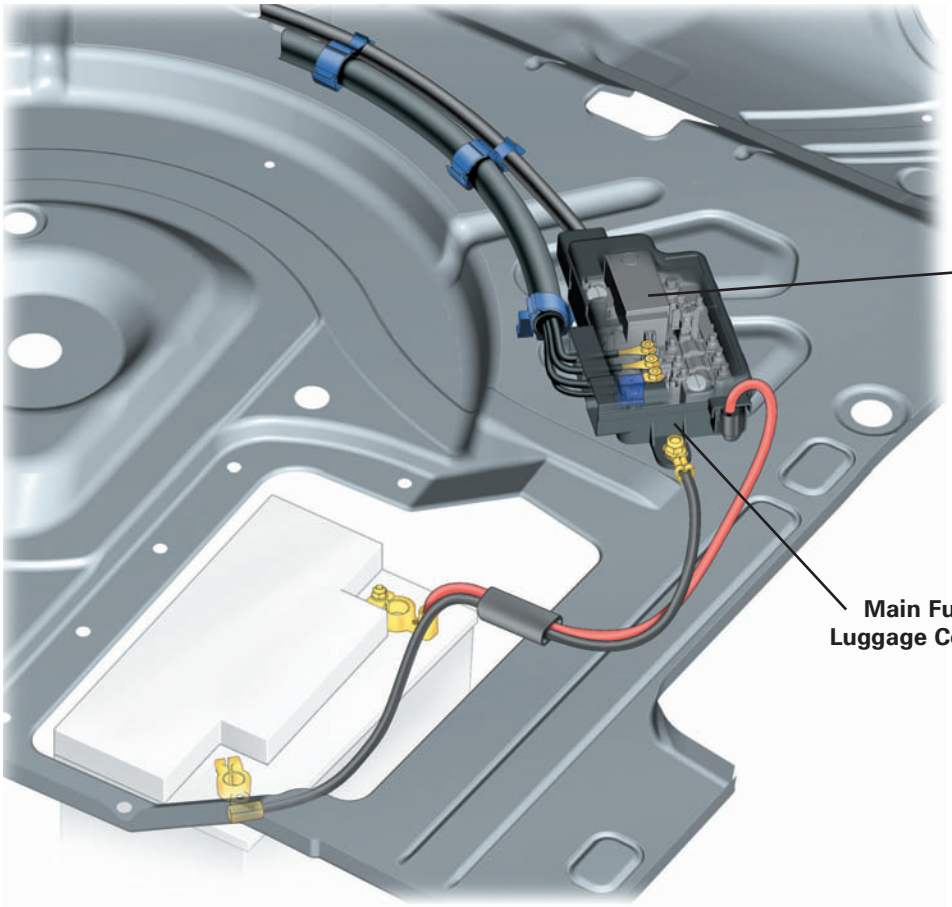
After being tripped by the airbag control module, a white panel appears in the element window instead of a copper coil.

The airbag control module is responsible for activation and diagnosis monitoring and stores any faults occurring.

The battery switch-off relay is only fitted on vehicles in which the battery is located in the luggage compartment.

Note

Battery Switch-Off Relay J655 is only fitted on vehicles equipped with the 3.2L V6 and a rear mounted battery.

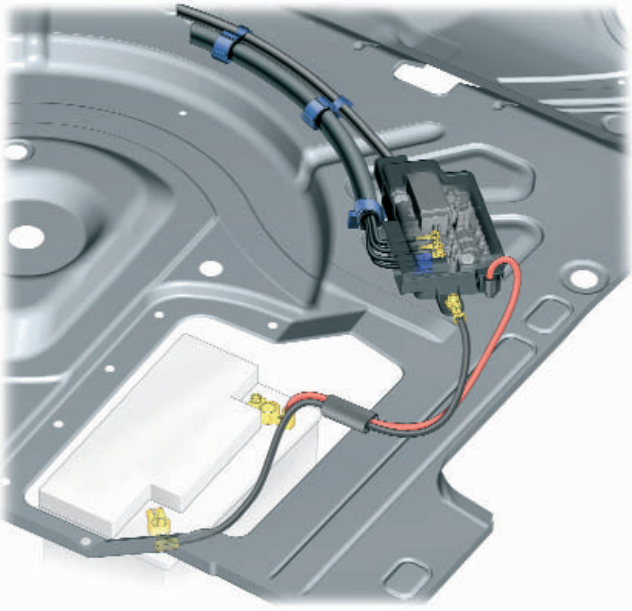


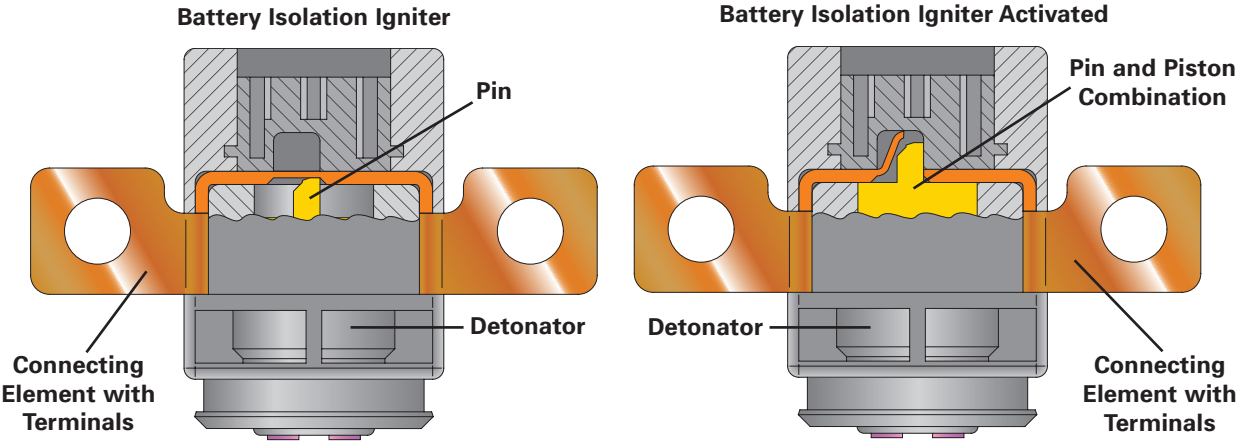
Battery Interrupt Igniter N253

N253 has the same task as Battery Switch-Off Relay J655. This involves disconnecting the starter and alternator leads from the vehicle battery in the event of a crash. N253 is used only on models where the battery is installed in the luggage compartment, such as in the 2006 A3 with the 3.2L V6 engine option.

N253 is activated and monitored for diagnosis by J234. Each time the airbag is deployed, N253 is activated and must then be replaced.

When the pyrotechnic propellant charge is ignited, the developing gas pressure displaces the bolt located on a piston and breaks the connection between the two battery terminals.





Notes

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)

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