Service Training

Self-study programme 319

The Golf 2004 Electrical system

Design and function

The most striking change compared with the previous model is the rear lighting of the Golf 2004.

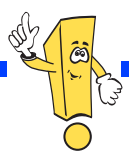
The one-piece light unit, common on the previous model, has now been replaced by a two-piece light unit. This is comprised of a separate independent light element in the side part and a fixed element in the tailgate.

In this way, the car's relationship to the prestige Volkswagen models is made evident.

A bright and high quality appearance is achieved by day and by night by means of round elements, comprised of several parts, located behind clear lenses.

S319_063

NEW



Important Note

This self-study programme shows the design and function of new developments!
The contents will not be updated.

For the latest testing, setting and repair instructions, please refer to the relevant workshop literature.

Contents

Introduction

Fuse boxes and relay slots in vehicle electrical system

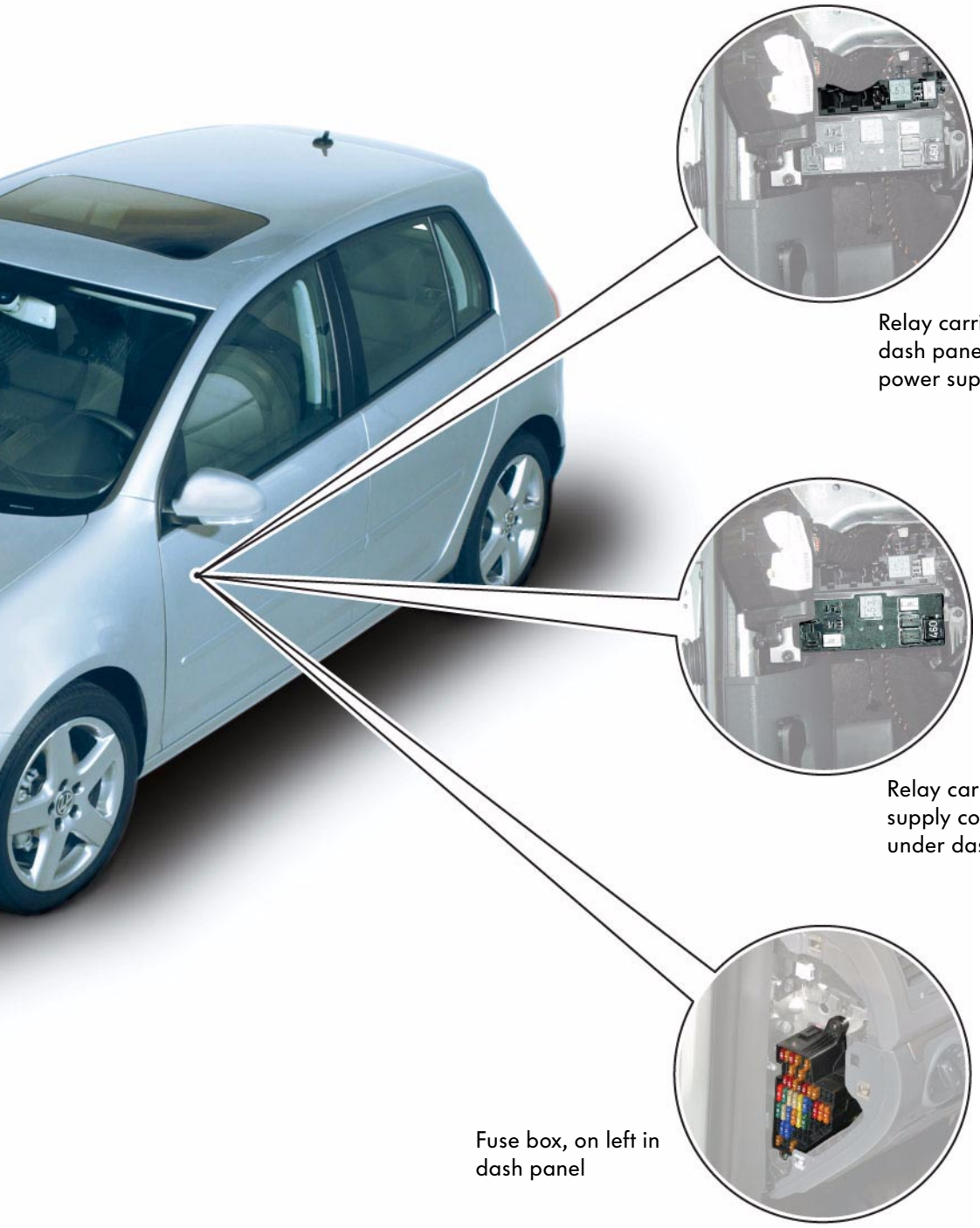
Fitting locations

The onboard electrical system of the Golf 2004 is similar to that of the Touran. Golf 2004 and Touran vehicles are based on the same platform.

The onboard electrical system of the Golf 2004 is of the decentral design. Distribution of the fuse boxes and relay sockets in various locations facilitates quick and precise fault diagnosis.

Electrics box, on left in engine compartment

Pre-fuse box, on left in engine compartment



Relay carrier, on left beneath dash panel, above onboard power supply control unit

Relay carrier of onboard power supply control unit on left under dash panel

Fuse box, on left in dash panel

S319_001

Introduction

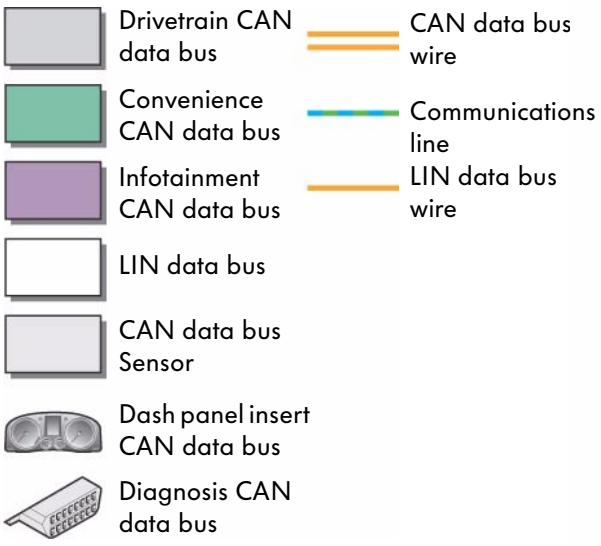
The networking concept

Overview of networked control units

In order that data can be transferred without conflict or interference between the individual control units, these are connected together in a network via various data bus systems.

The data bus diagnostic interface J533 (Gateway) provides an interface for the following data buses:

- Drivetrain CAN data bus
- Convenience CAN data bus
- Infotainment CAN data bus
- Dash panel insert CAN data bus
- Diagnosis CAN data bus



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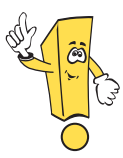
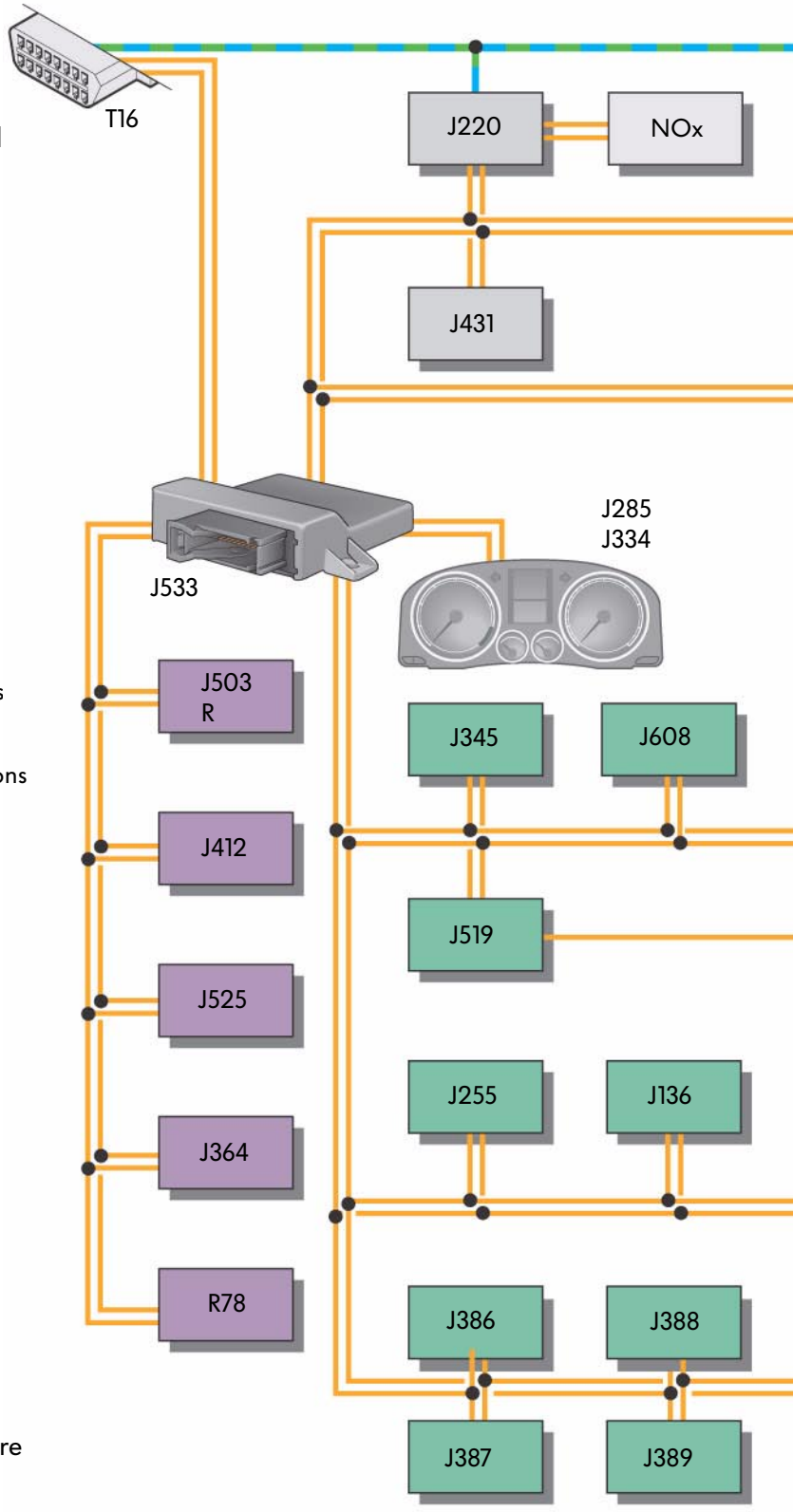
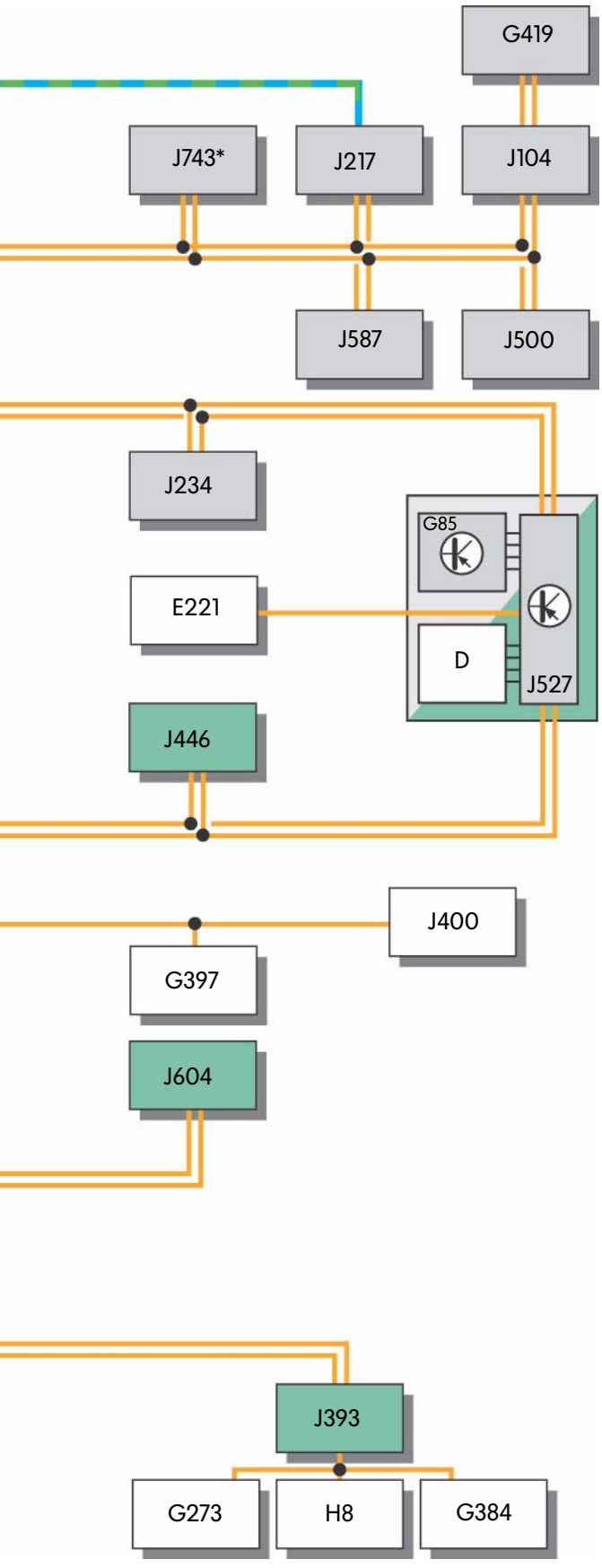


In addition to the CAN data bus, a number of electric components are networked via the LIN data bus.





S319_008

Key

D	Ignition/starter switch
E221	Operating unit in steering wheel
G85	Steering angle sender
G273	Interior monitoring sensor
G384	Vehicle inclination sender
G397	Rain and light detector sensor
G419	ESP sensor unit
H8	Anti-theft alarm system horn
J104	ABS with EDL control unit
J136	Seat and steering column adjustment control unit with memory
J217	Automatic gearbox control unit
J220	Motronic control unit
J234	Airbag control unit
J255	Climatronic control unit
J285	Control unit with display in dash panel insert
J334	Immobiliser control unit
J345	Trailer detection control unit
J364	Auxiliary heater control unit
J386	Driver door control unit
J387	Front passenger door control unit
J388	Rear left door control unit
J389	Rear right door control unit
J393	Convenience system central control unit
J400	Wiper motor control unit
J412	Mobile telephone operating electronics control unit
J431	Headlight range control, control unit
J446	Parking aid control unit
J500	Power steering control unit
J503	Control unit with display for radio and navigation
J519	Onboard supply control unit
J525	Digital sound package control unit
J527	Steering column electronics control unit
J533	Data bus diagnostic interface
J587	Selector lever sensors control unit
J604	Auxiliary air heater control unit
J608	Special vehicle control unit
J743*	Direct shift gearbox mechatronics
NO_x	NO_x sensor
R	Radio
R78	TV tuner
T16	16-pin connector, diagnosis interface
*	On direct shift gearboxes only

Introduction

Control units in drivetrain CAN data bus

Control units and fitting locations

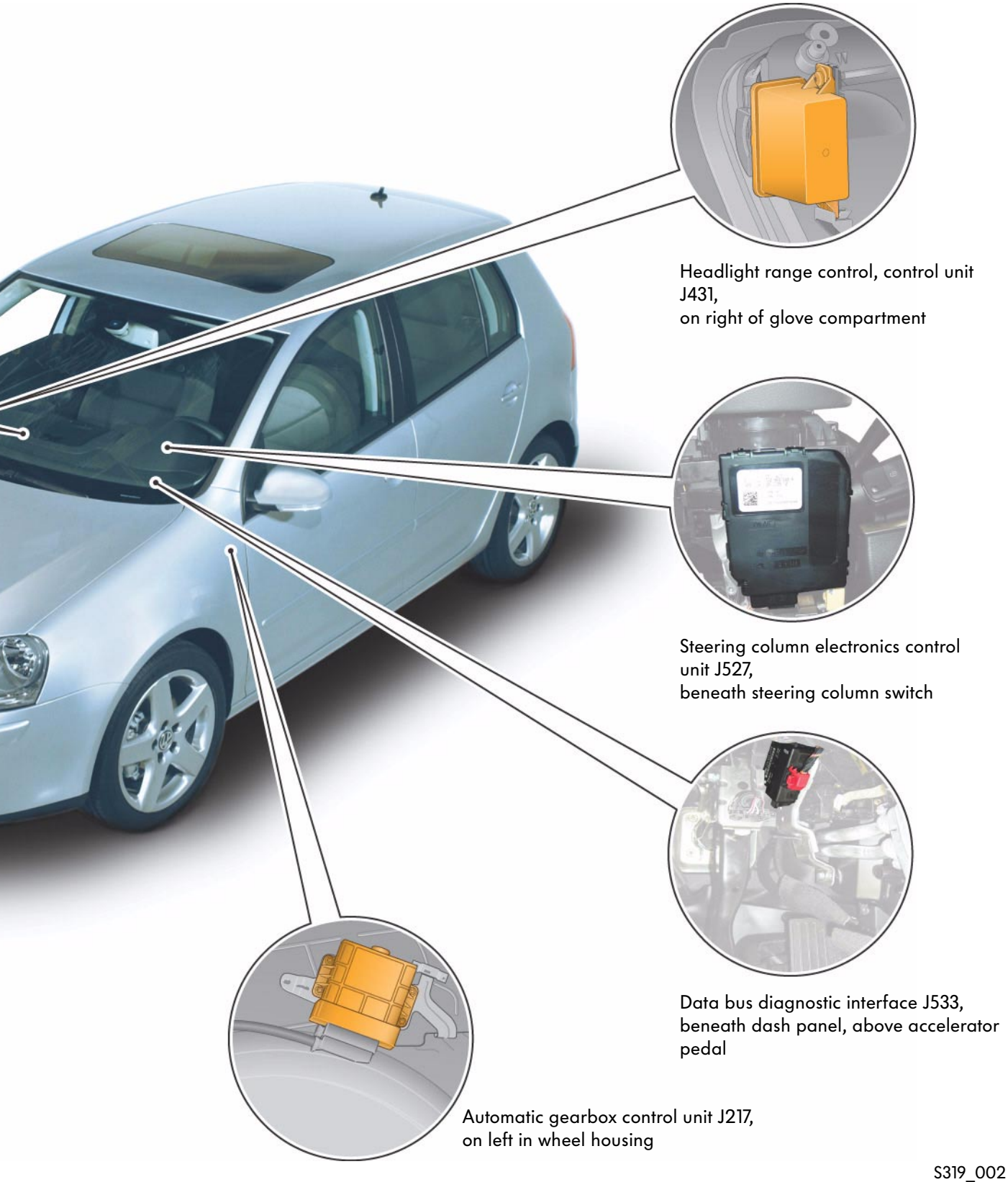
The adjacent illustration shows the control units of the drivetrain CAN data bus and associated fitting locations.

The data is transferred at a rate of 500 kbit/s. Transfer is made via the orange/black CAN high wire and orange/brown CAN low wire.
To guarantee data transfer without conflict or interference, the CAN wires are twisted together.

Airbag control unit J234, beneath centre console, on front of tunnel

ABS with EDL control unit J104, on right of bulkhead in engine compartment

Motronic control unit J220, under plenum chamber cover



Headlight range control, control unit J431,
on right of glove compartment

Steering column electronics control unit J527,
beneath steering column switch

Data bus diagnostic interface J533,
beneath dash panel, above accelerator pedal

Automatic gearbox control unit J217,
on left in wheel housing

S319_002

Introduction

The control units in the drivetrain CAN data bus

Control units and fitting locations

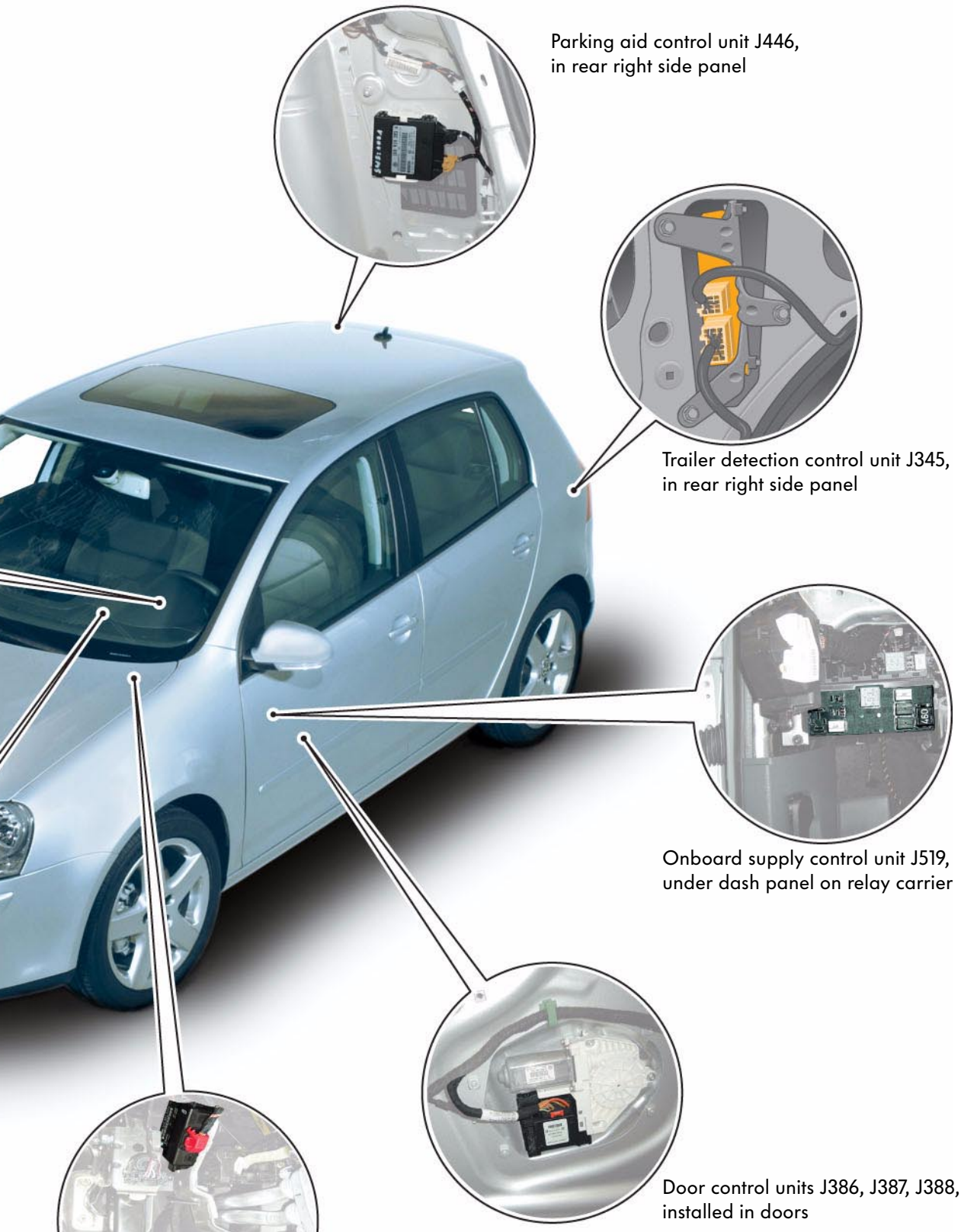
The adjacent illustration shows the control units of the convenience CAN data bus and associated fitting locations.

The speed of data transfer is 100 kbit/s.
The data is transferred via the orange/green CAN high wire and orange/brown CAN low wire.
To guarantee data transfer without conflict or interference, the CAN wires are twisted together.

Steering column electronics control unit J527, on steering column switch

Convenience system central control unit J393,
on right beneath dash panel,
behind glove compartment

Climatronic control unit J255,
in centre console



Parking aid control unit J446,
in rear right side panel

Trailer detection control unit J345,
in rear right side panel

Onboard supply control unit J519,
under dash panel on relay carrier

Door control units J386, J387, J388, J389,
installed in doors

Data bus diagnostic interface J533,
beneath dash panel, above accelerator pedal

S319_004

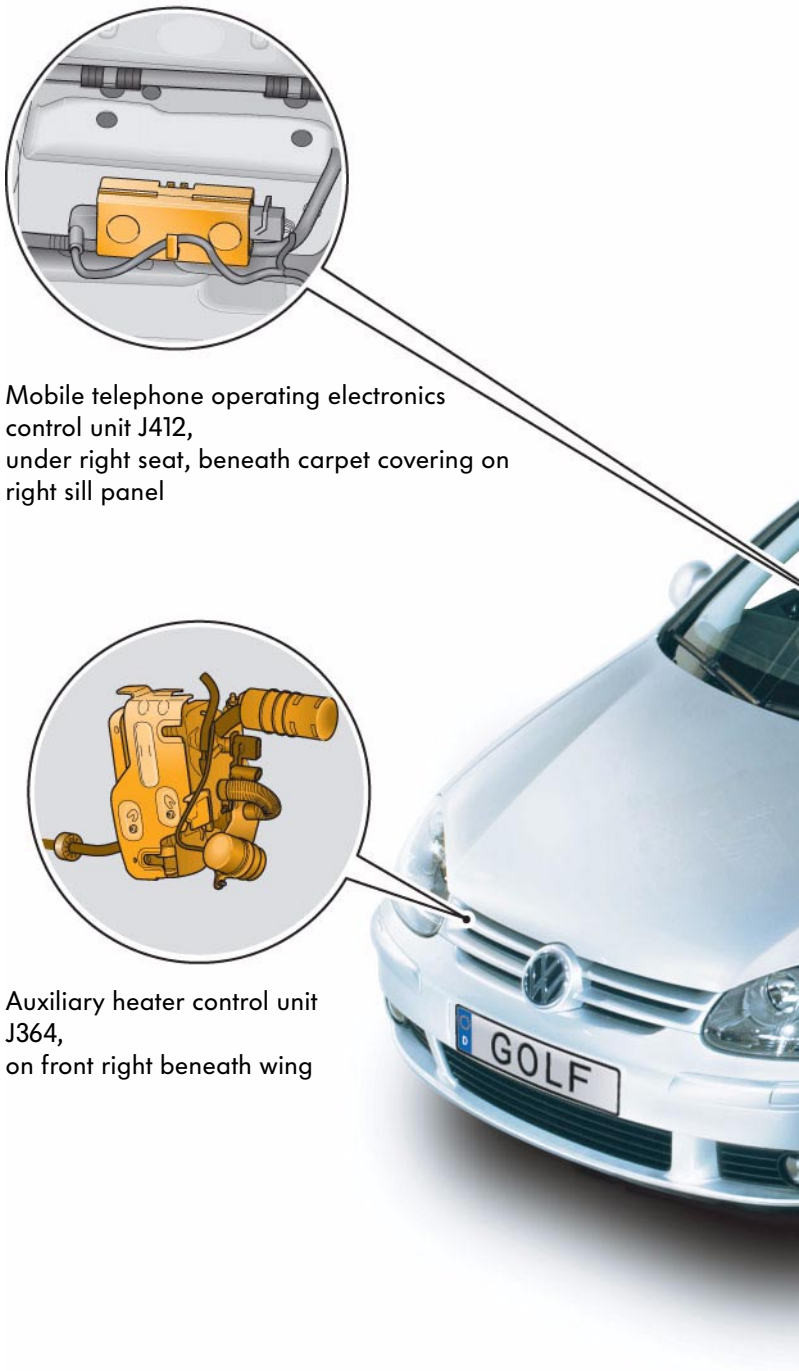
Introduction

The control units in the infotainment CAN data bus

Control units and fitting locations

The adjacent illustration shows the control units of the infotainment CAN data bus and associated fitting locations.

The infotainment CAN data bus transfers data at a rate of 100 kbit/s. The CAN high wire is orange/purple and the CAN low wire is orange/brown.
To guarantee data transfer, the CAN wires are twisted together.



Mobile telephone operating electronics control unit J412,
under right seat, beneath carpet covering on right sill panel

Auxiliary heater control unit J364,
on front right beneath wing

Control unit with display for radio and navigation J503 or Radio R, in centre console

CD changer R41, in centre console, beneath front armrest

S319_005

Introduction

The control units in the dash panel insert CAN data bus and in the diagnosis CAN data bus

Dash panel insert CAN data bus

Information is exchanged via the dash panel insert CAN data bus between the dash panel insert control unit and the data bus diagnostic interface. These are the only control units in this data bus system.

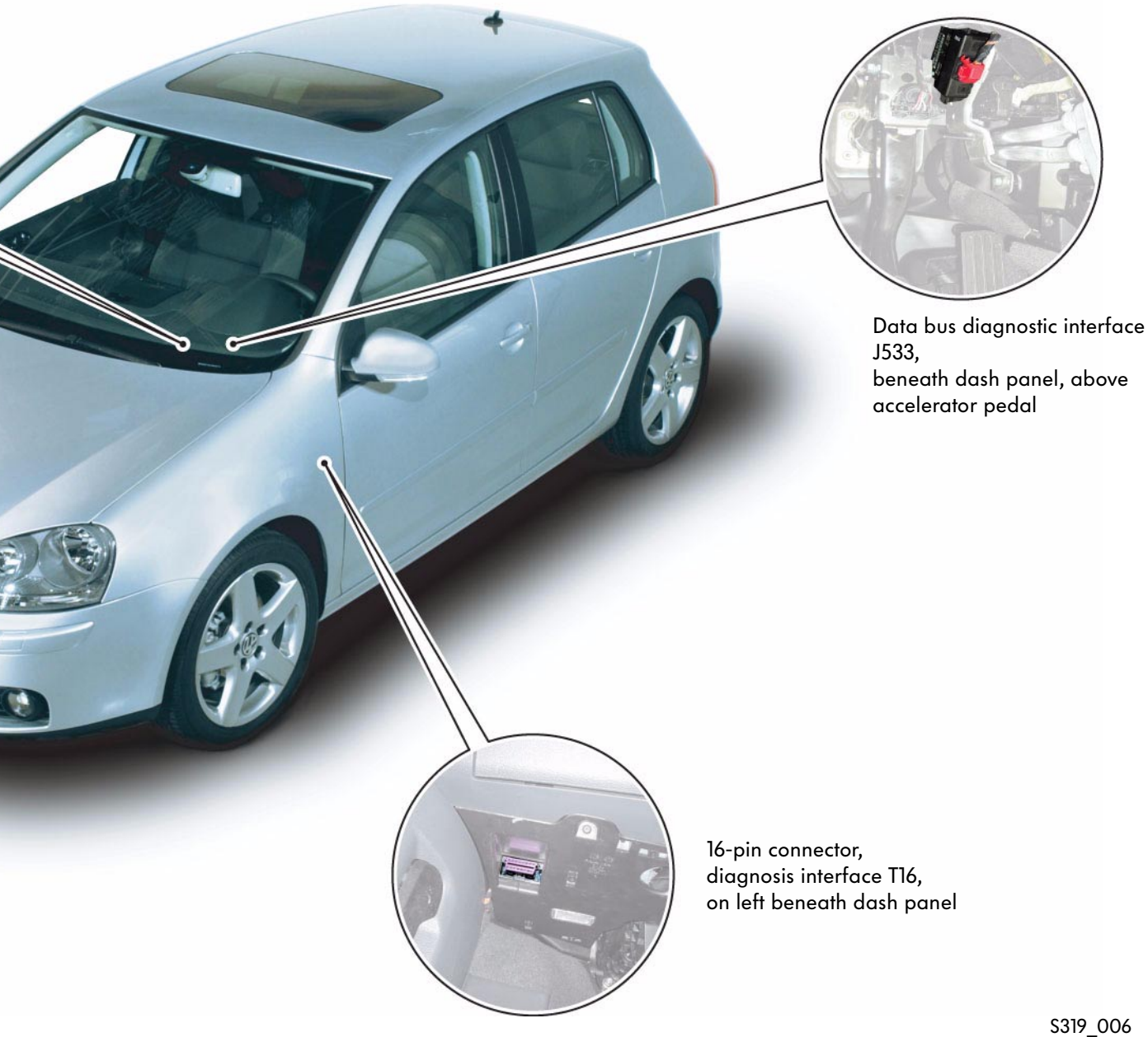
Diagnosis CAN data bus

The transfer of data between the diagnosis tester VAS 5051/5052 and the data bus diagnostic interface is via the diagnosis CAN data bus.

Rate of data transfer

The rate at which data is transferred is 500 kbit/s for both CAN data buses.

Dash panel insert control unit J285



Data bus diagnostic interface J533,
beneath dash panel, above accelerator pedal

16-pin connector,
diagnosis interface T16,
on left beneath dash panel

S319_006

LIN data bus

The LIN data bus as sub data bus system

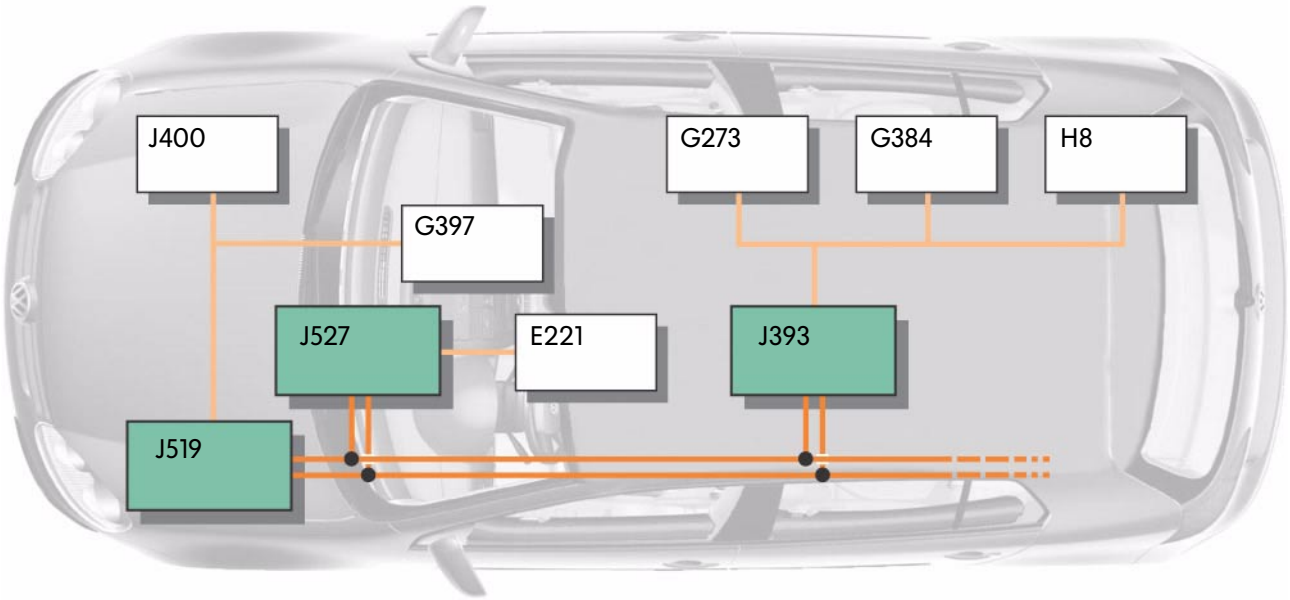
Local **I**nterconnect **N**etwork (LIN) defines a local system in which all associated components within a specific area are located.

- The local sub-system is a cost effective version of CAN data bus.
- The defined consumer interface makes simple exchange of the connectors possible.
- Bus connection in crash area
- Bus connection in critical safety areas

Information is exchanged in the LIN data bus system via a master control unit and up to 16 slave control units.
Communication is initiated only by the master. Slave control units cannot communicate independently.

Several independent LIN data buses can be installed in the vehicle with different functions. Information is exchanged between the individual bus systems via the master control units connected to the CAN data bus.

The LIN bus system



S319_007

Key

E221 Operating unit in steering wheel
G273 Interior monitoring sensor
G384 Vehicle inclination sender
G397 Rain and light detector sensor
H8 Anti-theft alarm system horn
J393 Convenience system central control unit
J400 Wiper motor control unit
J519 Onboard power supply control unit
J527 Steering column electronics control unit

Master control unit

The control unit connected to the CAN data bus takes on the master functions of the LIN data bus system.

Tasks

- Conversion of local data bus messages to data format of CAN data bus
- Monitoring of data bus conversion and rate of data transfer
- Control of data transfer cycle
- Transfer of diagnosis data from slave control units

Slave control unit

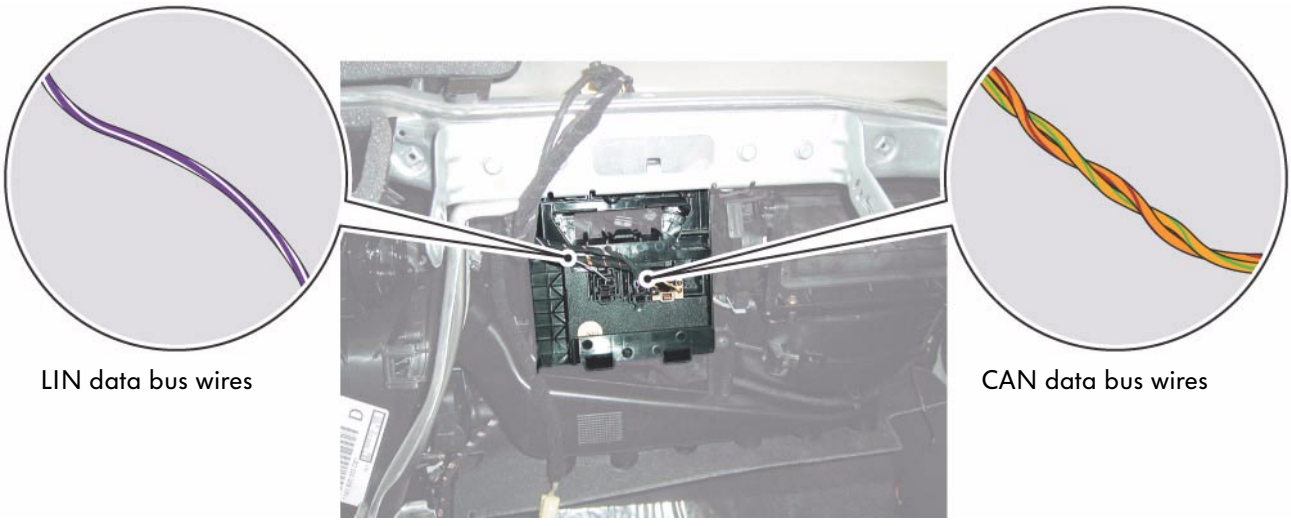
In the LIN data bus system, individual control units, sensors or actuators can act as slave control units.

The electronics integrated in the **control units** evaluate the information, convert it into digital information and send it, once the request has been made, via the LIN data bus to the master control unit.

Actuators are assigned their tasks by a signal, which comes from the master control unit via the LIN data bus.

Following interrogation of the master control unit, the electronics integrated in the **sensors** send the actual status to the master control unit, in which a target/reference comparison is carried out.

The convenience system central control unit, illustrated, shows the wiring of the LIN and CAN data buses.



LIN data bus wires

CAN data bus wires

S319_068