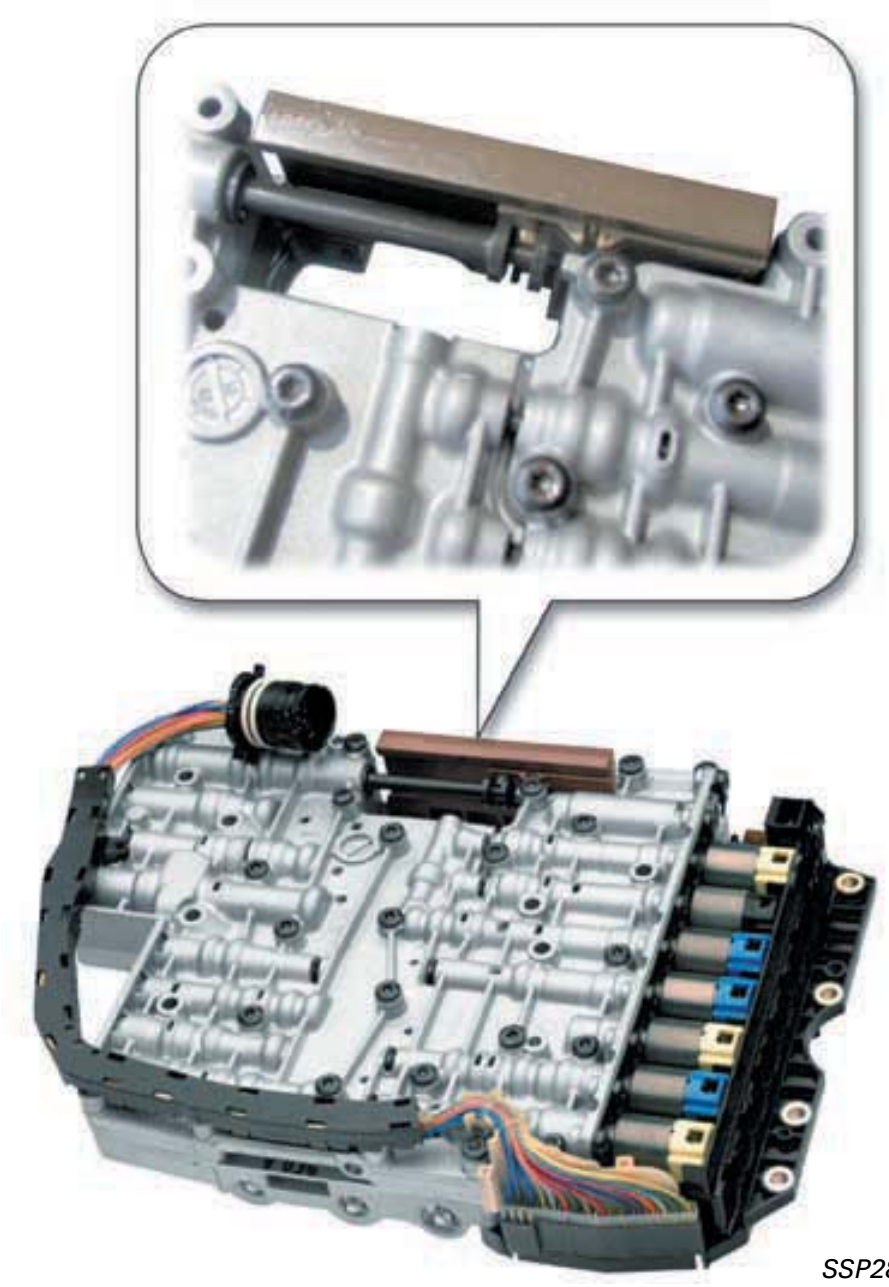
The mechatronic system integrated into the gearbox housing is a new development, combining the hydraulic control unit, sensors, actuators and electronic gearbox control unit in a coordinated assembly.

All data exchange with the vehicle periphery takes place via the drive system CAN, thus reducing the number of vehicle periphery interfaces to a minimum (11 pins) and at the same time enhancing operational reliability.



SSP282_046

In terms of the following functions, there are interesting new aspects to the shift mechanism in the new Audi A8 '03:

- Shift mechanism kinematics
- Ignition key removal lock
- Selector lever lock
- Selector lever lock emergency release
- Selector lever/lock button kinematics

Ignition key removal lock

Major modifications have been made to operation of the ignition key removal lock and selector lever lock (shiftlock). On account of the new entry and start authorisation switch E415, there is no mechanical link between the shift mechanism and ignition lock (locking cable).

Selector lever lock emergency release

This modification means that the selector lever remains locked in position "P" in the event of malfunctions or power supply failure (e.g. battery flat).
Selector lever lock emergency release is provided to enable the vehicle to be moved (e.g. towed) in such situations.

Selector lever/button kinematics

To prevent inadvertent shifting into selector lever position "S", a change has been made to the selector lever kinematics such that switching to "S" involves pressing the button in the gearstick knob.

A small gear mechanism is provided in the gearstick knob to reduce the required button operating force.

The locking rod is actuated by the application of pressure, which means changes have also been made to kinematics and gearstick knob assembly (refer to Workshop Manual).

SSP282_048

SSP282_049

Front axle

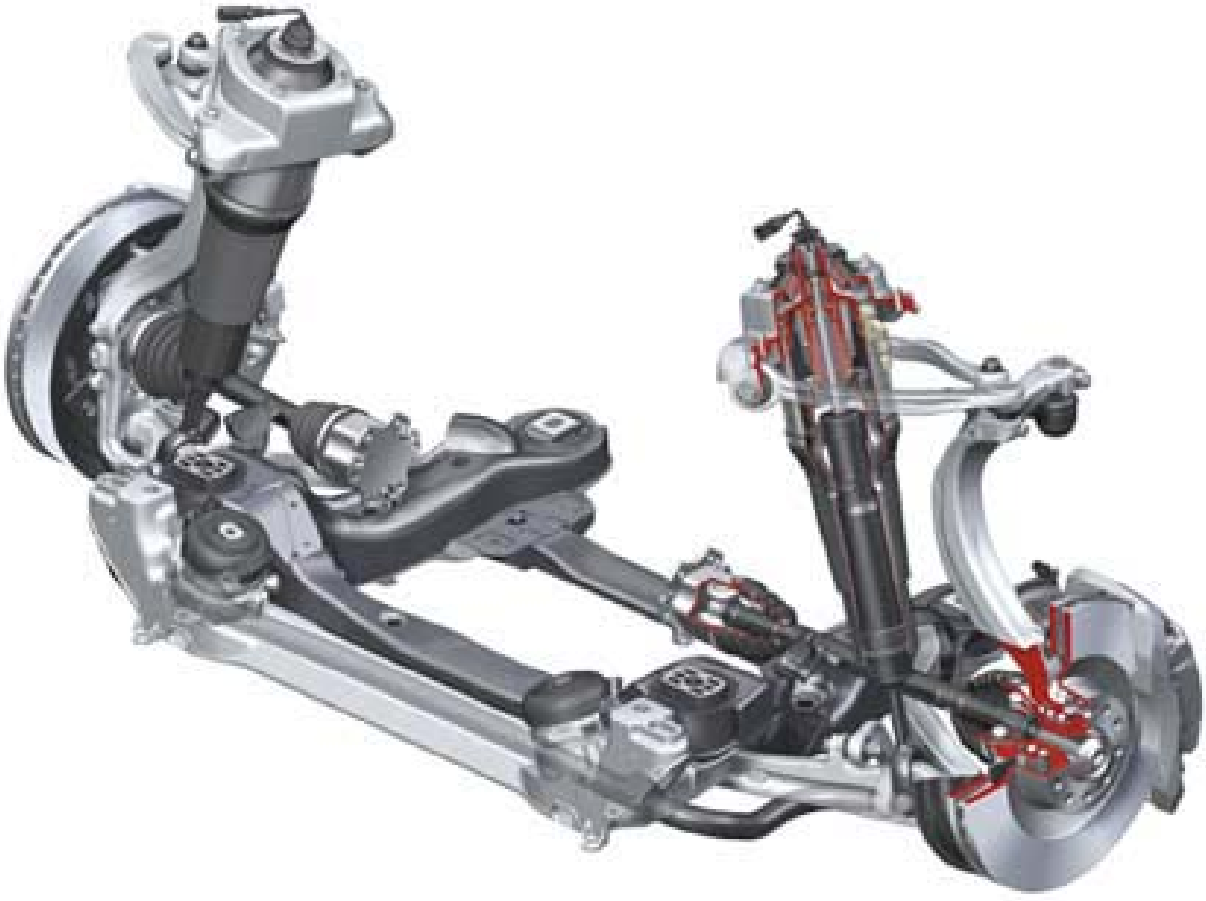
The familiar four-link front axle was retained for the Audi A8 '03.
A significant new feature is the air suspension in combination with electronically controlled dampers (refer to Section on air suspension).

All axle components are new on account of the geometric and kinematic modifications as compared to the predecessor model, the air suspension and the weight reductions achieved.

Front axle highlights

- Subframe
- Auxiliary frame
- Anti-roll bar
- Wheel bearing housing
- Wheel bearing with wheel speed sensing
- Mounting bracket for damper unit

Front axle design and operation are described in SSP 285.



SSP282_050

Rear axle

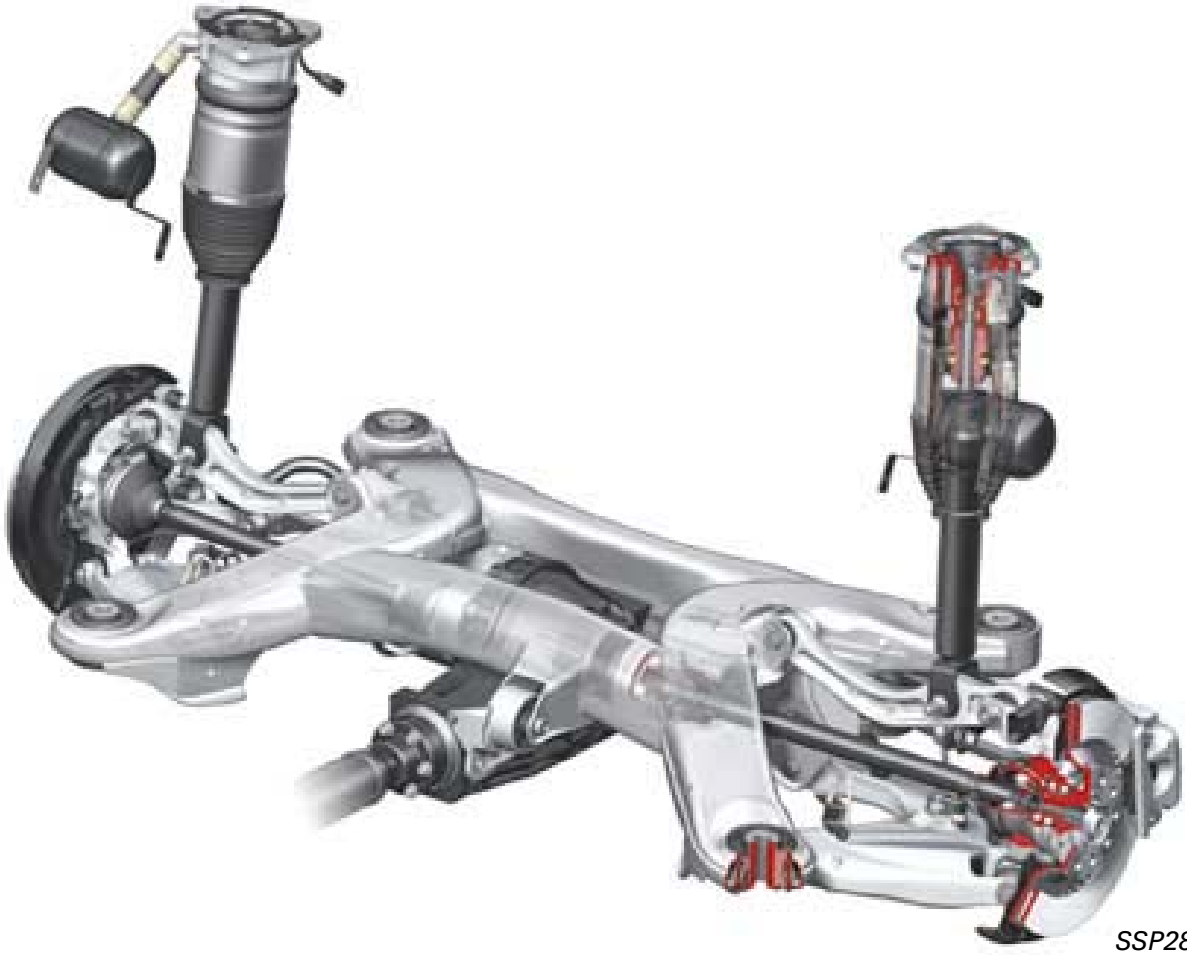
The rear axle is a more advanced version of the familiar Audi A8 trapezium-link axle.

All axle components are new on account of the geometric and kinematic modifications as compared to the predecessor model, the air suspension and the weight reductions achieved.

Rear axle highlights

- Use of air suspension in conjunction with electronically controlled damping
- Aluminium subframe to help reduce weight
- Connection of anti-roll bar to trapezium link
- Use of shorter track rod to reduce change in toe on compression and extension of suspension
- Use of ball studs to connect wheel bearing housing and track rod, thus reducing secondary spring rate
- Use of slotted bonded rubber bushes in upper transverse link and connection between trapezium link and subframe

Rear axle design and operation are described in SSP 285.



SSP282_051

4-level air suspension

The introduction of the Audi A8 ´03 is accompanied by a system featuring new technical details and functions. The major differences with respect to the familiar Audi allroad quattro® system are as follows:

EDC instead of PDC damping

The control system makes allowance for the currently applicable driving status. Wheel movement (unsprung masses) and body movement (sprung masses) are detected. Various damping characteristic curves are implemented within the scope of three selectable programs (modes) and each damper can be controlled individually.

Optimal comfort and road safety are thus always guaranteed whichever mode is set (comfort or sports).
The term "mode" thus describes a coordinated combination of adaptive suspension program and damping map.

Control concept

Integration into the MMI makes for convenient, logical and easy to remember control action.

SSP282_052

Extended range of sensors

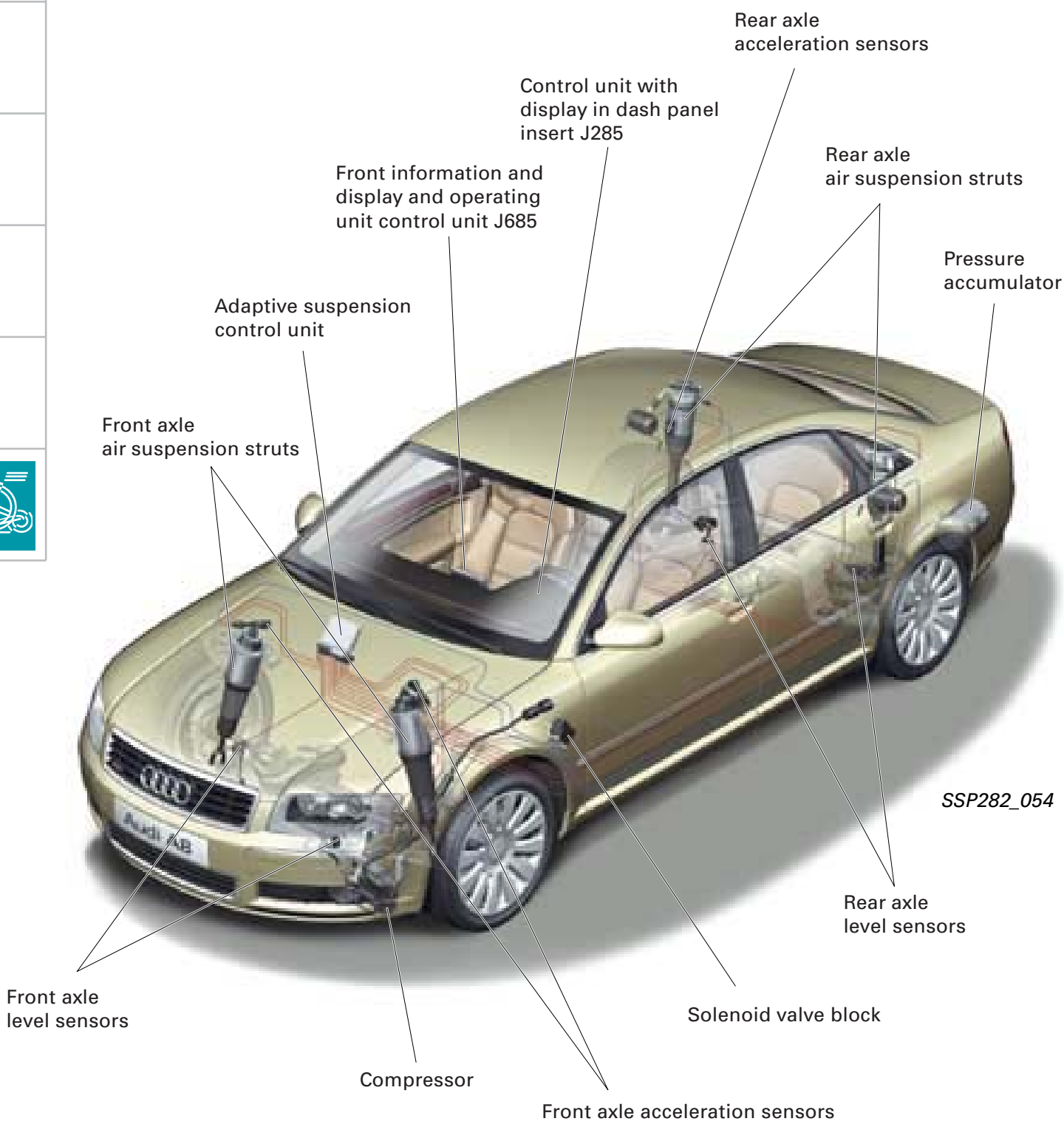
Use is made of three acceleration sensors to detect body movement.

External air springs

The air spring not only replaces the steel spring, it also offers major advantages (refer to SSP 242). The new external routing of the air spring through an aluminium cylinder permits the use of thinner-walled bellows. This results in an even more sensitive response to road surface irregularities.

SSP282_053

System layout



Design and operation of 4-level air suspension are described in SSP 292.

Electric parking brake

The brake pads are applied by way of a spindle mechanism.

Gear unit and motor are flanged to the brake caliper.

Implementation of the parking brake function involves translating the rotation of the drive motor into a very short brake piston stroke.

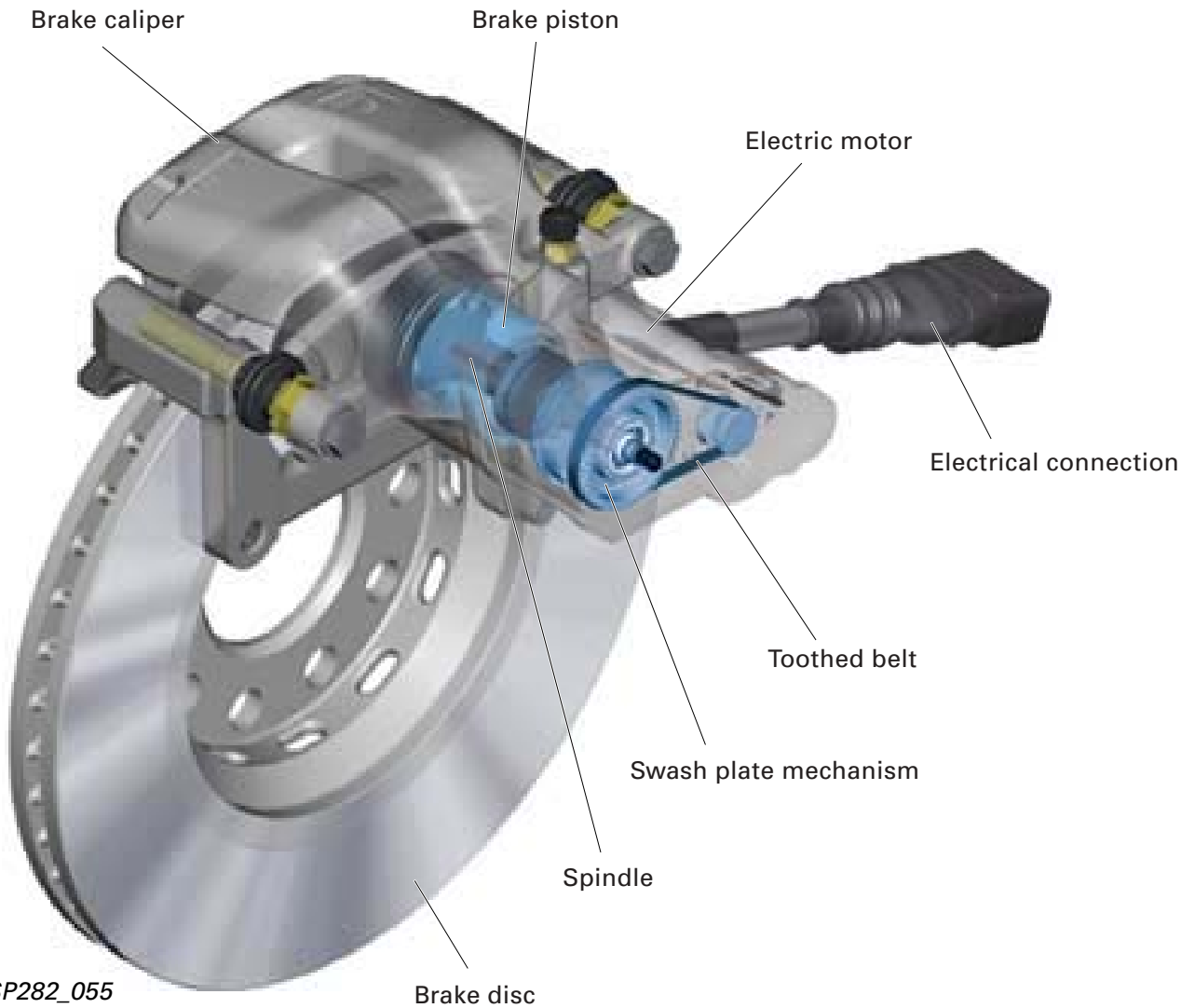
This is achieved through the use of a swash plate mechanism in combination with the spindle mechanism.

The emergency braking function is initiated via the parking brake button and transmitted to all four wheels by the brake hydraulics.

The following functions are provided by the electric parking brake:

- Parking brake function
- Emergency braking function
- Holding function when driving off on a hill
- Brake pad wear indicator

Design and operation of the electric parking brake are described in SSP 285.



SSP282_055

ACC (Adaptive Cruise Control)

Adaptive Cruise Control is a new system designed to assist drivers and offers a much wider range of functions than the conventional Tempomat.

Driver convenience is further enhanced, as fewer accelerator and brake pedal operations are required. Speed restrictions and safety factors are reliably observed and the flow of traffic thus better regulated.

SSP282_057

Summary of Adaptive Cruise Control (ACC)

The basic Adaptive Cruise Control function is to maintain a driver-selectable distance from the vehicle in front. ACC thus represents the logical next step on from the original cruise control system.

The distance from and speed of the vehicle in front are determined by a radar sensor. If the distance is greater than desired, the vehicle is accelerated until the required speed input by the driver is achieved.

If the distance is less than desired, the vehicle is decelerated by reducing power, changing gear and if necessary applying the brakes.

In the interests of comfort, maximum possible braking is restricted to approx. 25 % of the maximum deceleration potential of the brake system (full braking).

The control action is designed to assist the driver and thus contributes to greater road safety.

In certain traffic situations, active braking by the driver may still be necessary.

ACC system limits

- ACC is designed to assist the driver and is not a safety system.
- ACC is not a fully autonomous driving system.
- ACC provides control in a speed range of 30 - 200 km/h.
- ACC does not react to stationary objects.
- Radar operation is impaired by rain, spray and slush.
- Tight bends may restrict operation on account of the limited radar detection range.

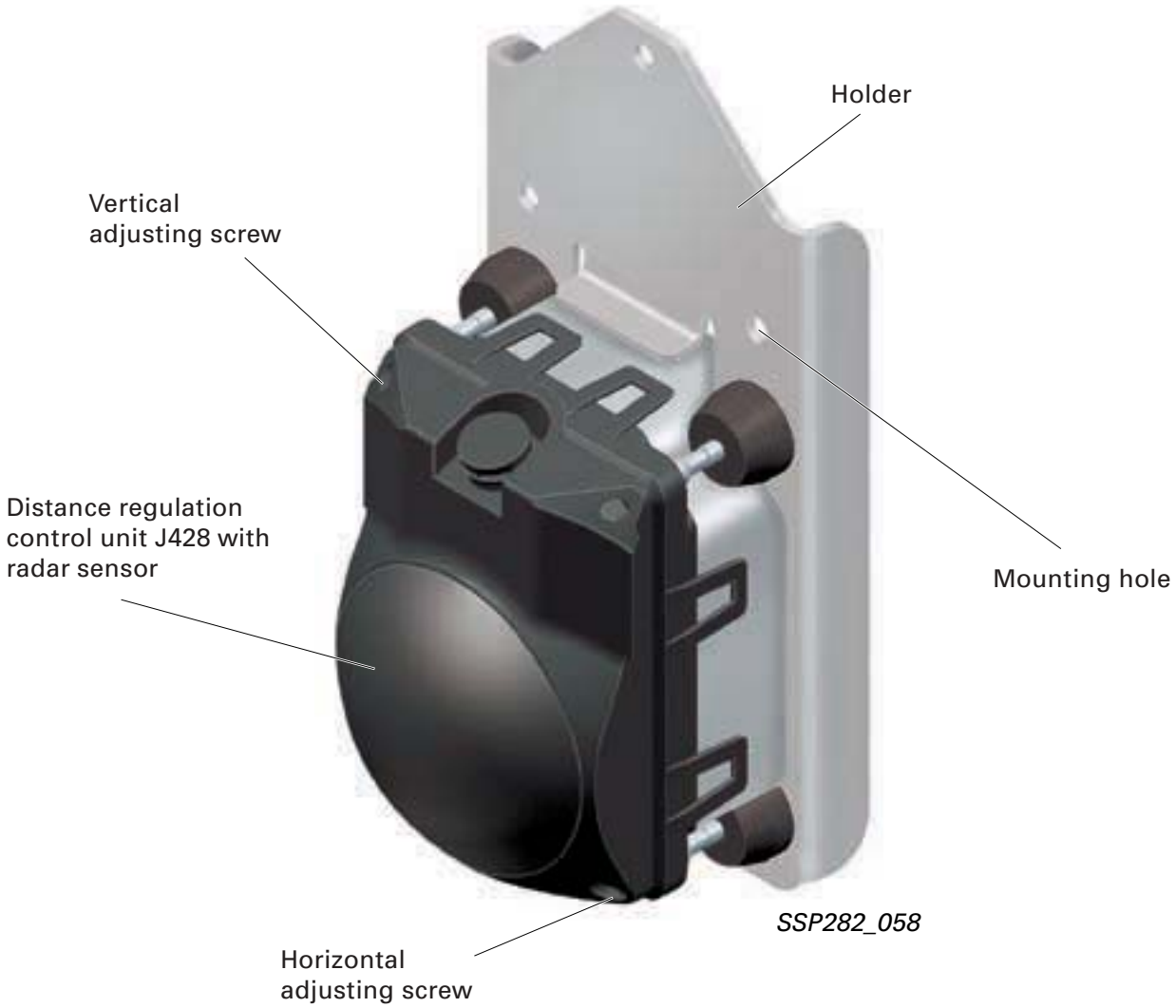
Radar sensor

An adapter plate permits fitting and adjustment at a holder bolted to the centre of the bumper bracket.

For details, refer to current Workshop Manual.

Design

Sender and control unit are integrated into one housing - the distance regulation control unit J428.
The entire assembly has to be replaced if the control unit is defective.



SSP282_058

Setting desired speed

The desired speed is the maximum speed to be controlled by the ACC on an open road (corresponds to cruise control system function).

Pressing the SET button stores the current speed as desired speed.

SSP282_061

The set speed is displayed by a bright red LED in the speedometer rim and the "ACC active" symbol appears in the speedometer.

The "ACC active" status is indicated by faint red illumination of all LEDs in the range between 30 and 200 km/h.

SSP282_060

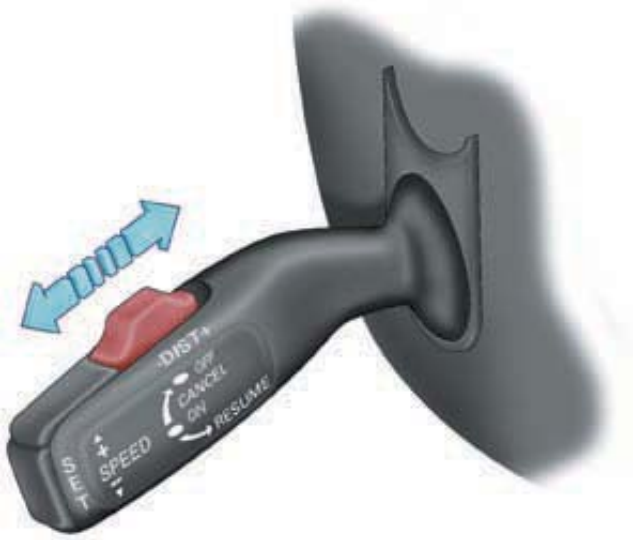
Setting desired distance

The desired distance from the vehicle in front can be set by the driver in four stages. The distance set by the ACC is governed by the respective vehicle speed. The distance increases with increasing vehicle speed.

The minimum setting ensures compliance with the permissible safety distance when travelling at a constant speed in traffic.

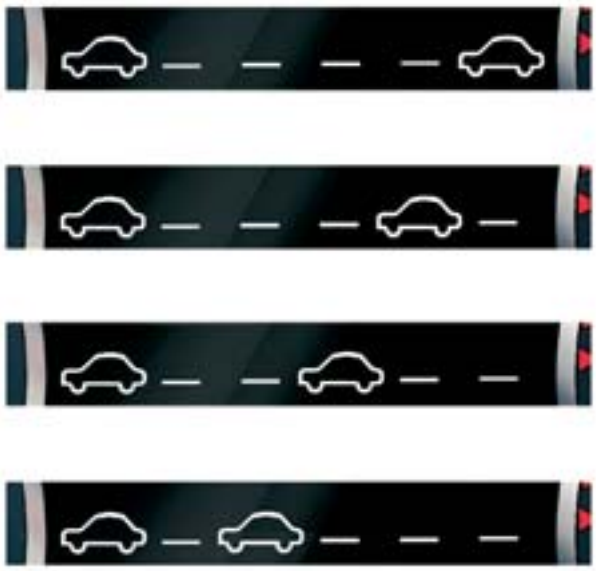
The desired distance from the vehicle in front is set by means of the sliding switch on the stalk. Actuation of the switch increases or reduces the distance by one stage each time.

The desired distance selected determines the vehicle acceleration dynamics.



SSP282_059

The chosen distance is briefly indicated on the info line in the speedometer centre display.
The centre display is activated the first time the button is pressed.
The number of bars between the vehicles displayed corresponds to the distance stage selected in each case.
The distance stage can be set for each driver.

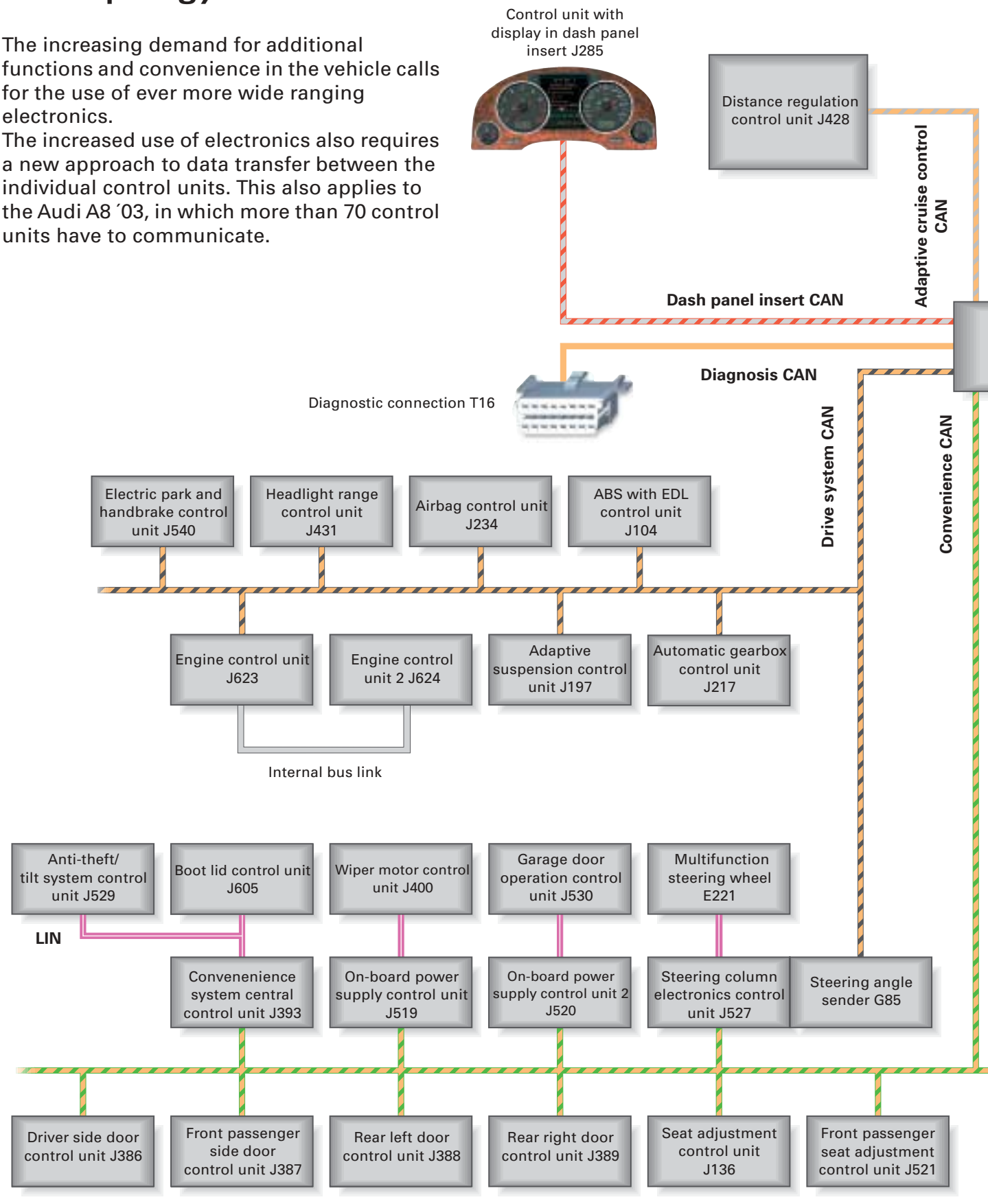


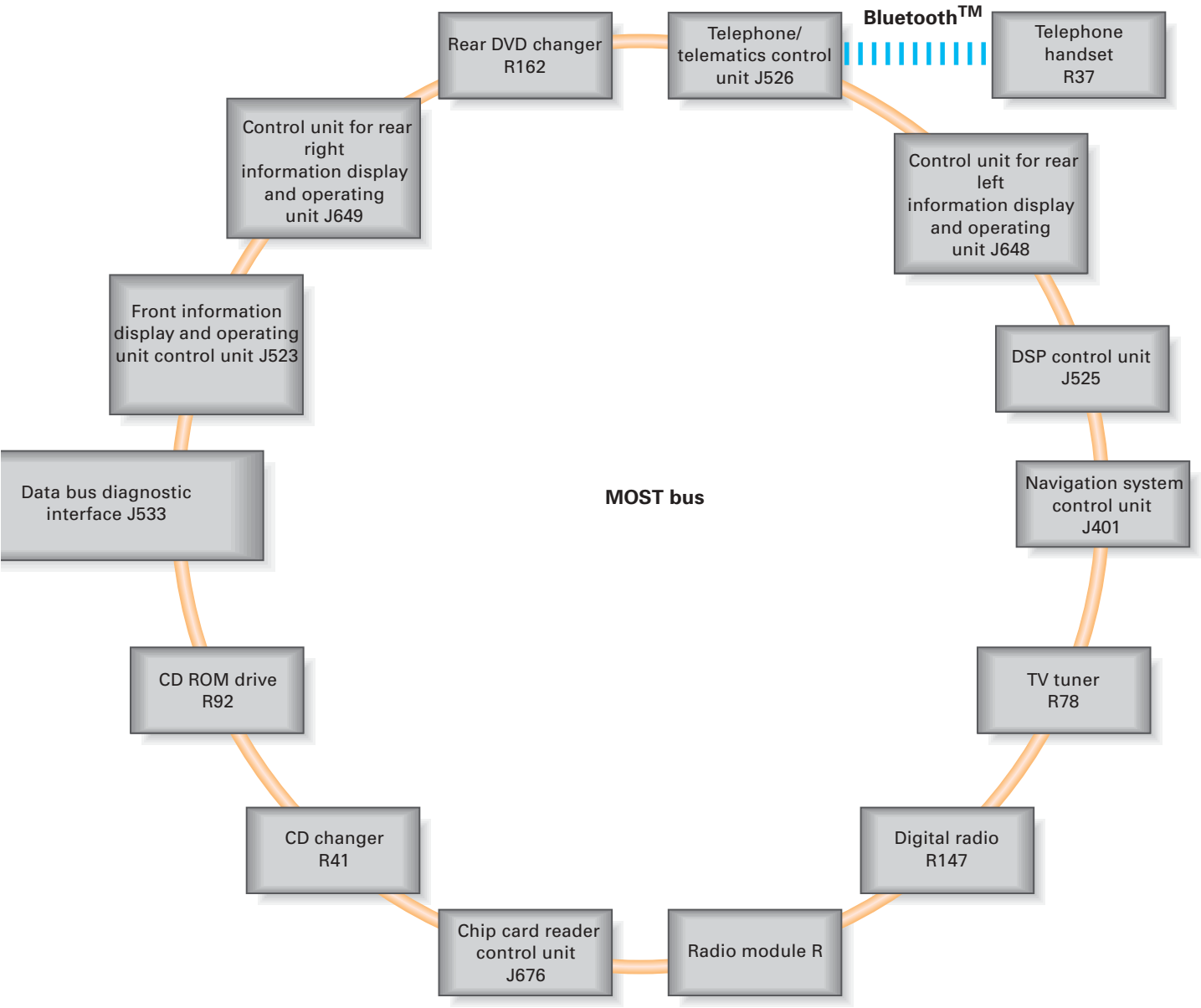
SSP282_062

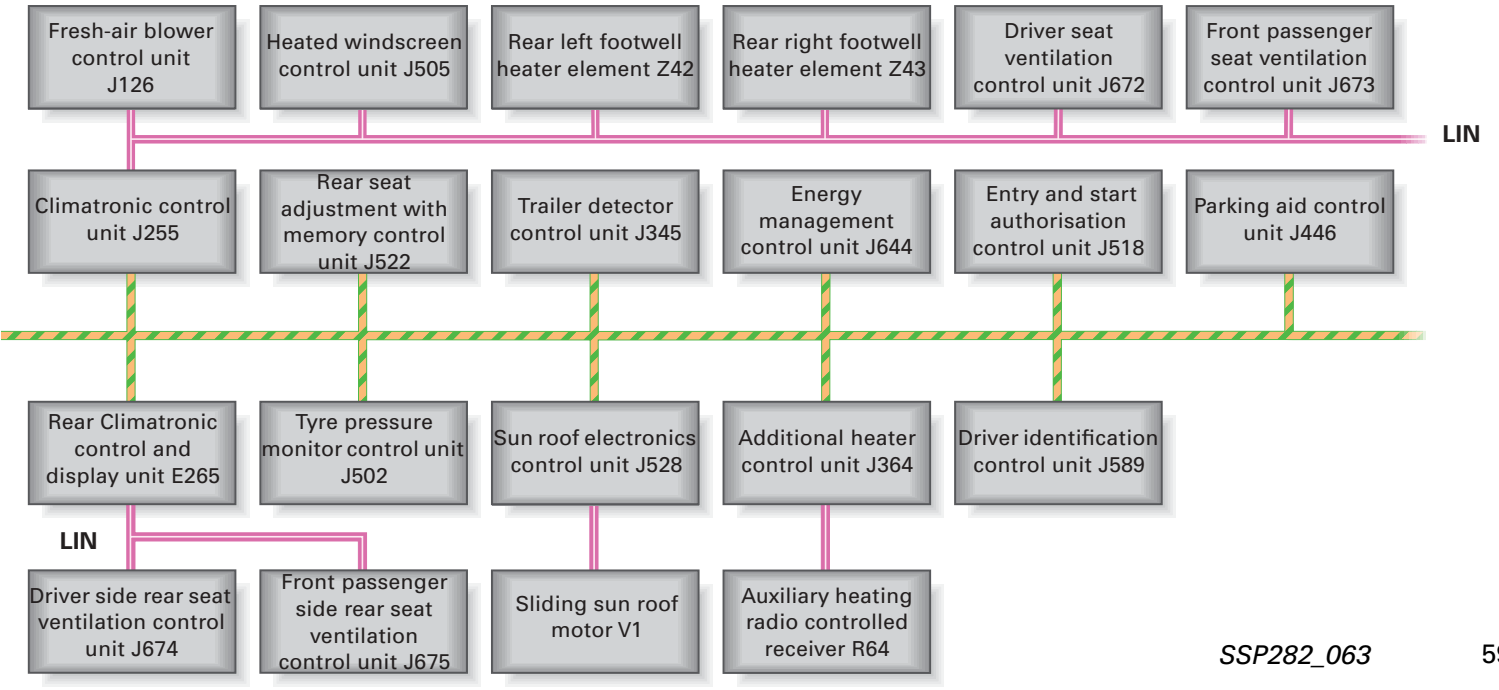
Design and operation of the ACC are described in SSP 289 – Adaptive Cruise Control.
Pay attention to operating instructions and manuals.

Bus topology

The increasing demand for additional functions and convenience in the vehicle calls for the use of ever more wide ranging electronics.
The increased use of electronics also requires a new approach to data transfer between the individual control units. This also applies to the Audi A8 ´03, in which more than 70 control units have to communicate.




Bluetooth™
Rear DVD changer R162
Telephone/ telematics control unit J526
Telephone handset R37
Control unit for rear right information display and operating unit J649
Control unit for rear left information display and operating unit J648
Front information display and operating unit control unit J523
DSP control unit J525
Data bus diagnostic interface J533
MOST bus
Navigation system control unit J401
CD ROM drive R92
TV tuner R78
CD changer R41
Digital radio R147
Chip card reader control unit J676
Radio module R


Fresh-air blower control unit J126
Heated windscreen control unit J505
Rear left footwell heater element Z42
Rear right footwell heater element Z43
Driver seat ventilation control unit J672
Front passenger seat ventilation control unit J673
LIN
Climatronic control unit J255
Rear seat adjustment with memory control unit J522
Trailer detector control unit J345
Energy management control unit J644
Entry and start authorisation control unit J518
Parking aid control unit J446
Rear Climatronic control and display unit E265
Tyre pressure monitor control unit J502
Sun roof electronics control unit J528
Additional heater control unit J364
Driver identification control unit J589
LIN
Driver side rear seat ventilation control unit J674
Front passenger side rear seat ventilation control unit J675
Sliding sun roof motor V1
Auxiliary heating radio controlled receiver R64

The familiar CAN bus (two-wire bus) is supplemented by the following bus systems:

- LIN bus (single-wire data bus)
- MOST bus (optical data bus)
- Bluetooth™ (wireless data bus)

LIN bus

LIN stands for **L**ocal **I**nterconnect **N**etwork.

Local Interconnect means that all control units are located within a limited structural space (e.g. roof). This is also referred to as "local sub-system".

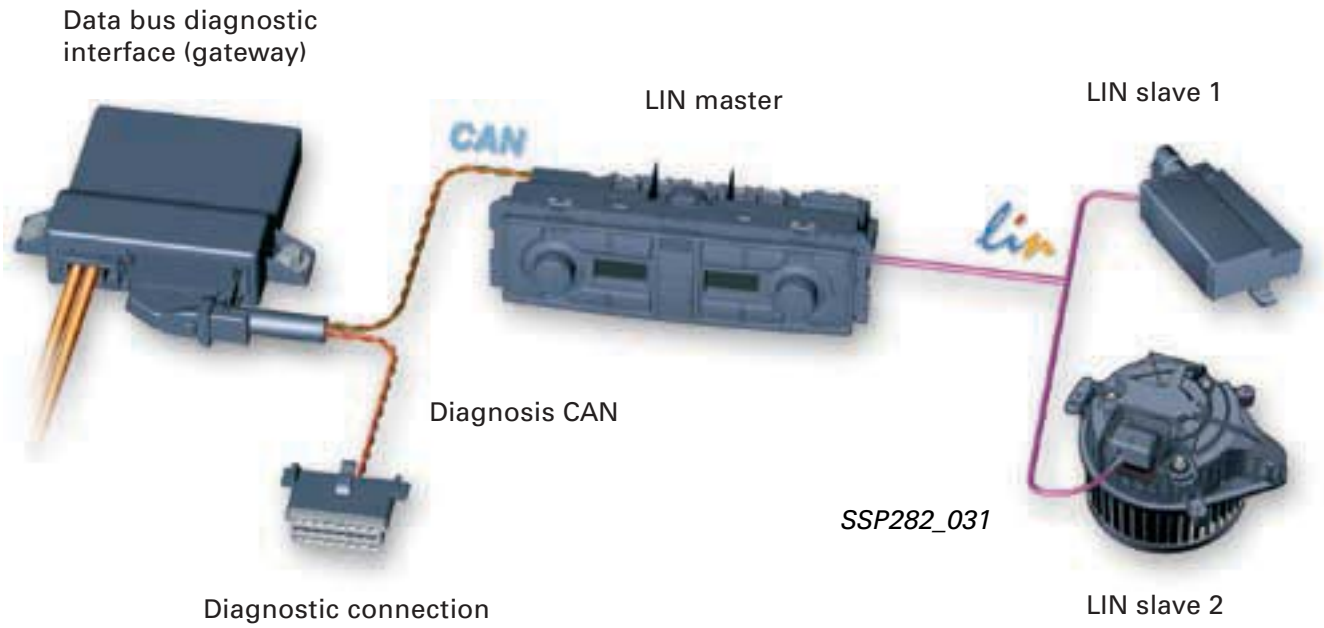
LOCAL INTERCONNECT NETWORK

Data are exchanged between the individual LIN bus systems in a vehicle by one control unit in each case using the CAN data bus.

The LIN bus system is a single-wire data bus. The wire has a basic colour (violet) and a code colour.
The wire cross-section is 0.35 mm^2. A screen is not necessary.

Design and operation of the LIN bus are described in SSP 286 – New data bus systems.

The system permits data exchange between one LIN master control unit and up to 16 LIN slave control units.



MOST bus

The term "**M**edia **O**riented **S**ystems **T**ransport" signifies a network featuring media-oriented data transport. This means that, in contrast to the CAN data bus, address-oriented messages are transmitted to a specific receiver.

This technique is used in Audi vehicles for the transfer of infotainment system data.

The infotainment system offers a wide range of modern **info**rmation and enter**tainment** media. In addition to the familiar CAN bus systems, use has been made for the first time in the Audi A8 ´03 of an optical data bus system.

The name of this data bus system is derived from "Media Oriented Systems Transport (MOST) Cooperation". This is an association formed by various motor vehicle manufacturers, their suppliers and software companies with a view to developing a standard high-speed data transfer system.

Design and operation of the MOST bus are described in SSP 286 – New data bus systems.

Bluetooth™

Bluetooth™ is an internationally standardised remote control data interface.
It permits control or monitoring of even minute units using radio waves.

The primary aim when developing this new type of interface was to create a wireless alternative to cable links, which used to be susceptible to interference and inconvenient and frequently featured incompatible connectors.

More and more manufacturers are making use of "Bluetooth™" radio wave technology for example for wireless interconnection of notebook and mobile phone accessories.

As initiator and main contributor to the development of this new transmission technology, the Swedish company Ericsson chose the name "Bluetooth".
The name originates from the Viking king Harald Blåtand II (Danish, literally meaning "Blue Tooth"), who lived around 1000 years ago in Denmark and Norway.

Motor vehicle applications

- Wireless telephone receiver
- Wireless mobile phone
- Hands-free unit with no additional adapters
- Wireless internet access
- Access for PCs and Notepads

Design and operation of the Bluetooth™ are described in SSP 286 – New data bus systems.

SSP282_037

Vehicle electrical system

A major factor in terms of vehicle reliability is one which is never even seen: the electrical system.

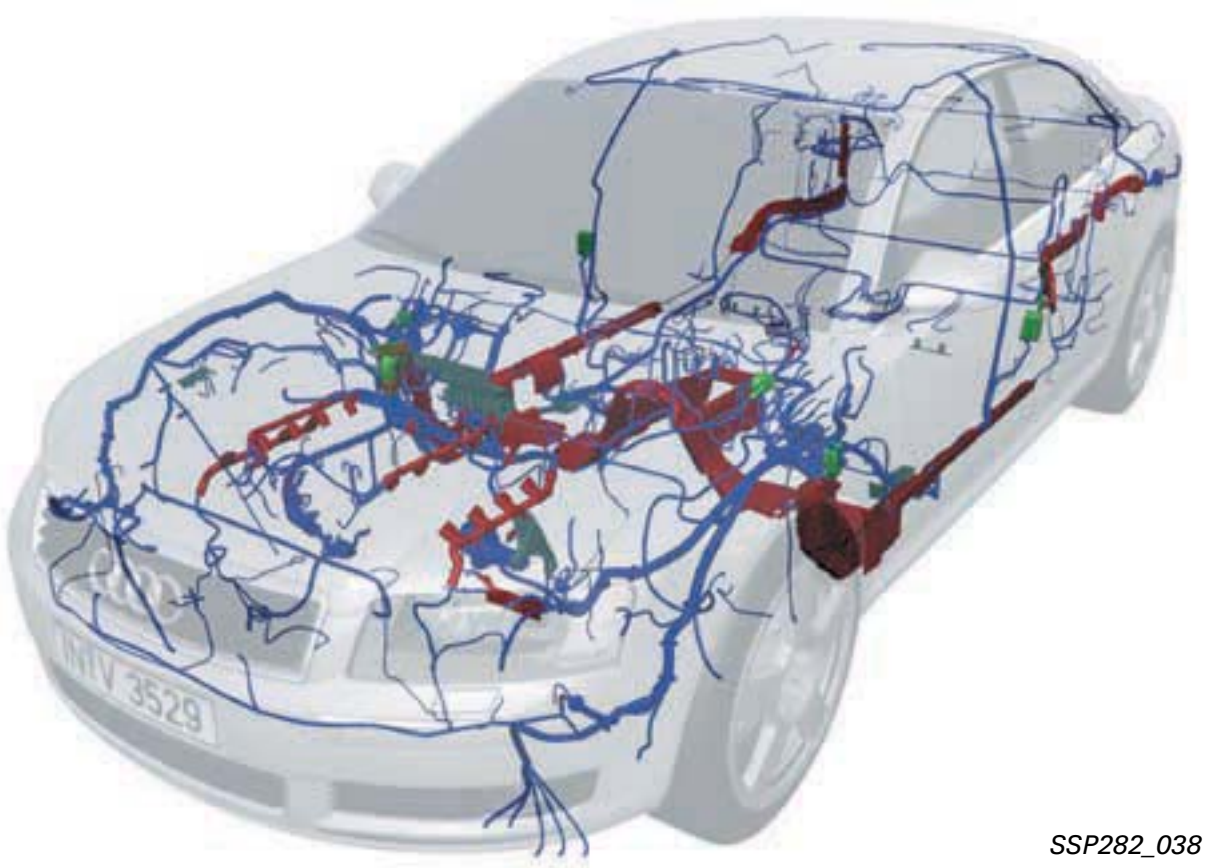
Use is made for the Audi A8 ´03 of a customer-specific one-piece modular wiring harness. "One-piece" means that power is supplied for all essential electrical functions from a single continuous wiring harness. The only isolating points are at the doors, roof module and engine.

"Customer-specific" means that each wiring harness is designed to serve exactly the equipment ordered by the customer. The wiring harness is subdivided into individual logic modules, each of which is responsible for a clearly defined range of functions.

A plastic optical fibre is fitted for the transmission of optical communication and infotainment signals.
Its advantages as compared to a copper conductor are its insusceptibility to electromagnetic interference, a high transmission capacity and less weight.

To achieve greater headroom, the wiring harness to the roof module has been extended to include the flexible flat cable (FFC). This represents a new method of solving the wiring problem in extremely confined spaces (max. 2 mm between headliner and body outer skin).

Design and operation of the optical fibre are described in SSP 286 – New data bus systems.



SSP282_038

Convenience and security electronics

"Advanced Key" entry and start authorisation system

"Advanced Key" can be taken to mean an "advanced locking and security system".

It takes the form of a non-contacting key recognition system. With the "Advanced Key" package, the "Vehicle unlocking" and "Vehicle locking" functions by way of a mechanical or remote control key are supplemented by the non-contacting functions "Vehicle unlocking" and "Vehicle locking".

Functions

Advanced Key "unlocking"

The key owner enters the key detection zone next to the vehicle (less than 1.5 m from door handle) and reaches into the recessed handle moulding. A proximity sensor starts a key scan by way of an aerial.
The key responds by way of radio waves and the vehicle is unlocked if authorised.

Advanced Key "starting"

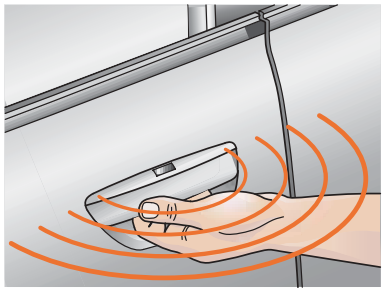
The driver presses the start button, which again initiates a key scan via the passenger-compartment aerials near the selector lever, at the rear centre vents and at the rear centre armrest. The remote control key provides confirmation, with the result that the ignition is switched on on depressing the first stage of the start button and the engine started on depressing the second stage. The engine is switched off with the STOP button.

Advanced Key "locking"

If the vehicle is to be locked from the outside, it is sufficient to press the locking button in one of the door handles. Actuation of the locking button triggers a key scan via the door handle aerial and the vehicle is locked on confirmation of the remote control key.

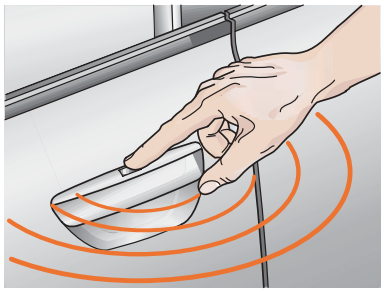
Design and operation are described in SSP 287 – Audi A8 ´03 Electrical Components.

In addition, the driver can start the engine with the START/STOP button (START/STOP function) without inserting the ignition key in the electronic ignition lock.



SSP282_093

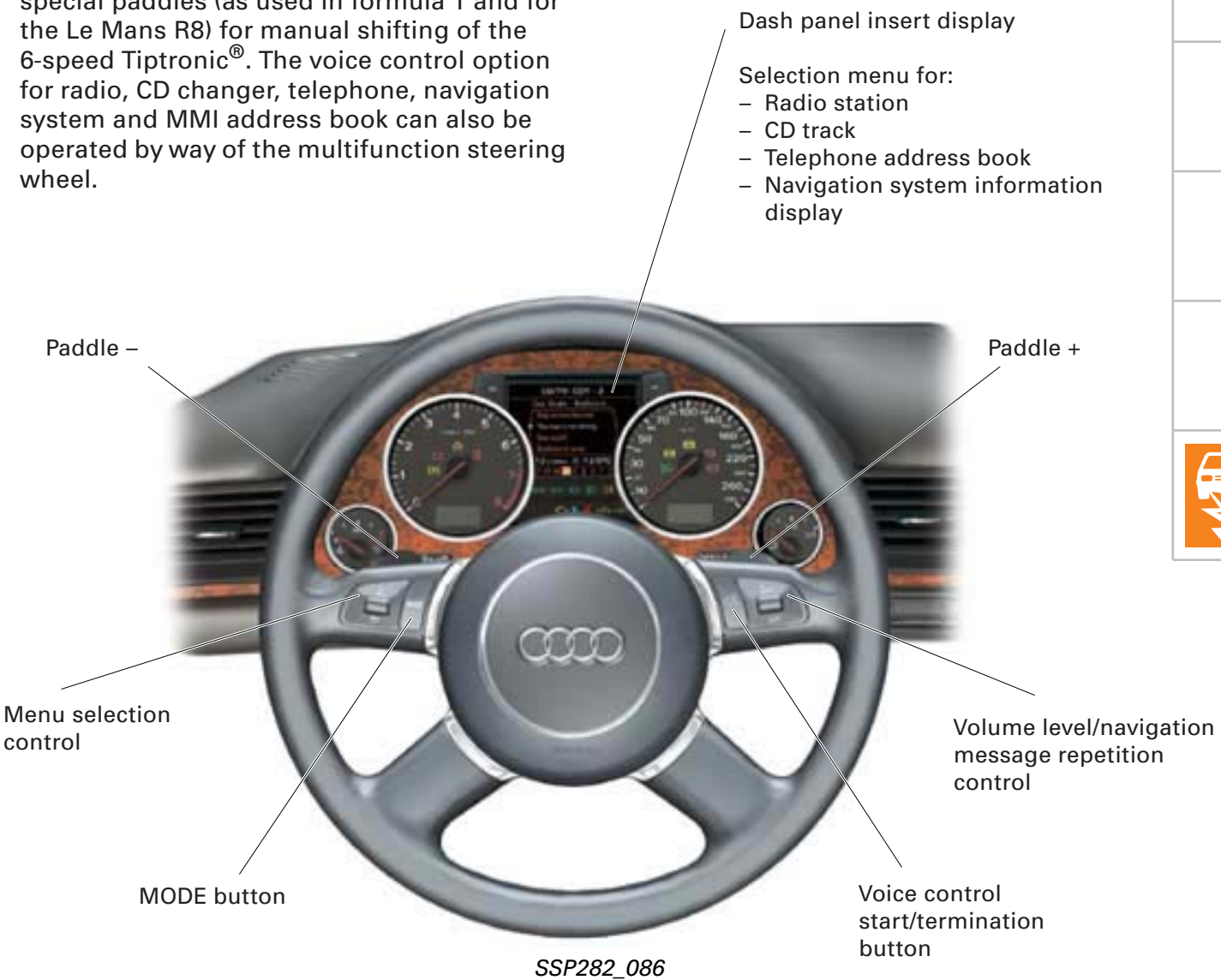
SSP282_094



SSP282_095

Multifunction steering wheel

A new multifunction steering wheel has been introduced as standard. This is equipped with special paddles (as used in formula 1 and for the Le Mans R8) for manual shifting of the 6-speed Tiptronic®. The voice control option for radio, CD changer, telephone, navigation system and MMI address book can also be operated by way of the multifunction steering wheel.



SSP282_086

Press MODE button:
For telephone, navigation system and radio/CD menu selection

Turn left function control:
To select menu item

Press left function control:
For selection within chosen menu item
To accept a telephone call

Press PTT (push to talk) button:
To activate/deactivate voice control

Turn right function control:
To regulate volume

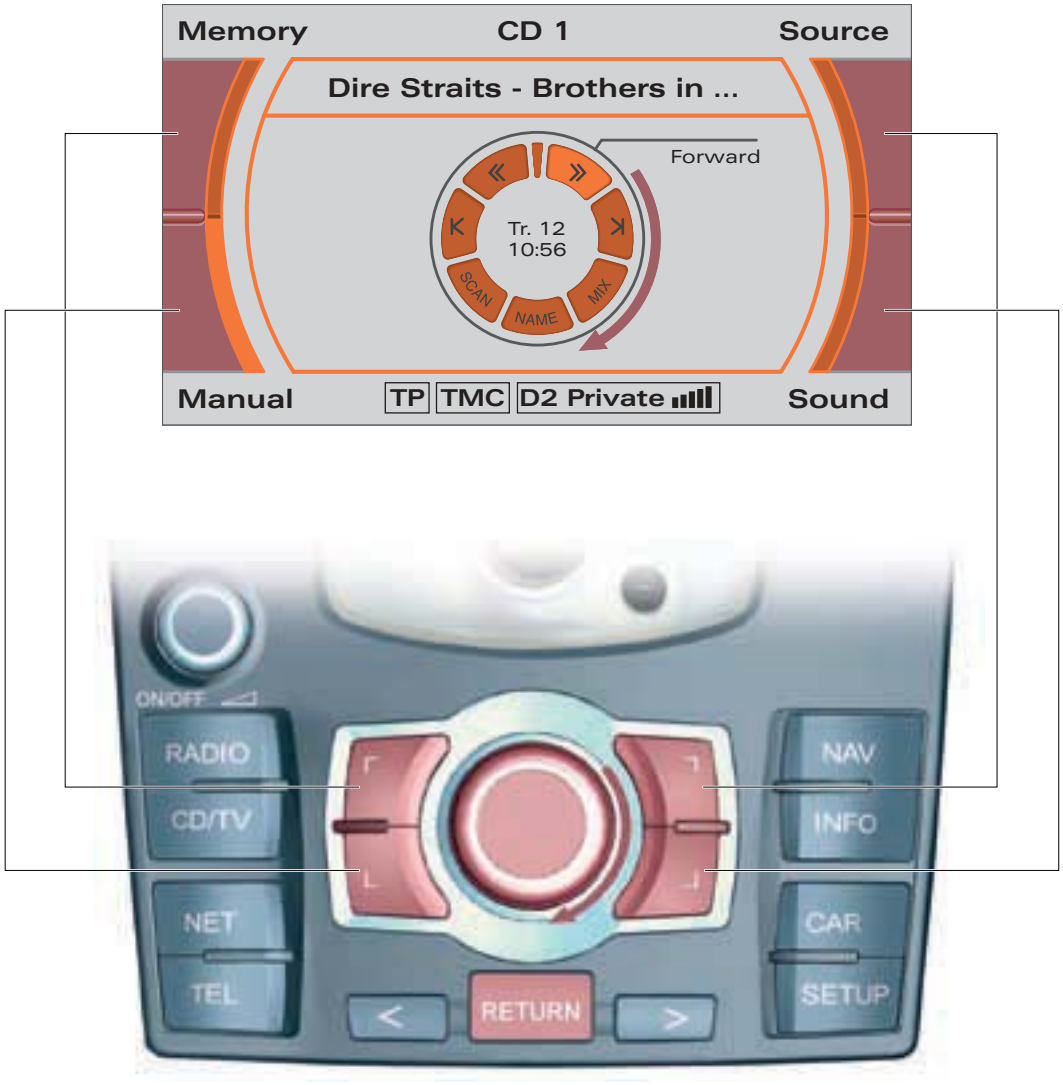
Press right function control:
To repeat last navigation system message

Infotainment

Both in the modern business world and in the private domain, mobile **info**rmation and enter**tainment** are becoming ever more important.

In other words, vehicle occupants are becoming increasingly interested in enjoying the benefits of modern media.

With this in mind, the Audi A8 ´03 is fitted with an infotainment system offering a wide range of modern media.

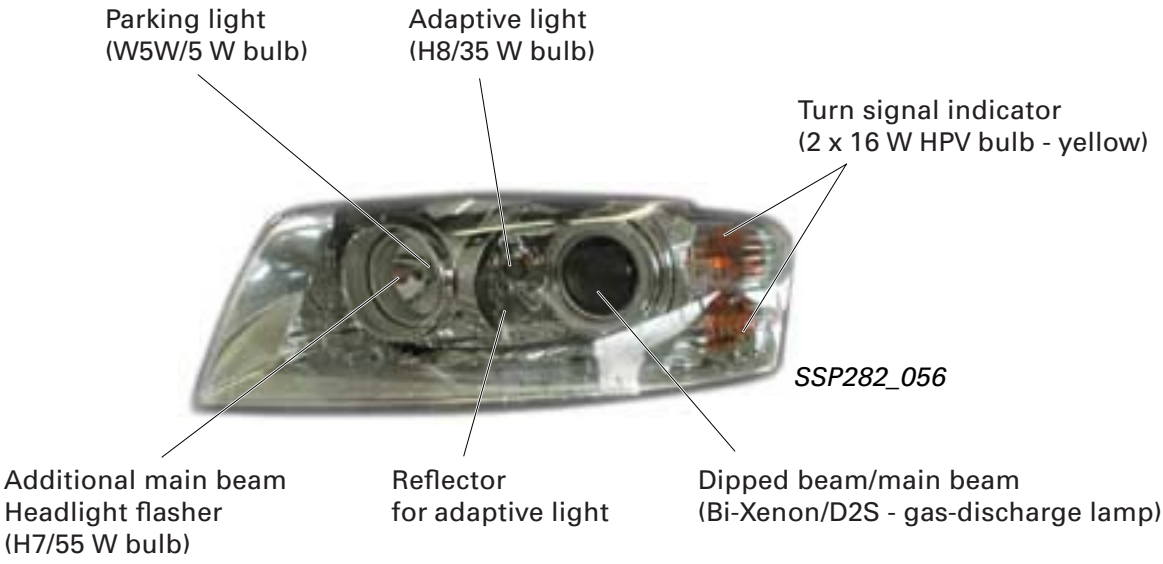


SSP282_096

Design and operation are described in SSP 293 - Audi A8 ´03 Infotainment.

Lighting system

Front lights



The headlight in the Audi A8 ´03 combines both design elements and innovative technology.

Headlight versions:

– Basic halogen version H7

  Dynamic headlight range control is not necessary with halogen headlights. The air suspension provides compensation for static load statuses and a thumbwheel is therefore also not required.

– Bi-xenon version

– Bi-xenon version with integrated adaptive light function

  The headlight range control unit J431 is responsible for providing static and dynamic compensation for vehicle tilting as well as actuation of the static adaptive light function. The sensor signals of the 4-level air suspension system are picked off by the drive system CAN for control purposes. A distinction is made between the two gas-discharge lamp versions by way of appropriate encoding (1 or 2) at the headlight range control unit.

Both bi-xenon versions feature an ellipsoid module with a moving screen to achieve both dipped beam and main beam with xenon light.

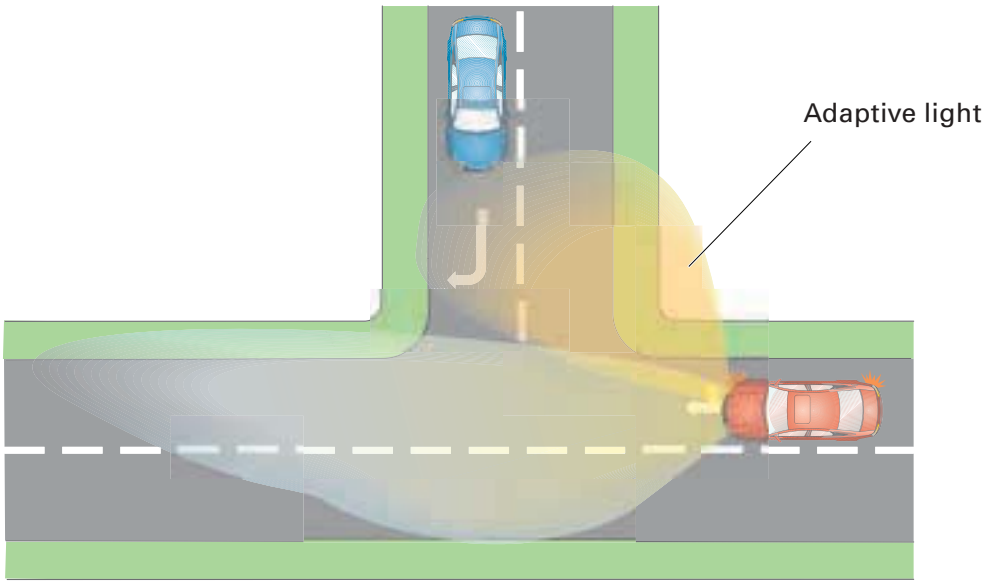
The automatic dynamic headlight range control represents a more advanced version of the standard automatic control system. It provides headlight tilt compensation not only for various load statuses but also as a dynamic function reacting to differences in running gear inclination caused by acceleration and deceleration.

HPV stands for high-performance bulbs, which are extremely compact and have a far longer service life. They have a 25 % lower power input than conventional bulbs. Such bulbs cannot be replaced by customers.

The optional headlights with adaptive light function are a clearly visible innovative feature in the Audi A8 ´03. To implement this function, the headlights are provided with an additional reflector between dipped beam and main beam.

SSP282_092

Light functions



SSP282_087

Adaptive light

The additional reflector with a 35 W H8 halogen bulb is actuated as the situation requires to ensure earlier perception of other road users or obstacles.

When reversing or parking, both adaptive lights are activated to provide the driver with a better overall view of the surrounding area.

Control of the headlight functions is a complex process.
It involves real time evaluation of several signals (e.g. vehicle speed, steering angle and turn signal indicator) by the headlight range control unit J431.

Assistant lighting system

This system adapts the vehicle lighting to the prevailing light conditions. For this purpose the light switch must be set to AUTO. The rain and light detector sensor G397 establishes the prevailing light conditions and activates the vehicle lighting system if appropriate.

Assistant lighting applies to:

- Dipped beam
- Parking lights
- Tail lights
- Number plate light

SSP282_110

Operation of the assistant lighting system is described in SSP 288 – Audi A8 ´03 Distributed Functions.

Side lights

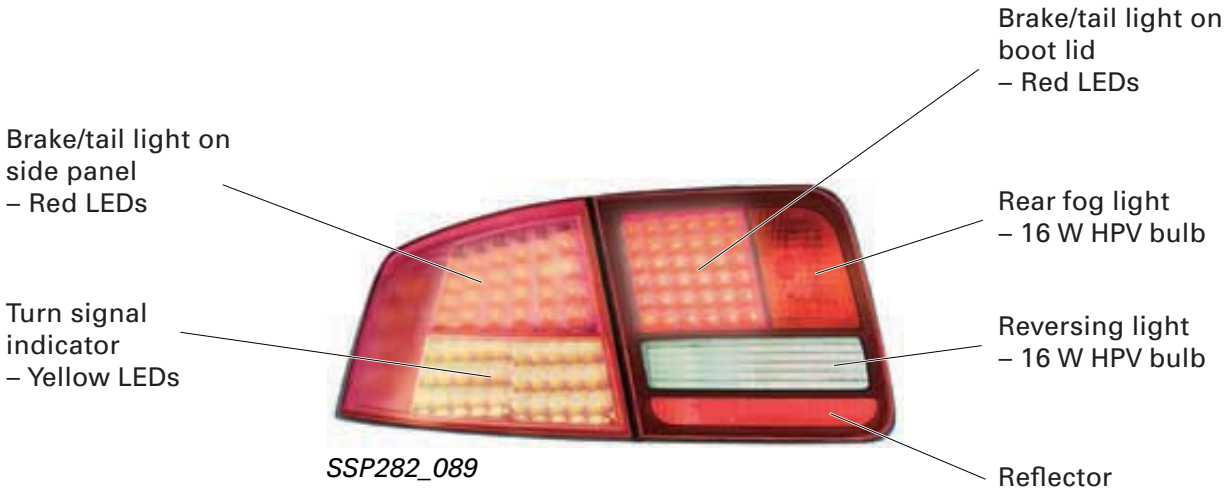
This is the first Audi vehicle to be fitted with LED-type lights. The individual LEDs are fitted in a graduated arrangement under a transparent glass lens and give off a yellow light when switched on. They appear neutral in colour when switched off.

LED technology offers numerous advantages:

- Rapid attainment of full power
- Up to 50 % energy saving as compared to bulbs
- Service life equal to that of the vehicle
- Shallow design
- Bright, distinct marking effect makes vehicle more noticeable

SSP282_088

Rear lights



SSP282_089

The newly designed rear lights are an ideal combination of design, function and ultra-modern technology.

Light-emitting diodes are used for the tail light, brake light and turn signal indicator functions. Newly developed "High-performance" bulbs are employed for the lesser used rear fog light and reversing light functions.
The high-level third brake light also features LEDs.

Rear light actuation is described in SSP 287 – Audi A8 ´03 Electrical Components.

Interior lighting

In addition to the usual interior, reading and door lights, the new Audi A8 also features new "ambiente" and door contour lights with variable functions depending on the lighting profile selected.

Users can choose between the following lighting profiles:

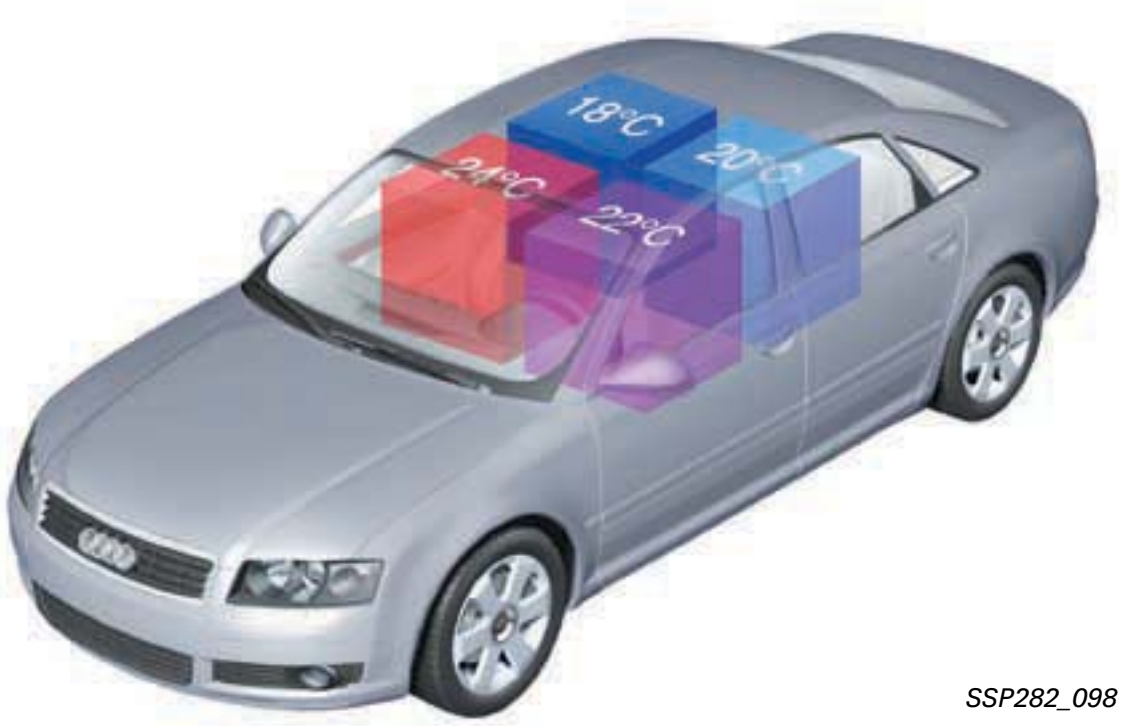
- Highway
- City
- Cockpit
- Fond = Rear

SSP282_111

Design and operation

The air conditioning system represents a more advanced version of the concept employed in the Audi A8 predecessor model with 2-zone climate control and features fully automatic regulation.

An optional feature for the Audi A8 ´03 is 4-zone climate control, enabling both driver and all passengers to make individual settings independently of the climate control level selected for the other occupants.



SSP282_098

The following components are new features as compared to the systems previously fitted in the Audi A8:

- Humidity sender G355
- Evaporator outflow temperature sender G263
- Two versions: 2-zone front climate control with 12 control motors and 4-zone front and rear climate control with 15 control motors
- Rear climate control with electric rear additional heater as additional equipment ("4-zone system") – rear left and rear right footwell heater element Z42 and Z43
- Second control and display unit with 4-zone climate control, Climatronic control unit J255, rear Climatronic control and display unit E265
- Climate control menu in MMI (Multimedia Interface) for display of climate control set values and basic settings
- Front and rear seat heating and seat ventilation
- Heated windscreen Z2
- Energy management control unit J644

The interaction of these components in coordination with the entire air conditioning system forms a control loop and permits comfortable front and rear climate control to suit all requirements.

SSP282_099

A distinction is made between two air conditioner unit versions

- 2-zone front and rear climate control
- 4-zone front and rear climate control

and three types of control and display unit

- Air conditioner control panel with no seat heating/ventilation
- Air conditioner control panel with seat heating
- Air conditioner control panel with seat heating and seat ventilation

(identified by part number index).

Self-diagnosis

Fault diagnosis and measured value blocks for air conditioner and seat heating system can be read out by way of address words 08 "Air conditioner/heater electronics" and 28 "Rear climate control". The functions of and exact procedure for self-diagnosis and assisted fault-finding with VAS 5051 can be found in the Heating/Air Conditioner Workshop Manual for the relevant vehicle model.

Operating principle

When the ignition is switched on, the Climatronic control unit J255 starts up with the same temperature, air distribution and fresh-air blower speed settings etc. as were applicable the last time the ignition was switched off by way of the appropriate key or using fingerprint recognition.
If fingerprint recognition has been implemented, this has priority over key recognition (refer also to SSP 287 – Audi A8 ´03 Electrical Components).

Key recognition takes place in the case of remote control (radio or key transponder), with the driver identification control unit providing the Climatronic control unit J255 with the appropriate information by way of the CAN bus.

Personalised settings

The following settings can be made for each climate control zone (front left, right and, optionally, with 4-zone climate control rear left and right):

- Left/right temperature
- Air flow
- Left/right air distribution
- Left/right seat heating
- Left/right seat ventilation
- Operating modes (AUTO for driver and front passenger, temperature-adjustable centre vents, automatically controlled recirculated-air mode, ECON)

The heated windscreen can be activated by way of the air conditioner defrost button or the air conditioner control unit automatically switches on the electric heated windscreen if the appropriate conditions are satisfied (windscreen defrost or automatic mode on cold starting).

The Climatronic J255 and heated windscreen J505 control units communicate by way of the LIN bus. The Climatronic control unit transmits the specified windscreen heating power to the heated windscreen control unit on the LIN bus.

The electrically heated windscreen is only supplied with the amount of power which can currently be drawn from the electrical system without draining the battery. This is monitored by the energy management control unit J644.

As is the case with the Audi A4, the windscreen is heated by applying voltage to a metallic foil fitted in the glass (refer to SSP 213).

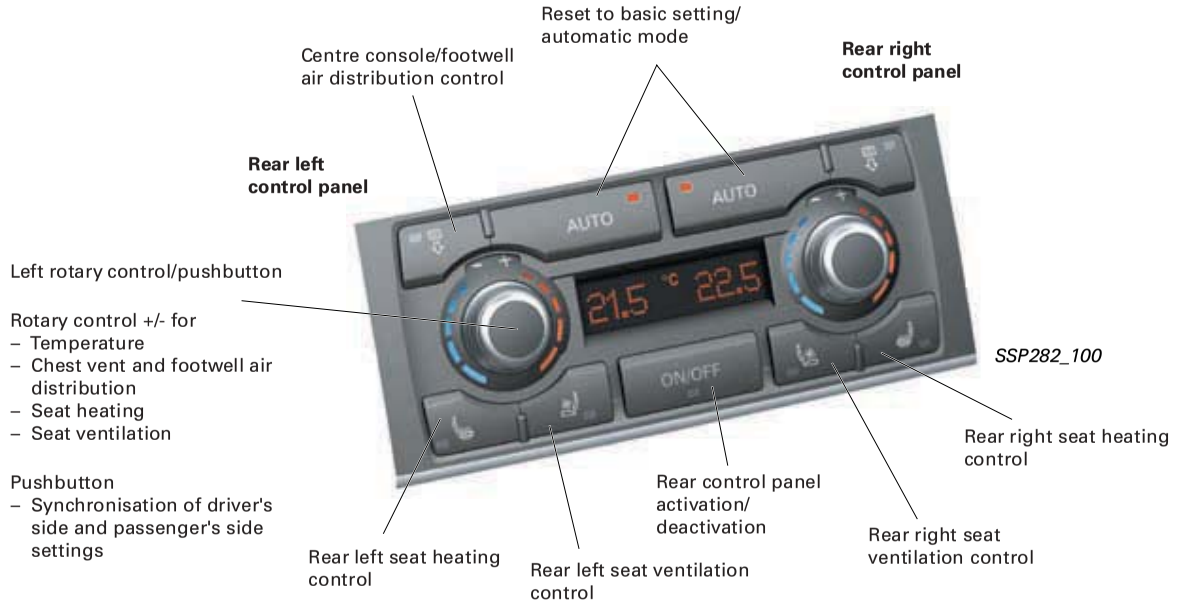
The Climatronic control unit J255 is connected to the convenience CAN, via which diagnosis is also performed.

A manual air conditioning system is not available.

As in the Audi A4, the air conditioner compressor is regulated as a function of load and controlled externally by way of the compressor regulating valve (refer to SSP 240).

Climatronic control unit J255

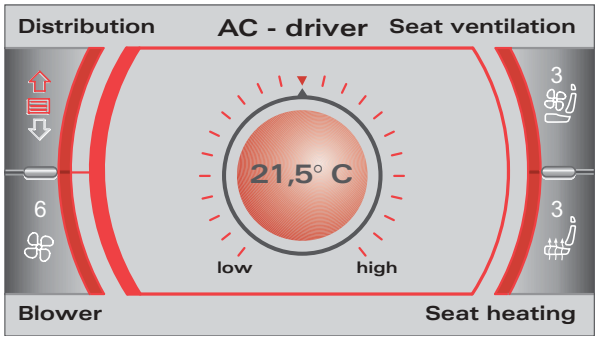
Rear Climatronic control and display unit E265



Air conditioning system control via MMI

All air conditioning system set values and basic settings (setup) can be displayed by way of the MMI. This applies both to the Climatronic control unit button functions and to setup.

If the air conditioning system is activated with the MMI switched on, the air conditioner function settings can be called up and altered by way of the multimedia control panel. The functions indicated in the corners of the displayed mask are activated using the softkeys.



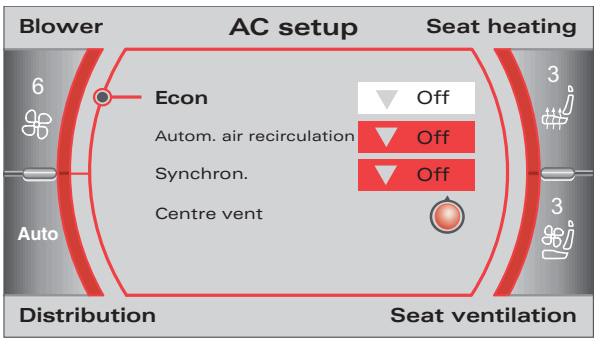
SSP282_112

Basic setting (setup)

The basic air conditioner settings can only be altered when the MMI is active. This involves pressing the SETUP button on the Climatronic control unit.

The following functions can be selected:

- ECON ON/OFF
- Automatic air recirculation active/inactive
- Synchronisation active/inactive
- Centre vent (temperature-adjustable) settings between - 3 and + 3
- Auxiliary heater active/inactive
- Auxiliary ventilation active/inactive
- Auxiliary heater/ventilation operating time 15 min./30 min./45 min./60 min.
- Auxiliary heater/ventilation timer status for timers T1, T2, T3 ON/OFF
- Solar mode active/inactive (solar cells C20)
- Rear control ON/OFF



SSP282_113

The desired settings can be called up and altered with the driver's/front passenger's control knob on the Climatronic control unit.

The current air conditioner settings are stored automatically and assigned to the appropriate remote control key. On vehicles with Audi one-touch memory (optional), the current setting is also assigned to the corresponding fingerprint.

Blower unit/air routing

As opposed to the predecessor model, the air conditioner features an additional evaporator outflow temperature sender G263. This is installed in the air duct downstream of the evaporator and constantly transmits the air temperature downstream of the evaporator to the Climatronic control unit J255.

If the left or right centre chest vent is closed manually, the left/right centre vent control motor V110/V111 is closed automatically by the centre left/centre right G347/G348 vent sensor signal.

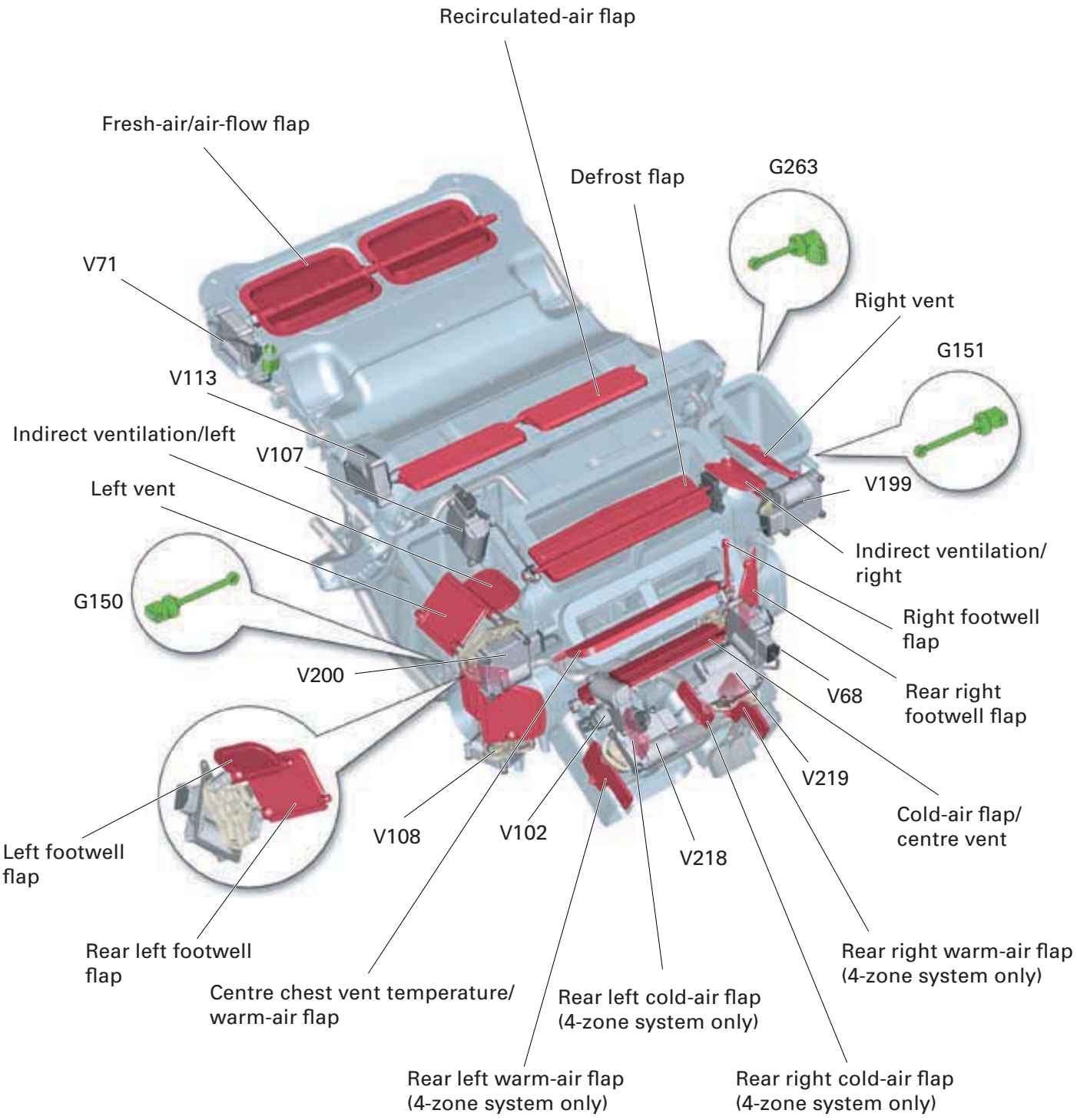
Automatically controlled recirculated air mode

Recirculated air mode is implemented automatically for a certain period

- If the windscreen washer system switch is actuated or
- In the event of actuation by the air quality sensor G238

When replacing control motors, attention must be paid to the assignment of the flaps in the cam plate guides.

G150	Left vent temperature sender
G151	Right vent temperature sender
G263	Evaporator outflow temperature sender
V68	Temperature flap control motor
V71	Air-flow flap control motor
V102	Centre vent control motor
V107	Defroster flap control motor
V108	Left footwell flap control motor
V109	Right footwell flap control motor (not illustrated)
V113	Air-recirculation flap control motor
V199	Front right defroster/chest vent shutoff flap control motor
V200	Front left defroster/chest vent shutoff flap control motor
V218	Rear left vent control motor (4-zone system only)
V219	Rear right vent control motor (4-zone system only)


Recirculated-air flap
Fresh-air/air-flow flap
Defrost flap
G263
V71
Right vent
G151
V113
Indirect ventilation/left
V107
V199
Left vent
Indirect ventilation/
right
G150
Right footwell
flap
V200
V68
Rear right
footwell flap
V219
Cold-air flap/
centre vent
Left footwell
flap
V108
V102
V218
Rear right warm-air flap
(4-zone system only)
Rear left footwell
flap
Centre chest vent temperature/
warm-air flap
Rear left cold-air flap
(4-zone system only)
Rear left warm-air flap
(4-zone system only)
Rear right cold-air flap
(4-zone system only)

SSP282_101

Heating/Air Conditioner

Electric rear additional heater

An electric rear additional heater is fitted under each front seat in the rear climate control footwell air ducts.

SSP282_102

Operation

Following a cold start or at low ambient temperatures, there is insufficient waste heat in the coolant to warm the rear of the vehicle by means of a conventional fluid-filled heater. In addition, the drop in temperature in the rear air duct is extremely high in the initial phase.

This problem has been solved by integrating two electric rear additional heaters into the rear footwell air duct.
These employ electrical energy from the vehicle electrical system to heat the air supplied to the passenger compartment.
In this way, the heating function is available immediately following cold starting.

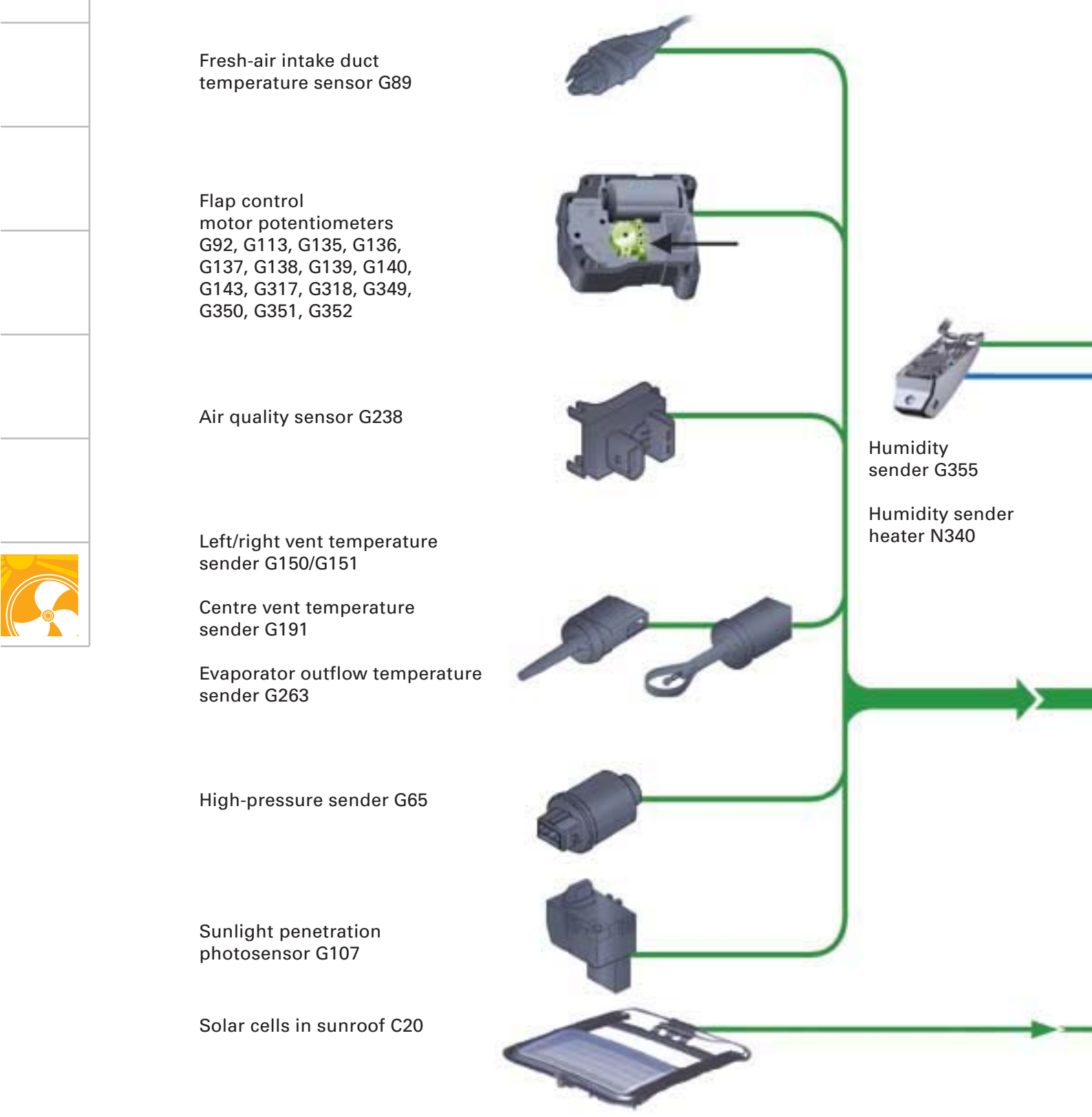
A further advantage is that independent temperature regulation (heating) can be provided for the rear footwell with the 4-zone system.
A supply of colder air to the rear climate zones as opposed to the front can be achieved by way of the centre chest vents.
The temperature can however only be reduced but not increased via these vents through the addition of cold air.

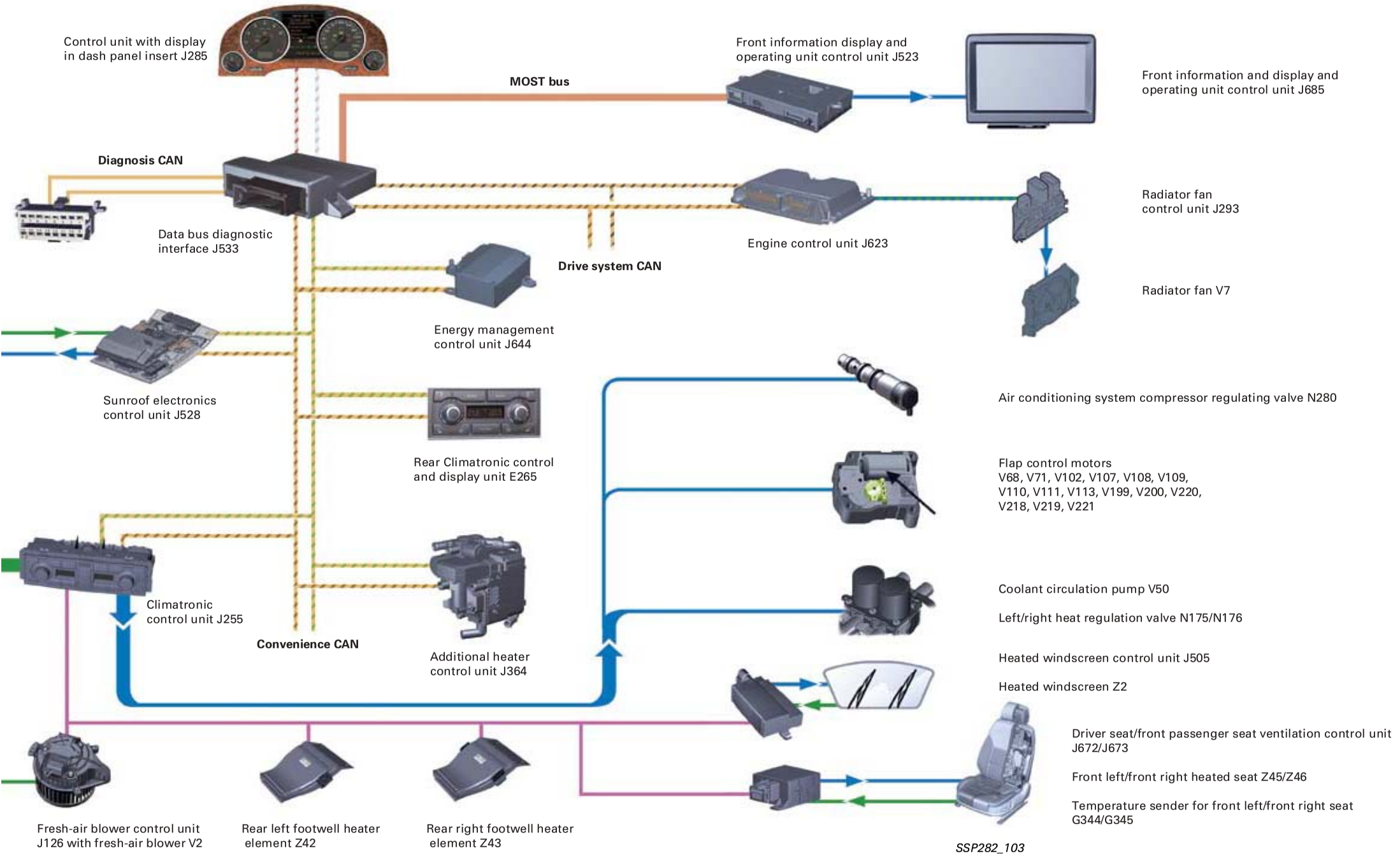
As in the predecessor model, two separately controlled heat exchangers permit the setting of different temperatures at front left/right.
All occupants can therefore be provided with individual climate control.

As was the case with the predecessor model, in situ heat exchanger replacement is possible. The procedure involved is described in the current Workshop Manual.

Notes

System layout




Control unit with display in dash panel insert J285
MOST bus
Front information display and operating unit control unit J523
Front information and display and operating unit control unit J685
Diagnosis CAN
Data bus diagnostic interface J533
Engine control unit J623
Radiator fan control unit J293
Radiator fan V7
Drive system CAN
Energy management control unit J644
Sunroof electronics control unit J528
Air conditioning system compressor regulating valve N280
Rear Climatronic control and display unit E265
Flap control motors V68, V71, V102, V107, V108, V109, V110, V111, V113, V199, V200, V220, V218, V219, V221
Climatronic control unit J255
Convenience CAN
Additional heater control unit J364
Coolant circulation pump V50
Left/right heat regulation valve N175/N176
Heated windscreen control unit J505
Heated windscreen Z2
Driver seat/front passenger seat ventilation control unit J672/J673
Front left/front right heated seat Z45/Z46
Temperature sender for front left/front right seat G344/G345
Fresh-air blower control unit J126 with fresh-air blower V2
Rear left footwell heater element Z42
Rear right footwell heater element Z43
SSP282_103

Humidity sender G355

SSP282_104

At low ambient temperatures, when the windscreen is extremely cold, the top third is particularly susceptible to fogging.
To cover this area, the humidity sender G355 is fitted in front of the base of the rear view mirror.

The sender is designed to detect the following:

- Humidity level
- Sender ambient temperature and
- Windscreen temperature

All three functions are combined in the sender housing.

The humidity sender is intended for all equipment versions.

The sender data enable the air conditioning system to detect potential misting of the windscreen in good time.
Before water vapour from the air in the passenger compartment can form on the windows, the output of the air conditioner compressor and the blower speed are automatically increased and the defrost flap is opened further. Dry air is then routed from the open defrost vents to the windscreen and side windows via the evaporator and heat exchangers.

Measurement of humidity level and corresponding temperature

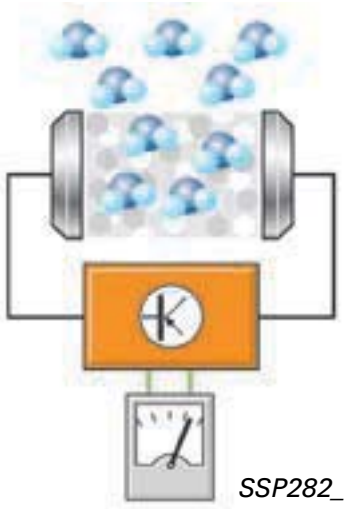
Physical principles

Humidity measurement involves determining the water vapour content of the passenger compartment air. The capacity of air to absorb water vapour is governed by the air temperature. It is thus necessary to determine not only the humidity level but also the corresponding air temperature in the measurement area.

The warmer the air, the more water vapour it can absorb. Water starts to condense if this water-vapour enriched air cools down again. This results in fine droplets forming on the windscreen.

Operation

Measurement is performed by way of a special capacitor which can absorb water vapour. The water absorbed produces a change in the electrical properties and thus the capacitance of the capacitor. The capacitance measurement thus provides information on the humidity level. The sender electronics convert the measured capacitance into a voltage signal.



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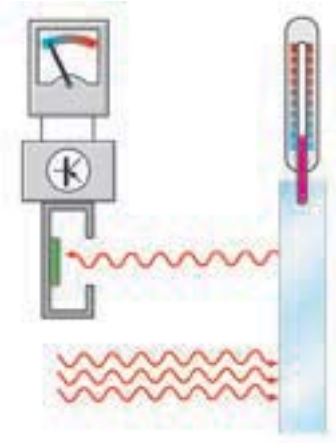
Measurement of windscreen temperature

Physical principles

All bodies exchange heat with their environment in the form of electromagnetic radiation. This electromagnetic radiation can include thermal radiation in the infrared range, visible light or ultraviolet components.

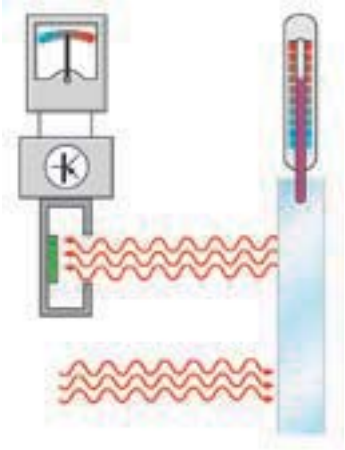
The wavelength of the radiation emitted depends on the temperature of the actual body. A change in the temperature of the body alters, for example, the infrared component of the radiation emitted. The temperature of the body can be determined in a non-contacting manner by measuring the infrared radiation emitted.



SSP282_106

Operation

The infrared radiation emitted by a body (windscreen) is measured by means of a highly sensitive infrared radiation sensor. A change in the temperature of the windscreen also produces a change in the infrared component of the thermal radiation emitted by the windscreen. This is detected by the sensor and converted by the sensor electronics into a voltage signal.

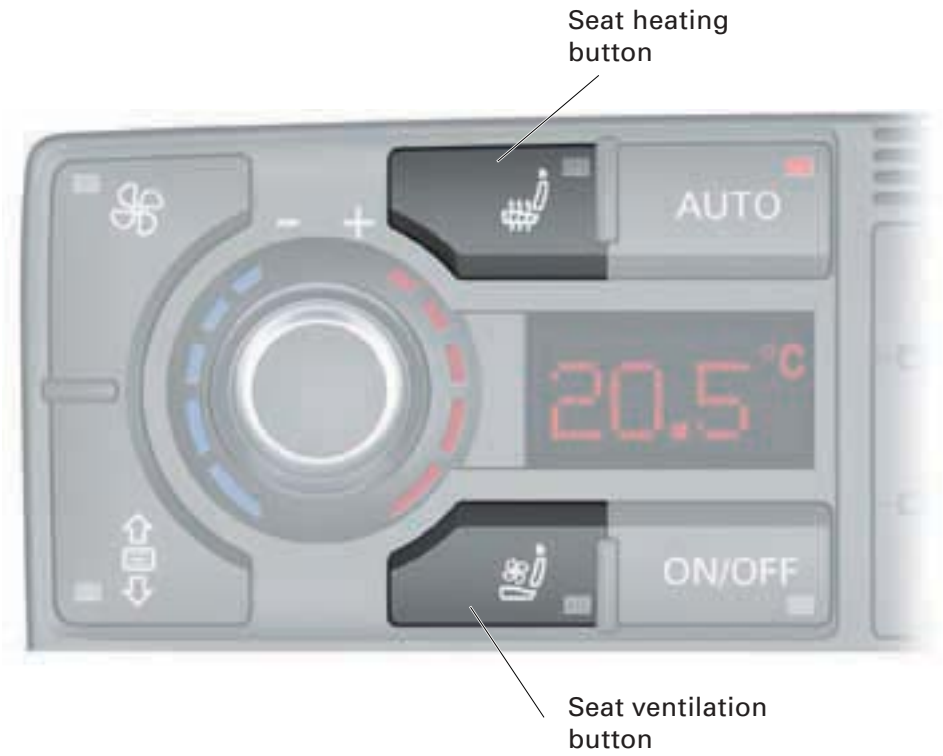


Heating/Air Conditioner

Climate-controlled seats with heating and ventilation function

The Audi A8 ´03 can be fitted with front and rear climate-controlled seats as optional equipment. These seats offer a combination of seat heating and seat ventilation and can be regulated individually for each occupant.

The buttons for the seat heating and ventilation options are integrated into the front and rear control and display units (refer to Page 74).



SSP282_107

The corresponding feedback LED lights after pushbutton activation of seat heating/seat ventilation. The selected seat heating/seat ventilation stage can be called up in the display segment of the Climatronic control unit J255 and in the MMI (Multimedia Interface) climate control menu. Once seat heating/seat ventilation has been activated, it remains active even after switching off the air conditioner by means of the ON/OFF button.

The use of seat ventilation leads to lower occupant skin temperatures. Automatic additional seat heating operation controlled as a function of temperature cancels the cooling effect and the air flow is warmed.

The ventilation function promotes pleasant conditions in the occupant's back and seat area and eliminates sweating more quickly.

Under normal circumstances, the seat ventilation function is deactivated automatically after approx. 30 minutes.

Comfort seat

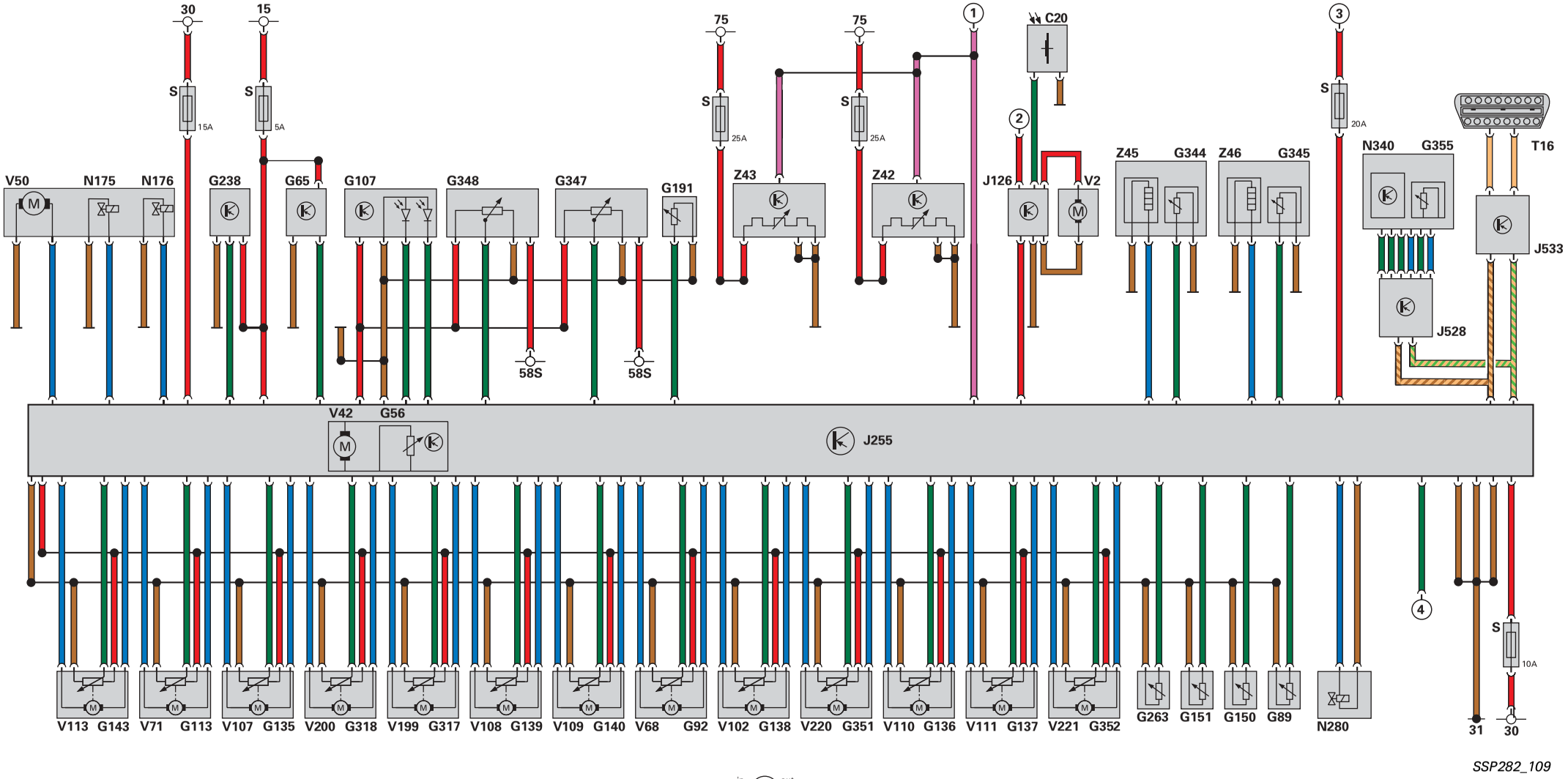
Seat climate control is achieved by way of integrated fans in the seat cushion and backrest. Air ducts in the seat padding convey the air warmed by the seat heating to the occupant through the fine perforations in the leather.

The seat heating and seat ventilation functions are not incorporated into automatic climate control mode.

Block diagram for front air conditioner

Key

C20	Solar cells
G56	Dash panel temperature sensor
G65	High-pressure sender
G89	Fresh-air intake duct temperature sensor
G92	Temperature flap control motor potentiometer
G107	Sunlight penetration photosensor
G113	Air-flow flap control motor potentiometer
G135	Defrost flap control motor potentiometer
G136	Left central vent control motor potentiometer
G137	Right central vent control motor potentiometer
G138	Central vent control motor potentiometer
G139	Left footwell flap control motor potentiometer
G140	Right footwell flap control motor potentiometer
G143	Air recirculation flap control motor potentiometer
G150	Left vent temperature sender
G151	Right vent temperature sender
G191	Centre vent temperature sender
G238	Air quality sensor
G263	Evaporator outflow temperature sender
G317	Front right defroster/ chest vent shutoff flap control motor potentiometer
G318	Front left defroster/ chest vent shutoff flap control motor potentiometer
G344	Temperature sender for front left seat
G345	Temperature sender for front right seat
G347	Centre left vent sensor
G348	Centre right vent sensor
G351	Rear left vent warm/cold control motor potentiometer
G352	Rear right vent warm/cold control motor potentiometer
G355	Humidity sender
J126	Fresh-air blower control unit
J255	Climatronic control unit
J528	Sunroof electronics control unit
J533	Data bus diagnostic interface
N175	Left heat regulation valve
N176	Right heat regulation valve
N280	Air conditioning system compressor regulating valve
N340	Humidity sender heater
T16	16-pin connector (diagnostic connection)
V2	Fresh-air blower
V42	Temperature sensor blower
V50	Coolant circulation pump
V68	Temperature flap control motor
V71	Air-flow flap control motor
V102	Central vent control motor
V107	Defroster flap control motor
V108	Left footwell flap control motor
V109	Right footwell flap control motor
V110	Left central vent control motor
V111	Right centre vent control motor
V113	Air-recirculation flap control motor
V199	Front right defroster/chest vent shutoff flap control motor
V200	Front left defroster/chest vent shutoff flap control motor
V220	Rear left vent warm/cold flap control motor
V221	Rear right vent warm/cold flap control motor
Z42	Rear left footwell heater element
Z43	Rear right footwell heater element
Z45	Front left heated seat
Z46	Front right heated seat



SSP282_109

in out

Colour code

- = Input signal
- = Output signal
- = Positive supply
- = Earth
- = Convenience CAN High
- = Convenience CAN Low
- = LIN bus

Additional signals

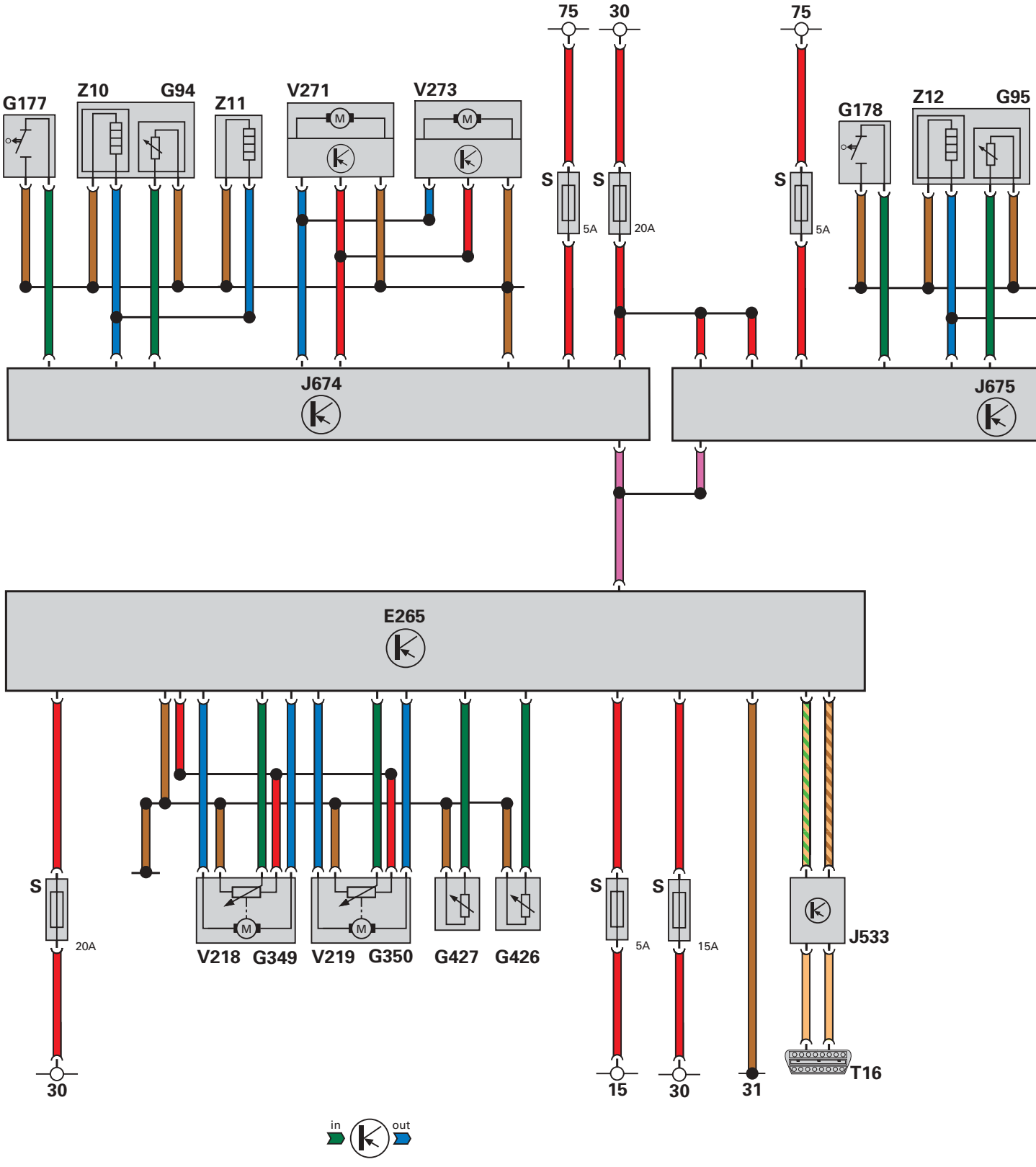
(1) Climate control LIN bus for
- Heated windscreen control unit J505
- Driver seat ventilation control unit J672
- Front passenger seat ventilation control unit J673

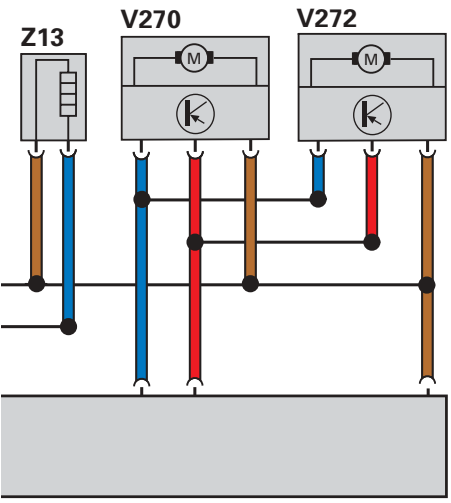
(2) Terminal 30/blower

(3) Terminal 30/front seat heating

(4) Input/rear roller blind switch E149

Block diagram for rear air conditioner





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Key

E265	Rear Climatronic control and display unit
G94	Rear left seat temperature sensor
G95	Rear right seat temperature sensor
G177	Driver side rear seat occupied sensor
G178	Front passenger side rear seat occupied sensor
G349	Positioning motor potentiometer for rear left vent
G350	Positioning motor potentiometer for rear right vent
G426	Driver side rear seat temperature sensor
G427	Passenger side rear seat temperature sensor
J533	Data bus diagnostic interface
J674	Driver side rear seat ventilation control unit
J675	Front passenger side rear seat ventilation control unit
T16	16-pin connector (diagnostic connection)
V218	Rear left vent control motor
V219	Rear right vent control motor
V270	Rear right seat fan
V271	Rear left seat fan
V272	Rear right seat backrest fan
V273	Rear left seat backrest fan
Z10	Left heated rear seat
Z11	Left heated rear seat backrest
Z12	Right heated rear seat
Z13	Right heated rear seat backrest

Colour code

= Input signal
= Output signal
= Positive supply
= Earth
= Convenience CAN High
= Convenience CAN Low
= LIN bus

Auxiliary heater/coolant additional heater

An auxiliary heater is available as an option for all vehicle and engine versions. The auxiliary heater with petrol engines and additional heater with diesel engines are integrated into the engine coolant circuit. Vehicles with diesel engine are fitted with an additional heater as standard. On diesel engines with auxiliary heater, the activated auxiliary heater is also used as engine additional heater depending on temperature.

Design and operation are described in SSP 240 – Audi A2 Technical Features.

Operation with cut-in by way of remote control or timer

In the Audi A8 ´03, the auxiliary heater is activated by the air conditioner. The heated coolant is initially supplied to the passenger compartment (primarily auxiliary heater mode). On attaining pre-determined temperature levels, engine pre-heating is then switched in in line with a characteristic curve.

The cut-in time is "programmed" by way of the MMI system (Multimedia Interface) under the menu item "timer status".

Activation sequence:

1 A remote control or timer signal is transmitted to the auxiliary heater control unit.

2 The auxiliary heater then transmits a signal via the CAN bus to the Climatronic control unit J255.

3 The control unit then decides as a function of desired temperature, ambient temperature and passenger compartment temperature whether auxiliary ventilation or auxiliary heating is to be employed. The setting of the auxiliary heater/ ventilation function is shown in the setup menu in the MMI (Multimedia-Interface).

4.1 Auxiliary ventilation sequence

The energy management control unit J644 interrogates the battery capacity check function of the battery and energy management system to determine whether auxiliary ventilation can be accepted. In the event of acceptance, the fresh-air blower is actuated.

4.2 Auxiliary heating sequence

The level of fuel in the tank is interrogated. If the fuel tank is "empty", the auxiliary heating function is not permitted and the auxiliary heater symbol in the dash panel insert goes out. "Empty" roughly corresponds to the red display zone. The energy management control unit J644 checks whether there is sufficient energy to accept auxiliary heating. If this is the case, the auxiliary heater is switched on in the various operating modes depending on the characteristic temperature curve and the fresh-air blower is actuated.
If the auxiliary heating temperature reaches a level of 30 °C, the fresh-air blower is activated and the coolant shutoff valve N279 pulsed in line with the characteristic curve.

The auxiliary heater is switched off automatically on completion of the operating time transmitted by the MMI system to the Climatronic control unit or it can be switched off using the remote control OFF button.

If the engine is switched off again and not all additional heater criteria (temperature, time) are satisfied, the auxiliary heater remains in operation for any residual operating time before being deactivated. This function can be encoded.

Auxiliary heater circulation pump control

To speed up heating of the passenger compartment and to achieve a better "heat yield" in the air conditioner unit heat exchanger, the circulation pump V55 and coolant shutoff valve N279 are pulsed as a function of water temperature and the heating circuit flow rate is thus reduced.

An electric circulation pump is used for the auxiliary heater. It is not possible to reduce the supply voltage in the auxiliary heater control unit and the circulation pump is thus actuated at specific intervals to decrease its output.

Additional control curve for "auxiliary heater" and "additional heater"

When the engine is on, the auxiliary heater and engine temperatures are constantly compared. A switch to the large coolant circuit is made as soon as the engine temperature exceeds the auxiliary heater temperature.

Activation of auxiliary heater circulation pump with engine on (pulsed operation of circulation pump)

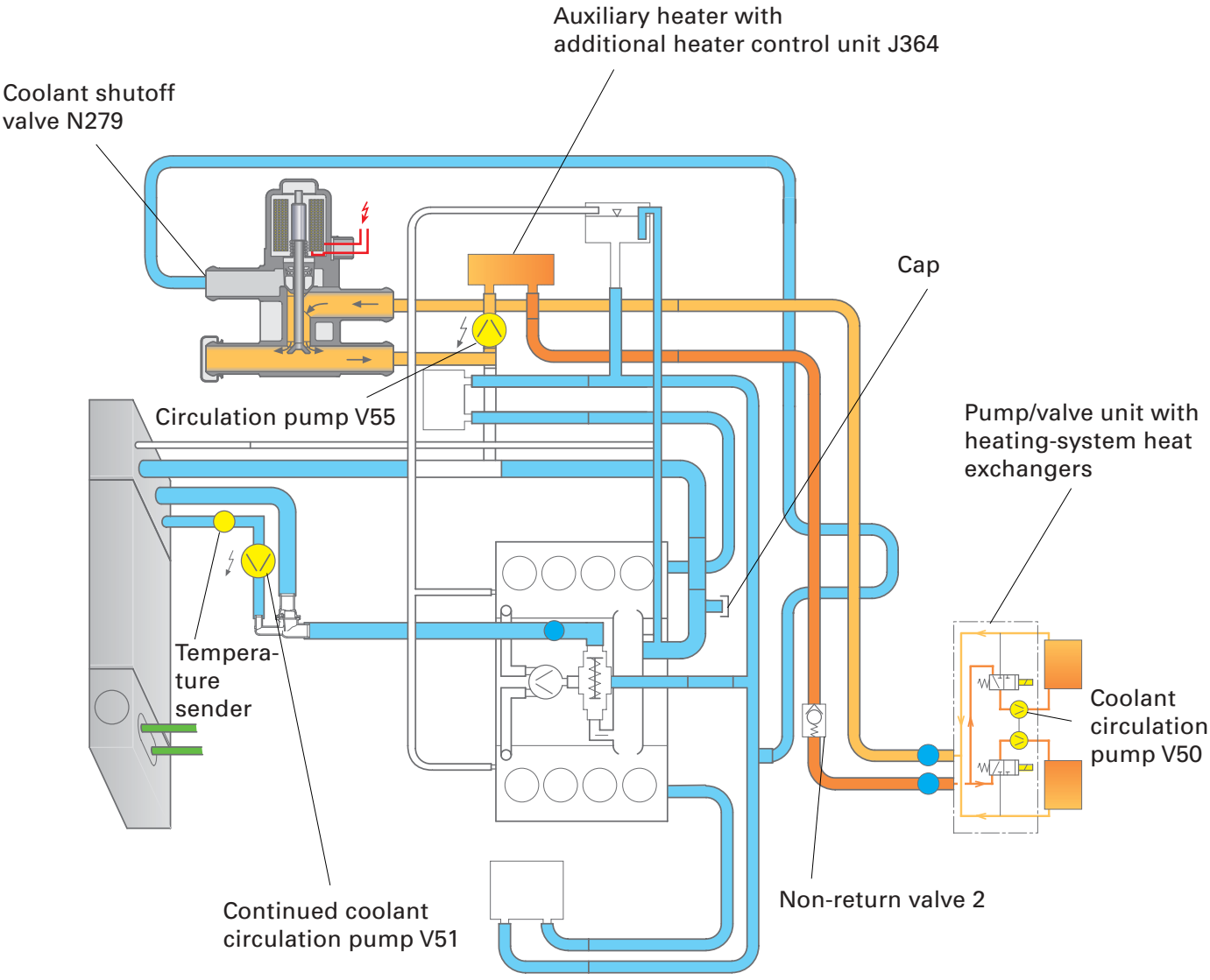
In order to be able to ensure a sufficient flow of water through the heat exchanger, the auxiliary heater circulation pump must additionally be switched on, as is the case for instance with the 12-cylinder engine.

Small coolant circuit with auxiliary heater

The small coolant circuit employed with auxiliary heating is designed to ensure rapid warming of the passenger compartment.

With the engine stopped, the coolant shutoff valve N279 switches to the small heating circuit until a defined temperature value has been attained. The coolant exiting from the heat exchangers via the pump/valve unit is conveyed by the circulation pump V55 into the auxiliary heater. After being warmed, the coolant is pumped back into the heat exchangers and initially heats the passenger compartment.

Design and operation are described in SSP 267 – The 6.0 l W12 engine in the Audi A8 - Part 1.



SSP282_097

Notes

Notes

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