Service Training

Commercial Vehicles

Self-Study Programme 566

The Crafter 2017

A development concept with its finger on the pulse of customers' requirements

Customer-orientated, functional, innovative – that is how the Crafter 2017 presents itself as a complete new development. For this purpose, Volkswagen Commercial Vehicles involved users and their special requirements in the development process at a previously unmatched level of intensity. Specialists from Hanover accompanied customers in their everyday driving and asked them directly in their workplace about their requirements and ideas. The focus was always on the slogan "Design must function". For example, it was possible to equip the Crafter 2017 with an optimum ratio between total space on the road and usable space, while nevertheless achieving the best drag coefficient in its class. The result is a previously unmatched combination of functionality, everyday practicability, cost effectiveness and environmental friendliness. A series of engines specially developed for the Crafter 2017, a diverse range of drive variants as well as an extensive palette of vehicle lengths and roof heights round off the concept and make the Crafter 2017 optimally customisable.

However, when it comes to driver assist systems, new standards are also set within this vehicle segment. The electromechanical power steering used for the first time in this vehicle category made it possible to equip the Crafter 2017 with an unusual range of active and passive driver assist systems. In this way, a significant contribution has been made to increasing safety.
Even shortly after its presentation, the Crafter was chosen as International Van of the Year 2017.

The Self-study Programme shows the design and function of new developments.
The contents are not updated.

For current testing, adjustment and repair instructions, refer to the relevant service literature.

Important note

At a glance

The model history

1975 LT1
Volkswagen started in-house development of a new load transporter.
Vehicle variants included a minibus with up to 14 seats, a panel van, a platform van and a chassis.

1996 LT2
A joint development by Volkswagen and Mercedes-Benz.
It was produced with three wheelbases and two roof heights. Petrol and diesel engines were available for the LT2.

2006 Crafter
The cooperation with Mercedes-Benz is continued. The "LT" becomes the "Crafter". It was also produced in many variants. The engines consisted of turbocharged diesel engines with several power levels.

2017 Crafter
It is an in-house development by Volkswagen Commercial Vehicles.
Primarily, the early involvement of customer requirements in development is a unique feature.
A drive concept with the options of front, rear or four-wheel drive also offers a variety of possible applications.

The production site

Commercial vehicles have been produced in Poznań (Poland) since 1993. In 2004, the T-model was joined by the Caddy as the most important product.

In Września, about 50 kilometres to the east of Poznań, work started on building a new plant in 2014 where the new Crafter is now being produced. It is being built on the assembly line there together with the MAN TGE.

At the factory premises, a modern paint shop, halls for the body manufacture and vehicle assembly were built as well as a supplier park with space for the logistics. Up to 3000 people will work in the new plant in three shifts, manufacturing as many as 100,000 vehicles each year. Production of the Crafter 2017 started at the Września plant on 5 September 2016. The plant was officially opened on 24 October 2016.

S566_014

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The product characteristics of the Crafter 2017

The overview lists new and striking product characteristics of the Crafter 2017. Deviations are possible depending on the country.

- New design
- Headlights with LED technology
- ESC with trailer stabilisation
- Adaptive cruise control
- Side-wind compensation
- Trailer Assist
- Automatic Post-Collision Braking System
- Main beam assist
- Cornering lighting
- Reversing camera
- Parking aid
- Rear Traffic Alert
- Three possible vehicle lengths
- Three possible roof heights
- Diesel engines of the EA288Nutz series with SCR system

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S566_005

The notable characteristics of the Crafter 2017

Radiator grille with redesigned bonnet and bumper

LED headlights

New dash panel, instruments and controls

Adjustable driver and front passenger seats – also as swing seat and AGR seat (with seal of approval from the campaign for healthy backs) with electrical lumbar support

Loadspace with universal floor and a wide variety of installation options

New tail light clusters with connecting character line

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Derivatives

Panel van

S566_021

Platform van with double cab

S566_023

S566_024

Window van

S566_020

Platform van with single cab

S566_022

As already in the first generation Crafter, the vehicle that most closely matches the customer's requirements can be selected from an extensive range of models. In total, there is a choice of 69 body and powertrain variants.

In terms of the body, there are basically four derivatives. As a panel van, the Crafter 2017 can accomplish all the tasks required of a load transporter with a closed body – as a window van it also satisfies the diverse requirements of passenger transport. The Crafter 2017 will also be built as a platform van, with both a single and a double cab.

Within the individual derivatives, it is additionally possible to select between different length and height variants.

In addition, the production range also includes variants that can be used as the basis for extensive, customer oriented special bodies. Specifically, these are the following models:

- Cowl panel
- Platform
- Chassis with flat frame

Dimension variants

Wheelbases

Two wheelbases are available.

- Wheelbase 1: 3640 mm (L3)
- Wheelbase 2: 4490 mm (L4/L5)

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Rear overhangs

Two rear overhang lengths are available.

- Overhang 1: 1346 mm (L3/L4)
- Overhang 2: 1901 mm (L5)[1)]

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Roof heights (panel van, window van)

Three roof heights are available.

- Roof height 1: 2355 / 2390 mm (H2)[2)]
- Roof height 2: 2590 / 2625 - 2637 mm (H3)[2)]
- Roof height 3: 2798 / 2830 - 2835 mm (H4)[1)2)]

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Cabs (platform van, chassis)

Two cab sizes are available for the platform van or chassis.

- Single cab
- Double cab

S566_033

Platform lengths

Three platform lengths are available with single cab (SC) and a further platform length for double cab (DC).

- Platform length 1 (DC): 2700 mm
- Platform length 2 (SC, DC): 3500 mm
- Platform length 3 (SC): 4300 mm
- Platform length 4 (SC): 4700 mm

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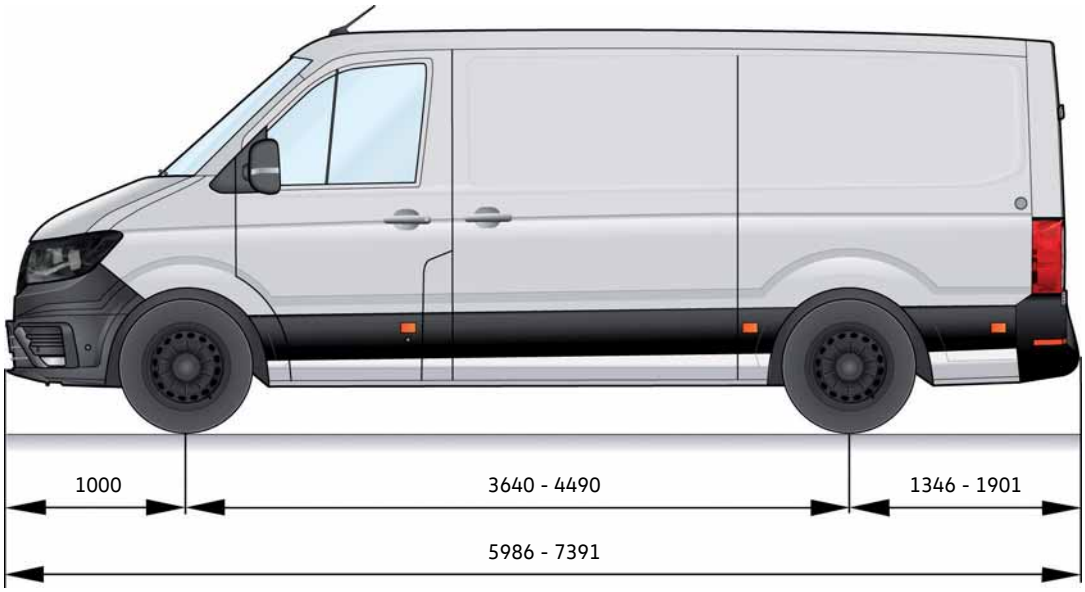
1) Not with window van.

2) Single/twin tyres

Technical data

Panel van, window van



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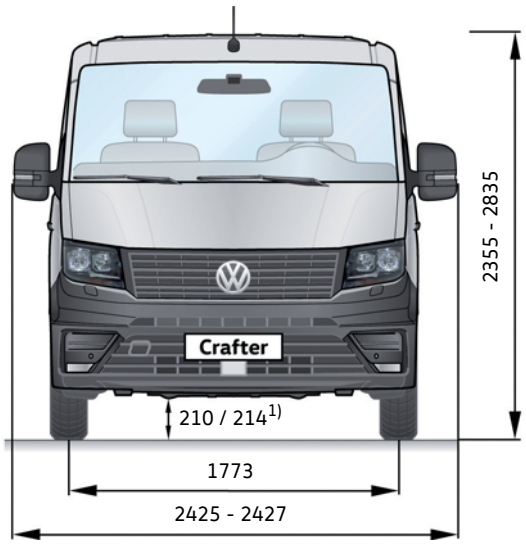

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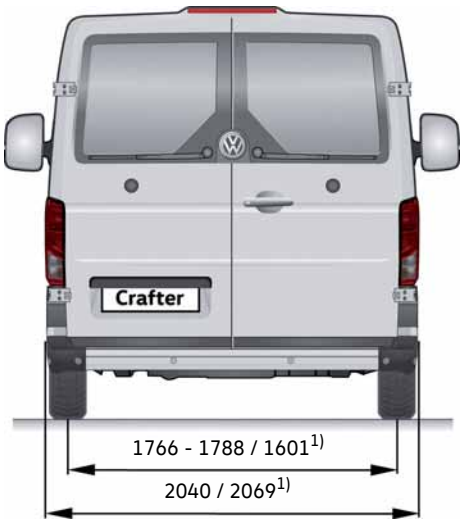

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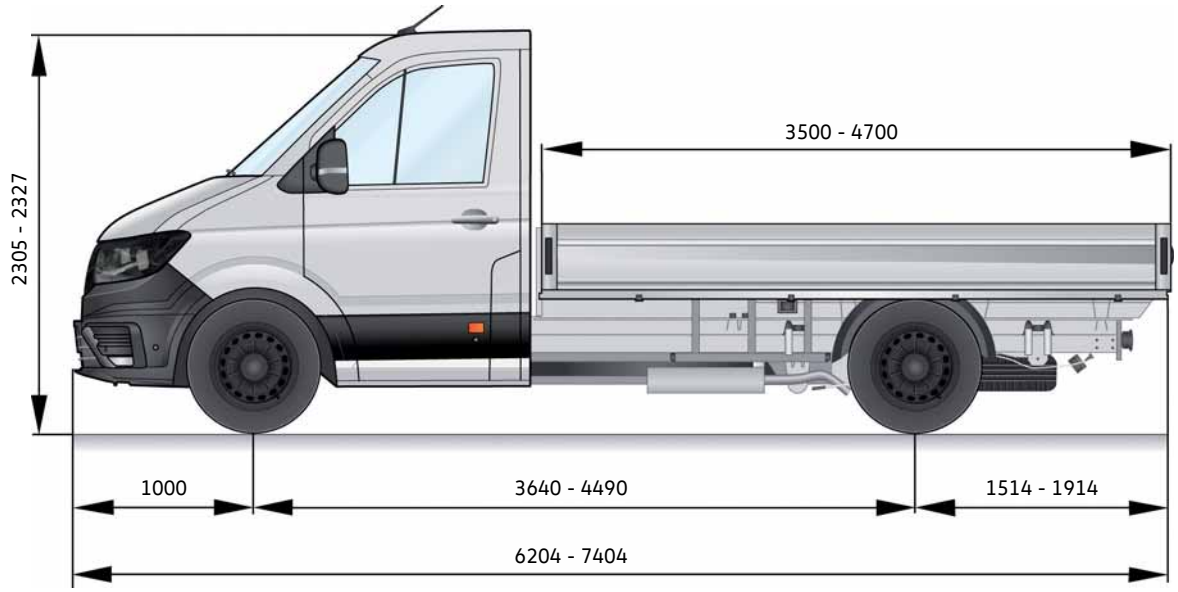
All figures are in millimetres.

[1)] Single/twin tyres

The illustrations only show selected variants and their dimensions/dimension areas. For the complete technical data for the entire model range, please refer to the current sales literature.

Single cab, double cab



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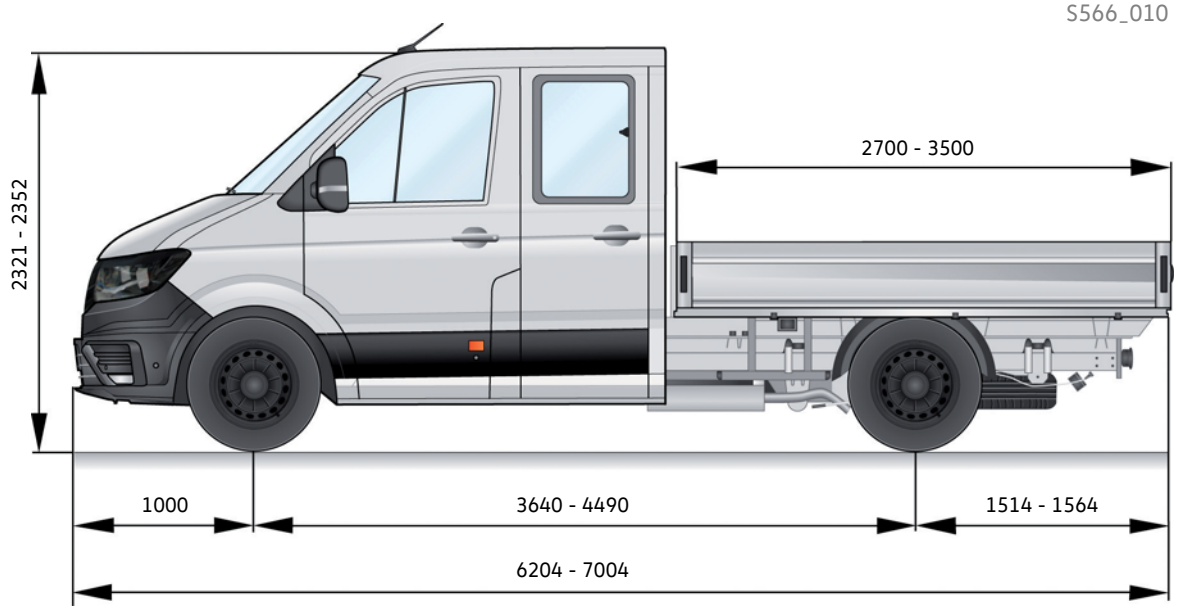

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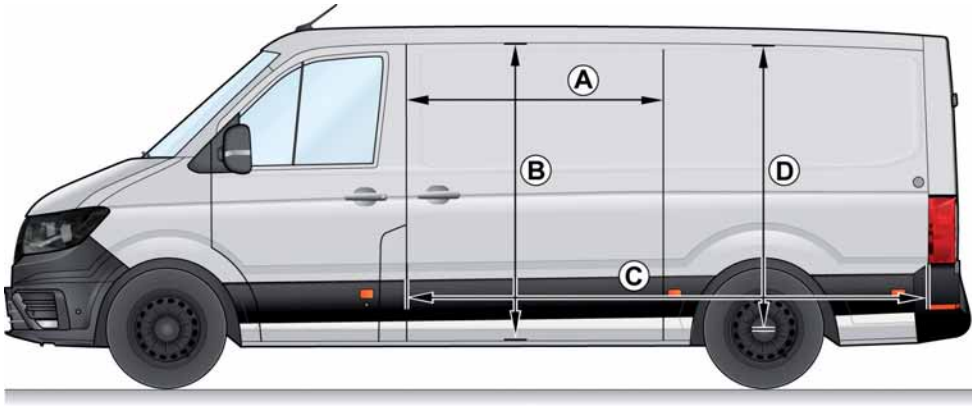
All figures are in millimetres.

Load compartment measurements



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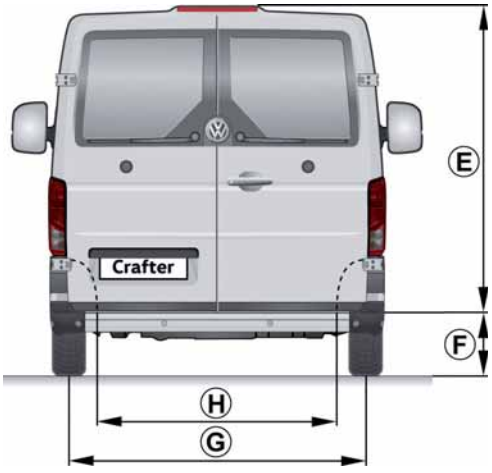
Ⓐ	Sliding door width	1311
Ⓑ	Sliding door height	1430 - 1587 / 1668 - 1822[1)]
Ⓒ	Maximum loadspace length	3450 - 4855
Ⓓ	Maximum loadspace height	1568 - 2196
Ⓔ	Height of rear wing door	1451 - 1605 / 1684 - 1840[1)]

Ⓕ	Loading height/loadsill	570 - 725 / 1000 - 1050[2)]
Ⓖ	Maximum loadspace width	1832
Ⓗ	Width between wheel housings	1375 - 1380 / 1030[3)]
Ⓘ	Maximum platform height	400
Ⓙ	Maximum platform width external	2098

All figures are in millimetres for vehicles with front-wheel drive.

Window van, panel van



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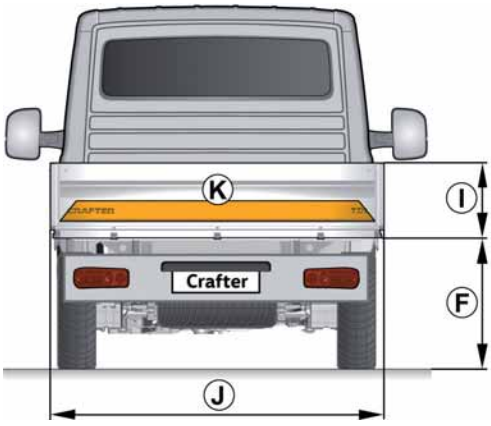
Flatbed



S566_013

1) Roof height 1 / roof height 2, roof height 3
2) Panel, window / platform
3) Single / twin tyres
4) Front and four-wheel drive / rear-wheel drive

Additional dimensions

Ⓚ	Maximum loadspace area	5.5 - 9.6 m^2
	Maximum trailer weight	3000/ 3500 kg[4)]
	Gross vehicle weight	3500 - 5500 kg

The vehicle concept

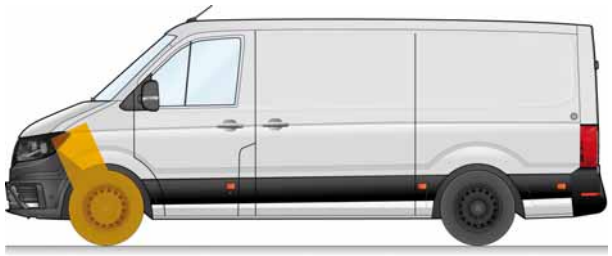
Drive system types

The insights gained from analyses of the customer survey on development of the new Crafter were incorporated into the fundamentally new commercial vehicle architecture. As a result of this, three different powertrain types were offered for the first time.

Front-wheel drive

The drive unit is installed transversally. Features are:
- low loadspace floor (about -100 mm), thereby increasing the loadspace volume and reducing the loadsill height
- Rear end without drive technology
- Driveline with reduced weight (approx. 100 kg less), lower fuel consumption

Applications include courier and logistics services, joiners/plumbers/glaziers, etc. and rescue services.



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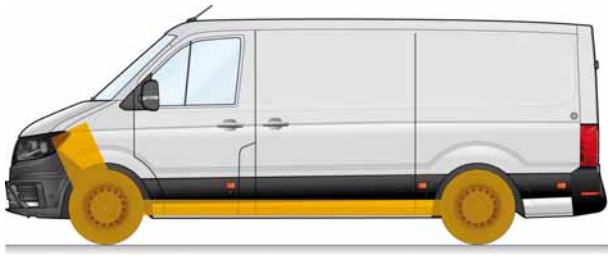
Four-wheel drive 4MOTION

The drive unit is installed transversally. Features are:
- 5th generation four-wheel drive coupling
- Optimum traction
- Particularly suitable for regions with poor weather conditions or roads

Applications include the building trade and forestry as well as the police and military.



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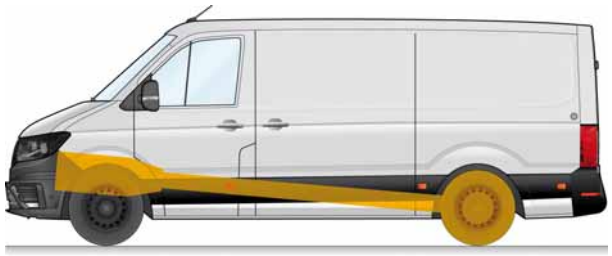
Rear wheel drive

The drive unit is in inline installation. Features are:
- Good traction for high loads
- Higher gross vehicle weight rating possible (up to 5.5 t)
- Single or twin tyres at rear
- Use of auxiliary drives on the gearbox (e.g. for body manufacturer) possible

Applications include service vehicles and mobile workshops with heavy built-in components as well as special bodies.



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Body structure

The body of the Crafter 2017 has been completely redesigned. As with other vehicles from the VW Group, hot-formed steels are used in processing for the body. These steels are stronger than conventional steel with a comparable weight. Using these steel sheets has made the body significantly lighter compared with the predecessor, considerably sturdier and thus safer.

S566_083

The following components are made from hot-formed steel:

- Sill panel reinforcement
- Corner reinforcement on the rear roof
- A-pillar bottom part
- Front bulkhead
- Longitudinal member reinforcement for driver's cab

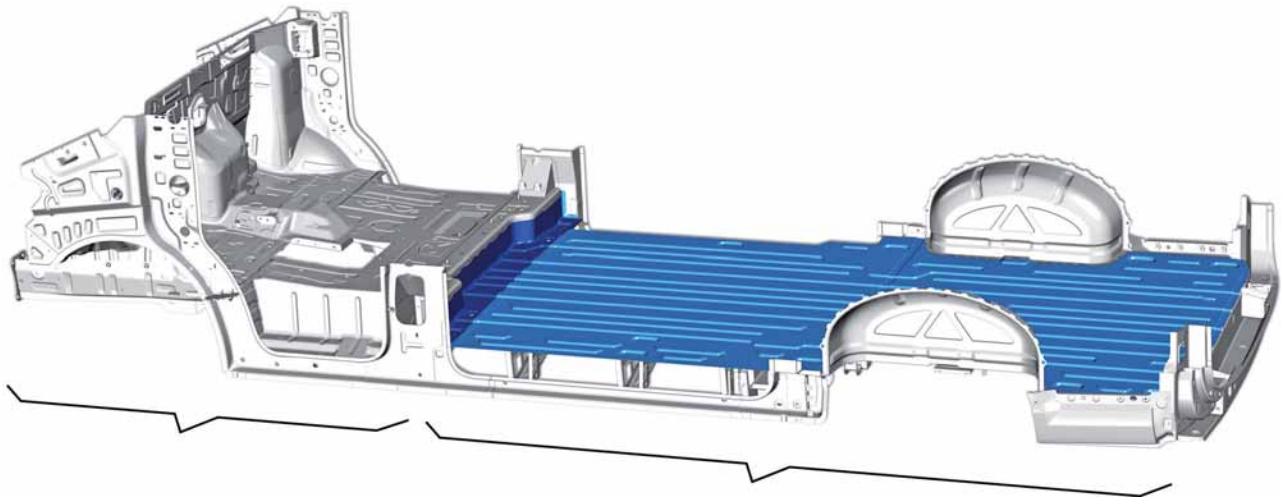
Modular structure

Use of as many identical parts as possible was an important goal during development of the body structure. The objective was to allow the numerous derivatives and variants such as different wheelbases and roof heights to be manufactured with great synergy effects.

Floor structure

The floor structure of the Crafter 2017 is the same for all variants in the vehicle front end area. At the rear end, however, there are significant differences regarding the floor panel, longitudinal members, wheel housings and the corresponding connecting parts as well as reinforcements. Their configuration and design are determined by the following factors:

- Type of drive
- Wheelbase
- Rear overhang
- Type of body
- Single or twin tyres on the rear axle



Vehicle front end the same for all variants

Vehicle rear end different depending on the variant, in this case short wheelbase with low loadspace floor (-100 mm)

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For more information about the body and occupant protection, refer to Self-Study Programme 568 "The Crafter 2017 body and occupant protection".

Engine/gearbox combinations

Transverse installation	2.0 l TDI engine 75 kW DAUB	2.0 l TDI engine 103 kW DAUA	2.0 l TDI engine 130 kW DAVA
			
6-speed Manual gearbox 0AX front-wheel drive			
6-speed Manual gearbox 0AX four-wheel drive			
8-speed Automatic gearbox 09Q front-wheel drive			
8-speed Automatic gearbox 09Q four-wheel drive			

Longitudinal installation	2.0 l TDI engine 90 kW DASA	2.0 l TDI engine 103 kW DASB	2.0 l TDI engine 120[1)] kW DAWB	2.0 l TDI engine 130 kW DAWA
				
6-speed Manual gearbox 0F6 rear-wheel drive				
8-speed Automatic gearbox 0DR rear-wheel drive				

The 2.0 l TDI engines

Exclusively 2.0 l TDI engines from the modular diesel system (MDBnutz) are used in the Crafter 2017. Accordingly, the engines have a modular structure.

Transverse installation

S566_140

Longitudinal installation

S566_141

Commercial vehicle-specific adaptations have been made to the engines in order to meet the exacting requirements in terms of mileage, driving resistance, driving profile and length of use. These have been made on the charge air cooling, for example, as well as the cylinder head, the variable intake manifold, the exhaust gas recirculation cooler, the turbochargers and the oil pan. The installation position has been adapted according to the commercial vehicle configuration. Depending on the drive concept used, the engines are installed transversally or inline – this is an absolute special feature within a vehicle series. Engines with transverse installation are additionally angled 8° forwards when installed in order to make optimum use of the available installation space. Engines with inline installation have a larger oil pan and an increased oil volume.
Engines with one and also two turbochargers are used. In total, there are up to five power levels ranging from 75 kW to 130 kW[1)]. Post-treatment of the exhaust gases is handled by an SCR system for nitrous oxide reduction. Additional ancillaries are also available ex works with the revised ancillary drive.

[1)] The 120 kW variant is not available in Europe.

Additional information about the diesel engines of the modular diesel system MDBnutz as well as the SCR system can be found in Self-Study Programme 564 "The 2.0 litre TDI engine in the T6".

Power units

Technical data

The engine is in the EA288nutz engine series, and is only installed in the T6 and the Crafter in this design. The engine is available in exhaust standards EU3 to EU6 plus depending on country packages and specific requirements.

S566_052

Technical features

- Liquid-cooled charge air cooler
- High-pressure exhaust gas recirculation
- Delphi common rail direct injection
- Liquid-cooled injector for reducing agent
- Injectors with solenoid valve
- Single-plunger high-pressure pump (mono-turbo), double-plunger high-pressure pump (biturbo)

Engine code	DAUB	DASA	DAUA transverse DASB inline	DAWB	DAVA transverse DAWA inline
Capacity	1968 cm^3				
Type	4-cylinder in-line engine				
Valves per cylinder	4				
Bore	81.0 mm				
Stroke	95.5 mm				
Compression ratio	15.5 : 1				
Maximum output at rpm	75 kW at 3250 - 3500	90 kW at 3250 - 3500	103 kW at 3500 - 3600	120[1)] kW at 3500 - 3600	130 kW at 3600
Max. torque at rpm	300 Nm at 1400 - 2250	300 Nm at 1400 - 2250	340 Nm at 1600 - 2250	410 Nm at 1500 - 2000	410 Nm at 1500 - 2000
Engine management	Delphi DCM6.2				
Fuel	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590
Forced induction	Mono turbo	Mono turbo	Mono turbo	Biturbo	Biturbo
Exhaust gas recirculation	yes	yes	yes	yes	yes
Emission standard	EU6 plus	EURO VI	EU6, EU6 plus	EU3/4, EURO V	EU6, EU6 plus, EURO V/VI,

[1)] The 120 kW variant is not available in Europe.

Ancillary drive

An ancillary drive with modular expansion capability is used in response to the wide variety of customer requirements. In addition to the usual units such as an alternator and air conditioner compressor, it is also possible to drive an additional air conditioner compressor or additional alternator. In vehicles with bodies such as camper vans or refrigerated vans, this allows the required form of energy to be provided, e.g. for air conditioning, cooling or driving electrically operated ancillaries.
An elastic belt alone is used as the poly V-belt in an engine with alternator. In all other variants, the poly V-belt is tensioned using a belt tensioner.

Basic drive

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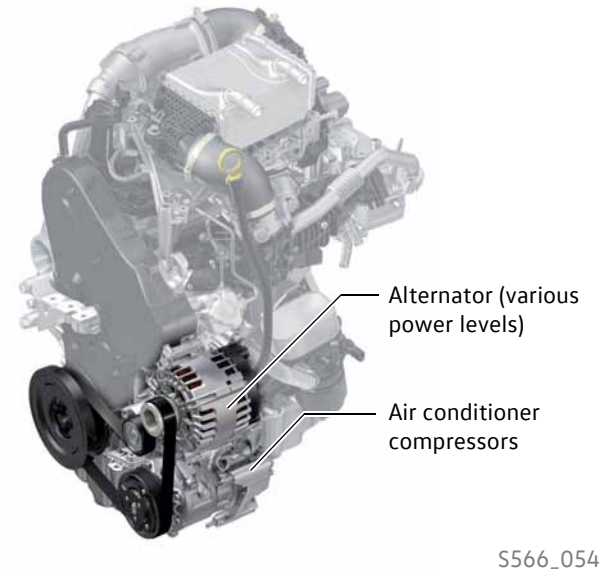
Air conditioning drive



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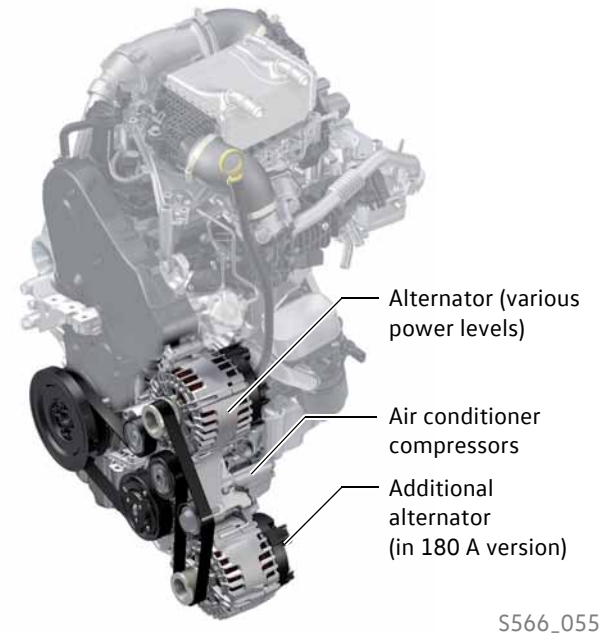
Additional drive



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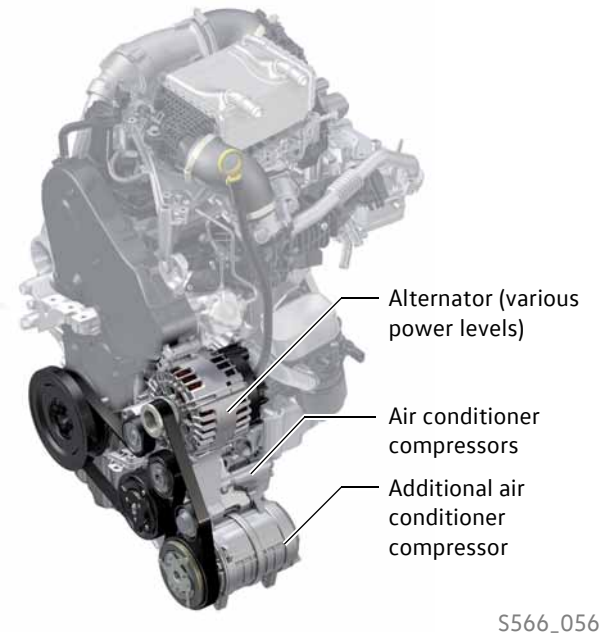

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Exhaust system

The exhaust system of the Crafter 2017 is available in various variants. Its structure depends on the engine or body variant, for example.

Inline installation, EU6

Transverse installation, EU6

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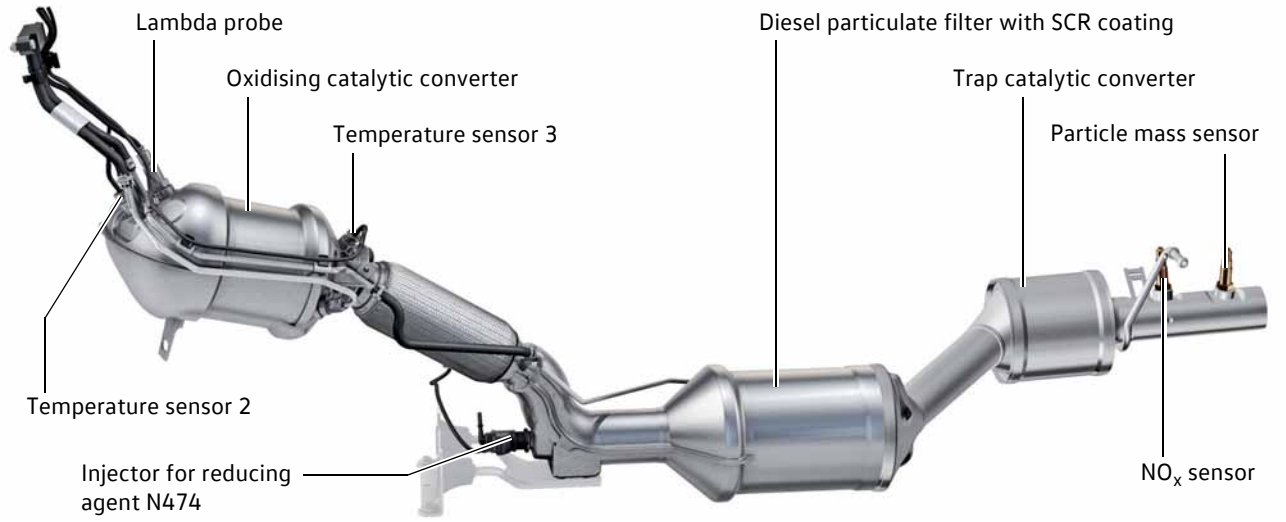
Exhaust gas treatment

In vehicles with SCR system (EU6 exhaust standard), there is a lambda probe (oxygen sensor) in the front part of the exhaust pipe as well as three temperature sensors, the injector for reducing agent as well as the corresponding catalytic converters.



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Reducing agent tank

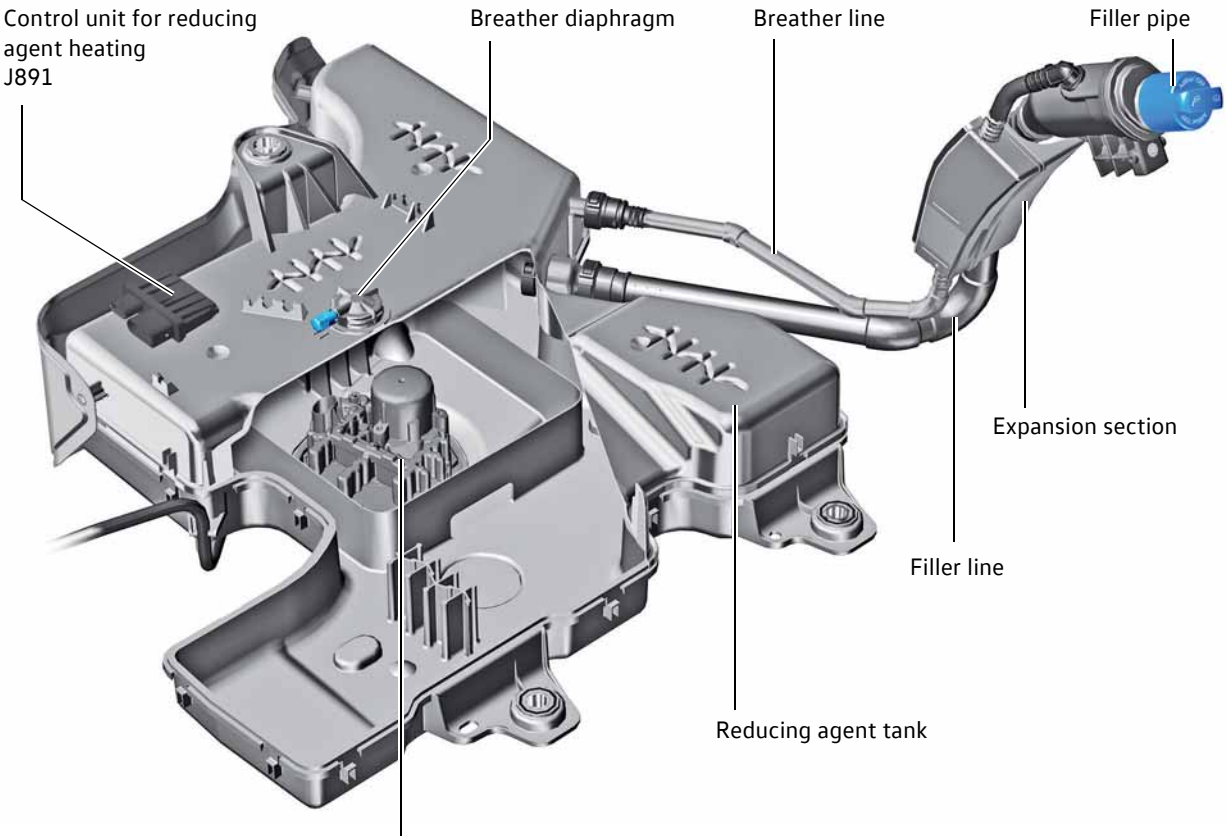
In addition to the fuel tank with a capacity of about 75 litres, there is also a tank for reducing agent with a capacity of about 18 litres. The reducing agent consumption depends on the individual driving style, operating temperature of the system and ambient temperature.
The tank for reducing agent is replenished via the filler neck for reducing agent under the fuel filler neck, and is sealed by a blue tank cap. The tank for reducing agent is located on the underbody ahead of the fuel tank. A compensation volume has been integrated in the top part of the vent in order for the reducing agent flowing in at high speed to be filled.

S566_061

Fuel filler neck

Filler neck for reducing agent

Body



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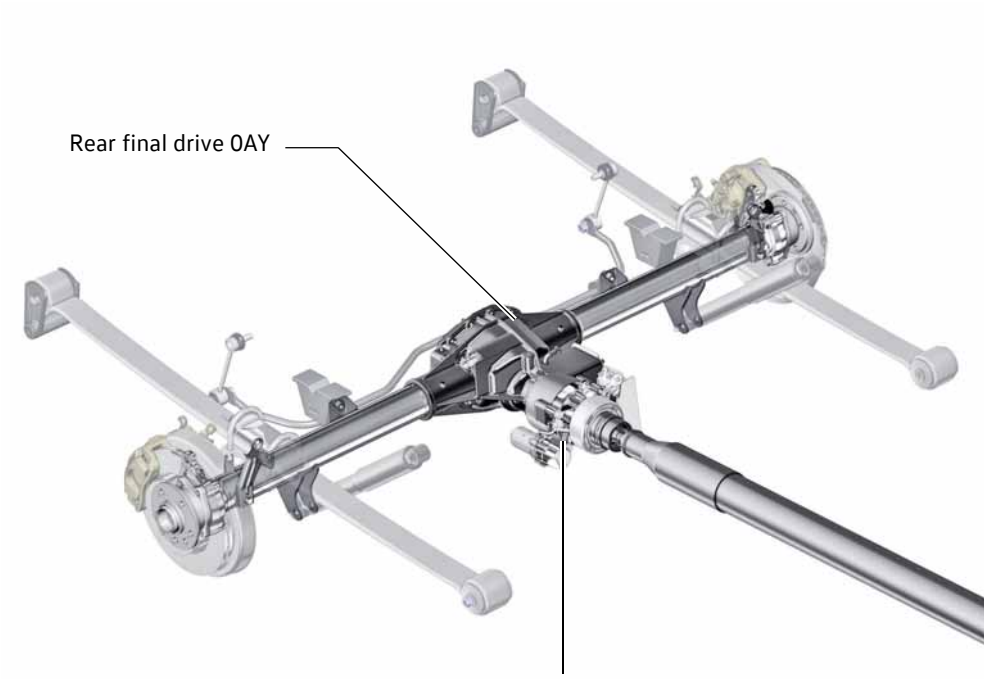
Overview

The diverse drive concept means there are also several variants of power transmission. The range extends from straightforward front-wheel drive with manual gearbox through to four-wheel drive and rear-wheel drive with an auxiliary drive on the gearbox for additional working implements. In vehicles with front or four-wheel drive, the gearbox is installed transversely whereas vehicles with rear-wheel drive have an inline gearbox installation.



Rear final drive

Vehicles with rear-wheel drive are equipped with the rear final drive 0HA. Vehicles with 4MOTION four-wheel drive, on the other hand, are equipped with the rear final drive with four-wheel drive coupling.

Final drive 0HA

Rear final drive with four-wheel drive coupling

Selector mechanism

The gears are changed using a joystick gearshift on the dash panel. In vehicles with manual gearbox, a gearshift recommendation is shown on the display of the instrument cluster.

The automatic gearbox selector lever has a Tiptronic gate in which the gears can be shifted manually. The current selector lever position is shown on the display of the instrument cluster.

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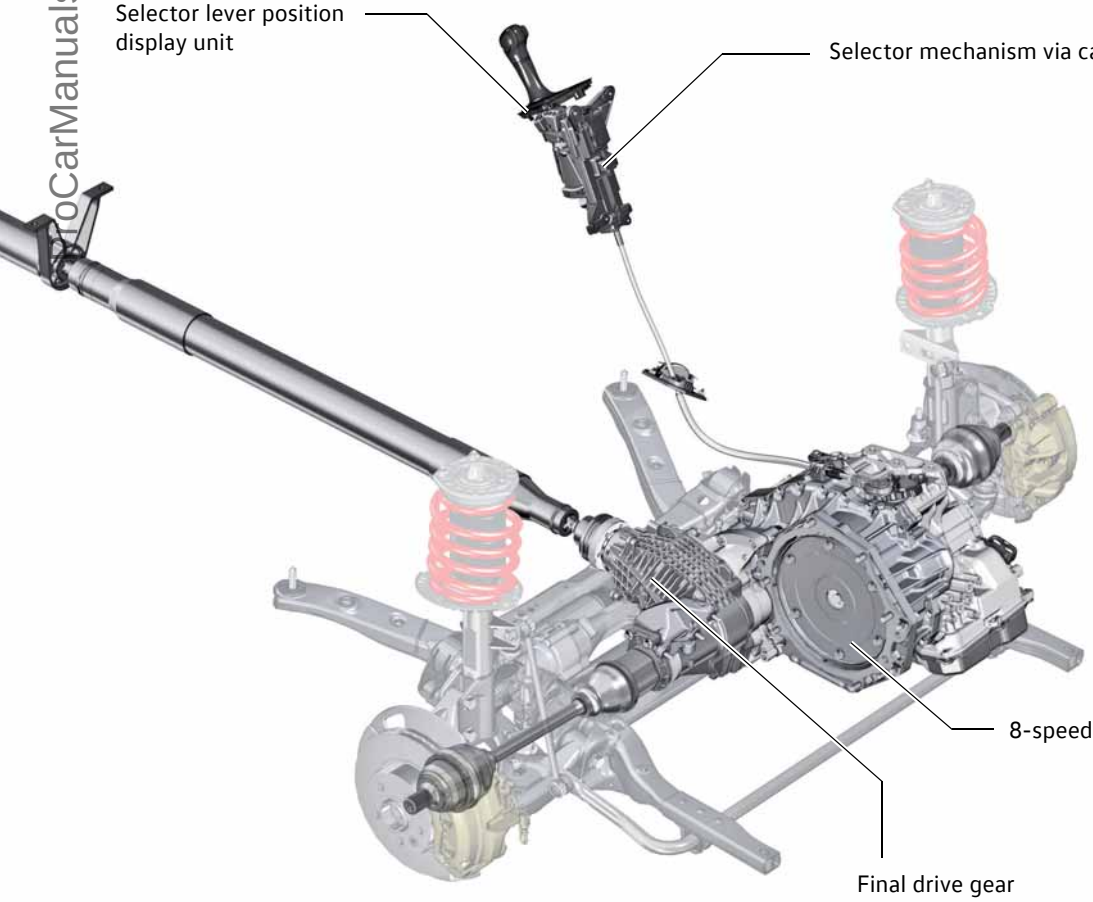
Selector lever position display unit

Interlock button on selector lever



Selector lever position display unit

Selector mechanism via cable

8-speed automatic gearbox 09Q

Final drive gear

S566_072

The gearboxes

6-speed manual gearbox 0AX

The gearbox is used in vehicles with front-wheel drive and 4MOTION four-wheel drive.
It has been given a correspondingly robust design for the Crafter 2017. The gearbox is based on the 6-speed manual gearbox 0A5, used in the T6.
For use in the Crafter 2017, its gear ratios have been adapted and the housing has been optimised for the specific installation space. In the Crafter 2017, it is used both for front-wheel drive and also for 4MOTION four-wheel drive with a flange-mounted bevel drive.

Front-wheel drive

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Four-wheel drive 4MOTION

S566_046

Developer/manufacturer	Volkswagen AG
Transmission designation	at VW: MQ500-6A/-6F in service: 0AX
Gearbox features	6-speed manual gearbox with four shafts and cable operation for front and four-wheel drive in transverse installation
Torque	410 Nm

More information about the basic structure of the 0AX gearbox can be found in Self-Study Programme 320 "6-speed manual gearbox 0A5" and in Self-Study Programme 569 "The Crafter 2017 power transmission".

8-speed automatic gearbox 09Q

The newly developed automatic gearbox is used in vehicles with front-wheel drive and 4MOTION four-wheel drive. It has been given a correspondingly robust design for the Crafter 2017.
For use in the Crafter, the converter, gearbox housing, differential, bearings and the parking lock have been configured for greater robustness.
In four-wheel drive vehicles, the drive is transmitted to the rear axle via a flange-mounted bevel drive.

Front-wheel drive

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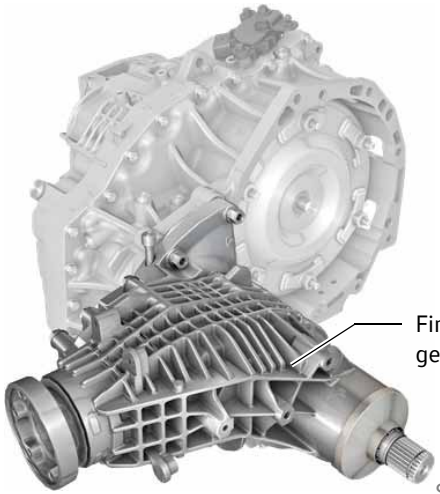
Four-wheel drive 4MOTION



S566_048

Developer/manufacturer	AISIN AW CO., LTD Japan
Transmission designation	at VW: AQ450-8A/-8F in service: 09Q
Gearbox features	Electrohydraulically controlled 8-speed planetary gearbox (automatic range-change gearbox) with hydrodynamic torque converter and limited-slip torque converter lock-up clutch for front and four-wheel drive in transverse installation
Torque	410 Nm

For more information about the basic structure of the 09Q gearbox, refer to Self-Study Programme 569 "The Crafter 2017 power transmission".

6-speed manual gearbox 0F6

The newly developed manual gearbox is used with vehicles with rear-wheel drive. It has been given a correspondingly robust design for the Crafter 2017. This concerns, for example, the configuration of the bearings and synchronisers. The mechanical structure of the gearbox is based on the design of the 6-speed manual gearbox 0F6 of the Amarok 2017 that is fitted in conjunction with the V6 engine. Housing and selector mechanism have been adapted in the Crafter 2017. An ancillary drive on the gearbox is possible as an option.

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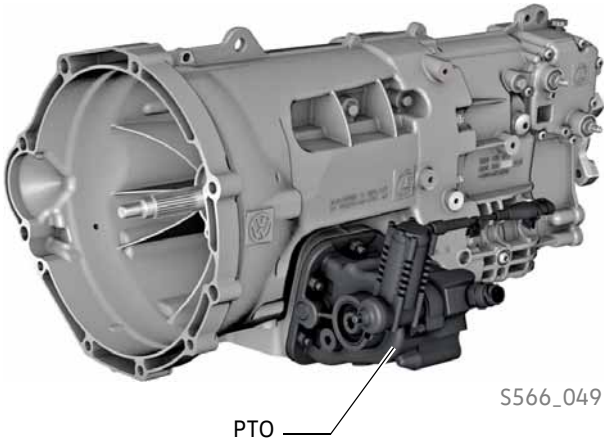

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Developer/manufacturer	ZF Friedrichshafen AG
Transmission designation	at VW: ML410-6H in service: 0F6
Gearbox features	2-shaft manual gearbox with single and multi-synchronised gear stages. The gearbox comprises an input shaft in conjunction with a coaxial output shaft, as well as a layshaft and a reverse shaft for reverse gear. The auxiliary drive is driven via the layshaft.
Torque	410 Nm

For more information about the basic structure of the 0F6 gearbox and the auxiliary drive, refer to Self-Study Programme 569 "The Crafter 2017 power transmission".

8-speed automatic gearbox 0DR

The newly developed automatic gearbox is used in rear-wheel drive vehicles. It has been given a correspondingly robust design for the Crafter 2017.
The gearbox is based on the design of the 8-speed automatic gearbox 0CM fitted in the Amarok 2017 with V6 engine.
For use in the Crafter 2017, the converter and one planetary gear set have been adapted. In addition, the gearbox housing, lined plates, plate carriers and the parking lock have been reinforced.

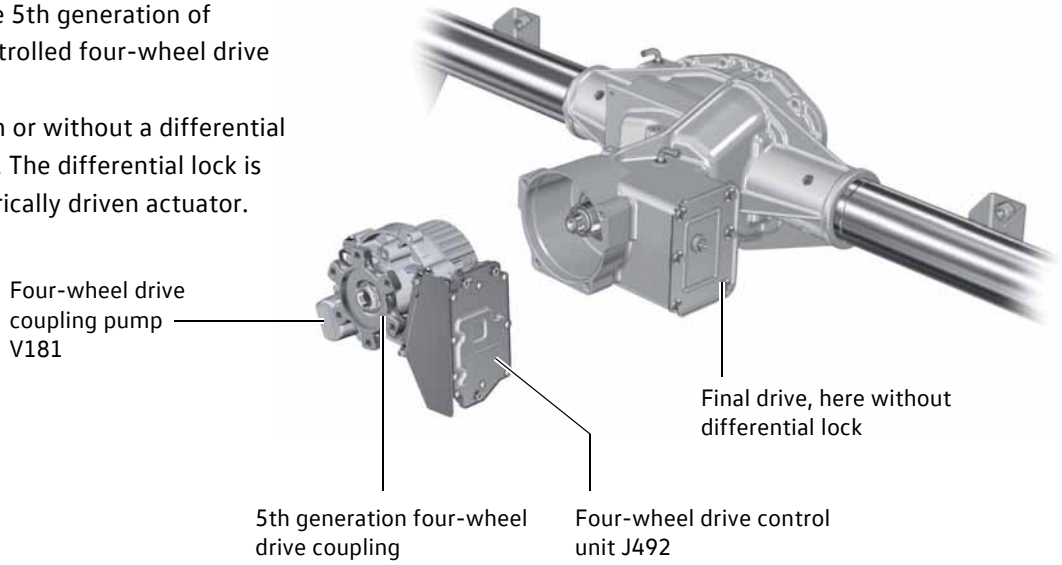
S566_050

Developer/manufacturer	ZF Friedrichshafen AG
Transmission designation	at VW: AL550-8H in service: 0DR
Gearbox features	Electro-hydraulically controlled 8-speed planetary gearbox with hydrodynamic torque converter and torque converter lock-up clutch with controlled slip
Torque	410 Nm

For more information about the basic structure of the 0DR gearbox refer to Self-Study Programme 507 "Amarok 2012 – The 8-speed automatic gearbox 0CM" – in which it is designated as 0CM and in Self-Study Programme 569 "The Crafter 2017 power transmission".

5th generation four-wheel drive coupling

The four-wheel drive coupling in the rear-wheel drive corresponds to the 5th generation of electrohydraulically controlled four-wheel drive couplings.
It is available either with or without a differential lock in the Crafter 2017. The differential lock is operated using an electrically driven actuator.



You will find more information on the 5th generation four-wheel drive coupling in Self-study Programme 515 "The Golf 2013 – Running Gear and Four-wheel Drive Concept".

Propshafts

Depending on the wheelbase, different propshafts are used in vehicles with rear or four-wheel drive. In a short wheelbase, a propshaft with a universal joint transmits the drive force to the rear axle, whereas in a long wheelbase there is a propshaft with two universal joints, which is also configured in two parts.

PTO

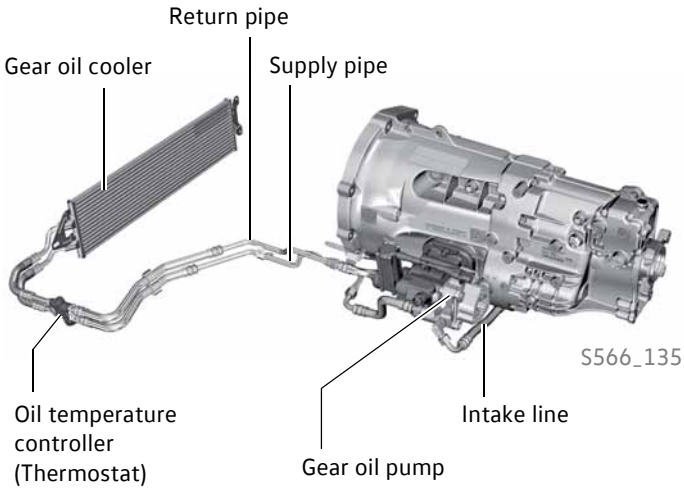
An auxiliary drive on the gearbox side is used if high power is required over a longer period. The manual gearbox 0F6 (only in vehicles with rear-wheel drive) can optionally be equipped with an auxiliary drive for driving additional external devices, such as:

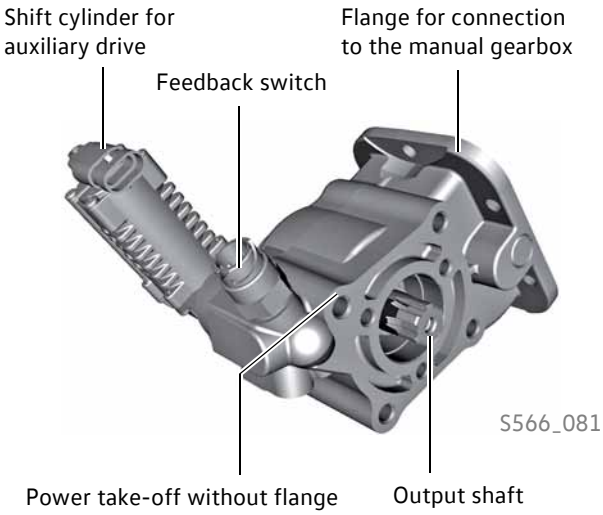
- Hydraulic pumps, e.g. for crane/tipper
- External underfloor generators
- Compressors, e.g. for high-pressure washers
- Drain flushing pumps

The auxiliary drive is activated by an electric shift cylinder. The power is taken off at the side of the gearbox. The auxiliary drive is available in three different variants:

- Power take-off without flange
- Auxiliary drive with flange
- Auxiliary drive with four-hole adapter sleeve, e.g. for axial piston pumps

Optionally, the auxiliary drive can be equipped with additional gear oil cooler for higher power output. In this case, the oil volume in the gearbox is increased. Comply with the instructions in the Electronic Service Information System ELSA.





Operation

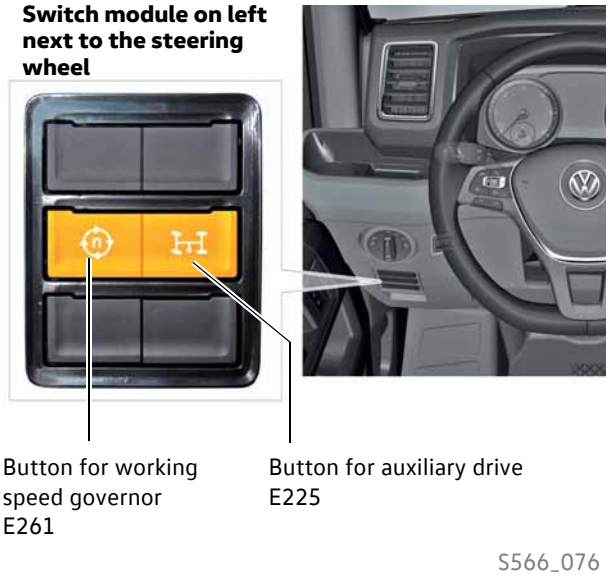
The auxiliary drive is switched on by button E225. The optional working speed governor can be engaged using button E261 when the auxiliary drive is switched on.

Switch-on conditions:

- Road speed = 0 km/h
- Parking brake applied
- Neutral detected
- Engine running (max. 1040 rpm)
- Press button E225 and hold it for 2 to 5 seconds
- The auxiliary drives is engaged if the clutch is depressed within 10 seconds following activation using button E225.

Switch-off condition: press clutch

Switch module on left next to the steering wheel



Overview of the chassis

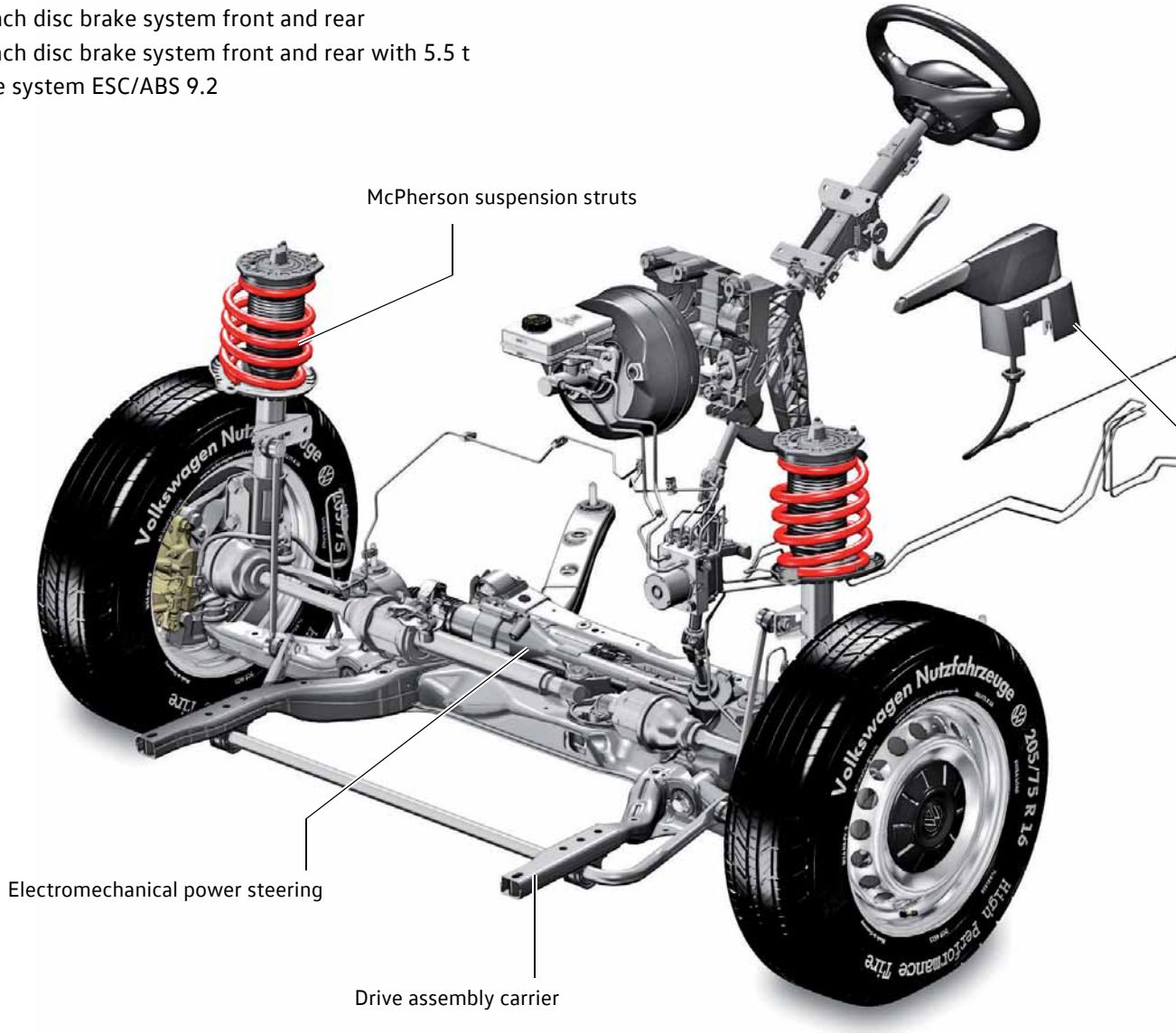
The overview shows important running gear equipment of the Crafter 2017 that is fitted as standard and optionally. The different drive concepts mean there have also been corresponding adaptations in the running gear.

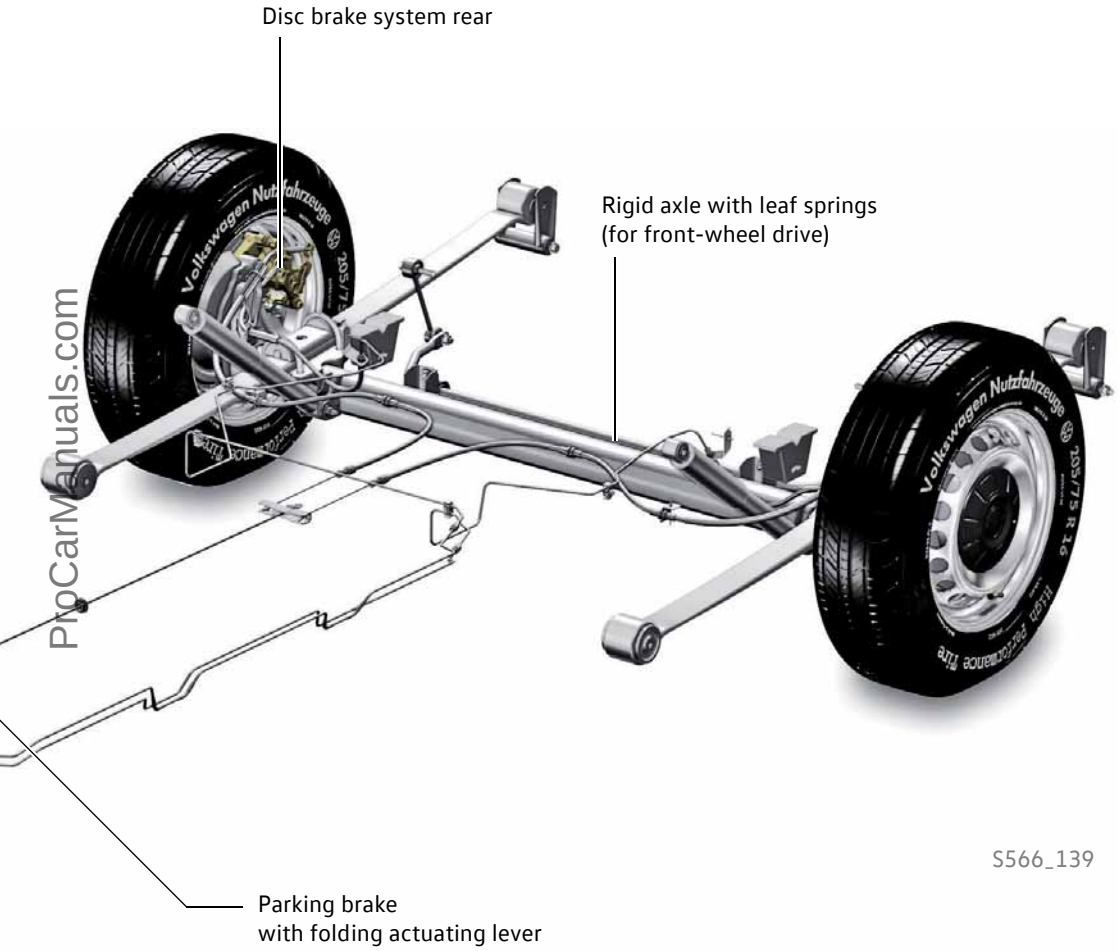
Running gear

Compared to the first generation Crafter, the Crafter 2017 features extensive innovations in its running gear.

Technical features

- Three-point assembly mountings with subframe
- McPherson strut front suspension
- Rear axle as rigid axle with leaf springs in four variants
- 16-inch disc brake system front and rear
- 17-inch disc brake system front and rear with 5.5 t
- Brake system ESC/ABS 9.2
- in vehicles with rear-wheel drive, twin tyres are an option on the rear axle
- Electromechanical power steering

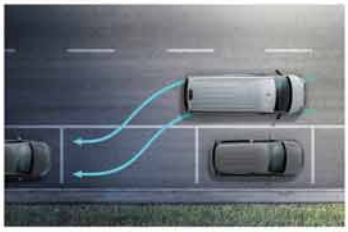




Overview of the driver assist systems

Available driver assist systems

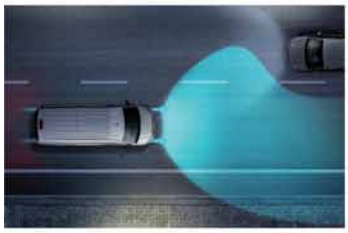
- Cruise control system (CCS)
- Speed limiter
- Parking distance warning system (PDW)
- Tyre Pressure Monitoring System (TPMS)
- Rain/light sensor



Park assist steering
(Park Assist)

Adaptive cruise control (ACC)
Area monitoring system
(Front Assist) with
City Emergency Brake (CEB) function

Driver Alert System
(DAS)



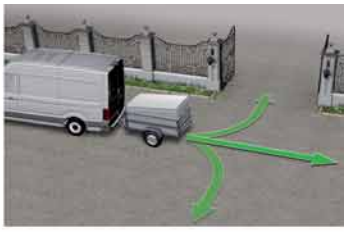
Main beam assist
(FLA)

Side wind assist
(ESC function)

Assist system for reversing out of
parking spaces
(Rear Cross Traffic Alert)

Automatic Post-Collision Braking System

Optical 360° parking system (OPS) with flank protection



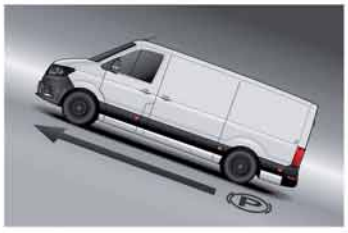
Trailer manoeuvring assist (Trailer Assist)

Lane departure warning (Lane Assist)

Blind Spot Detection (BSD)

Traffic sign detection (Sign Assist)

S566_137



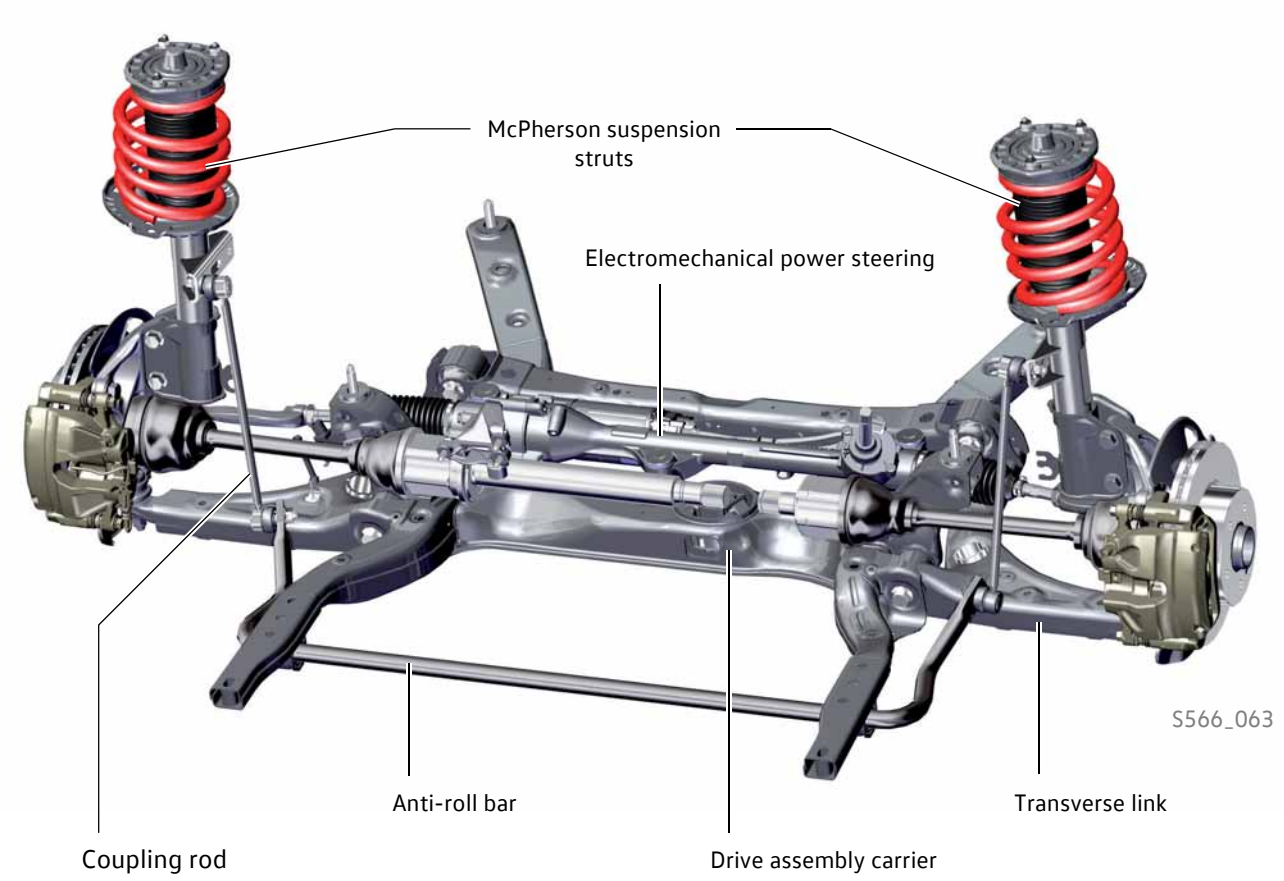
Hill Start Assist

Reversing camera (Rearview Camera System)

You will find further information on the driver assist systems in Self-Study Programme 567 "The Crafter 2017 assist systems".

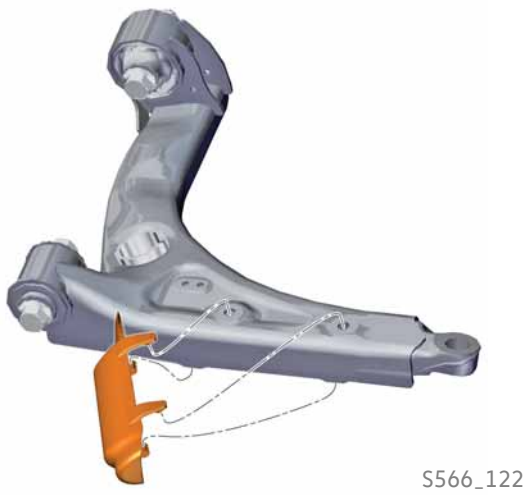
Front axle

The front axle in the Crafter 2017 is a new development. It has a subframe to which the transverse left are attached. The subframe is bolted onto the body at several mounting points. The anti-roll bar is now located ahead of the axle and is connected via coupling rods to the McPherson suspension struts.



Trim on the transverse left

If the vehicle is equipped with an aerodynamic package, the transverse left are provided with aerodynamic trims. The clipped-in trims contribute to reducing the drag coefficient and provide protection against stone chippings.



Rear axle

A rigid axle with leaf springs is used as the rear axle in the Crafter 2017. Depending on the drive type, this has a continuous steel tube (front-wheel drive), a rear final drive or a four-wheel drive coupling.

- In vehicles with front-wheel drive, there are two different variants depending on the height of the body floor.
- For vehicles with rear-wheel drive, there are two different variants depending on whether they are equipped with single or twin tyres.
- A four-wheel drive coupling of the fifth generation is used in vehicles with four-wheel drive.

Front-wheel drive

S566_064

Four-wheel drive 4MOTION

S566_065

Tear-wheel drive with single tyres

S566_066

Rear-wheel drive with twin tyres

S566_067

Brakes

Front brake

The Crafter 2017's front axle is fitted with a 16-inch or 17-inch floating caliper disc brake system with ventilated brake discs. The various double-piston brake calipers are used depending on equipment:

- Front or four-wheel drive: 48 mm
- Rear-wheel drive 16-inch: 52 mm
- Rear-wheel drive with 5.5 t and 17-inch: 52 mm

S566_071

Rear brake

Two different versions of the 16-inch brake system and one of the 17-inch brake system are fitted on the rear axle.

- Vehicles with four-wheel, front-wheel and rear-wheel drive with single tyres have a 16-inch floating caliper disc brake with ventilated brake discs and a brake piston with a diameter of 48 mm.
- Vehicles with rear-wheel drive and twin tyres have a 16-inch floating caliper disc brake with ventilated brake discs and two brake piston with a diameter of 44 mm each. From 5.5 t gross vehicle weight rating onwards, a 17-inch brake system is fitted with the same piston diameters.

S566_069

Parking brake

Due to the different brake systems on the rear axle, there are also two different kinds of parking brake:

- In vehicles with four-wheel, front-wheel and rear-wheel drive with single tyres, the parking brake acts directly on the disc brake.
- In vehicles with rear-wheel drive and twin tyres, the parking brake acts on an internal drum brake which is integrated in the disc brake. The parking brake is configured as a duo servo brake in this case.

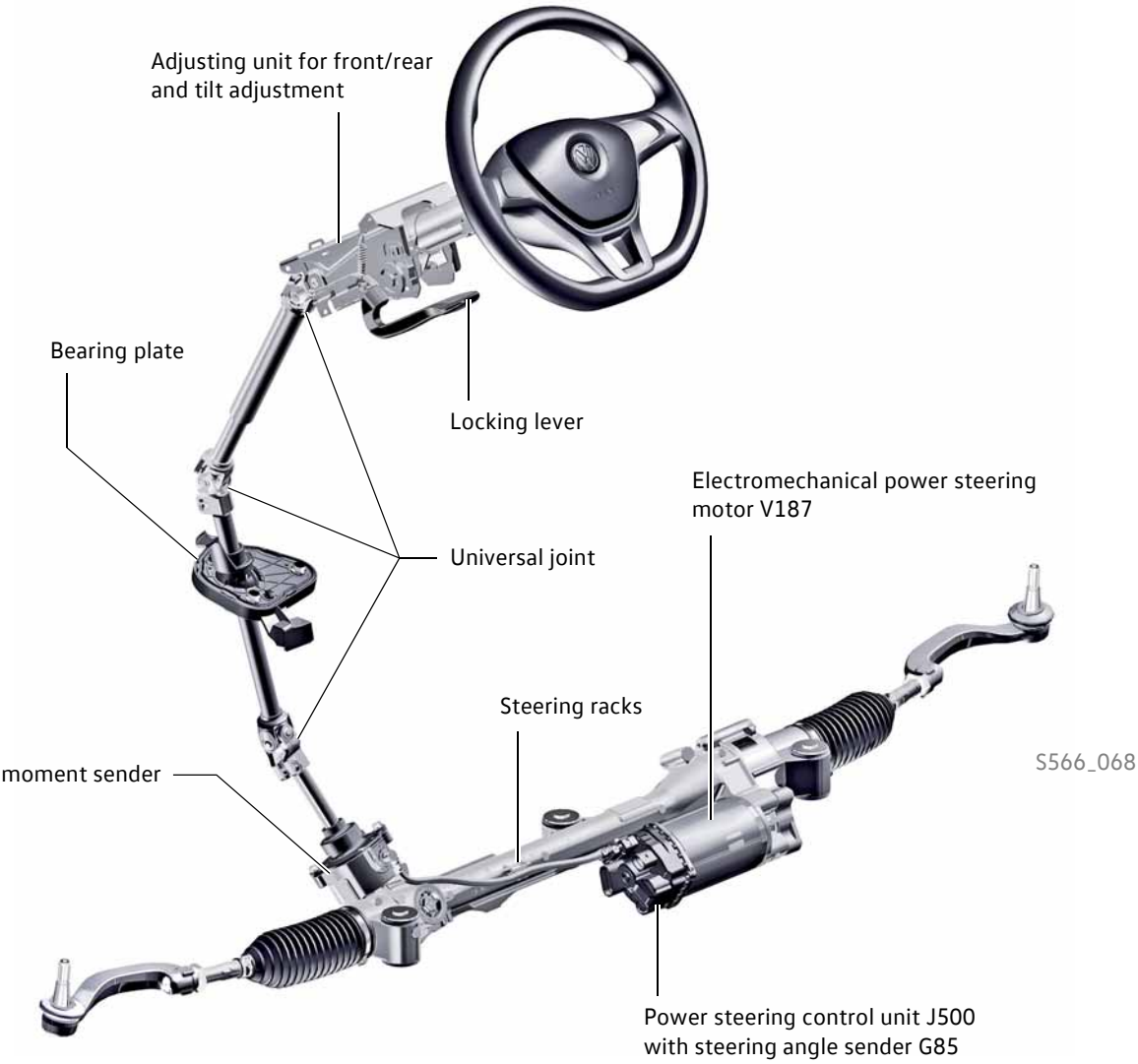
S566_070

For additional information about the parking brake and duo servo unit, refer to Self-Study Programme 369 "The Crafter 2006".

Electromechanical power steering system

The Crafter 2017 features electromechanical power steering with axle-parallel drive (APD). Power steering is provided as required depending on the vehicle speed, the steering moment applied by the driver, the current steering angle and the engine speed.
Electromechanical power steering offers many advantages compared to hydraulic steering. One major advantage is that when this steering is used, it is also possible to fit driver assist systems such as the Park Assist system, trailer manoeuvring assist and lane departure warning. In addition, it is possible to achieve a measurable consumption advantage compared to vehicles with conventional power steering.

Bosch APD steering



The internal steering angle sender is not a physical component but an algorithm in the control unit. More information about the Bosch APD steering can be found in Self-Study Programme 567 "The Crafter 2017 assist systems".

The power supply concepts

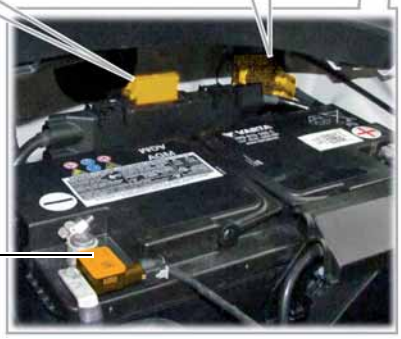
The Crafter 2017 is available with either one or two batteries.

In the engine compartment on the right
Earth connection for jump start

Jump-start terminal

Second battery charging circuit relay J713

Control unit 2 for battery monitoring J934



Second battery in the engine compartment on the left

Battery master switch above the accelerator pedal

Different power supply concepts are available for the Crafter. This means body manufacturers can select between several ex-works solutions depending on the application. In addition to the basic equipment with one starter battery and one alternator (140, 180, 250 A), it is possible to select between further variants:

Variant 1

One alternator (140, 180, 250 A):

- Second battery with isolator relay
- Second battery with isolator relay and battery monitoring

Variant 2

Two alternators (second alternator 180 A, in each case can be combined with 140 A or 180 A first alternator):

- Second battery with battery monitoring

The battery monitoring

The battery monitoring includes second battery energy management. The second battery is monitored by means of an additional date module, the control unit 2 for battery monitoring J934, on the negative terminal of the second battery and the control unit for special vehicles J608.

Most important highlights

- Battery monitoring for starter and second batteries
- Vehicle responses to maximum second battery charging as well as body supply
- Output of second battery status and second battery data
- Intelligent distribution of external charging between starter and second batteries
- Emergency start preparation for engine start from second battery if the starter battery is insufficiently charged

Battery underneath
Driver's footwell

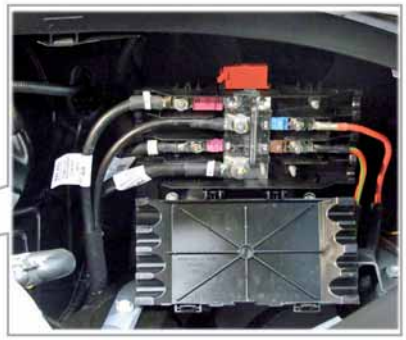
Battery monitor control unit J367

S566_125

The installation locations and safety concept

The vehicle electrical system architecture is adapted to the specific requirements of commercial vehicles.

At the driver seat
230 volt socket
with pure sine wave,
300 watt continuous
power



SH fuses in the engine compartment on the left

Fuses in the engine compartment

Fuse holder F (SF) on the second battery

In the instrument panel
Relay carrier and fuse holder C (SC) with onboard supply control unit J519

Under the driver seat
Relay carrier and fuse holder B (SB) and D (SD)

Residual current circuit breaker

On the rear side panel
230 volt supply

Battery under driver's footwell

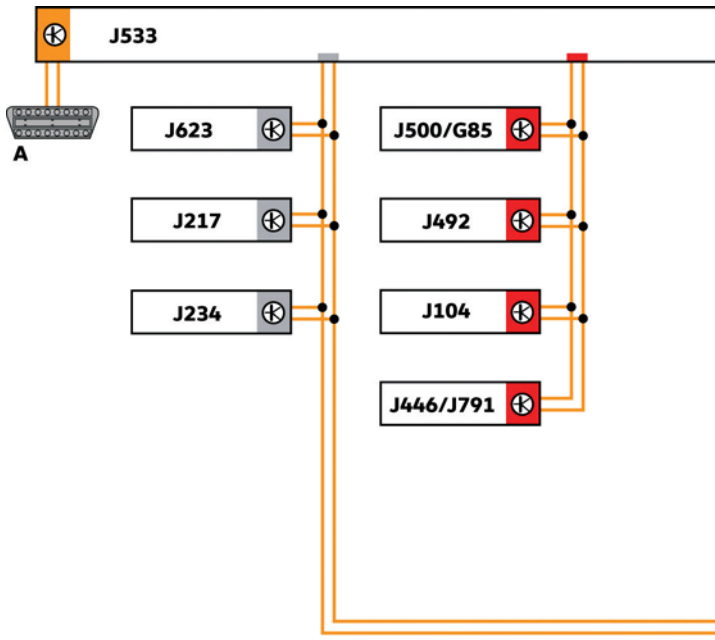
Main fuses (SA) of the battery

S566_133

Networking concept

The networking concept is based on that of the MQB[5)] and has been expanded and adapted for the Crafter 2017. All CAN bus systems in the Crafter 2017 have a transfer speed of 500 kbit/s. The LIN buses have a speed of 19.2 kbit/s.

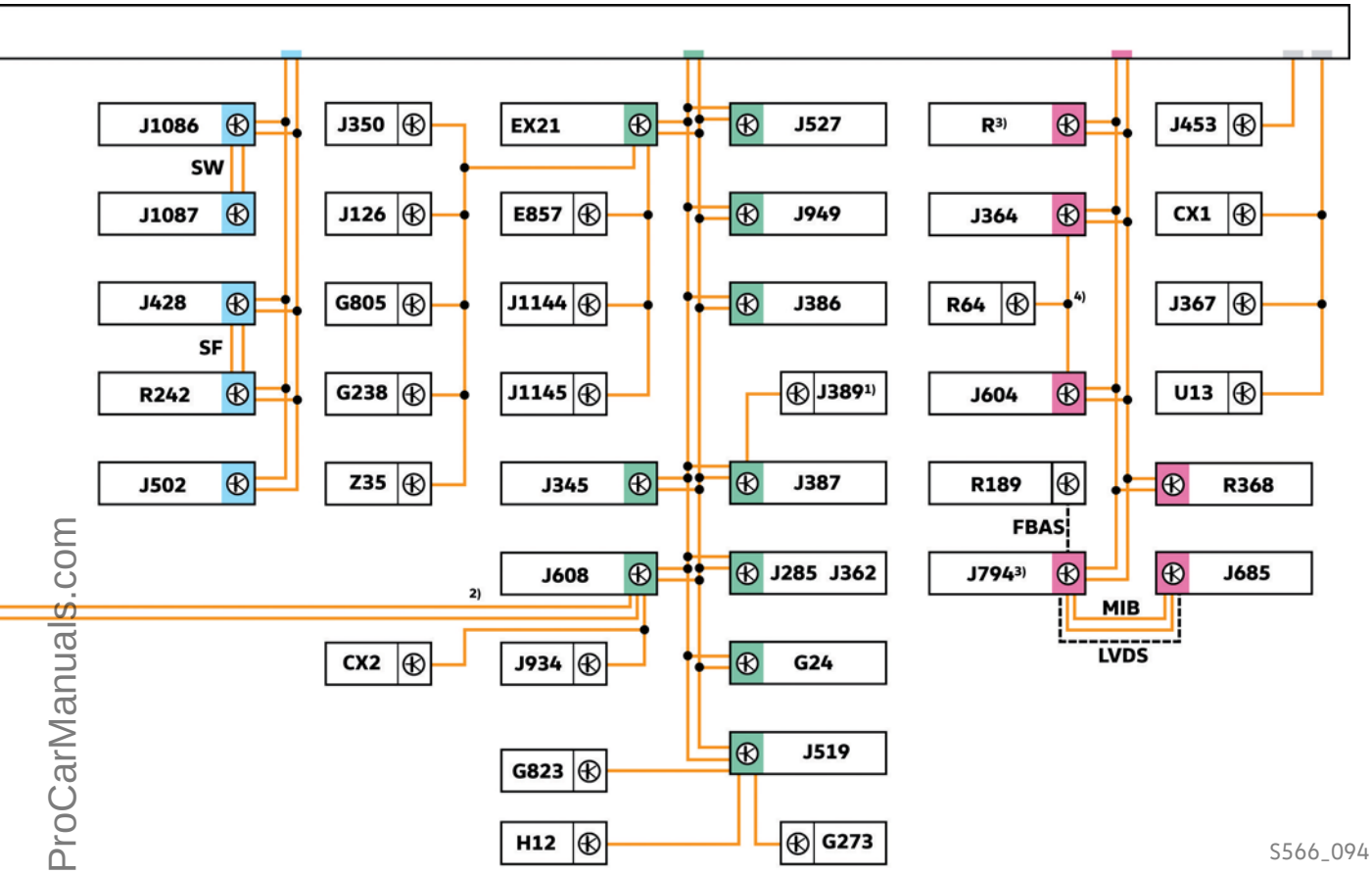
The data bus diagnostic interface J533 contains the control system for several LIN buses and forms the link between the individual CAN buses as usual. Further LIN buses are connected to various control units.



	Powertrain CAN bus
	Running gear CAN bus
	CAN bus extended
	Convenience CAN bus
	Infotainment CAN bus
	LIN bus
	CAN bus line
	LIN bus wire
A	Diagnostic CAN bus
CVBS	Colour Video Blanking Synchronisation signal
LVDS	Low-voltage differential signalling
MIB	Modular infotainment matrix CAN bus
SF	Sensor fusion CAN bus
1)	With left-hand drive vehicle; with right-hand drive vehicle J388 connected to J386 (LIN)
2)	Connection of J608 on the powertrain CAN bus read only
3)	R or J794 depending on equipment
4)	Connection to J364 or J604
5)	Modular Transverse Platform

Legend

CX1	Alternator with voltage regulator
CX2	Alternator 2 with voltage regulator
E857	Additional display and operating unit 1
EX21	Heater and air conditioning controls
G24	Tachograph
G85	Steering angle sender
G238	Air quality sensor
G273	Interior monitoring sensor
G805	Pressure sender for refrigerant circuit
G823	Air humidity, rain and light sensor
H12	Alarm horn
J104	ABS control unit
J126	Fresh air blower control unit
J217	Automatic gearbox control unit
J234	Airbag control unit
J285	Control unit in dash panel insert
J345	Trailer detector control unit
J350	Control unit for hot air blower
J362	Immobiliser control unit
J364	Auxiliary heater control unit
J367	Battery monitor control unit
J386	Driver door control unit

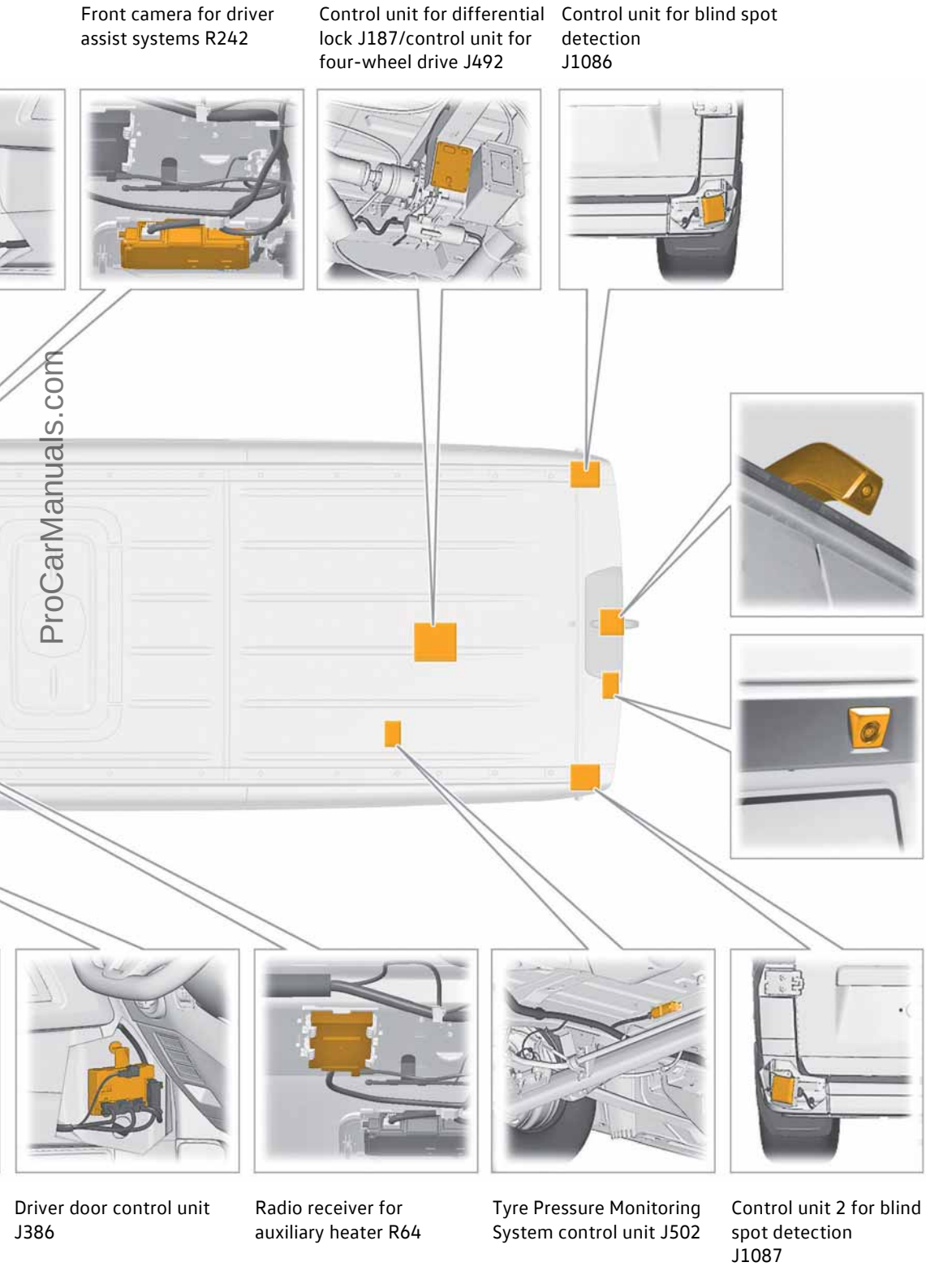


J387 Front passenger door control unit
J388 Rear left door control unit
J389 Rear right door control unit
J428 Adaptive cruise control unit
J446 Parking aid control unit
J453 Multifunction steering wheel control unit
J492 Four-wheel drive control unit
J500 Power steering control unit
J502 Tyre Pressure Monitoring System control unit
J519 Vehicle electrical system control unit
J527 Steering column electronics control unit
J533 Data bus diagnostic interface
J604 Auxiliary air heater control unit
J608 Control unit for special vehicles
J623 Engine control unit
J685 Display unit for front information display and operating unit control unit
J791 Park assist steering control unit
J794 Control unit 1 for information electronics
J934 Control unit 2 for battery monitoring
J949 Emergency call module control unit and communication unit
J1086 Control unit for blind spot detection
J1087 Control unit 2 for blind spot detection
J1144 Control unit for additional blower for air conditioning
J1145 Control unit for additional blower 2 for air conditioning
R Radio
R64 Remote control receiver for auxiliary heating
R189 Reversing camera
R242 Front camera for driver assist systems
R368 Camera for trailer manoeuvring assist
U13 DC/AC converter with socket, 12 V - 230 V
Z35 Auxiliary air heater element

The installation locations of the control devices

Some of the control units listed in this overview are optional or country-specific equipment. For reasons of clarity, not all of the control units fitted in the vehicle can be shown.

Information about the precise location description of the control units as well as instructions for installation and removal can be found in the current service literature.



S566_134

Lighting system

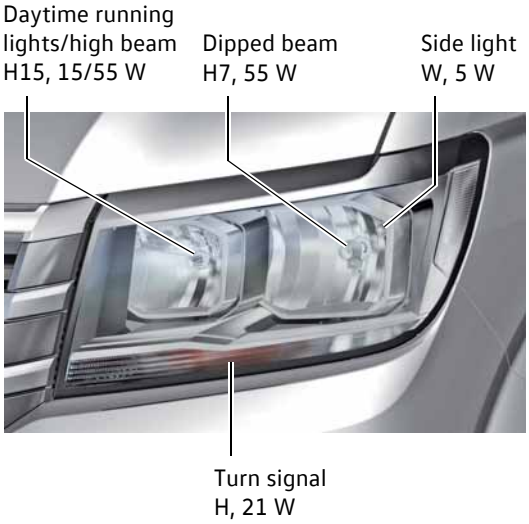
Headlights

Halogen headlights H7 and LED headlights can be selected for the Crafter 2017.

Headlight module H7

The headlight module has an H7 bulb for the dipped beam. An H15 bulb is used for the daytime running light and main beam.

The H7 headlights are equipped with manual headlight range control which can be adjusted using a potentiometer in the instrument panel.

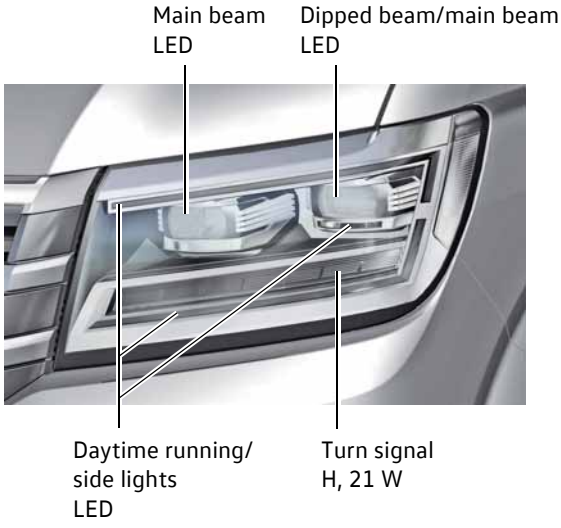


S566_041

Headlight module with LED technology

The light functions are provided by LEDs, except for the turn signal. One bulb is used for the turn signal.

The LED unit for the dipped/main beam uses LED lens technology. The light is emitted via a lens.
The LED unit for main beam emits the light using a reflector.
In the headlight flasher, only the inner LED module provided for the main beam function is activated.



S566_042

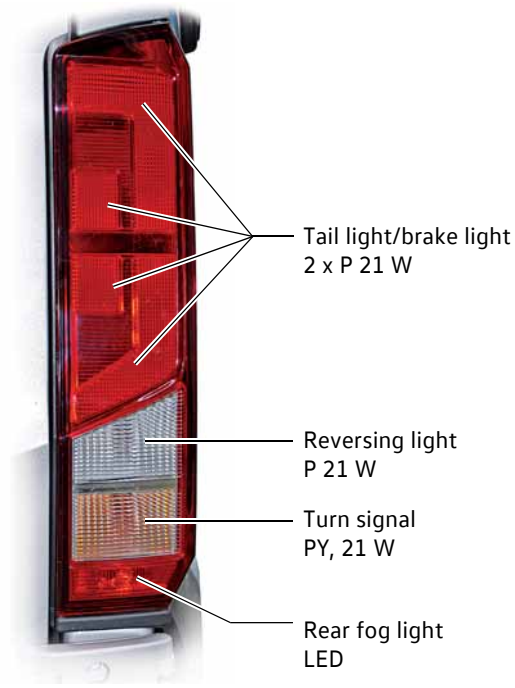
Tail lights

The rear lights (tail, brake, reflector and reversing lights) are individually designed and form a complete unit. In closed bodies, the light functions except for the rear fog light are configured with conventional bulb technology. An LED module is used for the rear fog light.

In addition, high-level turn signals can be mounted on the vehicle roof.

High-level brake light

The high-level brake light is mounted on the roof cross member above the wing doors. It is configured with LED technology and has 30 LEDs.



S566_098

Additional light module

The front fog lights are fitted in the bumper. They are also used as static cornering lights.

S566_099

The dash panel insert

Two variants of instrument clusters are available for the Crafter 2017. Both contain the immobiliser control unit J362. One of the two variants is used, depending on equipment:

- Basic instrument cluster
- Medium instrument cluster

Basic instrument cluster

This variant has a black/white segment display with a maximum of 480 display segments.
A loudspeaker for playback of warning signals is integrated in the instrument cluster. The time can be set, or the trip recorder can be reset, using a setting knob.
Equally, the dial is used for calibrating the tyre pressure monitoring system.

S566_090

Medium instrument cluster

This variant has a black/white TFT display as MFD with a dot matrix of 110 x 166 pixels.
Compared to the instrument cluster with MFD, it has an advanced display possibility as a precondition for fitting various equipment items such as driver assist systems.

S566_091

The central locking

For the first time, a locking concept specifically for a commercial vehicle is used in the Crafter 2017 which makes it possible to lock and unlock the doors of the loadspace and driver's cab not only jointly but also separately from one another.

Operation via the ignition key

Pressing the middle button on the ignition key unlocks the loadspace while the driver's cab is locked at the same time. This is useful, for example, if you are working on a building site and you want to store your personal belongings safely in the driver's cab.

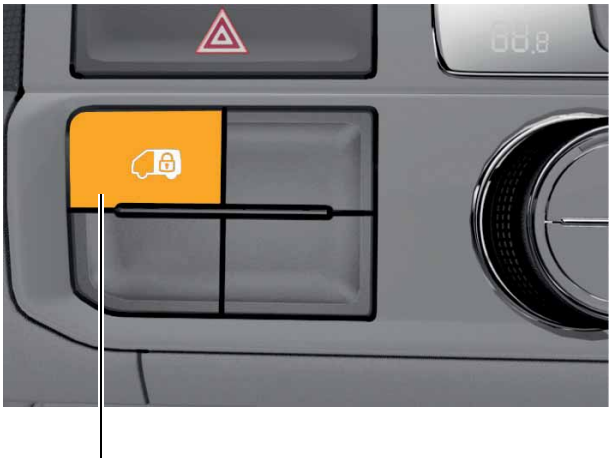
S566_100

Loadspace closing button

The button on the right next to the steering wheel enables the doors of the loadspace to be locked or unlocked if the ignition is switched on.

The warning lamp in the button lights up if the loadspace has been locked with the button. The doors of the loadspace can then only be unlocked and opened from the inside, not from the outside.

Pressing the loadspace closing button when the ignition is switched off causes the loadspace to be locked. In that case, it can no longer be opened by pressing the loadspace button again. This is useful, for example, if the payload should be kept secure while the driver's cab is open.



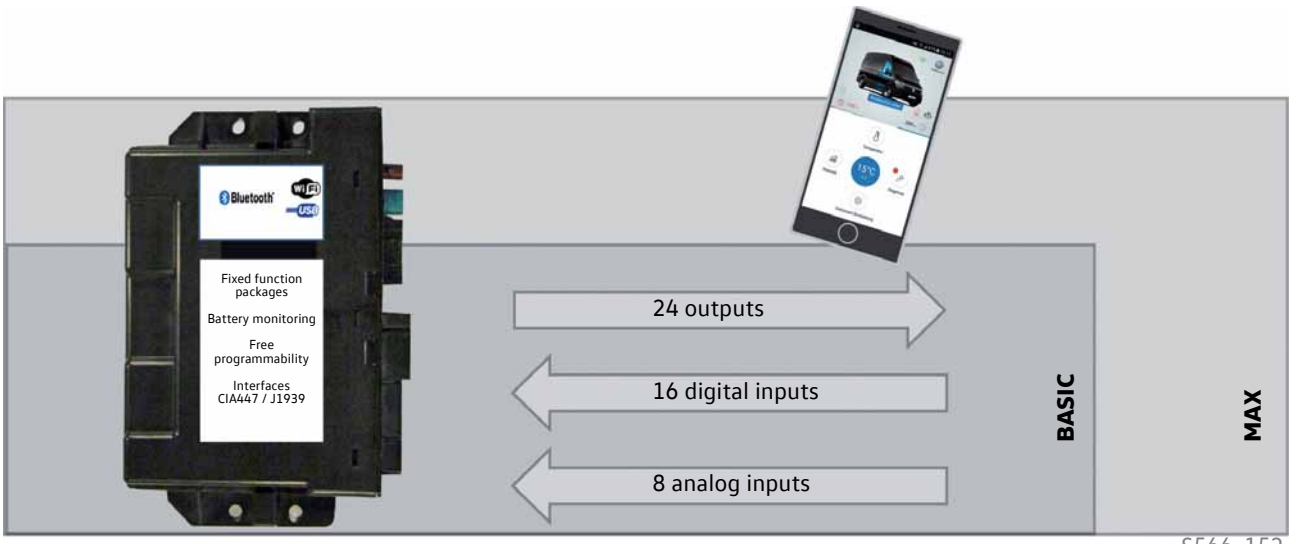
S566_101

The control unit for special vehicles J608

Back in the Crafter 2006, the control unit for programmable special functions (PSM) was used as the interface between the vehicle electrical system and special installation.
As a result of the increasing requirements of the various bodies and their signal diversities, the new control unit for special vehicles J608 has been developed for the Crafter 2017. If offers a wider range of functions, as well as more analog and digital inputs / outputs.

The control unit for special vehicles J608 is available in the variants BASIC and MAX. In addition to the functions of the BASIC control unit, the MAX control unit offers:

- A connection for an automotive-compatible USB cable
- A WLAN module (with connection for an external aerial to increase the range)
- A Bluetooth module



Basic functions (excerpt)

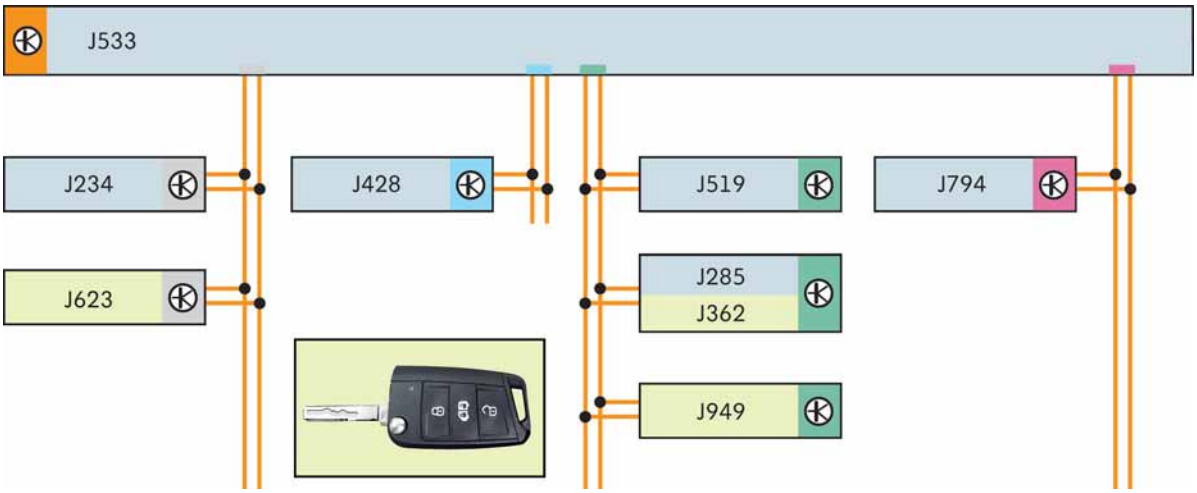
- Light: control of exterior lighting, taxi alarm, additional exterior lighting
- Engine: ignition bypass, starter inhibitor, engine remote start/stop, auxiliary drive
- Closing systems: CL status signals, door status signals
- Energy: terminal status, battery status, overload protection

The configuration file for the control unit for special vehicles is created by a specialist department at Volkswagen Commercial Vehicles. The configuration file is integrated into the vehicle via the Offboard Diagnostic Information System.

The PR number indicates whether the control unit for special vehicles has been enabled for user programming.

Immobiliser and component protection

The Crafter 2017 is equipped with the 5th generation immobiliser and component protection.



S566_142

Legend

J234	Airbag control unit
J285	Control unit in dash panel insert
J362	Immobiliser control unit
J428	Adaptive cruise control unit
J519	Vehicle electrical system control unit
J533	Data bus diagnostic interface
J623	Engine control unit
J949	Emergency call module control unit and communication unit
J794	Control unit 1 for information electronics

- Powertrain CAN bus
- CAN bus extended
- Convenience CAN bus
- Infotainment CAN bus
- CAN bus line
- Immobiliser participant
- Component protection participant

Volkswagen Commercial Vehicles is using the fifth generation immobiliser for the first time in the Crafter 2017. In contrast to the fourth generation immobiliser, for which the service employee had to decide which adaptations would be made to which components of the immobiliser in which order, the fifth generation uses the FAZIT database (vehicle information and central information tool) for immobiliser management. This single-head automatic system used for adapting the immobiliser therefore replaces all of the previous decision-making options.

You can find further information on the basic function sequences in Self-study Programme 517 "The Golf 2013 Electrical System".

Heating and air conditioning

Overview

The Crafter can be equipped with the following systems (the illustration shows the maximum possible range of equipment):

- Heating and ventilation system as basic equipment
- Manual air conditioning system
- Automatic air conditioning system "Climatronic" (two or three zones)

Air conditioning variants

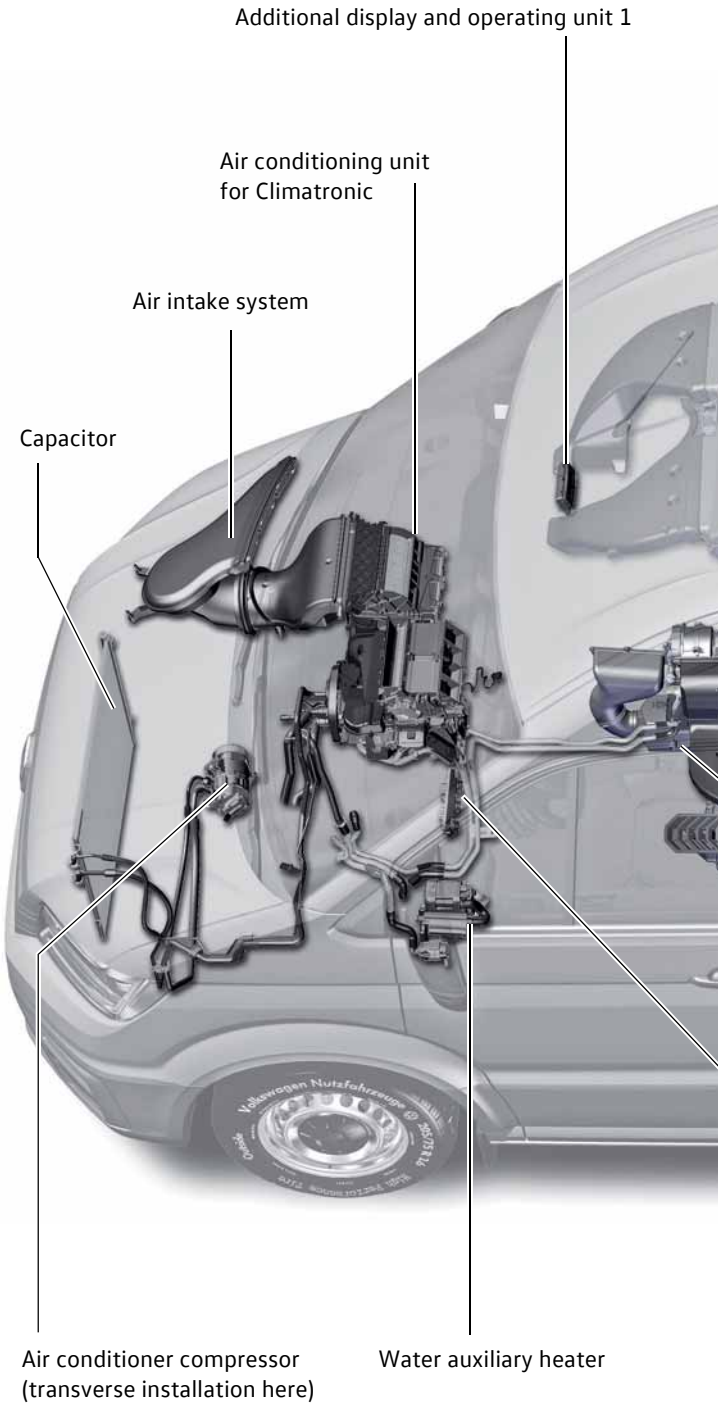
The climate zones in the Crafter 2017 can be divided up as follows:

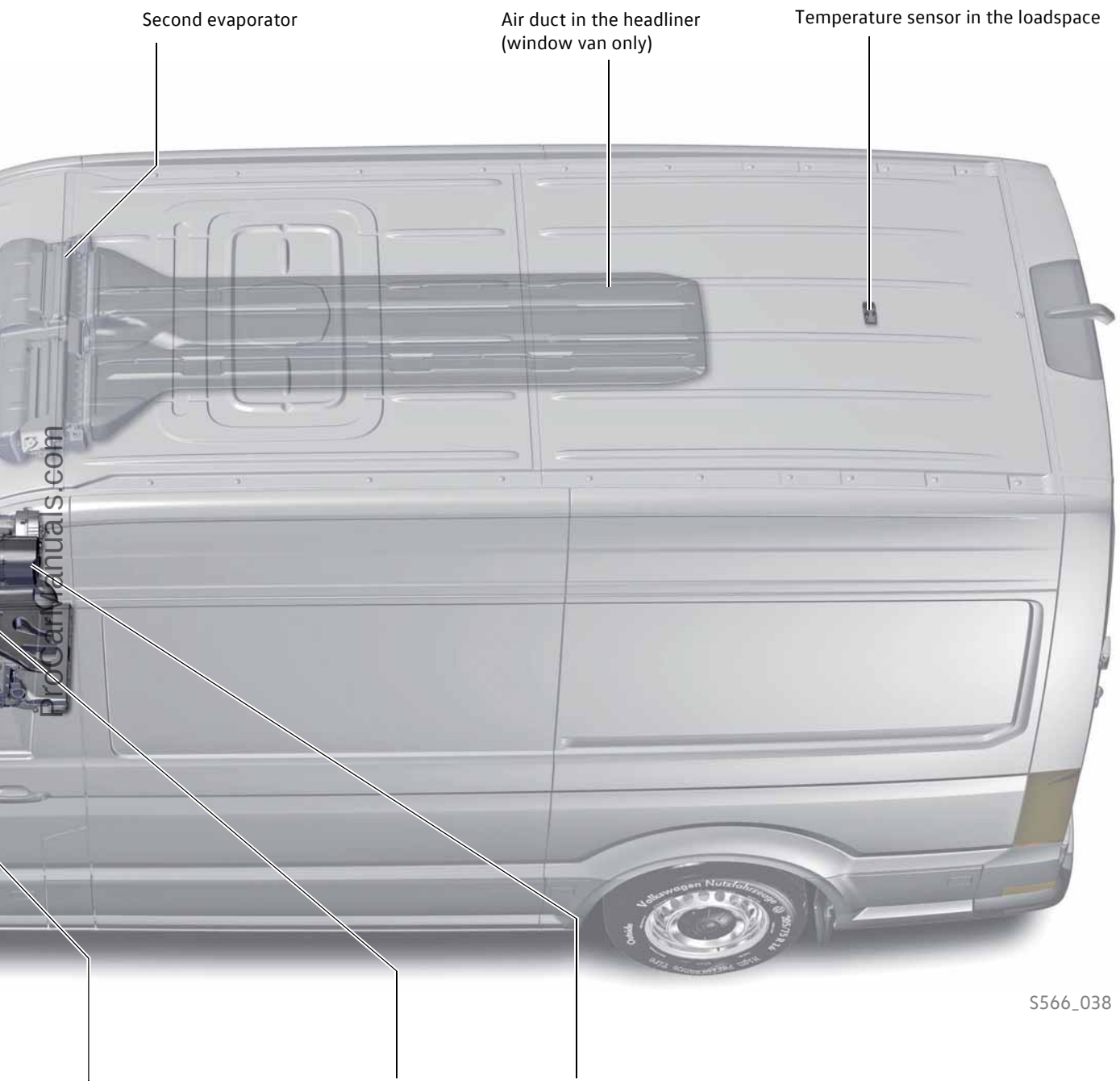
- One-zone heating and ventilation system or air conditioning
- Two-zone air conditioning in the driver's cab on the right/left
- Two-zone air conditioning in the driver's cab/ passenger compartment
- Three zone air conditioning in driver's cab on the right/left and passenger compartment

Supplementary equipment

Additional components can be fitted depending on equipment:

- Roof ventilator for air extraction or blow-in
- Water auxiliary heater
- Additional air heater (fuel-operated)
- Additional air heater (PTC / in air conditioner)
- Additional air conditioner compressor for body manufacturer directly on the engine
- Second heat exchanger for loadspace/passenger compartment
- Second evaporator for loadspace/passenger compartment)
- Heated steering wheel
- Heated windscreen
- Heated rear window



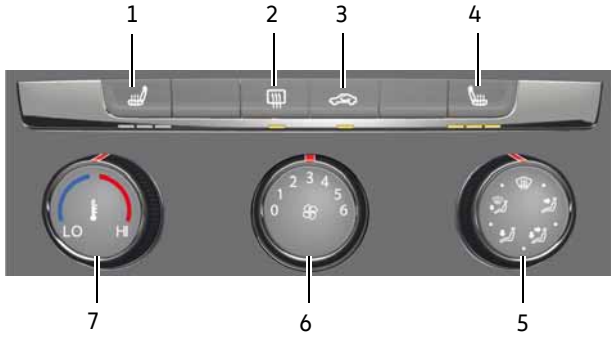


The refrigerant in the additional refrigerant circuit does not have to be R134a or R1234yf. It is defined by the body manufacturer according to the requirements of its body.

The operating units

Heating and ventilation system

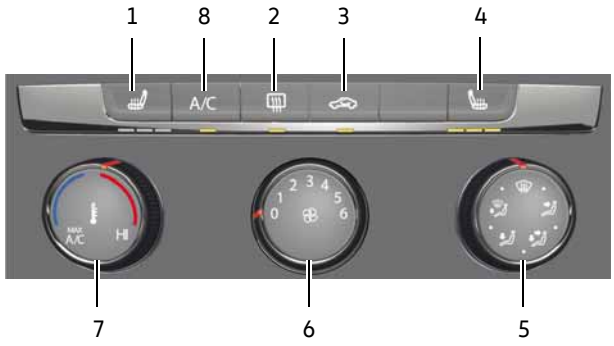
The control panel of the heating and fresh air system has three dials and one switch module.



S566_040

Manual air conditioning system

The control panel of the manual air conditioning system has the same design as that of the heating and fresh air system. However, some function-related elements are different.



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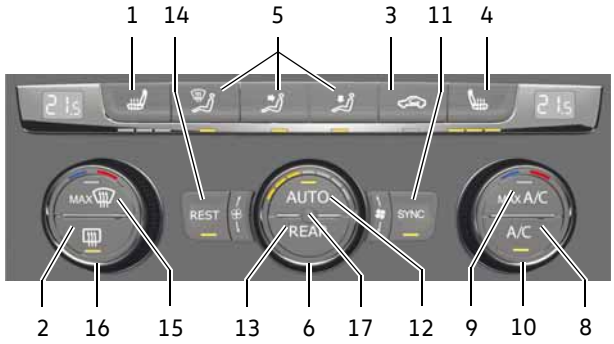
Automatic air conditioning system "Climatronic"

In this air conditioning system, different temperatures can be set for the various climate zones independently from one another. The blower stages and flap positions are controlled fully automatically, as is the control of the air blowing out of the nozzles and the interior temperature.



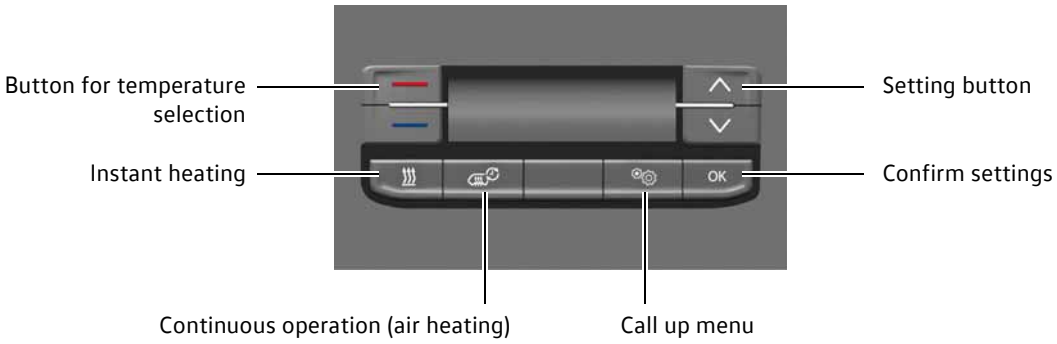
S566_036

Key to the figures

1 Seat heating left
2 Heated rear window
3 Air recirculation mode
4 Seat heating right
5 Air distribution
6 Blower speed
7 Temperature
8 Air conditioning system operation
9 Temperature setting to "LO", maximum blower output, air distribution to the nozzles
10 Temperature right
11 Synchronisation of the climate zones to the driver's value
12 Automatic control of the blower, temperature and air distribution depending on the sunshine intensity, outside and inside temperatures
13 Air conditioning regulation for passenger compartment
14 Use of residual heat when the engine is warm and ignition switched on, used for keeping the interior of the vehicle warm
15 Defrost, windscreen heating as well as maximum blower setting and air distribution towards the windows
16 Temperature left
17 Interior temperature sensor

Additional display and operating unit 1

In vehicles with heating and air conditioning system or with manual air conditioning system, the settings for the additional air conditioning systems are made using the control panel in the roof console at the front.

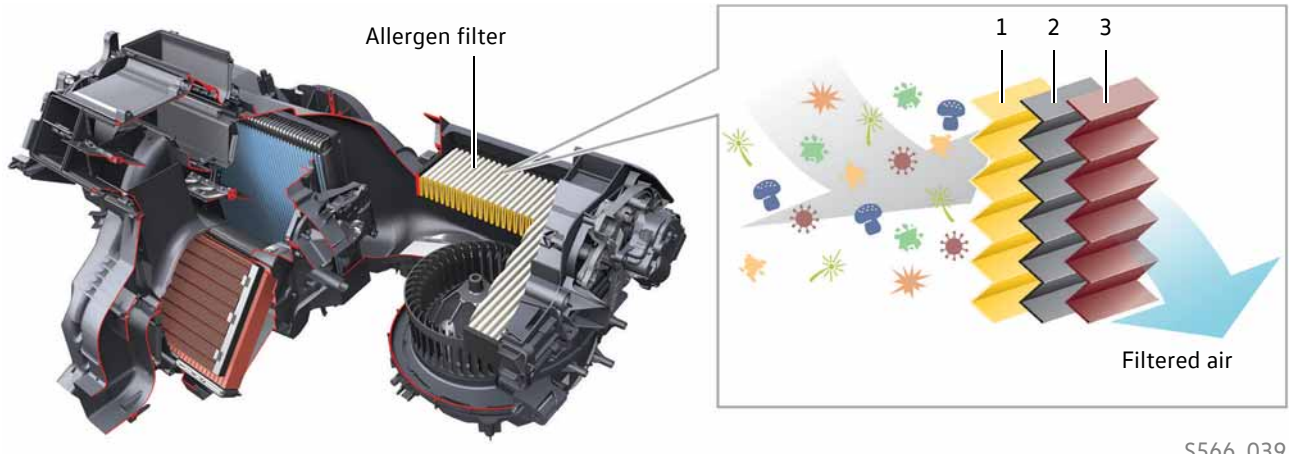


S566_037

Air Care (allergen filter) only with Climatronic

A polyphenol coating has been added to the dust and pollen filter with activated charcoal. This coating is a natural product that has anti-inflammatory properties and occurs in many plants. It absorbs allergens and renders them harmless. The yellow-coloured coating makes the filter easy to distinguish from conventional dust and pollen filters.

An air quality sensor G238 detects pollutants in the ambient air. The air conditioner compressor is activated or switched to recirculation mode depending on the pollution of the ambient air, the interior and outside temperature and the tendency of the windscreen to mist up.



S566_039

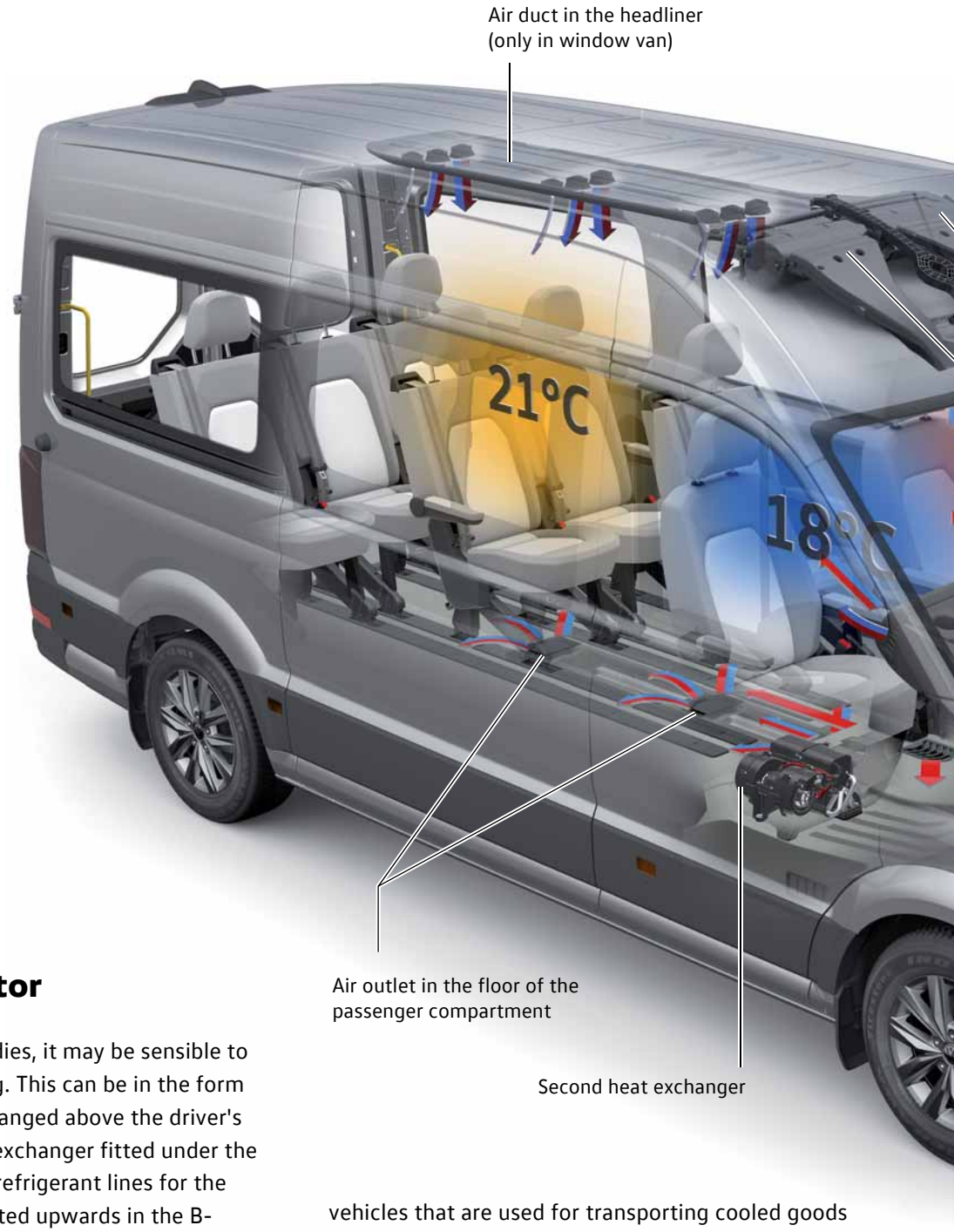
Legend

1 Fleece layer with antibacterial and antiallergenic polyphenol coating

2 Activated charcoal layer to filter out odours and gases

3 Fleece layer to filter out pollen and dust

Ventilation and air conditioning at rear

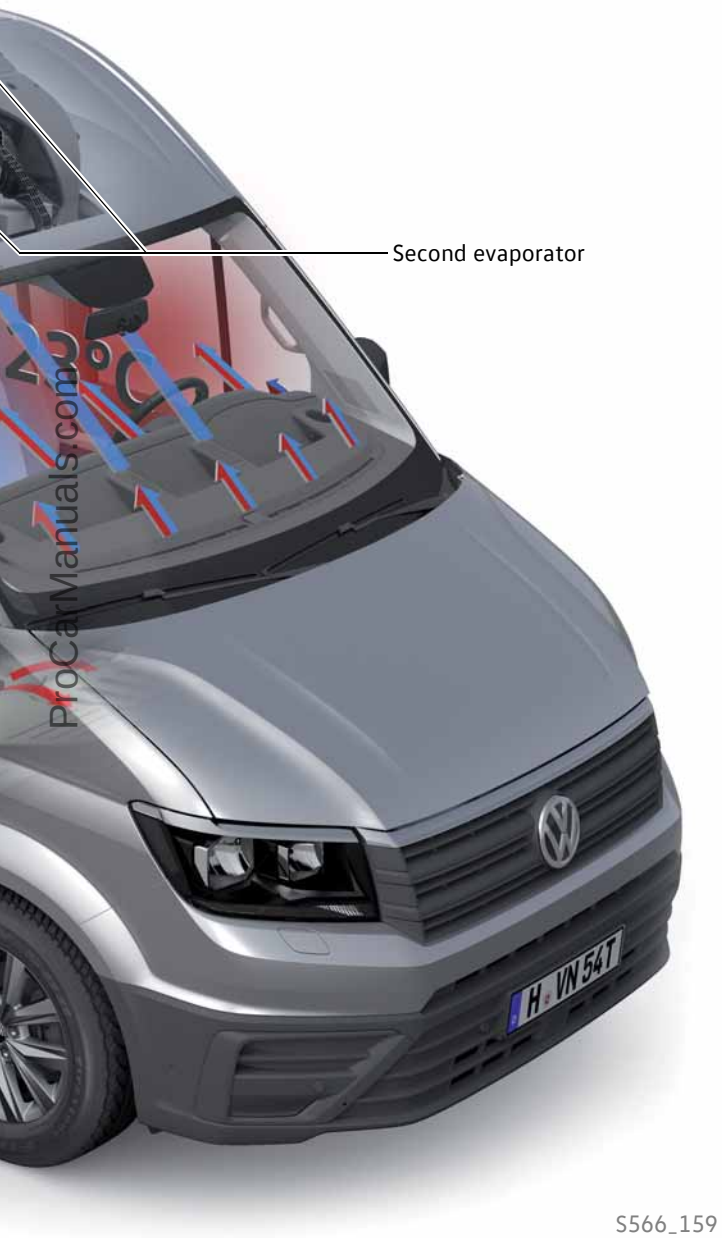


Second evaporator

In vehicles with closed bodies, it may be sensible to extend the air conditioning. This can be in the form of a second evaporator arranged above the driver's cab and/or a second heat exchanger fitted under the front passenger seat. The refrigerant lines for the second evaporator are routed upwards in the B-pillar, thus providing the connection to the vehicle air conditioning system. The regulated air enters the passenger compartment via an air duct in the headliner.
The volume of air flowing out is controlled by the blower speed. The direction of the air flow can be set using adjustable vents. The air duct is deleted in vehicles that are used for transporting cooled goods such as foodstuffs or pharmaceuticals. If the second heat exchanger is fitted, the air is channelled into the loadspace/passenger compartment via the footwell vents that are at the level of the B-pillar. In the window van, there is also an air duct running under the floor which additionally has two vents in the floor of the passenger compartment.

Ventilation of the loadspace via the roof ventilator

If explosives or strong-smelling substances are transported, it may be necessary to ventilate the loadspace. This is done using two different ventilation systems. Firstly, an electrical fan module on the vehicle roof which can be operated using two buttons on the left next to the steering wheel or mechanical ventilation without an electrical fan in the roof module, although in this case with an extraction duct on the rear left in the loadspace floor that is closed from above by a ventilation grille.



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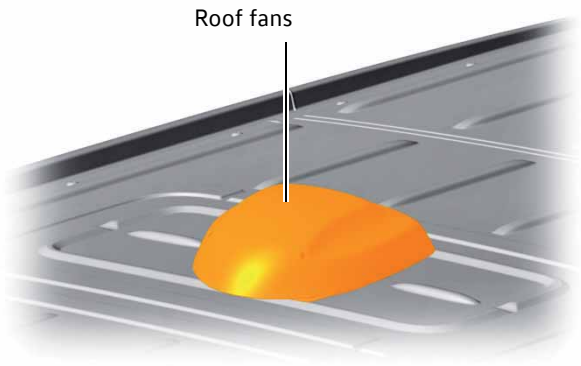


S566_118

Operation

S566_119

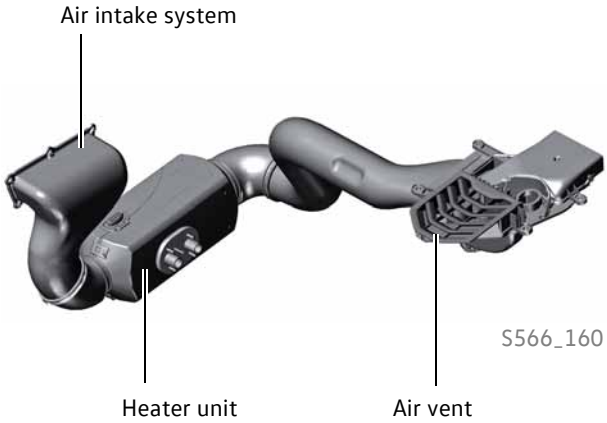
Supplementary heater and auxiliary heater

The Thermo Top Evo is used as the supplementary water heating system in the Crafter 2017. The supplementary air heating system is the Airtronic M2 D4A which is used as an auxiliary heater and a supplementary heater. It is infinitely variably controllable. In addition, for the first time it is possible to use a system of flaps with an auxiliary heater to control the air distribution forwards and to the rear.

Water auxiliary heater

S566_086

Supplementary air heater



S566_160

Heated steering wheel

Optionally, the Crafter 2017 is equipped with a heated steering wheel that features an incorporated PTC heating mat. The heating output of the PTC pad is elevated at the usual hand positions (3 o'clock and 9 o'clock).

S566_120

The radios and navigation systems

As already in other VW commercial vehicles, the Crafter 2017 feature a new generation of radios and navigation systems. These devices are from the Modular Infotainment System (MIS) of the second generation that is currently used in models from Volkswagen Passenger Cars that are based on the modular transverse matrix (MQB).

For the first time in a commercial vehicle, the devices now enable vehicle status information to be displayed and vehicle functions to be configured (Car menu).

S566_130

Composition Audio radio

The Composition Audio radio is the entry-level variant of the radio systems for the Crafter 2017.

S566_127

Technical features

- TFT monochrome display 370 x 98 px
- Output power of 4 x 20 watt
- AM/FM single tuner
- MP3, WMA format support
- SD card reader
- AUX-IN connection
- USB connection
- Bluetooth interface for mobile telephones (HFP, PBAP, A2DP, AVRCP)

For more information about the radios and navigation systems as well as Car-Net, refer to Self-Study Programme 562 "Infotainment and Car-Net in T6 2016 and Caddy 2016".

Composition Media radio

In the Composition Media, the "display unit for front information display and operating unit control unit J685" and the "control unit 1 for information electronics J794" are accommodated in separate housings. The control unit 1 for information electronics J794 is located in the glove compartment.

The two components are connected by the MIB CAN bus and a LVDS cable.

This strategy has also been implemented for the Discover Media.

S566_128

Technical features

- Capacitive 8-inch TFT colour display with touchscreen and proximity sensors*, WVGA, 800 x 480 pixel
- Output power of 4 x 20 watt
- FM phase diversity, AM
- CD drive
- MP3, WMA, AAC, FLAC audio format support
- JPEG viewer
- Bluetooth (HFP, A2DP, PBAP, AVRCP, MAP, 2 mobile phones can be paired simultaneously via HFP)
- SD card reader
- USB/AUX-IN connection (with Apple support) in the storage compartment of the dash panel above the steering wheel
- Voice control
- Car-Net App-Connect

S566_136

SD card reader

Optional

- DAB+

*** Proximity sensors:**
When a finger approaches the display, the virtual buttons are increased in size.

Discover Media radio/navigation system

The Discover Media has a navigation function. The navigation data is not transferred to the navigation system, but is called for dynamically, which means the SD card with the navigation data must always be left in one of the two SD card readers of the two SD card readers in the control unit 1 for information electronics.

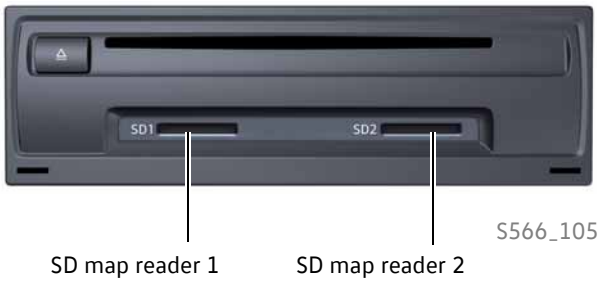
S566_129

One-shot destination entry

The navigation system can be operated by voice input. The destination is entered in a coherent spoken phrase instead of sequential requests for the address components.

Personal POIs (point of interest)*

A Personal POI database can be created on the Volkswagen portal and transferred to the Discover Media via SD card. The data is converted using the Nav Companion Internet application. Personal POIs can be displayed on the navigation map and used for POI searches.



S566_105

Technical features

In addition to the features of the Composition Media radio, this device configuration has the following characteristics:

- Second SD card reader
- Navigation with MapCare
  - Personal points of interest (POI)
  - Preset POIs
  - 2D/3D map display
- WLAN**

Optional

- Media Control
- Car-Net Guide & Inform

* Personal POIs can also be imported via the Car-Net customer portal when Guide & Inform services are activated, and transferred to the Discover Media via an Internet connection.

** In conjunction with Media Control or Car-Net Guide & Inform

The reversing camera R189

Fitting location

In the Crafter 2017, the reversing camera R189 is used and improves visibility to the rear when reversing. In vehicles with closed bodies, it is attached on the roof above the rear doors and supplies a real video image of the area behind the vehicle. The reversing camera can be combined with the Composition Media and Discover Media radio or navigation systems.

Radio display

When terminal 15 is on and reverse gear engaged, the video signal from the camera is shown on the screen.
The screen shows the real video image. The static help lines that overlay the surrounding picture in the colour display are applied by the screen and are used for gauging distances better. The reversing camera R189 does not require calibration.

Discover Media display example

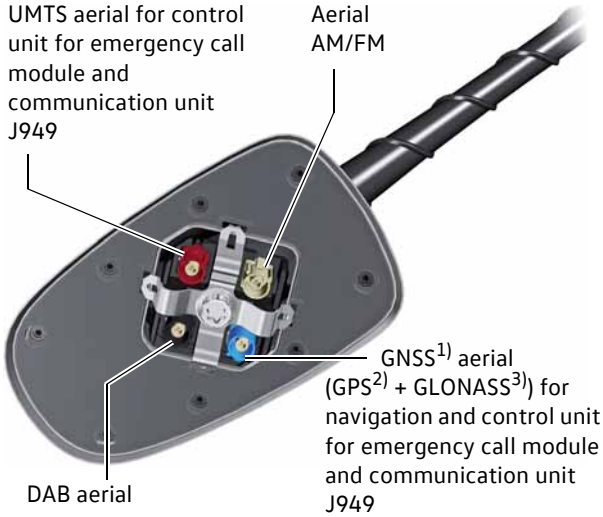
Aerial systems

In the Crafter 2017, a rod aerial as well as exterior mirrors with integrated vehicle aerials are used. The illustrations show a rod aerial and exterior mirrors with the maximum possible vehicle equipment.

Rod aerial

The rod aerial is bolted onto the roof above the driver's cab.

S566_110



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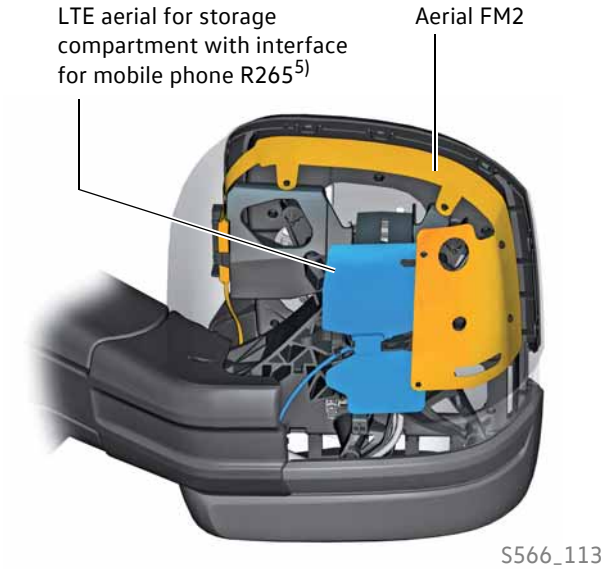
Aerials in the exterior mirrors

S566_112



S566_113

1) GNSS: Global Navigation Satellite System, GNSS is a collective term for using existing and future global satellite systems
2) GPS: Global Positioning System, also known as NAVSTAR GPS
3) GLONASS: GLObal NAvigation Satellite System of the Russian Federation
4) Telematics preparation: interface to fleet management systems
5) It would be added at a later point

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