

Body builder guidelines
from model year 2016



Nutzfahrzeuge

Body builder Guidelines The New Caddy



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* Electronic Stabilisation Program

1 General information

1.1 Introduction

These body builder guidelines provide body builders with important technical information which must be complied with when planning and manufacturing a body for road safety and operational reliability. The add-on, body, installation or conversion work required for this is referred to below as "body activities".

Due to the vast number of body builders and body types, it is not possible for Volkswagen AG to predict all possible changes, e.g. in driving properties, stability, weight distribution, centre of gravity of the vehicle and its handling characteristics which can occur due to the body activities.

Therefore, Volkswagen AG does not accept any liability for accidents or injuries arising from changes of this kind made to its vehicles, especially if the changes have a negative effect on the vehicle as a whole. As a result, Volkswagen AG only accepts liability for its own design, production and instruction services. The body builder itself is obliged to ensure that its body activities are not faulty in themselves, and also that they cannot result in defects or dangers on the vehicle as a whole. The body builder itself bears the product liability in the event that this obligation is violated.

These body builder guidelines are intended for professional body builders. As a result, these body builder guidelines assume corresponding background knowledge. Note that some work (e.g. welding on load-bearing parts) is only allowed to be performed by appropriately qualified personnel. This requirement exists in order to avoid risks of injury and to achieve the quality needed in the body activities.

1.1.1 Concept of these guidelines

The following body builder guidelines are divided into 8 chapters so that you can find information rapidly:

1. General information
2. Technical data for planning
3. Modifications to closed bodies
4. Implementation of special bodies
5. Technical data
6. Calculations
7. Weight tables
8. Directories

Information

For more information, see chapters 1.2.1.1 "Contact", 1.2.2 "Body builder guidelines, consulting", 1.3 "Delivery range".

The limit values selected in chapter 2 "Technical data for planning" must be complied with without fail, and must be used as the basis for planning.

1.1.2 Means of representation

The following means of representation are used in these body builder guidelines:

Warning note

A danger note draws your attention to possible accident or injury risks to which you or other persons might be exposed.

Environmental note

An environmental note provides you with information about environmental protection.

Practical note

This note draws your attention to a possible risk of damage to the vehicle.

Information

This note indicates additional information.

1.1.3 Vehicle safety

Warning note

Before installing external add-ons or mechanical units, it is essential that you read the chapters in these body builder guidelines that are related to installation, as well as corresponding chapters in the instructions and information for the suppliers' mechanical units and in the detailed owner's manual for the base vehicle. Otherwise you will not be able to recognise dangers, and might expose yourself or others to danger.

We recommend that you use parts, mechanical units, conversion parts or accessories that have been tested by Volkswagen AG for the corresponding vehicle type.

Have the vehicle's safety checked immediately if non-recommended parts, mechanical units, conversion parts or accessories are used.

Practical note

It is essential to comply with national registration regulations because body activities on the vehicle can alter the vehicle type under registration regulations and the operating permit may be invalidated.

This applies in particular to:

- modifications which change the vehicle type approved in the operating permit,
- modifications which might be expected to endanger road users or
- modifications which impair the exhaust or noise emissions characteristics.

1.1.4 Operational safety

Warning note

Incorrect interventions in electronic components and their software may result in these no longer functioning. Due to the networking of electronics, systems that were not modified can be affected.

Malfunctions to the electronics can significantly impair the operational safety of the vehicle.

Have work on or modifications to electronic components performed by a qualified specialist workshop which has the necessary specialist knowledge and tools for performing the necessary work.

Volkswagen AG recommends a Volkswagen AG customer service workshop for this purpose.

Service by a qualified specialist workshop is essential, in particular for safety-relevant work and work on safety-relevant systems.

Some safety systems only operate when the engine is running. Therefore, do not switch the engine off when driving.

1.2 General notes

The following pages contain technical guidelines for custom body builders and equipment fitters designing and mounting bodies. The body builder guidelines must be strictly adhered to when performing any modifications to the vehicle. The German version of the body builder guidelines is the exclusive authority for the most up-to-date information.

This also applies to legal claims.

1.2.1 Product and vehicle information for body builders

1.2.1.1 Contact in Germany

If you have questions about vehicle models from Volkswagen Commercial Vehicles, you can contact us on the Internet on the Conversion Portal of Volkswagen AG (www.umbauportal.de) using one of the following methods:

Free hotline (from a German landline)	0800-86228836
Contact:	info@umbauportal.de
Personal points of contact:	https://umbauportal.de/ansprechpartner

Alternatively, registered users can get in touch with us directly using the contact form. There, you can store vehicle-specific information in advance, which will help us to deal with your request faster.

Contact form:	https://umbauportal.de/allgemeine-fragen
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1.2.1.2 International contact

Please contact the body builder support personnel at the responsible importer for technical advice relating to Volkswagen Commercial Vehicles models and as a point of contact for conversions or the BB-database. To find the point of contact who is responsible for you, please register on the BB-database. Help is available for the registration option using the "Help" menu.

Personal points of contact:	https://www.bb-database.com/de/hilfe#faq_7
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1.2.1.3 Electronic Repair and Workshop Information from Volkswagen AG (erWin*)

Body builders can access repair and workshop information, e.g.

- Circuit diagrams
- Repair manuals
- Maintenance
- Self-study programmes

via the Electronic Repair and Workshop Information System from Volkswagen AG (erWin*).

Information

Volkswagen AG workshop manuals and workshop information can be downloaded from the Internet at erWin* (Electronic Repair and Workshop Information from Volkswagen AG):

<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

1.2.1.4 Genuine parts online ordering portal*

For the purchase of spare parts and for the research of Volkswagen Genuine Parts, our latest parts catalogues are available on the Internet on the "Genuine Parts Online Ordering Portal":

<https://www.partslink24.com>

* Information system from Volkswagen AG, subject to payment

1.2.1.5 Online owner's manuals

The Volkswagen AG website contains a "Service & Accessories" menu which provides access to the digital owner's manual for your vehicle:

<http://www.wvn-bordbuch.de>

Once you have entered the vehicle identification number for your Volkswagen, you can see all the manuals associated with your vehicle.

1.2.1.6 European Type Approval (ETA) and EC Certificate of Conformity (CoC)

Directive 2007/46/EC of the European Parliament establishes the standard for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles.

In this directive, provisions for the approval of vehicles which are produced in several stages were also adopted: the multi-stage approval process. Accordingly, each manufacturer involved in the construction of a vehicle is itself responsible for the approval of modified or added scopes in its production stage.

The manufacturer may choose one of the four following methods:

- EC type approval (ETA)
- EC type approval for small series
- National small series type approval
- Individual approval

CoC = Certificate of Conformity. A document that verifies the conformity of certain goods – thus also including vehicles and bodies – with the recognised (international) standards. The purpose of this EC Certificate of Conformity is to facilitate the approval of goods on international markets. As a result, the document is needed above all in import and export as part of the customs clearance procedure.

The manufacturer, the owner of an EC type approval or EC small series type approval, is obliged to provide a Certificate of Conformity with every vehicle which corresponds to an approved type.

If you are planning to apply multi-stage type approval, an agreement must be concluded in accordance with 2007/46/EC Annex XVII Paragraph 1.1. Please get in touch with us for information on this matter. (see 1.2.1.1 "Contact in Germany" and 1.2.1.2 "International contact")

1.2.2 Body builder guidelines, consulting

The body builder guidelines define the technical requirements for custom body builders and equipment fitters designing and mounting bodies for base vehicles of the Volkswagen Commercial Vehicles brand. The body builder guidelines must be strictly adhered to when performing any modifications to the vehicle. Ensure that no modification adversely affects the functional reliability and safety of the running gear, the body or the electric system. Modifications must only be performed by qualified specialists and in accordance with the generally acknowledged rules of the automotive industry.

Prerequisites for modifications to used vehicles:

The vehicle shall be in a good overall condition, i.e. structural parts such as longitudinal and cross members, pillars etc. shall not be corroded to such an extent that structural stability might be adversely affected.

Vehicles whose modifications might affect the validity of the general certificate of roadworthiness must be presented to an authorised testing centre for approval. It is recommended to clarify in advance with the relevant authority whether approval is required.

Please contact us in case of inquiries for proposed modifications.

We require precise information from you in order to respond to your inquiry quickly and comprehensively.

When inquiring, please enclose two sets of design drawings of the complete scope of the modifications, including all weights, centre of gravity and dimensions, which also clearly show how the body is attached to the chassis. Please also provide information about the intended operating conditions of the vehicle with your inquiry.

If bodies comply with the present body builder guidelines, no additional approval by Volkswagen AG is required for the presentation of the vehicle at the relevant authority examining roadworthiness.

The work safety regulations of the trade association and the EU Machinery Directive apply.

When making modifications to vehicles, all corresponding and applicable legal regulations, rules, laws and directives must be observed.

1.2.2.1 Safety certificate

Volkswagen AG does not issue body approvals for non-Volkswagen bodies. It merely provides body builders with important information and technical specifications for dealing with the product in these guidelines.

As a result, Volkswagen AG recommends that all work should be carried out on the base vehicle and the body in accordance with the current Volkswagen body builder guidelines applicable to the vehicle in question.

Volkswagen AG does not recommend body activities which

- are not conducted according to these Volkswagen body builder guidelines,
- exceed the gross vehicle weight rating,
- exceed the gross axle weight rating.

Volkswagen AG issues safety certificates on a voluntary basis, as follows:

The assessment conducted by Volkswagen AG is exclusively based on the documents submitted by the body builder which is carrying out the modifications. The inspection and safety assessment only relate to the expressly designated scope of work, its basic compatibility with the designated chassis and its interfaces or, in the event of chassis modifications, the fundamental admissibility of the design for the designated chassis. The safety certificate relates to the presented overall vehicle, and not

- to the design of the overall body,
- its functions or
- the planned use.

Safety is only provided if the design, production and installation are carried out by the body builder performing the modifications in accordance with the state of the art and in accordance with the applicable body builder guidelines of Volkswagen AG – and assuming any deviations from these guidelines have been declared to be technically safe. The safety certificate does not release the body builder who is performing the modifications from its responsibility for the product, or from its obligation to carry out its own calculations, tests and a trial of the entire vehicle in order to ensure that the operational safety, road safety and driving properties of the overall vehicle it has manufactured are acceptable. Accordingly, it is necessary to ensure that the body builder exclusively accepts its responsibility for ensuring that its body activities are compatible with the base vehicle as well as the operational and road safety of the vehicle. It is expressly stated that the safety certificate from Volkswagen AG does not represent a technical approval for the investigated changes.

In the course of assessment of a presented vehicle, an assessment report is written as a means of obtaining a safety certificate (safety certificate report).

The following assessment results are possible:

- **Classified as "safe"**
If the overall vehicle is classified as "safe", the Sales department can subsequently issue the safety certificate.
- **Classified as "not safe"**
Classification as "not safe" in the individual categories:
 - + base vehicle configuration
 - + impairment of the base vehicle and possibly
 - + sole body item

leads to a corresponding classification of the overall vehicle. This means no safety certificate can be issued initially.

In order for a not-safe classification to be resolved, the safety certificate report states the necessary change for each item in question. In order for the safety certificate to be obtained, these points will have to be addressed by the body builder and documented in a clearly comprehensible manner in a report along the same lines as the safety certificate report. On the basis of this detailed report, it is possible for the desk-review assessment to be completed with a positive result.

Depending on the defective points, it may be necessary not only to provide documentation of the defect resolution but also for the vehicle from the first inspection to be presented again. The first report indicates if it will be necessary for a new assessment to be carried out on the vehicle.

The assessment report may also contain "notes/recommendations".

Notes/recommendations are technical remarks which do not have any effect on the final result of a safety certificate. They should be construed as advice and suggestions for further consideration, as a means of continuously improving the final product for the customer.

In addition, "notes/recommendation solely relating to the conversion" can also be formulated.

The notes and recommendations stated as "solely relating to the body/conversion" must be dealt with and documented before the vehicle can be included in the body builder portal.

Practical note

Country-specific laws, directives and approval regulations shall be observed!

1.2.2.2 Application for the safety certificate

In order for the evaluation to be carried out for the safety certificate, the following documents and drawings shall be submitted to the responsible department before the start of work on the vehicle (see 1.2. "General notes"):

- All deviations from these Volkswagen body builder guidelines.
- All data about dimensions, weight and centre of gravity (weighing certificates).
- Attachment of the body on the vehicle.
- Application conditions of the vehicle, e.g.:
 - + on rough roads
 - + in very dusty conditions
 - + at high altitudes
 - + at extreme outdoor temperatures
- Certificates (e-registration, seat tensile test)

Complete documentation avoids the need for clarification queries, and makes the processing faster.

1.2.2.3 Legal entitlements

- There is no legal entitlement for a safety certificate to be issued.
- Due to further technical developments and their findings, Volkswagen AG can refuse a safety certificate.
- The safety certificate can be restricted to individual vehicles.
- The subsequent issue of a safety certificate may be refused for vehicles that have already been completed or delivered.
- The body builder is solely responsible for:
 - + the function and compatibility of its body activities with the base vehicle
 - + road safety and operational reliability
 - + all body activities and installed parts

1.2.3 Warranty and product liability of the body builder

The body builder's or fitter's warranty conditions apply to the body builder's or fitter's scope of supply. Therefore, warranty claims associated with complaints to this scope of supply cannot be made under the warranty conditions applicable to Volkswagen Commercial Vehicles.

Defects of bodies, installations and conversions provided by third parties as well as defects of the vehicle caused by the said bodies, installations or conversions are excluded from the Volkswagen warranty and also from the Volkswagen paint and body warranty. This also applies to accessories which were not installed and/or supplied by the vehicle manufacturer.

The body builder or fitter is solely responsible for the design and assembly of bodies and the execution of conversions.

All conversions must be documented by the body builder or fitter in the service schedule. This service schedule is provided with every Volkswagen vehicle.

Due to the multitude of changes and diversity of operating conditions, the information provided by Volkswagen AG is subject to the reservation that modified vehicles are not tested by Volkswagen AG.

Modifications may affect the properties of the vehicle.

For reasons of liability, the body builders or fitters shall provide the following information in writing to their customers:

"Due to the modifications* to your Volkswagen Commercial Vehicles base vehicle, the properties of your base vehicle may have changed. Please understand that Volkswagen AG does not assume any liability for any negative impacts resulting from the modifications* to the vehicle."

In individual cases, Volkswagen AG reserves the right to demand evidence of the information being passed on to the customer.

No general legal entitlement for the approval of a body modification exists, even if such approval was previously granted. If bodies comply with the present guidelines, no additional approval by Volkswagen AG is required for the presentation of the vehicle at the relevant authority examining roadworthiness.

* At this point, the term "modification" may be substituted by a more precise description of the work performed, e.g. by "camping equipment installation", "wheelbase extension", "box body".

1.2.4 Ensuring traceability

Body dangers only detected after delivery can mean that subsequent measures in the market will be necessary (customer information, warning, call-back). To make these measures as efficient as possible, it is necessary to be able to trace the product after delivery. For this purpose, and in order to be able to use the central vehicle register (CVR) operated by the Federal Motor Transport Authority or comparable registers abroad in order to trace the affected vehicle owners, we strongly recommend that body builders should store the serial number/identification number of their body linked to the vehicle identification number of the base vehicle in their databases. Also, it is recommended for the customers' addresses to be stored and to provide a means for subsequent owners to be registered.

1.2.5 Trademarks

VW badges and VW emblems are trademarks of Volkswagen AG. VW badges and VW emblems are not allowed to be removed without authorisation, or to be attached in a different location.

1.2.5.1 Positions on rear of the vehicle

VW badges and VW emblems which are also supplied must be fitted in the location intended by Volkswagen.

1.2.5.2 Appearance of overall vehicle

If the vehicle does not correspond to the appearance and the quality requirements set by Volkswagen AG, then Volkswagen AG reserves the right to request removal of the Volkswagen AG trademarks.

1.2.5.3 Non-Volkswagen trademarks

Non-Volkswagen trademarks are not allowed to be attached next to Volkswagen badges.

1.2.6 Recommendations for vehicle storage

Extended storage times cannot always be avoided. The following measures are recommended to ensure that vehicle quality is not affected by long-term storage:

At vehicle delivery:

- Fill tank.
- Do not park the vehicle under trees, poles, etc.
- Open all ventilation flaps, set blower to maximum speed.
- **Disconnect battery(ies). (see also chapter 2.5.4 "Vehicle battery")**
Please observe the Volkswagen AG workshop manuals when connecting and disconnecting the battery:
<http://erwin.volkswagen.de/erwin/showHome.do>
- Remove dirt, snow and moisture from vehicle (footwell).
- Close windows, doors, front lid, rear lid and sunroof.
- Put manual gearbox into 1st gear or lever of automatic gearbox into park position. Do not engage reverse gear. Do not apply the parking brake.
- Pull off windscreen wiper bags and clamp polystyrene block under the wiper arm. Please remove any other loose film. ("Aero wipers": detach and store in suitable location inside vehicle.)
- Check the tyre pressure.

Check vehicles weekly for contamination by aggressive media (e.g. bird droppings, industrial dusts) and clean, if required.

Check battery open-circuit voltage every 50 days, even if the battery is disconnected.

Open-circuit voltage means the voltage of the disconnected battery after a minimum storage period of 12 hours.

Recharge battery in due time before it reaches an open-circuit voltage of 12.4 V. Batteries with an open-circuit voltage of less than 11.6 V are in state of exhaustive discharge and should be disposed of without delay.

When recharging the battery only current-controlled and voltage-limited chargers must be used.

A maximum charging voltage of 14.4 V shall not be exceeded. It is recommended to check the tyre inflation pressure every three months.

Activation and deactivation of the transport mode:

The transport mode is a function of the vehicle to conserve the battery when the vehicle is delivered to the dealer. The mode is activated at the factory before delivery and is only used to transfer the vehicle from the production site to the dealer. When activated, certain power consumers such as the radio and central locking are switched off to conserve the battery.

Before the vehicle handover to the customer, the transport mode is deactivated again by the customer service workshop with the vehicle diagnostic tester.

Activation and deactivation of transport mode by the body builder is not provided and can only be performed by the customer service workshop. Manual activation or deactivation of transport mode is not possible.

1.2.7 Compliance with environmental rules and regulations

Environmental note

The following principles of environmentally friendly design and material selection should be followed right from the planning stage of add-ons or bodies, including with regard to the statutory requirements in the EC Directive on End-of-Life Vehicles 2000/53/EC.

Body builders shall ensure that they comply with all applicable environmental rules and regulations for add-ons and bodies (modifications), especially EC Directive 2000/53/EC concerning end-of-life vehicles and EC Directive 2003/11/EC relating to **restrictions on the marketing and use of certain dangerous substances and preparations ("low flammability" and certain flame-retardant agents)** for closer definition of Directive 76/769/EEC.

The registered keeper must keep all assembly documentation concerning the modification and hand them over together with the vehicle to the dismantler. This ensures that modified vehicles are processed in compliance with environmental rules and regulations at the end of their lifecycle.

Materials which represent a potential risk such as halogen additives, heavy metals, asbestos, CFCs and chlorinated hydrocarbons shall be avoided.

- EU directive 2000/53/EC must be adhered to.
- Preferably, materials which allow valuable substance recycling and closed material cycles shall be used.
- The material and production process shall be selected so that only low amounts of easily recyclable waste are generated.
- Plastics shall only be used where these offer advantages in terms of cost, function or weight.
- In the case of plastics, especially composite materials, only mutually compatible substances from one material family are allowed to be used.
- With regard to components that are relevant for recycling, the number of plastic types used shall be kept as low as possible.
- It is necessary to check whether a component can be manufactured from recycled material or with recycled additives.
- Care shall be taken to ensure that recyclable components can be removed easily, e.g. by means of snap-lock connections, predetermined breaking points, good accessibility, use of standard tools.
- Simple, environmentally friendly removal of the fluids shall be ensured by means of drain plugs, etc.
- Wherever possible, the components shall not be painted or coated; instead, dyed plastic parts shall be used.
- Components in areas at risk of accident shall be designed to be tolerant of damage, repairable and easy to exchange.
- **All plastic parts shall be identified according to the VDA material sheet 260 ("Components of motor vehicles; Identification of materials"), e.g. "PP-GF30R".**

1.2.8 Recommendations for inspection, maintenance and repair

Maintenance instructions or service schedules outlining inspection and servicing work should be provided for the modifications performed by the body builder or accessories fitter. These instructions or schedules must include the maintenance and inspection intervals as well as the required operating fluids and materials and the spare parts. Parts and components with a limited service life which must be checked in regular intervals to ensure service reliability and timely replacement must be explicitly stated. This should be supported by a repair manual including tightening torques, settings and tolerances as well as other relevant specifications. Special tools, including their source of supply, must also be stated.

The manual shall also state which type of work has to be performed only by the body builders and accessories fitters or their authorised workshops.

If the body builder's or accessory fitter's scope of supply includes electric, electronic or mechatronic, hydraulic or pneumatic systems, current flow diagrams and diagnosis routines or similar documentation facilitating a systematic search for faults shall be provided.

Please observe the Volkswagen AG owner's manual for the inspection, maintenance and repair of base vehicles. Please only use brake fluids and engine oils approved by Volkswagen for your vehicle.

More information about brake fluids and engine oils can be found in the owner's manual of your vehicle:

<http://www.vwn-bordbuch.de>

1.2.9 Accident prevention

Body builders shall ensure that the bodies comply with applicable legal rules and regulations as well as all regulations regarding work safety and accident prevention. All safety rules and the information material provided by accident insurance providers shall be observed.

All technically feasible measures must be taken to prevent unsafe operation. Country-specific laws, directives and approval regulations must be observed. The body builder is responsible for the compliance with these laws, rules and regulations. For further information about commercial freight traffic in the Federal Republic of Germany please contact:

Postal address:	Berufsgenossenschaft für Fahrzeughaltungen Fachausschuss "Verkehr" Sachgebiet "Fahrzeuge" Ottenser Hauptstrasse 54 D-22765 Hamburg
Telephone:	+49 (0) 40 39 80 - 0
Fax:	+49 (0) 40 39 80-19 99
Email:	info@bgf.de
Homepage:	http://www.bgf.de/

1.2.10 Quality system

Worldwide competition, increased quality requirements by customers on the overall product of the Transporter, national and international product liability legislation, new forms of organisation and increasing pressure on costs are demanding effective quality assurance systems in all areas of the automotive industry.

The requirements on a quality management system of this kind are described in DIN EN ISO 9001.

A VDA working group has prepared the guideline entitled "Quality management in the automotive industry – Minimum requirements on a management system for trailer and body manufacturers – System description and evaluation" for German body builders, on the basis of DIN EN ISO 9000 ff. Appeared as VDA Vol. 8 [VDA 8] (incl. CD-ROM), order no. A 13DA00080.

For the reasons stated above, Volkswagen AG strongly recommends that all body builders should set up and maintain a quality management system with the following minimum requirements:

- Definition of responsibilities and authorisations including organisation plan.
- Description of the processes and procedures.
- Appointment of a quality management representative.
- Performing contract and build feasibility checks.
- Performing product checks based on specified instructions.
- Regulating the handling of faulty products.
- Documentation and archiving of test results.
- Ensuring the quality records of employees are up to date.
- Systematic monitoring of test equipment.
- Systematic material and parts identification.
- Performing quality assurance measures at the suppliers.
- Ensuring the availability of process, working and test instructions, and that they are up to date, in the departments and in the workplace.

1.3 Planning bodies

Practical note

During the planning of bodies, the right choice of materials and thus the observance of corrosion protection measures are important in addition to a user and maintenance friendly design.

(See chap. 2.3.2.10 "Corrosion protection measures".)

1.3.1 Selecting the base vehicle

The base vehicle needs to be selected carefully to ensure safe usage in the respective field.

When planning, please consider the following for the use in question:

- Wheelbase
- Engine/gearbox
- Final drive ratio
- Maximum weight
- Centre of gravity
- Seating version (number and arrangement)
- Electrics – scope
- Power take-off systems
- Effect of energy recovery on the current distribution for vehicles with BlueMotion technology

Practical note

Before carrying out body building or conversion work, the supplied base vehicle should be checked with regard to the fulfilment of applicable requirements.

You will find more information on the available chassis and body versions in chapters 1.3 "Delivery range" or from the responsible department (see 1.2.1. "Contact possibilities").

Information

On the Volkswagen AG homepage, you can put your vehicle together with the configurator and view the available optional equipment:

<http://www.volkswagen-nutzfahrzeuge.de/de/cc5.html>

1.3.2 Vehicle modifications

Before starting work on the body, the body builder should check whether:

- the vehicle is suitable for the planned body,
- the chassis type and the equipment also correspond with the operating conditions after the conversion.

Build dimension drawings, product information and technical data can be obtained from the responsible department or via the communication system for the planning of bodies (see 1.2.1.1 "Contact in Germany", 1.2.1.2 "International contact" and 1.2.2 "Body builder guidelines, consulting").

Furthermore the optional equipment available from the factory should be noted (see 1.6 "Optional equipment").

Vehicles delivered from the factory comply with EC directives and the national laws (except for some vehicles for countries outside Europe).

The vehicles also need to meet the EC directives and the national laws after the modifications have been made.

Practical note

Sufficient space must be provided in order to guarantee the function and operating safety of the components.

Warning note

Do not modify the steering or brake system!
Modifications to the steering and brake system can result in these systems no longer working correctly and failing. This may result in the driver losing control of the vehicle and causing an accident.

Practical note

Modifications to the noise encapsulation can have effects which are relevant to registration.

1.3.3 Vehicle acceptance

The officially recognised appraiser or tester from the body builder must be informed about modifications to the chassis.

Practical note

Country-specific laws, directives and approval regulations shall be observed!

1.4 Optional equipment

We recommend using the optional equipment from Volkswagen AG that can be obtained with a PR no. for optimum adaptation of the body to the vehicle.

You can obtain information on the optional equipment available from Volkswagen as PR numbers from your Volkswagen customer service or from the body builder consultants (see chap. 1.2.1. "Contact possibilities").

Information

Furthermore you can put your vehicle together with the configurator on the Volkswagen AG homepage and look at the available special equipment:

<http://www.volkswagen-nutzfahrzeuge.de/de/cc5.html>

Optional equipment (e.g. reinforced springs, frame reinforcements, anti-roll bars etc.) or equipment fitted later increase the kerb weight of the vehicle (see also chapter 4 "Implementation of special bodies").

The actual vehicle weight and the axle loads should be determined before the body is built.

Not all additional equipment can be built into any vehicle without problems. This applies in particular to a subsequent installation.

We recommend using the reinforced springs that are available from the factory for bodies and conversions.

Practical note

Permanently installed components increase the kerb weight of the vehicle, as a result of which the suspension compression height on the rear axle is reduced accordingly. If the additional installation solution weighs more than 180 kg, or more than 200 kg in the Caddy Maxi, it is recommended to change over to a specially matched leaf spring (PR no. 2MK*).

Please note that on vehicles with installations, for example, refrigerated vehicles, on which the actual chassis number on the D-pillar is permanently covered by the installation, a second chassis number is required in the engine compartment on the right-hand side in the direction of travel to register the vehicle in the EU.

We offer a second chassis number (PR no. S24) as optional equipment for the Caddy and Caddy Maxi ex works for these kinds of conversions.

2 Technical data for planning

2.1 Base vehicle

2.1.1 Vehicle dimensions

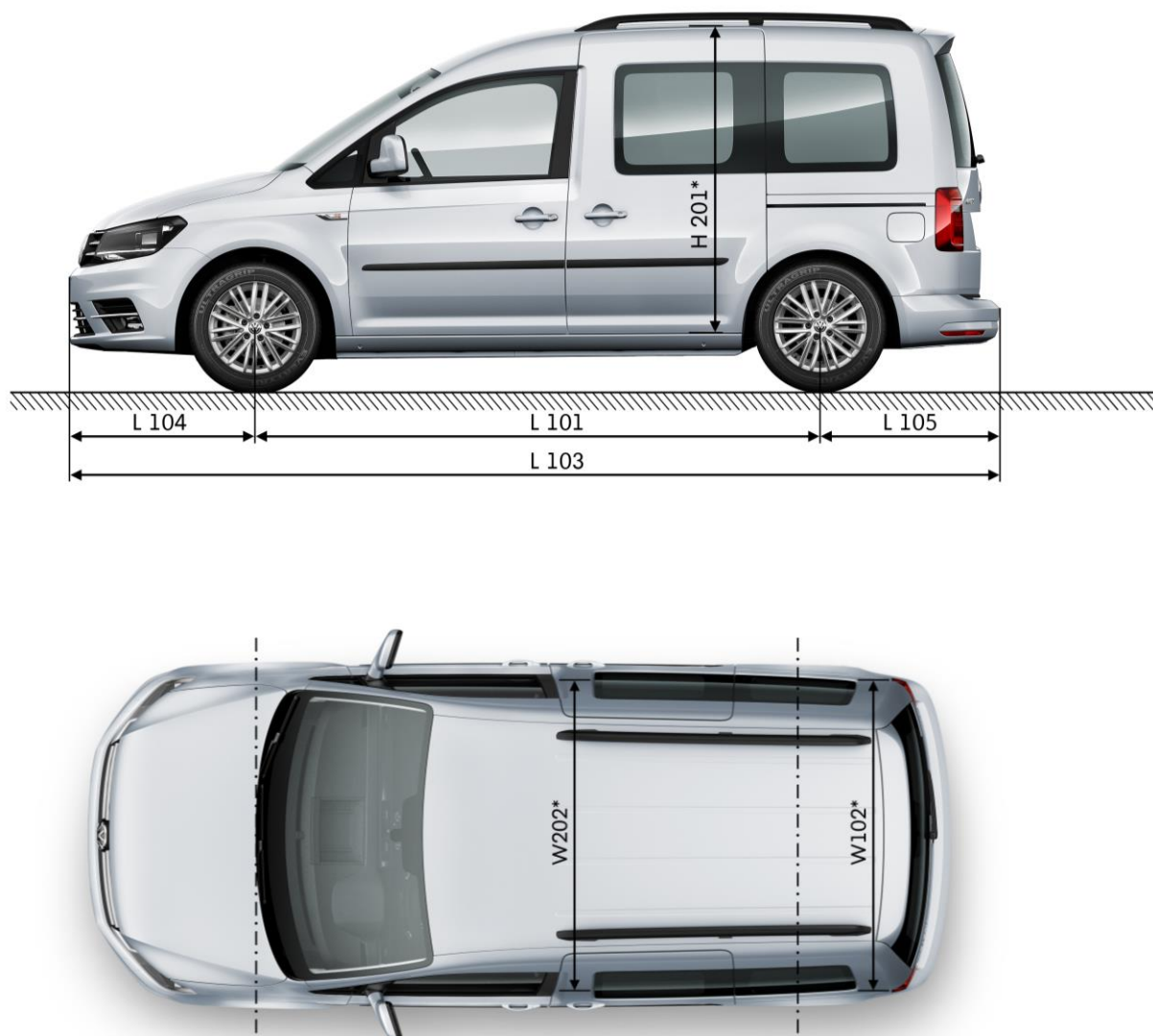


Fig. 1: Vehicle dimensions for Caddy (acc. to DIN 70020, T1)

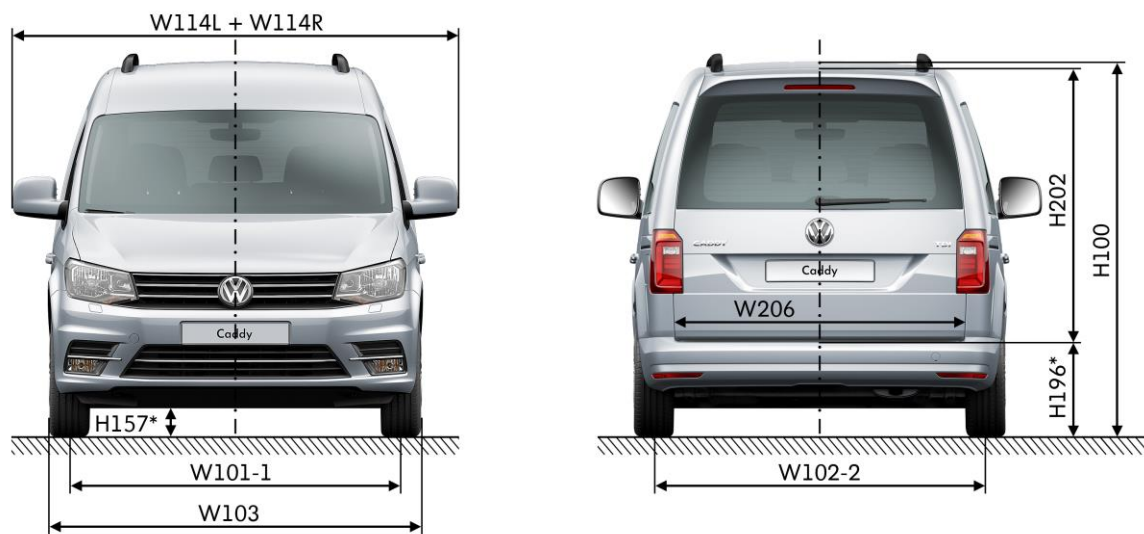


Fig. 2: Vehicle dimensions for Caddy/Caddy Maxi, view from front and rear (acc. to DIN 70020, P1)

* The vehicle dimensions concerning ground clearance and loadbed differ from one another depending on the engine and equipment variant.

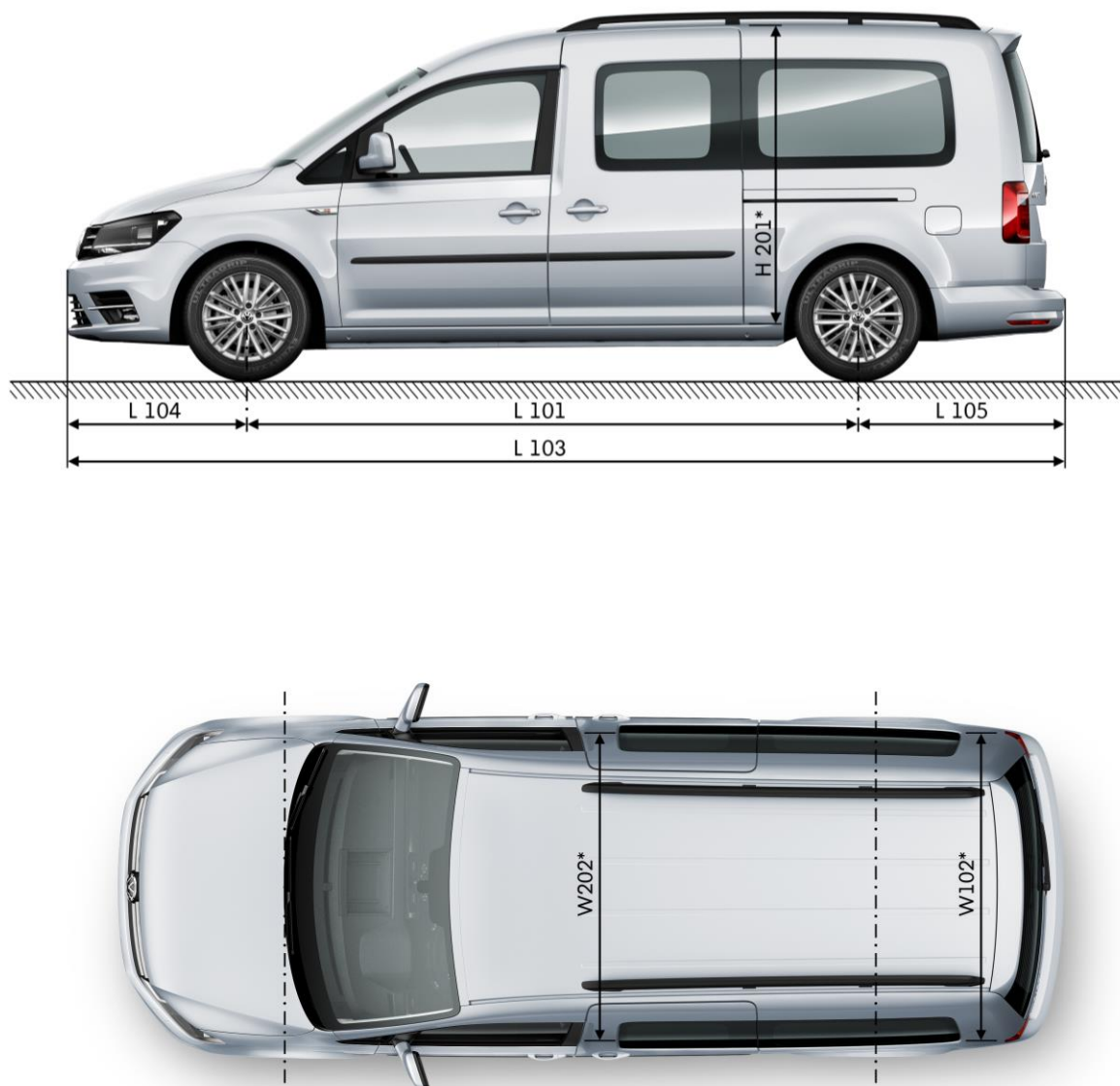


Fig. 3: Vehicle dimensions for Caddy Maxi (acc. to DIN 70020, T1)

2.1.1.1 Basic data of Caddy panel van

Basic data Caddy (all engines)			Caddy [mm]	Caddy Maxi [mm]
Dimensions	L101	Wheelbase	2682	3006
	L103	Vehicle length	4408	4878
	L102	Vehicle length with towing bracket (fixed/removable)	4506	4976
	L515	Centre of gravity position, load compartment, behind the front axle	2583	2818
	W103	Vehicle width: (measuring point: door handle)	1793	1793
	H100-B	Vehicle height body	1823	1836
		Vehicle height – 4MOTION	1873	1886
		Vehicle height – Ecofuel	1823	1836
		Vehicle height – Lowered suspension	1793	---
	H100-2	Vehicle height with roof railing	1860	1872
		Vehicle height – 4MOTION	1909	1922
		Vehicle height – Ecofuel	1860	1872
		Vehicle height – Lowered suspension	1829	---
	H100-7	Vehicle height with roof/ladder flap	1835	--
		Vehicle height – 4MOTION	1882	--
		Vehicle height – Ecofuel	1835	--
		Vehicle height – Lowered suspension	1805	--
	L104	Front overhang length	879	879
	L105	Rear overhang length	847	993
		Rear overhang with towing bracket	945	1091
	W101-1	Track width at front with rim offset 47	1542	1542
		With rim offset 50	1536	1536
	W101-2	Track width at rear		
		With rim offset 47	1534	1544
		With rim offset 47 / 4MOTION	1510	1512
		With rim offset 50	1528	1538
		With rim offset 50 / 4MOTION	1504	1506

Basic data Caddy (all engines)			Caddy [mm]	Caddy Maxi [mm]
	H157-1*	Ground clearance (engine shield, front)	166	163
		Ground clearance (tailpipe, exhaust system) – Ecofuel	124	149
		Ground clearance (engine shield, front) – 4MOTION	151	162
		Ground clearance (engine shield, front) – lowered suspension	125	---
	H157*	Ground clearance between axles	175	172
	H157*a	Ground clearance between Axles – 4MOTION	177	175
	H157*b	Ground clearance between axles – Ecofuel	124	149
	H157*c	Ground clearance between axles – lowered suspension	145	---
	A116-1	Front overhang angle at full load, limited by spoiler	17.1°	16.7°
		4MOTION	15.3°	15.2°
		Ecofuel	17.1°	16.7°
		Lowered suspension	13.2°	---
	A116-2	Rear overhang angle at full load, limited by bumper	17.3°	14.8°
		4MOTION	23.1°	20.1°
		Ecofuel	17.3°	14.8°
		Lowered suspension	18.1°	
Turning circle	D102	Minimum turning circle	11.1m	12.2m
Wheels/tyres		Basic tyres**	Smallest tyre 195/65 R15 91 T Largest tyre 205/50 R17 93 H	
Load compartment measurements	L202	Length of load bed 97/27/EC	1890	2360
	L301-2	Luggage compartment length 1st row of seats	1779	2249
		Luggage compartment floor length 1st seat row without net partition	1833	2299
	W500	Largest luggage compartment width (measuring point sliding door)	1556	1532
	W202*	Smallest luggage compartment width	1170	1168
	H201*	Loading height	1244	1259
		Loading height with floor covering	1241	1256
	H196*	Load sill height above ground plane	577	588
		4MOTION	642	652
		Ecofuel	577	588
		Lowered suspension	547	---
	H508	Clear opening height of sliding door	1097	1092
	L508	Clear opening width of sliding door	701	701
	H202	Body opening height with tailgate	1134	1134
		Body opening height with wing door	1114	1114
	W206	Largest width of rear opening	1183	1183

Basic data Caddy (all engines)			Caddy [mm]	Caddy Maxi [mm]
Garage dimensions	W120-1	Vehicle width, front doors open	3590	3590
	W120-2	Vehicle width, rear doors open	2028	2038
	W114-L	Width incl. left exterior mirror	1052	1052
	W114-R	Width incl. right exterior mirror	1013	1013
Vehicle interior dimensions	H61-1	Headroom – 1st seat row	1143	1143
	H61-2	Headroom 2nd seat row	--	--

Basic data of Caddy panel van, version dated: January 2015

* The vehicle dimensions concerning ground clearance and loadbed differ from one another depending on the engine and equipment variant.

** The permitted tyre size varies depending on the engine and the gross vehicle weight rating.

2.1.1.2 Basic data of Caddy window van

Basic data Caddy (all engines)			Caddy [mm]	Caddy Maxi [mm]
Dimensions	L101	Wheelbase	2682	3006
	L103	Vehicle length	4408	4878
	L102	Vehicle length with towing bracket (fixed/removable)	4506	4976
	L515	Centre of gravity position, load compartment, behind the front axle – 5-seater	3130	3130
		Centre of gravity position, load compartment, behind the front axle – 7-seater	3263	3521
	W103	Vehicle width: (measuring point: door handle)	1793	1793
	H100-B***	Vehicle height body	1822	1831
		Vehicle height – 4MOTION	1851	1863
		Vehicle height – Ecofuel	1822	1831
		Vehicle height – Lowered suspension	1792	---
	H100-2	Vehicle height with roof railing	1858	1868
		Vehicle height – 4MOTION	1887	1899
		Vehicle height – Ecofuel	1858	1868
		Vehicle height – Lowered suspension	1828	---
	L104	Front overhang length	879	879
	L105	Rear overhang length	847	993
		Rear overhang with towing bracket	945	1091
	W101-1	Track width at front with rim offset 47	1543	1543
		With rim offset 50	1537	1537
	W102-2	Track width at rear (W102-2) With rim offset 47	1534	1544
		With rim offset 47 / 4MOTION	1512	1512
		With rim offset 50	1528	1538
		With rim offset 50 / 4MOTION	1506	1506

Basic data Caddy (all engines)			Caddy [mm]	Caddy Maxi [mm]
	H157/1*	Ground clearance between axles	173	175
		Ecofuel	123	146
		4MOTION	172	187
		Lowered suspension	143	---
	H157/1* (ML1***)	Ground clearance (engine shield, front)	155	158
		Ground clearance (tailpipe, exhaust system) – Ecofuel	123	146
		Ground clearance (engine shield, front) – 4MOTION	153	152
		Ground clearance (engine shield, front) – lowered suspension	125	---
	A116-1	Front overhang angle at full load, limited by spoiler	15.7°	15.9°
		4MOTION	14.7°	14.7°
		Ecofuel	15.7°	15.9°
		Lowered suspension	13.2°	--
	A116-2	Rear overhang angle at full load, limited by bumper	17.5°	15.3°
		4MOTION	23.2°	20.2°
		Ecofuel	17.5°	15.3°
		Lowered suspension	18.1°	--
	A117	Brakeover angle	13.5	12.1°
		Breakover angle – 4MOTION	14.8°	12.6°
		Breakover angle – Ecofuel	13.2°	12.1°
		Breakover angle – Lowered suspension	12.3°	--
Turning circle	D102	Minimum turning circle	11.1m	12.2m
Wheels/tyres		Basic tyres** 1)	Small tyre diameter 195/65 R15 91 T 195/65 R15 95 T rf. Large tyre diameter: 205/55 R16 94H rf. 205/50 R17 93 H rf.	Small tyre diameter 195/65 R15 91 T 195/65 R15 95 T rf. Large tyre diameter: 205/55 R16 94H rf. 205/50 R17 93 H rf.
Load compartment measurements	L202	Length of load bed 97/27/EC	--	--
	L212-1	Luggage compartment floor length 1st seat row (2nd seat row, wound)	1876	2297
		Without seats in passenger compartment (measured on floor)	1781	2250
	L212-2	Luggage compartment length 2nd row of seats	1095	1566
	L212-3	Luggage compartment length 3rd row of seats	224	644
	W200*	Largest luggage compartment width	1190	1190
	W202*	Smallest luggage compartment width (behind 3rd seat row)	1168	1168
	H201*	Loading height	1230	1240

Basic data Caddy (all engines)			Caddy [mm]	Caddy Maxi [mm]
	H196*	Load sill height above ground plane	575	581
		4MOTION	612	624
		Ecofuel	575	581
		Lowered suspension	545	- - -
	L902	Clear opening height of front door (2-door and 4-door)	873	873
	H508	Clear opening height of sliding door	1086	1084
	L508	Clear opening width of sliding door	701	701
	H202*	Body opening height with tailgate	1134	1134
		Body opening height with wing door	1116	1116
	W206	Largest width of rear opening	1183	1183
Garage dimensions	W120-1	Vehicle width, front doors open (2-door and 4-door)	3590	3590
	W120-2	Vehicle width, rear doors open	2028	2038
	W114-L	Width incl. left exterior mirror	1052	1052
	W114-R	Width incl. right exterior mirror	1013	1013
Vehicle interior dimensions	H61-1	Effective head area – 1st seat row	1144	1144
	H61-2	Effective headroom 2nd seat row (standard)	1139	1147
		Effective headroom 2nd seat row (standard)	1130	1137
	H61-3	Effective headroom 3rd seat row (standard)	998	1021
		Effective headroom 3rd seat row (comfort)	993	1011

Basic data of Caddy window van, version dated: January 2015

* The vehicle dimensions concerning ground clearance and loadbed differ from one another depending on the engine and equipment variant.

** The permitted tyre size varies depending on the engine and the gross vehicle weight rating.

**** ML1 = Measurement Load 1 (unloaded vehicle)

1) Preliminary information

Information

For additional technical data, especially dimensional drawings and weight information on the Caddy/Caddy Maxi according to the engine and equipment variant, please refer to the Internet at:

<http://www.volkswagen-nutzfahrzeuge.de/de/downloads.htx>

2.1.2 Overhang angle and ramp angle

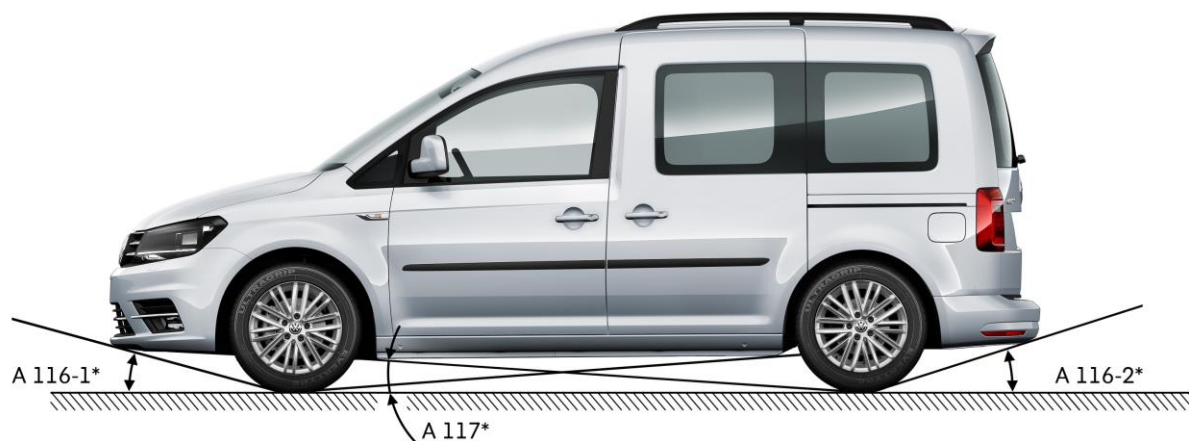


Fig. 1: Overhang and breakover angles, Caddy



Fig. 2: Overhang and breakover angles, Caddy Maxi

Please refer to the basic data tables for the values of the front and rear overhang angles ($A116-1$, $A116-2$) as well as the breakover angle ($A-117$) (see chapter 2.1.1.1 / 2.1.1.2).

* The values for the overhang angle $A116$ may differ for petrol and diesel engines due to different exhaust systems.

2.1.3 Vehicle centre of gravity

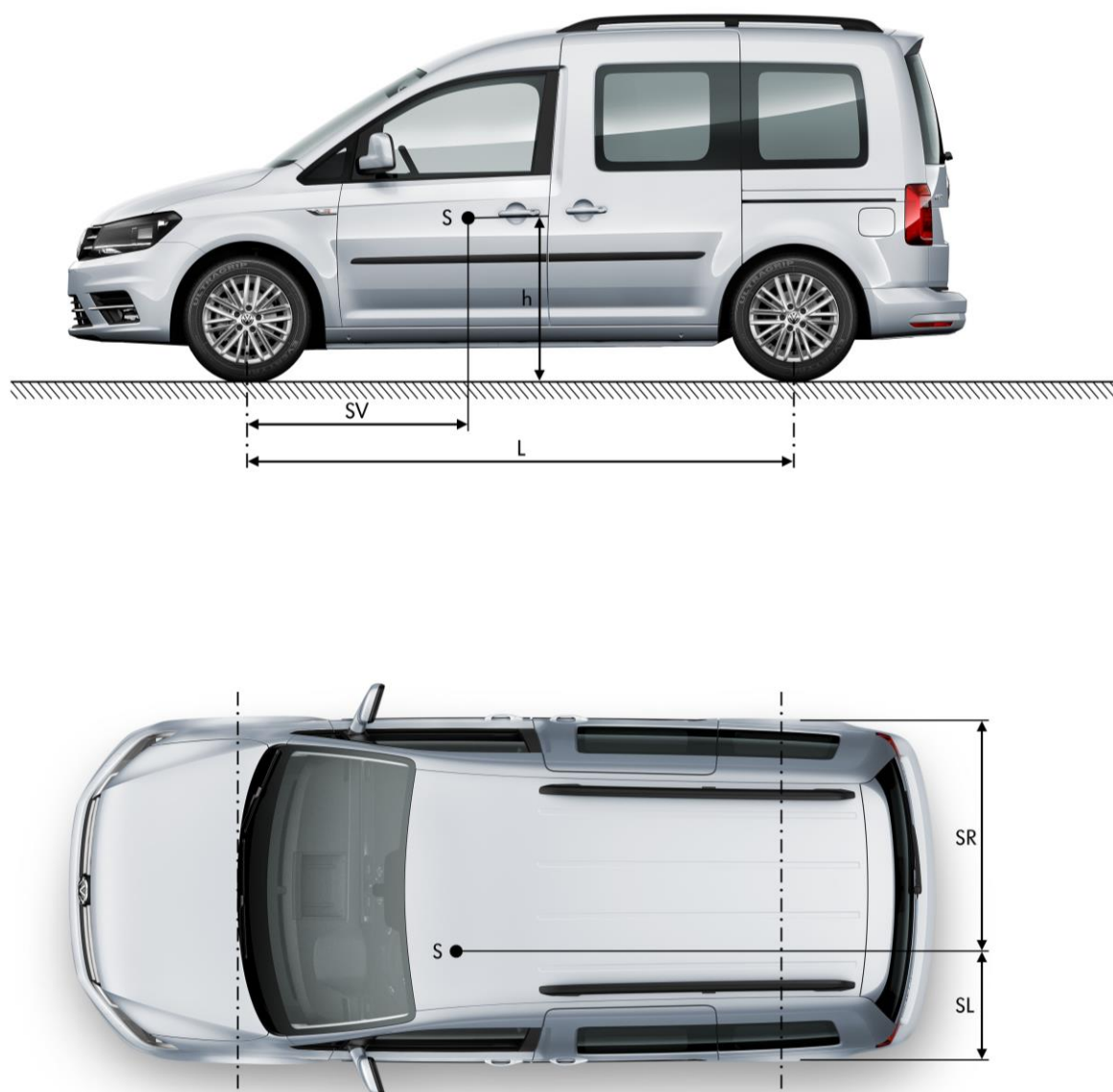


Fig. 2.1.3: Caddy centre of gravity

model	L [mm]	h* [mm]	SV* [mm]	SR* [mm]	SL* [mm]
Caddy	2682*	631	1132	777	760
Caddy Maxi	3001*	632	1273	781	739

* Position of centre of gravity measured on the vehicle without load rating and with driver

2.1.4 Bodies with a high centre of gravity

The driving properties of vehicles with a high body or with an elevated overall centre of gravity can be expected to be restricted (see also chap. 2.2.6 "Brake system and brake control system ESC").

2.1.5 Determining centre of gravity

Volkswagen recommends having the centre of gravity determined by a recognised test institution with experience in this field (for example, DEKRA, TÜV or others).

For the body builder to determine the centre of gravity, we recommend following the procedures described under 6.1 Determining the centre of gravity.

2.1.6 Steerability - minimum front axle load

In all load situations, the front axle load must correspond to at least 38% of the actual gross vehicle weight. The permitted axle loads must be observed in all load situations.

Please also comply with the following chapters:

- Chap. 5.5.1 Permitted weights and kerb weights
- Chap. 2.2.6 Brake system and brake control system ESC

2.2 Running gear

2.2.1 Permitted weights and unladen weights

The permitted axle loads listed in the weight tables (see chapters 5.5.1 and 5.5.2) must be observed.

Warning note

ATTENTION! The maximum gross axle weight rating specified in this body builder guideline must be adhered to for conversions that lead to an increase to the base vehicle's axle weight rating (e.g. weight increases). If these values are exceeded, the durability of all components (and in particular the wheel hubs) must be checked and safeguarded using suitable measures.

Information

Load ratings depend on the engine. Equipment features can influence the payload or load weight by increasing/reducing the unladen weight. The weight values in the technical data refer to the standard, base vehicle equipment. Weight tolerances of +5% in production are permitted in accordance with DIN 70020 and must be taken into account if necessary. Installing optional equipment reduces the payload.

The actual payload of a vehicle that is calculated from the difference between the gross vehicle weight rating and unladen weight can only be determined by weighing an individual vehicle.

Warning note

The weight data relates to the minimum kerb weight, with driver. Ordering standard and special equipment increases the kerb weight and reduces the load rating. The actual kerb weight should be established by weighing.

If the gross axle weight ratings are exceeded, the ESC system in vehicles with ESC will no longer be able to function correctly.

Furthermore, the overload can lead to damage to the running gear and load-bearing parts. This may result in the driver losing control of the vehicle and causing an accident.

2.2.1.1 One-sided weight distribution

Warning note

The following weights shall not be exceeded under any circumstances:

- Gross vehicle weight rating
- Maximum front axle weight
- Maximum rear axle weight

(see chap. 5.5.1 "Permitted weights and kerb weights").

When planning add-ons/additions, make sure that a one-sided weight distribution is avoided – in particular involving permanently secured add-ons.

The difference in actual wheel load between the left and right wheels on an axle is not allowed to exceed 8% of the higher wheel load. The tyre load ratings must be observed.

Example:

Rear axle load, weighed	1200 kg
Wheel load left/right	576/624 kg
Difference in wheel load	48 kg
% deviation from higher value	7.7%

The front axle load is not allowed to be less than the minimum permitted load, in order to ensure adequate steerability of the vehicle and a satisfactory driving behaviour under all loading conditions.

(see chap. 2.1.6 "Steerability – minimum front axle load")

2.2.2 Turning circle

See chapter 2.1.1 "Vehicle dimensions".

2.2.3 Authorised tyre sizes

The Volkswagen owner's manual provides information about the wheel/tyre combinations authorised by Volkswagen AG in conjunction with snow chains (see also chapter 2.1.1 "Vehicle dimensions").

2.2.4 Modifications to axles

Modifications to the axles are not permitted, because they can lead to an impairment in the driving properties and unstable driving behaviour.

2.2.5 Modifications to the steering system

Modifications to the steering system are not permitted.

Exceptions, e.g. conversions for people with disabilities, shall be approved by Volkswagen AG prior to the conversion. Please contact us before starting your conversion (see chap. 1.2.1)

2.2.6 Brake system and brake control system ESC*

2.2.6.1 General information

Changes to the brake system are not allowed under any circumstances:

If the modification to the brake system goes beyond the scope of the operating permit.

If the air inflow and outflow to and from disc brakes are modified.

Please note that the brake cable of the parking brake (FBA) as well as its cable support bracket are safety-relevant parts, and form part of the type approval for the brake system. Any modification will require a new approval process.

Exceptions shall be approved by Volkswagen AG prior to the conversion, and shall be documented with an independent brake approval report.

Please contact us before starting your conversion (see chap. 1.2.1)

Warning note

Work performed improperly on brake hoses, lines and cables can impair their function.

This can lead to a failure of components or safety-relevant parts. Therefore, work on brake hoses, lines and cables should only be performed by a qualified specialist workshop.

Information

Since 1 January 1991, all commercial vehicles have had to comply with the "EC Brake Systems Directive 71/320 EEC". When this EC Directive was adopted into national legislation (e.g. the Road Traffic Regulations (StVZO) in Germany), the effect was that these technical regulations also had to be complied with for individual acceptance.

* Electronic Stabilisation Program

2.2.6.2 Vehicle stability and ESC*

During acceptance of the converted vehicle, it is necessary to provide a validation calculation of the height of the centre of gravity of the loaded vehicle acc. to EC Directive 71/320/EEC and ECE Regulation ECE-R 13.

Refer to chapter 2.1.3 "Vehicle centre of gravity" for the permitted centre of gravity heights.

Volkswagen does not make any statement about:

- driving characteristics
- Braking behaviour
- Steering response and
- ESC control response in bodies for loadings with an unfavourably positioned centre of gravity (e.g. rear, high and side loads), because these aspects are significantly influenced by body activities and consequently can only be assessed by the body builder.

Warning note

Whether for conversions and installation, and also in the ready-to-drive condition, the gross wheel and axle weight ratings as well as the gross vehicle weight ratings (see chapter 5.5.1) of the vehicle are not allowed to be exceeded under any circumstances. If the gross axle weight ratings are exceeded, the ESC system in vehicles with ESC will no longer be able to function correctly. This may result in the driver losing control of the vehicle and causing an accident.

Practical note

From November 2014, ESC will be a requirement for new vehicles registered in Europe. Vehicles can be exempted from this obligation in special, exceptional cases. Please check whether ESC* is required in the intended country of registration for the envisaged type of the completed vehicle.

* Electronic Stabilisation Program

2.2.6.3 Influence of vehicle conversions on the function of the brake regulation system ESC*

ESP sub-systems	Modification on the vehicle				
	Wheelbase modification	Extreme centre of gravity increase	Modification of running gear (springs, dampers, anti-roll bars, wheels, tyres, track, steering)	Different rolling circumferences on individual axles	Modification to the brake (callipers, pads, design)
ABS Anti-lock brake system	+	+	+	++ ³	++
BAS Brake Assist system	--	--	+	++ ³	++
EDL Electronic differential lock	+	+	+	++ ³	+++
Hill Start Assist	--	--	-	++ ³	++
TCS Traction Control System	++	+	+	++ ³	+
ESC Electronic Stability Control	++	++++ ¹	+++ ¹	+++ ³	+++ ¹
Trailer stabilisation	++	++	++	++++	+++

1 In particular, a significantly increased risk of tipping over

2 Downgrading required

3 Hardware adaptation of the wheel speed sensors required

-- No effect

- Very little effect

+ Noticeable effect

++ Significant effect

+++ Very significant effect

++++ No technical solution

Warning note

Vehicles with add-ons, bodies, installed components or conversions in which the limit values of the specific vehicle (position of centre of gravity, axle loads, overhangs, etc.) are not complied with are regarded as problematical and can result in an impairment of driving behaviour. Therefore, they should not be operated.

* Electronic Stabilisation Program

Exceptions shall be approved by Volkswagen AG prior to the conversion, and shall be documented with an independent brake approval report. Please contact us before starting your conversion (see chap. 1.2.1).

2.2.6.4 Routing additional lines along the brake hoses/brake lines

No other additional lines are allowed to be fastened to brake hoses and brake lines.

Additional lines must remain at a sufficient distance from brake hoses and brake lines under all operating conditions, and are not allowed to touch or chafe against such brake hoses/lines under any circumstances.

(see also chap. 2.5.2.1 Electrical wiring/fuses)

2.2.7 Modification of springs, suspension mounting, dampers

The spring rates are never allowed to be modified.

We recommend using optimally matching springs from the Volkswagen delivery range for the vehicle with body.

Modifications to the springs must be assessed by a test centre/monitoring organisation/technical service responsible for this function, and can result in invalidation of the operating permit.

Important notice:

Ensure that longitudinal members are reinforced when installing helper springs at the rear axle.

The location of helper spring and reinforcements must be coordinated with and approved by Volkswagen AG before the modification is performed.

Practical note

Permanently installed components increase the kerb weight of the vehicle, as a result of which the suspension compression height on the rear axle is reduced accordingly. If the additional installation solution weighs more than 180 kg, or more than 200 kg in the Caddy Maxi, it is recommended to change over to a specially matched leaf spring (PR no. 2MK*).

Warning note

Please bear in mind that if the permanently installed components are removed then the spring pack PR no. 2MK must be replaced by the standard equipment. Otherwise, the driving properties might be negatively impaired.

* For all engines except LPG, 4MOTION and EcoFuel

2.2.8 Wheel alignment settings

Changes to wheel alignment parameters are not permitted!

2.2.9 Wheelbase and overhang extensions

No wheelbase and overhang extensions are permitted!

Exceptions shall be approved by Volkswagen AG prior to the conversion.

Please use the online contact form for this.

Please also comply with the following chapters:

- **2.1.1 "Vehicle dimensions"**
- **2.2.6.2 "Vehicle stability and ESC"**

2.3 Body-in-white

2.3.1 Roof loads/vehicle roof



2.3.1.1 Dynamic roof loads

Vehicle type	Max. roof load
Caddy	100 kg
Caddy Maxi	100 kg

Risk of accident

Please note that roof loads raise the centre of gravity of the vehicle and lead to a high dynamic axle load shift.

Also, there is greater body lean when driving on rough roads and when cornering.

The driving characteristics are significantly impaired by this.

2.3.1.2 Static roof loads

The values in the table (see 2.3.1.1) refer to dynamic roof loads.

The static roof loads with the vehicle stationary (e.g. roof tent) must be set higher. The attachments must be configured accordingly.

Please also comply with chapters:

- 2.1.4 "Bodies with a high centre of gravity"
- 2.2.6.2 "Vehicle stability and ESC"
- 2.2.6.3 "Influence of vehicle conversions"

2.3.2 Modifications to the body-in-white

Changes to the body are not allowed to impair the function and strength of units and operating devices of the vehicle, neither may they reduce the strength of weight-bearing parts.

During vehicle conversions and installation of bodies, it is not permitted to make any modifications which impair the function and freedom of movement of the suspension (e.g. for maintenance and inspection work) or the accessibility to the same.

2.3.2.1 Screw connections

If series-production bolts/nuts have to be renewed, it is only permitted for bolts/nuts to be fitted which have the:

- same diameter
- same strength
- same bolt standard or bolt type
- same surface coating (corrosion protection, coefficient of friction)
- same thread pitch.

Comply with VDI guideline 2862 during all installations.

Shortening the free clamping length, changing over to waisted shank and use of bolts with a shorter free thread proportion are not permitted.

Furthermore, take the settling behaviour of screw connections into account.

Components that are additionally clamped as well shall have the same or a higher strength than the previous clamped combination.

When attaching components to the base vehicle using screws, make sure that no panels or other components of the base vehicle are bent or damaged.

Use of Volkswagen **tightening torques** assumes that the total coefficient of friction is in the range $\mu_{\text{tot}} = 0.08$ to 0.14 for the particular items being bolted together.

If bolts are tightened by torque and angle at Volkswagen, no change of design is possible.

Risk of accident

No safety-relevant bolted connections, e.g. wheel guidance, steering and brake functions, are allowed to be modified. Otherwise the designated function may be impaired. This may result in the driver losing control of the vehicle and causing an accident. The new installation is to be carried out according to the instructions of VW Customer Service, using suitable standard parts. We recommend using genuine Volkswagen parts.

Information

Information about Volkswagen customer service instructions can be provided by any Volkswagen Customer Service.

2.3.2.2 Welding work

Incorrectly undertaken welding work can lead to a failure of safety-relevant components, and thus cause accidents. Therefore, the following safety measures must be complied with when welding work is performed:

- Welding work should only be undertaken by people with appropriate qualifications.
- Before starting welding work, it is necessary to remove components which might contain gases representing a fire or explosion hazard, e.g. fuel system, or else to protect them with a fireproof cover against airborne sparks. Gas containers which could be damaged by airborne sparks during welding work must be removed.
- Before welding work starts in the area of seat belts, airbag sensors or the airbag control unit, the components must be removed for the duration of the work. See 2.4 "Interior" for important information on handling, transporting and storing airbag units.
- Before starting welding work, cover springs and spring bellows to protect them against weld spatter. Springs are not allowed to be touched with welding electrodes or welding tongs.
- No welding is allowed on mechanical units such as the engine, gearbox, axles.
- Remove and cover the battery positive and negative terminal clamps.
- Connect the earth clamp of the welding machine directly to the part to be welded. The earth clamp is not allowed to be connected to mechanical units such as the engine, gearbox, axles.
- The housings of electronic components (e.g. control units) and electrical wiring are not allowed to be touched with the welding electrode or earth clamp of the welding machine.
- The electrodes are only allowed to be used with direct current via the positive terminal for welding. Always weld from bottom towards the top.

Risk of injury

Welding in the area of the restraint systems (airbag or belts) can lead to these systems ceasing to function properly.

Welding in the area of restraint systems is therefore prohibited.

Practical note

Disconnect the battery prior to starting welding work. Airbags, seatbelts, the airbag control unit and airbag sensors shall be protected against weld spatter, and removed if necessary.

2.3.2.3 Welded connections

In order to achieve high-quality welds, the following basic recommendations are given:

- Thoroughly clean the areas to be welded.
- Apply several short weld beads, rather than one long one.
- Make symmetrical beads, in order to limit shrinkage.
- Avoid making more than three welds at any one point.
- Avoid welding in work-hardened areas.
- Spot welds and stitch welding should be offset.

2.3.2.4 Selection of welding process

The mechanical properties of welds depend on which welding process is selected, and on the geometry of the parts to be connected.

If welding overlapping metal panels, the welding process depends on the accessibility of the sides:

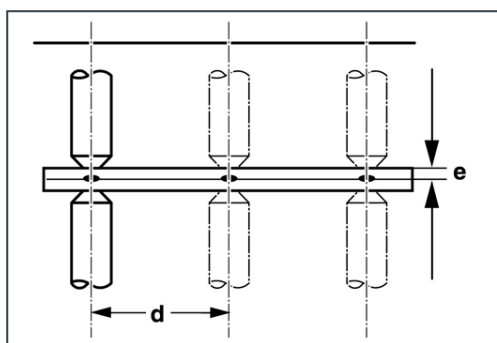
Accessible sides	Welding process
1	Shielding gas hole spot welding
2	Spot welding

2.3.2.5 Spot welding

Spot welding is used for overlapping parts with access on both sides. Avoid spot welding of more than two layers of metal panels.

Distance between spot welds:

In order to avoid shunt effects, the specified distances between the spot welds must be maintained ($d = 10e + 10 \text{ mm}$).



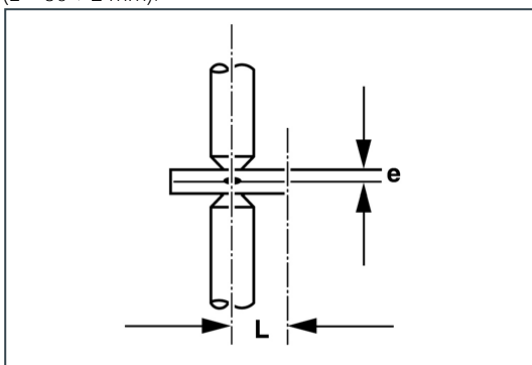
Ratio between panel thickness and distance between welds

d Distance between spot welds

e Panel thickness

Distance from the edge of the panel:

In order to avoid damage to the molten core, the specified distances from the edge of the panel must be maintained ($L = 3e + 2 \text{ mm}$).



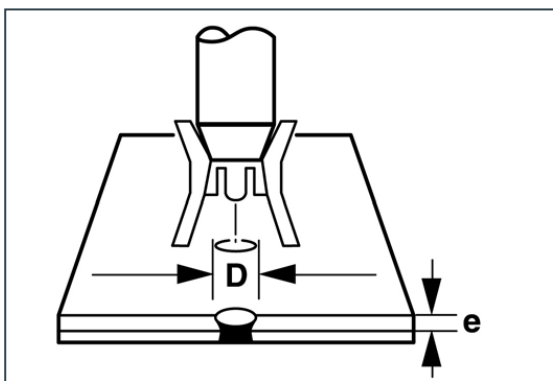
Ratio between panel thickness and distance from edge

e Panel thickness

L Distance from the edge of the panel

2.3.2.6 Shielding gas hole spot welding

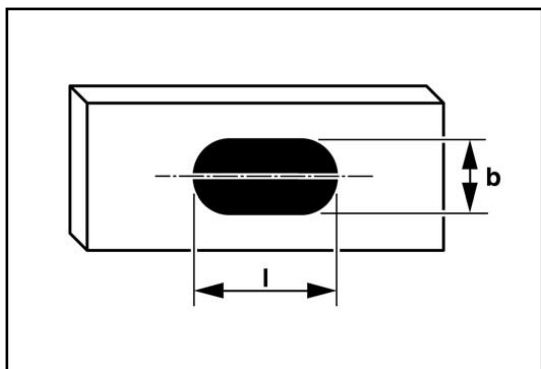
If overlapping panels can only be welded on one side, it is possible to achieve the connection by shielding gas hole spot welding or tacking. If the connection is achieved by punching or drilling and then spot welding the hole, the drilling area must be deburred before welding is carried out.



Ratio between panel thickness and hole diameter

D - hole diameter [mm]	4.5	5	5.5	6	6.5	7
e - panel thickness [mm]	0.6	0.7	1	1.25	1.5	2

The mechanical quality can additionally be improved by using slots ($l = 2 \times b$).



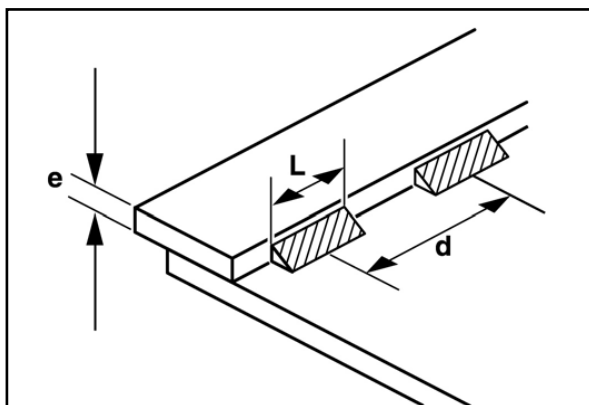
Ratio between width and length of slots

b Width of slot

l Length of slot

2.3.2.7 Tacking

If panels are > 2 mm thick, overlapping panels can also be connected by tacking ($30 \text{ mm} < L < 40 \times e$; $d > 2 L$).



Ratio between panel thickness and distance between welds

d Distance between tack welds

e Panel thickness

L Length of tack welding

2.3.2.8 Welding is not allowed

Welding is not allowed:

- On mechanical units such as the engine, gearbox, axles etc.
- On the chassis frame except if there is a frame extension.
- On the A and B-pillars.
- On the upper and lower chords of the frame.
- In bend radii.
- In the area of airbags.
- Hole welding is only permitted in the vertical webs of the frame longitudinal member.

2.3.2.9 Corrosion protection after welding

After all welding work on the vehicle, it is necessary to comply with the specified corrosion protection measures (see chap.

2.3.2.10 "Corrosion protection measures").

2.3.2.10 Corrosion protection measures

Following conversion and installation work on the vehicle, surface and corrosion protection shall be applied to the affected points.

Practical note

Only the corrosion protection agents tested and approved by Volkswagen are allowed to be used for all corrosion protection measures.

2.3.2.11 Planning measures

Corrosion protection should be taken into account in the planning and design in the form of a suitable material selection and component design.

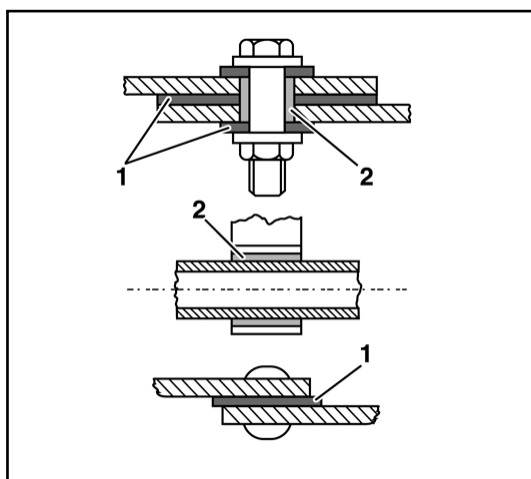
Information

If two different metallic materials are connected together by an electrolyte (e.g. moisture from the air) then this will give rise to a galvanic connection. The result will be electrochemical corrosion, and the less noble metal will suffer damage.

The electrochemical corrosion will be all the greater the further apart the metals in question are in the electrochemical series.

Therefore, the components must have a suitable treatment or insulation applied to them in order to prevent electrochemical corrosion, or the corrosion must be kept at a low level by a suitable choice of materials.

Avoidance of contact corrosion by electrical insulation



Avoidance of contact corrosion

1 Insulating washer

2 Insulating sleeve

Contact corrosion can be avoided by using electrical insulation such as washers, sleeves or tubes. Avoid welding work on inaccessible cavities.

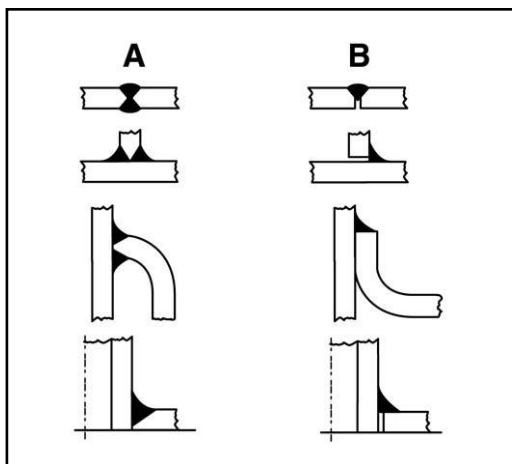
2.3.2.12 Component design measures

Design measures, in particular in the design of connections between the same or different materials, can be used for providing corrosion protection:

Corners, edges, beads and folds represent locations where dirt and moisture can collect.

Suitable surfaces, drains and the avoidance of gaps at component connections represent means by which corrosion can be counteracted by design measures.

Gaps at welded connections as a feature of the design, and how to avoid them:



Application examples of welded connections

A = Favourable	B = Unfavourable
(through-welded)	(gap)

2.3.2.13 Coating measures

It is possible to protect the vehicle against corrosion (see chap. 2.3.2.10 "Corrosion protection measures") by applying protective coatings (e.g. galvanizing, painting or high-temperature zinc application).

2.3.2.14 Work on the vehicle

After all work on the vehicle:

- Remove drilling chips.
- Deburr edges.
- Remove scorched paint and thoroughly prepare the surfaces for painting.
- Apply a primer to all bare metal parts, and paint them.
- Apply a wax-based corrosion protection agent to cavities.
- Carry out corrosion protection measures on the underbody and frame components.

2.4 Interior

2.4.1 Modifications in the area of airbags

Modifications to the airbag system and the belt tensioner system as well as to airbag components, the airbag sensors and the airbag control unit or in their vicinity are not permitted.

Please also note chapter 4.1 "Conversions for people with disabilities".

The interior fittings shall be designed so that the airbag deployment areas are left unobstructed (see also chap. 3.2 "Interior").

For information about the deployment zones of the airbags, refer to the owner's manual of the vehicle.

Warning note

Modifications or incorrectly performed work on seatbelts and seatbelt anchor points, belt tensioners or airbags or their cabling could impair the correct function of these components. They might be activated inadvertently or fail in the event of an accident.

2.4.2 Modifications in the area of seats

Modifications to the seat system or attachment of seats on the wheel house are not permitted, because the seats might be torn out of the anchoring points in the event of an accident.

The strength data for seats available ex-works is only valid in conjunction with the original attachment elements.

It is essential not to exceed the height of the centre of gravity (H-point) if retrofitting seats. See also chap. 3.2.1.

If reattaching seatbelts, make sure that the specified bolts are tightened with the original torque.

Information

You will find detailed information on torques, etc. in the workshop manuals.

Volkswagen AG workshop manuals and workshop information can be downloaded from the Internet at erWin* (Electronic Repair and Workshop Information from Volkswagen AG):

<http://erwin.volkswagen.de/erwin/showHome.do>

2.4.2.1 Belt anchors

The body builder is solely responsible for fitting additional belt points.

The necessary proof is to be provided by the body builder. The legal specifications and guidelines should be observed, for example, EC Directive 76/115/EEC.

2.4.3 Forced ventilation

Ventilation openings must be installed in the partition wall and the D-pillars in closed bodies with a partition wall. These outlet vents may be closed through modifications only if new outlets are created, e.g. in the cab doors.

This is important in several respects:

- Closing comfort of the doors
- Possible flow rate of the heating blower
- Pressure equalisation on airbag deployment

If installing non-factory-fitted partitions or cab rear panels, make sure that the selected forced ventilation cross sections correspond to those of the original factory-fitted partition.

Air inlets and outlets are not allowed to be fitted in the immediate vicinity of sources of noise or exhaust gases.

2.4.4 Acoustic insulation

Pay attention to minimising interior noise levels as part of conversions, in order to avoid modifying the noise level of the vehicle. The converted vehicle shall comply with the values for external noise given in EC Directive 70/157/EEC.

Specialists such as the manufacturer and suppliers of acoustic material should be contacted for advice on achieving the optimum acoustic protection for bodies.

2.5 Electrics/electronics

Incorrect interventions in electronic components and their software may result in these no longer functioning correctly. Due to the networking of electronics, systems that were not modified can be affected.

Malfunctions to the electronics can significantly impair the operational safety of your vehicle.

Work on or modifications to electronic components, in particular work on safety-relevant systems, is only allowed to be performed by a qualified specialist workshop, and by qualified specialist personnel who have the necessary specialist knowledge and tools for performing the necessary work.

Interventions in the vehicle electrical system/vehicle electronics can result in invalidation of the warranty/operating permit.

2.5.1 Lighting

2.5.1.1 Vehicle lighting devices

Comply with the registration provisions of the country in question with regard to the complete lighting devices (lighting and turn indicator devices).

Comply with the basic headlight setting (see type plate).

2.5.1.2 Mounting special lights

Comply with the registration provisions of the country in question when installing special lights.

Rotating beacon and siren systems can be ordered directly from Volkswagen as optional equipment with the PR no. YWS and YVD.

Please note that approval from the vehicle inspectorate is necessary.

Comply with the following chapters during the conversion:

- **3.1 "Body-in-white"**
- **3.1.4 "Modifications to the roof of panel van/window van"**
- **2.5.2.3 "Retrofitting electrical devices"**

2.5.1.3 Additional load compartment light

If an additional load compartment light is required, we recommend installing an additional switch and separate wiring (see chap. **2.5.2.1 "Electrical wiring/fuses"**; chap. **2.5.2.2 "Additional circuits"** and chap. **2.5.2.3 "Retrofitting electrical devices"**). A solution using a relay with the original lighting wiring is not recommended because the interior light is dimmed and switched off by means of PWM (pulse-width modulation signal).

No additional wires may be connected to the existing lighting wiring fitted by Volkswagen AG.

2.5.2 Vehicle electrical system

2.5.2.1 Electrical wiring/fuses

The following points shall be complied with if routing modifications are required:

- Avoid routing over sharp edges.
- Avoid routing inside excessively narrow cavities and close to moving parts.
- No additional lines are allowed to be fastened to brake hoses and brake lines.
- Additional lines must remain at a sufficient distance from brake hoses and brake lines under all operating conditions, and are not allowed to touch or chafe against such brake hoses/lines under any circumstances.
- Only lead-free PVC jacketed cables with an insulation limit temperature > 105 °C are allowed to be used.
- Connections shall be made professionally and water-tight.
- The cable shall be dimensioned according to the current drawn and protected by fuses.

Max. continuous current [A]	Rated current of fuse [A]	Wire cross-section [mm²]
0 - 4	5*	0.35
4.1 - 8	10*	0.5
8.1 - 12	15*	1
12.1 - 16	20*	1.5
16.1 - 24	30*	2.5
24.1 - 32	40**	4
32.1 - 40	50*	6
40.1 - 80	100	10
80.1 - 100	125	16
100.1 - 140	175	25
140.1 - 180	225	35
180.1 - 240	300	50

* Shape C; DIN 72581 blade-type connector

** Shape E; DIN 72581 blade-type connector

Warning note

No additional electrical cables or other lines are allowed to be secured to existing lines such as brake or fuel lines or cables, because standard holders might otherwise be overloaded. An independent attachment solution must be found.

2.5.2.2 Additional circuits

If additional circuits are required, we always recommend using the electrical interface for external use (PR no. IS1) (see chap. 2.5.3 "Electrical interface for special vehicles").

Additional circuits shall be safeguarded against the main circuit by means of suitable fuses. Cables shall be dimensioned according to the load, and protected against pulling off and the effects of impacts and heat.

2.5.2.3 Retrofitting electrical devices

Note the following for retrofitting additional electrical consumers:

- No further loads are allowed to be connected to occupied fuses.
- No additional cables are allowed to be connected to existing cables (e.g. with insulation-piercing terminals).
- Fuse consumers adequately by means of additional fuses.
- All installed electrical devices shall be checked acc. to EC Directive 72/245/EEC and shall bear the "e" mark.

2.5.2.4 Electromagnetic compatibility

Electromagnetic compatibility refers to the property of an electrical system to remain neutral whilst maintaining full functions in the presence of other systems.

Active systems in the surrounding area are not disrupted by the system, nor is system itself impaired.

Electrical interference in motor vehicle electrical systems is caused by the individual electrical loads. At Volkswagen AG, the factory-fitted electronic components have been checked for their electromagnetic compatibility in the vehicle.

When electrical or electronic systems are retrofitted, it is also necessary to check and demonstrate their electromagnetic compatibility. Volkswagen does not issue a manufacturer's declaration for electromagnetic compatibility when additional devices are subsequently installed by body builders.

Devices that are regarded as "electrical/electronic subassemblies" (ESA) as defined by EC Directive 72/245/EEC in the current version shall be type-approved and shall bear the "e" mark.

2.5.2.5 Mobile communication systems

1. Mobile phones

Commercially available mobile phones may be operated in the vehicle interior. Observe the respective national regulations for the transmission powers during use. Information about the radio bands can be found in the current vehicle-related manufacturer's declaration.

An installation set with external aerial is recommended for an optimum transmission and reception quality and to connect to wireless networks outside of the vehicle. The appropriate interface is available for the mobile phone ex-works as optional equipment.

2. Mobile phones for authorities and organisations with security tasks

Two-way radios complying with the technical guidelines of authorities and organisations with security tasks may be installed and operated in the vehicle with the appropriate installation set (according to the vehicle-specific manufacturer's declaration).

2.5.2.6 CAN bus

Interventions in the CAN bus and connected components are not permitted.

2.5.3 Electrical interface for special vehicles

Basic requirements for using the interface:

The special vehicles interface provides selected vehicle electrical system potentials.

These interfaces are only allowed to be used by authorised specialist personnel.

Inappropriate interventions can result in damage to the vehicle and breakdowns, and may also invalidate the operating permit.

The parameters of the multifunction control unit (MFG) are only allowed to be set in consultation with VW.

Subject to technical modifications.

The following points must be observed at all times:

- Various VDE guidelines for configuration and fitting of electrical wires and components (cable cross sections, fuses, etc.)
- Only components (cables, housings, contacts) approved by Volkswagen are allowed to be used for adapting to the vehicle electrical system. The part numbers of these components can be found in this description.
- Only the potential names normally used in VW are used in this description.
- It is not known what additional units will be connected, therefore the company fitting out the vehicle with the interface shall ensure a balanced current distribution.
- EMC safety for connections after the interface is the responsibility of the company fitting out the vehicle.
- The cable cross sections of the interfaces shall be maintained throughout the entire circuit, i.e. no cross-section reductions are permitted after the interface.
- Energy supply to the vehicle electrical system is only allowed to be done at potentials expressly provided for this purpose (see description) and shall be fused externally in accordance with VDE.
- For additional information, refer to the customer service documents.
- All electrical cables connected to the vehicle electrical system shall be reliably and durably protected against overload to battery “+” and the body earth.
- Earth potential: The specified potentials always refer to the vehicle body earth.

2.5.3.1 Location of the interfaces for special vehicles (IS1)

The electrical interface for special vehicles (multifunction control unit with connector point) is mounted on the airbag control unit in the area of the centre tunnel under the dash panel.



Fig. 1: Interface for special vehicles (no. 7)



Fig. 2: Front storage compartment ASSY



Fig. 3: Electrical interface for special vehicles, View R (PR no. IS1/UE1 cable 2K5.970.372)

1 connector point



Fig. 4: Electrical interface for special vehicles (PR no. IS1)

1 Trim (footwell, driver's side)

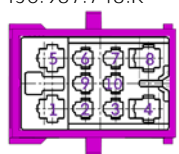
2 Multifunction control unit

2.5.3.2 Pin assignment at the connector point

The connector point is assigned selected vehicle electrical system potentials. The interface assignment and the possibility of drawing or supplying current depend on the equipment.

Connector point, 10-pin (violet)

1J0.937.743.K

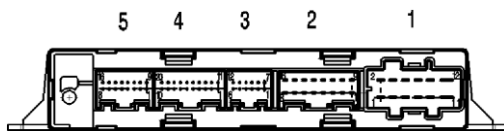


	potential	Max. current draw	Usage
1	Low active	2.0	Terminal 30
2	Highside	0.02	Speed signal
3	High active	2.0	Terminal 58
4	High active	2.0	Terminal 15
5	Low active	0	Starter inhibitor (E03)
6	Highside	0.2	Left turn signal
7	Highside	0.2	Right turn signal
8	Low active	0	Ignition bypass button (E01 MFG)
9	Highside	0.15	Cut-off relay (A13 MFG)
10	High active	0	Intermittent main beam (E16 MFG)

2.5.3.3 Pin assignment at the control unit for special vehicles (IS1 incl. MFG)

Discrete signals with terminal 30 level can be picked off at all highside outputs of the multifunction control unit. Signals with terminal 31 level can be picked off at all lowside outputs. The outputs can be loaded up to the particular prescribed value. The inputs of the control unit must be connected to earth (low active) or to positive (high active), according to specification.

The following plugs and contacts must be used for connecting external devices to the special vehicle control unit:



	Plug 5	Plug 4	Plug 3	Plug 2	Plug 1
Part number	8E0.972.416.A	8E0.972.420	Not assigned	443.972.807	4B0.973.721
Contact us	Pin 3 – 16: 0.5 mm ² N.907.649.01	Pin 1 – 20: 0.5 mm ² N.907.649.01		Pin 1 – 16: 0.5 – 1 mm ² N.101.905.01 1.5 – 2.5 mm ² N.101.906.01	Pin 1 – 8: 0.5 – 1 mm ² N.906.844.01 1.5 – 2.5 mm ² N.906.845.01

Inputs

Plug	PIN	MFG No.	Type	Taxi	Emergency vehicle	Driving aid	Driving school + Extra
4	1	E01	Low active	Taxi alarm passive button	Ignition bypass button	Reserve	Front passenger pedal activation switch
4	2	E02	Low active	Taxi alarm active button	Radio device supply button	Reserve	Footwell light button
4	3	E03	Low	Taxi alarm off	Starter inhibitor	Reserve	Warning buzzer button
4	4	E04	Low	Interior lighting	Interior lighting button	Driving aid button,	Driving aid button, front
4	5	E05	Low active	Roof sign button	Urban/rural switch	Driving aid button, front left, high	Driving aid button, front left, high
4	6	E06	Low active	Door release button, rear	Daytime running light switch-off button	Driving aid button, front right, low	Driving aid button, front right, low
4	7	E07	Low active	Reserve	Blue flashing light button	Driving aid button, front right, high	Driving aid button, front right, high
4	8	E08	Low active	Reserve	Sound sequence ready button	Engine start button	Engine start button
4	9	E09	Low active	Reserve	Button for emergency signal (continuous signal)	Remote control button	Remote control button
4	10	E10	Low active	Reserve	Stop command light 1	Reserve	Indicator button (left-side)
4	11	E11	Low active	Reserve	Stop command light 2	Reserve	Indicator button (right-side)
4	12	E12	Low active	Reserve	Stop command light 3	Reserve	Button for main beam
4	13	E13	Low active	Reserve	Button for microphone/radio over external speaker	Reserve	Button for dipped beam
4	14	E14	Low	Reserve	Reserve	Reserve	Horn operation

4	15	E15	High	Taxi alarm radio	Reserve	Reserve	Reserve
4	16	E16	High active	Status input signal from	Status input signal from emergency signal device	Reserve	Reserve
4	17	E17	High active	Reserve	Reserve	Reserve	Reserve
4	18	E18	High active	Reserve	Reserve	Reserve	Reserve

Outputs

Plug	PIN	MFG No.	Type	Max. current draw [A]	Taxi	Emergency vehicle	Driving aid	Driving school + Extra
1	1	A01	High /Lowside	6.5 / 3.8	Supply 1, roof sign	Supply, radio 1	Reserve	Reserve
1	2	A02	High	6.5 / 3.8	Supply 2, roof	Supply, radio 2	Reserve	Reserve
1	3	A03	Highside	5.0	Terminal 15	Terminal 15	Terminal 15	Terminal 15
1	4	A04	Highside	5.0	Reserve	Flashing lights, rear	Supply, remote control	Supply, remote control
1	5	A05	Highside	5.0	Reserve	Additional flashing light (left-side)	Reserve	Supply, footwell lights
1	6	A06	Highside	5.0	Reserve	Additional flashing light (right-side)	Reserve	Supply, warning buzzer
1	7	A07	Highside	5.0	Interior light	Load compartment light	Reserve	Reserve
1	8	A08	Highside	5.0	Supply output with total discharge protection	Supply output with total discharge protection	Supply output with total discharge protection	Supply output with total discharge protection
5	9	A09_C	Relay		Radio call for help	Terminal 15 from cylinder shut-off	Reserve	Reserve
5	10	A09_NO	Relay		Radio call for help	Reserve	Reserve	Reserve
5	11	A09_NC	Relay		Reserve	Terminal 15 to the onboard	Reserve	Reserve
5	13	A10_C	Relay		Reserve	Reserve	Reserve	Reserve
5	14	A10_NO	Relay		Reserve	Reserve	Reserve	Reserve
5	15	A10_NC	Relay		Reserve	Reserve	Reserve	Reserve
2	1	A11	Highside	0.15	Reserve	Ignition bypass terminal 15	Engine start terminal 50	Engine start terminal 50
2	2	A12	Highside	0.15	Reserve	Signal device Activate tone sequence (indicator lamp for sound sequence ready – operation of emergency signal)	Reserve	Reserve
2	3	A13	Highside	0.15	Cut-off relay second battery	Cut-off relay second battery	Reserve	Reserve

Plug	PIN	MFG No.	Type	Max. current draw [A]	Taxi	Emergency vehicle	Driving aid	Driving school + Extra
2	4	A14	Highside	0.15	Reserve	Indicator lamp for blue flashing light	Reserve	Indicator lamp for dipped beam
2	5	A15	Highside	0.15	Reserve	Indicator lamp for microphone/radio over external speaker	Reserve	Indicator lamp for left turn signal
2	6	A16	Highside	0.15	Reserve	Indicator lamp for continuous signal	Reserve	Indicator lamp for right turn signal
2	7	A17	Highside	0.15	Door status	Door status	Reserve	Indicator lamp for main beam
2	8	A18	Lowside	0.15	Indicator lamp for roof sign button	Indicator lamp for ignition bypass button	Indicator lamp for remote control button	Indicator lamp for remote control button
2	9	A19	Lowside	0.15	Indicator lamp for interior lighting button	Indicator lamp for interior lighting button	Reserve	Indicator lamp for warning buzzer button
2	10	A20	Lowside	0.15	Reserve	Indicator lamp for urban/rural (and error status, emergency signal operation)	Reserve	Indicator lamp for footwell light button
2	11	A21	Lowside	0.15	Reserve	Indicator lamp for radio button	Reserve	Reserve
2	12	A22	Lowside	0.15	Speed signal	Speed signal	Speed signal	Speed signal
2	13	A23	Lowside	0.15	Reserve	Indicator lamp for daytime running light switch-off button	Door status	Door status
2	14	Pull-up	Highside		Pull-up – speed signal	Pull-up – speed signal	Pull-up – speed signal	Pull-up – speed signal

2.5.3.4 Pin assignment and circuit diagrams for interface for special vehicles

Detailed information about the "electrical interface for external use" can be found in the Workshop Manuals (repair group 97-Cables) and the current flow diagrams (no. 34/1) of Volkswagen AG.

Information

The circuit diagrams and workshop manuals of Volkswagen AG can be downloaded from the Internet from erWin* (Electronic Repair and Workshop Information from Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

2.5.4 Vehicle battery

If a vehicle is not operated for a long time, its battery gradually loses charge due to the electrical loads (clock, tachograph, cigarette lighter or radio) and can suffer permanent damage.

To avoid this damage, the wiring harness is disconnected in the production facility using a connector and shall be reconnected during transfers or vehicle delivery services.

The connector shall be disconnected again if the vehicles are to be left unused at the body builder for some time.

To prevent damage to the battery clamps, we recommend only tightening the screws on the battery clamp in accordance with the instructions in the workshop manual. Please observe the tightening torques specified in the workshop manual (see chap. 1.2.1.3).

It is possible to obtain an uprated battery ex-works as optional equipment for the increased current draw of additional loads:

Order no. (PR no.)	Name
NY1	More powerful battery (72Ah, 380A) and more powerful alternator (140A)
NY2	More powerful battery (72Ah, 380A)

2.5.4.1 Installation of additional battery

No additional battery is available ex-works at the moment.

If it is necessary for an additional battery to be fitted, this can only be done by the body builder. The body builder bears sole responsibility for this.

Installing an additional battery is only allowed in conjunction with a battery isolator relay.

The additional battery may only be used for your specific additional consumers.

Additional consumers could be, for example: refrigeration systems, auxiliary heating etc.

If an additional battery is accommodated in the passenger compartment, ensure that there is sufficient ventilation.

Make sure the battery is securely attached and covered.

Warning note

When work is performed on the vehicle electrical system, the earth cables should always be disconnected from the battery and the additional battery. Only then should you disconnect the positive cables.

Short-circuits could occur if this is not observed.

2.5.5 Subsequent installation of generators

If additional electrical consumers are retrofitted, the increased power requirement can be met by using more powerful alternators.

The following optional equipment is available from the factory for this purpose:

Order number (PR no.)	Name
NY1	More powerful battery (72Ah, 380A) and more powerful alternator (140A)
NY3	More powerful alternator (140A)

If ancillaries are used, the factory fitted power take-offs should be used (see chap. 2.7.2 "Power take-off systems").

If other alternators are to be added, the following points should be observed:

- Vehicle parts and their function should not be impaired by the installation of a generator.
- The capacity of the battery and power supplied by the alternator must be dimensioned sufficiently.
- The alternator **circuit should be provided with an additional fuse (see chap. 2.5.2.1 "Electrical wiring/fuses")**.
- The cable cross-section **should be dimensioned according to the current drawn (see chap. 2.5.2.1 "Electrical wiring/fuses")**.
- The higher power requirement can make it necessary to replace the starter/alternator warning harness.

We recommend Volkswagen genuine parts for this.

- **Ensure that electrical wiring is routed correctly (see 2.5.2.1 "Electrical wiring/fuses")**.
- The accessibility of the ancillaries installed and simple maintenance possibilities may not be impaired.
- The necessary air supply and the engine cooling may not be impaired.
- The guidelines of the equipment manufacturer for the compatibility with the base vehicle should be observed.
- The Owner's Manual and the maintenance manual for the ancillaries should be handed over when the vehicle is delivered.

2.6 Engine peripherals/drive train

In the event of modifications to noise-relevant components such as the engine, exhaust system, tyres, air intake system, etc., noise measurements shall be carried out acc. to EC Directives. The permitted values are not allowed to be exceeded.

The national regulations and directives apply.

Components for sound insulation that are installed as standard are not allowed to be modified or removed (see also chap. 2.4.4 "Acoustic insulation").

2.6.1 Engine/powertrain components

No modifications to the engine air intake system are permitted.

Subsequent solutions regarding engine speed control are not possible.

Modifications to the cooling system (radiator, radiator grille, air ducts, etc.) are not permitted.

Keep cooling air intake areas clear.

2.6.2 Drive shafts

The correct configuration and implementation of a modified powertrain prevents noise and vibration, and should only be performed by a company which is qualified to build drive shafts.

Only genuine Volkswagen parts should be used.

2.6.3 Fuel system

No modifications are permitted to the fuel system, and any such modifications may result in invalidation of the vehicle's operating permit.

In the event that the fuel system must be modified, the body builder is solely responsible for the work being carried out correctly, including all the components and materials used.

A new operating permit must be applied for from the registration authority.

Comply with the following points if making any modifications to the fuel system:

- The whole system must be permanently leak-proof in all operating conditions.
- Ensure good quality refuelling if modifications are made to the tank filler pipe, and avoid any siphon effect in the pipe routing.
- All components that come into contact with fuel must be suitable for the particular type of fuel used (e.g. petrol/diesel/ethanol additive, etc.) and the ambient conditions in the installation location.
- Hoses must retain their shape and remain adequately stable throughout the service life, in order to ensure that there is no constriction in the cross section (e.g. 4-layer hoses acc. to DIN 73379-1)
- Multi-ply hoses should be favoured
- Install reinforcing support sleeves at the connections between hose sections so as to prevent any constriction at the clip connection and to guarantee air-tightness.
- At the connections, use spring-type clips which automatically compensate for possible settling behaviour of the material and to maintain the preload. Hose clips with worm threads must be avoided.
- All parts of the fuel filler system must be routed at a sufficient distance from moving parts, sharp edges and components at high temperature, in order to avoid damage.
- Vehicles with a petrol engine have their activated charcoal container located at the front on top of the fuel tank.
- The position and attachment of the activated charcoal container are not allowed to be modified.
- Do not attach heat-conducting components or components that restrict the installation space.
- Modifications to the fuel pump, fuel line length and fuel line routing are not permitted. Modifications to these mutually matched components can impair the function of the engine.
- Modifications to the body in the area of the fuel tank require the fuel tank to be removed first.

- If the body builder replaces the standard tank with a different fuel tank, make certain that the ground clearance with the new tank is no less than with the standard one.
Exceptions are possible for vehicles for special applications (e.g. vehicles for transporting people with disabilities). Please contact us (see chapter 1.2.1.1 Contact in Germany and 1.2.1.2 International contact).

Comply with the workshop manuals of Volkswagen AG.

Information

Volkswagen AG workshop manuals and circuit diagrams can be downloaded from the Internet at erWin* (Electronic Repair and Workshop Information from Volkswagen AG):

<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

2.6.4 Exhaust system

Modifications to the exhaust system up to the main silencer and in the area of the components for exhaust post-treatment (diesel particulate filter, catalytic converter, lambda probe, etc.) are never permitted.

If a modification is required to the exhaust system for the add-on/removal/conversion nevertheless, this can have effects which are relevant to registration. Please contact us in advance regarding the scope of your conversion so that we can advise you.

We recommend that you use VW genuine parts and comply with the workshop manuals of Volkswagen AG.

Information

You will find further information on installation and removal of the exhaust system on the Internet at erWin* (Electronic Repair and Workshop Information from Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

Information

Country-related regulations and guidelines shall be complied with

Exceptions require the approval of Volkswagen AG before the conversion, and shall be documented in a registration report detailing the modifications and adjustments made.

Please contact us before starting your conversion (see chap. 1.2.1).

Warning note

Attention! Danger of fire!

The lengths and routings of the exhaust system have been configured optimally with regard to their temperature properties. Modifications may result in relatively high to extreme heating of the exhaust system and the surrounding components (drive shafts, tank, floor pan, etc.).

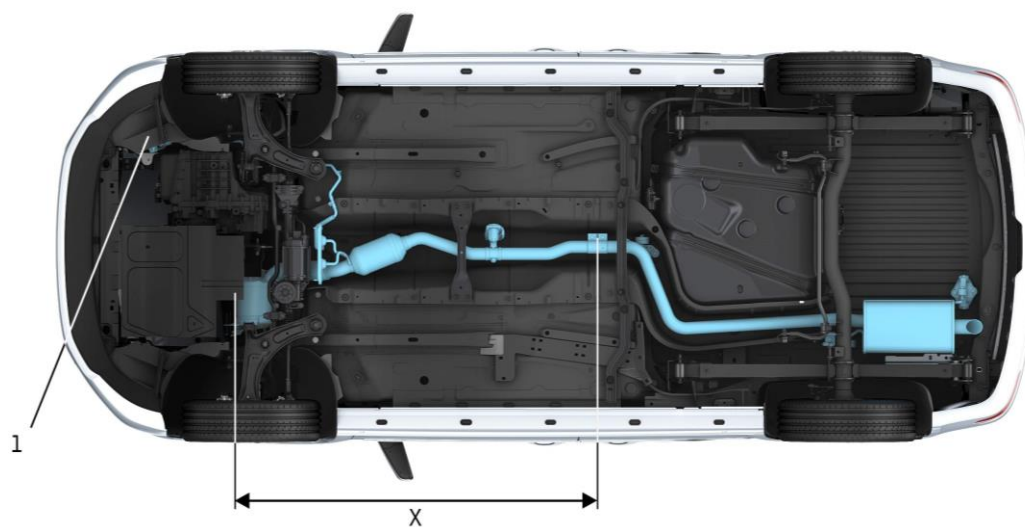


Fig. 1. Caddy exhaust system with SCR system

1 AdBlue® tank

X Area in which modifications are not permitted

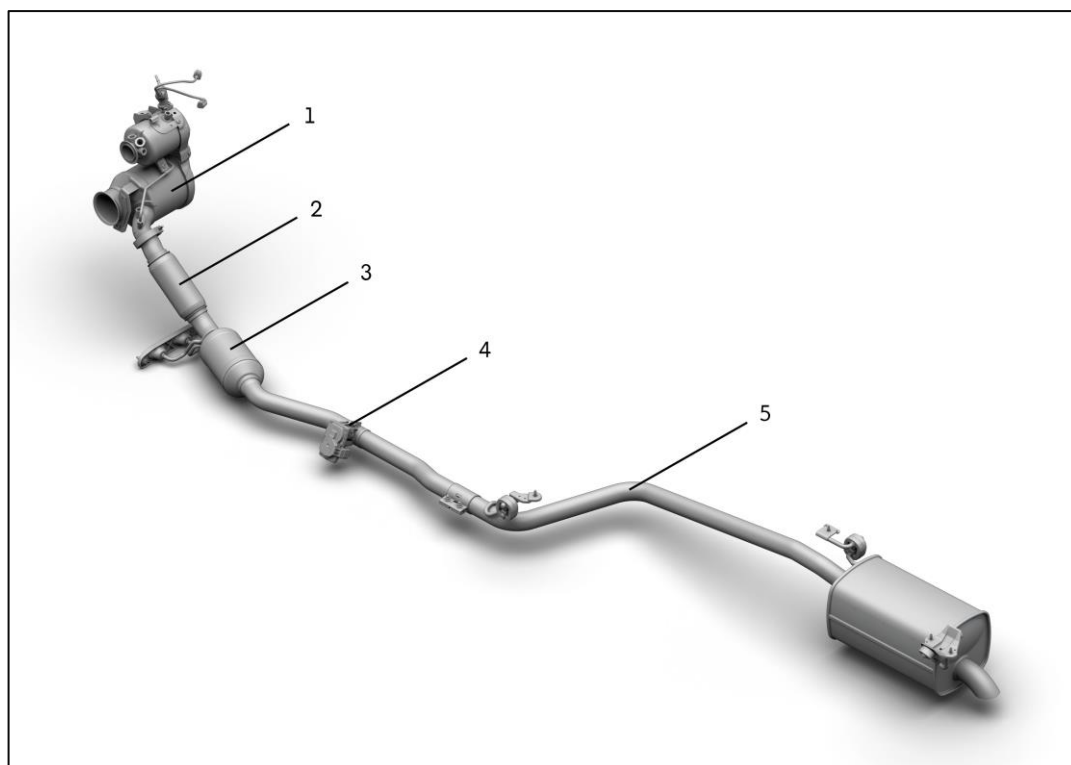


Fig. 2 Emission control with SCR system

1 Emission control module SCR EU6

2 Exhaust system assembly, front

3 Ammonia trap

4 EGR valve

5 Exhaust system assembly, rear

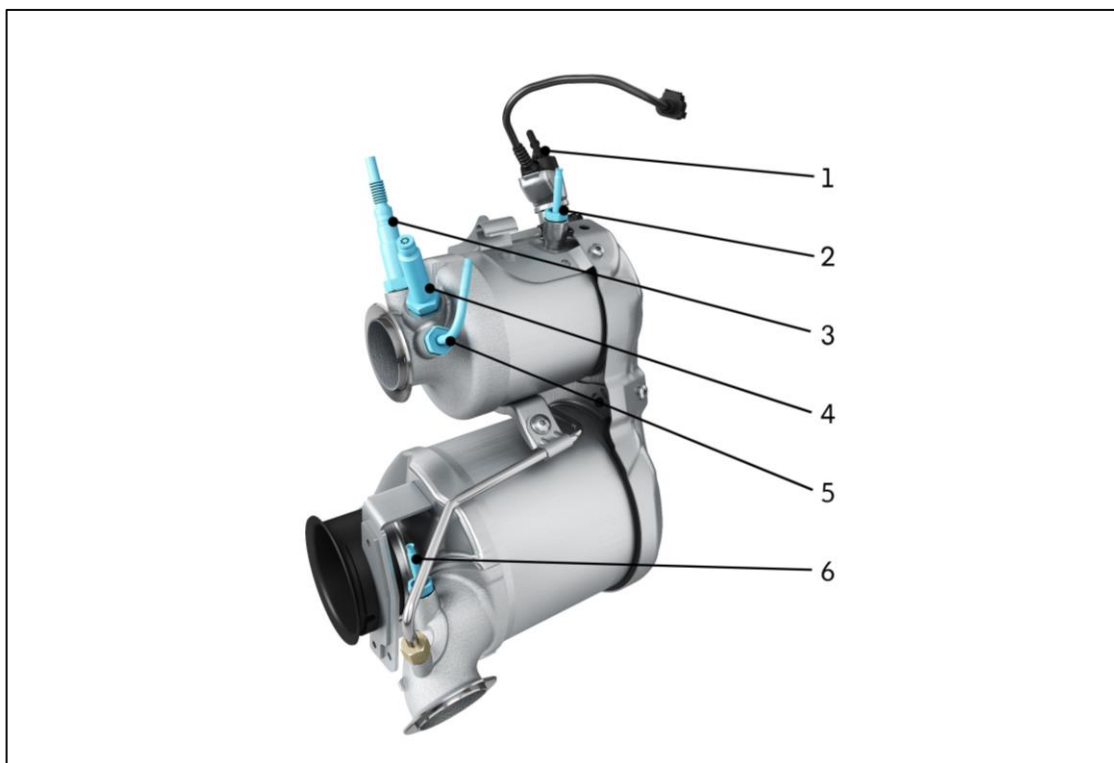


Fig.3 Emission control module for emission control system, left-hand drive vehicle

- 1 SCR metering module
- 2 T5 sensor
- 3 Lambda probe
- 4 NOx sender
- 5 T4 sensor
- 6 T6 sensor

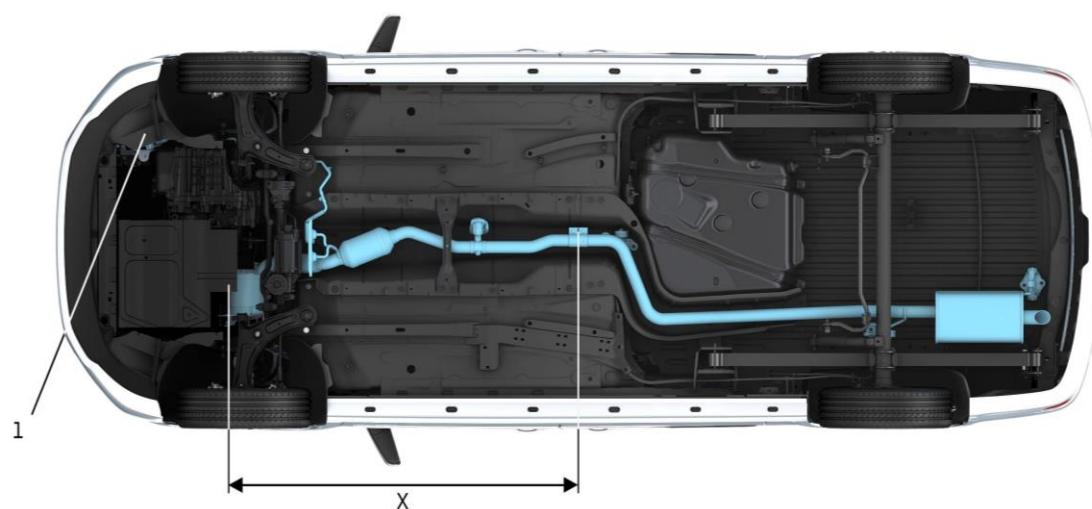


Fig. 4. Caddy Maxi exhaust system with SCR system

- 1 AdBlue® tank
- X Area in which modifications are not permitted

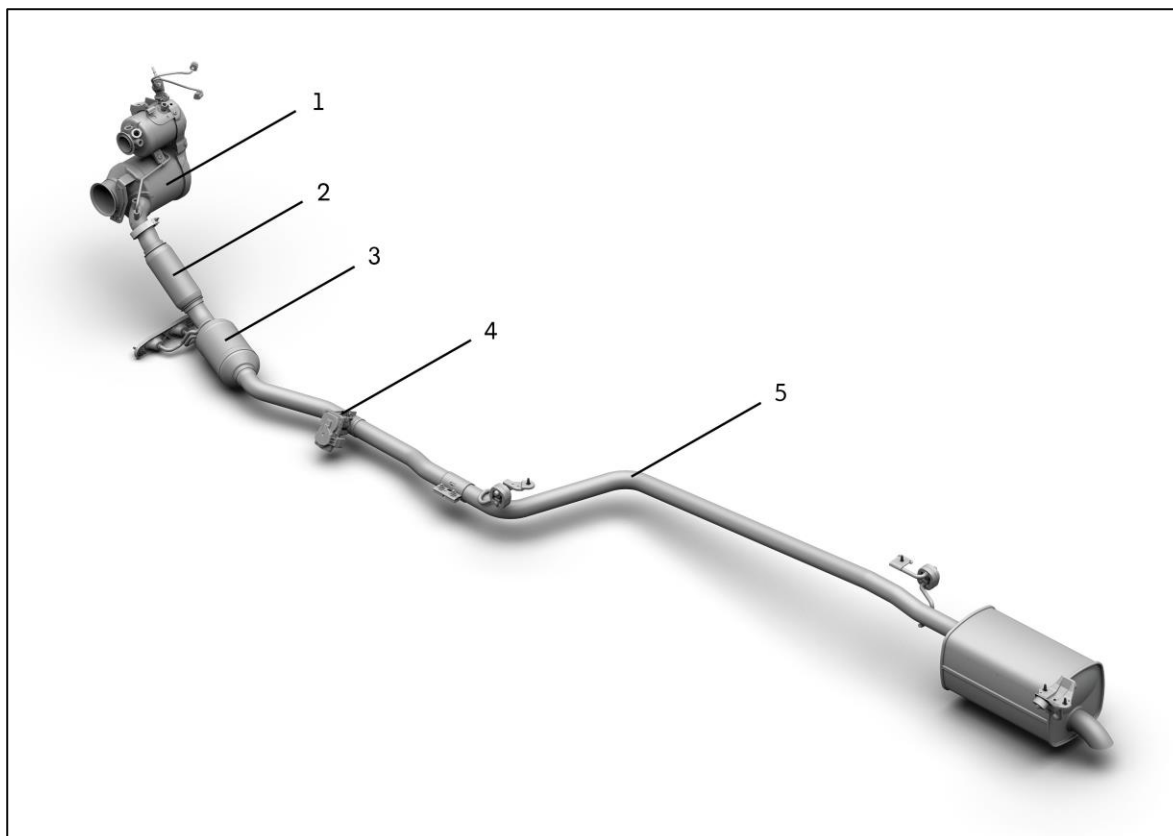


Fig. 5 Emission control with SCR system

- 1 Emission control module SCR EU6
- 2 Exhaust system assembly, front
- 3 Ammonia trap
- 4 EGR valve
- 5 Exhaust system assembly, rear

Modifications to exhaust systems with an SCR system are not permitted under any circumstances. Neither the geometry nor the position of the sensors are allowed to be changed.

If a modification is required to the exhaust system for the add-on/removal/conversion nevertheless, this can have effects which are relevant to registration. Please contact us in advance regarding the scope of your conversion so that we can advise you.

Changes as a result of add-ons or conversions are only possible outside of the SCR emission control area indicated by X (see Fig. 1 Exhaust system with SCR system).

Practical note

When working on lines carrying AdBlue®, comply with the workshop manuals from Volkswagen AG. Otherwise, AdBlue® could crystallise and lead to damage to system components.

2.6.5 SCR system (Euro 6)

To meet EURO 6 emissions regulations for diesel engines, engine are available ex-works with different performance levels, with SCR system.

Selective Catalytic Reduction (SCR) is a process used in automotive engineering for diesel vehicles to reduce emissions.

The SCR catalytic converter selectively converts the nitrogen oxide (NOx) exhaust component into nitrogen and water. This conversion is undertaken using AdBlue®, a synthetically manufactured, aqueous reducing agent. AdBlue® comprises 32.5 per cent high-purity urea and demineralised water. The AdBlue® solution is not mixed with the fuel, but carried in a separate tank.

From here, the AdBlue® is injected continuously into the exhaust gas line in front of the SCR catalytic converter. The AdBlue® reacts with the nitrogen oxides in the SCR catalytic converter and is split into nitrogen and water. The dosing is determined by the exhaust mass flow. The engine management system is informed by an NOx sender after the SCR catalytic converter and ensures exact dosing. The AdBlue® reducing agent is non-poisonous, odourless and water-soluble.

2.6.5.1 Installation position of the AdBlue® tank in the vehicle

The AdBlue® tank is mounted uniformly for all vehicle versions, at the front left in the engine compartment as seen in the direction of travel.



Fig.1 Installation position of the AdBlue® tank in the vehicle

1 AdBlue® tank

The SCR system consists of an AdBlue® tank, line and a metering valve and forms an optimised electrical-hydraulic unit. The location of the AdBlue® tank, the heated metering line and their relative position to the vehicle shall not be changed (see chapter 2.6.4. Exhaust system).

2.6.5.2 Filling the AdBlue® tank

The filling opening of the AdBlue® tank is located at the front left in the engine compartment. The capacity of the AdBlue® tank is approx. 9 litres.



Fig. 2 Filling opening of the AdBlue® tank in the engine compartment

1 - Filler neck of the AdBlue® tank

Practical note

Once a particular residual range is reached, the display on the instrument cluster displays a reminder to top up the AdBlue®.

AdBlue® consumption depends on the individual driving style, and can be up to 1% of fuel consumption.

When the AdBlue® tank is empty, the vehicle can only be driven at reduced power and lower engine torque.

If topping up AdBlue® while the residual range display is active, always add the minimum replenishment amount of 6 litres. An adequate amount of AdBlue® shall be replenished when the residual range reaches about 1000 km, if not sooner.

Never run the AdBlue® tank empty.

Practical note

AdBlue® attacks surfaces such as painted surfaces, aluminium, plastics, clothing and carpets. If AdBlue® is spilled, wipe it up as quickly as possible with a damp cloth and plenty of cold water. Remove crystallised AdBlue® with warm water and a sponge. More information about AdBlue® is available in ISO standards ISO 22241-1 to 4.

Practical note

To ensure the purity of AdBlue®, never reuse AdBlue® that has been extracted from the reducing agent tank.

Comply with the laws and regulations of the country in question regarding correct storage and disposal.

Information

More information and safety instructions for the SCR system can be found in the owner's manual for your vehicle and the Workshop Manuals of Volkswagen AG on the Internet:

<http://erwin.volkswagen.de/erwin/showHome.do>

2.7 Engine power take-off systems

When planning the special vehicle, select the equipment of the base vehicle according to the requirements of the future application (see chap. 1.5.1 "Selecting the base vehicle").

You can optimise your base vehicle in advance for the conversion by selecting the following optional equipment items:

- More powerful alternator (see chapter 2.5.5.)
- Upgraded battery (see chapter 2.5.4.)
- Electrical interface for special vehicles (see chap. 2.5.3)

2.7.1 Compatibility with base vehicle

If retrofitting or renewing ancillaries such as the refrigerant compressor, ensure that these are compatible with the base vehicle.

It is also essential to comply with the following points:

- Vehicle parts and their function should not be impaired by the installation of an air conditioning system.
- The capacity of the battery and power supplied by the alternator must be dimensioned sufficiently.
- Additional fuse protection of the air-conditioning system circuit (see chap. 2.5.2.1 "Electrical wiring/fuses").
- The refrigerant compressors should be mounted on the provided assembly carriers.
- The weight of the ancillary is not allowed to exceed the weight of the series production refrigerant compressor (see chap. 2.7.5.2).
- The diameter and position of the drive pulley for the ancillary must correspond with that of the original refrigerant compressor. (see Fig. 2.7.5.3)
- There shall be adequate space for operating the ancillary.
- The track position of the poly V-belt must be identical to the original and the poly V-belt specifications must be observed (see chap. 2.7.5.4).
- The specifications for the pulleys must match the specifications for the poly V-belt exactly (identical width and number of grooves, e.g. 6PK).
- To ensure the belt is guided properly, **"shouldered washers" (with leading edge) must be used.**
- Ensure that lines (brake hoses/cables and wires) are routed correctly.
- The accessibility of the ancillaries installed and simple maintenance possibilities may not be impaired.
- The owner's manual and the maintenance manual for the ancillaries should be handed over when the vehicle is delivered.
- The necessary air supply and the engine cooling may not be impaired.
- When compact systems (evaporator, condenser and fan) are mounted on the cab roof, the permitted roof loads may not be exceeded (see chap. 2.3.1 "Maximum roof loads").
- Attachments to the roof require a safety certificate from the responsible department (see chap. 1.2.1).
- If the standard refrigerant system is modified, the fill volumes of refrigerant and refrigerant oil must be redefined and indicated accordingly on a plate in the vehicle.
- In order for a safety certificate to be issued, it is necessary to submit documentation relating to the design of the additional auxiliary drives, specifying the tolerance position, to Volkswagen AG.
- Standard dynamic belt tensioners with spring/shock absorber systems should always be used. Rigid belt tensioning elements are not allowed to be used.
- It is of great importance that the dynamic properties of the belt drive should be investigated in operation, or ideally that a belt dynamics measurement should be performed.

Practical note

Please note that subsequent modifications to the factory-fitted air conditioning system by the body builder are solely the responsibility of the body builder. In such cases, Volkswagen is unable to make any statement about the lubrication of the compressor and the effects on its service life.

As a result, Volkswagen AG does not offer any warranty for the compressor in this case.

In order for the warranty to be retained, it would be necessary for an extensive measurement of the oil circulation in the refrigerant circuit to be carried out.

Practical note

In vehicles without air conditioning, it is necessary to recode the engine control unit when an ancillary is retrofitted.

2.7.2 Retrofitting air conditioning system

To retrofit air conditioning systems, we recommend the "regulated air conditioning system" PR no. KH6 (Climatic air conditioning system) or the system with PR no. 9AD ("Climatronic air conditioning system") that you can buy ex works as optional equipment and use of the genuine refrigerant compressor:

Engine designation		Air-conditioned area	Refrigerant compressor type	Displacement [cm ³]	Component no.
Petrol (EU6)	1.2l TSI 62kW	Cab and passenger compartment	DENSO-6SES14	140	5Q0.820.803.F
	1.4l TSI 92kW		DELFI 6CVC140		5Q0.820.803.D
	1.4l TGI BM 81 kW		SANDEN 07PXE14		5Q0.820.803.E
Diesel (EU6)	2.0l TDI 75kW	Cab and passenger compartment	DENSO-6SES14	140	5Q0.820.803.F
	2.0l TDI 90 kW		DELFI 6CVC140		5Q0.820.803.D
	2.0l TDI 110 kW		SANDEN 07PXE14		5Q0.820.803.E
Diesel (EU5)	2.0l TDI 55kW	Cab	SANDEN 07PXE14	140	5K0.820.803.
	2.0l TDI 75kW		DELFI 6CVC140		5K0.820.803.A
	2.0l TDI 81kW	Cab and passenger compartment	SANDEN 07PXE16	160	1K0.820.808.F
	2.0l TDI 103kW				

If other air conditioning systems are to be retrofitted, the guidelines from the equipment manufacturer and for the system components should be observed. The body builder is then solely responsible for operating and road safety.

Retrofitting or renewal of ancillaries such as the refrigerant compressor is only possible instead of the genuine refrigerant compressor in the main belt track. (see chap. 2.7.1 "Compatibility with base vehicle" and chap. 2.7.5. "Genuine refrigerant compressor specification")

2.7.3 Preparation for load compartment cooling (fresh produce vehicles)

A preparation for load compartment cooling is available ex-works under order no. ZX9 (F0J) as optional equipment.

It is based on the "9AD" air conditioning system with the large externally controllable refrigerant compressor SANDEN-7PXE16 in the case of diesel engines.

Furthermore the ZX9 specification package uses increased engine cooling (double fan 220 W+300 W) to allow maximum cooling output even at low speeds. It is the ideal preparation for retrofit load compartment cooling systems above zero degrees or load compartment climate control by body builders, e.g. for fresh produce vehicles.

This optional equipment ZX9 can be ordered for the Caddy panel van.

Practical note

On BlueMotion vehicles you should also note that the load compartment cooling system must be integrated into the BMT function so that shut-down of the engine is prevented during the cooling process (cooling system on and load compartment temperature not reached).

For ease of implementation of this requirement, we recommend also ordering the multifunction control unit (IS1).

For further information, see chap. 2.5.3.3

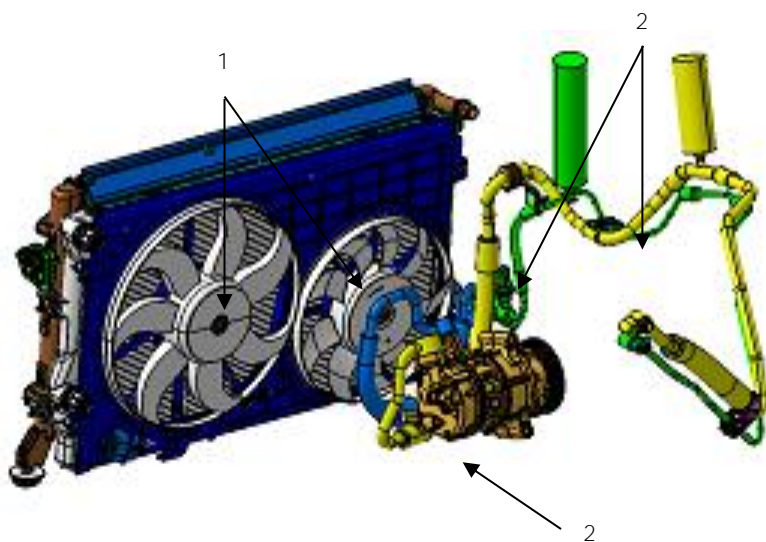


Fig. 1: Load compartment cooling preparation (refrigerated vehicle)

1. Double fan (300 W+220 W)
2. Refrigerant lines
3. Larger refrigerant compressor (Sanden 7PXE16)

2.7.4 Retrofit load compartment cooling system

Retrofitting or replacing ancillaries (for example, refrigerant compressor, pumps etc.) is only possible in place of the original component.

For retrofit load compartment cooling, we recommend using the original refrigerant compressor (see also chap. 2.7.3 "Preparation for load compartment cooling" and chap. 2.7.5 "Specifications of standard refrigerant compressor"):

Engine designation		Air-conditioned area	Refrigerant compressor type	Displacement [cm ³]	Component no.
Petrol (EU6)	1.2l TSI 62kW	Cab and passenger compartment	DENSO-6SES14	140	5Q0.820.803.F
	1.4l TSI 92kW		DELFI 6CVC140		5Q0.820.803.D
	1.4l TGI BM 81 kW		SANDEN 07PXE14		5Q0.820.803.E
Diesel (EU6)	2.0l TDI 75kW	Cab and passenger compartment	DENSO-6SES14	140	5Q0.820.803.F
	2.0l TDI 90 kW		DELFI 6CVC140		5Q0.820.803.D
	2.0l TDI 110kW		SANDEN 07PXE14		5Q0.820.803.E
Diesel (EU5)	2.0l TDI 55kW	Cab and passenger compartment	SANDEN 07PXE16	160	1K0.820.808.F
	2.0l TDI 75kW				
	2.0l TDI 81kW				
	2.0l TDI 103kW				

If other refrigerant compressors are to be fitted, the guidelines from the equipment manufacturer and for the system components should be observed. The body builder is then solely responsible for the operating and road safety of the refrigerant compressor and the air-conditioning system.

Compatibility with the base vehicle must be observed without fail (see chap. 2.7.1 Compatibility with base vehicle and chap. 2.7.5 Specifications of genuine refrigerant compressor).

Please also note the information on the working range of the belt tensioner (see chapter 2.7.6 "Installation and removal of the poly V-belt").

Practical note

In vehicles without air conditioning, please note that it is necessary to recode the engine control unit when an ancillary is retrofitted.

2.7.5. Specifications of genuine refrigerant compressor

2.7.5.1 Maximum cooling output

Engine designation		Refrigerant compressor type	Output "L" [kW]	Cooling output "Q" [kW]
Petrol (EU6)	1.2l TSI 62kW	DENSO-6SES14	--- ²⁾	--- ²⁾
	1.4l TSI 92kW	DELFI 6CVC140		
	1.4l TGI BM 81 kW	SANDEN 07PXE14		
Diesel (EU6)	2.0l TDI 75kW	DENSO-6SES14	--- ²⁾	--- ²⁾
	2.0l TDI 90 kW	DELFI 6CVC140		
	2.0l TDI 110kW	SANDEN 07PXE14		
Diesel (EU5)	2.0l TDI 55kW	SANDEN 07PXE16	--- ²⁾	--- ²⁾
	2.0l TDI 75kW			
	2.0l TDI 81kW			
	2.0l TDI 103kW			

2) Figures were not available at the copy deadline.

Information regarding the maximum cooling output of the refrigerant compressor should be obtained from the equipment manufacturer.

2.7.5.2 Weight of the refrigerant compressor

Engine designation		Refrigerant compressor type	Weight [g]
Petrol (EU6)	1.2l TSI 62kW	DENSO-6SES14	4340
	1.4l TSI 92kW	DELFI 6CVC140	4570
	1.4l TGI BM 81 kW	SANDEN 07PXE14	4340
Diesel (EU6)	2.0l TDI 75kW	DENSO-6SES14	4340
	2.0l TDI 90 kW	DELFI 6CVC140	4570
	2.0l TDI 110kW	SANDEN 07PXE14	4340
Diesel (EU5)	2.0l TDI 55kW	SANDEN 07PXE16	5004
	2.0l TDI 75kW		
	2.0l TDI 81kW		
	2.0l TDI 103kW		

2.7.5.3 Pulley diameter of the refrigerant compressor

Engine designation		Refrigerant compressor type	Pulley diameter d [mm]	Diameter of crankshaft drive wheel [mm]	Transmission ratio "I" (Crankshaft/air conditioner compressor)
Petrol (EU6)	1.2l TSI 62kW	DENSO-6SES14 DELFI 6CVC140 SANDEN 07PXE14	Average: 110	Average: 138	1.25
	1.4l TSI 92kW				
	1.4l TGI BM 81 kW				
Diesel (EU6)	2.0l TDI 75kW	DENSO-6SES14 DELFI 6CVC140 SANDEN 07PXE14	Average: 110	Average: 138	1.25
	2.0l TDI 90 kW				
	2.0l TDI 110kW				
Diesel (EU5)	2.0l TDI 55kW	SANDEN 07PXE16	Average: 110	Average: 138	1.25
	2.0l TDI 75kW				
	2.0l TDI 81kW				
	2.0l TDI 103kW				

2.7.5.4 Specification of the poly V-belt

Engine designation		Refrigerant compressor type	Belt specification	Part number
Petrol (EU6)	1.2l TSI 62kW 1.4l TSI 92kW 1.4l TGI BM 81 kW	DENSO-6SES14 DELFI 6CVC140 SANDEN 07PXE14	6PK-1005	04E.145.933.R
Diesel (EU6)	2.0l TDI 75kW 2.0l TDI 90 kW 2.0l TDI 110kW	DENSO-6SES14 DELFI 6CVC140 SANDEN 07PXE14	06PK-1026	03L.260.849.C 03L.260.849.D
Diesel (EU5)	2.0l TDI 55kW 2.0l TDI 75kW 2.0l TDI 81kW 2.0l TDI 103kW	SANDEN 07PXE16	6PK-1070	03L.903.137

2.7.5.5 Connection dimensions of genuine refrigerant compressor

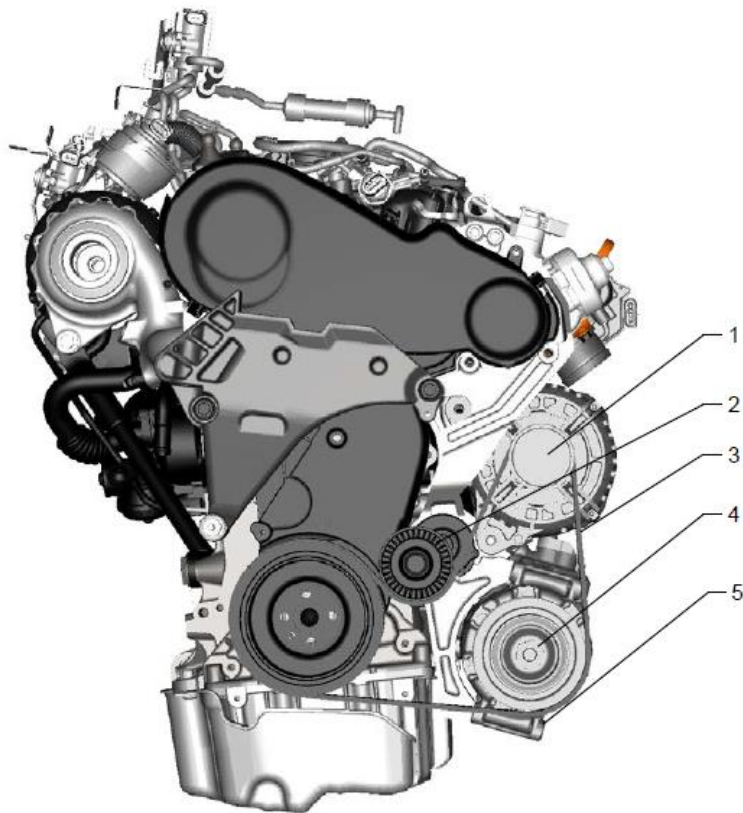


Fig. 2: Poly V-belt drive (TDI engine shown, EU5)

- 1-Alternator
- 2-Belt tensioner
- 3-Poly V-belt
- 4-Air conditioner compressor
- 5-Bolt with washer

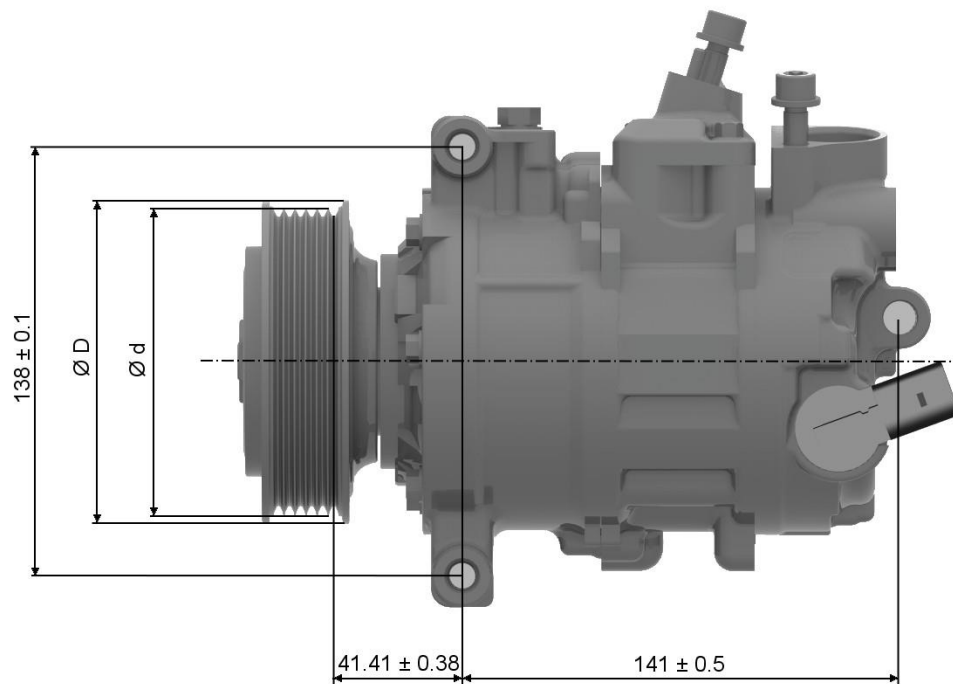


Fig. 3: Dimensions of refrigerant compressor, pulley diameter 110 mm (side view)

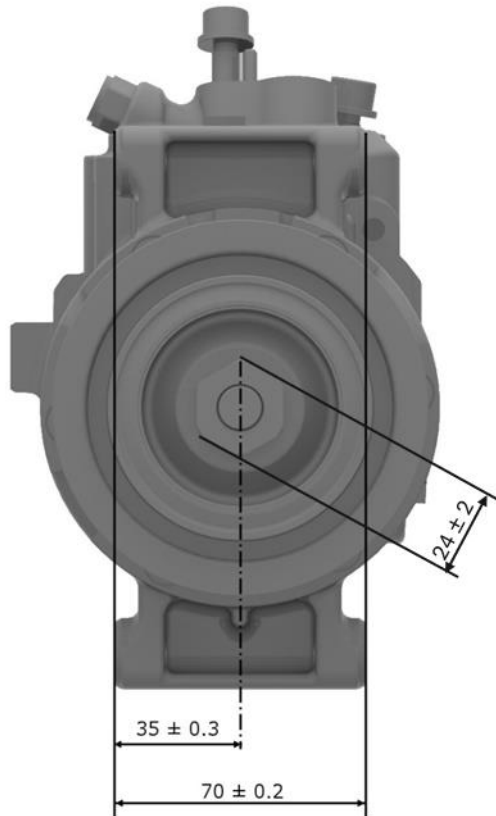


Fig. 4: Connection dimensions of air conditioner compressor (front view)

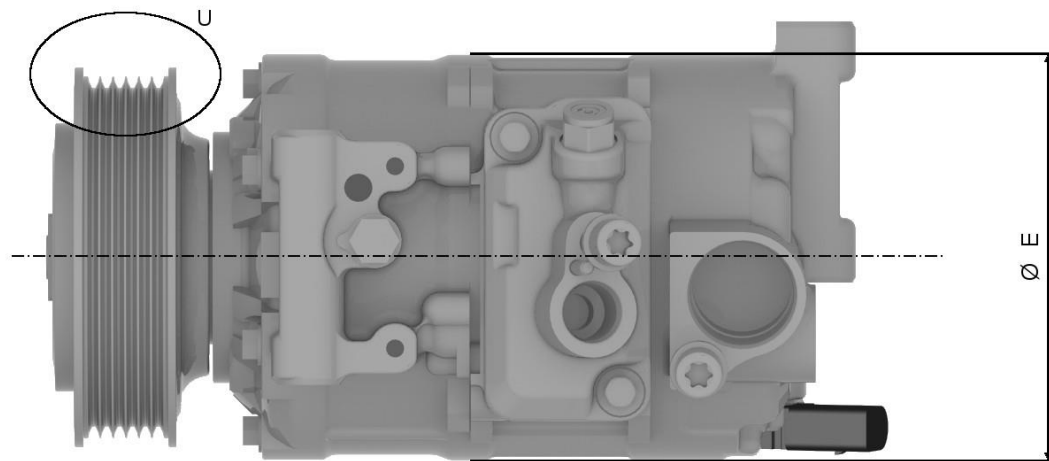


Fig. 5: Connection dimensions of refrigerant compressor (view from above)

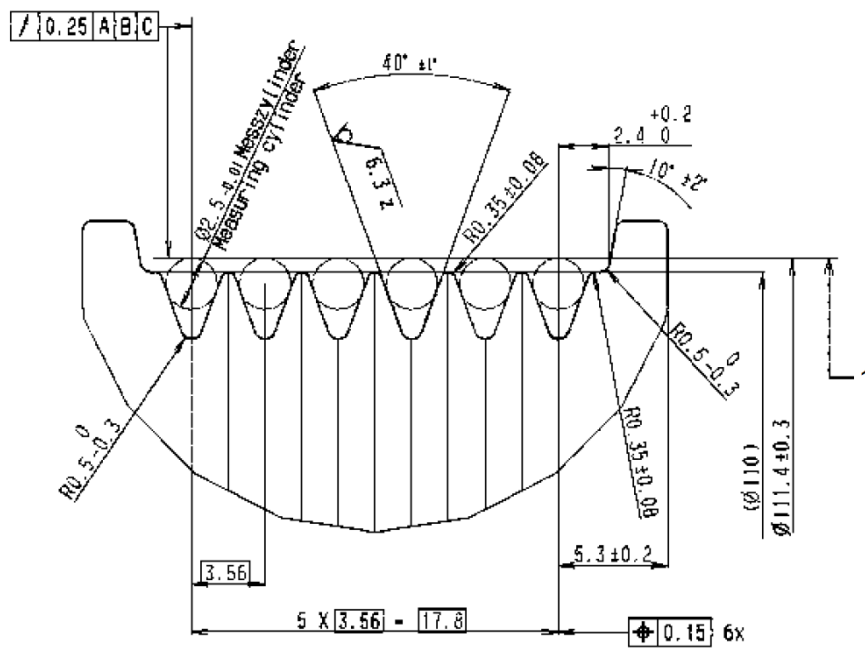


Fig. 6: Detail U - refrigerant compressor drive pulley, pulley diameter 110 mm

1-Diameter deviation between the grooves max. 0.2 mm

Engine designation		Refrigerant compressor type	Displacement [cm ³]	d [mm]	D max [mm]	E max [mm]	Number of Grooves
Petrol (EU6)	1.2l TSI 62kW	DENSO-6SES14	140	Average: 110	Average: 116.6	Average: 114	6
	1.4l TSI 92kW	DELFI 6CVC140			Average: 114	Average: 120	
	1.4l TGI BM 81 kW	SANDEN 07PXE14			Average: 113	Average: 115	
Diesel (EU6)	2.0l TDI 75kW	DENSO-6SES14	140	Average: 110	Average: 116.6	Average: 114	6
	2.0l TDI 90 kW	DELFI 6CVC140			Average: 114	Average: 120	
	2.0l TDI 110kW	SANDEN 07PXE14			Average: 113	Average: 115	
Diesel (EU5)	2.0l TDI 55kW	SANDEN 07PXE16	160	Average: 110	Average: 113	Average: 124	6
	2.0l TDI 75kW						
	2.0l TDI 81kW						
	2.0l TDI 103kW						

Please observe the installation and removal regulations of Volkswagen AG when performing conversions.

Information

For detailed instructions about the installation and removal, for example, of the poly V-belt, refer to the Workshop Manuals of Volkswagen AG on the Internet under erWin* (ElectronicRepair and Workshop Information from Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

2.7.6 Installation and removal of the poly V-belt

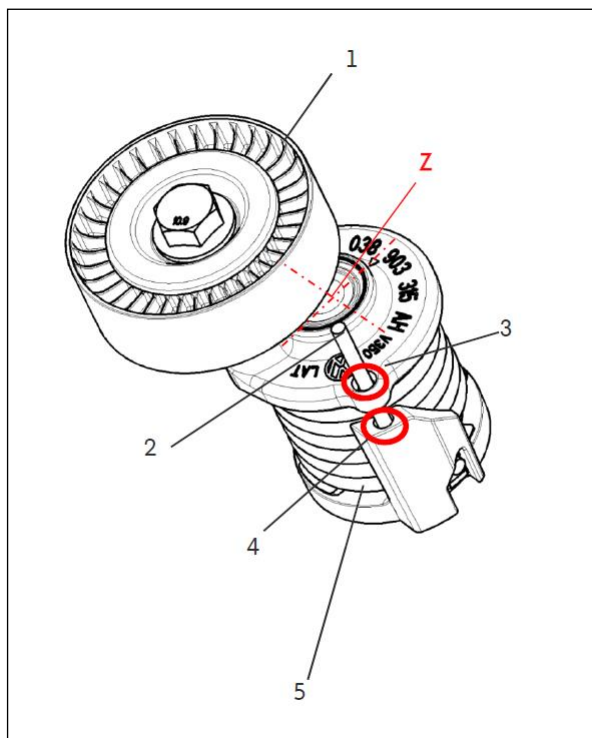


Fig.7: Belt tensioner

- 1 - Belt tensioner
- 2 - Locking pin
- 3 - Moveable eye
- 4 - Fixed eye
- 5 - Spring
- Z - Midpoint of the central bolt

2.7.6.1 Removal of the belt

In order to remove the belt, it is necessary to turn the moveable eye "3" clockwise using a suitable tool until it overlaps with the fixed eye "4", and secure it with a locking pin "2" (d = 5 mm). This means the spring pack of the belt tensioner is tensioned, the tension of the belt is removed and the belt can be removed.

This position of the tensioner is referred to below as the unlocking position.

2.7.6.2 Installation of the belt

For installation, the belt must be guided over all units and reversing pulleys, and then finally placed over the belt tensioner. After the locking pin has been removed (which is only permitted in installed condition), the spring is released and turns the pulley anticlockwise and transfers the clamping force to the belt. You must ensure that the belt tensioner can operate within its defined working range by using a suitable belt length (in particular if this does not correspond to the initial equipment status). The position of the tensioner in the installed position at rest (engine off) is referred to below as the normal position. From this position, the belt tensioner is capable of compensating for tolerances and belt stretching due to temperature, etc. At the lower limit stop, the spring pack is slackened and cannot exert tension on the belt any longer.

2.7.6.3 Working range of the belt tensioner:

The following display shows various reference points of the working range and should make it easier to check that the belt tensioner is in the correct position. This diagram does not provide any statement relating to the safety of a belt drive that is different from the series production status.

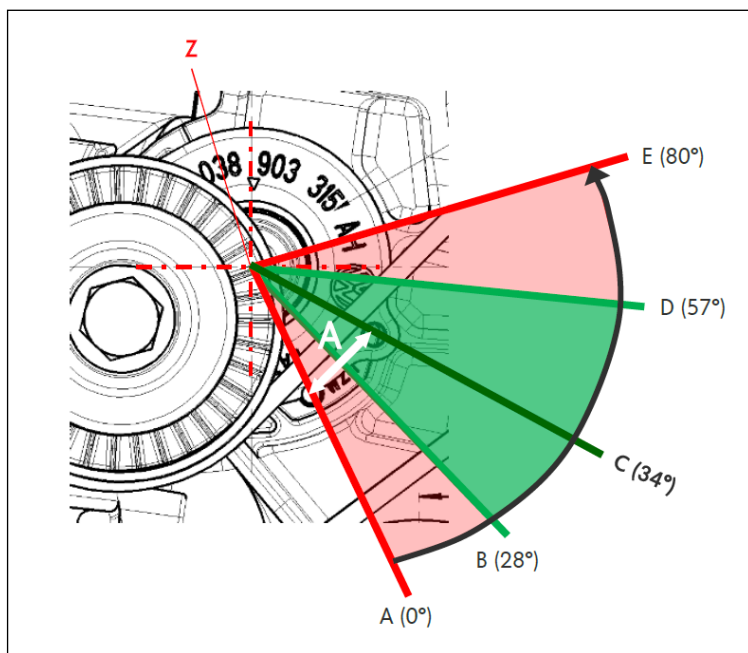


Fig. 8: Working range of the belt tensioner

A - Locking position 0° (overlap)

B - Start of working range 28°

C - Nominal position 34° (rated)

D - End of working range 57°

E - Bottom stop 80°

Angle [°]	Distance A [mm]	Position of the belt tensioner
0	0	Locking position (overlap) – A
28	14.5	Start of working range –B
34	17.5	Nominal position (NOM) – C
57	50.3	End of working range - D

The angle is measured between the point of overlap (fixed eye) and the movable eye.

In the nominal position, it is 34°. It is not allowed to exceed or fall below the working range of 28°-57°. For distance A, it is necessary to specify the actual dimension between the fixed eye and the moveable eye, assuming the moveable eye is in the working range. The distance in the nominal position is 17.5 mm.

Information

You will find further information in the Volkswagen AG Workshop Manuals on the Internet at erWin* (Electronic Repair and Workshop Information from Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

2.7.4.4 Belt routing

The function of the belt tensioner can be significantly impaired if the belt routing is changed from that of series production and passed over the idler roller of the belt tensioner. The bisector (1) between the arriving and departing sides of the belt should be almost at right angles ($\beta \approx 90^\circ$) to the lever arm of the belt tensioner in the working area. (Fig. 9)

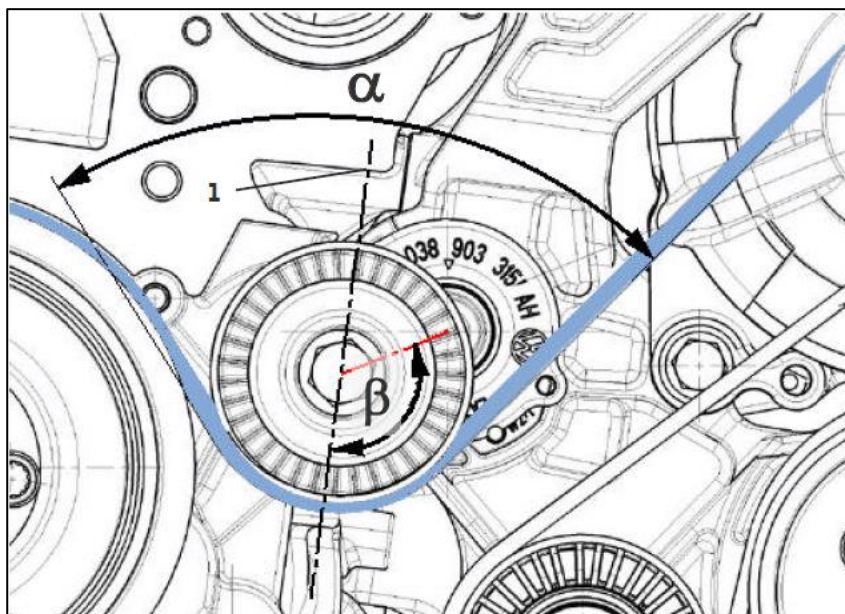


Fig. 9: Belt routing around the belt tensioner

1 - Bisector of the arriving and departing sides of the belt around the belt tensioner

α - Angle of the belt routing around the belt tensioner

β - Angle between the bisectors of the arriving and departing sides of the belt in relation to the lever arm of the belt tensioner.

Information

You will find further information in the Volkswagen AG Workshop Manuals on the Internet at erWin* (Electronic Repair and Workshop Information from Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

2.8 Add-ons/units

2.8.1 Roof rack

Roof loads raise the centre of gravity of the vehicle and lead to a high dynamic axle load shift. Also, there is greater body lean when driving on rough roads and when cornering. The driving characteristics are significantly impaired.

For this reason, roof loads should be avoided if at all possible.

Where possible, the fixed points on the roof should be used for attaching racks (see the manufacturer's installation instructions!). Depending on the load distribution, it is necessary to have at least 2 base supports which should be fitted in the areas of the pillars wherever possible.

There are 3 mounting points in the roof on each side in the Caddy (SWB) as standard (see Fig. 1).

There are 4 mounting points in the roof on each side in the Caddy Maxi as standard (see Fig. 2).

Various roof carriers are available ex-works as optional equipment.

For more information, refer to the sales documents of Volkswagen AG.

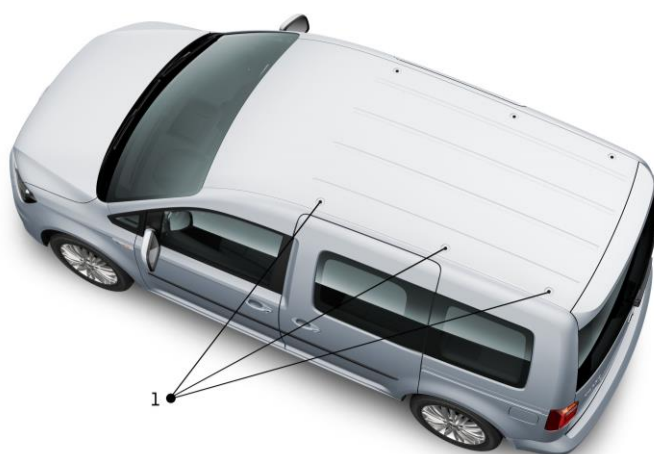


Fig. 1 Caddy mounting points

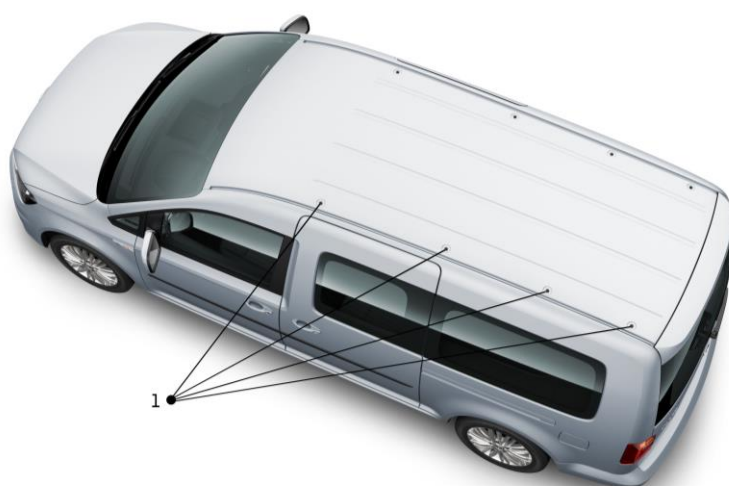


Fig. 2 Caddy Maxi mounting points

On request, body builders can receive drawings in the formats Catia V.4 and TIFF.

Please contact us before starting your conversion (see chap. 1.2.1)

2.8.2 Rear luggage carrier/rear ladders

The rear luggage carrier or the rear ladder must be configured so that no static or dynamic loads are exerted on the bumpers after they have been fitted. The maximum load on the tailgate is 45 kg.

2.8.3 Towing brackets/clearance acc. to DIN 74058

Only towing brackets approved by the factory are permitted to be used as hitches.

2.8.3.1 Maximum trailer weights*

Caddy

Vehicle type	Engine type	Braked [kg]	Unbraked [kg]
Panel van	Depending on engine	1200-1500	630-750
Window van	Depending on engine	1200-1500	670-750

with 12% gradeability depending on engine.

Caddy Maxi

Vehicle type	Engine type	Braked [kg]	Unbraked [kg]
Panel van	Depending on engine	1200-1500	670-750
Window van	Depending on engine	1200-1500	700-750

with 12% gradeability depending on engine.

* for standard load rating (OJ2)

The maximum permitted draw bar weight is 80 kg for the panel van and 75 kg for the window van.

2.8.3.2 Clearance acc. to DIN 74058

When fitting a towing bracket, the clearance dimensions according to DIN 74058 must be observed.

Unspecified details shall be selected in a reasonable manner.

The test of dimensions and angles shall be undertaken with suitable length and/or angle measuring instruments.

2.8.3.3 Retrofitting a towing bracket

When retrofitting a towing bracket, the regulations of the particular country, ECE regulation

ECE-R 55 and EC Directive 94/20/EC in their most up-to-date versions must be observed.

The vehicle shall be presented to a motor vehicle test centre with responsibility for this matter.

2.9 Lifting the vehicle

With lifting platforms:

The vehicle is only allowed to be raised at the lifting points provided (see owner's manual).

With a jack:

See the owner's manual for the procedure and lifting points for the jack on all vehicle variants (in all chassis without standard add-ons). The body builder is responsible for making sure that the jack corresponds to the weight of the body. The hard points for lifting platforms on the ladder frame can be used (with large pads) and shall remain accessible even after the conversion.

Alternative hard points should be created if this is not possible.

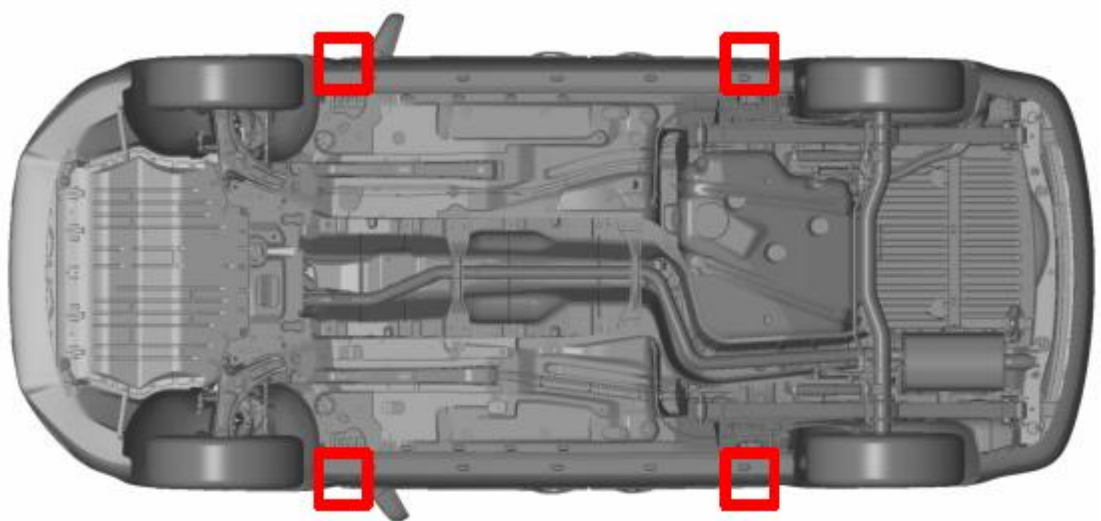


Fig. 1: Positions for the jack

3 Modifications to closed bodies

3.1 Body-in-white/bodywork

Comply with the following instructions with regard to mounting bodies and making conversions on the vehicle:

- Changes to the body are not allowed to impair the function and strength of units and operating devices of the vehicle, neither may they reduce the strength of weight-bearing parts.
- During vehicle conversions and installation of bodies, it is not permitted to make any modifications which impair the function and freedom of movement of the suspension (e.g. for maintenance and inspection work) or the accessibility to the same.
- Interventions in the cross-member structure from the front end to the rear of the B-pillar are not allowed.
- Modifications in the roof area and on the rear gate are not allowed.
- The clearance for the fuel filler neck as well as for the fuel tank lines and fuel lines shall be maintained.
- Avoid corners with sharp edges.
- Neither drilling nor welding is permitted on the A and B-pillars.
- If cutting is performed on the C and D-pillars (rear gate), including the corresponding roof bows, then rigidity shall be restored by means of additional components.
- The permitted axle loads are not allowed to be exceeded.
- Holes in the frame longitudinal member are the result of the production process and are not suitable for attaching add-ons, bodies, installations and conversions; otherwise, the frame may be damaged.
- The standard tank cap is not allowed to be removed or covered with a part which creates a block.

3.1.1 Side wall cut-outs

The body and underbody form a self-supporting unit. Weight-bearing parts of this self-supporting unit are not allowed to be removed without replacement.

The body and chassis frame form a self-supporting unit in the panel van.

Windows, roof hatches and air inlets and outlets shall be surrounded by a stable frame.

This frame shall be connected to other body elements by means of a force-locking connection.

Warning note

It is not permitted for the outer roof frame to be machined on vehicles with side head airbags!

Information

You will find further information on body assembly work on the Internet at erWin* (Electronic Repair and Workshop Information from Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

3.1.2 Subsequent installation of windows

Subsequent installation of windows is complicated and costly. It is therefore advisable to order the desired windows ex works (see delivery schedule).

If windows are to be installed subsequently, proceed in accordance with the Workshop Manual for Caddy 2011> (body assembly instructions, exterior, section 64 - Glazing/subsection 5.10 Side window, sliding door, panel van, postal and courier vehicles).

Information

For detailed instructions about the installation and removal of windows, refer to the Workshop Manuals of Volkswagen AG on the Internet under erWin* (Electronic Repair and Workshop Information from Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

Comply with the following points if smaller windows are to be installed:

- The cut-out is only allowed to be made between the pillars.
- No weight-bearing parts are allowed to be cut into or weakened.
- The cut-out must be provided with a continuous frame which has a force-locking connection to the adjacent weight-bearing parts.

3.1.3 Roof cut-outs

Roof cut-outs are only possible between the roof bows and the side roof frames. For details, see Figs. 1 and 2 below.

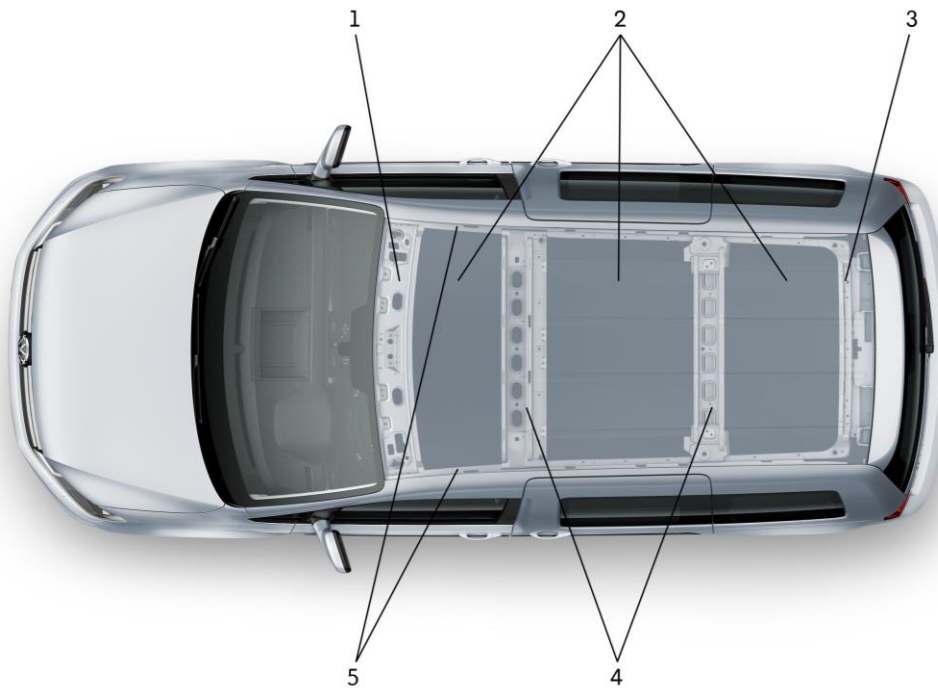


Fig.1: Caddy

- 1 Front roof frame
- 2 Areas for roof cut-outs
- 3 Rear roof frame
- 4 Roof bow
- 5 Roof frame right/left

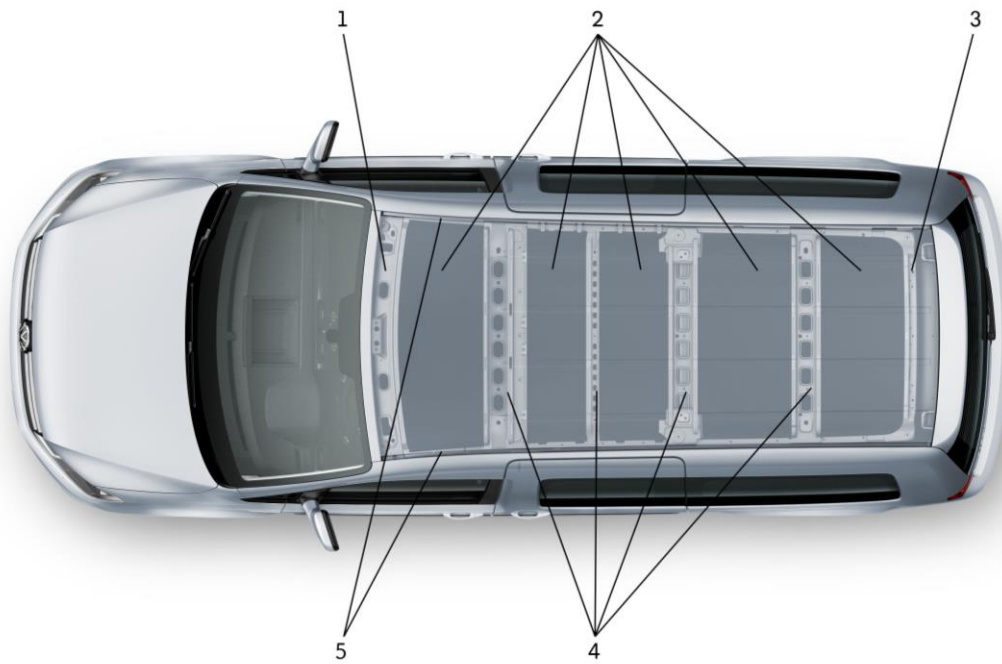


Fig. 2 Caddy Maxi

- 1 Front roof frame
- 2 Areas for roof cut-outs
- 3 Rear roof frame
- 4 Roof bow
- 5 Roof frame right/left

Practical note

The roof cut-out shall be provided with an all-round frame having a force-locking connection with the adjacent, weight-bearing parts (cross strut and roof frame).

Information

You will find further information on body assembly work on the Internet at erWin* (Electronic Repair and Workshop Information from Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

3.1.4 Modifications to the roof of panel van/window van

The following points shall be observed if modifications are made to the roof structure of a panel van/window van:

- The all-round concept shall be retained, and adequate replacement rigidity shall be guaranteed.
- Impairments to the function of the rain/light sensor shall be avoided.
- Attachments similar to the roof rack are possible for subsequent attachment of add-ons.
- The vehicle constraints (strength, overall vehicle dimensions, registration, etc.) shall be considered with regard to attachments on the roof panel. (This does not apply to area illumination and spotlights.)
- The replacement rigidity of the new roof structure shall correspond to that of the standard roof.
- Following all conversion and installation work on the vehicle, surface and corrosion protection shall be applied to the affected points.

Information

You will find further information on body assembly work on the Internet at erWin* (Electronic Repair and Workshop Information from Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

3.1.5 Modifying the partition wall/forced ventilation

Partition walls do not have any weight-bearing function. Partitions in the panel van can be complete or partial.

The following partitions are available ex works as optional equipment for the panel van:

PR no.	Description
ZT4	Partition wall (tall) with windows
ZT2	Partition wall (tall) with grille, for vehicles with up to 730 kg load rating, only for Caddy SWB
ZT6	"Flexseat Plus package" max. 800 kg load rating

You can obtain more information on optional equipment depending on the vehicle model from your Volkswagen customer service and from the Volkswagen Commercial Vehicles website at:

<http://www.volkswagen-nutzfahrzeuge.de/de/downloads.htm>

If installing non-factory-fitted partitions, make sure that the selected forced ventilation cross sections correspond to those of the factory-fitted partition.

This is important in several respects:

- Closing comfort of the doors
- Possible flow rate of the heating blower
- Pressure equalisation on airbag deployment

The installed partition should have a type plate for clear identification.

If the partition is located behind the 1st seat row (driver's compartment), bear the possible seat adjustment range in mind.

If the non-VW partition is located behind the 1st seat row (driver's compartment) then the standard bolt-on points and bonding surface should be used if possible. (See chap. 3.1.6 Partition connection points.)

Please note that the new Caddy is equipped on a series-production basis in some equipment variants with side head-protection airbags on the roof side member for the driver, front passenger and for the rear passengers on the outer seats of the second seat row.

Warning note

In vehicles with side head-protection airbags on the roof side member, no add-ons or modifications can be carried out in the area of deployment of the airbags (e. g. dividing walls).

The series-production position of the elements may not be changed. Otherwise, the passengers on the outer seats are no longer protected in the event of a side impact.

You will find further information on the standard contact points as well as installing and removing the standard partition in the Volkswagen AG Workshop Manuals.

Information

Volkswagen AG workshop manuals and workshop information can be downloaded from the Internet at **erWin*** (Electronic Repair and Workshop Information from Volkswagen AG):

<http://erwin.volkswagen.de/erwin/showHome.do>

The partition should be adequately stable and cushioned with regard to acoustic comfort.

The strength of the partition shall be validated according to ISO 27956, irrespective of the country in which the vehicle is to be marketed. (Although validation according to this standard is not legally binding, it is a requirement of the trade association if the vehicle is used for commercial purposes. Given the intention to enter the vehicle in the body builder portal, this strength validation shall be documented even though the partition is categorised as "only relating to the body".)

3.1.6 Partition connection points

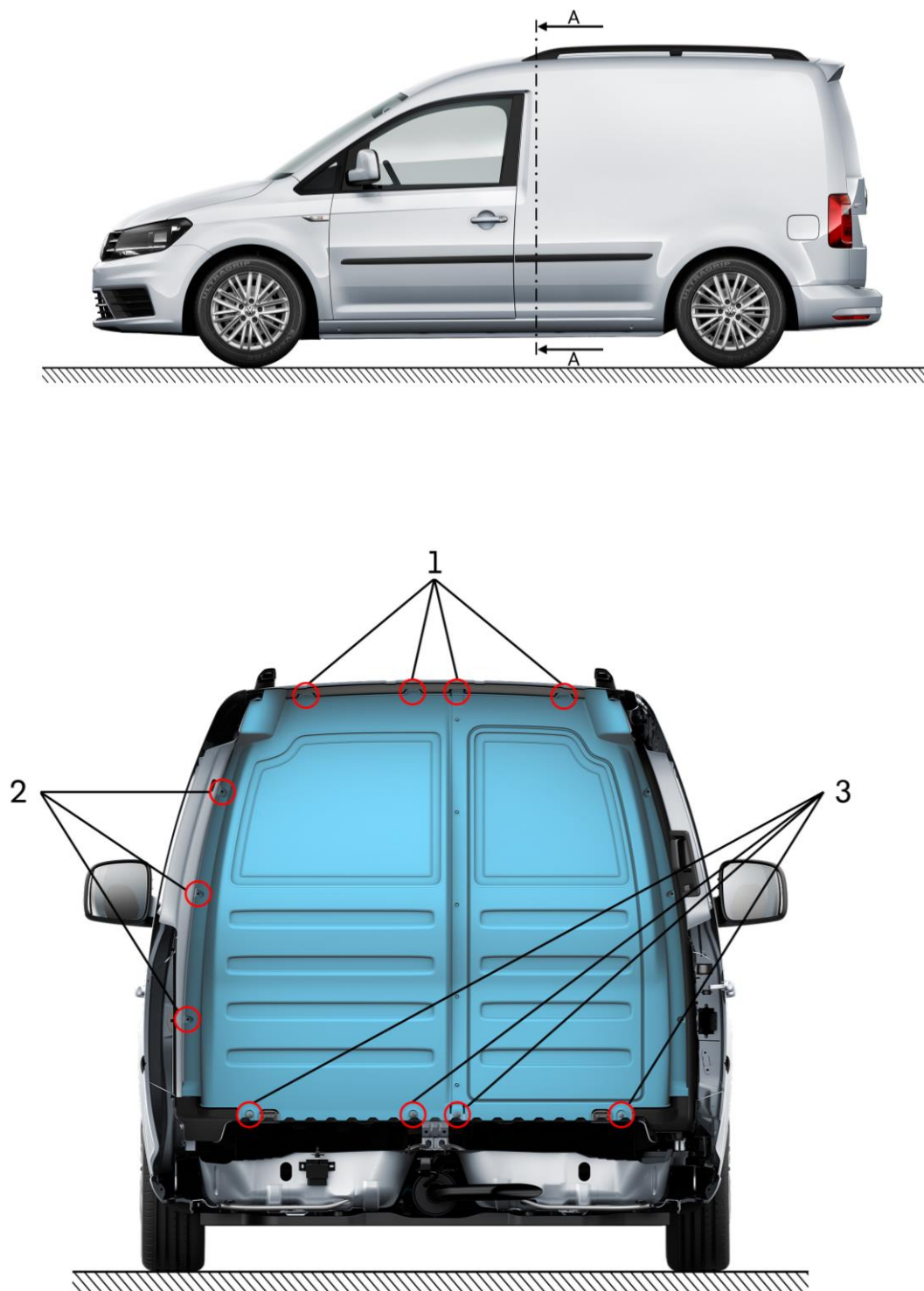


Fig.1: Mounting points for the standard partition (section A-A)

Mounting points on the vehicle for the standard partition:

- 1 - Roof reinforcement middle: 4x square weld nut M6
- 2 - Side panel, left and right each: 3x hexagonal hole WAF 9.7 mm
- 3 - Floor panel 4x notch \varnothing 10 mm

3.2 Interior

The following points shall be observed without fail for conversions:

- The driver and front passenger airbag units, the airbags and belt tensioners are pyrotechnical objects. Their handling, transport and storage are subject to legislation on potentially explosive substances, and the responsible public authority or government agency shall therefore be notified. Purchase, transport, storage, installation and removal as well as disposal are only allowed to be performed by trained personnel in accordance with the corresponding safety regulations.
- Modifications in the cockpit area and above the shoulder line shall be conducted in accordance with the criteria of the head impact tests acc. to ECE-R 21 or 74/60/EEC in the version 2000/4/EC. This applies in particular to the deployment areas of airbags (wood décor, additional installations, mobile phone holders, bottle holders, etc.).
- Painting or surface treatment of the dash panel, steering wheel impact absorber and the tear seams of the airbags is not permitted.
- The permitted centre of gravity position and axle loads are not allowed to be exceeded.
- The interior fitting-out shall be configured with soft edges and surfaces.
- Installations shall be manufactured from flame-retardant materials, and be firmly installed.
- Unhindered access to the seats shall be guaranteed.
- No projecting parts, corners or edges that could cause injuries are allowed to be located in the area of the seats.

3.2.1 Safety equipment

Warning note

In case of interventions by the body builder in the structure of the vehicle, such as

- modifications to the seats and consequently altered kinematics of the occupants in case of a crash
- modifications to the front body
- installations of parts in the vicinity of the exit openings and the deployment range of the airbags. (see owner's manual of the vehicle)
- installation of third-party seats
- modifications to the doors

The safe function of the front airbag, side airbag and belt tensioners is no longer guaranteed. This could result in personal injuries.

No vehicle components that give rise to vibration are allowed to be attached in the vicinity of the airbag control unit or the sensor installation locations.

Modifications to the floor structure in the area of the airbag control unit or the satellite sensors are not allowed either. For information about the deployment zones of the airbags, refer to the owner's manual of the vehicle.

3.3 Add-ons

3.3.1 Accessories

An extensive range of accessories for the Caddy/Caddy Maxi can be obtained from Volkswagen Accessories.

Information

For more information about this topic, refer to:
<http://www.volkswagen-zubehoer.de/>

4 Implementations of special bodies

4.1 Conversions for people with disabilities

Depending of the type of disabilities, a large number of driving aids are available as optional equipment from Volkswagen AG. For more information, please contact your Volkswagen dealership.

Information

For more information about this topic, refer to:

<http://www.volkswagen-nutzfahrzeuge.de/de/kundenloesungen/menschen-mit-behinderung.html>

4.1.1 Base vehicle equipment

When planning the special vehicle, select the equipment of the base vehicle according to the requirements of the future application (see also chap. 1.5.1 Selecting the base vehicle).

Please note that certain conversions are only allowed to be used by people with corresponding entries in their driving licence.

You can optimise your base vehicle in advance for the conversion by selecting the following optional equipment items:

- Up-rated battery and alternator.
- Sector-specific preparations.

Practical note

Permanently installed components increase the kerb weight of the vehicle, as a result of which the suspension compression height on the rear axle is reduced accordingly. If the additional installation solution weighs more than 180 kg, or more than 200 kg in the Caddy Maxi, it is recommended to change over to a specially matched leaf spring (PR no. 2MK*).

* For all engines except LPG, 4MOTION and Ecofuel

Warning note

Please bear in mind that if the permanently installed components are removed then the spring pack PR no. 2MK must be replaced by the standard equipment, otherwise the driving properties might be negatively affected.

4.1.2 Selection of steering rack for conversions for people with disabilities

In the Caddy, Volkswagen offers you power steering with mobility aid (PR no. 1N5) as optional equipment.

The convenient power steering is given a lower steering torque by setting a different mobility characteristic. This has a positive effect, especially at relatively slow driving speeds (parking, urban driving).

4.1.3 Notes on conversion solutions for the wheelchair transporter

- Ensure adequate clearance between the anti-roll bar attachment (projects approx. 20 mm beyond the axle tube) and floor pan even during the dynamic driving test on undulating asphalt road with permitted gross vehicle weight rating and permitted rear axle load.
- If the routing of the exhaust system is modified or if sections of the pipe are cut out, it is necessary to ensure that there are adequate clearances to other components even when the exhaust system expands at operating temperature, and touching is avoided.
- The general certificate of roadworthiness of the whole vehicle will be invalidated if the exhaust system is modified. The wheelchair transporter is classified as a "special purpose" vehicle, which means the approval for the whole vehicle is retained. If a modified rear silencer is used, it is only necessary to provide verification of the noise level during "driving past at accelerated speed" for the vehicle.
- If modifications are made to the exhaust system and the fuel system, it is necessary to ensure adequate protection against fire by fitting heat shields.
- If the rear end is converted in order to create a flat loading ramp for driving the wheelchair in easily, it is necessary to ensure adequate floor clearance in the rear area so that an adequate exit angle can be achieved (e.g. ferry, multi-storey car park) with the permitted rear axle load.
- Any PDC sensors must remain in the original position; the function must be the same as in the standard vehicle.
- The upper securing bolts of the rear axle shock absorbers must still be accessible after installation to allow the shock absorbers to be removed.

Practical note

Please note that no special exhaust systems are offered for disabled conversions from the factory. Modifications to the exhaust system require the approval of Volkswagen AG before the conversion, and shall be documented in a registration report detailing the modifications and adjustments made. (see chap. 2.6.4 Exhaust system)

4.1.4 Notes on installing manual operating devices for the service brake

- Do not modify the brake pedal when installing manual operating devices. Select a clamped solution for connecting the manual operating device.
- The operating travel of the manual operating device must also be sufficient for a blocking braking, with reserve travel for a circuit failure.
- If a manual operating device is used for the accelerator and brake, the standard pedals must be covered by suitable means.

4.1.5 Deactivating airbags

In exceptional cases, e.g. drivers with a disability (entered accordingly in the driving licence), if there is insufficient distance from the steering wheel or if the steering wheel is too small with drivers in a wheelchair (self-drive), and no airbag can be installed, the customer service workshop can also deactivate the driver airbag. For more information, please contact Volkswagen customer service.

Please also comply with the following chapters during your conversion:

- 1.5.1 Selecting the base vehicle
- 2.2.1 Permitted weights and unladen weights
- 2.3.2 Modifications to the body-in-white
- 2.5.2.1 Electrical wiring and fuses
- 2.5.2.3 Retrofitting electrical devices
- 2.5.3 Electrical interface for special vehicles
- 2.5.4 Vehicle battery
- 2.5.5 Subsequent installation of generators
- 3.1 Body-in-white/bodywork.
- 2.6.3 Fuel system
- 2.6.4 Exhaust system
- 3.2.1 Safety equipment

4.2 Refrigerated vehicles

When planning the special vehicle, select the equipment of the base vehicle according to the requirements of the future application. (see also chap. 1.5.1 "Selecting the base vehicle" and chap. 2.7.3 "Subsequent load compartment cooling")

You can optimise your base vehicle in advance for the conversion by selecting the following optional equipment items:

- Up-rated alternator
- Up-rated battery
- Use of the refrigerant compressor provided ex-works for the base vehicle.

A preparation for load compartment cooling is available ex-works under order no. ZX9 (FOJ) as optional equipment for the Caddy panel van.

Notes on the panel van:

- To facilitate repair, accessibility to the components of the door mechanism (e.g. guide rails and hinges) must be ensured.
- Please note that the insulation in the panel van increases the weight of the doors, and therefore also the load on the hinges, carriage and lock systems.

Please also comply with the following chapters as part of the conversion:

- 1.5.1 Selecting the base vehicle
- 2.2.1 Permitted weights and unladen weights
- 2.3.2 Modifications to the body-in-white
- 2.5.2.1 Electrical wiring and fuses
- 2.5.2.3 Retrofitting electrical devices
- 2.5.3 Electrical interface for special vehicles
- 2.5.4 Vehicle battery
- 2.5.5 Subsequent installation of generators
- 2.7.2 Power take-off systems
- 3.1 Body-in-white/bodywork.
- 3.1.4 Modifications to the roof of panel van/window van

Practical note

On BlueMotion vehicles you should also note that the load compartment cooling system must be integrated into the BMT function so that shut-down of the engine is prevented during the cooling process (cooling system on and load compartment temperature not reached). For ease of implementation of this requirement, we recommend also ordering the multifunction(IS1) control unit (IS1). For further information, see chap. 2.5.3.3.

4.3 Shelf installation/workshop vehicles

For shelf and workshop installations, the following points must be observed:

1. Selection of a suitable base vehicle (gross vehicle weight rating, running gear, equipment)
2. Driver's compartment and load compartment should be separated by means of a retaining device (partition, load guard) according to DIN ISO 27956.
3. The maximum permitted weights and axle loads of the base vehicle must be observed (see chap. 2.2.1 and 6.5.)
4. The installation should take place in a way that ensures that the forces induced are evenly distributed.
5. The suitability of the available fastening rings should be checked before they are used to secure items.
6. Assembly, maintenance and owner's manuals specifying the load limits should accompany the modified vehicle.
7. The maximum permitted load of drawers and shelves must be indicated.
8. The vehicle structure must not be weakened by the installed components in the event of an accident.
9. The regulations and standards for load securing must be observed:
 - + DIN ISO 27956 (securing of cargo in delivery vans),
 - + VDI 2700 ff
 - + StVO or country-specific laws and regulations.
10. The installation should be performed so as to be safe in the event of a crash (e.g. ECE-R 44-3 City Crash):
 - + all items in the vehicle should be secured, installed or stowed in such a way that they do not become projectiles in the event of acceleration/deceleration in a forwards, backwards, left, right or vertical direction.
 - + All tested compartments, rails, installations not intended for storage or storage equipment must be marked with the highest permitted weights.
11. Exposed edges that may come into contact with the hands, legs, head, etc. of a vehicle occupant during normal operation must not have a radius of less than 2.5 mm.
12. Following all work to the body, drilling chips should be removed and corrosion protection measures should be performed. (see chap. 2.3.2 Modifications to the body-in-white).
13. The requirements of the body builder guidelines for electrical wiring and fuses must be observed:
 - + Chap. 2.5.2.1 Electrical wiring/fuses
 - + Chap. 2.5.2.2. Additional electrical circuits
 - + Chap. 2.5.3 Electrical interface for special vehicles
14. During installation and conversion no electric wires or other components of the base vehicle (e.g. fuel tank, brake lines) may be damaged.
15. Conversion should only be performed by trained specialist personnel.

For robust delivery transport such as courier services, we recommend the "Robust delivery transport" equipment package with PR no. F4B.

Practical note

Permanently installed components increase the kerb weight of the vehicle, as a result of which the suspension compression height on the rear axle is reduced accordingly. If the additional installation solution weighs more than 180 kg, or more than 200 kg in the Caddy Maxi, it is recommended to change over to a specially matched leaf spring (PR no. 2MK*).

Warning note

Please bear in mind that if the permanently installed components are removed then the spring pack PR no. 2MK must be replaced by the standard equipment. Otherwise, the driving properties might be negatively impaired.

Information

For more information about this topic, refer to the body builder portal of Volkswagen AG.

4.4 Emergency vehicles

Please also comply with the following chapters as part of the conversion:

- 1.5.1 Selecting the base vehicle
- 2.2.1 Permitted weights and unladen weights
- 2.3.2 Modifications to the body-in-white
- 2.5.2.1 Electrical wiring and fuses
- 2.5.2.3 Retrofitting electrical devices
- 2.5.3 Electrical interface for special vehicles
- 2.5.4 Vehicle battery
- 2.5.5 Subsequent installation of generators
- 2.7.2 Power take-off systems
- 3.1 Body-in-white/bodywork.
- 3.1.4 Modifications to the roof of panel van/window van
- 3.2.1 Safety equipment

Practical note

Permanently installed components increase the kerb weight of the vehicle, as a result of which the suspension compression height on the rear axle is reduced accordingly. If the additional installation solution weighs more than 180 kg, or more than 200 kg in the Caddy Maxi, it is recommended to change over to a specially matched leaf spring (PR no. 2MK*).

Warning note

Please bear in mind that if the permanently installed components are removed then the spring pack PR no. 2MK must be replaced by the standard equipment, otherwise the driving properties might be negatively affected.

Information

For more information about this topic, refer to:

<http://www.volkswagen-nutzfahrzeuge.de/de/kunden/sonderabnehmer/rettungsfahrzeuge.html>

4.5 Taxi

Please also comply with the following chapters as part of the conversion:

- 1.5.1 Selecting the base vehicle
- 2.2.1 Permitted weights and unladen weights
- 2.3.2 Modifications to the body-in-white
- 2.5.2.1 Electrical wiring and fuses
- 2.5.2.3 Retrofitting electrical devices
- 2.5.3 Electrical interface for special vehicles
- 2.5.4 Vehicle battery
- 2.5.5 Subsequent installation of generators
- 3.2.1 Safety equipment

For more information about this topic, refer to the body builder portal of Volkswagen Nutzfahrzeuge AG on the Internet.

Information

The body builder portal of Volkswagen AG can be reached at the following Internet address:

<http://www.volkswagen-nutzfahrzeuge.de/de/kundenloesungen/gewerbekunden.html>

4.6 Leisure vehicles

The new Caddy and Caddy Maxi can be ordered as leisure vehicles with the Beach equipment directly ex works.

For more information, please contact your Volkswagen dealership.

Please also comply with the following chapters as part of your conversions:

- 1.5.1 Selecting the base vehicle
- 2.2.1 Permitted weights and unladen weights
- 2.3.2 Modifications to the body-in-white
- 2.5.2.1 Electrical wiring and fuses
- 2.5.2.3 Retrofitting electrical devices
- 2.5.3 Electrical interface for special vehicles
- 2.5.4 Vehicle battery
- 2.5.5 Subsequent installation of generators
- 3.2.1 Safety equipment
- 2.6.3 Fuel system
- 2.6.4 Exhaust system
- 3.2.1 Safety equipment

Practical note

Permanently installed components increase the kerb weight of the vehicle, as a result of which the suspension compression height on the rear axle is reduced accordingly. If the additional installation solution weighs more than 180 kg, or more than 200 kg in the Caddy Maxi, it is recommended to change over to a specially matched leaf spring (PR no. 2MK*).

Warning note

Please bear in mind that if the permanently installed components are removed then the spring pack PR no. 2MK must be replaced by the standard equipment, otherwise the driving properties might be negatively affected.

Information

For more information about this topic, refer to the Volkswagen AG website at:

<http://www.volkswagen-nutzfahrzeuge.de/de/kunden/sonderabnehmer/freizeitmobile.html>

4.7 Vehicles for local and public authorities

Please also comply with the following chapters as part of the conversion:

- 1.5.1 Selecting the base vehicle
- 2.2.1 Permitted weights and unladen weights
- 2.3.2 Modifications to the body-in-white
- 2.5.2.1 Electrical wiring and fuses
- 2.5.2.3 Retrofitting electrical devices
- 2.5.3 Electrical interface for special vehicles
- 2.5.4 Vehicle battery
- 2.5.5 Subsequent installation of generators
- 3.2.1 Safety equipment

Information

For more information about this topic, refer to the Volkswagen AG website at:

http://www.volkswagen-nutzfahrzeuge.de/de/kunden/kommunen_und_behoerden.html

5 Technical data

5.1 Build dimension drawings

Please refer to our build dimension drawings for the dimensions of the new Caddy and Caddy Maxi. They are available for download in DXF, TIFF and PDF format at the body builder portal of Volkswagen AG. All files (except PDFs) are packed as Zip archives. The files can be unpacked using Winzip (PC) or ZipIt (MAC).

Information

Current build dimension drawings are available for downloading from the body builder portal of Volkswagen AG under the "Technical drawings" menu item.

5.2 Diagrams (foil templates)

Vehicle views of the Caddy and Caddy Maxi in 1:25 scale are available for download in TIF, DXF and EPS format to help you create diagrams.

All files are packed as Zip archives. The files can be unpacked using Winzip (PC) or ZipIt (MAC).

Information

Current diagrams are available for downloading from the body builder portal of Volkswagen AG under the "Foil templates" menu item.

5.3 Circuit diagrams

For detailed information about this topic, refer to the workshop manuals and circuit diagrams of Volkswagen AG.

Information

Volkswagen AG workshop manuals and circuit diagrams can be downloaded from the Internet at **erWin*** (**E**lectronic **R**epair and **W**orkshop **I**nformation from Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

* Information system from Volkswagen AG, subject to payment

5.4 CAD models

On request, body builders can receive 3D data models in the formats CATIA V.5 / STEP/JT for design purposes.

Information

The available 3D data can be found on the body builder portal of Volkswagen AG under the "CAD data" menu option.

6 Calculations

6.1 Determining the centre of gravity

The overall centre of gravity height (vehicle with add-ons or complete body without load) should be kept as low as possible.

The centre of gravity in the vehicle longitudinal direction is given in relation to a vehicle axle. The centre of gravity height is related to the wheel hub or related to the road. Volkswagen recommends having the centre of gravity determined by a recognised test institution with experience in this field (for example, DEKRA, TÜV or others).

For the body builder to determine the centre of gravity, we recommend following the procedure described under 6.1.1

"Determining the centre of gravity in x-direction" and 6.1.2 "Determining the centre of gravity in z-direction" and using personnel with the corresponding qualifications to obtain usable results.

6.1.1 Determining the centre of gravity in x-direction

Procedure:

The vehicle must be weighed with the add-ons or complete body without load.

Inflate the tyres up to the tyre pressure that is specified for the respective gross axle weight rating.

Completely fill all fluid containers (fuel tank, washer fluid reservoir, if applicable, hydraulic tank, water tank etc.).

Drive the vehicle onto the scales, switch off the engine, shift the gearbox to neutral and release the brakes.

The vehicle must be standing horizontal and level for weighing.

First weigh the individual axle loads (front and rear axle load) and then the gross weight of the vehicle.

The measured values can be used to calculate the position of the centre of gravity in the vehicle longitudinal direction with the equations (3) and (4). The equation (2) should be used to check the results of (3) and (4).

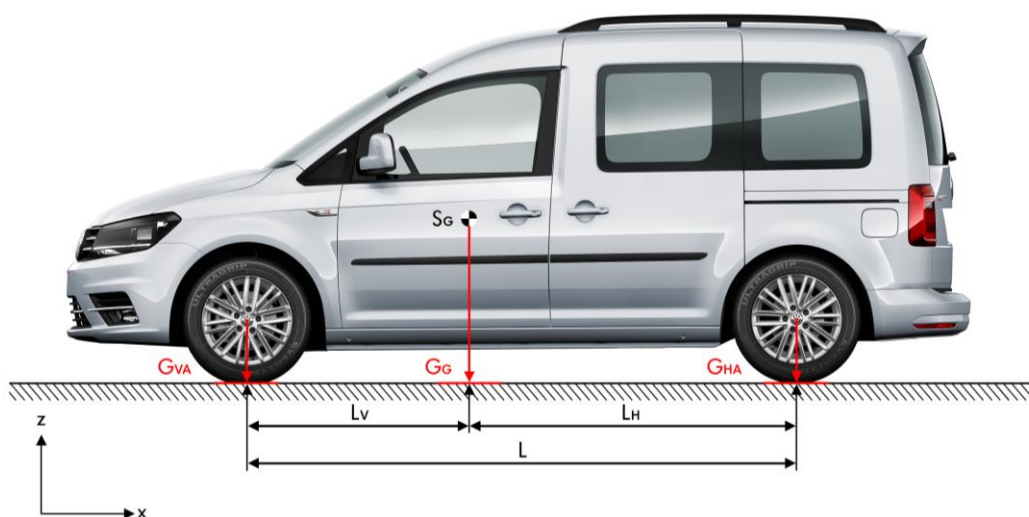


Fig. 1: Determining the position of the vehicle centre of gravity in x-direction

Determining the total weight of the unladen vehicle with add-ons and body.

$$G_G = G_{HA} + G_{VA} \quad (1)$$

Calculating the position of the overall centre of gravity S_G in x-direction

$$L = L_V + L_H \quad (2)$$

$$L_V = \frac{G_{HA}}{G_G} L \quad (3)$$

$$L_H = \frac{G_{VA}}{G_G} L \quad (4)$$

Abbreviations and parameters used:

G_G	-	Total weight of unladen vehicle
G_{VA}	-	Front-axle load of the unladen vehicle (specification or weighing of the respective chassis)
G_{HA}	-	Rear-axle load of the unladen vehicle (specification or weighing of the respective chassis)
S_G	-	Overall vehicle centre of gravity
L	-	Wheelbase
L_V	-	Distance from the overall centre of gravity of the empty vehicle to the front axle.
L_H	-	Distance from the overall centre of gravity of the empty vehicle to the rear axle.

Practical note

The practical determination of the centre of gravity height may only be performed by appropriately qualified personnel with the help of suitable and calibrated scales.

To reduce measuring errors, each measured value should be calculated at least three times and an average value calculated from the three results. This value is then used for calculating in accordance with the equations (3) and (4).

Information

The wheelbase "L" is defined by the vehicle prototype (see order) or should be defined by measuring the length in accordance with DIN 70020, part 1.

6.1.2 Determining the centre of gravity in z-direction

So that the body builder can determine the vehicle total centre of gravity height h_s (see Fig. 1), Volkswagen AG recommends the following procedure after completion of the whole vehicle:

- After conversion, the vehicle should be weighed on board scales or on suitable wheel load scales in two subsequent driving positions.
- Here, the measured axle loads shall be determined with the vehicle in a level state G_{FA} and G_{RA} (see 6.1.1 "Determining the centre of gravity in x-direction") and the axle loads on an axle Q_{RA} or Q_{FA} increased by the quantity h' .

The raising height h' should be as large as possible in accordance with the front and rear overhang angles of the vehicle (also known as entry or exit angles). The target value is > 600 mm.

- To reduce measuring errors, at least six individual measurements should be made in the axle load calculation for each axle: three per axle with vehicle level and three each with raised axle.
- The average value for each axle should be calculated from the three measurements for a state. The average value should be calculated from these three values and used in the calculations with the equations (5) to (9).

To improve the accuracy of the final result, the axle load modification should be determined with raised rear axle and raised front axle.

Practical note

Observe the following to avoid incorrect measurements:

The vehicle must be standing perfectly horizontal for weighing in level vehicle state. Height differences between the axles caused by scales should be compensated accordingly.

- When raising to the required lifting height, the axle being weighed should be locked to prevent suspension compression or extension.
- When raising to the required lifting height, no part of the vehicle may touch the ground.
- All vehicle wheels must be able to rotate freely: select neutral, release all brakes including handbrake and place chocks at sufficient distance from the wheels, if necessary.
- Move vehicle with own power (to weigh the respective other vehicle axle) to relieve any tension in the vehicle.
- Ensure that no objects inside the vehicle can move during the measurements.

If the vehicle suspension cannot be locked due to the body or available space, further axle load measurements must be carried out at different levels (for example, 600 mm, 700 mm and 800 mm). This also allows errors to be limited by averaging. The centre of gravity height results from the arithmetic average of the individual centre of gravity heights for each raising height.

Example of procedure:

1. The vehicle must be weighed with the add-ons or complete body without load.
2. Inflate the tyres up to the tyre pressure that is specified for the respective gross axle weight rating.
3. Completely fill all fluid containers (fuel tank, washer fluid reservoir, if applicable, hydraulic tank, water tank etc.).
4. On the scales, switch off the engine, set gearbox to neutral and release the brakes.
5. Position the vehicle with the rear axle (RA) horizontal and level on the scales and measure the axle load.
6. Raise the front axle by the value h' , at least 600 mm. A greater height h' taking the other vehicle-related conditions into consideration is more favourable for the final result. The value h' must be measured for all individual measurements with raised axle and should be as identical as possible. Alternatively to the raised height h' , the angle α between the wheel hubs can be defined.
7. Determine the axle load displacement QHA that occurs at the rear axle on the scales.
8. Lower and turn the vehicle around and perform the corresponding measurements on the front axle (first GFA with level and then QFA with the rear axle raised by h').
9. Perform steps 4–7 a total of three times (with locked suspension).
10. The measured values can be used to calculate the height of the centre of gravity with the equations (5) to (9).
11. In the calculations using the equations (3) to (9), all length measurements should be in millimetres (mm) and all weight figures in decanewton (1 daN = 10 N).
12. Raise the raised axle further (by e.g. 100 mm) and measure the height of the centre of gravity again to confirm the measuring result.

Practical note

The practical determination of the centre of gravity height may only be performed by appropriately qualified personnel with the help of suitable and calibrated measuring systems and measuring tools.

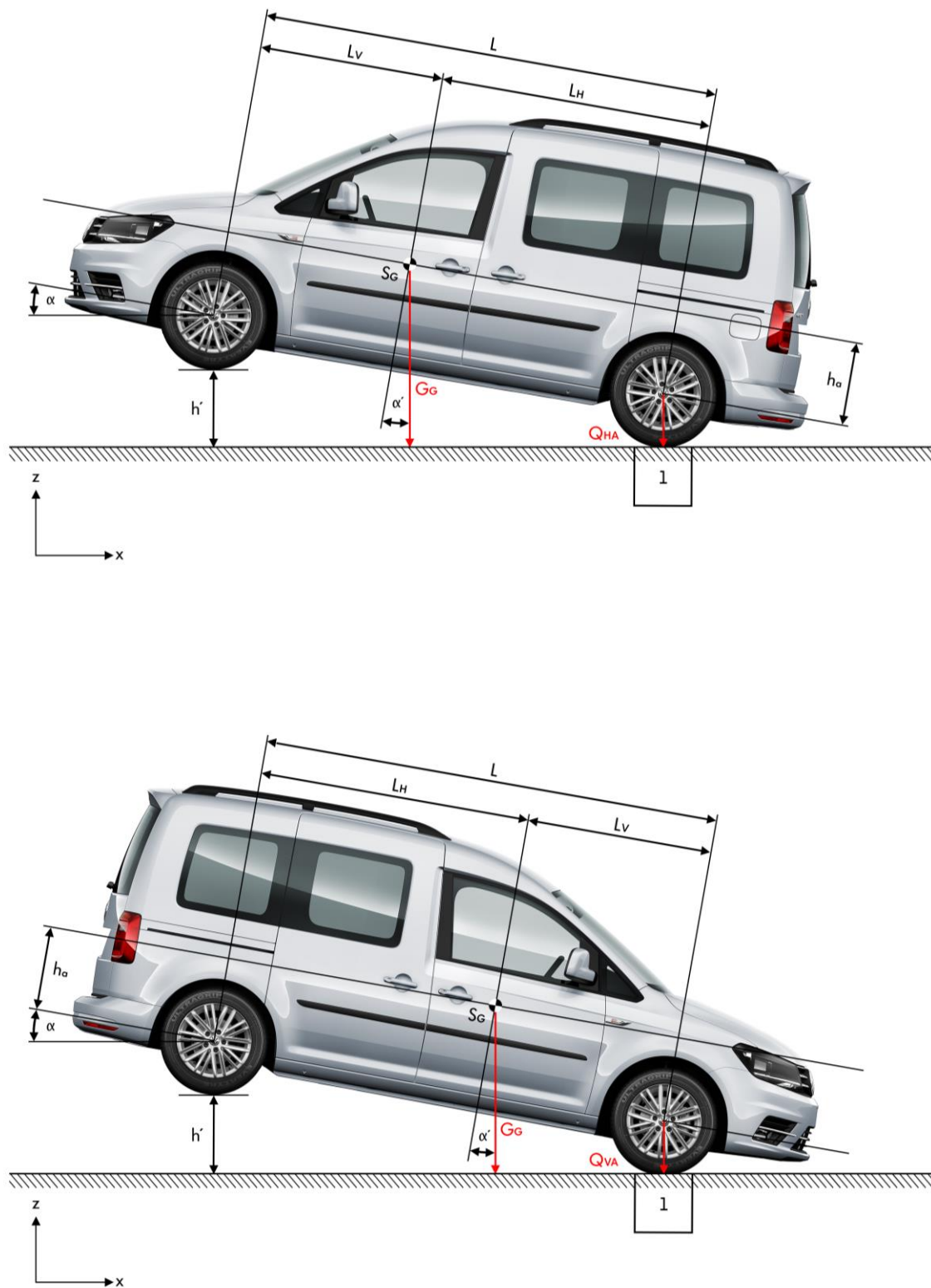


Fig. 2: Determining the position of the vehicle centre of gravity in z-direction

Determining the overall centre of gravity S_G in z-direction:

$$h_S = h_a + r_{stat} \quad (5)$$

Determining the overall centre of gravity S_G in z-direction for the raised front axle:

$$h_S = \left(\frac{Q_{HA} - G_{HA}}{G_G} \times L \times \frac{1}{\tan \alpha} \right) + r_{stat} \quad (6)$$

$$\sin \alpha = \frac{h'}{L} \quad (6a)$$

$$\alpha = \arcsin \left(\frac{h'}{L} \right) \quad (6b)$$

$$h_S = \left(\frac{1}{h'} \times \frac{Q_{HA} - G_{HA}}{G_G} \times \sqrt{L^2 - h'^2} \right) + r_{stat} \quad (7)$$

Determining the overall centre of gravity S_G in z-direction for the raised front axle:

$$h_S = \left(\frac{Q_{VA} - G_{VA}}{G_G} \times L \times \frac{1}{\tan \alpha} \right) + r_{stat} \quad (8)$$

$$\sin \alpha = \frac{h'}{L} \quad (8a)$$

$$\alpha = \arcsin \left(\frac{h'}{L} \right) \quad (8b)$$

$$h_S = \left(\frac{1}{h'} \times \frac{Q_{VA} - G_{VA}}{G_G} \times \sqrt{L^2 - h'^2} \right) + r_{stat} \quad (9)$$

Abbreviations and parameters used:

r_{stat}	-	Static tyre radius
Q_{VA}	-	Front axle load when vehicle raised at rear
Q_{HA}	-	Rear axle load when vehicle raised at front
G_G	-	Total weight of unladen vehicle
G_{VA}	-	Front axle load of unladen vehicle (specification or weighing of respective chassis).
G_{HA}	-	Rear axle load of unladen vehicle (specification or weighing of respective chassis)
L	-	Wheelbase
L_V	-	Distance from the overall centre of gravity of the empty vehicle to the front axle.
L_H	-	Distance from the overall centre of gravity of the empty vehicle to the rear axle.
h_S	-	Centre of gravity height over road
h_a	-	Centre of gravity height over centre of wheel
h'	-	Height by which the vehicle has been raised
1	-	Weighing equipment

Information

The wheelbase "L" is defined by the vehicle prototype (see order) or should be defined by measuring the length in accordance with DIN 70020, part 1.

7 Weight tables

5.5.7.1 Weight tables Caddy short wheelbase (SWB)

(Kerb weights with driver, ready to drive with 90% tank fill)

7.1.1 Caddy panel van (CV) from model year 2016 EU6

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	1.0l/75kW TSI	MG	0J2	2026	1050	1230	1264	763	500	762
			0J6	1792	1050	1100	1264	763	500	528
			0J8	2096	1050	1230	1264	763	500	832
	1.2l/62kW TSI	MG	0J2	2034	1050	1230	1272	771	501	762
			0J6	1800	1050	1100	1272	771	501	528
			0J8	2104	1050	1230	1272	771	501	832
	1.4l/92 kW TSI	MG	0J2	2068	1050	1230	1306	803	503	762
			0J6	1834	1050	1100	1306	803	503	528
			0J8	2138	1050	1230	1306	828	503	832
	1.4l/92 kW TSI	DSG	0J2	2095	1050	1230	1333	828	505	762
			0J6	1861	1050	1100	1333	828	505	528
			0J8	2165	1050	1230	1333	832	505	832
Gas	1.4 l/81 kW TGI (CNG) *	MG	0J2	2225	1100	1250	1463	805	658	762
			0J6	1991	1100	1100	1463	805	658	528
2.0l diesel	2.0l/55KW TDI	MG	0J2	2127	1075	1230	1365	864	501	762
			0J6	1893	1075	1100	1365	864	501	528
			0J8	2197	1075	1285	1365	864	501	832
	2.0l/55KW TDI (for postal vehicles)	MG	0J2	2134	1075	1230	1372	871	501	762
			0J6	1900	1075	1100	1372	871	501	528

Engine	Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
			Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
2.0I/55KW TDI (for postal vehicles) (4MOTION)	MG	0J2	2245	1140	1230	1483	920	563	762
		0J6	2011	1140	1100	1483	920	563	528
	MG	0J2	2141	1075	1230	1379	878	501	762
		0J6	1907	1075	1100	1379	878	501	528
		0J8	2211	1075	1285	1379	878	501	832
	DSG	0J2	2177	1100	1230	1415	912	503	762
		0J6	1943	1100	1100	1415	912	503	528
	MG	0J2	2251	1140	1230	1489	922	567	762
		0J6	2017	1140	1100	1489	922	567	528
	MG	0J2	2160	1075	1230	1398	895	503	762
		0J6	1926	1075	1100	1398	895	503	528
2.0 I/110KW TDI (4MOTION)	MG	0J2	2272	1155	1230	1510	944	566	762
2.0I/110KW TDI	DSG	0J6	1947	1100	1100	1419	915	504	528
2.0 I/110KW TDI (4MOTION)	DSG	0J6	2038	1155	1100	1510	944	566	528

Status: Nov. 2015

*Caddy 2–7 seater (CNG) without towing bracket

7.1.2 Caddy panel van (CV) from model year 2016

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Panel van	1.6l/55 kW TDI (EU5)	MG	0J2	2135	1075	1230	1390	863	527	745
			0J6	1901	1075	1100	1390	863	527	511
	1.6l/55 kW TDI (increased load rating)		0J8	2205	1075	1285	1390	863	527	815
	1.6l/75kW TDI (EU5)	MG	0J2	2152	1075	1230	1407	879	528	745
			0J6	1918	1075	1100	1407	879	528	511
	1.6l/75kW TDI (increased load rating)	MG	0J8	2222	1075	1285	1407	879	528	815
	1.6l/75kW TDI (EU5)	DSG	0J2	2174	1075	1230	1429	899	530	745
			0J6	1940	1075	1100	1429	899	530	511
	2.0l/75kW TDI (EU3/EU5) (Increased payload)	MG	0J8	2222	1075	1285	1407	879	528	815
	2.0l/81 kW TDI (EU4/EU5)	MG	0J2	2147	1075	1230	1402	874	528	745
	2.0l/81kW TDI (EU4)	MG	0J6	1913	1075	1100	1402	874	528	511
	2.0l/81 kW TDI (EU5) (4MOTION)	MG	0J2	2266	1150	1230	1521	928	593	745
			0J6	2032	1100	1100	1521	928	593	511
	2.0l/103kW TDI (EU4/EU5)	MG	0J2	2171	1075	1230	1426	897	529	745
	2.0l/103kW TDI (EU5)	MG	0J2	2198	1100	1230	1453	922	531	745
			0J6	1937	1100	1100	1426	897	529	511
	2.0l/103kW TDI (EU5)	DSG	0J2	2280	1150	1230	1547	952	595	733
			0J6	1964	1100	1100	1453	922	531	511
	2.0l/103kW TDI (EU5) (4MOTION)	DSG	0J6	2058	1100	1100	1547	952	595	511

Status: May 2015

7.1.3 Caddy panel van, lowered suspension (2MH) from model year 2016 EU6

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	1.0l/75kW TSI	MG	0J2	2045	1050	1100	1264	763	500	781
	1.0l/75kW TSI	MG	0J6	1792	1050	1100	1264	763	500	528
	1.2l/62kW TSI	MG	0J2	2045	1050	1100	1272	771	501	773
			0J6	1800	1050	1100	1272	771	501	528
	1.4l/92 kW TSI	MG	0J2	2045	1050	1100	1306	803	503	739
			0J6	1834	1050	1100	1306	803	503	528
	1.4l/92 kW TSI	DSG	0J2	2045	1050	1100	1333	828	505	712
			0J6	1861	1050	1100	1333	828	505	528
Diesel 2.0l	2.0l/55kW TDI	MG	0J2	2045	1075	1100	1365	864	501	680
			0J6	1893	1075	1100	1365	864	501	528
	2.0l/75kW TDI	MG	0J2	2045	1075	1100	1379	878	501	666
			0J6	1907	1075	1100	1379	878	501	528
	2.0l/75kW TDI**		0J2	2000	1075	1100	1381	878	503	619
	2.0l/75KW TDI	DSG	0J2	2045	1100	1100	1415	912	503	630
			0J6	1943	1100	1100	1415	912	503	528
	2.0l/110KW TDI	MG	0J2	2045	1075	1100	1398	895	503	647
			0J6	1926	1075	1100	1398	895	503	528

Status: Nov. 2015

7.1.4 Caddy panel van, lowered suspension (2MH) from model year 2016

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Diesel 1.6l	1.6l-TDI 75 kW (EU3/EU5)	MG	0J2	2045	1050	1100	1407	879	528	638
			0J6	1918	1050	1100	1407	879	528	511
	1.6l-TDI 75kW (EU5)	DSG	0J2	2045	1075	1100	1429	899	530	616
			0J6	1940	1075	1100	1429	899	530	511
Diesel 2.0l	2.0l -TDI 103kW (EU4/EU5)	MG	0J2	2045	1075	1100	1426	897	529	619
			0J6	1937	1075	1100	1426	897	529	511
	2.0l-TDI 103kW (EU5)	DSG	0J2	2045	1075	1100	1453	922	531	592
			0J6	1964	1075	1100	1453	922	531	511

Status: May 2015

7.1.5 Caddy window van petrol/gas (passenger car) from model year 2016 EU6

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	1.0l/75kW TSI**	MG	0J2	2180	1100	1200	1342	776	566	838
	1.2l/62kW TSI	MG	0J2	2165	1100	1200	1350	784	566	815
	1.2l/62kW TSI **		0J2	2165	1100	1200	1350	784	566	815
	1.4l/92kW TSI	MG	0J2	2180	1100	1200	1414	844	570	786
	1.4l/92kW TSI **		0J2	2180	1100	1200	1414	844	570	786
	1.4l/92 kW TSI	DSG	0J2	2200	1100	1200	1414	844	570	786
	1.4l/92 kW TSI		0J2	2200	1100	1200	1414	844	570	786
Gas	1.4l/81 kW CNG ***	MG	0J2	2175	1025	1200	1541	818	723	634
	1.4l/81 kW CNG**		0J2	2280	1050	1250	1541	818	723	739

Status: Nov. 2015

**2-7seater

***Gas engine with 2-7 seats = no towing bracket!

7.1.6 Caddy window van diesel 2.0l (passenger car) from model year 2016 EU6

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Diesel 2.0l	2.0l/55 kW-TDI	MG	0J2	2245	1150	1200	1442	877	565	803
	2.0l/55 kW-TDI **		0J2	2245	1150	1200	1442	877	565	803
	2.0l/75 kW-TDI	MG	0J2	2255	1150	1200	1457	892	565	798
	2.0l/75 kW-TDI **		0J2	2255	1150	1200	1457	892	565	798
	2.0l/75 kW-TDI	DSG	0J2	2280	1170	1200	1492	925	567	788
	2.0l/75 kW-TDI**		0J2	2280	1170	1200	1492	925	567	788
	2.0l/90KW-TDI (4MOTION)	MG	0J2	2280	1200	1200	1571	939	632	709
	2.0l/90KW-TDI** (4MOTION)		0J2	2280	1200	1200	1571	939	632	709
	2.0l/110 kW-TDI	MG	0J2	2255	1150	1200	1477	910	567	778
	2.0l/110 kW-TDI**		0J2	2255	1150	1200	1477	910	567	778
	2.0l/110 kW-TDI	DSG	0J2	2280	1170	1200	1498	929	569	782
	2.0l/110 kW-TDI**		0J2	2280	1170	1200	1498	929	569	782
	2.0l/110KW-TDI** (4MOTION)	DSG	0J2	2290	1200	1200	1590	958	632	700

Status: Nov. 2015

7.1.7 Caddy window van diesel 1.6 l and 2.0 l (passenger car) from model year 2013

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Diesel 1.6l	1.6l -TDI 55kW (EU5)	MG	OJ2	2265	1100	1200	1458	871	587	807
	1.6l-TDI** 55 kW (EU5)		OJ2	2265	1100	1200	1458	871	587	807
	1.6l-TDI** 55 kW (EU5)		OJ3	2248	1100	1250	1458	876	582	790
	1.6l -TDI 75kW (EU3/EU5)	MG	OJ2	2280	1100	1200	1473	886	587	807
	1.6l-TDI 75 kW (EU3**/EU5**)		OJ2	2280	1100	1200	1473	886	587	807
	1.6l-TDI 75 kW (EU3**/EU5**)		OJ3	2270	1150	1250	1473	891	582	797
	1.6l -TDI 75kW (EU5)	DSG	OJ2	2280	1100	1200	1495	906	589	785
	1.6l-TDI* 75 kW (EU5)		OJ2	2280	1100	1200	1495	906	589	785
	1.6l-TDI* 75 kW (EU5)		OJ3	2290	1150	1250	1495	911	584	795
Diesel 2.0l	2.0l-TDI 81 kW (EU4)	MG	OJ2	2250	1100	1200	1468	880	588	782
	2.0l-TDI 81 kW (EU4**)		OJ2	2250	1100	1200	1468	880	588	782
	2.0l-TDI 81 kW (EU4)		OJ3	2261	1100	1250	1468	886	582	793
	2.0l-TDI 81 kW (EU4***)		OJ3	2290	1200	1250	1587	939	648	703
	2.0l-TDI 81 kW (EU5) (4MOTION)	MG	OJ2	2280	1150	1200	1587	934	653	693
	2.0l-TDI 81 kW (EU5) (4MOTION**)		OJ2	2280	1150	1200	1587	934	653	693
Diesel 2.0l	2.0l-TDI 103kW (EU5) (4MOTION)	DSG	OJ2	2290	1150	1200	1615	959	656	675
	2.0l-TDI 103kW (EU5) (4MOTION**)		OJ2	2290	1150	1200	1615	959	656	675
	2.0l -TDI 103kW (EU4/EU5)	MG	OJ2	2280	1100	1200	1494	904	590	786
	2.0l-TDI 103 kW (EU4/EU5)		OJ2	2280	1100	1200	1494	904	590	786

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Diesel 2.0l	2.0l-TDI 103 kW (EU4/EU5)	MG	0J3	2280	1150	1250	1486	907	579	794
	2.0l -TDI 103kW (EU5)	DSG	0J2	2280	1100	1200	1521	929	592	759
	2.0l-TDI 103 kW** (EU5)		0J2	2280	1100	1200	1521	929	592	759
	2.0l-TDI 103 kW** (EU5)		0J3	2290	1175	1250	1513	932	564	769

Status: Nov. 2015

*** 2.0l 81kW CR DSG with 0J3 = without towing bracket!!

7.1.8 Caddy panel van, lowered suspension (2MH) from model year 2016 (EU6)

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	1.2I/62KW TSI	MG	OJ2	2100	1100	1100	1350	784	566	750
	1.0I/75KW TSI		OJ2	2100	1100	1100	1342	776	566	758
	1.4I/92KW TSI	MG	OJ2	2100	1100	1100	1387	819	568	713
	1.4I/92KW TSI	DSG	OJ2	2100	1100	1100	1414	844	570	686
Diesel 2.0 I	2.0I/55kW TDI	MG	OJ2	2100	1150	1100	1442	877	565	658
	2.0I/75kW TDI	MG	OJ2	2100	1150	1100	1457	892	565	643
	2.0I/75kW TDI	MG	OJ2	2100	1150	1100	1457	892	565	643
	2.0I/75 kW TDI*	MG	OJ2	2000	1150	1100	1457	890	567	543
	2.0I/75kW TDI	DSG	OJ2	2100	1170	1100	1492	925	567	608
	2.0I/110kW TDI	MG	OJ2	2100	1150	1100	1477	910	567	623
	2.0I/110kW TDI	DSG	OJ2	2100	1170	1100	1498	929	569	602

Status: Nov. 2015

*No towing bracket

7.1.9 Caddy panel van, lowered suspension (2MH) from model year 2016

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
	1.6l/75 kW-TDI (EU3/EU5)	MG	OJ2	2100	1075	1100	1473	886	587	627
	1.6l/75 kW2-TDI (EU5)	MG	OJ2	2100	1100	1100	1495	886	589	605
	2.0l/81 kW-TDI (EU4)	MG	OJ2*	2045	1075	1100	1402	874	528	643
			OJ2**	2100	1100	1100	1468	880	588	632
			OJ6	1913	1075	1100	1402	874	528	511
	2.0l/103 kW-TDI (EU4/EU5)	MG	OJ2	2100	1100	1100	1494	904	590	606
	2.0l/103 kW ² TDI	DSG	OJ2	2100	1100	1100	1521	929	592	579

Status: Nov. 2015

*1-2 seater

**2-5 seater

7.1.10 Caddy window van (0J3) 2–5 seater from model year 2016 EU6

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	1.0l/75kW TSI	MG	0J3	2130	1100	1230	1342	781	560	788
	1.4l/92 kW TSI**	MG	0J3	2222	1150	1250	1447	866	581	775
	1.4l/92 kW TSI***	MG	0J3	2169	1100	1230	1387	825	562	782
	1.4l/92 kW TSI	DSG	0J3	2196	1150	1250	1414	850	564	782
Diesel 2.0l	2.0l/55 kW-TDI	MG	0J3	2230	1150	1230	1442	883	559	788
	2.0l/75 kW-TDI	MG	0J3	2244	1150	1230	1457	897	560	787
	2.0l/75 kW-TDI	DSG	0J3	2280	1170	1250	1492	931	561	788
	2.0l/90kW TDI* (4MOTION)	MG	0J3	2290	1200	1250	1571	944	627	719
	2.0l/110 kW-TDI	MG	0J3	2246	1150	1250	1477	915	562	769
	2.0l/110 kW-TDI	DSG	0J3	2267	1175	1250	1498	934	564	769

Status: Nov. 2015

*No towing bracket

**5-speed manual gearbox

***6-speed manual gearbox

7.2 Weight tables Caddy Maxi (LR)

(Kerb weights with driver, ready to drive with 90% tank fill)

7.2.1 Caddy Maxi panel van (CV) from model year 2016 EU6

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	1.0l/75kW TSI	MG	OJ2	2183	1050	1300	1351	807	545	832
			OJ7	2113	1050	1230	1351	807	545	762
	1.4l/92 kW TSI	MG	OJ2	2227	1050	1300	1395	848	547	832
			OJ7	2157	1050	1250	1395	848	547	762
	1.4l/92 kW TSI	DSG	OJ2	2255	1050	1300	1423	874	549	832
			OJ4	2368	1100	1300	1423	874	549	945
			OJ7	2185	1050	1250	1423	874	549	762
Gas	1.4l/81kW TGI (CNG)	MG	OJ2	2345	1175	1300	1600	856	744	745
Diesel 2.0l	2.0l/75KW-TDI (for postal vehicles)	MG	OJ2	2280	1150	1300	1460	915	545	820
	2.0l/75KW-TDI (for postal vehicles)	DSG	OJ2	2280	1200	1250	1571	963	608	709
	2.0l/75 kW-TDI	MG	OJ2	2299	1150	1300	1467	922	545	832
			OJ7	2229	1150	1230	1467	922	545	762
	2.0l/75 kW-TDI	DSG	OJ2	2326	1175	1300	1494	952	542	832
			OJ7	2256	1175	1230	1494	952	542	762
	2.0l/90KW-TDI (4MOTION)	MG	OJ2	2375	1200	1250	1578	968	610	797
	2.0l/110 kW-TDI	MG	OJ2	2312	1150	1300	1480	933	547	832
			OJ4	2425	1200	1300	1480	933	547	945
			OJ7	2242	1150	1230	1480	933	547	762

Status Nov 2015

7.2.2 Caddy Maxi panel van (CV) from model year 2013

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Diesel	1.6l/75 kW-TDI (EU3/EU5)	MG	0J2	2313	1125	1300	1498	924	574	815
			0J7	2243	1125	1230	1498	924	574	
	1.6l/75 kW-TDI (EU5)	DSG	0J2	2335	1150	1300	1520	944	576	815
			0J7	2265	1150	1230	1520	944	576	745
	2.0l/81 kW-TDI (EU4)	MG	0J2	2300	1175	1250	1485	911	574	815
			0J7	2230	1175	1230	1485	911	574	745
	2.0l/81 kW-TDI (EU5) (4MOTION)	MG	0J2	2350	1200	1250	1612	973	639	738
	2.0l/103 kW-TDI (EU4/EU5)	MG	0J2	2332	1150	1300	1517	942	575	815
	2.0l/103 kW-TDI (EU5) (4MOTION)	DSG	0J2	2350	1200	1250	1638	997	641	712
			0J7	2265	1150	1230	1520	944	576	745
	2.0l/103 kW-TDI (EU5)	MG	0J2	2350	1150	1300	1535	958	577	815
			0J7	2262	1150	1250	1517	942	575	745
		DSG	0J2	2350	1150	1300	1535	958	577	815
			0J7	2280	1150	1250	1535	958	577	745

Status Nov 2015

7.2.3 Caddy window van petrol/gas (passenger car) from model year 2016 EU6

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	1.0l/75KW TSI***	MG	0J2	2260	1150	1230	1403	819	583	857
	1.0l/75KW TSI****		0J2	2260	1150	1230	1403	823	580	857
	1.4l/92KW TSI	MG	0J2	2260	1150	1250	1447	861	586	813
	1.4l/92KW TSI**		0J2	2260	1150	1250	1447	861	586	813
	1.4l/92KW TSI	DSG	0J2	2280	1150	1250	1474	886	588	806
	1.4l/92KW TSI**		0J2	2280	1150	1250	1474	886	588	806
Gas	1.4l/81 kW (CNG)	MG	0J2	2280	1150	1250	1651	868	782	629
	1.4l/81KW* (CNG)**		0J2	2415	1150	1300	1651	873	778	764

Status: Nov. 2015

* Gas engine with 2-7 seats = no towing bracket!!

***2-5 seater

****2-7seater

7.2.4 Caddy maxi window van diesel 2.0l (passenger car) from model year 2016 (EU6)

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Diesel 2.0l	2.0l/75 kW-TDI	MG	OJ2	2280	1175	1230	1519	934	585	761
	2.0l/75 kW-TDI**		OJ2	2330	1175	1250	1519	939	580	811
	2.0l/75 kW-TDI	DSG	OJ2	2280	1200	1230	1554	968	586	726
	2.0l/75 kW-TDI**		OJ2	2360	1200	1250	1554	973	581	806
	2.0l/90 kW-TDI (4MOTION)	MG	OJ2	2415	1235	1250	1630	980	650	785
	2.0l/90 kW-TDI** (4MOTION)		OJ2	2415	1235	1250	1630	984	646	785
	2.0l/110KW TDI	MG	OJ2	2345	1200	1250	1537	951	586	808
	2.0l/110KW TDI**		OJ2	2345	1200	1250	1537	955	582	808

Status: Nov. 2015

7.2.5 Caddy maxi window van diesel 1.6 l and 2.0 l (passenger car) from model year 2016

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	1.6l -TDI 75kW (EU3/EU4/EU5)	MG	0J3	2228	1125	1230	1438	836	602	790
Diesel 1.6l	1.6l-TDI 75 kW (EU3/EU5)	MG	0J2	2280	1150	1230	1536	930	606	744
	1.6l-TDI 75 kW** (EU3/EU5)		0J2	2345	1150	1250	1536	934	602	809
	1.6l -TDI 75kW (EU5)	DSG	0J2	2280	1175	1230	1558	950	608	722
	1.6l-TDI 75kW** (EU5)		0J2	2365	1175	1250	1558	954	604	807
Diesel 2.0 l	2.0l -TDI 103kW (EU4)	MG	0J2	2280	1150	1230	1531	925	606	749
			0J2	2330	1150	1250	1531	929	602	799
	2.0l-TDI 81 kW (EU5) (4MOTION)	MG	0J2	2280	1220	1200	1650	978	672	630
	2.0l-TDI 81kW** (EU5) (4MOTION)		0J2	2415	1220	1250	1650	982	668	765
	2.0l-TDI 81kW** (EU5) (4MOTION)		0J3	2332	1200	1250	1650	982	668	682
	2.0l-TDI 103kW (EU4/EU5)	MG	0J2	2355	1175	1250	1555	947	608	800
	2.0l-TDI 103kW** (EU4/EU5)		0J2	2355	1175	1250	1555	951	604	800
	2.0l-TDI 103kW (EU5)	DSG	0J2	2380	1175	1250	1582	972	610	798
	2.0l-TDI 103 kW (EU5) (4MOTION**)		0J2	2380	1175	1250	1582	976	606	798
	2.0l-TDI 103 kW** (EU5)	DSG	0J2	2415	1235	1250	1676	1007	669	739

Status: Nov. 2015

7.2.6 Caddy/Caddy Maxi panel/window van (0J3) 2–5 seater from model year 2016 EU6

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	1.0l/75kW TSI	MG	0J3	2194	1150	1230	1403	823	580	791
	1.4l/63kW TSI	MG	0J3	2139	1100	1230	1350	790	560	789
	1.4l/92 kW TSI	DSG	0J3	2249	1150	2249	1474	891	583	775
Diesel 2.0l	2.0l/75 kW-TDI	MG	0J3	2299	1200	1250	1519	939	580	780
	2.0l/75 kW-TDI	DSG	0J3	2329	1200	1250	1554	973	581	775
	2.0l/90kW TDI** (4MOTION)	MG	0J3	2332	1200	1250	1630	984	645	702
	2.0l/110 kW-TDI	MG	0J3	2329	1200	1250	1558	975	583	771

Status: Nov. 2015

*No towing bracket

7.2.7 Caddy/Caddy Maxi panel/window van (0J3) 2–5 seater from model year 2016

Engine		Gearbox	PR number	Permitted weights [kg]			Kerb weight incl. driver [kg]			Load rating max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	1.6l/81kW MPI (EU3/EU4/EU5)	MG	0J3	2174	1000	1250	1375	793	582	799
Diesel 1.6l	1.6l/75 kW TDI (EU3/EU5)	MG	0J3	2337	1175	1250	1536	934	602	801
	1.6l/75 kW TDI (EU5)	DSG	0J3	2346	1200	1250	1558	954	604	788
Diesel 2.0l	2.0l/81 kW TDI (EU4)**	MG	0J3	2318	1175	1230	1531	929	602	787
	2.0l/103kW TDI (EU4/EU5)	MG	0J3	2336	1200	1230	1555	951	604	781
	2.0l/103kW TDI (EU4/EU5)	DSG	0J3	2363	1200	1250	1582	976	606	781

Status: Nov. 2015

Abbreviations:

SWB = Short wheelbase

LWB = long wheelbase

MG – Manual gearbox

DSG – Dual-clutch gearbox (automatic gearbox)

BMT – BlueMotionTechnology

CNG – Engine running on natural gas

PR-NR. – 0J1 = payload reduced

0J2 = standard payload

0J3 = Increased load rating

0J6 = Reduced load rating (version 2)

0J7 = Reduced load rating (version 3)

0J8 = Increased load rating

If you have any questions, please contact your customer service workshop or get in touch with us (see also chapter 1.2.1.1 "Contact").

**For some variants and versions, an increased permitted total mass and an increased permitted rear-axle load may be permitted for towing.

Details can be found in the vehicle documents.

8 Listings

8.1 Change record

Changes to the body builder guidelines compared to the data status of May 2015

Chapter no.	Section heading	Scope of modification
1	General information	
1.1	Introduction	
1.1.1	Concept of these guidelines	Chapter revised
1.1.2	Means of representation	
1.1.3	Vehicle safety	
1.1.4	Operational safety	
1.2	General instructions	
1.2.1	Product and vehicle information for body builders	
1.2.1.1	Contact in Germany	
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1.2.1.3	Electronic Repair and Workshop Information of Volkswagen AG (erWin)	
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Body builder guidelines

The new Caddy

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Internet:

www.volkswagen-nutzfahrzeuge.de

www.umbauportal.de

www.bb-database.com

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