



Body builder guidelines Amarok



Table of contents

Table of contents	1
1 General information.....	6
1.1 Introduction.....	6
1.1.1 Concept of these guidelines	7
1.1.2 Means of representation.....	8
1.1.3 Vehicle safety	9
1.1.4 Operational safety.....	10
1.2 General notes	11
1.2.1 Product and vehicle information for body builders	11
1.2.1.1 Contact	11
1.2.1.2 Conversion Portal	12
1.2.1.3 Electronic Repair and Workshop Information from Volkswagen AG (ERWIN*).....	13
1.2.1.4 Genuine parts online ordering portal*	14
1.2.2 Body builder guidelines and consulting	14
1.2.2.1 Safety certificate	15
1.2.2.2 Application for the safety certificate	16
1.2.2.3 Legal entitlements	16
1.2.3 Warranty and product liability of the body builder	17
1.2.4 Ensuring traceability.....	18
1.2.5 Trademarks	18
1.2.5.1 Positions on rear of the vehicle	18
1.2.5.2 Appearance of overall vehicle	18
1.2.5.3 Non-Volkswagen trademarks	18
1.2.6 Recommendations for vehicle storage	19
1.2.7 Compliance with environmental rules and regulations	20
1.2.8 Recommendations for inspection, maintenance and repair.....	21
1.2.9 Accident prevention.....	22
1.2.10 Quality system	23
1.3 Delivery range.....	24
1.4 Advantages of the concept	25
1.5 Planning bodies	26
2 Technical data for planning	30
2.1 Base vehicle.....	30
2.1.1 Vehicle dimensions	30
2.1.1.1 Basic data Single Cab and Double Cab.....	32
2.1.2 Overhang angle and ramp angle	34
2.1.3 Vehicle centre of gravity	35
2.1.4 Bodies with a high centre of gravity.....	35
2.1.4.1 Extremely high centres of gravity (>800 mm).....	35
2.1.5 Determining centre of gravity	36
2.1.5.1 Determining the centre of gravity in x-direction	36
2.1.5.2 Determining the centre of gravity in z-direction	38
2.1.6 Maximum dimensions	43
2.2 Running gear	45
2.2.1 Permitted weights and unladen weights	45
2.2.1.1 One-sided weight distribution.....	50
2.2.2 Turning circle.....	51

2.2.3 Authorised tyre sizes	51
2.2.4 Modifications to axles.....	51
2.2.5 Modifications to the steering system	51
Chap. 2.2.6 Modifications to the braking system.....	51
2.2.6.1 General information.....	52
2.2.6.2 Vehicle stability and ESP.....	53
2.2.6.3 Influence of vehicle conversions on the function of the ESP brake regulation system.....	54
2.2.6.4 Downgrading ESP	55
2.2.6.5 Activating the ESP	55
2.2.7 Modification of springs, suspension mounting, dampers	56
2.2.8 Wheel alignment settings	56
2.2.9 Wings and wheel houses.....	56
2.2.10 Overhang extension.....	57
2.2.10.1 Requirements for trailer operation with overhang extension	59
2.2.11 Wheelbase modification	59
2.3 Body-in-white	60
2.3.1 Roof loads/vehicle roof	60
2.3.2 Modifications to the body-in-white	60
2.3.2.1 Screw connections	60
2.3.2.2 Welding work	61
2.3.2.3 Welded connections	62
2.3.2.4 Selection of welding process	62
2.3.2.5 Spot welding	62
2.3.2.6 Shielding gas hole spot welding	63
2.3.2.7 Tacking	64
2.3.2.8 Welding is not allowed	64
2.3.2.9 Corrosion protection after welding.....	64
2.3.2.10 Corrosion protection measures.....	64
2.3.2.11 Planning measures.....	65
2.3.2.12 Component design measures	66
2.3.2.13 Coating measures	66
2.3.2.14 Work on the vehicle	66
2.3.3 Tailgate.....	67
2.4 Interior	68
2.4.1 Modifications in the area of airbags	68
2.4.2 Modifications in the area of seats.....	68
2.4.3 Forced ventilation	68
2.4.4 Acoustic insulation.....	68
2.5 Electrics/electronics	69
2.5.1 Lighting.....	69
2.5.1.1 Vehicle lighting devices	69
2.5.1.2 Mounting special lights.....	69
2.5.1.3. Installing 3rd brake light	69
2.5.1.4 Additional load compartment light	70
2.5.2 Vehicle electrical system	70
2.5.2.1 Electrical cables/fuses	70
2.5.2.2 Additional circuits.....	70
2.5.2.3 Electrical interface for special vehicles	70
2.5.2.3.1 Position of the interface.....	71
2.5.2.3.2 Interface assignment.....	73

2.5.2.3.3 Connector pin assignment and circuit diagrams for interface for special vehicles	74
2.5.2.4 Retrofitting electrical devices	75
2.5.2.4.1 Electromagnetic compatibility	75
2.5.2.5 Mobile communication systems	76
2.5.2.6 CAN bus	76
2.5.3 Vehicle battery/protection for the vehicle's battery if the vehicle is not used for some time	76
2.5.3.1 Installation of additional battery	76
2.6 Engine peripherals/powertrain	77
2.6.1 Engine/powertrain components	77
2.6.2 Drive shafts	77
2.6.3 Fuel system	77
2.6.4 Exhaust system	78
2.7 Ancillary drives, engine/gearbox	79
2.7.3. Specifications of standard refrigerant compressor	82
2.7.3.1 Connection measurements of standard refrigerant compressor	84
2.7.4 Installation and removal of the poly V-belt	88
2.7.4.1 Removal of the belt	88
2.7.4.2 Installation of the belt	88
2.7.4.3 Working range of the belt tensioner:	88
2.8 Add-ons/units	90
2.8.1 Roof rack	90
2.8.2 Towing bracket	91
2.9 Lifting the vehicle	93
3 Modifications to closed bodies	94
3.1 Body-in-white/bodywork	94
3.1.1 Side wall and rear wall cut-outs	94
3.1.2 Installation of windows	95
3.1.3 Roof cut-outs	95
3.1.4 Modifications to the roof	95
3.2 Interior	96
3.2.1 Safety equipment	96
4 Modifications to open bodies	97
4.1 Removal of the cargo box	97
4.1.1 Removal of tail lights	98
4.1.2 Releasing the parking brake cable at the rear	98
4.1.3 Removal of the wheel housing liner	99
4.1.4 Removal of the filler neck	100
4.1.5 Unscrewing securing bolts	101
4.1.6 Removal of the bumper	101
4.1.7 Recommendations for attaching the filler neck	102
4.1.7.1 Diesel filler pipe	103
4.1.7.2 Petrol filler pipe	104
4.1.8 Weight of cargo box	105
4.2 Chassis frame	106
4.2.1 Ladder frame AMAROK DC (Double Cab)	106
4.2.2 Ladder frame AMAROK SC (Single Cab)	107
4.2.3 Sections, AMAROK-SC (Single Cab)/AMAROK DC (Double Cab)	108
4.3 Standard attachment points for special bodies	109
4.4 Subframe (mounting frame)	111
5 Implementation of special bodies	112

5.1 Conversions for people with disabilities	112
5.2 Refrigerated vehicles.....	113
5.3 Shelf installation/workshop vehicles.....	114
5.4 Conversions for caravans	115
5.5 Conversions for municipal vehicles	116
5.6 Articulated vehicles	117
5.7 Elevated work platforms	118
5.8 Crane superstructures and lift systems	119
6 Technical data	120
6.1 Build dimension drawings.....	120
6.1.1 Amarok Double Cab	120
6.1.2 Amarok Single Cab	120
6.2 Diagrams.....	121
6.2.1 Amarok Double Cab (all views)	121
6.2.2 Amarok Single Cab (all views)	121
6.2.3 Side view all derivatives	122
6.3 Circuit diagrams.....	123
6.4 CAD models.....	124
7 Listings	125
7.1 List of changes.....	125

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 7 chapters so that you can find information rapidly:

- 1 General information
- 2 Technical data for planning
- 3 Modifications to closed bodies
- 4 Modifications to open bodies
- 5 Implementations of special bodies
- 6 Technical data
- 7 Listings

Information

For further information see 1.2.1.1 Contact, 1.2.2 Body builder guidelines, advice and 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.

More 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 in 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

1.2.1 Product and vehicle information for body builders

1.2.1.1 Contact

If you have questions about Volkswagen Commercial Vehicles models, you can reach us in one of the following ways:

Non-registered users:

Free hotline (from German landline)	0800-86228836
Letter:	Volkswagen Customer Support Postfach 1998 38436 Wolfsburg
Contact form:	http://www.volkswagen-nutzfahrzeuge.de/de/kontakt/ihr_kontakt_zu_uns.htm

If you have questions about increasing and decreasing vehicle loading, please contact our customer support. Volkswagen AG customer support can be reached at the following Internet address:

http://www.volkswagen-nutzfahrzeuge.de/de/kontakt/technische_frage.htm

For swift processing, we require a clearly legible copy of the vehicle documents, logbook or vehicle registration document together with your question.

Registered user (www.umbauportal.de):

Free hotline (from German landline)	0800-86228836
Fax:	+49 (0)511 / 7 98 - 85 00
Letter:	Volkswagen Nutzfahrzeuge Brieffach: 2963 Postfach 21 05 80, D - 30405 Hannover
Contact form:	http://umbauportal.de/web/guest/kontaktformular

If you have special technical questions about Volkswagen Commercial Vehicles, please use the online contact form for registered users.

1.2.1.2 Conversion Portal

The Conversion Portal of Volkswagen Nutzfahrzeuge AG offers body builders not only a direct point of contact via the free hotline, but also the opportunity to find out details about products, systems and topics relating to all aspects of Volkswagen commercial vehicle bodies.

Information

The Conversion Portal and contact form of Volkswagen AG can be reached at the following Internet address
<http://umbauportal.de/>

In order to clarify your technical questions on the base vehicle, we offer you the opportunity to use the contact form on the Conversion Portal to make direct contact with support for commercial vehicle body builders.

Information

The contact form of Volkswagen AG can be reached at the following Internet address:
<http://umbauportal.de/web/guest/kontaktformular>

Volkswagen Nutzfahrzeuge AG has developed an innovative partner system with the objective of intensifying cooperation with you, and to make it easier for the customers and dealers of Volkswagen commercial vehicles to search for a suitable body builder as easily as possible. In the new Conversion Portal, you as a body builder have the opportunity to select between three forms of cooperation:

- Registered user
- Integrated partner
- Premium partner

Registered user

As a registered member, you have access to a wide range of technical data and information, such as:

- Body builder guidelines
This contains the technical requirements for body builders designing and mounting bodies or performing conversions to the models of the Volkswagen Commercial Vehicles brand.
- Technical drawings
The "Technical drawings" section provides dimensional drawings for designing and mounting bodies or performing conversions for Volkswagen commercial vehicles which can be downloaded in various file formats.
- Diagrams
This section contains diagrams for creating illustrations and stickers on Volkswagen commercial vehicles. The vehicle views in a defined scale (1:20 or 1:10) are available for downloading in various formats.
- CAD data
Here, you can order CAD data in Catia V5 and STEP formats for the corresponding vehicles for delivery by post. Please only request the CAD data for current conversion projects because the data modules are subject to updates.
- List of questions (technical FAQ)
This page contains a list of answers to the most frequently asked questions.

- Newsletter

Subscribe to the technical newsletter and receive regular e-mail notification about current topics. This includes current technical modifications to Volkswagen commercial vehicles, information about exhibitions, training courses and events as well as news of general interest relating to bodies and conversions.

Make use of these possibilities and register on the website: <http://umbauportal.de/> using the link "Become a partner".

Integrated partner

- Your company will be presented to the users of the Conversion Portal as an integrated partner of Volkswagen Commercial Vehicles. In this way, you can reach end users and dealers in a targeted way.
- We use your proposals and suggestions for model development.
- As an integrated partner, you have the opportunity to publish your company information and contacts for your customers and the dealers of Volkswagen Commercial Vehicles.
- Benefit from access to additional information in the logon area for registered users.

Premium partner*

- Your company is presented as a selected specialist in the branch in question, and can present its products in the Conversion Portal.
- The products you display in the Portal must undergo a safety assessment by Volkswagen Commercial Vehicles. In this way, Volkswagen Commercial Vehicles confirms that the body or conversion is technically safe. You can also use the safety assessment for commercial purposes.
- Following prior agreement, your products can be presented together with Volkswagen commercial vehicles at exhibitions.

Information

For more information about the partnership system and registration, refer to:
<http://umbauportal.de/>

* Advantages for integrated partners automatically also apply to premium partners.

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 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”:

www.partslink24.com

*Information system from Volkswagen AG, subject to payment

1.2.2 Body builder guidelines and 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 if you have questions about proposed modifications.

Information

Please use the online contact form:

<http://umbauportal.de/web/guest/kontaktformular>

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

When making enquiries, 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 enquiry.

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 machine 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 does not relate to the design of the body overall, its functions or planned application. 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 or 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.

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 conversions 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 effects resulting from the modifications* to the vehicle.

In individual cases, Volkswagen AG reserves the right to demand proof 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).
- Remove dirt, snow and moisture from vehicle (footwell).
- Close windows, doors, front lid, rear lid and sunroof.
- On manual gearboxes select 1st gear and on automatic select P. 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"*: remove 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 three months. 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 ('magic eye' changes from green to black). 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.

Batteries shall be recharged only with current-controlled and voltage-limited chargers. A maximum charging voltage of 14.4 V shall not be exceeded.

It is recommended to check the tyre inflation pressure every three months.

Reconnect battery negative lead(s) before recommissioning the vehicle.

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 fitted components or bodies, including with regard to the statutory requirements in the EU Directive on End-of-Life Vehicles 2000/53/EC.

Fitters of accessories and body builders shall ensure that they comply with all applicable environmental rules and regulations, especially EU directive 2000/53/EC concerning end-of-life vehicles and EU 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 vehicle owner 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 at 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.

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, Germany
Telephone:	+49 (0) 40 39 80 - 0
Fax:	+49 (0) 40 39 80-19 99
E-mail:	info@bgf.de
Homepage:	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 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 Delivery range

The vehicle drawings shown here are symbolic representations. The vehicle drawings are not to scale.

Wheelbase [mm]	Gross vehicle weight rating [kg]	Amarok Single Cab 2-seater	Amarok Double Cab 5-seater
3095	2820		
3095	3040		

Wheelbase [mm]	Gross vehicle weight rating [kg]	Amarok Single Cab Chassis* 2-seater	Amarok Double Cab Chassis* 5-seater
3095	3040		

Information

Further information on the availability of individual combinations of gross vehicle weight rating, engine, gearbox and body variants and figures for consumption, CO₂ emissions and energy efficiency classes can be found in the sales documents and the configurator on the Volkswagen website:

www.volkswagen-nutzfahrzeuge.de

www.umbauportal.de

1.4 Advantages of the concept

- One wheelbase
- Two weight classes, 2820 kg and 3040 kg, for Double Cab.
- Frame with cab body and cargo box
- Large load bed with the largest dimensions in its class.
- Through-load width of 1,222 millimetres between the wheel houses. This means Euro pallets can be loaded crossways to save space, which is a first in a mid-size pickup. Thanks to these impressive dimensions and a payload up to 1.15 metric tonnes, it is also possible to transport sports equipment such as quad bikes or large implements.
- Four load securing points in the corners of the load bed for securing the cargo whilst driving.
- Low, flat load bed
- Max. trailer load (12% incline) up to 2,800 kg (optional towing bracket) 3,200 kg with 8-speed automatic gearbox
- Drawbar weight 120 kg
- Independent suspension at front and rigid axle at rear
- Top-grade cw value: 0.42
- Powerful and economical engine range
- 3 powertrain variants:
Permanent four-wheel drive, non-permanent four-wheel drive or rear-wheel drive. The Amarok has rear wheel drive in its basic version.
- 4x4 drive is available for all models
- Upshift recommendation, standard feature in all Amaroks
- High level of vehicle safety
- ABS and TCS are standard features in the Amarok.
- Electronic differential locks (EDL).
- Offroad-ABS activated at the push of a button to significantly shorten braking distances offroad and on dirt roads.
- The optionally available ESP also activates the hill descent assistant when Offroad-ABS is active at speeds below 30 km/h.
- All vehicles with ESP are equipped with a hill-hold assist that holds the vehicle stationary when performing a hill start until the driver accelerates sufficiently to prevent it's rolling back.
- Low maintenance requirements
- Heavy-duty suspension package
- 80 litre tank
- Extensive range of accessories – ranging from the styling bar, running boards, loadspace cover and multiconnect attachment system (standard from Trendline onwards) through to a range of alloy wheels

1.5 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”).

Information

The contact form of Volkswagen AG can be reached at the following Internet address:
<http://umbauportal.de/web/guest/kontaktformular>

1.5.1 Selecting the base vehicle

The base vehicle needs to be selected carefully to ensure safe usage in the respective field.
 The following must be taken into consideration during planning and adapted for the respective usage:

Wheelbase
 Engine/gearbox
 Final drive ratio
 Maximum weight
 Centre of gravity
 Seating version (number and arrangement)
 Electrics – scope
 Ancillary drives

are taken into consideration during planning and are adapted for the respective application.

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 detailed information on the offered chassis and body variants in chap. 1.3 “Delivery range” or from the responsible department (see 1.2.1.1 Contact, 1.2.1.2 Conversion portal and 1.2.2 “Body builder guidelines, advice”).

Information

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

<http://umbauportal.de/>

1.5.2 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 chap. 1.2.1.1 “Contact”, 1.2.1.2 Conversion Portal and 1.2.2 “Body builder guidelines, Advice”).

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

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

The vehicles also need to meet the EC guidelines 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

No modifications to the noise encapsulation are permitted.

1.5.3 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!

1.6 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 provided by Volkswagen under PR nos. from your Volkswagen Customer Service or in the advice for body builders (see chap. 1.2.1.1 “Contact”, 1.2.1.2 “Conversion portal” and 1.2.2 “Body builder guidelines, advice”).

Please also note chapter 5 “Implementation of special bodies”.

Information

Furthermore you can put your vehicle together with the configurator on the Volkswagen AG homepage and look at the available special equipment:
<http://umbauportal.de/>

Optional equipment (e.g. reinforced springs, frame reinforcements, anti-roll bars etc.) or equipment fitted later increase the kerb weight of the vehicle.

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 if it is fitted later on.

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

Practical note

Permanently installed components increase the unladen weight of the vehicle, as a result of which the suspension compression height on the rear axle is reduced accordingly. In order to ensure an optimum rear ride height as well as stable road holding in the case of weight increase, we recommend the heavy-duty suspension (gross vehicle weight rating 3.04t). This is available ex-works by means of PR no. OWL.

2 Technical data for planning

2.1 Base vehicle

2.1.1 Vehicle dimensions

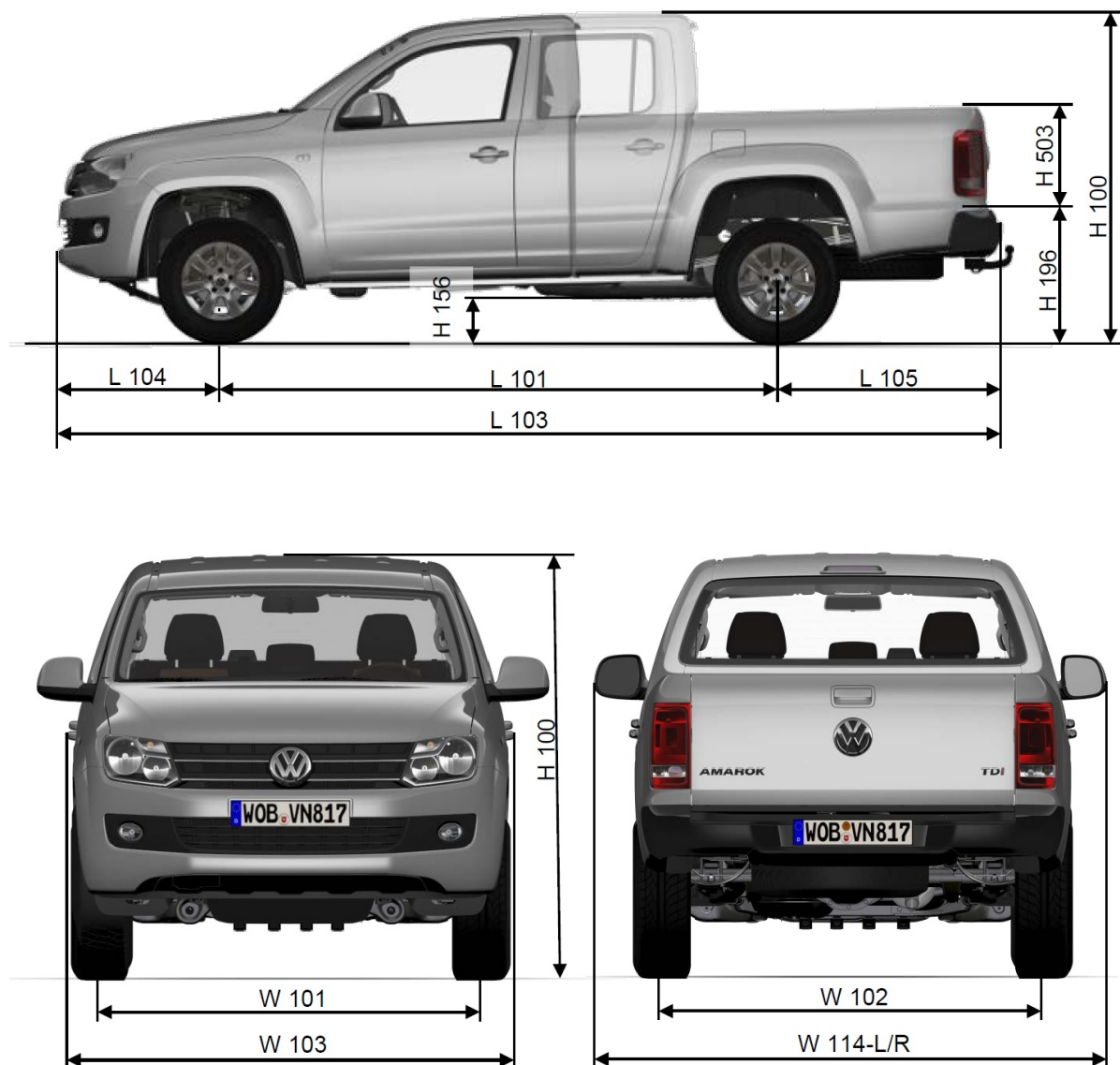


Fig. 2.1.1.1 Vehicle dimensions of AMAROK (views: side, front and rear)

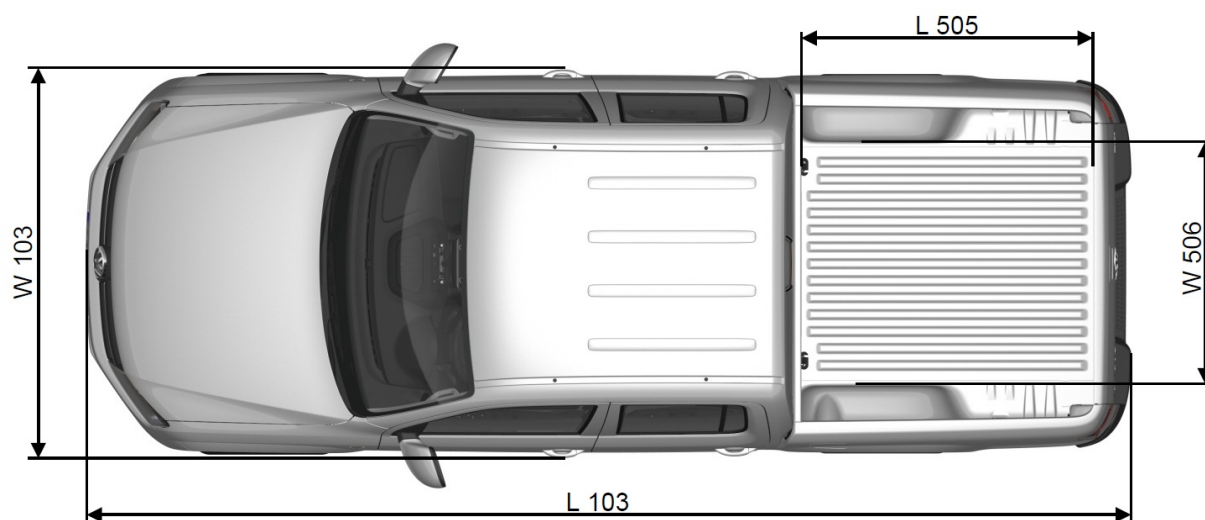


Fig. 2.1.1.2 Plan view of AMAROK-DC (Double Cab)

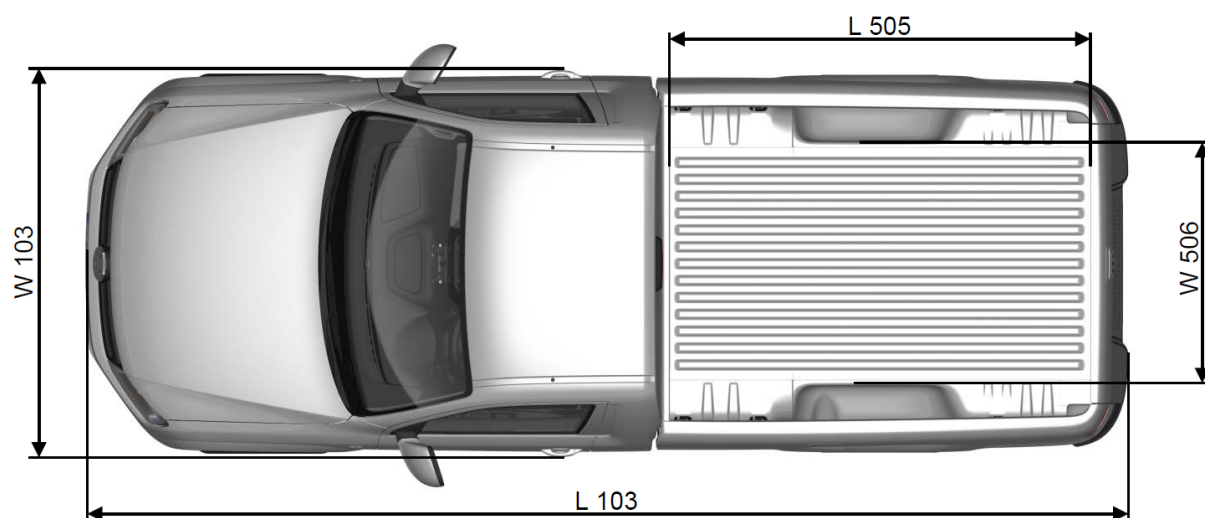


Fig. 2.1.1.3 Plan view of AMAROK SC (Single Cab)

2.1.1.1 Basic data Single Cab and Double Cab

Basic data AMAROK (all engines)			Single Cab [mm]	Double Cab [mm]
Dimensions	L101	Wheelbase with measuring load 1*	3095	3095
	L103	Vehicle length	5181	5181
		Vehicle length incl. rear bumper	5254	5254
	L 104	Front overhang with measuring load 1*	898	898
	L 105	Rear overhang with measuring load 1*	1188	1188
			1261 (with bumper)	1261 (with bumper)
	L505	Length of load bed	2205	1555
	W103	Vehicle width	1944	1944
			1954 (with wheel cover)	1954 (with wheel cover)
	H 100	Height of body with measuring load 1*	1820	1834
	W101-1	Front track width with measuring load 1*	1648	1648
	W102-2	Rear track width with measuring load 1*	1644	1644
	H156*	Ground clearance with measuring load 1*	250	250
	A116-2	Rear entry angle to gradients ML1 limited by bumper	23.6°	23.6°
		Rear entry angle to gradients ML1 without bumper	28°	28°
		Rear entry angle to gradients ML3 without bumper	15.4°	15.4°
		Rear entry angle to gradients ML3 limited by bumper with step	18°	17.6°
		Rear entry angle to gradients ML3 limited by exhaust system (petrol engine)	15.6°	15.4°
	A116-1	Front entry angle to gradients with ML1	28°	28°
		Front entry angle to gradients ML3 limited by bumper	29.8°	30.6°
	A117	Breakover angle ML1 with skid plate	21.4°	21.4°
		Without skid plate	23°	23°
		Breakover angle ML3 with skid plate	16.4°	16.7°
		Without skid plate	18°	18.6°
Turning circle	D102	Minimum turning circle	12.95m	12.95m
Wheels / tyres		Basic tyres*	Small tyre	Small tyre 205/65 R16 C 110/108T

Basic data AMAROK (all engines)			Single Cab [mm]	Double Cab [mm]
			205/65 R16 C 110/108T large tyre 245/65 R17 111T	large tyre 245/65 R17 111T
load bed dimensions	W200	Width of load bed max.	1620	1620*
	H502/1, H196	Rear load sill height, measuring load 1*	780	780
	H503	Tail lift height	508	508
	W506	Through-load width	1222	1222
Garage dimensions		Max. width with doors opened	3668	3668
	W114-L / W114R	Width incl. left/right exterior mirror	2228	2228
Interior dimensions	H61	Driver headroom	1026	1026
		Headroom 2nd seat row	--	1008
	H115/1	Driver entry height	520	520
	H115/2	Entry height 2nd seat row	--	529
	L34-1	Legroom 1st seat row	1019	1019
	L34-2	Legroom 2nd seat row	--	865

* Meas. loads ML1 and ML3 acc. to DIN 70020

Info from Volkswagen Commercial Vehicles intranet\Project AMAROK\Basic data, status: 07/12/2009

* The vehicle dimensions concerning ground clearance and load bed 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.

Information

You will find additional technical data (dimensional drawings, weight information and emissions figures) on the Amarok according to the engine and equipment variant on the Internet at:

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

<https://umbauportal.de/produkt-und-marketing>

2.1.2 Overhang angle and ramp angle

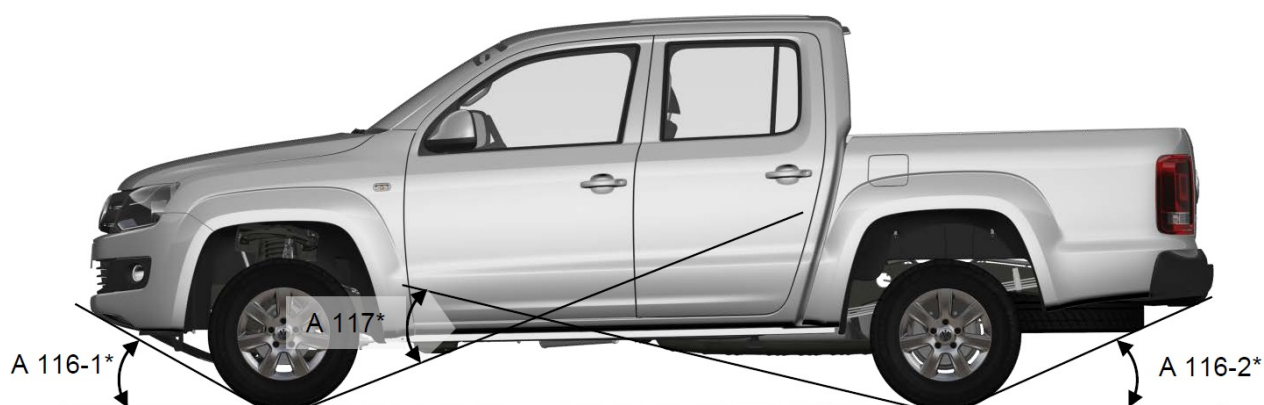


Fig. 1 Overhang and ramp angles, AMAROK DC (double cab)

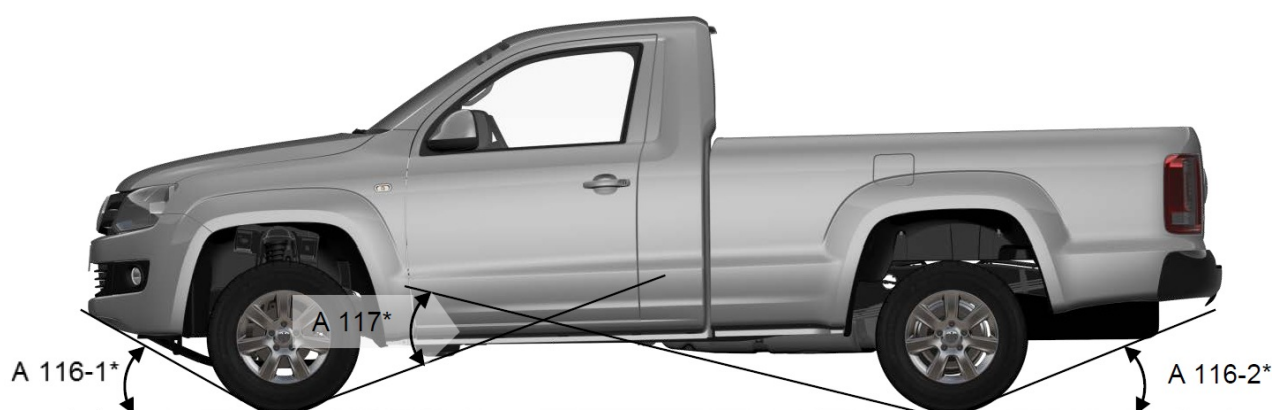
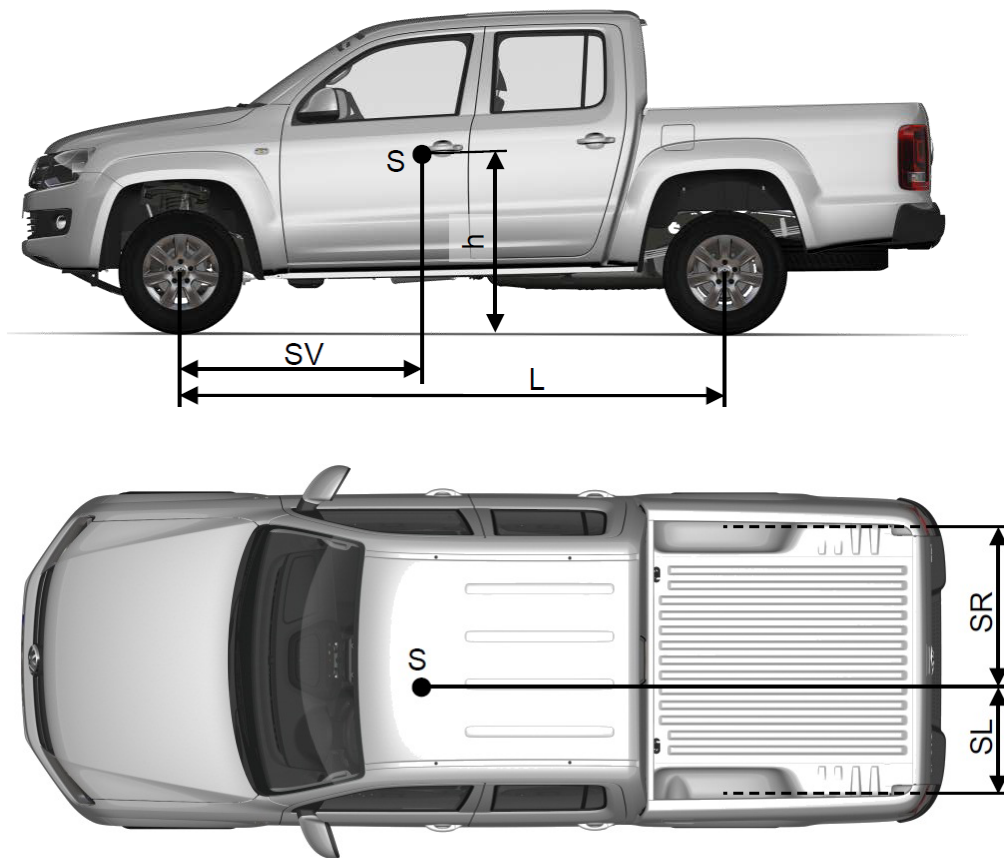


Fig. 2 Overhang and ramp angles, AMAROK SC (single cab)

The values for the overhang angle (A116) and the ramp angle A117 can be found in the basic data table for the Amarok Single Cab and Double Cab in chap. 2.1.1.1.

* 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



Model	L [mm]	h* [mm]	SV* [mm]	SR* [mm]	SL* [mm]
Double Cab	3095	680	1444	~840	~796
Single Cab	3095	657	1350	~853	~805

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. A centre of gravity height up to 800 mm above the carriageway is not problematical.

2.1.4.1 Extremely high centres of gravity (>800 mm)

Centre of gravity heights higher than 800 mm are only permitted following consultation with Volkswagen AG.

If necessary, the chassis and ESP must be modified.

The vehicle needs to be taken to Volkswagen AG for an inspection of the vehicle modifications.

Information

Please use the online contact form for this:

<http://umbauportal.de/web/guest/kontaktformular>

* Position of centre of gravity measured on the vehicle without payload and without driver (status:2010-11-11)

2.1.5 Determining 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 2.1.5.1 “Determining the centre of gravity in x-direction” and 2.1.5.2 “Determining the centre of gravity in z-direction” and using personnel with the corresponding qualifications to obtain usable results.

2.1.5.1 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 maximum permitted axle load.
- Completely fill all fluid containers (fuel tank, washer fluid reservoir, if applicable, hydraulic tank, water tank etc.).
- The vehicle is on the scales, the engine switched off, gearbox in neutral and the brakes released.
- 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).

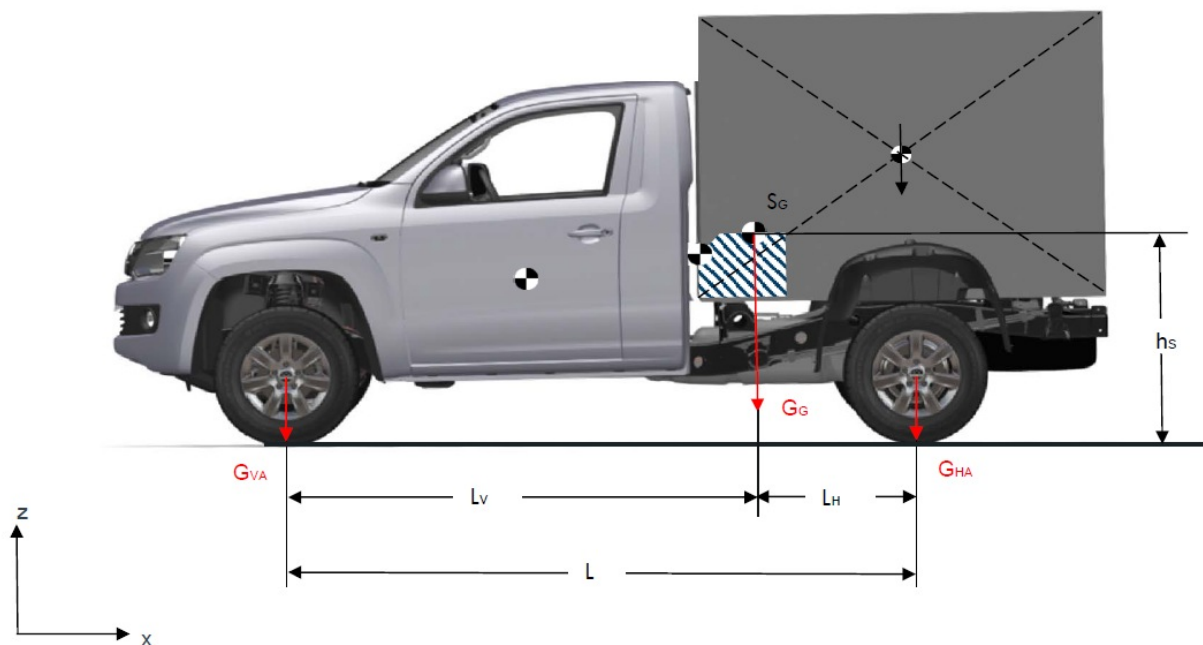


Fig. 1: Determining the position of the vehicle centre of gravity in x-direction

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 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 unladen vehicle (specification or weighing of respective chassis)
G_{HA}	-	Rear axle load of unladen vehicle (specification or weighing of respective chassis)
S_G	-	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.

2.1.5.2 Determining the centre of gravity in z-direction

For the body builder to determine the overall vehicle centre of gravity h_S (see fig.1), Volkswagen AG recommends the following procedure once the complete vehicle has been finished:

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 should be determined with the vehicle in a level state GFA and GRA (see 2.1.5.1 “Determining the centre of gravity in x-direction”) and the axle loads on an axle QRA or QFA h' 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 maximum permitted axle load.
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 (FA) 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 between the wheel hubs can be defined.
7. Determine the axle load displacement QRA that occurs at the rear 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. Raised 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.

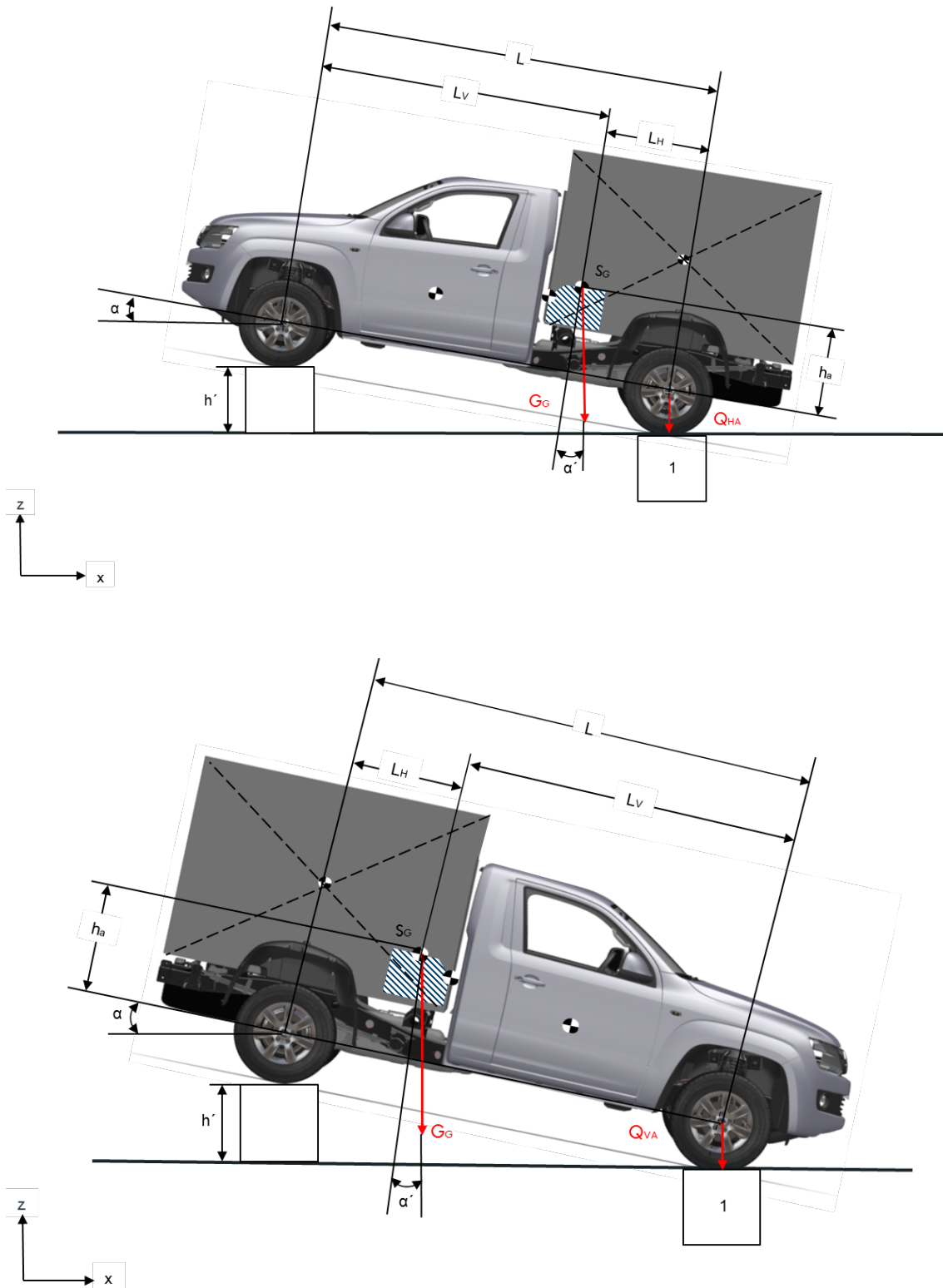


Fig. 2: Determining the position of the vehicle centre of gravity in z-direction

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 system

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.

Practical note

The measured centre of gravity may not exceed the limit values named in 2.1.3 "Vehicle centre of gravity".

2.1.6 Maximum dimensions

The ride height of the frame may change if reinforced springs, comfort springs or tyre sizes other than the standard sizes are installed. The exact heights shall be measured prior to the start of conversion work.

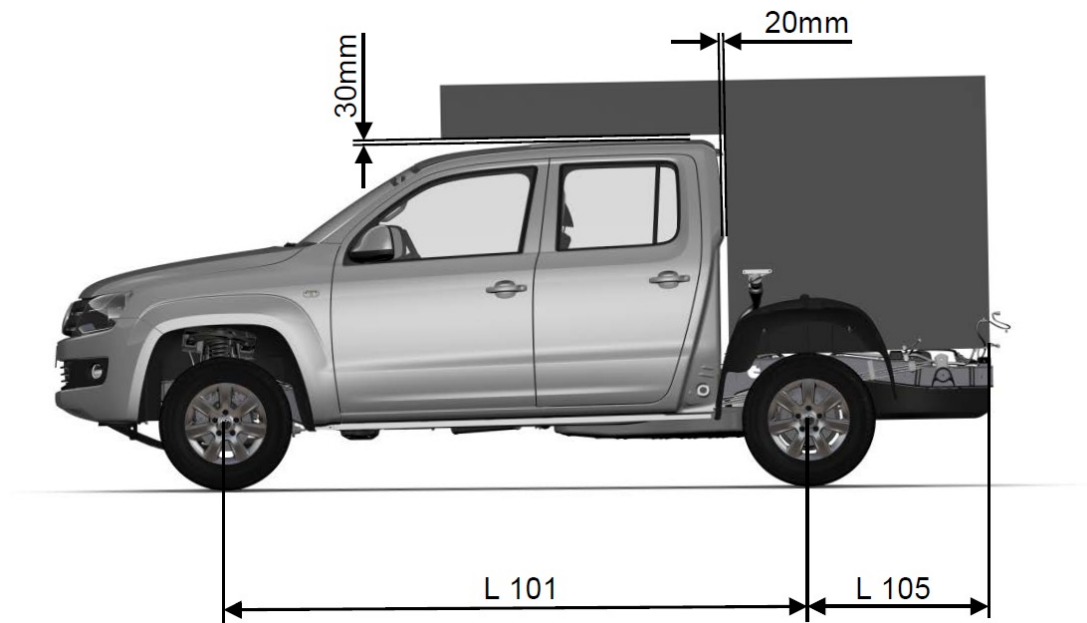


Fig. 1 Max. dimensions of AMAROK double cab

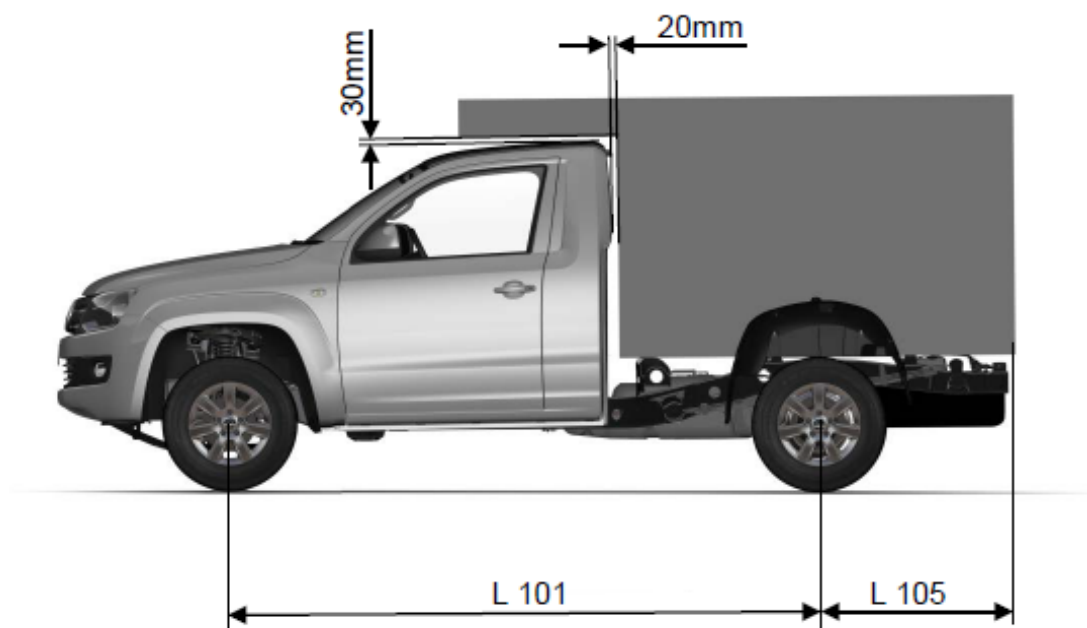


Fig. 2 Max. dimensions of AMAROK single cab

Important:

- The minimum distance between the cab and body must be 20 mm.
- The minimum distance between the cab roof and superstructure must be 30 mm.
- The front overhang of the body may not affect the view of traffic lights.

It is possible to extend the overhang measurement (L105:1188 mm) up to 1800 mm if certain requirements are met (see chapter 2.2.10 "Overhang extension").

The vehicle width is 1944-1954 mm (W103) without mirrors!

The aforementioned body width is not allowed to be exceeded when standard exterior mirrors are used.

Please also comply with the following chapters:

Chap. 2.2.1. "Permitted weights and unladen weights",

Chap. 2.2.1.1 "One-sided weight distribution"

Chap. 2.2.6 "Modifications to the braking system"

Chap. 2.2.10 "Overhang extension"

Chap. 2.2.11 "Wheelbase extension"

2.2 Running gear

2.2.1 Permitted weights and unladen weights

Volkswagen AG offers vehicles with rear-wheel drive (4x2) and four-wheel drive (4x4), with Single and Double Cabs, in the weight classes 2820 kg and 3040 kg.

The Amarok SC and Amarok DC are available with a GVWR of 2820 kg and 3040 kg.

See also chapter 2.8.2 "Towing bracket".

Petrol engines:

2.0 l / 118 kW TFSI

Diesel engines:

2.0 l / 90 kW TDI

2.0 l / 120 kW BiTDI *

2.0 l / 132 kW BiTDI 4MOTION

2.0 l / 90 kW TDI 4MOTION

2.0 l / 120 kW BiTDI 4MOTION *

2.0 l / 132 kW BiTDI BlueMotion 4MOTION

* End of model production planned for calendar week 26 2012

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, basic vehicle equipment. Weight tolerances of +5% in production are permitted in accordance with DIN 70020 and must be taken into account if necessary. Installing standard and special 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.

Weights of Double Cab:

Engine		Gearbox	PR no.	Perm. weights [kg]			Unl. weight incl. driver [kg]			Payload max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	2.0 l TFSI 118 kW petrol ²⁾	MG	0WA	2820	1300	1620	1850	1031	819	970
	2.0 l TFSI 118 kW petrol ³⁾		0WL	3040	1310	1860	1871	1031	840	1169
Diesel	2.0 l TDI 90 kW ²⁾	MG	0WA	2820	1315	1620	1868	1044	824	952
	2.0 l TDI 90 kW ³⁾		0WL	3040	1325	1860	1889	1044	845	1151
Diesel	2.0 TDI 120 kW ^{2) *}	MG	0WA	2820	1325	1620	1898	1068	830	922
	2.0 TDI 120 kW ^{3) *}		0WL	3040	1335	1860	1919	1068	851	1121
	2.0 l TDI 132 kW ³⁾		0WA	2820	1325	1620	1888	1064	824	932
	2.0 l TDI 132 kW ³⁾		0WL	3040	1335	1860	1909	1064	845	1131
Diesel	2.0 l TDI 132 kW ^{4) *}	A	0WA	2820	1415	1620	1975	1140	835	845
	2.0 l TDI 132 kW ^{4) *}		0WL	3040	1415	1860	1996	1140	856	1044
Diesel	2.0 l TDI 90 kW ²⁾	4Mo	0WA	2820	1375	1620	1931	1105	826	889
	2.0 l TDI 90 kW ^{1) 3)}		0WL	3040	1375	1860	1968	1115	853	1072
Diesel	2.0 l TDI 120 kW ^{2) *}	4Mo	0WA	2820	1385	1620	1961	1129	832	859
	2.0 l TDI 120 kW ^{1) 3) *}		0WL	3040	1385	1860	1998	1139	859	1042
	2.0 l TDI 132 kW ³⁾		0WA	2820	1385	1620	1951	1125	826	869
	2.0 l TDI 132 kW ^{1) 3)}		0WL	3040	1385	1860	1988	1135	853	1052

Status: 23/01/2012

1) Non-permanent 4-wheel drive; 2) 2+1 leaf springs (comfort); 3) 3+2 leaf springs (heavy duty); 4) Permanent Torsen

Gearbox abbreviations: MG = manual gearbox, 4Mo = 4-wheel drive gearbox, A = automatic

* End of model production planned for calendar week 26 2012

Weights of Double Cab: Chassis / CabChassis

Engine		Gearbox	PR no.	Perm. weights [kg]			Unl. weight incl. driver [kg]			Payload max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	2.0 l TFSI 118 kW petrol ²⁾	MG	0WA	2820	1300	1620	1732	1045	687	1088
	2.0 l TFSI 118 kW petrol ³⁾		0WL	3040	1310	1860	1753	1045	708	1287
Diesel	2.0 l TDI 90 kW ²⁾	MG	0WA	2820	1315	1620	1750	1058	692	1070
	2.0 l TDI 90 kW ³⁾		0WL	3040	1325	1860	1771	1058	713	1269
Diesel	2.0 l TDI 120kW ²⁾ *	MG	0WA	2820	1325	1620	1780	1082	698	1040
	2.0 l TDI 120kW ³⁾ *		0WL	3040	1335	1860	1801	1082	719	1239
	2.0 l TDI 132 kW ³⁾		0WA	2820	1325	1620	1770	1078	692	1050
	2.0 l TDI 132 kW ³⁾		0WL	3040	1335	1860	1791	1078	713	1249
Diesel	2.0 l TDI 132 kW ⁴⁾ *	A	0WL	3040	1415	1860	1878	1154	724	1162
	2.0 l TDI 132 kW ²⁾		0WA	2820	1415	1620	1857	1154	703	963
Diesel	2.0 l TDI 90 kW ²⁾	4Mo	0WA	2820	1375	1620	1813	1119	694	1007
	2.0 l TDI 90 kW ^{1) 3)}		0WL	3040	1375	1860	1850	1129	721	1170
Diesel	2.0 l TDI 120 kW ²⁾ *	4Mo	0WA	2820	1385	1620	1843	1143	700	977
	2.0 l TDI 120 kW ^{1) 3)} *		0WL	3040	1385	1860	1880	1153	727	1160
	2.0 l TDI 132 kW ²⁾		0WA	2820	1385	1620	1833	1139	694	987
	2.0 l TDI 132 kW ^{1) 3)}		0WL	3040	1385	1860	1870	1149	721	1170

Status: 23/01/2012

1) Non-permanent 4-wheel drive; 2) 2+1 leaf springs (comfort); 3) 3+2 leaf springs (heavy duty); 4) Permanent Torsen

Gearbox abbreviations: MG = manual gearbox, 4Mo = 4-wheel drive gearbox, A = automatic

* End of model production planned for calendar week 26 2012

Single Cab weights:

Engine		Gearbox	PR no.	Perm. weights [kg]			Unl. weight incl. driver [kg]			Payload max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	2.0 l TFSI 118 kW	MG	0WL	3040	1255	1860	1776	1014	762	1264
Diesel	2.0 l TDI 90 kW	MG	0WL	3040	1270	1860	1795	1027	768	1245
	2.0 l TDI 120 kW *	MG	0WL	3040	1280	1860	1812	1042	770	1228
	2.0 l TDI 132 kW	MG	0WL	3040	1280	1860	1815	1047	768	1225
Diesel	2.0 l TDI 90 kW ¹⁾	4Mo	0WL	3040	1335	1860	1874	1098	776	1166
Diesel	2.0 l TDI 120 kW ^{1)*}	4Mo	0WL	3040	1345	1860	1905	1127	778	1135
Diesel	2.0 l TDI 132 kW ¹⁾	4Mo	0WL	3040	1345	1860	1894	1118	776	1146

Status: 23/01/2012

* End of model production planned for calendar week 26 2012

1) Non-permanent 4-wheel drive; 2) 2+1 leaf springs (comfort); 3) 3+2 leaf springs (heavy duty)

Gearbox abbreviations: MG = manual gearbox, 4Mo = 4-wheel drive gearbox, A = automatic

Weights of Single Cab: Chassis / CabChassis

Engine		Gearbox	PR no.	Perm. weights [kg]			Unl. weight incl. driver [kg]			Payload max. [kg]
				Total weight	Front axle load (FA)	Rear axle load (RA)	Total weight (min.)	FA	RA	
Petrol	2.0 l TFSI 118 kW	MG	0WL	3040	1255	1860	1628	1019	609	1412
Diesel	2.0 l TDI 90 kW	MG	0WL	3040	1270	1860	1647	1032	615	1393
	2.0 l TDI 120 kW *	MG	0WL	3040	1280	1860	1664	1047	617	1376
	2.0 l TDI 132 kW	MG	0WL	3040	1280	1860	1667	1052	615	1373
Diesel	2.0 l TDI 90 kW ¹⁾	4Mo	0WL	3040	1335	1860	1726	1103	623	1314
Diesel	2.0 l TDI 120 kW ^{1)*}	4Mo	0WL	3040	1345	1860	1757	1132	625	1283
Diesel	2.0 l TDI 132 kW ¹⁾	4Mo	0WL	3040	1345	1860	1746	1123	623	1294

Status: 23/01/2012

* End of model production planned for calendar week 26 2012

1) Non-permanent 4-wheel drive; 2) 2+1 leaf springs (comfort); 3) 3+2 leaf springs (heavy duty)

Gearbox abbreviations: MG = manual gearbox, 4Mo = 4-wheel drive gearbox, A = automatic

2.2.1.1 One-sided weight distribution

The following weights shall not be exceeded under any circumstances:

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

(see chap. 2.2.1 "Permitted weights and unladen weights").

When planning add-ons/additions, make sure that a one-sided weight distribution is avoided – in particular involving permanently secured add-ons. If this is unavoidable, the maximum wheel load on one side is not allowed to deviate from the theoretical max. wheel load by more than 4%. The permitted axle load shall be complied with.

AMAROK example:

Perm. axle load (rear)	1860 kg
Theor. wheel load left/right	930 kg/930 kg
4% of this wheel load	37.2 kg
Perm. wheel load distribution left/right	892.8 kg/967.2 kg

Information

Please also refer to chap. 2.2.1. "Permitted weights and unladen weights" and chap. 2.1.6. Observe "Max. dimensions".



Fig. 1.: One-sided weight distribution (rear view)



Fig. 2: One-sided weight distribution (side view)

2.2.2 Turning circle

See chapter 2.1.1 Vehicle dimensions.

2.2.3 Authorised tyre sizes

See chapter 2.1.1 Vehicle dimensions.

2.2.4 Modifications to axles

Warning note

Modifications to the wheel suspension and the axles can lead to an impairment in the driving properties and unstable driving behaviour. Therefore, do not make modifications to chassis components.

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 use the contact form on the Volkswagen Commercial Vehicles website for your enquiries:

<http://umbauportal.de/web/guest/kontaktformular>

Chap. 2.2.6 Modifications to the braking system

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.

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

Please use the contact form on the Volkswagen Nutzfahrzeuge AG website for your enquiry:

<http://umbauportal.de/web/guest/kontaktformular>

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 1/1/1991, 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.

2.2.6.2 Vehicle stability and ESP

When the vehicle with the body mounted is presented for approval, it is a requirement of the EC Brakes directive 71 / 320 / EEC and ECE R13 to provide mathematical proof of the height of the centre of gravity when the vehicle is loaded.

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 2.2.1) of the vehicle are not allowed to be exceeded under any circumstances. If the gross axle weight ratings are exceeded, the ESP system in vehicles with ESP will no longer be able to function correctly. This may result in the driver losing control of the vehicle and causing an accident.

2.2.6.3 Influence of vehicle conversions on the function of the ESP brake regulation system

ESP sub-systems	Modification on the vehicle					
	Wheelbase modification	Extreme raising of centre of gravity >800 mm	Modification of running gear (springs, dampers, anti-roll bars, wheels, tyres, track width, steering)	Modification to the brakes (callipers, pads, design)	Conversion into tractor unit 2	Vehicle overhang extension within limits specified in body builder guidelines (<1800mm)
ABS Anti-lock brake system	+	+	+	++	+	+
Offroad ABS	+	+	+	++	+	+
BAS Brake assist system	--	--	--	++	--	--
EDL Electronic differential lock	+	+	+	+++	+	+
TCS Traction control system	++	+	+	-	+	+
ESP Electronic stabilisation program	++	+++ 1	+++ 1	+++ 1	++++	+++
Trailer stabilisation system	++	++	+++	+++	++++	++++ 3
Hill hold assist	-	-	-	++	-	-
Downhill driving assistant	+	+	+	++	++++	+

1 In particular, a significantly increased risk of tipping over

2 Downgrading required

3 A towing bracket cannot be fitted

-- No effect

- Very little effect

+ Noticeable effect, can be adapted if necessary

++ Significant effect, can be adapted if necessary

++ Very significant effect, can be adapted if necessary

++++ 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.

If specific basic conditions are met, overhang extensions, changes to the wheelbase and conversion into an articulated vehicle are possible to a limited extent. (see chap. 2.2.10 "Overhang extension", 2.2.11 "Wheelbase modification" and 5.6 "Articulated vehicles".)

2.2.6.4 Downgrading ESP

When the ESP is downgraded, the vehicle software needs to be updated to downgrade to the basic functions of the ABS (anti-lock brake system) including offroad ABS and EDS (electronic differential lock).

The hill hold assist function can still be used. The downhill assist function is deactivated for technical reasons.

The disabled ESP Off or ASR Off button needs to be replaced with a cap and the connectors in the vehicle electrical system secured.

2.2.6.5 Activating the ESP**Practical note**

If necessary, longer wheelbases can be offered with all functions of the brake control system.

This is only permitted following consultation with Volkswagen AG.

If necessary, the chassis and ESP shall be modified according to the specifications of Volkswagen AG.

The vehicle needs to be taken to Volkswagen AG for an inspection of the vehicle modifications.

Please use the online contact form for this:

<http://umbauportal.de/web/guest/kontaktformular>.

2.2.7 Modification of springs, suspension mounting, dampers

The spring rates are not allowed to be modified. Exceptions shall be approved by Volkswagen AG prior to the conversion.

Please use the online contact form for your enquiry:

<http://umbauportal.de/web/guest/kontaktformular>

2.2.8 Wheel alignment settings

Changes to wheel alignment parameters are not permitted!

2.2.9 Wings and wheel houses

The required clearance for the wheels including snow chains must be complied with.

In some bodies, it is necessary to ensure there is sufficient clearance for the wheel/tyre combination acc. to 92/23/EEC as well as for adequate wheel coverage based on EC Directive 78/549/EEC

2.2.10 Overhang extension

The overhang extension should allow longer superstructures that do not significantly shift the whole centre of gravity towards the rear to be mounted on special vehicles.

Overhang extensions measuring up to a maximum of 1800 mm are permitted if the requirements listed below are met:

– Load distribution:

Please note that the front axle load must be at least 38.8% of the gross vehicle weight rating for all load situations. The gross axle weight ratings may not be exceeded and the minimum front axle load of 1000 kg must be met. (see figure 1 Max. permitted overhang extension and figure 2 Minimum front axle load)

– Running gear:

Vehicles with overhang extensions shall always be equipped with the heavy-duty chassis (perm. HA load 1860 kg).

– Towing bracket:

Towing brackets may never be fitted to vehicles with overhang extensions.

– Rear departure angle:

A rear departure angle of at least 12 degrees should be ensured in all load situations.

– Centre of gravity weights:

During body modifications involving an overhang extension, the maximum permitted height of the centre of gravity, which is 800 mm (see chapters 2.1.3 “Vehicle centre of gravity” and 2.1.4 “Bodies with a high centre of gravity”), must also be observed.

All traction control system functions are still available under these conditions.

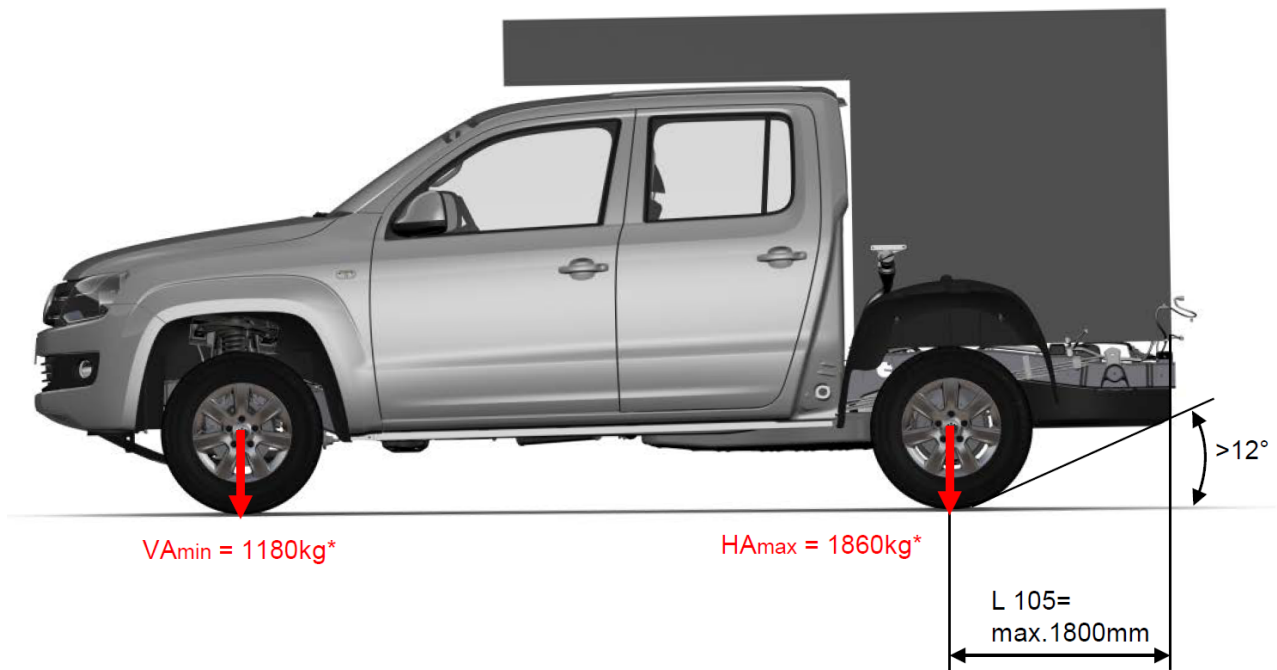


Fig. 1.: Maximum permitted overhang extension (heavy-duty chassis)

FA_{min}	-	Minimum required front axle load
RA_{max}	-	Maximum permitted rear axle load
*	-	Heavy-duty chassis

The displacement of the overall centre of gravity towards the rear must be limited to retain the positive driving properties of the Amarok in terms of self-steering effect, steering, brake functions, driver assistance functions and body longitudinal incline.

The permitted displacement of the overall centre of gravity towards the rear is ensured by observing a minimum front axle load depending on the utilised rear axle load.

The following diagram illustrates this context:

- Up to 1575 kg rear axle load, the minimum front axle load is 1000 kg
- From 1575 kg to maximum 1860 kg rear axle load, the minimum front axle load must increase consistently

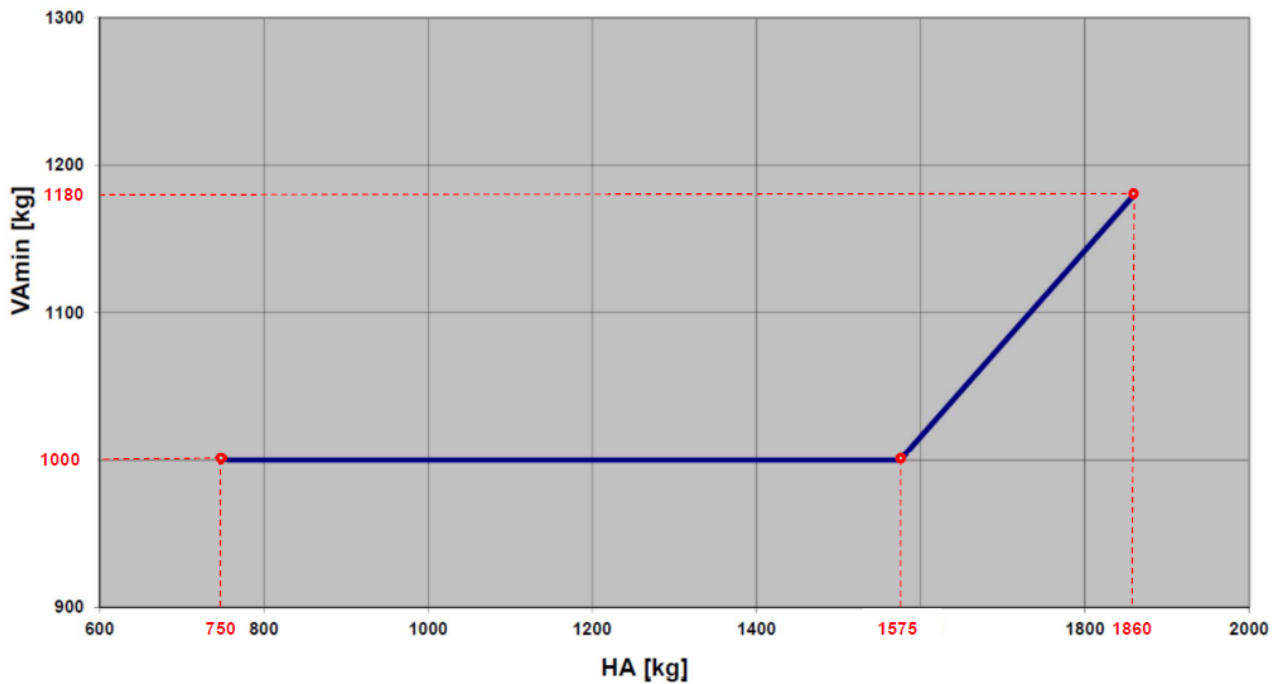


Fig. 2.: Minimum front axle load for Amarok (heavy-duty chassis)

FAmin - Minimum front axle load
RA - Rear axle load

2.2.10.1 Requirements for trailer operation with overhang extension

If the specifications mentioned above in chap. 2.2.10 regarding axle loads

- and their distribution (minimum FA load) are taken into consideration,
- Suspension (heavy-duty RA springs)
- Gradient entry angle
- Centre of gravity height

an Amarok with overhang extension can be used with a towing bracket if the following conditions are met in addition:

- Overhang extension WITHOUT frame extension
- Towing bracket in original position
- The axle loads and their distribution (minimum FA load) incl. the axle load displacement caused by the vertical load of the trailer must be observed.
- The axle loads and their distribution (minimum FA load) must be observed also in conjunction with the trailer (vertical load).
- Sufficient clearance between extended body and trailer (see DIN 74058 “Coupling ball; dimensions, clearance”)
- Possible loading of the extended body can be limited considerably by these restrictions when a trailer is towed.
- An improvement can be achieved by extending the wheelbase while maintaining the standard overhang.

2.2.11 Wheelbase modification

Vehicles with modified wheelbases should always be downgraded in terms of brake regulation functions. (see chap. 2.2.6 Modifications to the braking system).

This concerns all vehicles with ESP (Electronic Stabilisation Programme) and all vehicles with TCS system (Traction Control System) and rear or non-permanent four-wheel drive.

Downgrading:

The vehicle software needs to be updated to downgrade to the basic functions of the ABS (anti-lock brake system) including offroad ABS and EDS (electronic differential lock).

The hill hold assist function can still be used. The downhill assist function is deactivated for technical reasons.

The disabled ESP Off or ASR Off button needs to be replaced with a cap and the connectors in the vehicle electrical system secured.

If necessary, longer wheelbases can be offered with all functions of the brake control system.

This is only permitted following consultation with Volkswagen AG.

If necessary, the chassis and ESP shall be modified according to the specifications of Volkswagen AG.

The vehicle needs to be taken to Volkswagen AG for an inspection of the vehicle modifications.

Please use the online contact form for this:

<http://umbauportal.de/web/guest/kontaktformular>

2.3 Body-in-white

2.3.1 Roof loads/vehicle roof

Dynamic roof loads:

Vehicle model	Max. roof load
AMAROK Double Cab (DC)	100 kg
AMAROK Single Cab (SC)	50 kg

Risk of accident

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, we recommend that you avoid roof loads as far as possible. Please also comply with chapter 2.1.4 "Bodies with a high centre of gravity".

Static roof loads:

The maximum static roof load for the Amarok Double Cab is 225kg (incl. roof tent up to max. 75kg).

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 used 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.
- Use of Volkswagen tightening torques assumes that the total coefficient of friction is in the range $\mu_{tot} = 0.08$ 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 chap. 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.
- Directly connect the earth clamp of the welding machine 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 cables 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, airbag sensors and fuel tanks 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

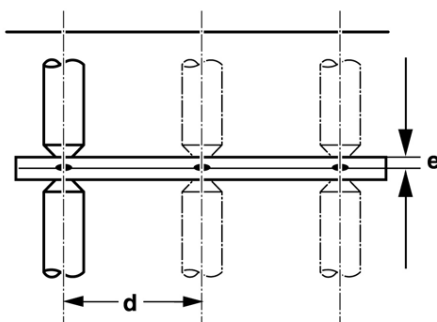
2.3.2.5 Spot welding

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 ($d = 10e+10$ mm).

□



Ratio between panel thickness and distance between welds

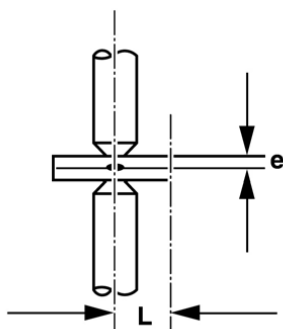
d Distance between spot welds

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 ($L = 3e+2$ mm).

□



Ratio between panel thickness and distance from edge

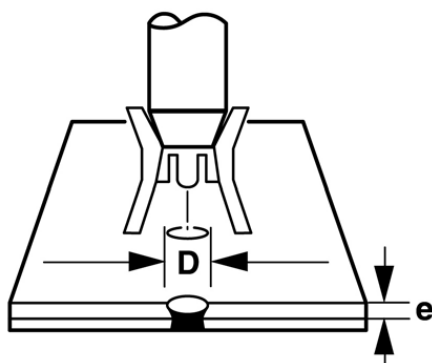
e Panel thickness

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.

□

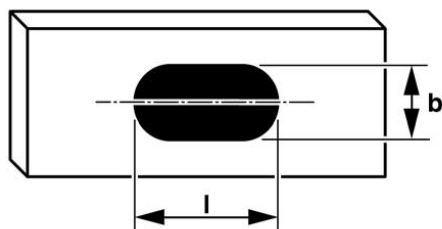


Ratio between panel thickness and hole diameter

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

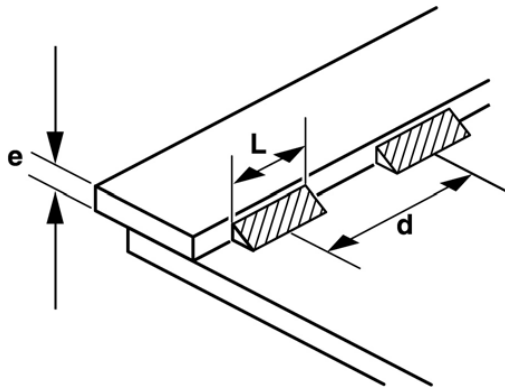
b Width of slot

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 weld

2.3.2.8 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 chapter 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 work.

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.

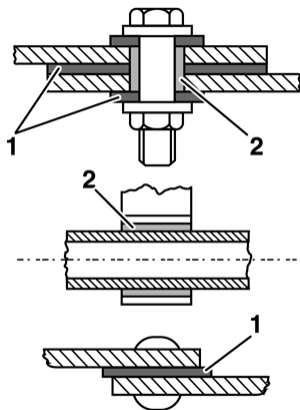
Information

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

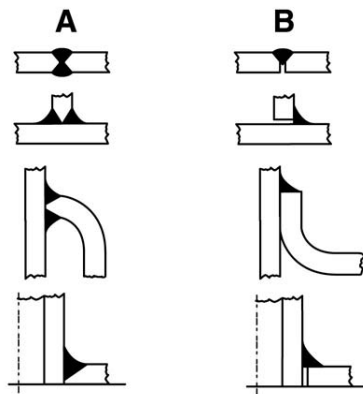
Design measures, in particular in the design of connections between the same or different materials, can be used for providing corrosion protection:

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 2.3.10 "Paint work / 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

2.3.3 Tailgate

The tailgate on the Amarok Double Cab and Single Cab has the following properties:

- Cannot be removed
- Outer panel
- Inner panel
- Reinforcement parts (hinge/lock reinforcement left and right; lateral reinforcement)
- Closing plate for installation opening
- Hinges
- Lock
- No step in the tailgate
- 180° opening (no rear bumper)
- Can be locked in 90° position

150 kg static load in 90° position

2.4 Interior

2.4.1 Modifications in the area of airbags

Modifications to the airbag system and the belt tensioner system are not permitted

Furthermore, modifications on and in the area of airbag components, the airbag sensors and the airbag control units are not permitted.

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.

The interior fittings shall be designed so that the airbag deployment areas are left unobstructed.

2.4.2 Modifications in the area of seats

Modifications to the seat system or attachment of seats on the wheel housing 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.

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

2.4.3 Forced ventilation

Outlet vents may be closed through modifications only if new outlets are created, e.g. in the cab doors.

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 in 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). Failing to comply can result in the operating permit being invalidated.

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

The use of LED lights is not intended by the manufacturer.

Installing LED lights instead of the original VW lights can cause the bulb failure check to issue a warning because the lighting system is not configured for this. The bulb failure check function cannot be activated.

We recommend using Volkswagen Genuine rear lights or a product with E test symbol and conventional bulbs.

2.5.1.2 Mounting special lights

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

Comply with the following chapters during the conversion:

- 3.1 Body-in-white/bodywork
- 3.1.4 Modifications to the roof
- 2.5.2.4 Retrofitting electrical devices

2.5.1.3. Installing 3rd brake light

When higher bodies are fitted, it may be necessary to integrate the 3rd brake light into the body.

A cover (7H0.971.341) for the 3rd brake light is available from the factory to cover the original brake light aperture. For more information, please contact your Volkswagen partner.

2.5.1.4 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 cables / 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 (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 cables/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.
- 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.

Warning note

No additional electrical cables or hose lines are allowed to be secured to existing lines such as brake or fuel lines using cable ties. An independent attachment solution must be found.

2.5.2.2 Additional circuits

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 Electrical interface for special vehicles

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.

Subject to technical modifications.

The following points shall be adhered to:

- Various VDE guidelines for configuration and fitting of electrical cables 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 AMAROK 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.

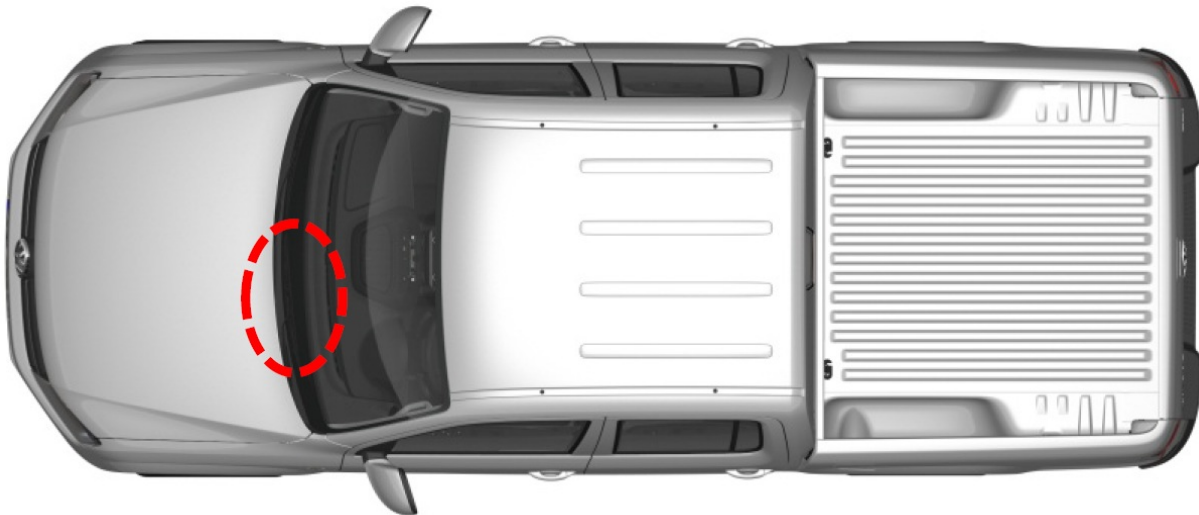
2.5.2.3.1 Position of the interface

Fig. 1: Electrical interface for special vehicles

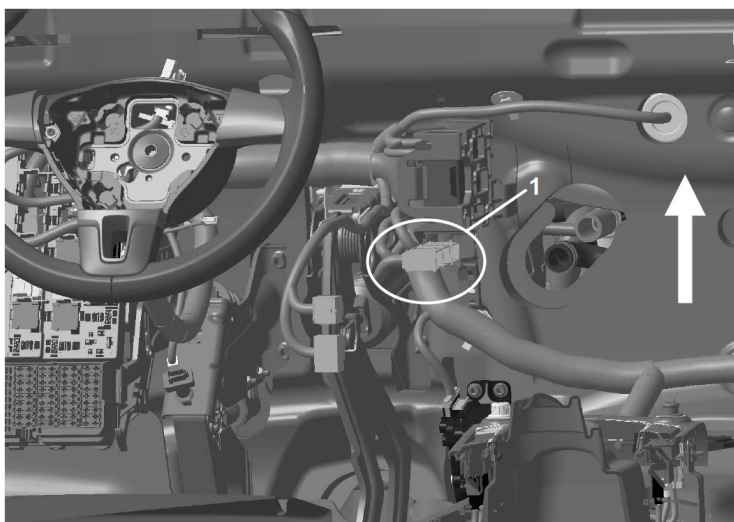


Fig. 2: Position of the electrical interface in the vehicle

* 1 => UF1 interface for special vehicles

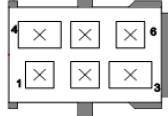
** "Arrow" => Direction of travel

2.5.2.3.2 Interface assignment

	Pin	Poten- tial	Colour	Cross- section [mm²]	Max. current draw [A]	Max. current supply [A]	Fusing	Mating plug contact	Use
Plug 1 1J00.937.743.K 	A1	75A	Black/w hite	2.5	12	-	F69 / 15A	1J0.937.733.K	Output terminal of relay X-contact
	A2	55	Black/vi olet	1.5	SENSE*	16	F53 / 20A	1J0.937.733.K	Fog light terminal
	A3	RFL	Black/bl ue	1.0	SENSE*	12	F3 / 10A	1J0.937.733.K	Reversing light
	A4	56bL	Yellow/ black	1.5	SENSE*	16	F29 / 10A	1J0.937.733.K	Dipped beam (left)
	A5	56bR	Yellow/r ed	1.5	SENSE*	16	F55 / 15A	1J0.937.733.K	Dipped beam (right)
	A6	86S	Black/gr een	0.5	4	-	F7 / 5A	1J0.937.733.K	S-contact ignition lock
	A7	58d	Green/ yellow	0.5	6	-	F28 / 15A	1J0.937.733.K	Terminal 58d
	A8	56aL	White/ black	1.5	SENSE*	16	F30 / 10A	1J0.937.733.K	High beam (left)
	A9	15A	Black/bl ue	1	4	-	F70 / 5A	1J0.937.733.K	Terminal 15
	A10	58LA	Green/bl ack	1	SENSE*	12	F18 / 5A	1J0.937.733.K	Side lights
Plug 2 1J00.937.743.C 	A1	56aR	White/ red	1.5	SENSE*	16	F32 / 10A	1J0.937.733.C	High beam (right)
	A2	V	White/ violet	0.5	SENSE*	-	-	1J0.937.733.C	Speed signal
	A3	L	Black/w hite	1	SENSE*	12	-	1J0.937.733.C	Turn signal left
	A4	50	Red/blac k	2.5	SENSE*	-	HSB F2 / 175A	1J0.937.733.C	Starter
	A5	n.c.						1J0.937.733.C	n.c.
	A6	R	Black/gr een	1	SENSE*	12	-	1J0.937.733.C	Turn signal right
	A7	HB Sig	Brown/vi olet	0.35	SENSE*	-	-	1J0.937.733.C	Parking brake
	A8	50b	Red/ black	2.5	SENSE*	-	HSB F2 / 175A	1J0.937.733.C	Starter
	A9	n.c.						1J0.937.733.C	n.c.
	A10	71a	Brown/g reen	1	SENSE*	-	-	1J0.937.733.C	Horn momentary contact
	A1	54	Black/gr een	0.5	SENSE*	-	-	1J0.937.731.G	Brake

Plug 3

1J00.937.741.G



Pin	Poten- tial	Colour	Cross- section [mm²]	Max. current draw [A]	Max. current supply [A]	Fusing	Mating plug contact	Use
A2	54	Black/gr een	0.5	SENSE*	-	-	1J0.937.731.G	Brake lights
A3	15a	Black/vi olet	4	20	-	F71 / 25A	1J0.937.731.G	Continued engine running tl 15
A4	30A	Red/bro wn	4	32	-	HSB F3/40 A	1J0.937.731.G	Terminal 30
A5	75A	Black/yel low	1	8	-	F72/10 A	1J0.937.731.G	Continued engine running tl 75
A6	n.c.						1J0.937.731.G	-

2.5.2.3.3 Connector pin assignment and circuit diagrams for interface for special vehicles

Detailed information about the special interface can be found in the workshop manuals and circuit diagrams (no. 21/1) 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>

*SENSE = digital, high-impedance import of a signal with a controller; < 20 mA

2.5.2.4 Retrofitting electrical devices

Note the following for retrofitting additional electrical consumers:

- No further consumers 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).
- Protect consumers adequately by means of additional fuses.
- All installed electrical devices shall be checked acc. to EU Directive 72/245/EEC and shall bear the "e" mark.

Warning note

Please note that in vehicles with towing brackets, the socket for supplying the trailer electrical system influences the control functions of the brake system (ABS/TCS/ESP), and it is exclusively provided for supplying power to the trailer.

When the trailer socket is occupied:

The offroad button has no effect (no offroad ABS and hill descent assist is no longer possible (ESP vehicles only))

ESP functions respond more sensitively

The hill start assist becomes more robust

We recommend using the interface for special vehicles to provide electrical power to special vehicle conversions. (see also chap. 2.5.2.3 "Electrical interface for special vehicles")

2.5.2.4.1 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 the system itself impaired.

Electrical interference in motor vehicle electrical systems is caused by the individual consumers. 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.

The devices shall possess a type approval acc. to EU Directive 72/245/EEC in the current version, and shall bear the "e" mark.

2.5.2.5 Mobile communication systems

In order to avoid subsequent disruptions to operation, it is necessary to take account of the following points when retrofitting mobile communication systems (e.g. telephone, CB radio):

- The devices shall possess a type approval acc. to EU Directive 72/245/EEC in the current version, and shall bear the "e" mark.
- All devices to be fitted shall possess a type approval acc. to EU Directive 72/245/EEC in the current version, and shall bear the "e" mark.
- The maximum transmission power is not allowed to be exceeded.
- The devices and holders shall be located outside the deployment range of the airbags.
- They shall be permanently installed.
- Mobile devices within the cab are only allowed to be operated via an external aerial installed in such a way as to eliminate reflections.
- The transmitter shall be installed in a separate location from the vehicle electronics.
- The device shall be protected against moisture and severe mechanical shocks; comply with the permitted operating temperature.

2.5.2.6 CAN bus

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

2.5.3 Vehicle battery/protection for the vehicle's battery if the vehicle is not used for some time

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 manufacturer for some time.

2.5.3.1 Installation of additional battery

When installing additional batteries, please note that this may only be done in conjunction with a battery isolation 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.

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.

2.6 Engine peripherals/powertrain

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

Modifications to the fuel system are not permitted.

Modifications to the body in the area of the fuel tank require the fuel tank to be removed first.

Comply with the workshop manuals of Volkswagen AG.

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>

Note the following when working on the fuel system:

- Vehicles with a petrol engine have their activated charcoal container located at the rear end 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 configured components can impair the function of the engine.

Please also comply with chapter 4.1.4 Removal of the filler neck.

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 not permitted.

We recommend using genuine VW parts if making modifications to the exhaust system, and to follow the repair instructions 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 of Volkswagen AG):

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

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 use the online contact form for this:

<http://umbauportal.de/web/guest/kontaktformular>

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.).

2.7 Ancillary drives, engine/gearbox

If ancillaries are used, the recommended ancillary drives should be used.

2.7.1. Retrofitting air-conditioning system

All installed electrical devices must be checked acc. to EU directive 72/245/EEC and shall bear the "e" mark.

To retrofit air-conditioning systems, we recommend the “regulated air-conditioning system” PR no. 9AD/9AP (“Climatic/Climatronic air-conditioning system”) that you can buy ex works as optional equipment.

We recommend using the original refrigerant compressor:

Engine designation		Climate control	Refrigerant compressor Type
Petrol	2.0 l 118 kW TFSI	Cab	DENSO-6SEU14 (140 ccm)
Diesel	2.0 l 90 kW TDI 2.0 l 103 kW TDI 2.0 l 132 kW TDI	Cab	DENSO-6SEU14 (140 ccm)

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 replacing ancillaries, for example, the refrigerant compressor, is possible in place of the original refrigerant compressor or with the aid of an additional belt pulley via the second belt track. (see chap. 2.7.3 “Specifications of standard refrigerant compressor”. 2.7.2 Driving an ancillary via 2nd belt track)

The following points should be observed for the compatibility with the base vehicle:

- 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 cables/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 table 2).
- The diameter and position of the drive pulley for the ancillary must correspond with that of the original refrigerant compressor. (see Fig. 1-5)
- 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 table 4).
- If the standard refrigerant compressor is used, it is necessary to optimise the fill volume and conduct oil circulation and oil return measurements. Measurements for ensuring the oil circulation in the refrigeration circuit shall be carried out by the body builder at its own cost, and be conducted at the corresponding compressor manufacturers.
- 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 page 7).

Practical note

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

2.7.2. Driving an ancillary via the 2nd belt track

Further ancillaries (e.g. generators, compressors or pumps) can be driven via the second belt track with the aid of an additional pulley. You can obtain the corresponding conversion kit separately from Volkswagen Genuine Parts.

The conversion kit comprises:

- Hub (part no. 03L.105.215)
- Belt pulley, diameter:160mm 6PK (03L.105.255.C)
- Fixtures

For information on the conversion kit, please ask your VW partner or contact the superstructure manufacturer support via the contact form.

<http://umbauportal.de/web/guest/kontaktformular>

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 (Electronic Repair and Workshop Information of Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

The max. consumable power with 4-cylinder TDI engines is: 8.0 kW.

2.7.3. Specifications of standard refrigerant compressor

Table 1: Maximum output of refrigerant compressor

Engine designation		Refrigerant compressor type	Power L [kW]	Cooling power Q [kW]
Petrol	2.0 l 118 kW TFSI	DENSO-6SEU14 (140 ccm)	5.71 l)	8.32 l)
Diesel	2.0 l 90 kW TDI 2.0 l 103 kW TDI 2.0 l 132 kW TDI	DENSO-6SEU14 (140 ccm)	5.71 l)	8.32 l)

1) Figures on refrigerant compressor with high pressure $P_d=1.47\text{MPaG}$, suction pressure $P_s = 0.196\text{MPaG}$ and speed $N = 4000\text{rpm}$

Table 2: Weight of refrigerant compressor

Engine designation		Refrigerant compressor type	Max. weight [kg]
Petrol	2.0 l 118 kW TFSI	DENSO-6SEU14 (140 ccm)	4.62 kg
Diesel	2.0 l 90 kW TDI 2.0 l 103 kW TDI 2.0 l 132 kW TDI	DENSO-6SEU14 (140 ccm)	4.62 kg

Table 3: Belt pulley diameter of refrigerant compressor

Engine designation		Refrigerant compressor type	Pulley diameter	Transmission ratio "i" (crankshaft/ref rigerant compressor)
Petrol	2.0 l 118 kW TFSI	DENSO-6SEU14	100mm	---2)
Diesel	2.0 l 90 kW TDI 2.0 l 103 kW TDI 2.0 l 132 kW TDI	DENSO-6SEU14	100mm	1.38

Table 4: Specifications of poly V-belt

Engine designation		Refrigerant compressor type	Belt specification/part no.
Petrol	2.0 l 118 kW TFSI	DENSO-6SEU14 (140 ccm)	6 PKD 1577 / 06H.903.137.H
Diesel	2.0 l 90 kW TDI 2.0 l 103 kW TDI 2.0 l 132 kW TDI	DENSO-6SEU14 (140 ccm)	6PK1555, SILENT GRIP / 03L.903.137.H

2) Figures were not available at the copy deadline.

2.7.3.1 Connection measurements of standard refrigerant compressor

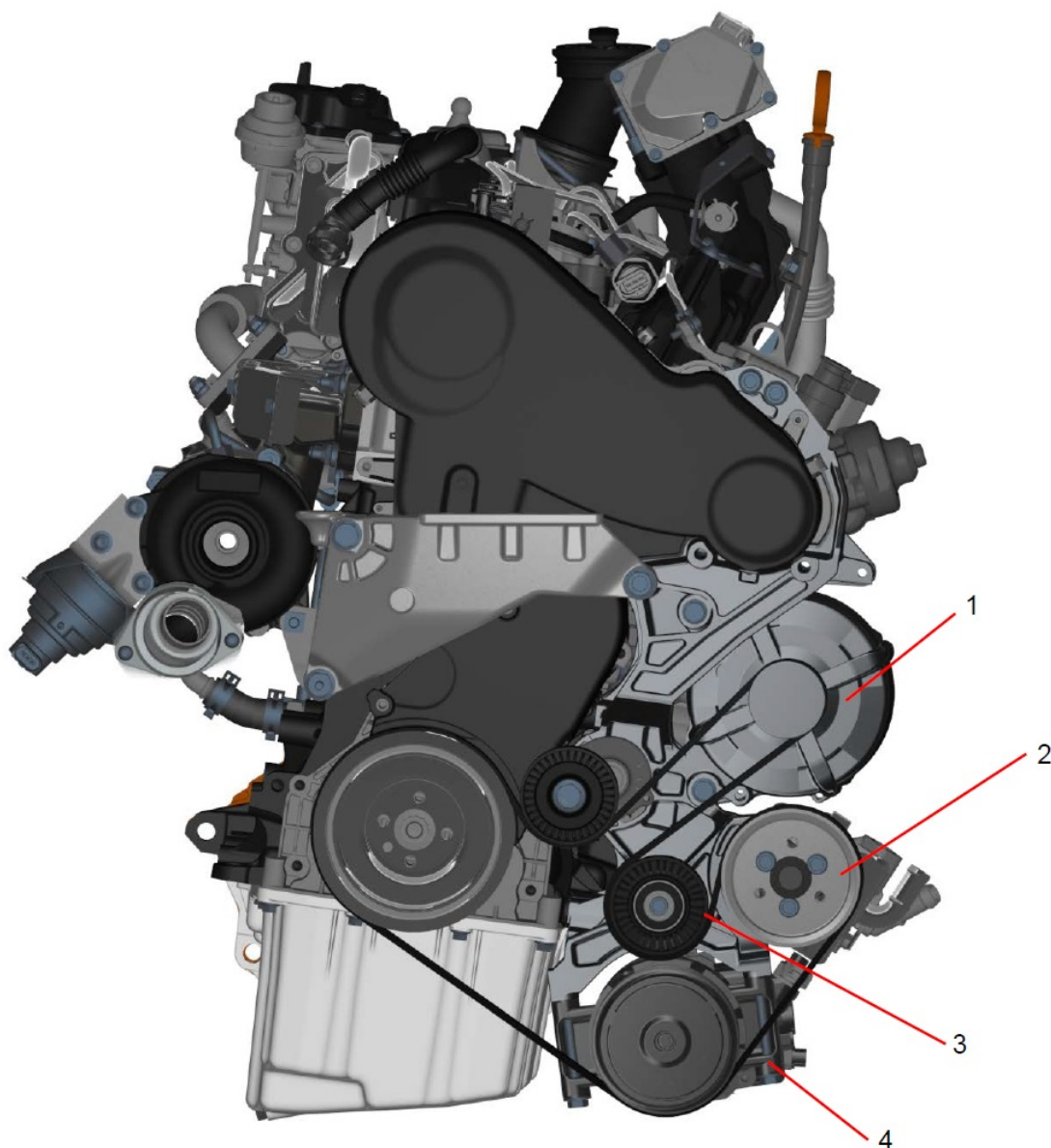


Fig. 1 Poly V-belt drive (here only TDI engine depicted, the original engine position differs from the picture)

- 1 - Alternator
- 2 - Poly-V-belt pulley
- 3 - Reversing pulley
- 4 - Air-conditioning compressor assembly

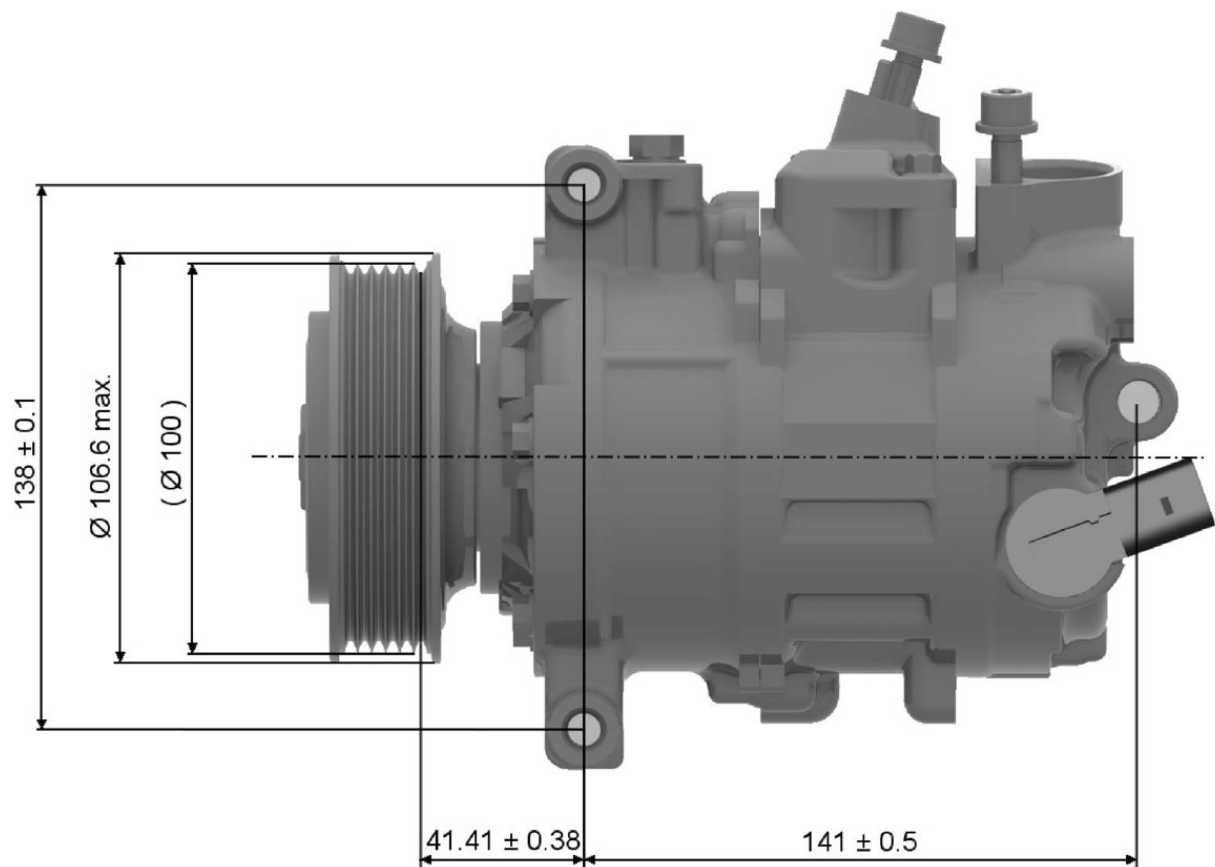


Fig. 2: Dimensions of air-conditioning compressor, pulley diameter 100 mm (side view)

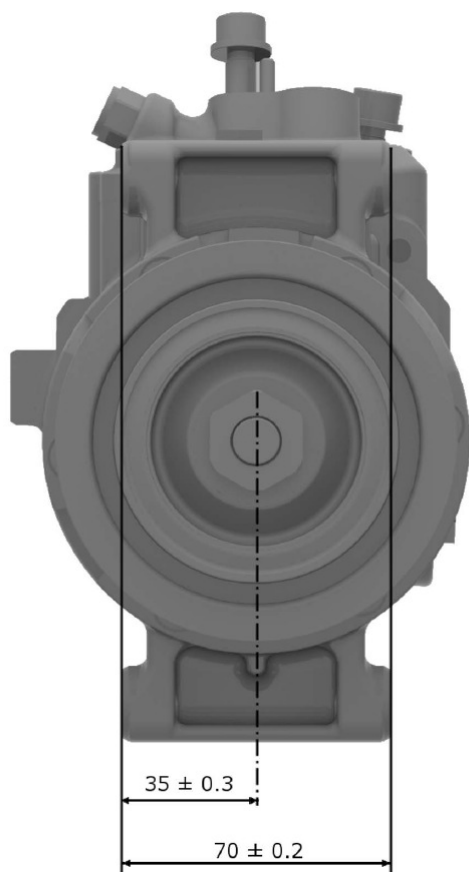


Fig. 3: Dimensions of air-conditioning compressor Denso 6SU14 (front view)

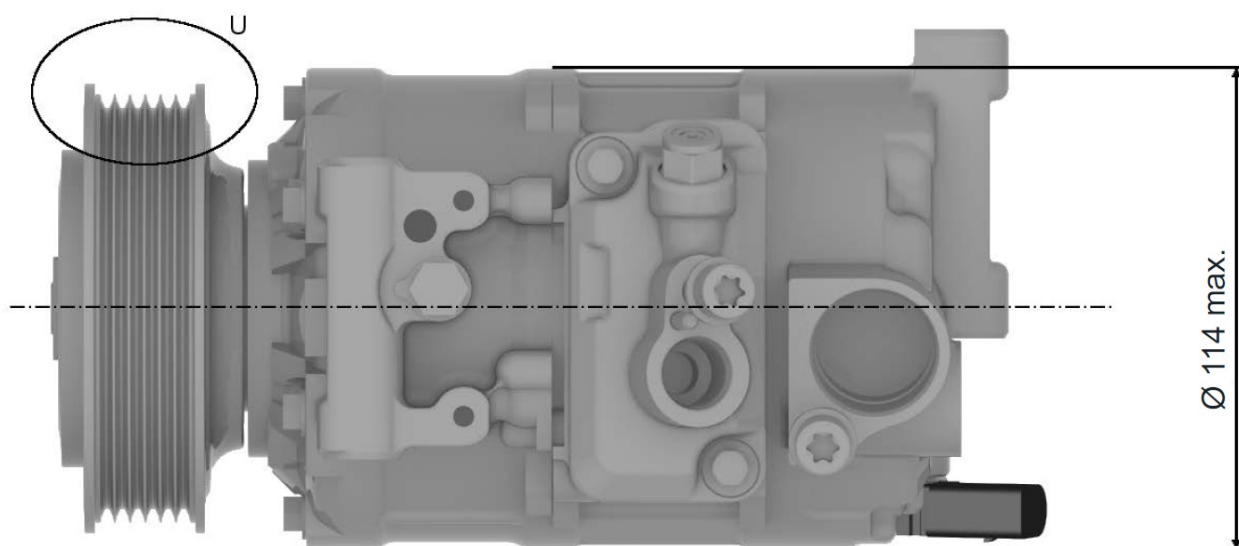


Fig. 4: Dimensions of air-conditioning compressor Denso 6SU14 (view from above)

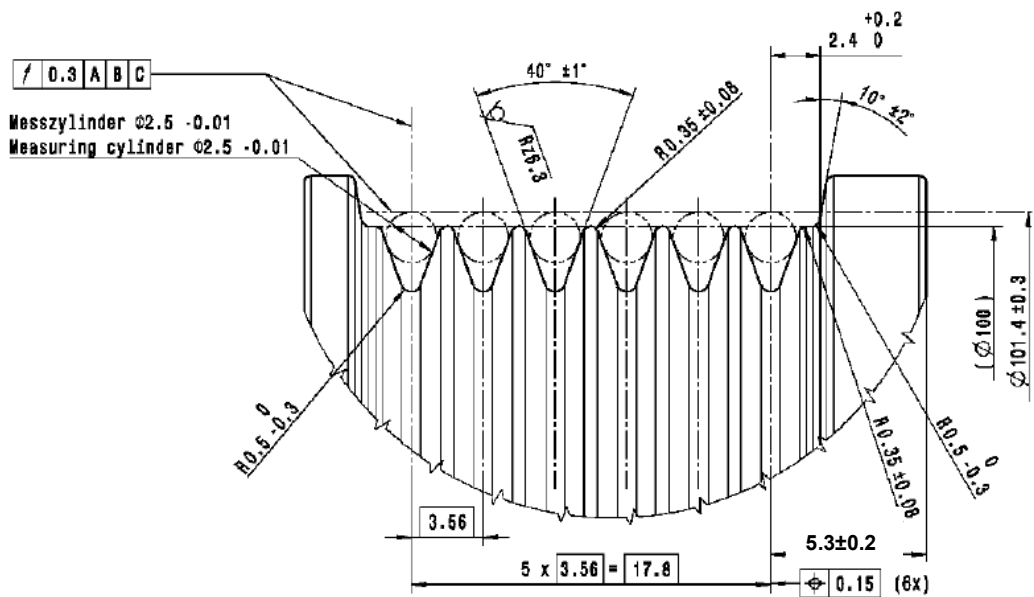


Fig. 5: Detail U - Denso 6SU14 air-conditioning compressor drive pulley, pulley diameter $d=100\text{mm}$

Please also comply with the following chapters during the conversion:

- Additional units (chapter 2.7.1)
- Vehicle battery (chap. 2.5.3)
- Additional circuits (chapter 2.5.2.2)
- Modifications to closed bodies (chapter 3)

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 (Electronic Repair and Workshop Information of Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

2.7.4 Installation and removal of the poly V-belt

□

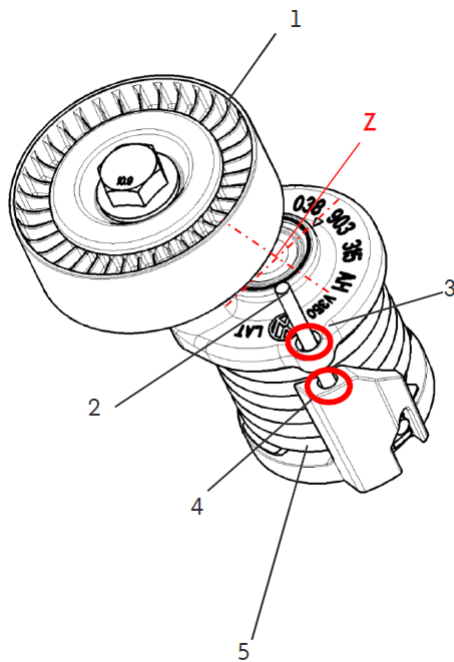


Fig. 1 Belt tensioner

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

2.7.4.1 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" ($d = 5 \text{ mm}$). 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 locking position.

2.7.4.2 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 nominal 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.

2.7.4.3 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 picture provides no indication of the safety

of a belt drive differing from the production version.

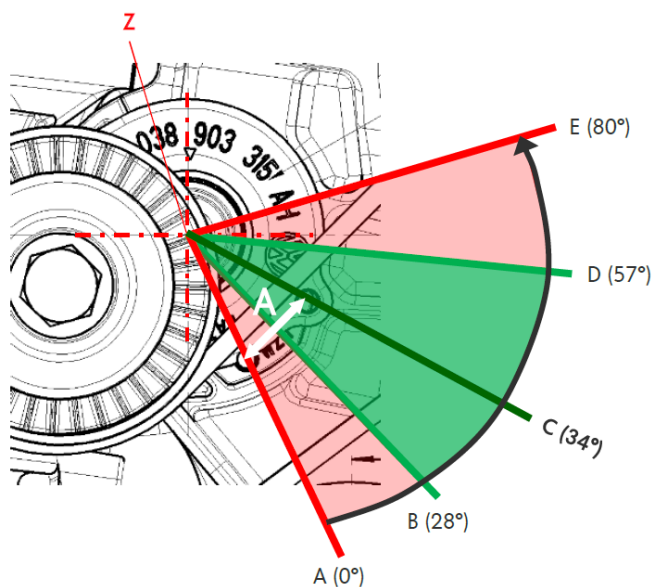


Fig. 2 Working range of the belt tensioner

A - Locking position 0° (overlap)

B - Start of working range 28°

C - Nominal position 34°

D - End of working range 57°

E - Bottom stop 80°

Distance A [mm]	Position of the belt tensioner
0	Locking position (overlap)
14.5	Start of working range
17.5	Nominal position
50.3	End of working range

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 go beyond the working range from 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 of Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>

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).

The AMAROK DC (Double Cab) has 2 bolt-on points on each side of the roof and the AMAROK SC (Single Cab) has 1 bolt-on point on each side (see Fig. 2.8.1.1).

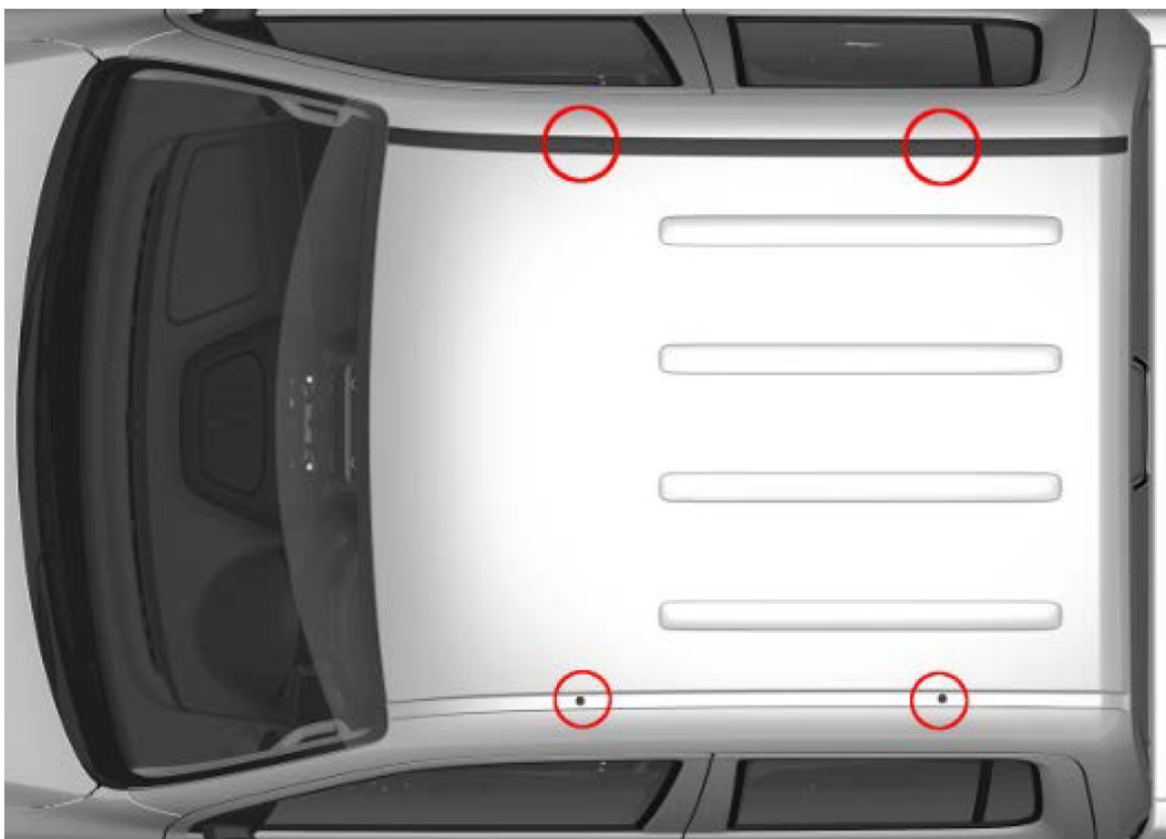


Fig. 1 Roof rack bolt attachment points on AMAROK DC (marked in red)

2.8.2 Towing bracket

We recommend using hitches approved by Volkswagen as towing brackets.

The “Preparation for towing bracket” (PR no: 1D7) is part of the standard equipment on vehicles from model year 2012.

You can obtain the ball head towing bracket incl. electrical set as a genuine accessory (PR no. YAK) directly from Volkswagen AG.

□

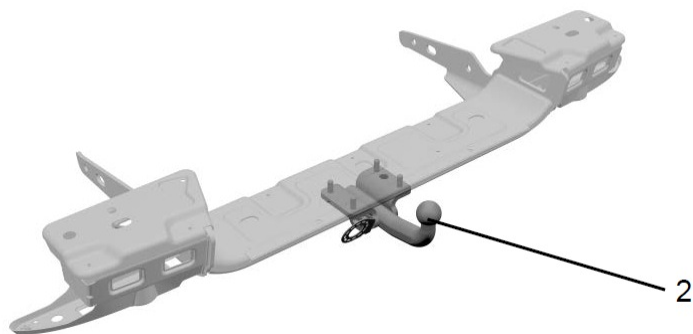


Fig. 1: 2 = ball head

Maximum trailer loads:

Engine		Total towing weight [kg]	Max. trailer load ¹ (12% climb) [kg]	Drawbar load [kg]
Petrol	2.0 l 118 kW TFSI	5550	3000 (2800) ³	120
Diesel	2.0 l 90 kW TDI			
	2.0 l 120 kW TDI			
	2.0 l 132 kW BiTDI	5950 ²	3200 ²	130 ²
	2.0 l 132 kW BiTDI 8-speed automatic			

* End of model production planned for calendar week 26 2012

¹ Unbraked trailer load: 750kg

² Does not apply to hot country (8Z6) and super hot country (8Z9)

³ Does not apply to 4x2 comfort variants

The maximum permitted gross combination weight and maximum permitted trailer load specified in the documents are not allowed to be exceeded.

For retrofitting a towing bracket

- The regulations of the country in question shall be adhered to
- The necessary clearance for the towing bracket shall be guaranteed (DIN 74058)
- The vehicle shall be presented to a motor vehicle test centre with responsibility for this matter.

Practical note

There are attachment points in the vehicle's chassis rails, or if the towing bracket preparation and step have been ordered, then they are below the step.

Operation with the factory-fitted hitch may be excluded at a very low ride height or if there is a long body overhang, as well as after an extension of the overhang.

Information

The towing brackets listed here are only valid for EU countries. There are different variants for countries outside the EU. You can obtain more information on this from your Volkswagen dealer.

2.8.3 Other accessories

You can purchase further extensive accessories for the Amarok through Volkswagen Accessories.

Information

For further information, see:

<http://www.volkswagen-zubehoer.de/>

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 jacking points on all vehicle variants

- (in all chassis without standard add-ons).

The body maker 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.

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 tank 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 additions, 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.

Please also refer to chapter 4.1 "Cargo box removal".

3.1.1 Side wall and rear 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.

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.

Information

You will find further information on body assembly work on the Internet at erWin (Electronic Repair and Workshop Information of Volkswagen AG):

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

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

3.1.2 Installation of windows

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 of Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>
<https://erwin.volkswagen.de/erwin/showHome.do>

3.1.3 Roof cut-outs

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

Information

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

3.1.4 Modifications to the roof

The following points shall be observed if modifications are made to the roof structure:

- 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.
- 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 of Volkswagen AG):
<http://erwin.volkswagen.de/erwin/showHome.do>
<http://erwin.volkswagen.de/erwin/showHome.do>

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-R21 or 74/60/EEC as amended by 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 instrument 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 inematics 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
- 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.

4 Modifications to open bodies

4.1 Removal of the cargo box

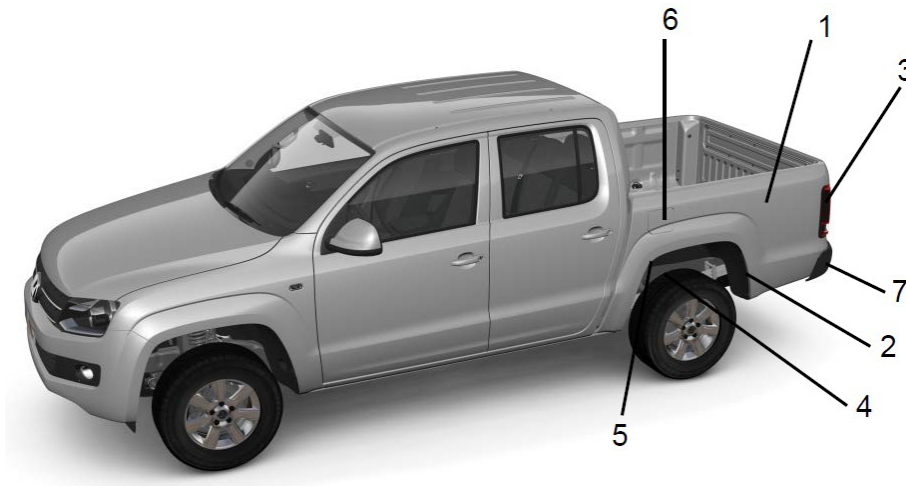


Fig. 4: Cargo box removal

The following work is required in order to remove the cargo box (1):

- Removal of the tail lights (3)
- Disconnecting of the cable routing for the number plate light and the earth cable
- Releasing the parking brake cable from underneath (4)
- Removing the left wheel housing liner (5)
- Unscrewing the filler neck (6)
- Removing the electrical cables from the load bed
- Unscrewing the bolts (2) on the left and right
- Removing the complete rear bumper (7) or at least the cover and the plastic trim (only applies to vehicles with rear bumpers)
- Lifting the cargo box, e.g. with a crane (attaching the cargo box at the 4 standard load securing points).

To do this, the vehicle should be lifted on a lifting platform so its suspension is fully extended.

To avoid damage to the metal panels during removal, carefully pull the cargo box towards the rear out of the overlapping area with the driver's cab prior to lifting.

You will find further information on removal of the rear bumper (7) and the cargo box in the Volkswagen AG workshop manuals.

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>

Important notes:

- The spare wheel is secured to the cargo box using a support bracket. A replacement attachment of the spare wheel shall be provided if the cargo box is dispensed with/removed.
- A suitable holder shall be created for the filler neck of the fuel tank (a new type approval may be required).
- Provide suitable tail lights with the same performance figures as the standard ones.

Furthermore, comply with the data for special bodies listed in chapter 3.2 “Interior”.

4.1.1 Removal of tail lights

The following work is required to remove the tail light:

- Switch off the ignition and all electrical consumers, and pull out the ignition key.
- Open the tailgate.
- Unscrew and remove the fastening screws (arrows) from the tail light (Fig. 1).
- Guide the tail light sideways out of the ball head in the direction of the arrow. (Fig. 2)
- Disconnect the plug connection -arrow- at the tail light. (Fig. 3)

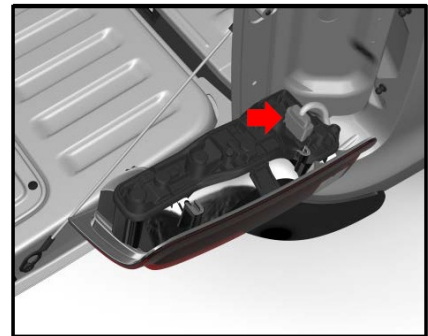
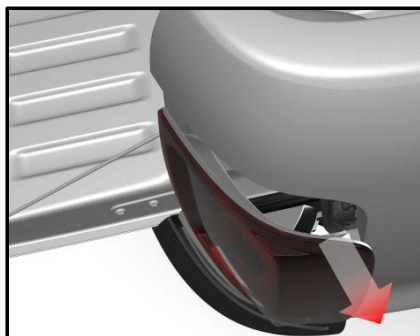
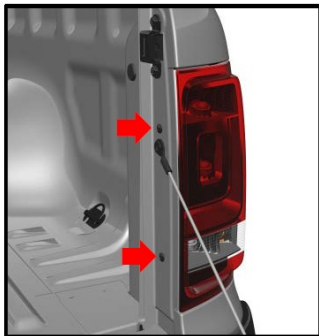


Fig. 4.1.1.1: Removal of the tail light (Figs. 1, 2 and 3)

4.1.2 Releasing the parking brake cable at the rear

The following steps are required to release the parking brake cable:

- Lift the vehicle (see also chap. 2.9 “Lifting the vehicle”)
- Remove rear wheels.
- Following this, pull the parking brake cable (A) out of the holders on the body (bottom arrow).

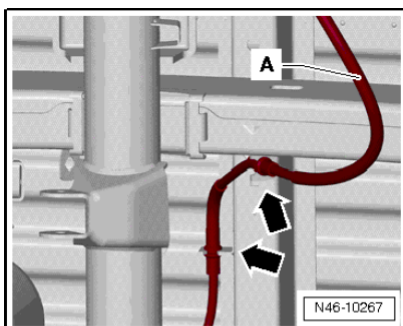


Fig. 4.1.2.1: Releasing the parking brake cable

4.1.3 Removal of the wheel housing liner

The following work shall be performed in order to remove the wheel housing liner:

- Remove the wheel.
- Unscrew and remove the bolts (3).
- Unscrew the hexagon nut (2).
- Pull the rear wheel housing liner (1) out of the wheel housing.

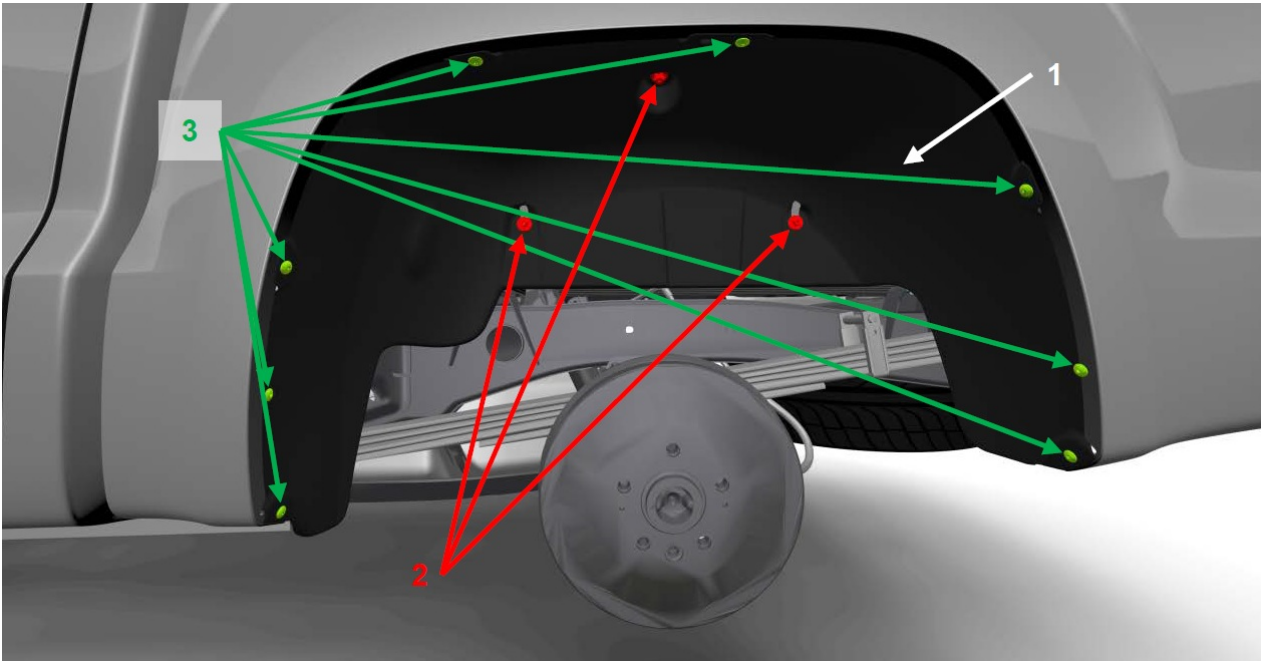


Fig. 4.1.3.1: Removal of the wheel housing liner

4.1.4 Removal of the filler neck

Important safety note:

Work on the filler neck is only allowed to be performed when the tank is empty or has been removed!

The following work shall be performed in order to remove the filler neck:

Unscrew the bolt (2) for the filler neck (1) on the underbody.

- Open the tank flap and clean the inside of the tank flap unit thoroughly.
- Unscrew the cover.

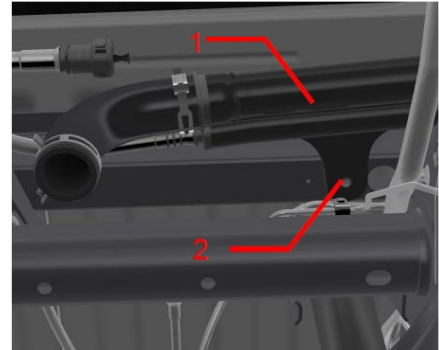


Fig. 4.1.4.1: Detaching the filler neck on floor

- Unscrew and remove the bolt (2) on the tank flap unit.
- Unclip the tank flap unit and remove it completely.

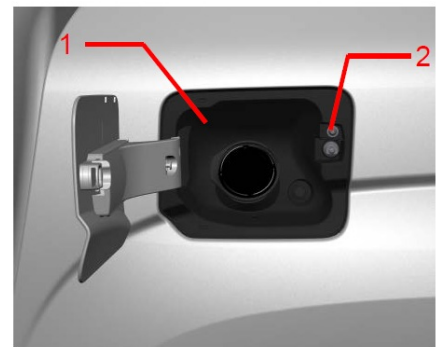


Fig. 4.1.4.2: Releasing the tank flap unit

- Unscrew and remove nuts (2) from the filler neck (1) on the top of the cut-out for the tank flap unit.
- Remove the filler neck (1) from below; this requires turning the filler neck.
- In vehicles with central locking, the plug for the filling station element shall be disconnected.

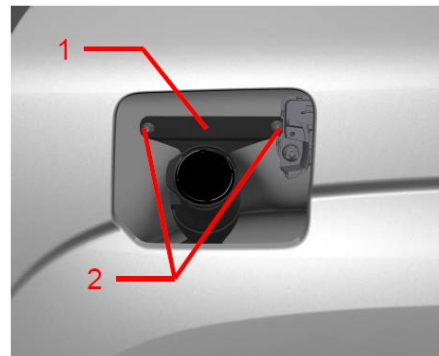


Fig. 4.1.4.1: Releasing the filler neck

Please also comply with the following chapters for your conversion:

- Recommendations for attaching the filler neck (chap. 4.1.7)
- Standard attachment points for special bodies (chap. 4.3)

4.1.5 Unscrewing securing bolts

The following work shall be performed:

- Remove bolts (2) on left and right.

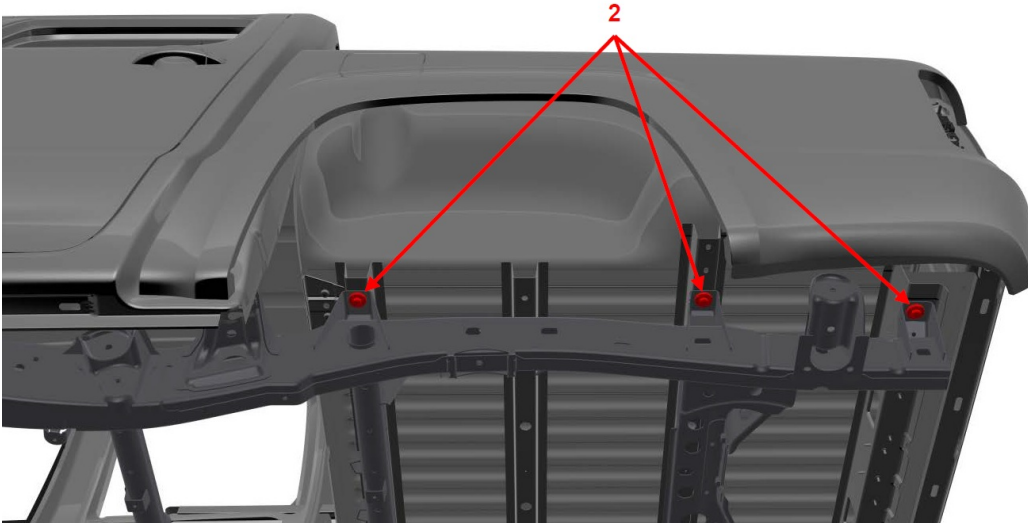


Fig. 4.4.5.1: Unscrewing securing bolts

4.1.6 Removal of the bumper

You will find further information on removal of the rear bumper (7) and the cover on the plastic trim in the Volkswagen AG workshop manuals.

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>

You can order the Amarok (Single Cab or Double Cab) without rear bumper and with 180° folding tailgate as optional equipment with PR no. 0S0.

4.1.7 Recommendations for attaching the filler neck

Warning note

Please note that work on the filler neck may only be performed when the tank is empty or has been removed!

If the cargo box is removed for a body modification or is modified in the corresponding area, a suitable new fastening must be created for the filler neck. The fastening must meet the requirements of regulation ECE-R 34 "Prevention of fire risks".

Comply with the following points during the work:

- The filler pipe shall be fixed to the ladder frame if possible, or else to components attached to that.
- The whole system with fuel filler pipe, filler neck and filler cap may not be damaged.
- The whole system must be permanently leak-proof in all operating conditions.
- The hose clamp must have the same retention force and durability as the production solution.
- All parts of the fuel filler system must be routed at a sufficient distance from moving parts and sharp edges to avoid damage. Sufficient distance from the rear wheel should be ensured in particular.
- Components of the fuel filler system may not be attached to safety-related parts, for example, brake lines.
- All materials used must be petrol- or diesel-resistant.
- A sufficient angle of the filler pipe to the tank should be ensured. Pipe routing that could cause a siphon effect must be avoided.
- If the standard tank cap is not used, it must be ensured that the overpressure and vacuum protection functions integrated into the standard tank cap are retained.
- The accessibility of the pump nozzle to the filler neck should be guaranteed as with the production solution.

In addition, and depending on the fuel, the following requirements and recommendations shall be complied with when routing the filler neck for diesel and petrol "filler pipes".

4.1.7.1 Diesel filler pipe

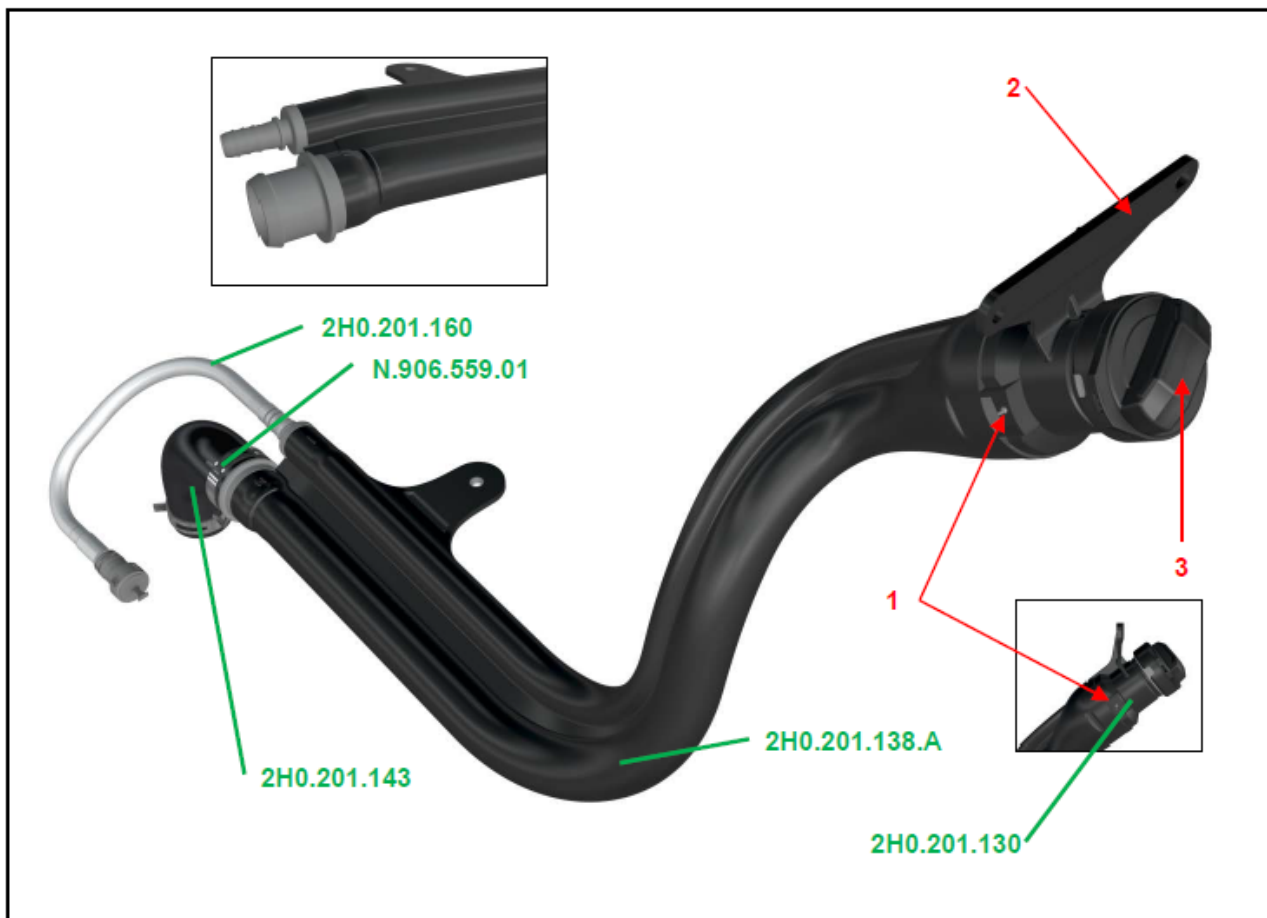


Fig. 1: Filler pipe assembly (ASSY)

1 Ventilation valve

2 Fastening lug for closure neck

3 Closure cap (tank cap):

- Opening pressure at 0.025 to 0.045 bar negative pressure (rel.)

- Opening pressure at 0.150 to 0.250 bar positive pressure (rel.)

Requirements on the Amarok diesel filler pipe:

- An earthing path from the filler pipe via the closure neck and fastening lug to the vehicle body work (screw connection) shall be guaranteed.
- A ventilation function for the fuel tank via the filler pipe shall be provided.
- The connecting hose and vent line are not allowed to be kinked.
- The filler pipe, connecting hose and vent line are not allowed to be in contact with adjacent components, in order to prevent any chafing or leaks.

Recommendations for the conversion:

- The positive pressure and negative pressure protection functions integrated in the closure cap (tank cap) shall be retained if at all possible.
- The filler pipe shall be fixed to the ladder frame if possible, or else to components attached to that.

4.1.7.2 Petrol filler pipe

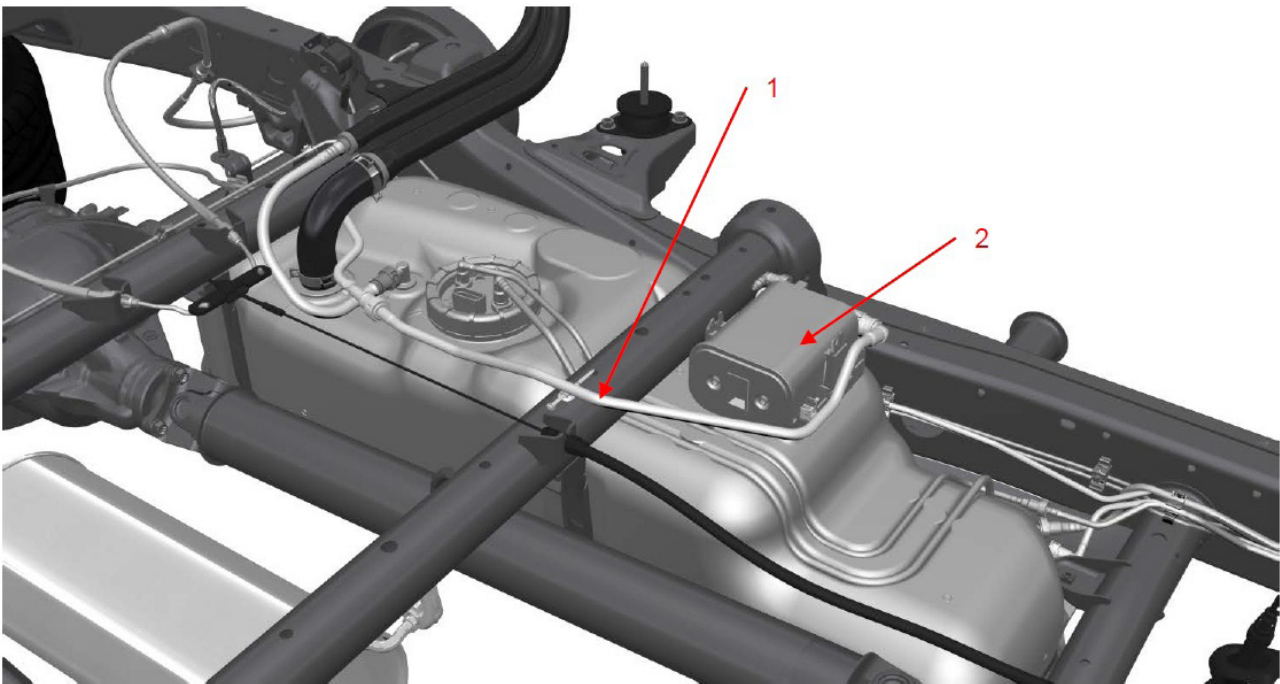


Fig. 2: Petrol filler pipe

1 Ventilation line

2 Activated charcoal container

Requirements on the Amarok petrol filler pipe:

- An earthing path from the filler pipe via the closure pipe and fastening lug to the vehicle body work (screw connection) shall be guaranteed (same as diesel).
- The positive pressure protection function for the fuel tank shall be ensured in the filler pipe (Amarok petrol standard solution: protection valve in the tank cap).
- The connecting hose and vent line are not allowed to be kinked.
- The filler pipe, connecting hose and vent line are not allowed to be in contact with adjacent components, in order to prevent any chafing or leaks.
- The air intake for the activated charcoal canister (ACC) shall be routed in an area where no water can be sucked in even when driving through water.
(Amarok petrol standard solution: ACC ventilation line for air intake routed in the area of the fuel filler pipe in the wheel housing).

4.1.8 Weight of cargo box

Component	Amarok DC	Amarok SC
Cargo box*	121 kg	151 kg

* incl. the add-on parts for the tailgate, hinges, tail light cluster, wheel housing liner and tailgate lock

4.2 Chassis frame

4.2.1 Ladder frame AMAROK DC (Double Cab)

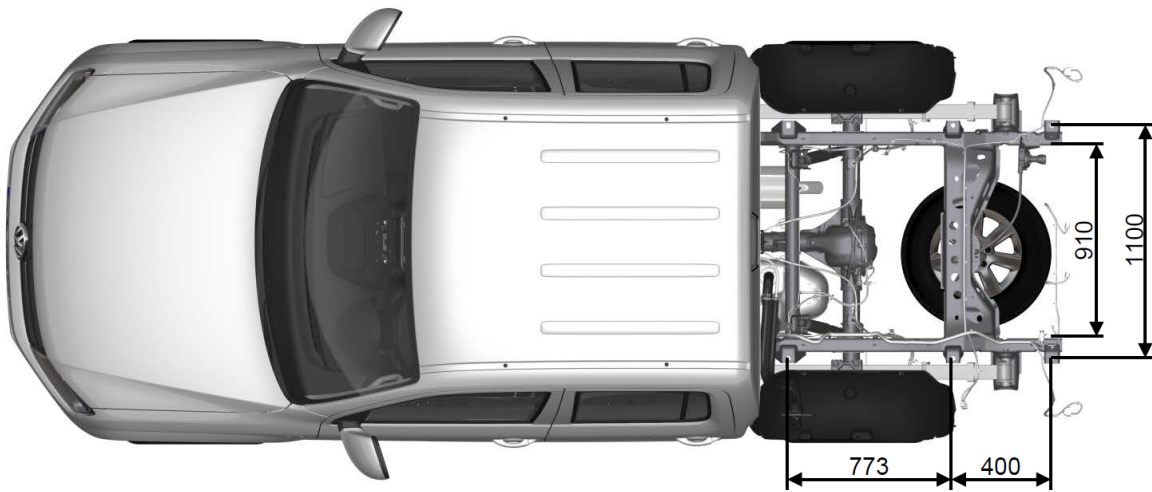


Fig. 4.2.1.1: Plan view of AMAROK DC without cargo box

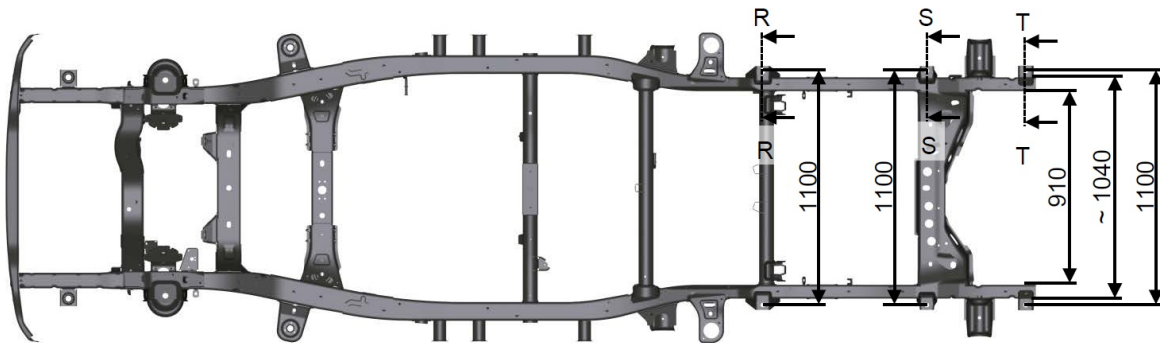


Fig. 4.2.1.2: Plan view of ladder frame AMAROK DC

4.2.2 Ladder frame AMAROK SC (Single Cab)

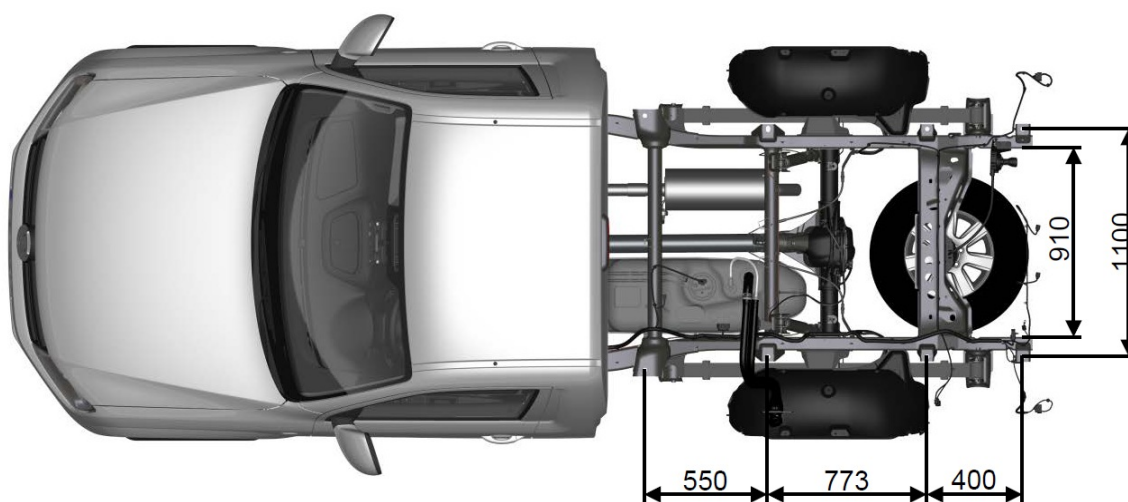


Fig. 4.2.2.1: Plan view of AMAROK SC (Single Cab) without cargo box

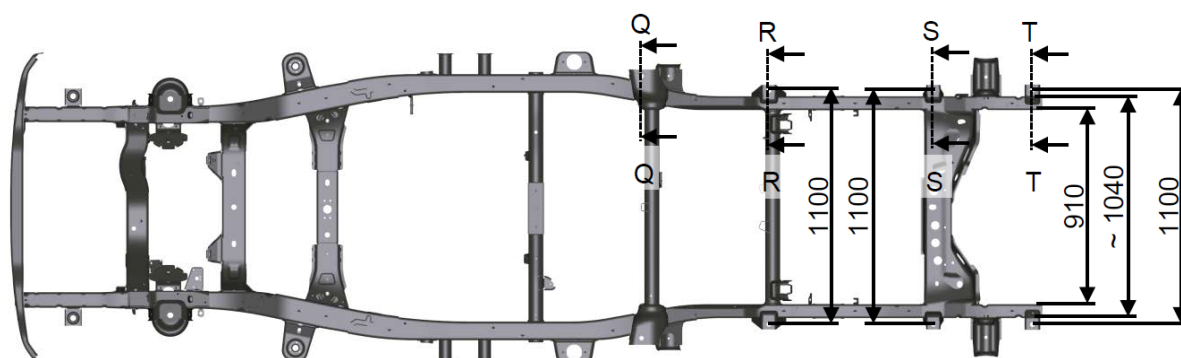


Fig. 4.2.2.2: Plan view of ladder frame AMAROK SC

4.2.3 Sections, AMAROK-SC (Single Cab)/AMAROK DC (Double Cab)

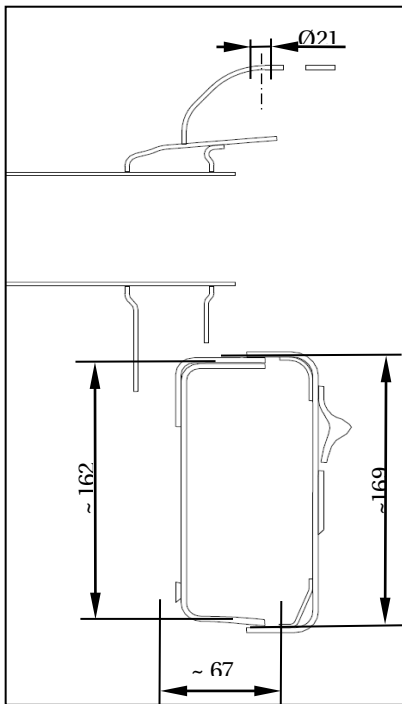


Fig. 4.2.2.1: Section Q-Q (Amarok SC)

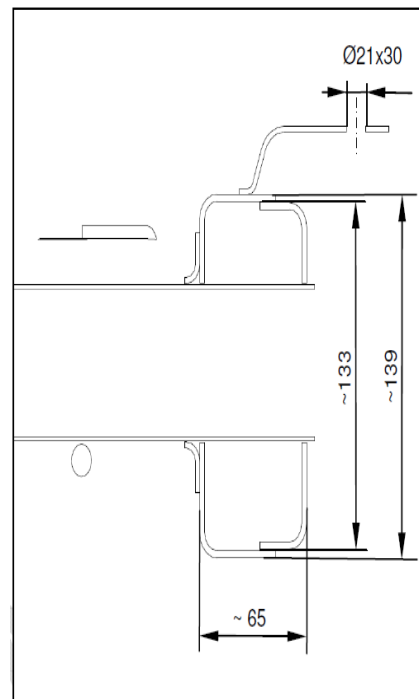


Fig. 4.2.2.2 Section R-R (Amarok SC/DC)

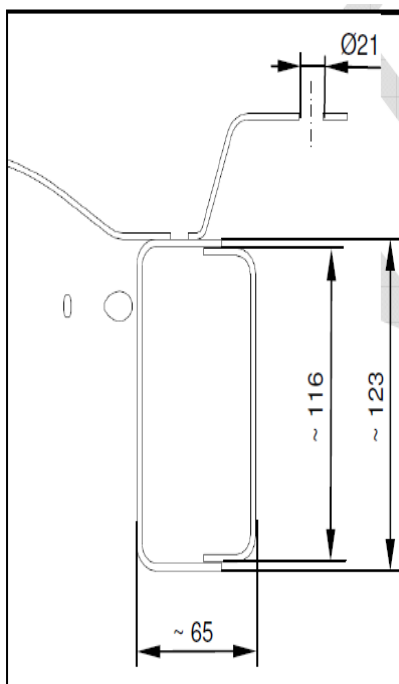


Fig. 4.2.2.3: Section S-S (Amarok SC/DC)

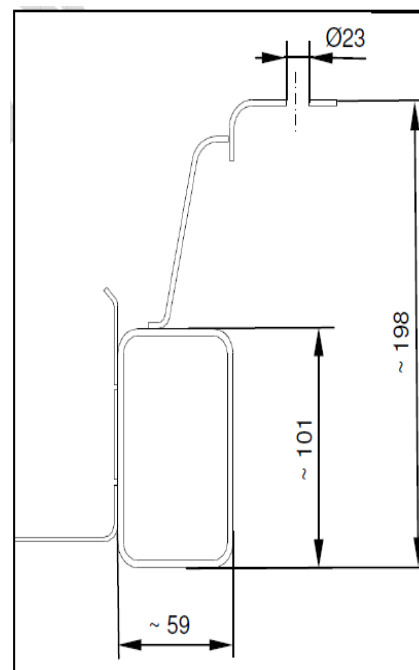


Fig. 4.2.2.4 Section T-T (Amarok SC/DC)

Please refer to the Amarok DoubleCab and SingleCab build dimension drawings for further connection sizes (see chapter 6.1 “Technical data”).

4.3 Standard attachment points for special bodies

Special bodies are possible after the cargo box has been removed (see chap. 4.1).

Comply with the following points when mounting special bodies:

- Use standard attachment points.
- If the cargo box is replaced by other bodies, the new body shall have a maximum static torsional rigidity of $CT=1400 \text{ Nm/}^\circ$ (see Fig. 4.3.3).
- The wheel clearance on the rear axle shall be maintained.
- A suitable holder shall be created for the filler neck of the fuel tank (a new type approval may be required).
- Suitable tail lights with the same performance data as the standard ones shall be used.

The frame is a **hollow section construction** consisting of pressed sheet metal parts.

Brackets are welded onto the longitudinal members for attachment of the cargo box. Holes or slots with the dimension **21 mm, 23 mm or 21x30 mm** are provided for attachment of the cargo box (Fig. 4.3.1/4.3.2). For more information, refer to chap. 4.2 “Chassis frame”.

The attachment between the body and vehicle frame shall always use all brackets.
The screw connections onto the brackets shall be force-locking.

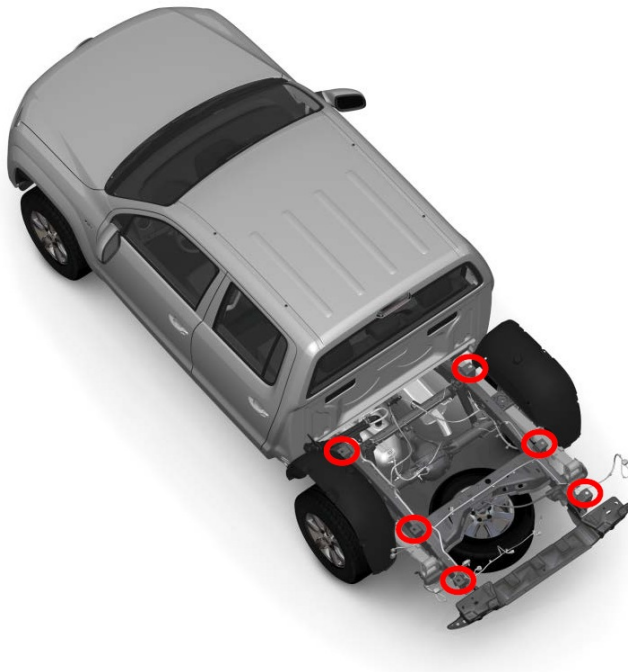


Fig. 4.3.1: Amarok Double Cab – mounting brackets for cargo box (see red mark)

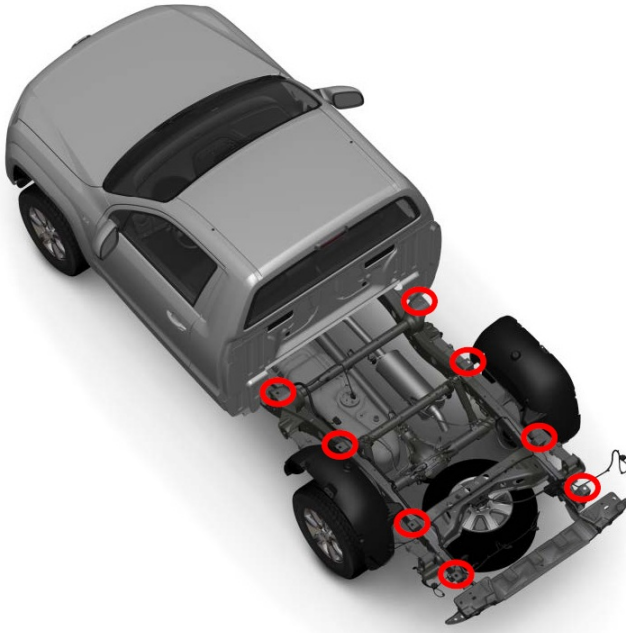


Fig. 4.3.2: Amarok Single Cab – mounting brackets for cargo box (see red mark!)

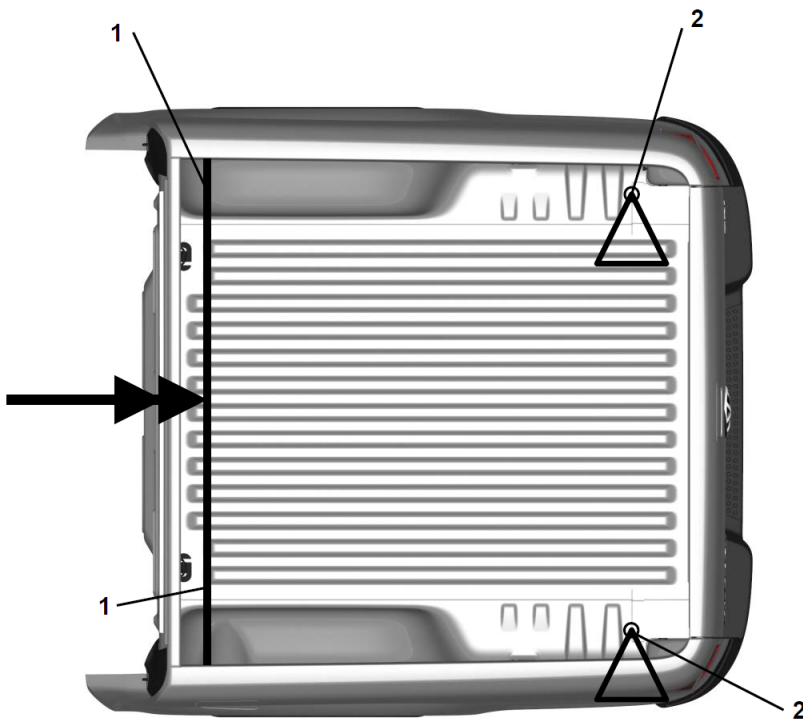


Fig. 4.3.3: Static rigidity of cargo box between the bolting points at the front (1) and rear (2) of body-in-white, $CT = 1,400 \text{ Nm/}^\circ$

4.4 Subframe (mounting frame)

The subframe shall be designed to be self-supporting according to the load.

The preferred material is steel. If alternative materials are used, the strength of the subframe shall at least correspond to that of a steel frame.

Cross members shall be provided at least in the front and rear areas to ensure the structure is torsionally rigid.

The subframe is required for bodies in which point loads are applied to the chassis, e.g. for tippers and semitrailer tractors.

The purpose of the subframe is to distribute the applied point loads evenly over the vehicle frame. For this purpose, it should lie on top of the longitudinal members, be continued up to the cab and be tapering in the front area.

The various air gaps between the cab and subframe shall not be filled in. Self-supporting bodies can be attached directly to the standard brackets on the frame by means of a base frame.

The subframe and self-supporting bodies shall be attached to the chassis using all available brackets.

Bolts with strength class 10.9 shall be used for securing.

Information

For further information, see:
Chap. 4.1 "Removal of the cargo box"
Chap. 4.3 "Standard attachment points
for special bodies"

5 Implementation of special bodies

5.1 Conversions for people with disabilities

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

- 2.5.2.1 “Electrical cables and fuses”
- 2.5.2.4 “Retrofitting electrical devices”
- 3.2.1 “Safety equipment”

Information

For more information about this topic, refer to:

<http://umbauportal.de/umbauten>

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

5.2 Refrigerated vehicles

Comply with the following chapters during the conversion:

- 2.2.1 “Permitted weights and unladen weights”
- 2.3.2 “Modifications to the body-in-white”
- 2.5.2.1 “Electrical cables and fuses”
- 2.5.2.4 “Retrofitting electrical devices”
- 2.7.2 “Power take-offs”
- 3.1 “Body-in-white”
- 3.1.4 “Modifications to the roof”

Information

For more information about this topic, refer to:

<http://umbauportal.de/umbauten>

5.3 Shelf installation/workshop vehicles

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

- 2.2.1 “Permitted weights and unladen weights”
- 2.3.2 “Modifications to the body-in-white”
- 2.5.2.1 “Electrical cables and fuses”
- 2.5.2.4 “Retrofitting electrical devices”
- 2.6.3 “Fuel system”
- 2.6.4 “Exhaust system”
- 3.2.1 “Safety equipment”
- 2.5.2.4 “Retrofitting electrical devices”

Information

For more information about this topic, refer to:
<http://umbauportal.de/umbauten>

5.4 Conversions for caravans

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

- 2.2.1 “Permitted weights and unladen weights”
- 2.3.2 “Modifications to the body-in-white”
- 2.5.2.1 “Electrical cables and fuses”
- 2.5.2.4 “Retrofitting electrical devices”
- 2.6.3 “Fuel system”
- 2.6.4 “Exhaust system”
- 3.2.1 “Safety equipment”

Information

For more information about this topic, refer to:

<http://umbauportal.de/umbauten>

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

5.5 Conversions for municipal vehicles

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

- 2.2.1 “Permitted weights and unladen weights”
- 2.3.2 “Modifications to the body-in-white”
- 2.5.2.1 “Electrical cables and fuses”
- 2.5.2.4 “Retrofitting electrical devices”
- 2.7.2 “Power take-offs”
- 2.6.3 “Fuel system”
- 2.6.4 “Exhaust system”
- 3.2.1 “Safety equipment”

Information

For more information about this topic, refer to:
<http://umbauportal.de/umbauten>

5.6 Articulated vehicles

Vehicles with ESP are not suitable for use as articulated vehicles.

Otherwise the ESP system in vehicles with ESP will no longer function correctly and will fail. This may result in the driver losing control of the vehicle and causing an accident.

Downgrading the ESP (see chapter 2.2.6.4 "Downgrading ESP") is generally necessary when the Amarok is converted into an articulated vehicle.

A safety certificate from the responsible department is required for the conversion.

The vehicle needs to be taken to Volkswagen AG for an inspection of the vehicle modifications.

Information

Please use the online contact form for this:

<http://umbauportal.de/web/guest/kontaktformular>

5.7 Elevated work platforms

Practical note

If bodies have moving attachments, ensure sufficient clearance from the base vehicle. Otherwise attachments could collide with the base vehicle and cause damage.

Practical note

The elevated work platform may only be operated if the vehicle has been fully raised on outriggers. The vehicle may not be moved if the elevated work platform has been raised. The frame could be damaged if the vehicle is moved while the elevated work platform is raised. The superstructure manufacturer must install a safety mechanism so that the vehicle cannot be moved while the elevated work platform is raised.

Practical note

There must be no additional loads in or on the cab while the vehicle is raised on its outriggers. Otherwise the frame could be damaged.

Please also comply with the following chapters for your conversion:

- 2.2 “Running gear”
- 2.2.1 “Permitted weights and unladen weights”
- 2.3.2 “Modifications to the body-in-white”
- 2.5.2.1 “Electrical cables and fuses”
- 2.5.2.4 “Retrofitting electrical devices”
- 2.7.2 “Power take-offs”
- 3.1 “Body-in-white”
- 2.5.2.4. “Retrofitting electrical devices”

Information

For more information about this topic, refer to:

<http://umbauportal.de/umbauten>

5.8 Crane superstructures and lift systems

Please comply with the following points during the conversion:

- The crane size must be suitable for the chassis size.
- Loading cranes must be secured on a mounting frame to reduce the load on the frame.
- The compliance with the permitted axle loads should be checked with the aid of a weight assessment.
- The stability of the vehicle must be guaranteed by the body builder.
- The swivel range of the crane must be limited accordingly.
- In Germany, loading cranes mounted on vehicles must comply with the accident prevention regulations.
- Please observe the applicable regulations in your respective country.
- The assembly instructions from the crane manufacturer must be followed.

Information

For more information about this topic, refer to:
<http://umbauportal.de/umbauten>

Please also comply with the following chapters of the Body builder guidelines for your conversion:

- 2.2 “Running gear”
- 2.2.1 “Permitted weights and unladen weights”
- 2.3.2 “Modifications to the body-in-white”
- 2.5.2.1 “Electrical cables and fuses”
- 2.5.2.4 “Retrofitting electrical devices”
- 2.7.2 “Power take-offs”
- 3.1 “Body-in-white”
- 2.5.2.4. “Retrofitting electrical devices”

6 Technical data

6.1 Build dimension drawings

6.1.1 Amarok Double Cab

Please refer to our dimensional drawings for the dimensions of the Amarok. They are available for download in DXF, TIFF and PDF format at the Conversion Portal of Volkswagen AG.



Information

Current dimensional drawings can be downloaded from the Conversion Portal of Volkswagen AG at:

<http://umbauportal.de/technische-zeichnungen>

6.1.2 Amarok Single Cab

The individual dimension drawings are available in the formats DXF, TIF and PDF. All files (except PDFs) are packed as Zip archives. The files can be unpacked using Winzip (PC) or ZipIt (MAC).



Information

Current dimensional drawings can be downloaded from the Conversion Portal of Volkswagen AG at:

<http://umbauportal.de/technische-zeichnungen>

6.2 Diagrams

Vehicle views in 1:10 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).

6.2.1 Amarok Double Cab (all views)



Information

Current diagrams can be downloaded from the Internet Conversion Portal of Volkswagen AG at:

<http://umbauportal.de/vignetten>

6.2.2 Amarok Single Cab (all views)



Information

Current diagrams can be downloaded from the Internet Conversion Portal of Volkswagen AG at:

<http://umbauportal.de/vignetten>

6.2.3 Side view all derivatives




To help you create diagrams, you can download the side views of all derivatives on the Conversion Portal of Volkswagen Nutzfahrzeuge AG.

Information

Current diagrams can be downloaded from the Internet Conversion Portal of Volkswagen AG at:

<http://umbauportal.de/vignetten>

The following side views are available:

Designation	Picture
Amarok Double Cab basic	
Amarok Double Cab	
Amarok Single Cab	

6.3 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* (Electronic Repair and Workshop Information from Volkswagen AG):

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

6.4 CAD models

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

Information

For more information about CAD data, refer to the Conversion Portal of Volkswagen AG on the Internet.

<http://umbauportal.de/cad-daten>

7 Listings

7.1 List of changes

Changes to the body builder guidelines compared to the data status of November 2011

Chapter No.	Chapter heading	Scope of change
1.	General Information	
1.1	Introduction	
1.1.1	Concept of these guidelines	
1.1.2	Means of representation	
1.1.3	Vehicle safety	
1.1.4	Operating safety	
1.2	General Information	
1.2.1	Product and vehicle information for body builders	Chapter revised
1.2.1.1	Contact	Chapter revised
1.2.1.2	Conversion Portal	
1.2.1.3	Electronic repair and workshop information (ERWIN)	Chapter revised
1.2.1.4	Genuine parts online ordering portal	Chapter revised
1.2.2	Body builder guidelines and consulting	
1.2.2.1	Safety certificate	
1.2.2.2	Application for the safety certificate	
1.2.2.3	Legal entitlements	Numbering adapted
1.2.3	Warranty and product liability of the body builder	
1.2.4	Ensuring traceability	
1.2.5	Badges	
1.2.5.1	Positions on rear of vehicle	
1.2.5.2	Appearance of overall vehicle	
1.2.5.3	Non-Volkswagen trademarks	
1.2.6	Recommendations for vehicle storage	
1.2.7	Compliance with environmental rules and regulations	
1.2.8	Recommendations for inspection, maintenance and repair	
1.2.9	Accident prevention	
1.2.10	Quality system	
1.3	Delivery range	Info box added.
1.4	Advantages of the concept	Chapter revised
1.5	Planning bodies	New chapter added
1.5.2	Vehicle modifications	New chapter added
1.5.3	Vehicle acceptance	New chapter added
1.6	Optional equipment	New chapter added
2.	Technical data for planning	
2.1	Base vehicle	
2.1.1	Vehicle dimensions	
2.1.1.1	Basic data Single Cab and Double Cab	Chapter revised
2.1.2	Overhang angle and ramp angle	

Chapter No.	Chapter heading	Scope of change
2.1.3	Vehicle centre of gravity	
2.1.4	Bodies with a high centre of gravity	
2.1.4.1	Extremely high centres of gravity (>800mm)	
2.1.5	Determining centre of gravity	Chapter with sub-chapters added
2.1.6	Maximum dimensions	Chapter no. changed, SingleCab diagram added, traffic light view text added
2.2	Running gear	Chapter revised, engines adapted to sales range
2.2.1	Permitted weights and unladen weights	Text revised/weight tables revised, 132 kW automatic added, weight table for hardtop deleted/engine designation adapted to sales range
2.2.1.1	One-sided weight distribution	Info box added.
2.2.2	Turning circle	
2.2.3	Authorised tyre sizes	
2.2.4	Modifications to axles	
2.2.5	Modifications to the steering system	
2.2.6	Modifications to the brake system	
2.2.6.1	General Information	
2.2.6.2	Vehicle stability and ESP	
2.2.6.3	Influence of vehicle conversions	
2.2.6.4	Downgrading ESP	
2.2.6.5	2.2.6.5 Activating the ESP	
2.2.7	Modification of springs, suspension mounting, dampers	
2.2.8	Wheel alignment settings	
2.2.9	Wing and wheel housing	
2.2.10	Overhang extension	
2.2.10.1	Requirements for trailer operation with overhang extension	Chapter no. and new content added.
2.2.11	Wheelbase modification	
2.3	Body-in-white	
2.3.1	Roof loads/vehicle roof	
2.3.2	Modifications to the body-in-white	
2.3.2.1	Bolted connections	
2.3.2.2	Welding work	
2.3.2.3	Welded connections	
2.3.2.4	Selection of welding process	
2.3.2.5	Spot welding	
2.3.2.6	Shielding gas hole spot welding	
2.3.2.7	Tacking	
2.3.2.8	Welding is not allowed	
2.3.2.9	Corrosion protection after welding	
2.3.2.10	Corrosion protection measures	
2.3.2.11	Planning measures	

Chapter No.	Chapter heading	Scope of change
2.3.2.12	Component design measures	
2.3.2.13	Coating measures	
2.3.2.14	Work on the vehicle	Chapter revised
2.3.3	Tailgate	
2.4	Interior	
2.4.1	Modifications in the area of airbags	Warning note added
2.4.2	Modifications in the area of seats	
2.4.3	Forced ventilation	
2.4.4	Acoustic insulation	
2.5	Electrical/electronic systems	
2.5.1	Lights	
2.5.1.1	Vehicle lighting devices	Chapter expanded to include LED lights
2.5.1.2	Mounting special lights	
2.5.1.3	Installing 3rd brake light	New sub-chapter added
2.5.1.4	Additional load compartment light	New sub-chapter added
2.5.2	Vehicle electrical system	
2.5.2.1	Electrical cables / fuses	
2.5.2.2	Additional electrical circuits	
2.5.2.3	Electrical interface for special vehicles	
2.5.2.3.1	Position of the interface	
2.5.2.3.2	Interface assignment	
2.5.2.3.3	Connector pin assignment and circuit diagrams for interface for special vehicles	
2.5.2.4	Retrofitting electrical devices	
2.5.2.4.1	Electromagnetic compatibility	
2.5.2.5	Mobile communication systems	
2.5.2.6	CAN bus	
2.5.3	Vehicle battery	
2.5.3.1	Installation of additional battery	New sub-chapter added
2.6	Engine peripherals/powertrain	
2.6.1	Engine/powertrain components	
2.6.2	Drive shafts	
2.6.3	Fuel system	Info box added
2.6.4	Exhaust system	
2.7	Ancillary drives, engine/gearbox	
2.7.1	Retrofitting air-conditioning system	Chapter title and content completely revised
2.7.2	Driving an ancillary via the 2nd belt track	Chapter title and content completely revised
2.7.3	Specifications of standard refrigerant compressor	New sub-chapter added
2.7.3.1	Connection dimensions of original refrigerant compressor	New sub-chapter added
2.7.4	Assembly and disassembly of the poly V-belt	Chapter no. adapted.
2.8	Add-ons/units	
2.8.1	Roof rack	

Chapter No.	Chapter heading	Scope of change
2.8.2	Towing bracket	Chapter revised, engines adapted to sales range
2.8.3	Other accessories	Chapter revised
2.9	Raising the vehicle	
3.	Modifications to closed bodies	
3.1	Body-in-white/bodywork	
3.1.1	Side wall and rear wall cut-outs	
3.1.2	Installation of windows	
3.1.3	Roof cut-outs	
3.1.4	Modifications to the roof	
3.2	Interior	
3.2.1	Safety equipment	
4.	Modifications to open bodies	
4.1	Cargo box removal	Chapter revised/erWIN info box added
4.1.1	Removal of tail lights	
4.1.2	Releasing the parking brake cable at the rear	
4.1.3	Removal of the wheel housing liner	
4.1.4	Removal of the filler neck	
4.1.5	Unscrewing securing bolts	
4.1.6	Removing bumper	New sub-chapter added.
4.1.7	Recommendations for attaching the filler neck	Chapter no. adapted and content revised.
4.1.7.1	Diesel filler pipe	Chapter no. adapted and picture replaced.
4.1.7.2	Petrol filler pipe	Chapter no. adapted!
4.1.8	Weight of the cargo box	Chapter no. adapted!
4.2	Chassis frame	
4.2.1	Ladder frame AMAROK DC (Double Cab)	
4.2.2	Ladder frame Amarok SC (Single Cab)	
4.2.3	Sections, Amarok SC/Amarok DC	
4.3	Standard attachment points	
4.4	Subframe	
5.	Implementation of special bodies	
5.1	Conversions for people with disabilities	
5.2	Refrigerated vehicles	
5.3	Shelf installation/workshop vehicles	
5.4	Conversions for caravans	
5.5	Conversions for municipal vehicles	
5.6	Articulated vehicles	
5.7	Elevated work platforms	

Chapter No.	Chapter heading	Scope of change
5.8	Crane superstructures and lift systems	
6.	Technical data	
6.1	Build dimension drawings	
6.1.1	Amarok Double Cab	
6.1.2	Amarok Single Cab	
6.2	Diagrams	
6.2.1	Amarok Double Cab (all views)	
6.2.2	Amarok Single Cab (all views)	
6.2.3	Side view all derivatives	
6.3	Circuit diagrams	
6.4	CAD models	
7.	Listings	
7.1	List of modifications	Updated

Body builder guidelines Amarok

Body builder guidelines

Subject to modifications

Edition May 2012

Internet: www.volkswagen-nutzfahrzeuge.de

Consulting for body builders in Germany is available from the listed address.

Volkswagen Nutzfahrzeuge

Brieffach: 2963

Postfach 21 05 80

D-30405 Hannover

Fax. +49 (0)511/798-8500