Guide for emergency and recovery personnel

Information on rescue from vehicles of the Volkswagen and Volkswagen Commercial Vehicles brands that have been involved in accidents

Version dated: October 2022

Legal notice:
This guide was created exclusively for emergency and recovery personnel who are specially trained in technical assistance after road accidents and can therefore carry out the activities described in it.
Furthermore, the guide contains information about vehicles intended for sale in the European Union.
It does not contain any information about vehicles intended for sale outside the European Union.
Specifications and special equipment in Volkswagen vehicles, and the range of vehicles made by Volkswagen AG, are subject to constant changes.
Volkswagen therefore explicitly reserves the right to modify or change the content of this guide at any time.
The information was up to date at the time it was written.

Please note:
The information contained in this guide is not intended for end customers, and also not for qualified workshops and dealerships.
End customers can find information on the functions of their Volkswagen AG vehicle, as well as important vehicle and passenger safety information, in the vehicle wallet. Workshops and dealerships receive repair information from their accustomed sources.

Version dated: October 2022

Contents

Preface

Driver, vehicle and surroundings: these are the three key factors whose interaction is critical for road safety.

The vehicle has a number of jobs to do when an accident occurs, including:

- Keeping the passenger compartment as rigid as possible to ensure a space for survival.
- Dissipating the impact energy using intelligent structural concepts and elements.
- Using an optimised restraint system – consisting of airbags and seat belts with belt tensioners and belt force limiters – to effectively protect the occupants.
- Using safety systems to minimise the hazards from service fluids and powertrain components.

Volkswagen vehicles have proven in international tests that they are among the safest. However, accidents and the associated injuries can never be ruled out. This means a short, fast and effective chain of rescue is as essential as ever.
This guide was created in accordance with ISO 17840 and is intended to help emergency and recovery personnel do their jobs by providing the necessary information on the technology used in Volkswagen vehicles.
Technical innovations such as new materials or new drive technologies require a modified approach when performing a rescue from a vehicle that has been in an accident.

The processes and procedures in the different countries around the world are usually governed by official instructions or guidelines issued by legislators, or the rescue organisation itself. If information about the procedure is provided in this guideline for rescue services, they should be considered as suggestions only for these reasons.
The information is intended in particular for the training and development of emergency and recovery personnel. Appropriate rescue cards for Volkswagen vehicles are available for use at the scene of an accident.

In each case, the valid version can be found at https://www.volkswagen.com, whereby changes to the vehicles may only be updated in the guideline for rescue services with a delay.

0. Rescue card/cards

Version dated: October 2022

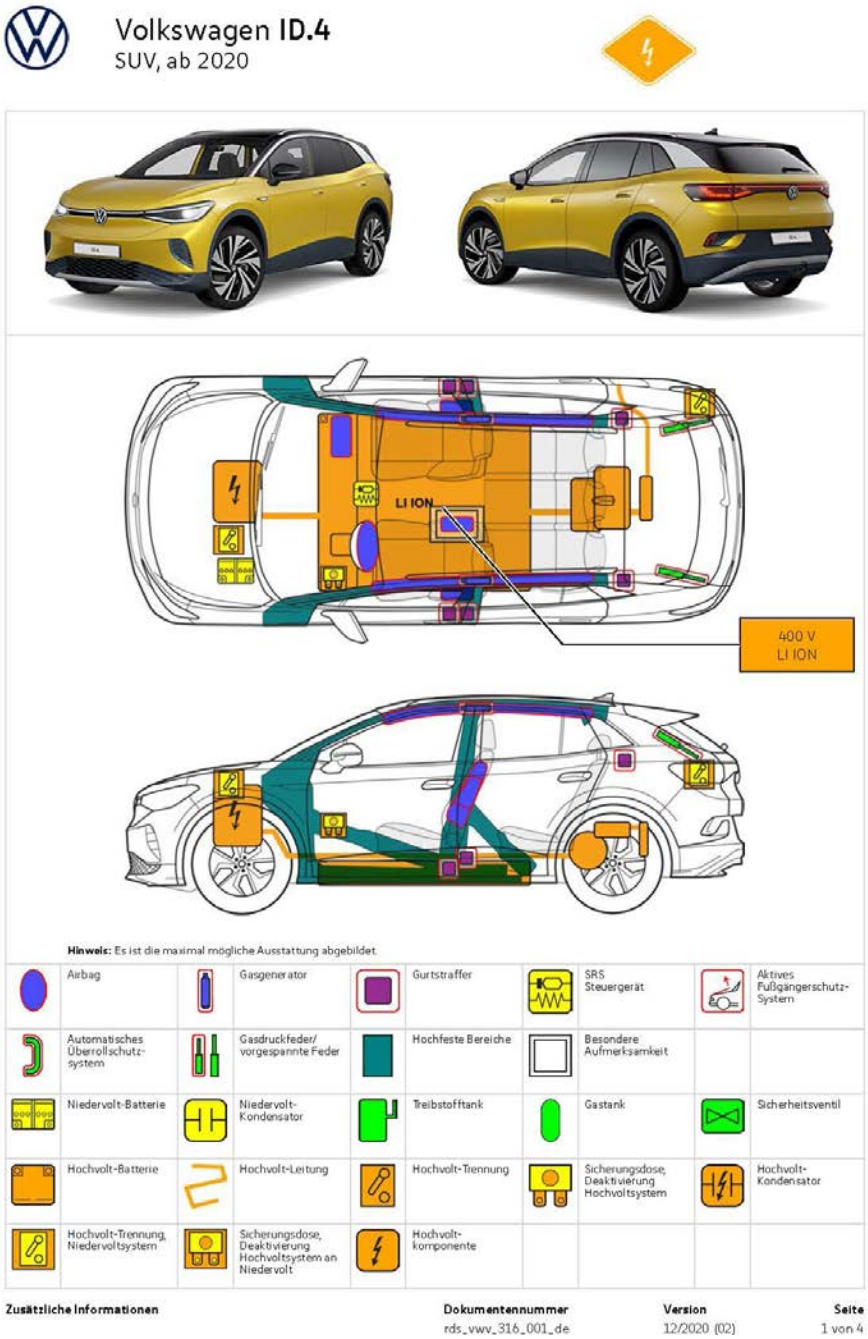
Volkswagen and Volkswagen Commercial Vehicles provide rescue cards for all models and vehicle variants.

All models made by Volkswagen and the Volkswagen and Volkswagen Commercial Vehicles brands are listed in an overview of models. The individual rescue cards can be downloaded directly from the model overview.

The illustration shown here includes an example of the first page of the rescue card for the Volkswagen ID.4 in accordance with ISO 17840-1:2015.

The current Volkswagen rescue cards can also be accessed at www.volkswagen.com:

	The rescue cards for all vehicles launched since 2020 have been created in accordance with ISO 17840. The rescue cards for vehicles launched prior to this feature the manufacturer's layout.



Area of application

This guide for emergency and recovery personnel is valid for all vehicles made by the Volkswagen and Volkswagen Commercial Vehicles brands.
The range of models is wide, and extends from compact vehicles to light commercial vehicles. The models include petrol and diesel engines, as well as natural gas drives. Hybrid and electric vehicles are equipped with a high-voltage drive.

The most common models made by Volkswagen and Volkswagen Commercial Vehicles are shown as examples on this page and the pages that follow.

The current model range made by Volkswagen Passenger Cars can also be accessed at www.volkswagen.com:

Current Volkswagen model range

up!
Petrol, natural gas, electric

Polo
Petrol, natural gas

Taigo
Petrol

T-Cross
Petrol

ID.3
Electric

ID.4
Electric

Current Volkswagen model range

ID.5
Electric

Golf
Petrol, diesel, natural gas
Plug-in hybrid

T-Roc
Petrol, diesel

T-Roc Cabriolet
Petrol

Golf Estate
Petrol, diesel, natural gas

Touran
Petrol, diesel

Tiguan/Tiguan Allspace
Petrol, diesel, plug-in hybrid

Passat
Petrol, diesel, plug-in hybrid

Passat Estate
Petrol, diesel, plug-in hybrid

Arteon
Petrol, diesel, plug-in hybrid

Arteon Shooting Brake
Petrol, diesel, plug-in hybrid

Sharan
Petrol

Current Volkswagen model range

Touareg

Petrol, diesel, plug-in hybrid

Current Volkswagen Commercial Vehicles model range

Caddy, Caddy Estate

Petrol, diesel, natural gas

Caddy Cargo

Petrol, diesel, natural gas

Caddy California

Petrol, diesel

Caravelle, Transporter Kombi

Diesel

Multivan

Petrol, diesel, plug-in hybrid

Transporter panel van

Diesel

Current Volkswagen Commercial Vehicles model range

Transporter, dropside van, chassis

Diesel

California

Diesel

ID. Buzz

Electric

ID. Buzz Cargo

Electric

e-Crafter

Electric

Crafter panel van

Diesel

Crafter Dropside van, chassis

Diesel

Crafter Grand California

Diesel

Amarok

Diesel

	Volkswagen Commercial vehicles sold the Caddy, Transporter and Caravelle with electric drives in cooperation with the vehicle tuner ABT from 2019 to 2022.
	Volkswagen Commercial Vehicles may exhibit a different body shape to the ones shown here due to individual superstructures and modifications.

1. Identification / recognition

Version dated: October 2022

Distinguishing features of Volkswagen models

Along with the Volkswagen logo, the individual models can be identified by the respective body shape, body size and the individual vehicle design.
In addition, the model designation and the technology lettering on the rear of the vehicle can help with identification. This lettering is not present, however, if it was not ordered with the vehicle, or was subsequently removed.
The illustrations on this page show examples of how the logo and the lettering are attached.

Volkswagen logo

Volkswagen logo in the radiator grille

Volkswagen logo on the rear lid

Model designation

Model designation on the rear of the vehicle

Distinguishing features of high-voltage vehicles

Volkswagen models with a high-voltage drive are available as a plug-in hybrid (PHEV) or a fully electric drive (electric vehicle, BEV).

	The electric drive motor is silent. The display in the dash panel insert (power display) provides feedback as to whether the electric drive is switched to “OFF”, or “READY” for operation.

Exterior features of the vehicle

- Lettering on the radiator grille, side panels and boot lid
- External charging socket for the high-voltage battery (charging flap integrated in the radiator grille or behind the Volkswagen badge, charging flap with charging socket at the side of the body)
- Country-specific charging sockets
- No visible exhaust system (tailpipe, exhaust pipe)
- Letter “E” in the number plate (Germany only)

Exterior features of the vehicle

	Charging flap on the Golf GTE as of 2020 (Plug-in hybrid)

Exterior features of the vehicle

	GTE lettering on the rear lid (Plug-in hybrid)
	eHYBRID lettering (Plug-in hybrid)

Other exterior features of the vehicle

	Charging socket CCS2 DC and AC (e.g. in the EU)
	Charging socket Type 2 AC (e.g. in the EU)

Other exterior features of the vehicle

	Charging socket CCS1 DC and AC (e.g. in North America, South Korea)
	Charging socket Type 1 AC (e.g. in North America, South Korea, Japan)
	Charging socket CHAdeMO DC (e.g. in Japan)

Features in the motor compartment

- Orange coloured high-voltage cables
- Uniform warning labels for high-voltage technology
- High-voltage components labelled with a warning

Features in the motor compartment

	Orange high-voltage cables in the motor compartment
	Warning labels in the ID.3

Features in the interior

The “vehicle’s drive system” is activated by operating the “START ENGINE STOP” button in current Volkswagen models with a high-voltage drive.

A high-voltage vehicle can be identified by the following features:

- e-specific displays in the dash panel insert, such as charging displays (power display, “READY” for the vehicle’s drive system)
- Button for “extended electric drive mode” in the centre console
- Sport program button (GTE)
- Hybrid or GTE lettering, e.g. on the cockpit and/or steering wheel

Features in the interior	
	Digital instrument cluster with power display and “OFF” or “READY” display, shown here using the ID. family as an example.
	No conventional gear lever in the centre console and electromechanical parking brake on the steering column switch (example ID. family).

	The vehicle’s drive system can be activated by occupying the driver seat and stepping on the brake pedal in vehicles in the ID. family.

Volkswagen model range with natural gas drive

A number of points distinguish vehicles with natural gas drive (CNG) from conventional vehicles and vehicles with a liquefied petroleum gas drive. Knowledge of these differences is highly significant for the rescue operations.

Volkswagen offers a range of vehicle models with petrol/natural gas drive as “TGI” vehicles. Other vehicles with natural gas drive were sold with the designation “EcoFuel”. Vehicles with liquefied petroleum gas (LPG) drive feature the designation “BiFuel”.

The natural gas vehicles made by Volkswagen also have a small fuel tank for petrol installed along with various natural gas tanks.

Being able to identify natural gas vehicles immediately is of critical importance for emergency and recovery personnel deployed e.g. to traffic accidents in order to allow them to assess the risks at the scene of deployment and take appropriate measures.

	Natural gas (also referred to as CNG – compressed natural gas) must not be mistaken for LPG – liquefied petroleum gas. Liquefied petroleum gas and autogas systems are fundamentally different to natural gas and natural gas systems.
	The term “BiFuel” was also used for natural gas vehicles when vehicles with a gas drive were introduced. The term “EcoFuel” has been used for natural gas vehicles and the term “BiFuel” has been used for liquefied petroleum gas vehicles since 2009. Current vehicles with a natural gas drive are sold under the designation “TGI”.

	Further information about natural gas vehicles can be found in section 3 “Disable direct hazards / safety regulations”, section 5 “Stored energy / liquids / gases / solids”, section 6 “In case of fire”, section 7 “In case of submersion” and section 8 “Towing / transportation / storage”.
	Dealing with natural gas vehicles is different to dealing with conventional vehicles. However, any dangers can, so to speak, be appropriately brought under control when knowledge of their special features is available.

Current Volkswagen models with natural gas drive (CNG)

eco-up!

Polo TGI

Golf TGI

Golf Estate TGI

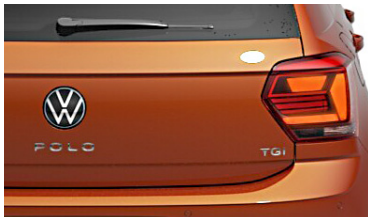
Caddy Kombi TGI

Caddy Cargo TGI

Distinguishing features of natural gas vehicles

Exterior features of the vehicle

- Lettering on the rear lid
- Separate natural gas connection, integrated behind the tank cap

Exterior features of the vehicle	
	"TGI" lettering on the rear lid
	Natural gas connection at the fuel filler neck

Volkswagen model range with LPG drive

A number of points distinguish vehicles with a liquefied petroleum gas drive – also designated as LPG or liquefied gas – from conventional vehicles. Knowledge of these differences is very important for emergency personnel when performing a rescue operation.

Volkswagen currently does not offer any vehicles with a liquefied petroleum gas (LPG) drive. The Sharan was sold with a liquefied petroleum gas drive under the designation Sharan 2.0 LPG until April 2010.

All vehicles made by Volkswagen with a liquefied petroleum gas drive can be operated using both liquefied petroleum gas and petrol. The BiFuel vehicles feature bivalent drive, meaning that along with the liquefied petroleum gas tank, the conventional, series-standard petrol tank is installed.

Being able to identify liquefied petroleum gas vehicles immediately is of critical importance for emergency and recovery personnel deployed, e.g. to traffic accidents, in order to allow them to assess the risks at the scene of deployment and take appropriate measures.

	Liquefied petroleum gas (also designated as LPG or liquefied gas) must not be mistaken for natural gas (also designated as CNG or compressed natural gas). Natural gas and natural gas systems have features that fundamentally distinguish them from liquefied petroleum gas and autogas systems.
	Dealing with liquefied petroleum gas vehicles is different to dealing with conventional vehicles. However, any dangers can, so to speak, be appropriately brought under control when knowledge of their special features is available.

Distinguishing features of LPG vehicles

No vehicles with a liquefied petroleum gas drive are currently being sold, however a range of different Volkswagen models can be found on the road.

Exterior features of the vehicle

- "BiFuel" lettering on the rear lid
- Separate LPG connection

Exterior features of the vehicle

	"BiFuel" lettering on the rear lid
	LPG or liquefied gas tank in the luggage compartment floor

Volkswagen Commercial Vehicles with camping gas equipment

Volkswagen Commercial Vehicles offers a range of models with additional camping gas equipment.

Different types of camping gas cylinders (propane or butane) are installed at different positions in the vehicle in these models.

Being able to identify vehicles with camping gas equipment immediately is of critical importance for emergency and recovery personnel deployed, e.g. to traffic accidents, in order to allow them to assess the risks at the scene of deployment and take appropriate measures.

	Propane or butane gas is highly flammable.
	Dealing with vehicles with camping gas equipment is different to dealing with conventional vehicles. However, any dangers can, so to speak, be appropriately brought under control when knowledge of their special features is available.

Current Volkswagen Commercial Vehicles with camping gas equipment

Caddy California
1 × 1.8 kg gas cylinder

California Beach
1 × 1.8 kg gas cylinder

California Coast/Ocean
1 × 11 kg gas cylinder

Grand California 600
2 × 11 kg gas cylinder

Grand California 680
2 × 11 kg gas cylinder

Distinguishing features of camping gas vehicles

Exterior features of the vehicle

- TÜV inspection sticker on rear lid
- Special roof structure
- Awning on front passenger side
- “California” lettering

Features in the vehicle interior

- Kitchen with one or two gas hobs
- Basin
- Shower cabin
- Toilet
- Up to four beds

Exterior features of the vehicle

	TÜV inspection sticker
	Special roof structure
	Awning on front passenger side

Features in the vehicle interior (examples)

	Extendable mini kitchen at the rear of the vehicle for the Caddy California
	Kitchenette with basin on the driver side in the California
	Kitchen with a basin accessible from the outside on the passenger side for the Grand California

2. Immobilisation / stabilisation / lifting

Version dated: October 2022

The increasing number of equipment options for the vehicles means the number of energy consumers has increased, and with them the need for several energy storage units.

This also has an impact on the rescue operations, as there are more issues to be taken into account, particularly when disabling the vehicle electrical system (switching off the ignition, disconnecting the vehicle batteries).

Disabling the vehicle electrical system not only reduces the risk of fire caused by short circuits, but also the risk of delayed deployment of airbags, belt tensioners or rollover bars. When disabling the vehicle electrical system, it must also be ensured that the power supply to any trailers attached is disconnected and any solar elements in the sliding sunroof are covered.

	The vehicle's drive system is automatically disabled after an accident has been identified in vehicles in the ID. family! Pressing the "Start engine stop" button again while simultaneously operating the brake pedal restores the vehicle's drive system.
	In high-voltage vehicles, one accessible high voltage device that disconnects high voltage should always be opened to de-energise the high-voltage system. Also see section 3 "Disable direct hazards / safety regulations".

	When the 12-V vehicle battery has been disconnected, all functions of the electrical system stop working (this applies in particular to the hazard warning lights and electric seat adjustment). Also observe the information in section 4 "Access to the occupants" and section 9 "Important additional information".

Preventing the vehicle from rolling away

Volkswagen models may be equipped with a manual gearbox or an automatic gearbox (torque converter or dual clutch gearbox).
To prevent the vehicle from rolling away or starting off accidentally, the gear lever must first be placed in the "Neutral" (for a manual gearbox) or in the "P" position for automatic gearboxes.

1. Locate the electronic or mechanical parking brake.
2. Operate the parking brake.

Vehicle with an automatic gearbox without a selector lever: press the "P" button

Switching off the ignition

Turn the ignition key to “Off” and remove it. Many Volkswagen models are equipped with a “START ENGINGE STOP” button. This may be located on the steering column, in the centre console or in the dash panel.

The following possibilities, amongst others, must be kept in mind:

- The vehicle may still have a traditional ignition lock or it may have Keyless Entry, a system where the ignition key can switch on the vehicle from anywhere inside it (such as the driver’s pocket or handbag). Some vehicles can also be controlled using an app.
- Use the ignition key, if there is one, to switch the vehicle to “Off”.

If the vehicle features a “START ENGINE STOP” button that can be used to deactivate the vehicle, press this.
Do not press the foot brake or clutch to switch off the ignition.

“START ENGINE STOP” button

⚠	Instead of the ignition key, use of a key card or smartphone app is also possible. Remove the ignition key, the key card or the smartphone from the vehicle (a minimum distance of five metres should be observed when doing so).
⚠	When the “START ENGINE STOP” button is pressed and the brake pedal is simultaneously operated, the vehicle may switch to vehicle drive mode. Observe the information in the rescue cards!
ℹ	The exact position of the “READY” display is described in the respective rescue cards.

Raising the vehicle

The points where the vehicle can and cannot be lifted are indicated in the rescue cards.

⚠	For deformed vehicles, the emergency and recovery personnel on site must decide at which points to raise the vehicle.
▲	If possible, lift up the vehicle at the indicated lifting points.

3. Disable direct hazards / safety regulations

For high-voltage vehicles: emergency cut-out connections to deactivate the high-voltage system

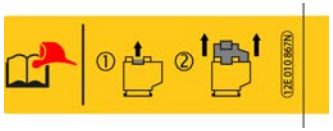
	The drive motor is silent in vehicles with a high-voltage drive. The display in the dash panel insert (power display) provides feedback as to whether the electric drive is switched to “OFF”, or “READY” for operation.
	In the event of accidents in which the airbag is triggered, the high-voltage system is automatically disabled. The high-voltage system is de-energised approx. 20 seconds after deactivation.
	In all other cases, an emergency cut-out connection can be used to deactivate the high-voltage system. In particular, using an emergency cut-out connection prevents the system from switching on again.

The emergency cut-out connections provide emergency personnel with an easily accessible way of safely deactivating the high-voltage system.
The high-voltage system is immediately and irreversibly disconnected from the high-voltage battery when the triggering of the airbag is detected.

Because some types of accident may prevent access to the motor compartment (for example when a passenger vehicle is stuck under a lorry), there are usually at least two emergency cut-out connections, one under the bonnet, one in the fuse carrier and one in the rear of the vehicle.
These emergency cut-out connections indicated by yellow flags only carry the 12-V electrical system voltage, which means they can be safely disconnected by the emergency personnel using the procedure described on the flags.

	Disconnection of a marked emergency cut-out connection only disables the high-voltage system. Safety systems such as airbags or belt tensioners are still supplied with voltage by the 12-V electrical system.

	If the airbag has not been triggered, the 12-volt electrical equipment may still be supplied with electrical energy from the high-voltage battery via the DC converter after the electrical system battery has been disconnected!
	The positions of the emergency cut-out connections and the procedure for disabling the vehicle are shown on the Volkswagen rescue cards.
	Even after disabling the high-voltage system, there is still voltage inside the high-voltage battery. The high-voltage battery must therefore neither be damaged nor opened over the course of rescue measures.
	Do not touch damaged high-voltage components, and cover them using suitable means if necessary! Wear personal protective equipment in accordance with the local standards!

	Indicates the emergency cut-out connection in the passenger compartment (pulling out the fuse in the fuse carrier)
	Indicates the emergency cut-out connection in the motor compartment (opening the maintenance connector for high-voltage system)
	Indicates the emergency cut-out connection in the luggage compartment or rear of the vehicle (cutting through the marked cable)

Disconnecting the high-voltage system from the vehicle

	Electric and hybrid vehicles operate extremely quietly in electric mode. This means that when at a standstill, the vehicle's drive system cannot be identified by the engine noise otherwise customary for combustion engines. This is why it is particularly important to disable the vehicle when dealing with vehicles with a high-voltage drive. Observe the information in the rescue cards.

There are at least two cut-out connections in current Volkswagen models. One is in the vehicle front end, and another is installed in the fuse carrier. There is an additional third cut-out connection in the rear of the vehicle in vehicles in the ID. family.

Different procedures may be necessary, depending on the vehicle type and equipment. The way in which the vehicle is disabled depends on the accident situation and the vehicle equipment.

	The procedures required can be found in the Volkswagen rescue cards.
	The vehicle and, above all, the high-voltage system cannot be disabled with the maximum possible level of certainty until an emergency cut-out connection provided by the manufacturer and the 12-V electrical system battery have been disconnected, or the airbag control unit has detected the accident and shut down the system.

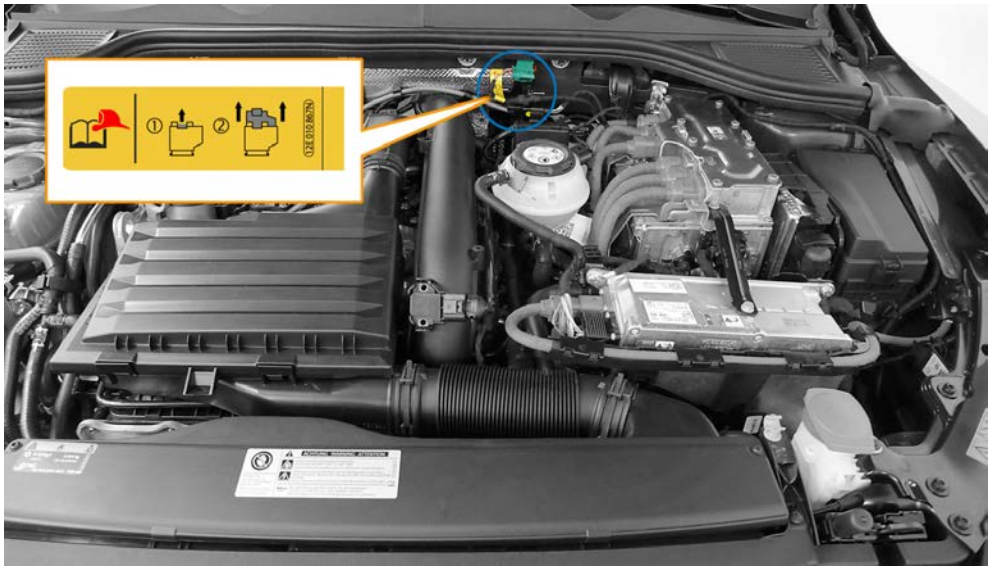
Use rescue equipment with caution and consideration near high-voltage components

Regardless of whether the vehicle is a hybrid or electric vehicle, the following points always apply in rescue operations at high-voltage vehicles.

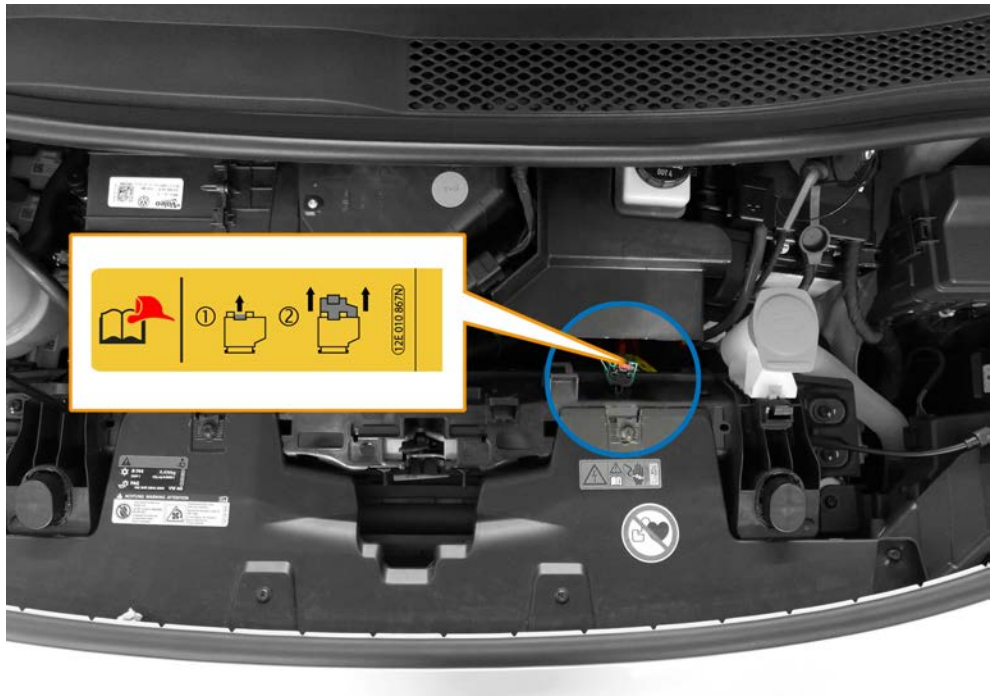
	Improper handling of high-voltage components can prove fatal due to high voltage and the associated potential flow of current through the human body.
	Do not perform any work on badly damaged high-voltage components. One of the accessible emergency cut-out connections should also be opened. If the airbags have not deployed, the vehicle must be disabled by the emergency and recovery personnel using an emergency cut-out connection. The high-voltage system has been de-energised after approx. 20 seconds. If the airbags have deployed, the high-voltage system will have already been switched off; this means the emergency and recovery personnel can act immediately.
	Even after disabling the high-voltage system, there is still electrical energy inside the high-voltage battery. The high-voltage battery must therefore neither be damaged nor opened over the course of rescue measures. If the high-voltage battery has been damaged due to the effects of an accident, avoid any contact with the high-voltage battery or with any liquids and vapours escaping from the high-voltage battery.
	Do not touch damaged high-voltage components, and cover them using suitable means if necessary! Wear personal protective equipment in accordance with the local standards!

High voltage device that disconnects high voltage in the engine compartment

The "low-voltage service disconnect" in the motor compartment is used as an emergency cut-out connection for high-voltage systems in plug-in hybrid electric vehicles (PHEV) and electric vehicles (BEV). The connector has a green connector housing and a tab for release. The connector is clearly identified as an emergency cut-out connection by a yellow label on the connection cable.
The connector is identified with the "emergency cut-out connection" symbol on the rescue card.



Cut-out connection in a hybrid vehicle engine compartment (Golf GTE, from 2020 onwards)



Cut-out connection in an electric vehicle engine compartment (ID.3)

Procedure for deactivating the high-voltage system using the emergency cut-out connection:

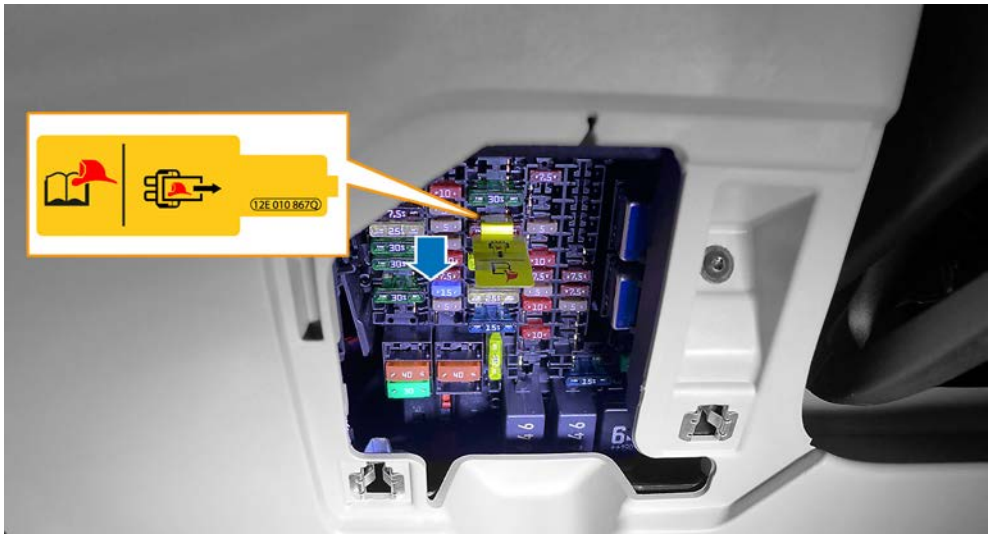
Pull out the red tab

Press and hold the red tab and, while doing so, pull out the back connector until it locks in position.

High voltage device that disconnects high voltage in the passenger compartment

Some vehicle models may also have a cut-off point on one of the fuse carriers (for example in the interior near the dash panel), also indicated with a yellow flag. In this case, the high-voltage system is disconnected and disabled by pulling the appropriately labelled fuse out of its holder.

In both cases, the contactors in the high-voltage battery open and disconnect it from the rest of the high-voltage system, which is then de-energised after 20 seconds have passed.



Cut-out connection in the passenger compartment, dash panel and on the fuse carrier

High voltage device that disconnects high voltage in the rear of the vehicle

There may be an additional cut-out connection in the rear of the vehicle in vehicles in the ID. family. In this case, a cable, labelled with a yellow flag, must be cut.

The high voltage device that disconnects high voltage was installed behind the luggage compartment trim up to production date 12/2020; it has been behind the right tail light cluster since 01/2021.

Version 1: Cut-out connection in the luggage compartment (example ID.3) behind the side panel trim until the end of 2020. The yellow flag indicates the cut-out connection.

Version 2: Cut-out connection in the rear of the vehicle behind the right tail light cluster from the start of 2021 onwards.

Disconnecting the 12-V vehicle battery

Depending on the type of vehicle and equipment, one or more 12-V vehicle batteries may be installed.
Disabling the vehicle electrical system not only reduces the risk of fire caused by short circuits, but also the risk of delayed deployment of airbags, belt tensioners or rollover bars.
When disabling the vehicle electrical system, it must also be ensured that the power supply to any trailers attached is disconnected and any solar elements in the sliding sunroof are covered.

	When the 12-V vehicle battery has been disconnected, all functions of the electrical system stop working (this applies in particular to the hazard warning lights and electric seat adjustment). The additional information in section 4 “Access to the occupants” and section 9 “Important additional information” must be noted.
	The procedure necessary for disabling the 12-V electrical system voltage is described in the Volkswagen rescue cards.

Separate from charging station (emergency release)

As high-voltage vehicles are usually charged when parked, public car parks, private carports and public or private garages may have high-voltage charging stations which a vehicle can be connected to.

The more high-voltage vehicles come onto the market, the more widespread public and private high-voltage charging stations will become. This must be taken into account by emergency and recovery personnel called out to emergencies and fires when assessing the situation and deciding which measures to take.

⚠	Public charging stations may be connected to the public power grid at more than 1,000 volts. If this is the case, the correspondingly larger safety distances must be observed when responding to fires.
ℹ	The procedure for operating the manual release mechanism for the charging connector on the vehicle is described in the rescue cards.

Another difference is the type of charging voltage. Some systems charge with alternating current while others charge with direct current.
A system that uses direct voltage (DC) supplies the battery directly using the charging connection. If alternating voltage (AC) is used to charge the high-voltage battery, the battery charger in the vehicle functions as a voltage converter.

⚠	Observe existing regional and national contingency plans for emergency and recovery personnel for public charging stations.
⚠	The charging connections and the appearance of public and private charging stations differ depending on the manufacturer and country. Also see section 1, “Identification/recognition”.

Today's vehicles feature intelligent drive systems and a variety of driver assist systems. A number of them are operated using an additional 48-V electrical system that is installed.

Volkswagen models with a 48-V electrical system are also referred to as mild hybrid vehicles (MHEV). These vehicles are not high-voltage vehicles.

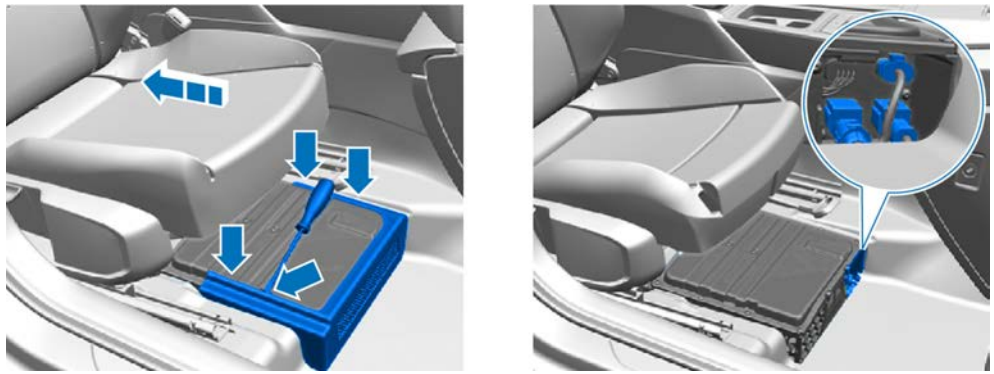
A number of examples of use are:
- Rear wheel steering
- Roll stabilisation
- Advanced start/stop mode with help from a belt-driven starter-alternator

	In the event of accidents involving triggering of the airbag, the 48-V electrical system is automatically disabled.

	When disconnecting the 48-V battery, there is a danger of an electric arc! Wear appropriate personal protective equipment!
	Lithium-ion batteries can self-ignite either immediately or after a delay when damage occurs or they are not used properly, or re-ignite after fire-fighting measures. Wear appropriate personal protective equipment!
	A 48-V lithium-ion battery is installed in a number of Volkswagen models.
	A 48-volt capacitor is installed on the right side of the rear of the vehicle in a number of Touareg models with roll stabilisation. Orange coloured wires lead to the component.
	The procedure for disconnecting the 48-V battery is described in the rescue cards.

Disconnecting the 48-V battery

The specific danger associated with the 48-volt voltage level can, so to speak, be appropriately brought under control, just like the conventional 12-V electrical system batteries, when knowledge of their special features is available.



Disconnecting the 48-V electrical system in a Golf from 2020 onwards.

Natural gas drive – safety equipment

The entire natural gas system has been installed in a way that provides the best possible protection from damage and the effects of weather. The gas tanks are highly stable and heat resistant. The high-pressure pipes and connecting elements are made of seamless stainless steel and are routed outside the passenger compartment.

Along with the electromagnetic shut-off valves, the cylinder valves have an integrated thermal fuse and a flow rate limiter that prevents the uncontrolled escape of gas if any damage to the pipes occurs. A non-return valve is also installed in the first cylinder valve. This prevents gas from flowing back out of the cylinder and into the filler line.

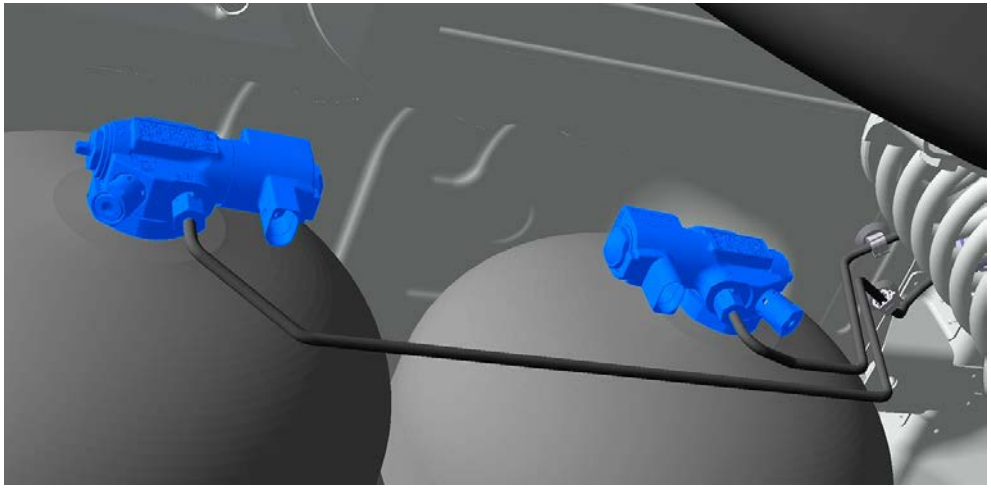
	The electromagnetic fuel tank shut-off valves automatically disconnect the supply of gas when the engine is at a standstill, in petrol mode and in the event of an accident involving triggering of the child restraint systems.

Fuel tank shut-off valve

Remove the tank covers on the underbody

The tank covers are marked in green in this illustration.

Manually shut off gas tanks



Localise the gas tank shut-off valves

Turn the shut-off valve clockwise as far as it will go using a 5 mm open-end spanner or pliers or a special tool.

	The procedure required for manual shut-off of the gas tanks is described in the Volkswagen rescue cards.
	Labelling of the CNG gas tanks in the rescue cards.
	Labelling of the CNG shut-off valves in the rescue cards.

A number of points distinguish vehicles with liquefied petroleum gas drive from conventional vehicles.

Knowledge of these differences is very important for emergency personnel when performing a rescue operation.

	Liquefied petroleum gas (also designated as LPG or liquefied gas) must not be mistaken for natural gas (also designated as CNG or compressed natural gas). Natural gas and natural gas systems have features that fundamentally distinguish them from liquefied petroleum gas and autogas systems.

Liquefied petroleum gas drive – safety equipment

The entire autogas system has been installed in a way that provides the best possible protection from damage and the effects of weather. The gas tanks are highly stable and heat resistant. All high-pressure pipes and connecting elements are made of copper/stainless steel and are routed outside the passenger compartment.

Along with the electromagnetic shut-off valve, the tank has integrated overpressure protection. Furthermore, a non-return valve is installed in the filler stop valve, which prevents the gas from flowing back from the gas tank and into the filler line.

Fuel tank shut-off valve

The fuel tank shut-off valve is an electromagnetic valve and is opened by the gas control unit during LPG operation.

	The valve closes automatically when the system is switched over to petrol mode, when the engine is switched off, in the event of an accident involving triggering of an airbag and/or belt tensioner, or if the voltage supply fails.

Camping gas equipment – safety equipment

The entire camping gas system has been installed in a way that provides the best possible protection from damage and the effects of weather. The gas lines installed are equipped with a shut-off tap in the vehicle models made by Volkswagen Commercial Vehicles.

Permanently installed shut-off tap for camping gas lines.

Propane or butane gas cylinders are equipped with an additional shut-off tap.

The gas cylinders are secured against slippage in the vehicle, and can be removed from the vehicle.

Camping gas cylinders are usually secured against slippage.

Shutting off camping gas cylinders manually

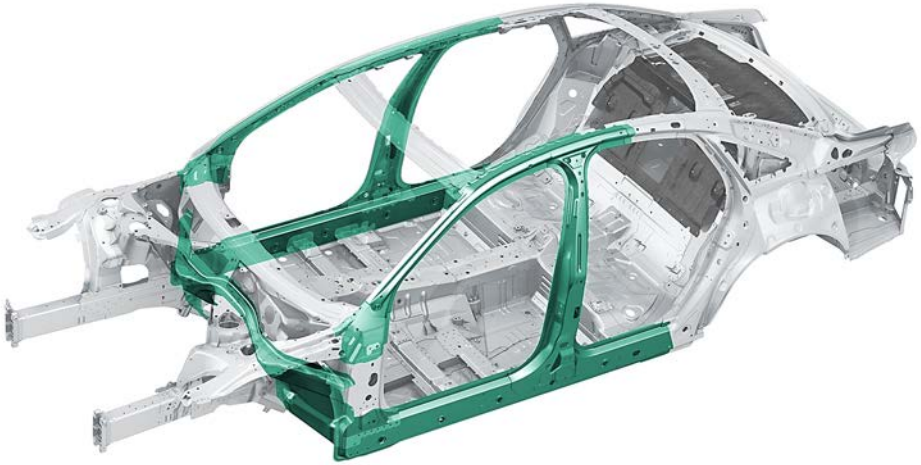
- Locate the shut-off valves for the gas cylinders
- Turn the shut-off valve clockwise as far as it will go

4. Access to the occupants

Body reinforcements

One particularly effective way to optimise safety for the vehicle occupants is to make the passenger compartment as rigid as possible.

Extra-high-strength and hot-formed steels, thicker walls and a multi-shell structure are used in vehicle body construction. These are the primary areas to avoid when rescuing occupants involved in an accident from today's vehicles, but if they must be opened, this requires sufficiently powerful cutting equipment.



Body with reinforced passenger compartment

	Information about the position of reinforcements can be found on the vehicle-specific rescue cards.

	Labelling of high-strength areas in the rescue cards.

The A-pillar

Convertibles in particular have an additionally reinforced body in order to achieve the necessary rigidity even without a roof. Reinforcing tubes may be fitted at various positions in the vehicle including the A-pillar in order, together with the roll bars, to optimise the protected area if the vehicle overturns. It may also be possible to open the convertible roof (which is usually a fabric roof) by conventional means or by pushing up the roof with a ram.

A-pillar reinforcement in cabriolets

	Cutting through the A-pillar near the A-pillar reinforcement is only possible using powerful rescue equipment.
	The location of particular reinforcement measures in the individual vehicles can be found in the rescue cards.

The B-pillar

The B-pillar in particular is reinforced using extra-high-strength and hot-formed sheet metal and a multi-shell structure. In addition, modern B-pillars have a larger cross-section.

The pillar is additionally reinforced around the belt guide, which makes it more difficult to cut through. These areas should therefore be deliberately avoided.

B-pillar with multi-shell structure

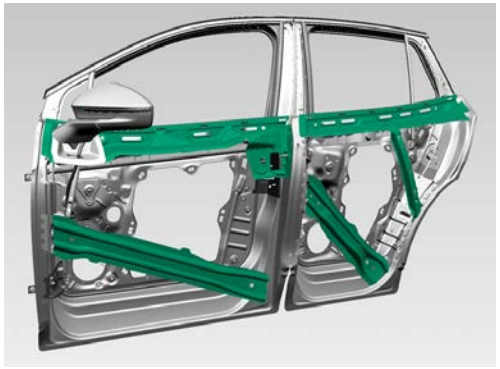
	The easiest point to cut through vehicle pillars is the area above the belt height adjuster. The bottom of the pillar can also be cut through, but it should be kept in mind that this part of the pillar has a very large cross-section and usually contains the belt tensioner.
	Always observe the rescue cards!

The side members

In modern vehicles, special steels are used to reinforce the side members. These increase safety in the event of side collisions, especially if the vehicle hits a pole.

Impact protection in the door area

The impact protection in the door area of Volkswagen Group vehicles is made of steel tubes or steel profiles. The tubes or sections are arranged horizontally or diagonally behind the outer door panels.
The high-strength sections can be cut through with powerful cutting equipment. The steel tube is installed above the door lock and provides the vehicle with support in the event of a head-on collision, while the steel profiles below the door lock are relevant in the case of a side impact.



Side impact protection in the doors

	The location of particular reinforcement measures in the individual vehicles can be found in the rescue cards.
	Labelling of high-strength areas in the rescue cards.

Glazing

The windows in Volkswagen Group vehicles are made of toughened or laminated safety glass. The windscreen is always made of laminated safety glass and the side and rear windows are made of toughened safety glass, depending on the equipment. Volkswagen vehicles may also feature side and rear windows with laminated safety glass.

Toughened safety glass

Toughened safety glass is thermally tempered glass that can withstand high loads. When broken it crumbles into small granular pieces.
Toughened safety glass is used for side windows, rear windows, sliding sunroofs and the tilting sunroof.

	Intact windows can suddenly burst during rescue work at the vehicle. Depending on the accident situation and the scope of emergency work, the windows should be removed first. Windows can be removed by concentrated impact using an automatic punch or an emergency hammer, for example. The windows should first be secured.

Laminated safety glass

Laminated glass consists of two panes of glass with a layer of film in between. The glass remains largely intact when damaged. It is used for windscreens and sometimes for side windows. The windscreens are bonded to the body with adhesive.

	Because laminated windscreens cannot suddenly burst, they only have to be removed if it is necessary for the rescue work. Laminated windows can be removed using special glass saws or metal cutting claws.

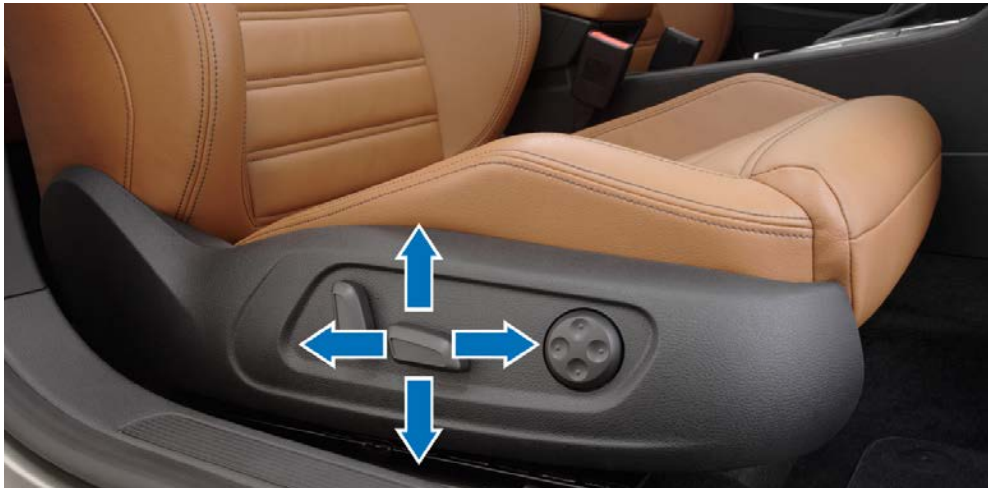
Toughened safety glass

Laminated safety glass

	Protect the occupants from shards of glass before removing the panes of glass.
	Information about the window versions installed is also described in the respective rescue cars for more recent models.

Driver seat and steering wheel adjustment mechanisms

The seat systems and steering columns in Volkswagen vehicle models may be operated mechanically or electrically.



Electric convenience systems

Depending on the model series and vehicle equipment, Volkswagen AG vehicles feature a range of electrically operated convenience systems, for example:

- Electric doors
- Electric windows
- Electric sliding sunroof
- Electric seat adjustment
- Electric steering column adjustment
- Electric unlocking, opening and closing of the luggage compartment

If the battery or batteries are disconnected, these systems can no longer be operated.

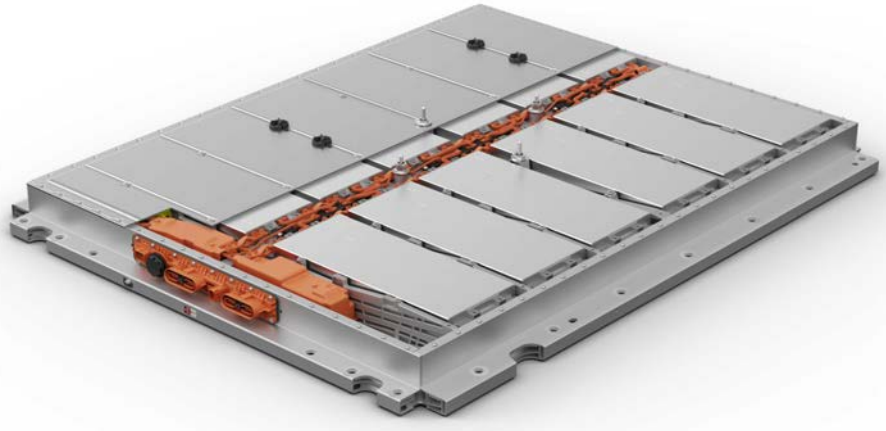
	In the event of an accident in which the airbag is deployed, electrically operated doors and flaps are automatically unlocked.
	When possible, the electric convenience systems should be used for the rescue prior to disconnection of the battery.
	The battery should only be reconnected to the vehicle electrical system by workshop personnel.

5. Stored energy / liquids / gases / solids

Version dated: October 2022

Only if you recognise a hazard during an emergency can you react appropriately and take suitable action to prevent it.

This is why extensive warning labelling comprises a part of the safety concept of, for example, high-voltage vehicles.



Example of a high-voltage battery for the ID.3

Warning labels for high-voltage components

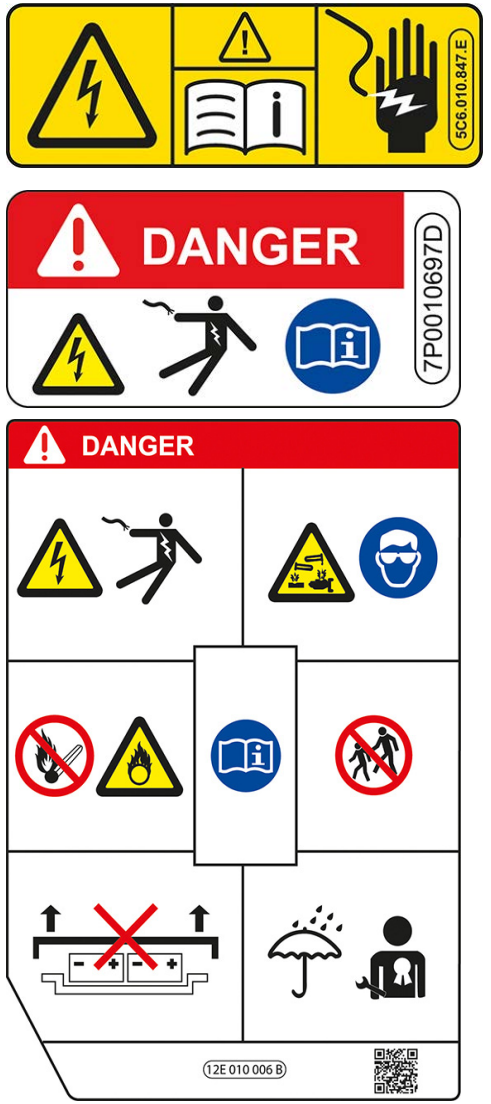
All high-voltage components are labelled with clear warning stickers. An exception to this are the high-voltage cables, which are immediately recognisable by the orange warning colour of their sheathing.

Three types of warning sticker are always used:

- Yellow stickers with a warning symbol for electrical voltage
- Stickers with the word "Danger" on a red background
- Stickers with a special warning for people with pacemakers.

The yellow stickers refer to the high-voltage components that are installed near the sticker or concealed under covers.

The warning stickers with the "Danger" lettering indicate the high-voltage components directly.



Examples of warning stickers in high-voltage vehicles.

What does “high voltage” mean?

Definition of terms used in vehicle construction (example Volkswagen)

- Low voltage: of up to 60 volts (usually 12 volts and 48 volts in passenger vehicles and 24 volts for lorries/commercial vehicles)
- High voltage: from 60 volts to approx. 1,000 volts

	Even though the terms are based on the voltage, the actual danger from direct contact with electrical energy is the strength of the current that flows through the human body in a closed circuit. This means that, even at low voltage, contact with electrical energy can present a danger to life when the current rating is correspondingly high.
	Do not touch, cut or open high-voltage components and high-voltage batteries! Wear appropriate personal protective equipment!
	Only a few electrical components in high-voltage vehicles are operated using high voltage (e.g. high-voltage battery, high-voltage cables, power and control electronics for electric drive, electric drive motor/alternator, air conditioner compressor, external charging socket). All other electrical components, such as lighting, vehicle electronics etc. are supplied with power by the 12-V electrical system voltage (passenger vehicle) or 24 V electrical system voltage (lorry).

The high-voltage battery

High-voltage batteries are rechargeable batteries. Various types of battery are used, depending on the manufacturer and the vehicle. They differ in the chemical components used in the battery cells for the anode, cathode and electrolyte, as well as in the shape of the battery cell (round, prismatic, pouch).
Lithium-ion batteries (Li-ion) are often currently used, for example.
The sizes and fitting locations of the high-voltage batteries differ depending on the type of vehicle. A fully electric vehicle requires a larger high-voltage battery than a hybrid vehicle.

The following battery locations are common at present:

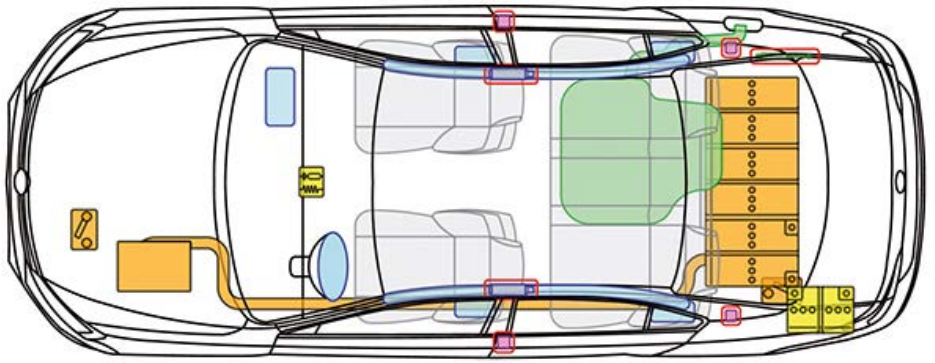
- Below almost the entire underbody
- Below the underbody in front of the rear axle
- Between the axles

A high-voltage battery consists of many battery modules, which in turn consist of the battery cells themselves.
All high-voltage batteries are protected by design measures, for example to reduce the escape of electrolyte from defective battery cells following an accident.
In the event of an accident, the high-voltage battery is protected from mechanical influences by a battery housing. This directs most of the impact energy into the vehicle structure.

	In addition to the high-voltage battery, Volkswagen electric vehicles also have at least one 12-V electrical system battery.
	Because there are so many different battery types with different chemical components and because battery technology is constantly developing, this guide cannot address the specific behaviour and hazards of each type.

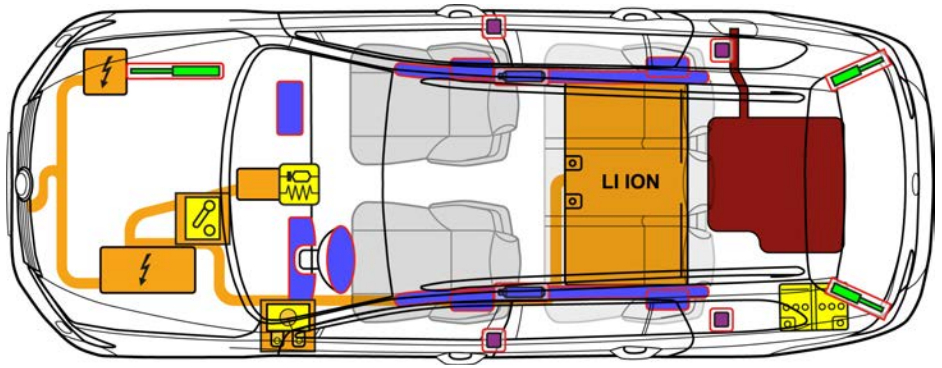
Battery concepts

The high voltage battery of the Jetta Hybrid



Fitting location of the high-voltage battery in the Jetta Hybrid.
(The illustration does not correspond to the current ISO 17840-1.)

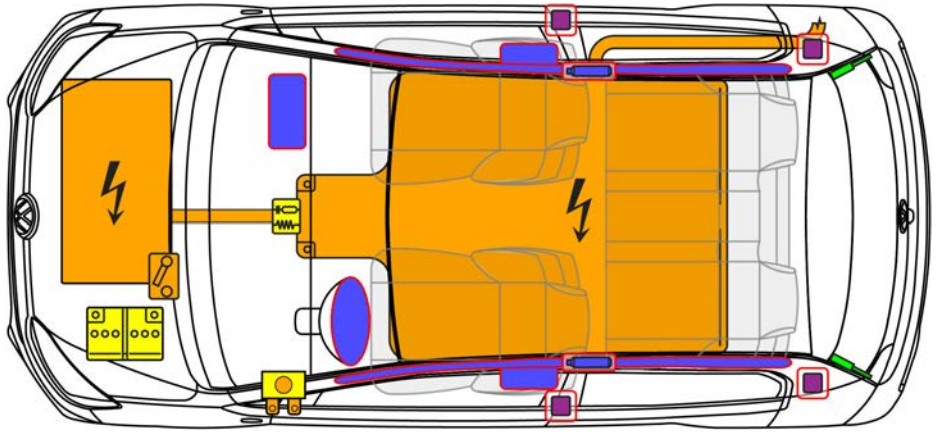
The high-voltage battery of the Passat GTE



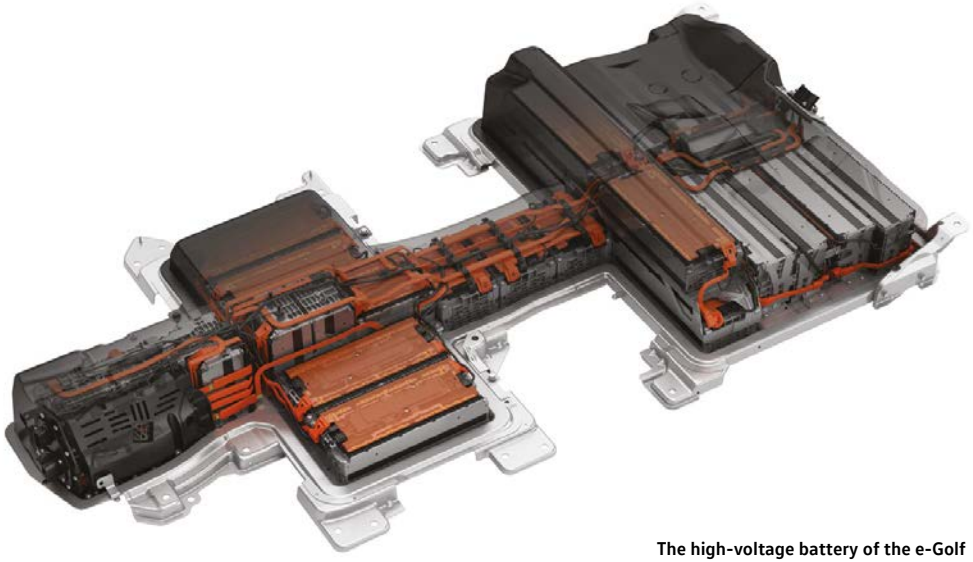
Fitting location of the high-voltage battery in the Passat GTE.

Battery concepts

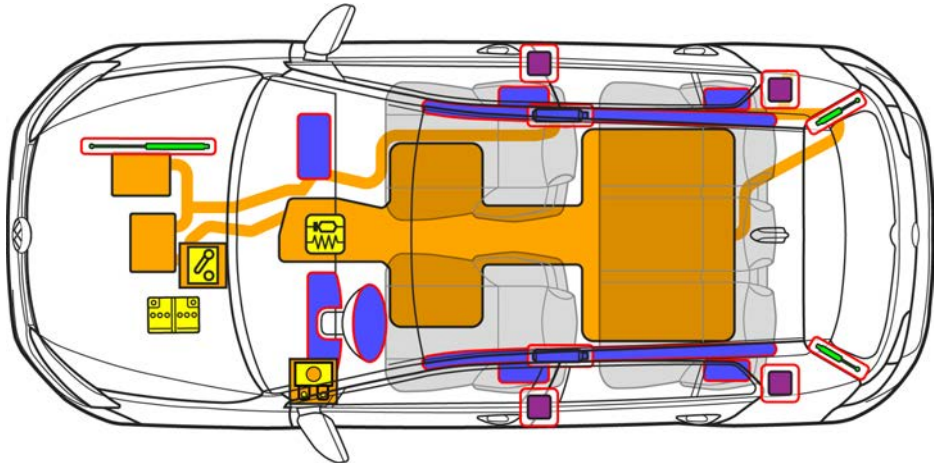
The high-voltage battery of the e-up!



Fitting location of the high-voltage battery in the e-up!

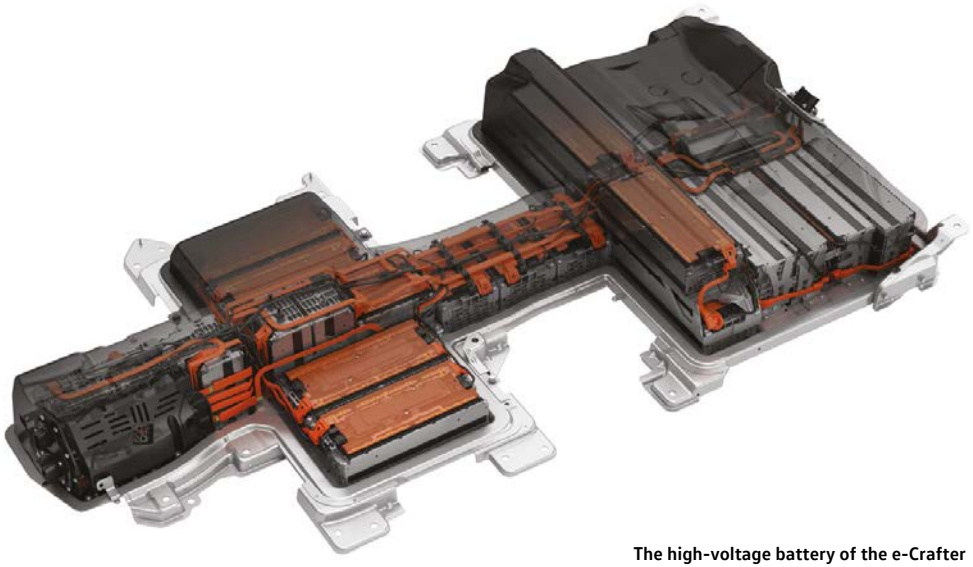


The high-voltage battery of the e-Golf

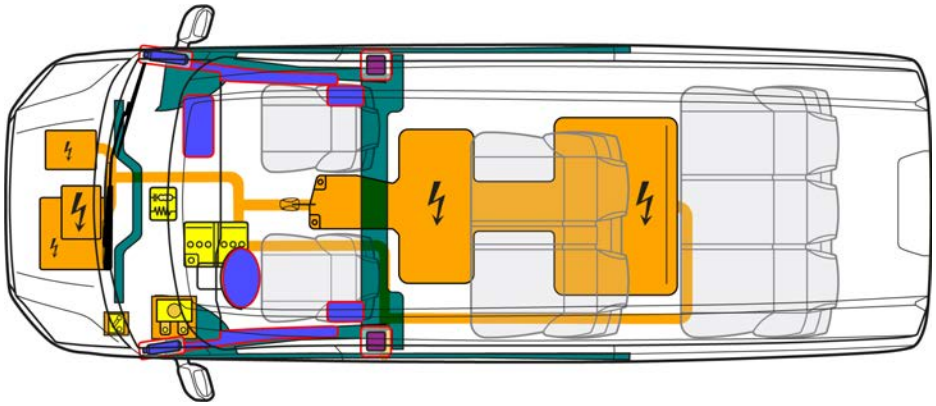


Fitting location of the high-voltage battery in the e- Golf.

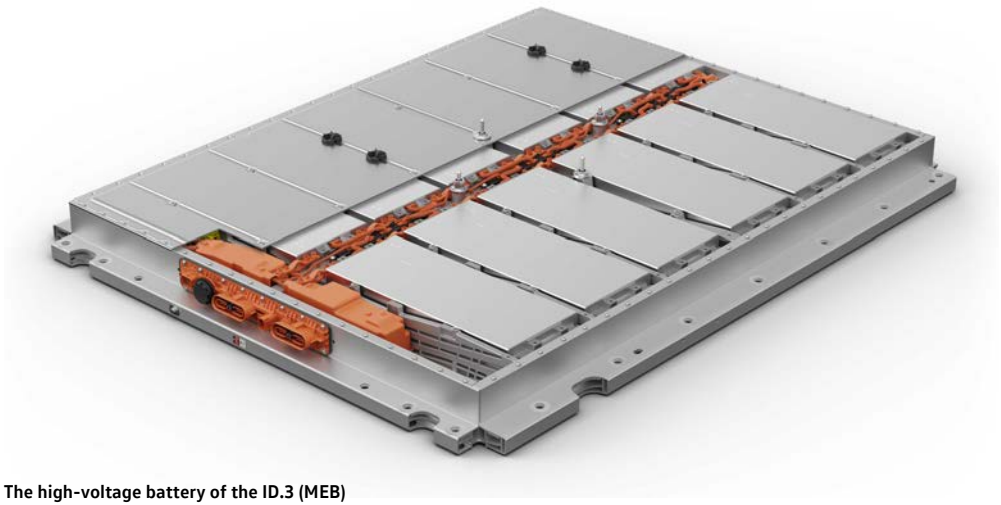
Battery concepts



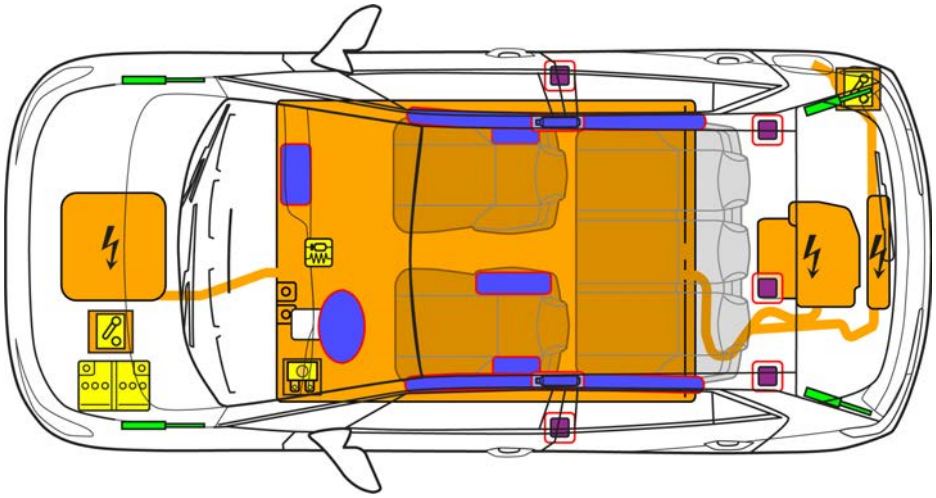
The high-voltage battery of the e-Crafter



Fitting location of the high-voltage battery in the e-Crafter



The high-voltage battery of the ID.3 (MEB)



Fitting location of the high-voltage battery in the ID.3

Air conditioning system

The refrigerants R134 a, R1234 yf and R744 (CO_2) are used for the air conditioning systems. More detailed information on the different refrigerants can be found on the following web page:

www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index.jsp

High-voltage battery – cooling system

In normal operating conditions, there is no danger of exposure to the contents of the battery.

	If refrigerant escapes from the battery cooling system, there is a risk of a thermal reaction in the high-voltage battery. Monitor the temperature of the high-voltage battery!
	In the event of outgassing of the high voltage battery, toxic vapours may form. Wear appropriate personal protective equipment!
	Vehicle-specific information is also described in the respective rescue cards.

12-V electrical system battery

12-V vehicle batteries in lead-acid technology are primarily used in the Volkswagen Passenger Cars and Volkswagen Commercial Vehicles models. The 12-V lead batteries differ in terms of a leak-proof technology (completely black box and “AGM” lettering on the label) and a technology that is not leak-proof in the event of damage to the housing (identifiable by the black cover and transparent box). Both technologies use “sulphuric acid” as the electrolyte.

 	There may be a highly explosive gas mixture in the battery. No flames, sparks, open light and smoking near the battery! Wear appropriate personal protective equipment! “Explosive” sticker on the battery
	Escaping electrolyte can cause severe burns to skin.
	Vehicle-specific information is also described in the respective rescue cards.

Batteries with a solid electrolyte

The absorbent glass mat batteries, also known as AGM batteries or recombination batteries, are used in vehicles with a start/stop system and energy recovery. Glass mat batteries are batteries in which the sulphuric acid is sealed in an absorbent glass mat (AGM). This battery type can be identified by the AGM lettering that appears on the battery cover and the completely black battery housing.

	Escaping electrolyte can cause severe burns to skin.
	Vehicle-specific information is also described in the respective rescue cards.

Lithium-ion battery (12 and 48 volts)

Lithium-ion batteries with a voltage of 12 or 48 volts are installed in a number of Volkswagen models (e.g. mild hybrid models with belt-driven starter-alternator).

	Lithium-ion batteries can self-ignite or re-ignite after fire-fighting measures! Wear appropriate personal protective equipment!
	Escaping electrolyte can cause severe burns to skin.
	In the event of outgassing of the lithium-ion battery, toxic vapours may form. Wear appropriate personal protective equipment!
	Vehicle-specific information is also described in the respective rescue cards.

Further information is available from the Zentralverband Elektrotechnik- und Elektronikindustrie e. V. (German Central Electrical Engineering and Electronics Industry Association), Battery Association. www.zvei.org/verband/fachverbaende/batterien

Compressed air tanks

Some Volkswagen models have accumulators for air suspension or air conditioning systems, for example. Do not damage these accumulators and never open them by force.

Flammable materials

Examples of these include:

- Plastics
- Electrolytes
- Resins
- Magnesium
- Gases or other flammable liquids

Resins are used for bonding carbon fibres, magnesium components are found in the engine compartment.

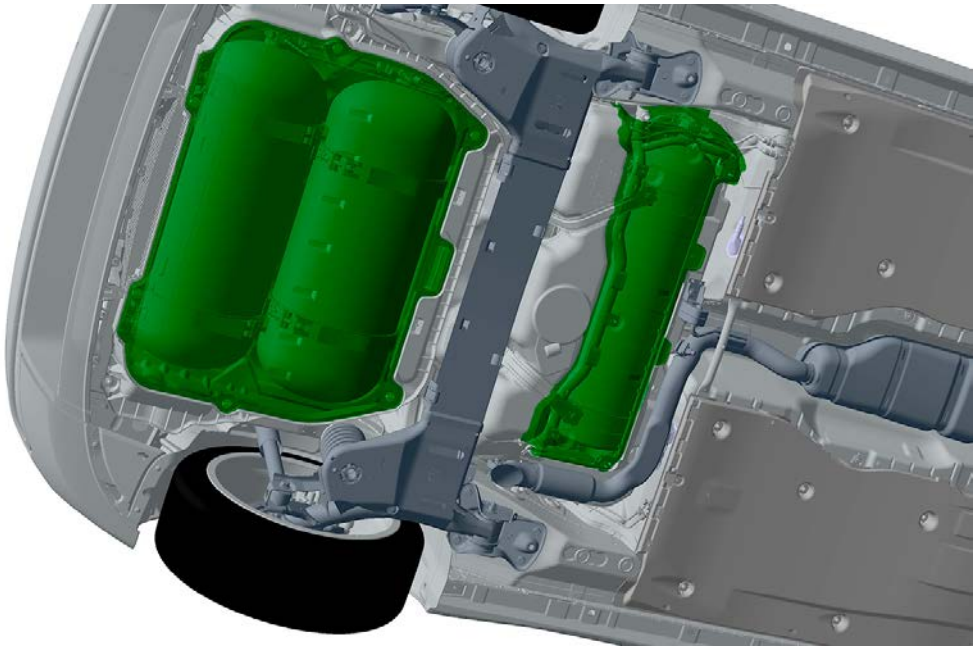
	Avoid skin contact and inhaling electrolyte vapours, as electrolyte is combustible, corrosive and irritating. Please wear appropriate personal protective equipment!
	Contaminated extinguishing water must be dealt with according to the national procedures for emergency and recovery personnel.

Physical properties of natural gas

Dealing with natural gas vehicles is different to dealing with conventional vehicles. However, any dangers can, so to speak, be appropriately brought under control when knowledge of their special features is available.

The gas tanks in current Volkswagen models can be made of steel or of carbon fibres.

- Natural gas is mixed with an odourant, for example, for use in e.g. a vehicle. This allows any escape of natural gas to be determined before the lower explosion limit is reached.
- Natural gas is lighter than air (density ratio natural gas/air approx. 0.6) and therefore dissipates quickly outdoors!
- Explosion range between 4% by volume and 17% by volume
- Ignition temperature approx. 640°C



	Labelling of vehicles with CNG drive.
	Avoid skin contact and inhalation of broken carbon fibres.

Physical properties of liquefied petroleum gas (also referred to as liquefied gas or LPG)

A number of points distinguish vehicles with liquefied petroleum gas drive from conventional vehicles.

Knowledge of these differences is very important for emergency personnel when performing a rescue operation.

- An odourant with an intensive smell is added to liquefied petroleum gas for use in vehicles.
- Gaseous, liquefied petroleum gas is heavier than air (density ratio of LPG/air approx. 1.55) and accumulates in depressions and open shafts (e.g. waste water shafts and channels).
- Liquefied petroleum gas is liquefied at a pressure of 8 bar, whereby its volume decreases considerably (1/260th of its original volume).
- Explosion range between 1.4 and 10.9% by volume
- Ignition temperature approx. 460 °C

	Liquefied petroleum gas (also designated as LPG or liquefied gas) must not be mistaken for natural gas (also designated as CNG or compressed natural gas). Natural gas and natural gas systems have features that fundamentally distinguish them from liquefied petroleum gas and autogas systems.

Safety equipment

The entire autogas system has been installed in a way that provides the best possible protection from damage. The gas tanks are highly stable and heat resistant. All high-pressure pipes and connecting elements are made of copper/stainless steel and most of them are routed outside the passenger compartment.

Along with the electromagnetic shut-off valve, the tank has integrated overpressure protection. Furthermore, a non-return valve is installed in the filler stop valve, which prevents the gas from flowing back from the gas tank and into the filler line.

Fuel tank shut-off valve

The fuel tank shut-off valve is an electromagnetic valve and is opened by the gas control unit during LPG operation.

	The valve closes automatically when the system is switched over to petrol mode, when the engine is switched off, in the event of an accident involving triggering of an airbag and/or belt tensioner, or if the voltage supply fails.

Physical properties of camping gas

Dealing with vehicles with camping gas equipment is different to dealing with conventional vehicles. However, any dangers can, so to speak, be appropriately brought under control when knowledge of their special features is available.

Camping gas cylinders are accessories and are normally not included in the equipment that comes with vehicles.

Camping gas (propane or butane gas) exhibits similar properties to liquefied petroleum gas (LPG), is heavier than air and accumulates in depressions and shafts.

	Labelling of vehicles with camping gas equipment.
	Camping gas cylinders (propane or butane) are generally secured to stop them moving in the vehicle.

6. In case of fire

Version dated: October 2022

General information on vehicle fires

In principle, all country-specific regulations, work instructions and guidelines issued by the respective fire-fighter associations and public authorities on how to proceed in the event of a vehicle fire must be observed. When possible, the fire must be prevented from spreading to the energy storage unit (fuel, gas, battery).

All the usual and familiar extinguishing agents such as water, foam, CO_2 or powder can be used.
Which extinguishing agent is to be used with which extinguishing method can only be decided at the deployment site, and is highly dependent on the actual situation and the equipment available.

	If the airbags did not deploy during the accident, they may deploy in the event of a vehicle fire.

Fire in high-voltage vehicles

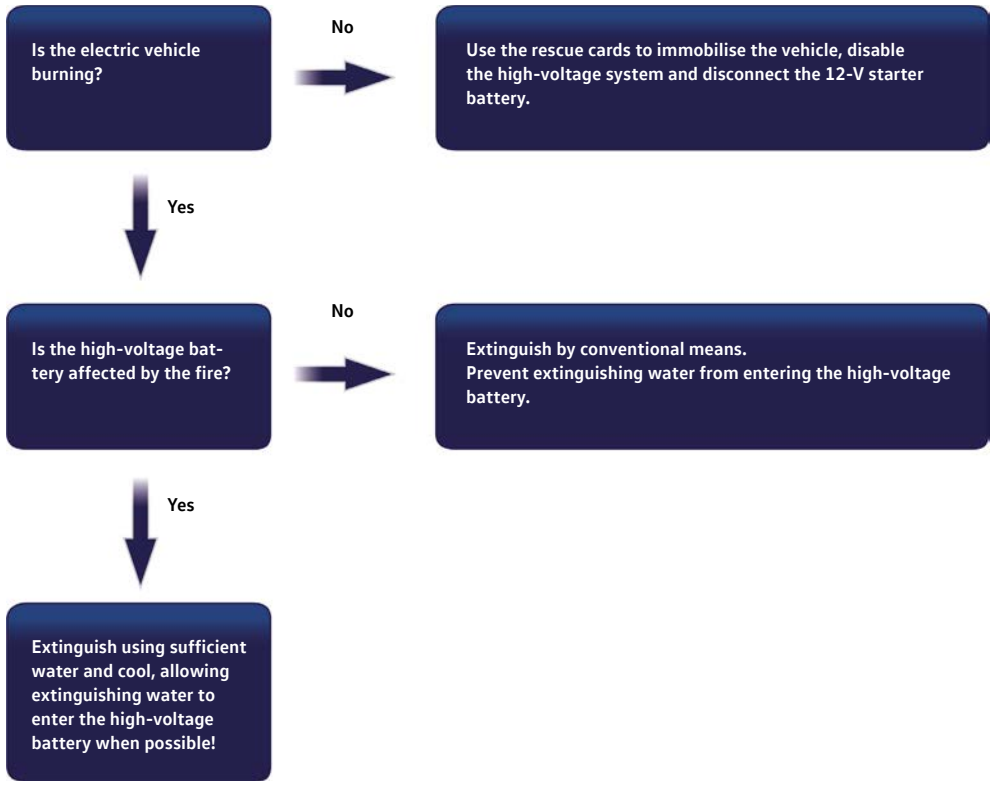
Dealing with high-voltage vehicles is usually no more dangerous than dealing with petrol or diesel vehicles, however a number of points do differ. Knowledge of these differences can be important for the rescue operations in the event of accidents involving passenger vehicles.

The following distinction must be made in the event of a vehicle fire with high-voltage vehicles:

- **Vehicle fire without an energy storage unit with a flammable electrolyte catching fire:**
  As is the case for a passenger vehicle with a conventional drive, all conventional and familiar extinguishing agents such as water, foam, CO_2 or powder can be used in case of a "normal" fire in a hybrid or electric vehicle (HEV or BEV, without the high-voltage battery catching fire) depending on requirements and/or availability.

- **Vehicle fire with an energy storage unit with a flammable electrolyte catching fire:**
  Smoke, flying sparks, darting flames from the battery may indicate that the lithium-ion battery is involved in the fire.
  When a high-voltage battery catches fire, it should be extinguished with water whenever possible and then be cooled.
  In this case, it must be ensured that sufficient water is used and, when possible, the extinguishing water enters the high-voltage battery through the openings caused by the fire or collision.
  The jet of water should be aimed as directly as possible at the battery.
  The installation position of the high-voltage battery can be found in the rescue card for the respective model.

The decision about which measures are suitable is made at the deployment site by the fire brigade, and is highly dependent on the actual situation (e.g. progress of the fire and time at which the fire brigade arrives) and the equipment available.



Flow chart for fires in electric vehicles.

If severe damage occurs (e.g. a dented, broken or cracked housing), a lithium-ion battery may react to the effect of water or effect of the fire immediately or only after a delay. This is why signs of a reaction (e.g. smoke, heat, noises, sparks etc.) must be observed during activities on a vehicle with a lithium-ion battery which has been in an accident.

In the event of a reaction by the lithium-ion battery, protective measures and countermeasures must be initiated.
Smoke hazardous to the human health is produced from fires in electric or hybrid vehicles, just as it is in vehicles with a conventional drive. This is why the corresponding personal protective equipment is recommended.

6. In case of fire

In the event of a fire, outgassing of the high-voltage battery should be expected, as the battery features mechanical safety mechanisms that open, for example in the event of an increase in temperature or pressure due to a fire, and therefore result in deliberate “outgassing” and pressure release.

Extinguishing a vehicle with a high-voltage battery and extinguishing a burning high-voltage battery is possible. According to the VDA guide on rescue and recovery in accidents, water is the most suitable extinguishing agent and there is no fundamental difference from fighting a fire in a conventionally powered vehicle.

If the high-voltage battery is involved in a fire, large quantities of water are required to cool or extinguish an undamaged high-voltage battery that is reacting.

Following a reaction, the lithium-ion battery must be cooled with water until it has reached a temperature approximately equivalent to ambient temperature. The use of a thermal imaging camera or an IR thermometer is recommended.

	After putting out the fire, there may still be dangerous voltages.
	When batteries are not completely burnt out, they may ignite again. Extinguished vehicles must be moved to a safe position; the vehicle may have to be watched.
	A sufficient safety distance must be maintained. The corresponding self-contained respiratory protection equipment must be worn!
	Evaporation and gases can be suppressed by spraying jets of water.

	Defective cells may burst, causing an exothermic reaction.
	A fire may break out some time after the accident, as there may be a residual risk of delayed fire. This is particularly the case if the high-voltage battery is damaged (see also section 8 “Towing / transportation / storage”). An electrical hazard may also persist. High-voltage components must not be touched and suitable personal protective equipment must be worn. High-voltage cables may have been damaged by the heat.
	Further information can be found in the respective rescue cards.

Fire in natural gas vehicles

Dealing with natural gas vehicles usually is no more dangerous than dealing with petrol or diesel vehicles; however there are also a number of special features in this case that must be observed during rescue operations in the event of accidents involving passenger vehicles.

In the event of a vehicle fire in which the natural gas fuel tanks are also exposed to heat, the thermal fuses will react at a temperature of approx. 110°C and a defined discharge of the natural gas occurs, which ignites and burns off. When the natural gas fuel tank is full, blowing off the natural gas takes approx. 90 seconds until it is completely empty.

Vehicles may be equipped with one or more gas tanks. The time at which a specific tank blows off/burns off cannot be determined precisely.
As soon as no more natural gas is being blown off, conventional fire fighting can begin. If the natural gas tanks are not affected by the fire (e.g. in the event of a fire in the engine compartment), fire fighting can also be initiated straight away.

	When the overpressure protection reacts, gas escapes from the valve. If the vehicle is standing on its wheels, the flow is gas is directed downwards towards the ground. If the vehicle is lying on its side or on its roof, a darting flame may emerge to the side or upwards. Maintain the safety distance from the vehicle. Approach it from the front whenever possible.
	Personal protective equipment must be worn, including self-contained breathing apparatus!

	If the airbags did not deploy during the accident, they may deploy in the event of a vehicle fire.
	A sufficient safety distance must be maintained. Corresponding personal protective equipment must be worn!
	Further information can be found in the respective rescue cards.

Fire in LPG vehicles

In the event of a vehicle fire in which the liquefied petroleum gas tank is also exposed to heat, the overpressure protection responds at a pressure of 27.5 bar and a pulsating discharge of the liquefied petroleum gas occurs, which ignites and burns off.

If the liquefied petroleum gas tanks are not affected by the fire (e.g. in the event of a fire in the engine compartment), conventional fire fighting can also be initiated straight away.

	If the vehicle is lying on its side or on its roof, a darting flame may emerge when the overpressure protection responds. If the vehicle is standing on its wheels, the flow of gas is directed out below the gas tank, vertically to the ground. Maintain the safety distance from the vehicle. Approach it from the front whenever possible.
	If possible, take cover when cooling the gas tank to prevent heating up before the overpressure protection responds. Continue cooling the tank even when the overpressure protection responds.
	Personal protective equipment must be worn, including self-contained breathing apparatus!
	If the airbags did not deploy during the accident, they may deploy in the event of a vehicle fire.

	A sufficient safety distance must be maintained.
	The loud discharge noise (hissing) indicates that overpressure protection has responded!
	Further information can be found in the respective rescue cards.

7. In case of submersion

Version dated: October 2022

Vehicle under water

A vehicle that is immersed in water must be dealt with in the same way as a damaged vehicle that has been in an accident.
The safety and security regulations must be observed, and the procedure to eliminate immediate dangers must be followed, see section 3.

High-voltage vehicle under water

- When it is in the water, the high-voltage system does not present an increased risk of electric shock.
- The same information applies as described in section 3, “Disable direct hazards / safety regulations”.
- The recovery procedure is the same as for conventional vehicles. This also applies to bodies made of carbon fibre reinforced polymers.

Source: Verband der Automobilindustrie (VDA), Unfallhilfe & Bergen bei Fahrzeugen mit Hochvolt-Systemen, FAQ.

	In the event that water enters the high-voltage battery, electrolysis may be triggered and cause a deflagration of oxyhydrogen gas.
	The high-voltage system must be disabled (see section 3 “Disable direct hazards / safety regulations”). Wear appropriate personal protective equipment!

Natural gas vehicle under water

- The same instructions as described in section 3 “Disable direct hazards / safety regulations” apply.
- The recovery procedure is the same as for conventional vehicles.

After recovering the vehicle, allow the water to drain.

	If gas escapes, close the shut-off valves for the tanks (see section 3 “Disable direct hazards / safety regulations”).

8. Towing / transportation / storage

Recovering vehicles involved in accidents

When loading, transporting and storing, the instructions in the rescue cards must be observed.

Recovering high-voltage vehicles involved in accidents from a danger area

Vehicles with high-voltage batteries should, in principle, be transported away on flatbed vehicles.

The high-voltage system must be disabled prior to transport, see section 3 “Disable direct hazards / safety regulations”.

Before transporting the vehicle away (e.g. by a towing company), the condition of the lithium-ion battery should be checked again. The vehicle may only be loaded and transported away if the vehicle does not show any signs of a reaction near the lithium-ion high-voltage battery for an extended period, see the flow chart on the next page.

If vehicles that have been in accidents have a damaged battery or the battery exhibits anomalies, wait until the reaction of the lithium-ion battery has abated before loading, so that no further reaction need be expected on the transport route, see the flow chart on the next page. The shortest and safest route possible must be selected. Travelling through tunnels should be avoided.
If there is any need or doubt, it may be necessary to have the breakdown truck accompanied by a fire engine.
Vehicles with a damaged high-voltage battery should be transported to a safe storage location.

After transport, electric or hybrid vehicles that have been in accidents should not be parked in enclosed buildings, but outdoors at a sufficient distance from other vehicles, buildings and combustible objects or surfaces.

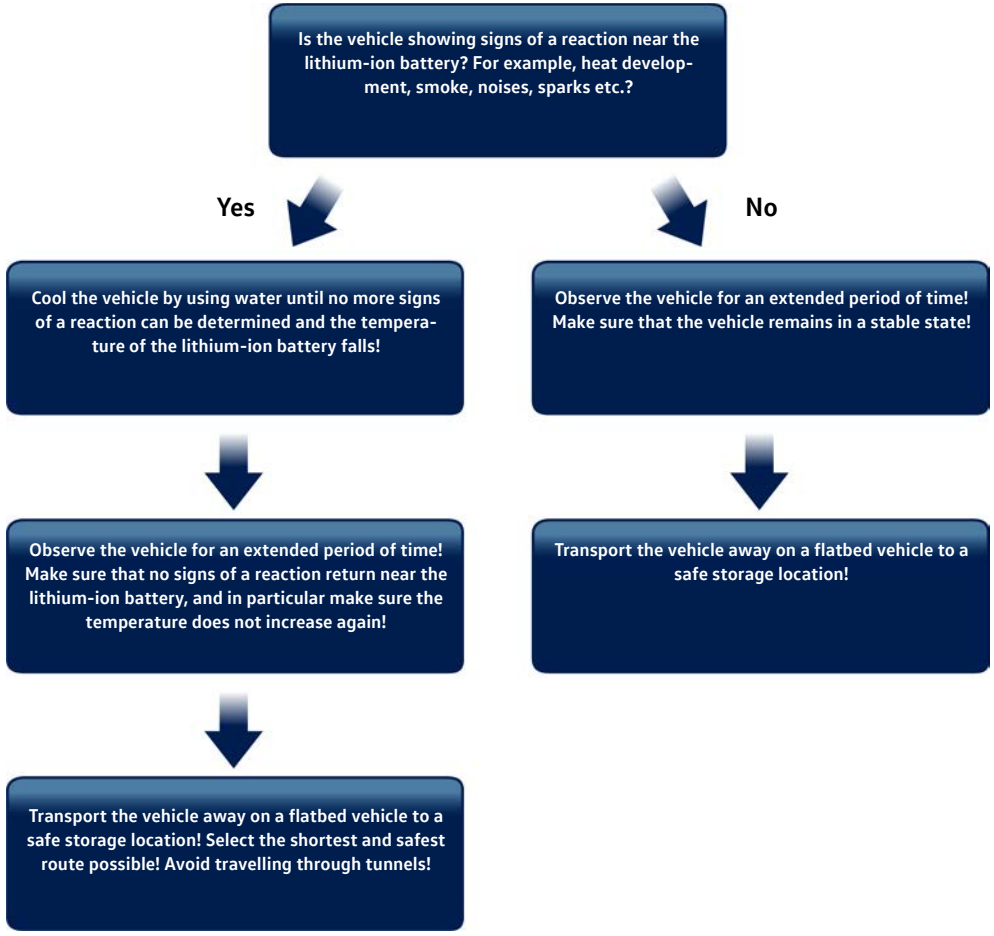
Preference should be given to using designated “quarantine areas” at the storage location. The vehicle that was involved in the accident must be parked outdoors in a suitable location due to the potential which exists, in theory, for the lithium-ion battery to still react. The parking space must be marked accordingly (signs/fencing).
A minimum distance of five metres must be maintained to other vehicles, buildings or flammable objects. The distance can be reduced by taking appropriate measures, e.g. fire barriers etc.
The persons responsible at the towing company, the workshops and, if relevant, the scrapyard must be made aware of the special features of and risks presented by the vehicle.

	Lithium-ion batteries can self-ignite or re-ignite after fire-fighting measures!
	In the event that vehicles that have been in accidents have a damaged battery or the battery exhibits anomalies: disable the high-voltage system (see section 3). Park the vehicle at a safe distance of at least 5 m from buildings and other vehicles (quarantine area).

8. Towing / transportation / storage

⚠	When loading the vehicle, take care not to damage the high-voltage components. If possible, lift up the vehicle at the indicated lifting points.
⚠	Vibrations during transport may cause high-voltage batteries to self-ignite again.
ℹ	Recommendations for specific vehicles can be found on their rescue cards.

ℹ	Whenever possible, monitor any changes in temperature using corresponding devices, e.g. IR camera, for an extended period.
ℹ	A large metal container, e.g. container, is recommended for transporting away a high-voltage energy storage unit or parts thereof that have been disconnected from the vehicle. The condition of the high-voltage energy storage unit must be observed (e.g. development of smoke, noises, sparks, development of heat) and flooding of the metal container must be prepared.
ℹ	Further information about this can be found in section 5 “Stored energy / liquids / gases / solids” (lithium-ion battery that has been disconnected from the vehicle).



Flow chart for towing electric vehicles.

Recovery of natural gas vehicles involved in accidents from a danger area.

When loading, transporting and storing, the instructions in the rescue cards must be observed.
Prior to transport, shut off the natural gas tanks manually, see section 3 “Disable direct hazards / safety regulations”.

	Do not tow away a vehicle that was in an accident by the drive axles.
	When towing and parking the vehicle, make sure that the gas tanks are not damaged.
	If gas escapes, shut off the shut-off valves for the tanks manually (see section 3 “Disable direct hazards / safety regulations”).
	Recommendations for specific vehicles can be found on their rescue cards.

9. Important additional information

Modern vehicles have extensive occupant protection systems which can vary according to the vehicle type and specification package.

Airbag

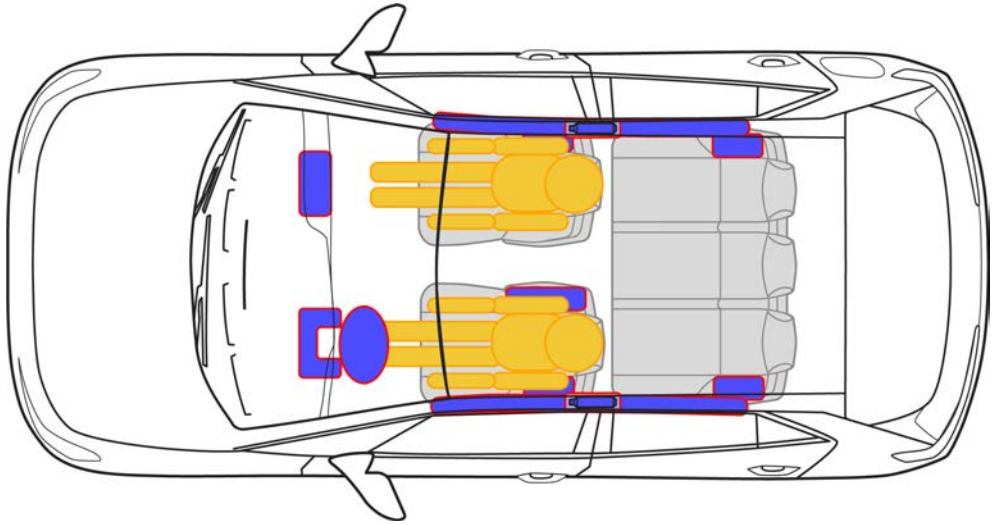
A current vehicle with maximum equipment includes the following main components:

- Airbags
- Airbag control unit
- Sensors
- Belt tensioners
- Components that release the rollover bar in convertibles

Preloaded springs or pyrotechnics are used to trigger it. The job of the electronics integrated in the airbag control unit is to detect vehicle deceleration and acceleration and decide whether to deploy protection systems.
In addition to the sensors in the airbag control unit, sensors e.g. in the front doors are also used to detect vehicle deceleration and acceleration during an accident. Only once they have evaluated the information from all sensors do the electronics in the airbag control unit decide whether and when to activate the safety components. Depending on the nature and severity of the accident, they may only deploy the belt tensioners or the tensioners together with the airbags, for example.

The control unit is indicated as follows on the rescue cards:

	Identification of airbag control unit as per ISO 17840



Airbags in today's vehicle models.

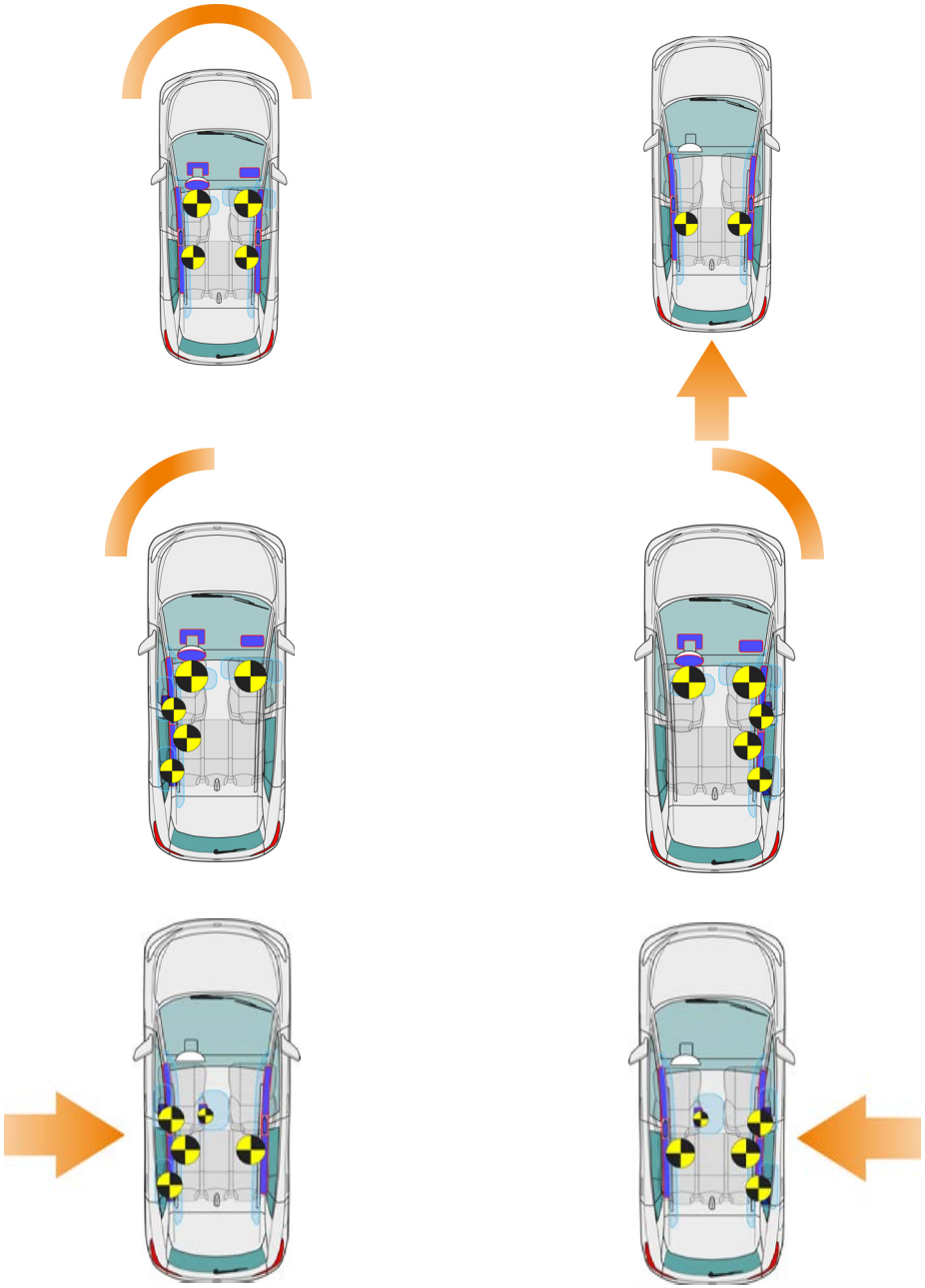
Only those safety systems which afford protection in the specific accident situation are triggered.

In addition to the main function for controlling the airbags, the airbag control unit may also have the following functions:

- Emergency release of the central locking
- Switching on the interior lights
- Switching off the fuel pump
- Switching on the hazard warning lights
- Transmission of a signal to send the eCall

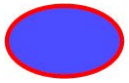
Stored gas inflators produce the quantity of gas required for inflating the airbags, filling the airbags within milliseconds. The inflated airbags protect vehicle occupants who are wearing seatbelts from striking the inner body contours (e.g. the steering wheel, dash panel etc.) in the event of a severe accident.
Depending on the installation location and requirements, stored gas inflators of various designs or modes of action are used.

The safety systems are triggered depending on the type of accident or direction of impact



The safety systems are triggered depending on the type of accident or direction of impact (ms = milliseconds).

Airbags are indicated in the rescue cards as symbols or outlines as follows:

	Driver airbag, front passenger airbag, side or centre airbag, knee airbag and curtain airbag

Front airbag

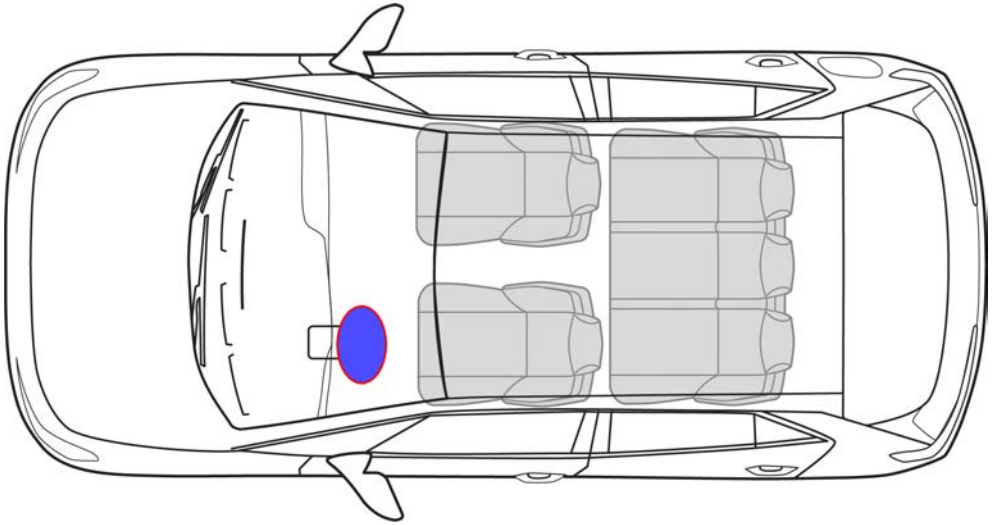
Driver airbag

The driver airbag unit essentially consists of a cap, the airbag and a stored gas inflator. It is fitted in the steering wheel and electrically connected to the airbag control unit via a contact unit.

The airbag is folded up under the cap and its shape and size are designed so that it inflates as protection between the driver and steering wheel.

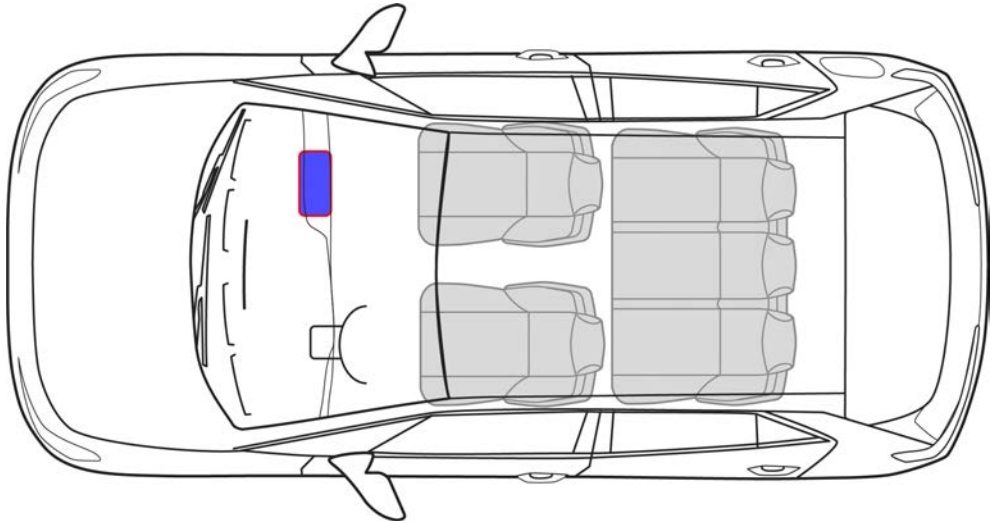
The driver airbag is inflated by a stored gas inflator. The unfolding airbag breaks the cap on the steering wheel along a special seam and is instantly filled with gas. The entire process from ignition of the stored gas inflator to the fully inflated airbag only takes a few milliseconds.

Vents on the side facing away from the driver reduce the kinetic energy of the upper body impact by allowing the gas to escape at a controlled rate.



Front passenger airbag

The airbag unit for the front passenger is located in the dash panel in front of the passenger seat. Because the airbag unit is further from the occupant, the front passenger airbag has a much larger volume. The action, function and process sequence of the front passenger airbag are comparable to those of the driver airbag.

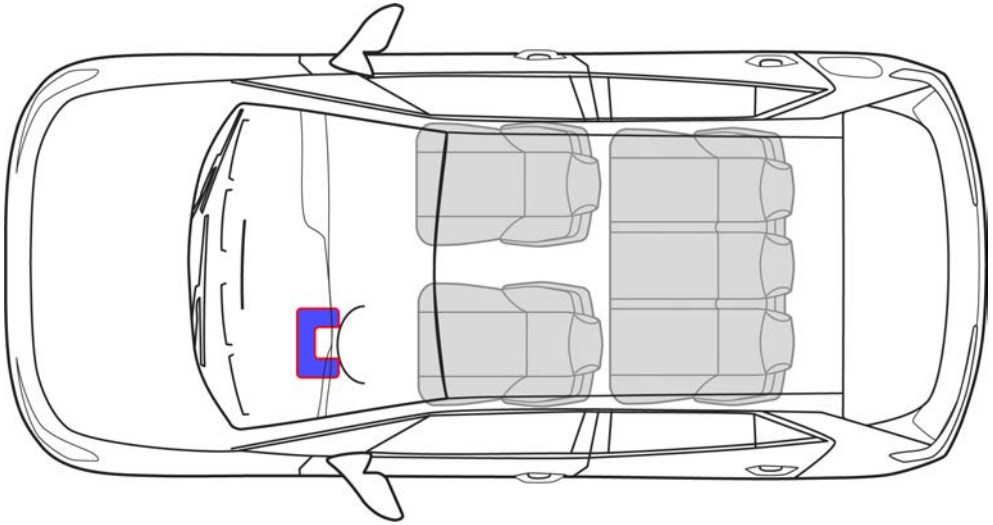


Knee airbag

The design of the knee airbag is similar to that of the front passenger airbag. It is located in the footwell trim below the dash panel.

The knee airbag is always deployed together with the driver airbag. Single-stage stored gas inflators are used to inflate the knee airbags.

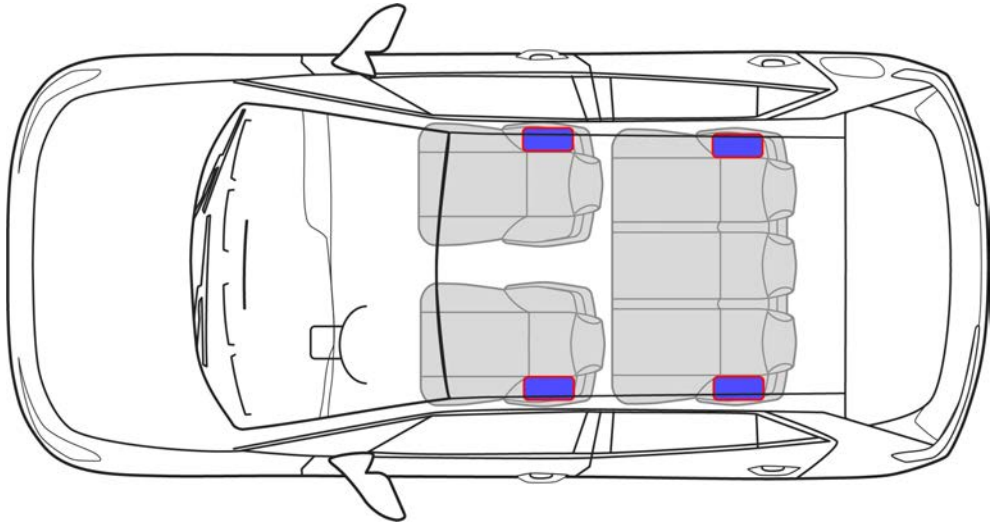
The deployment of the knee airbag reduces the occupants' risk of knee and leg injury, and connects the occupant sooner to the vehicle's deceleration.



Side airbag

In a lateral collision, side airbags protect the occupant's thorax and pelvis on that side of the vehicle and reduce the impact on the occupant. They inflate at the side between the occupant's upper body and any trims that protrude, and therefore distribute the force of the impact on the occupant more evenly, who is thereby paired with the motion of the intrusion early on.

The side airbags are installed in the backrest of the driver and front passenger seats, and on the outer seats in the 2nd row of seats in a number of Volkswagen models. This guarantees a uniform distance to the vehicle occupants in every seat position.

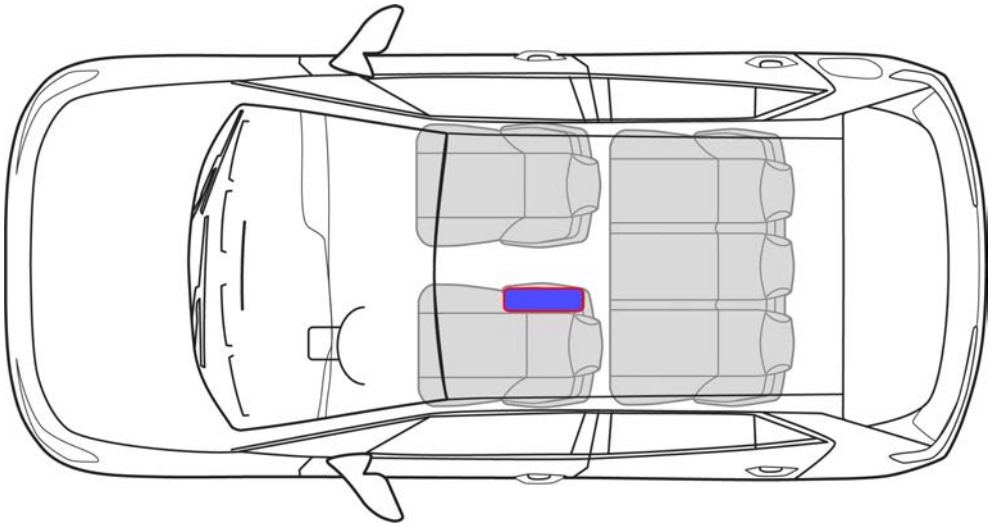


Head/thorax airbag

The head-thorax airbag for the driver and front passenger are integrated into the front seat backrests. The design and function are similar to those of a side airbag. It extends from the occupant's ribcage to the head and is particularly used in convertibles where a curtain airbag is not possible.

Centre airbag

Centre airbags are installed in the driver seat armrest on the tunnel side. They prevent a collision between the heads of the driver and the front passenger, and prevent the driver from being thrown too far to the passenger side if it is unoccupied.

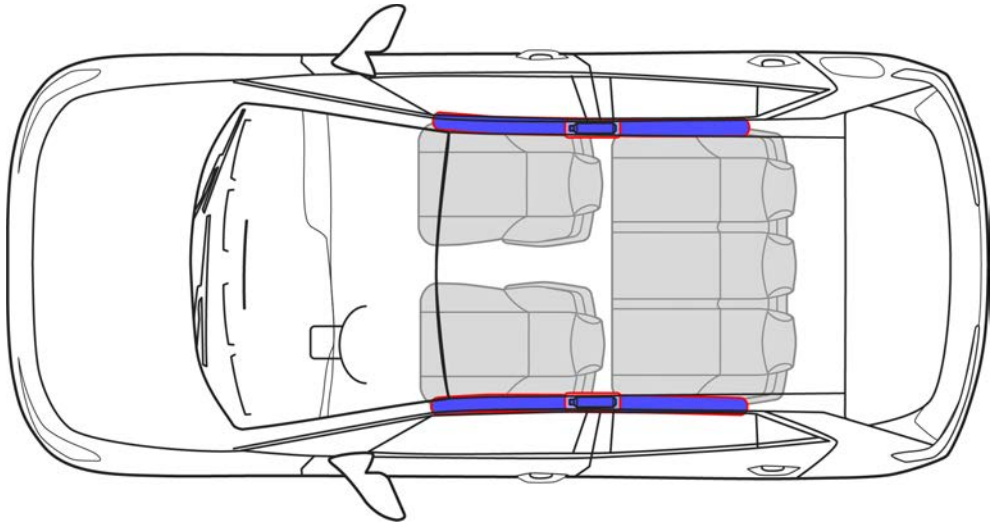


Curtain airbag

Curtain airbags protect the head in the event of a side impact. They consist of a large airbag up in the roof lining which usually extends from the A-pillar to the C-pillar.

Depending on the vehicle model, the stored gas inflators may be installed in the roof near the B-pillar, between the B- and C-pillars, between the C- and D-pillars or even in the rear roof area. The exact installation position is described on the rescue cards. In contrast to front and side airbags, the curtain airbag can retain its internal pressure for some time after being deployed. This is to provide protection if the vehicle subsequently overturns or secondary collisions occur.

Both the side and curtain airbags are deployed by the airbag control unit when a limit configured in it is reached. A side impact is detected by lateral acceleration sensors or pressure sensors in the doors.



Airbag stored gas inflators

Solid propellant generators

The solid propellant stored gas inflators consist of a housing containing a solid propellant charge with an ignition unit. When the solid propellant is ignited, the airbag is filled with non-toxic gas.

Procedure:

- The igniter is activated by the airbag control unit.
- The propellant charge is ignited and quickly combusts.
- The gas thus produced flows through the metal filter into the airbag.

Hybrid stored gas inflators

The hybrid stored gas inflators consist of a housing containing a highly compressed gas, combined with a solid propellant charge and an ignition unit. The design and shape of the generator housing are adapted to the installation conditions. These generators are usually tubular. The main components are the pressure vessel for the airbag inflation gas, and the (solid) propellant charge which is integrated in the pressure vessel or flange-mounted on it. The solid propellant is used in tablet or ring form. The stored and compressed gas is a mixture of inert gases, for example argon and helium. Depending on the stored gas inflator design, it is pressurised to between 200 bar and 800 bar.

- When the solid propellant is ignited, it opens the pressure vessel, producing a gas mixture consisting of the solid propellant and the inert gas mixture. The igniter is activated by the airbag control unit and the propellant charge is ignited.

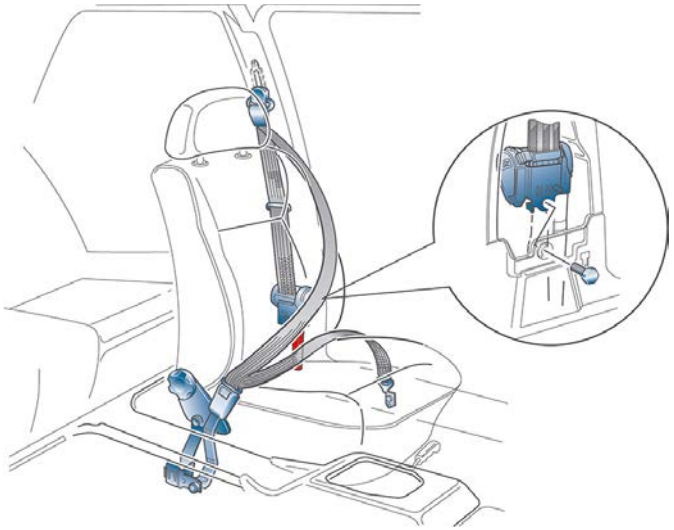
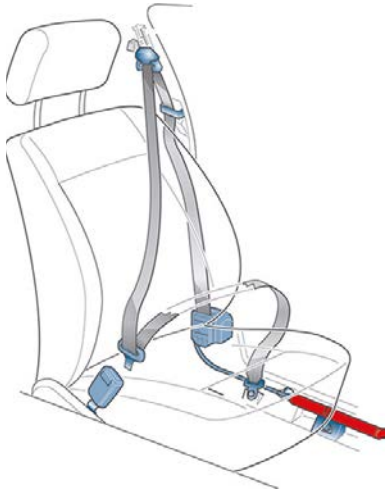
	Do not damage the stored gas inflators during rescue work. The compressed gas in the pressure vessel and the pyrotechnic propellants may pose a hazard to the emergency services and the occupants.

Belt tensioners

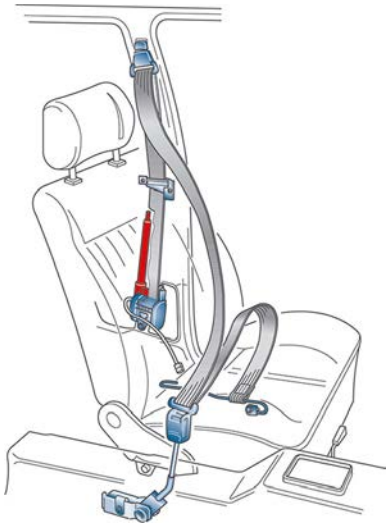
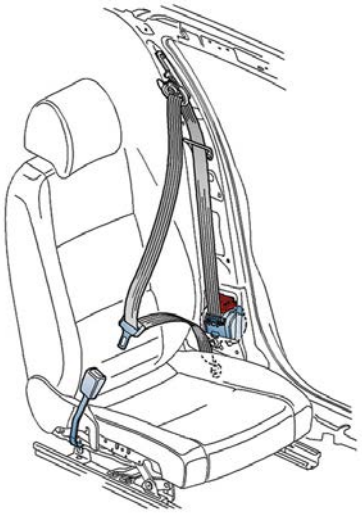
In the event of a crash, belt tensioners retract the belt in the opposite direction to which it is being pulled – this reduces slack (a gap between the belt and the body). This acts as soon as possible to prevent the occupant from being thrown forward (relative to the motion of the vehicle). A belt tensioner can retract the seat belt by up to 200 mm within 10 milliseconds. The belt tensioners are integrated in the belt system. However, they may be installed in different locations depending on the type of vehicle (for example in the B-pillar, in the side member beside the seat or on the outside of the rear seat) and have different functional principles. In some cases, two belt tensioners may even be used on one seat.

	This means belt tensioners should not be damaged with rescue equipment if at all possible. Avoid hammering on this area.
	The belt also locks if the vehicle is at a steep angle, has overturned, or possibly if the belt tensioner has been damaged by the accident.
	Non-triggered belt tensioners with mechanical activation can still be triggered even after the battery is disconnected.
	If the situation allows, the seat belt should be taken off or cut off as soon as possible.
	Identification of belt tensioners as per ISO 17840

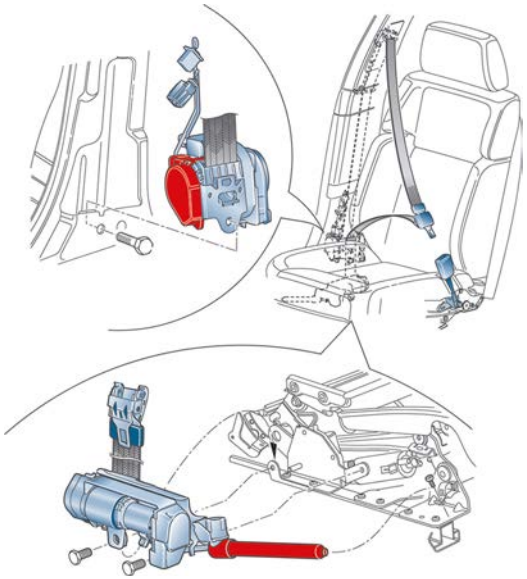
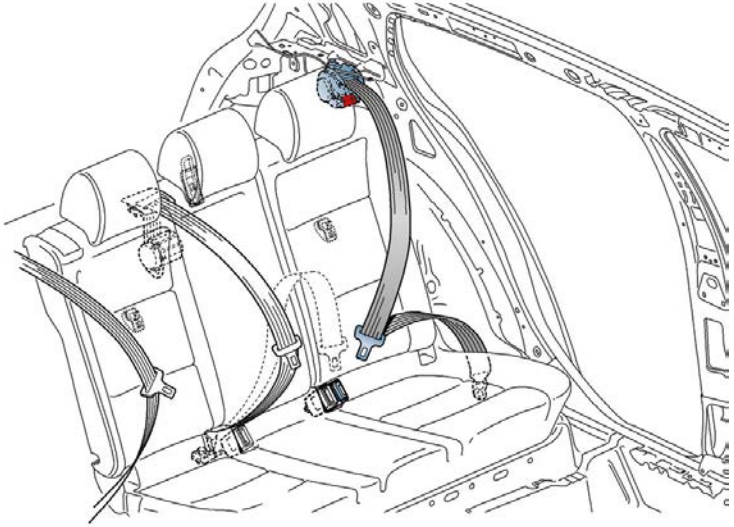
Belt tensioner installation variants

Variant	Fitting location
	**Variant 1** The front three-point seat belt with the cylindrical belt tensioner and mechanical or electrical triggering of the ignition form a unit and are installed either: a) In the B-pillar below the automatic belt retractors b) As external components next to the side member c) In the B-pillar above the automatic belt retractor **Installation variant 1a – Belt tensioner in the B-pillar below the belt retractor**
	**Installation variant 1b – Belt tensioner as external component next to the side member**

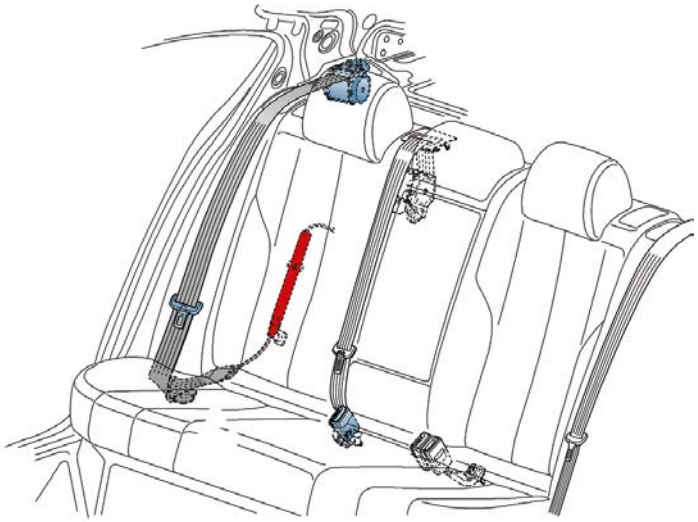
Belt tensioner installation variants

Variant	Fitting location
	**Installation variant 1c – Belt tensioner in the B-pillar above the belt retractor**
	**Variant 2** In the front compact tensioner, the three-point automatic seat belt and belt tensioner with electric or mechanical ignition trigger form a single unit and are installed in the B-pillar. **Installation variant 2 – Compact belt tensioner in the B-pillar**

Belt tensioner installation variants

Variant	Fitting location
	**Variant 3** In the front twin tensioner, the shoulder section of belt with compact tensioner and the lap part of the seat belt with cylindrical tensioner form a functional unit. The electric ignition trigger of the shoulder section is located in the B-pillar and the trigger for the lap belt section is on the seat frame. **Installation variant 3 – Twin belt tensioner in the B-pillar and seat frame**
	**Variant 4** In the rear compact tensioner, the three-point automatic seat belt and belt tensioner with electric or mechanical ignition trigger form a single unit and are installed behind the rear seat backrest. **Installation variant 4 – Compact belt tensioner in the rear shelf**

Belt tensioner installation variants

Variant	Fitting location
	**Variant 5** Three-point automatic seat belt and tensioner are arranged independently of each other. The belt tensioner with electric ignition trigger is installed in the wheel housing / C-pillar area. **Installation variant 5 – Rear belt pretensioner in the wheel housing / C-pillar area**
	**Variant 6** Three-point seat belt and lap belt tensioner are installed separately. The lap belt tensioner with electric triggering of the ignition is installed at the side member/B-pillar. **Installation variant 6 – Lap belt tensioner in the side member / B-pillar area**

Roll bar

Convertibles must provide the greatest possible protection for occupants even when the roof is open. This is why a rollover protection system is used, which in combination with reinforced A-pillars provides a protective zone for the occupants. It can be rigid or dynamic.

A dynamic system functions as follows:

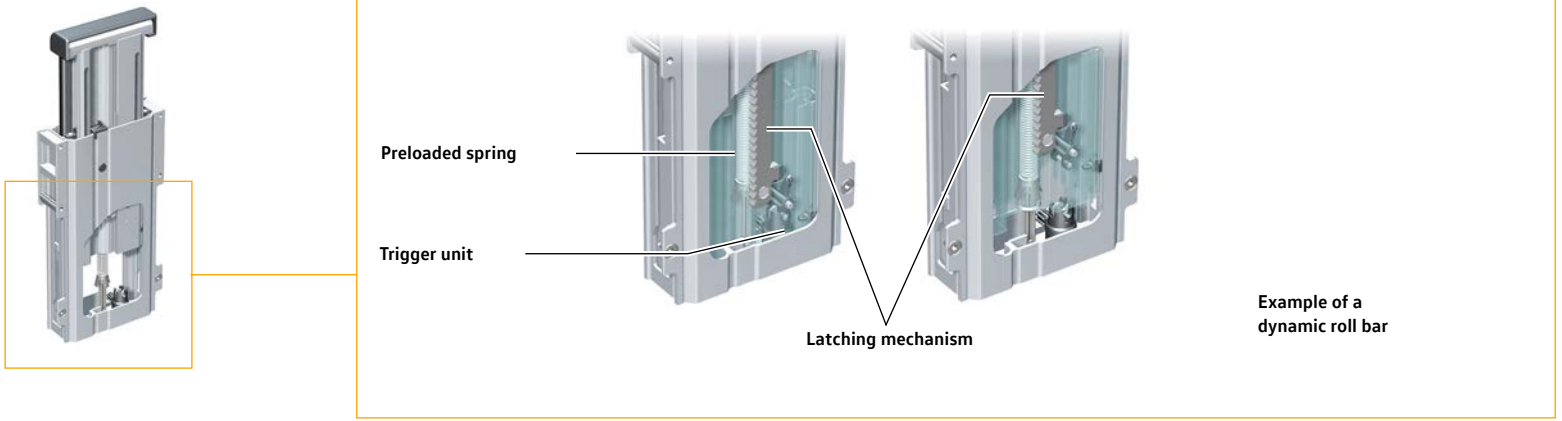
- The airbag control unit contains a sensor for detecting if the vehicle is about to roll over.

Together with other sensors in the control unit, the severity of the accident is determined and the rollover bar and belt tensioners are deployed.

The rollover bar is also deployed as a precaution in the event of a severe frontal, lateral or rear impact as soon as a belt tensioner or airbag is triggered.

It is deployed via a rollover bar trigger unit. A preloaded spring moves the bar to the protective position within 0.25 seconds, and it is locked in the extended position by a latching mechanism.

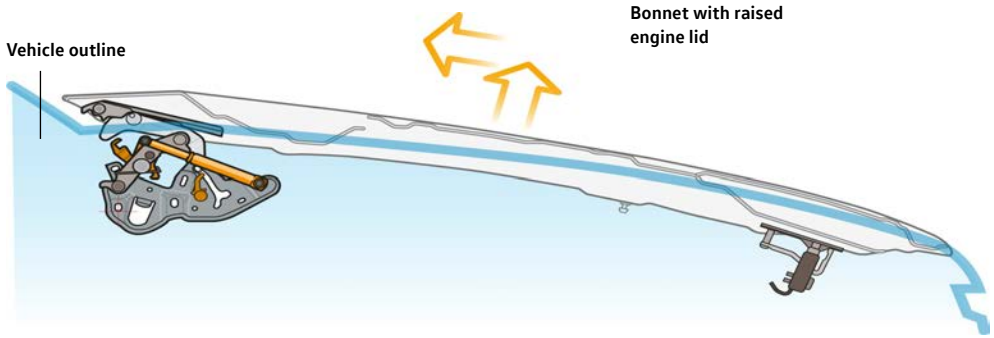
	If the rear window is still intact when the roll bar is triggered, the rollover bar will not break it. If the window is removed as part of the rescue operation, the rollover bar is pushed up a further 10 cm. It could hit emergency and recovery personnel and scatter glass shards.
	Identification of rollover bar as per ISO 17840



Re-active bonnet

To ensure optimum protection for pedestrians, some Volkswagen vehicles are equipped with a re-active bonnet.
In the event of a collision with a pedestrian, the front and rear of the active bonnet are raised by preloaded gas struts and pyrotechnic propellants.
This increases the space between the bonnet and engine. The bonnet can absorb more impact energy in this position, thereby reducing the severity of injury caused by the engine.

Example of a re-active bonnet with pyrotechnic actuator.



	Do not damage the stored gas inflators during rescue work. The compressed gas in the pressure vessel and the pyrotechnic propellants may pose a hazard to the emergency services and the occupants.
	Labelling in the rescue card in accordance with ISO 17840: Re-active bonnet

Sources, further information

- VDA: Accident assistance and recovery of vehicles with 48-V and high voltage systems
- DGUV: Hinweise für die Brandbekämpfung von Lithium-Ionen-Akkus bei Fahrzeugbränden (Information for fighting fires in lithium-ion batteries in vehicle fires) (FBFHB 024)

10. Explanation of pictograms used

Components, functions and measures that have to be taken into account during a rescue operation are indicated by special pictograms.

The pictograms are used:

- to indicate, together with the rescue card illustration, where the respective components/functions are located in the vehicle
  (for details, see ISO 17840-1 and ISO 17840-2)
- To indicate a specific function or danger; they can be used in the sections of the additional pages of the rescue card or the guide for emergency personnel
- To show how to identify the type of drive
- To indicate fire extinguishing measures.

Importance:
1 = Information that is essential for the rescue depending on the vehicle type/model
2 = Optional information which provides additional support for rescue measures

The following tables list the pictograms used by Volkswagen for passenger vehicles and light commercial vehicles and the components and functions to be taken into account.

	A number of pictograms may be adapted to reflect the actual size and shape. A combination of simple forms can also be used.

Pictograms concerning recognition

Examples for identifying the drive type

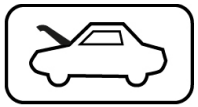
Reference: ISO 17840-4

Importance: 1

Used for:
- Rescue card illustration
- Guide for emergency personnel, section 1

Note: Example pictograms for petrol and electric drive systems are shown here.
See ISO 17840-4 for principles and other drive pictograms.

Pictograms concerning access to the components

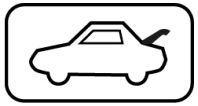


Title/meaning/reference:
Bonnet

Function/description:
Identifies the control that opens the compartment outside the interior at the front of the vehicle. The pictogram may have a frame to distinguish it from the background.

Importance: 2

Used for:
- Rescue card illustration
- Guide for emergency personnel, section 3



Boot

Identifies the control that opens the compartment outside the interior on the rear of the vehicle. The pictogram may have a frame to distinguish it from the background.

Importance: 2

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

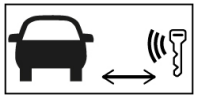
Pictograms concerning disabling of the vehicle (excluding high voltage)

Device to shut down power in the vehicle

All power sources in the vehicle are switched off using:
- Ignition key
- Button
- Measure in the engine compartment
- Measure on the dash panel
- Battery switch
- Other measure

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3



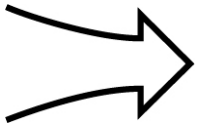
Remove smart key

Reminder to remove the Keyless Access key from the vehicle so that the engine is not accidentally started. Optionally, a safety distance may be specified.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

Pictograms concerning disabling of the vehicle (excluding high voltage)



Air intake

Identifies the air intake that can admit CO_2 to stop the engine.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

Pictograms concerning disabling of the vehicle high voltage

- **Orange = high-voltage system (class B voltage)**
- **Yellow = control of the high-voltage system by the low-voltage system**
- **Orange coloured frame = procedure for disabling the high-voltage vehicle**

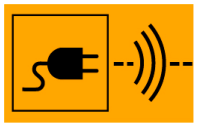
Dangerous voltage

Indicates hazards caused by dangerous voltages.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, relevant section as necessary
- Guide for emergency personnel, relevant section as necessary

Pictograms concerning disabling of the vehicle high voltage



Vehicle induction charging

Indicates that the vehicle is connected to an electromagnetic induction source for charging the high-voltage batteries. Shows the location of the induction charging system and its components.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

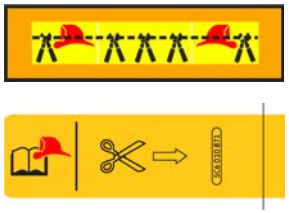
Fuse box disabling high voltage

Identifies the low-voltage fuse that controls the high-voltage system.

Importance: 1

Used for:
- Illustration and additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

Pictograms concerning disabling of the vehicle high voltage



Cable cut

Identifies which cable to cut in order to disconnect the high-voltage and SRS components from the power network. Indicates that the cable must be cut at two separate points. The size and proportions may be adapted to the intended purpose.

Importance: 1

Used for:
- Illustration and additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

High voltage device that disconnects high voltage (e.g. maintenance connector)

Identifies the device that disconnects the high-voltage system, as well as the personal protective equipment (PPE) that may have to be used.

Importance: 1

Used for:
- Rescue card illustration
- Illustration and additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

Pictograms concerning disabling of the vehicle high voltage

Low voltage device that disconnects high voltage

Identifies the low-voltage device that disconnects the high-voltage system.

Importance: 1

Used for:
- Rescue card illustration
- Illustration and additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

Pictograms concerning access to occupants

Steering wheel, tilt control

Identifies the control for adjusting the steering wheel inclination up or down. The pictogram may have a frame to distinguish it from the background.

Importance: 2

Used for:
- Guide for emergency personnel, section 4

Seat height adjustment

Identifies the control for adjusting the seat height up or down. The pictogram may have a frame to distinguish it from the background.

Importance: 2

Used for:
- Guide for emergency personnel, section 4

Pictograms concerning access to occupants

Seat adjustment, longitudinal

Identifies the control for moving the seat forward or back. The pictogram may have a frame to distinguish it from the background.

Importance: 2

Used for:
- Guide for emergency personnel, section 4

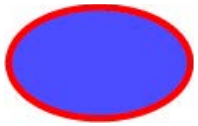
Lifting point; central support

Identifies the points on the vehicle that the manufacturer deems suitable for placing a jack or support.

Importance: 1

Used for:
- Rescue card illustration
- Illustration and additional pages of the rescue card, section 2
- Guide for emergency personnel, section 2

Other vehicle related pictograms



Airbag

Identifies an airbag.

Airbag versions, e.g.:
- Driver/front passenger airbags
- Side airbag
- Curtain airbag
- Knee airbag
- Belt airbag
- Centre airbag

Importance: 1

Used for:
- Rescue card illustration
- Guide for emergency personnel, section 9

Airbag stored gas inflator

Identifies an airbag stored gas inflator.

The pictogram shows the location of a stored gas inflator, e.g. for curtain airbags or active pedestrian protection systems.
This pictogram is not used for conventional airbag systems with integrated stored gas inflators, such as the front airbag in the steering wheel or dash panel, side airbags and knee airbag.

Importance: 1

Used for:
- Rescue card illustration
- Guide for emergency personnel, section 9

Other vehicle related pictograms

Belt tensioner

Identifies a belt tensioner.

If a seat has more than one belt tensioner (e.g. for hip and shoulder belts), all belt tensioner positions should be indicated with a pictogram.

Importance: 1

Used for:
- Rescue card illustration
- Guide for emergency personnel, section 9

Gas strut / Preloaded spring

Identifies a gas strut.

The red border is only used when the device is triggered.
The pictogram can be modified to reflect the actual size and shape.

Importance: 1

Used for:
- Rescue card illustration
- Guide for emergency personnel, section 9

Other vehicle related pictograms

Pedestrian protection active system

Identifies the active pedestrian protection system.

The pictogram for active pedestrian protection systems is intended to indicate that the vehicle is equipped with a system that can be triggered (e.g. the bonnet).
The background of the pictogram is usually white, but the colour of the trigger mechanism may be used as an alternative.
The pictogram can be combined with the trigger mechanism of the system (e.g. bonnet) or connected to it (airbag, stored gas inflator, gas strut, preloaded spring).

Importance: 1

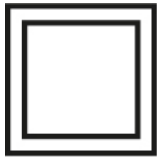
Used for:
- Rescue card illustration
- Guide for emergency personnel, section 9

High strength zone

Identifies a high-strength area.

Importance: 1

Used for:
- Rescue card illustration
- Guide for emergency personnel, section 9



Zone requiring special attention

Identifies the area to which particular attention should be paid.

Importance: 1

Used for:
- Illustration and additional pages of the rescue card, section 5
- Guide for emergency personnel, section 5

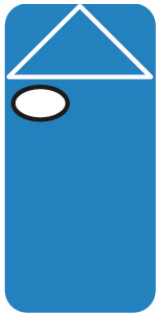
Other vehicle related pictograms

Carbon structure

Information that the vehicle body contains carbon. Indicates that there is a risk of inhalation and that appropriate PPE must be used.

Importance: 1

Used for:
- Illustration and additional pages of the rescue card, section 5
- Guide for emergency personnel, section 5



Left hand drive

Identifies a left-hand drive vehicle.

For use in the header of the rescue card.
The colour may be changed to stand out from the background of the header.

Importance: 1

Used for:
- Rescue card illustration

Right hand drive

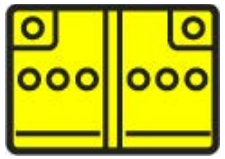
Identifies a right-hand drive vehicle.

For use in the header of the rescue card.
The colour may be changed to stand out from the background of the header.

Importance: 1

Used for:
- Rescue card illustration

Other vehicle related pictograms



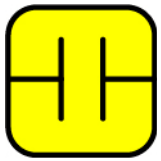
Battery low voltage

Identifies a low-voltage battery.

The battery technology should also be indicated (e.g. Li-Ion or NiMH) if it is a conventional battery.

Importance: 1

Used for:
- Rescue card illustration
- Illustration and additional pages of the rescue card, section 5
- Guide for emergency personnel, section 5



Ultra-capacitor, low-voltage

Identifies a low-voltage supercapacitor.

Importance: 1

Used for:
- Rescue card illustration
- Illustration and additional pages of the rescue card, section 5
- Guide for emergency personnel, section 5

Solar Panel

Identifies a solar cell.

Importance: 1

Used for:
- Rescue card illustration
- Illustration and additional pages of the rescue card
- Guide for emergency personnel, section 3

Other vehicle related pictograms

SRS control unit

Identifies an SRS control unit.

Importance: 1

Used for:
- Rescue card illustration
- Guide for emergency personnel, section 9

Battery pack, high-voltage

Identifies a high-voltage battery.

The battery technology should also be indicated (e.g. Li-Ion or NiMH). Optionally, the nominal voltage of the battery can be indicated.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

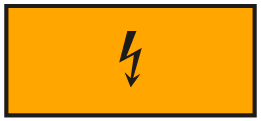
High voltage ultra-capacitor

Identifies a high-voltage supercapacitor.

Importance: 1

Used for:
- Rescue card illustration
- Illustration and additional pages of the rescue card, section 5
- Guide for emergency personnel, section 5

Other vehicle related pictograms



High voltage component

Identifies a high-voltage component.

The lightning bolt may be omitted if there is not enough space.

Importance: 1

Used for:
- Rescue card illustration
- Illustration and additional pages of the rescue card
- Guide for emergency personnel, section 3

High-voltage cable

Identifies a high-voltage cable.

It should be possible to distinguish high-voltage components from the high-voltage battery. The key and the pictogram graphics should match each other with regard to the line concept used for the frames.

Importance: 1

Used for:
- Rescue card illustration
- Illustration and additional pages of the rescue card

Fuel tank content Diesel

Indicates the tank capacity with a defined colour.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 5
- Guide for emergency personnel, section 5

Other vehicle related pictograms

Fuel tank content gasoline/ethanol

Indicates the tank capacity with a defined colour.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 5
- Guide for emergency personnel, section 5

Gas tank with gas type indication (CNG)

Indicates the tank capacity with a defined colour and names the type of gas.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

Manual gas shut-off valve with gas type indication (CNG)

Indicates the manual gas shut-off valve with a defined colour and names the type of gas.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

Other vehicle related pictograms

Automatic gas overpressure safety valve with gas type indication (CNG)

Indicates the device that controls gas overpressure in a tank with a defined colour and names the type of gas.

- Pressure-controlled (pressure relief device)
- Temperature-controlled (temperature-controlled pressure relief device)

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 5

Gas tank with gas type indication (LPG)

Indicates the tank capacity with a defined colour and names the type of gas.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

Other vehicle related pictograms

Manual gas shut-off valve with gas type indication (LPG)

Indicates the manual gas shut-off valve with a defined colour and names the type of gas.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 3

Automatic gas overpressure safety valve with gas type indication (LPG)

Indicates the device that controls gas overpressure in a tank with a defined colour and names the type of gas.

- Pressure-controlled (pressure relief device)
- Temperature-controlled (temperature-controlled pressure relief device)

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 3
- Guide for emergency personnel, section 5

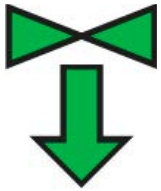
Gas line (generic)

Identifies a gas line with a defined colour.

Importance: 1

Used for:
- Rescue card illustration
- Guide for emergency personnel, section 5

Other vehicle related pictograms



Direction gas overpressure safety valve (e.g. LPG) in vehicle

Indicates the direction of the gas safety valve in an illustration with a defined colour.

Importance: 1

Used for:
- Rescue card illustration

Compressed air tank

Identifies a compressed air tank.

Importance: 1

Used for:
- Rescue card illustration
- Guide for emergency personnel, section 5

Air-conditioning component

Identifies an air-conditioning component with a defined colour.

The coolant must be specified on the additional pages and the rescue card (e.g. CO_2 fluorocarbon basis).
If there is not enough space, the snowflake may be omitted.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 5
- Guide for emergency personnel, section 5

Other vehicle related pictograms

Air-conditioning line

Identifies a gas line with a defined colour.

The type or designation of the coolant must be identified (e.g. CO fluorocarbon basis).

Importance: 1

Used for:
- Rescue card illustration
- Guide for emergency personnel, section 5

Pictograms related to fire fighting and safety

General warning sign

Indicates a general warning.

Importance: 1

Used for:
- Additional pages of the rescue card, corresponding sections as necessary
- Guide for emergency personnel, corresponding sections as necessary

Warning: Electricity

Warns of electricity and dangerous voltage.

Importance: 1

Used for:
- Additional pages of the rescue card, corresponding sections as necessary
- Guide for emergency services

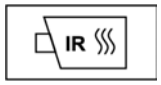
Pictograms related to fire fighting and safety

Warning; low temperature

Indicates hazards caused by low temperatures, e.g. frostbite from cold gases (e.g. LNG, air conditioning gas).

Importance: 1

Used for:
- Additional pages of the rescue card, sections 5, 6 and 8
- Guide for emergency personnel, sections 5, 6, 8 and 9



Use thermal infrared camera

Indicates that a thermal infrared camera should be used to detect a fire.

Importance: 2

Used for:
- Additional pages of the rescue card, section 6
- Guide for emergency personnel, section 6

Automatic fire suppression system

Indicates that the vehicle has an automatic fire extinguisher system.

Importance: 1

Used for:
- Rescue card illustration
- Additional pages of the rescue card, section 6
- Guide for emergency personnel, section 6

Pictograms related to fire fighting and safety

Special battery access

Special access through which water can be poured into the high-voltage battery of an electric vehicle.

Importance: 1

Used for:
- Additional pages of the rescue card, section 6
- Guide for emergency personnel, section 6

Use water to extinguish the fire

Indicates that a fire must be extinguished with water.

Importance: 1

Used for:
- Additional pages of the rescue card, section 6
- Guide for emergency personnel, section 6

Use wet foam to extinguish the fire

Indicates that a fire must be extinguished with wet compressed air foam. System in which foam and air are constantly mixed under pressure with the water from the fire extinguishing centrifugal pump (CAFS).
When using wet compressed air foam, the nominal ratio of foam to air volume is 1:3 to 1:10 for mixture in the CAFS.

Importance: 1

Used for:
- Additional pages of the rescue card, section 6
- Guide for emergency personnel, section 6

Pictograms related to fire fighting and safety

Use dry foam to extinguish the fire

Indicates that a fire must be extinguished with dry compressed air foam.
System in which foam and air are constantly mixed under pressure with the water from the fire extinguishing centrifugal pump (CAFS). When using dry compressed air foam, the nominal ratio of foam to air volume is more than 1:10 for mixture in the CAFS.

Importance: 1

Used for:
- Additional pages of the rescue card, section 6
- Guide for emergency personnel, section 6

Use ABC powder to extinguish the fire

Indicates that a fire must be extinguished with ABC powder.

Importance: 1

Used for:
- Additional pages of the rescue card, section 6
- Guide for emergency personnel, section 6

Do not extinguish with water

Prohibits the use of water to extinguish a fire.

Importance: 1

Used for:
- Additional pages of the rescue card, section 6
- Guide for emergency personnel, section 6

10. Explanation of pictograms used

Worldwide standard symbols

Explosive

Indicates the risk of explosion.

Importance: 1

Used for:
- Additional pages of the rescue card, sections 5, 6, 8 and 9
- Guide for emergency personnel, sections 5, 6, 8 and 9

Flammable

Indicates danger due to flammability.

Importance: 1

Used for:
- Additional pages of the rescue card, sections 5, 6, 8 and 9
- Guide for emergency personnel, sections 5, 6, 8 and 9

Gases under pressure

Indicates danger due to pressurised gases.

Importance: 1

Used for:
- Additional pages of the rescue card, sections 5, 6, 8 and 9
- Guide for emergency personnel, sections 5, 6, 8 and 9

Worldwide standard symbols

Oxidiser

Indicates danger due to substances that intensify fire.

Importance: 1

Used for:
- Additional pages of the rescue card, sections 5, 6, 8 and 9
- Guide for emergency personnel, sections 5, 6, 8 and 9

Corrosives

Indicates danger due to corrosive substances.

Importance: 1

Used for:
- Additional pages of the rescue card, sections 5, 6, 8 and 9
- Guide for emergency personnel, sections 5, 6, 8 and 9

Hazardous to the human health

Indicates a hazard to human health.

Importance: 1

Used for:
- Additional pages of the rescue card, sections 5, 6, 8 and 9
- Guide for emergency personnel, sections 5, 6, 8 and 9

10. Explanation of pictograms used

Worldwide standard symbols

Acute toxicity

Indicates danger due to acute toxicity.

Importance: 1

Used for:
- Additional pages of the rescue card, sections 5, 6, 8 and 9
- Guide for emergency personnel, sections 5, 6, 8 and 9

Environmental hazard

Indicates the risk of endangering the environment.

Importance: 1

Used for:
- Additional pages of the rescue card, sections 5, 6, 8 and 9
- Guide for emergency personnel, sections 5, 6, 8 and 9

Symbols used in this guide

Warning: potentially explosive materials

ISO 7010

Information

General information