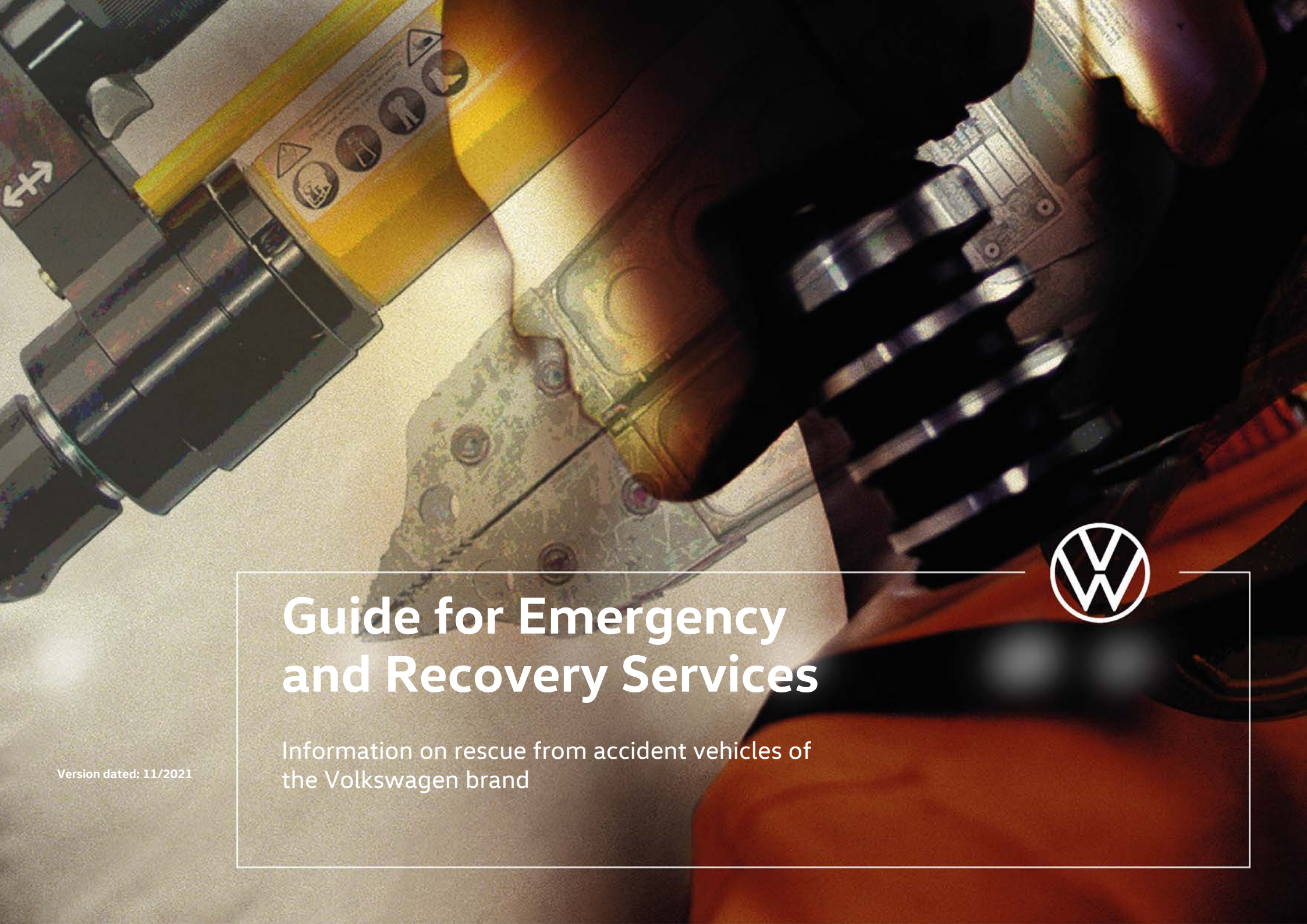


Guide for Emergency and Recovery Services

Information on rescue from accident vehicles of the Volkswagen brand

Version dated: 11/2021

Legal notice:
These guidelines were created for emergency and rescue personnel only, who have specific training in the area of technical assistance following road accidents, and are therefore able to carry out the activities described in these guidelines.
Not all vehicles used in illustrations are available in North America.
Specifications and optional equipment for Volkswagen vehicles and the range of vehicles made by Volkswagen AG are subject to ongoing changes.
Volkswagen therefore explicitly reserves the right to make changes or modifications to these guidelines at any time.
The information factors in the state of knowledge at the date of creation.

Please note:
The information that these guidelines contain is **not** intended for end customers, **nor** for workshops and dealerships.
End customers can find information about the functions of their vehicles and important safety information on vehicle and occupant safety in the vehicle wallet of the respective Volkswagen AG vehicle.
Workshops and dealers can obtain repair information from the usual sources known to them.

Version dated: 11/2021

Content

Preface

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

The following are some of the vehicle's tasks in an accident situation:

- To largely guarantee a survival space inside a stiff passenger cell.
- To reduce the impact energy via intelligent structural concepts and elements.
- By means of an optimized restraint system – consisting of airbags and seat belts with belt tensioners and belt force limiters – to protect the occupants effectively.
- Using safety equipment to minimize hazards from operating equipment or drive components.

Volkswagen vehicles have proven in international tests that they are among the safest vehicles. However, accidents and associated injuries cannot be ruled out. The existence of a short, fast and effective chain of rescue is therefore essential.
The purpose of these guidelines is to support emergency and recovery personnel in performing their tasks with the necessary information on the technology of Volkswagen vehicles.
Technical innovations such as new materials in addition to steel and aluminum in vehicle body building require an adapted approach to the recovery of vehicles that have been involved in accidents.

The information is intended in particular for training emergency and recovery personnel. For working at accident sites, corresponding rescue cards are available for Volkswagen vehicles.
You can find the latest information at https://www.volkswagen.de/de/besitzer-und-nutzer/wichtige-kundeninformationen/rechtliches/rescue-data.html, although modifications to the vehicles may not be updated in the rescue guidelines until later.

0. Rescue sheet / sheets

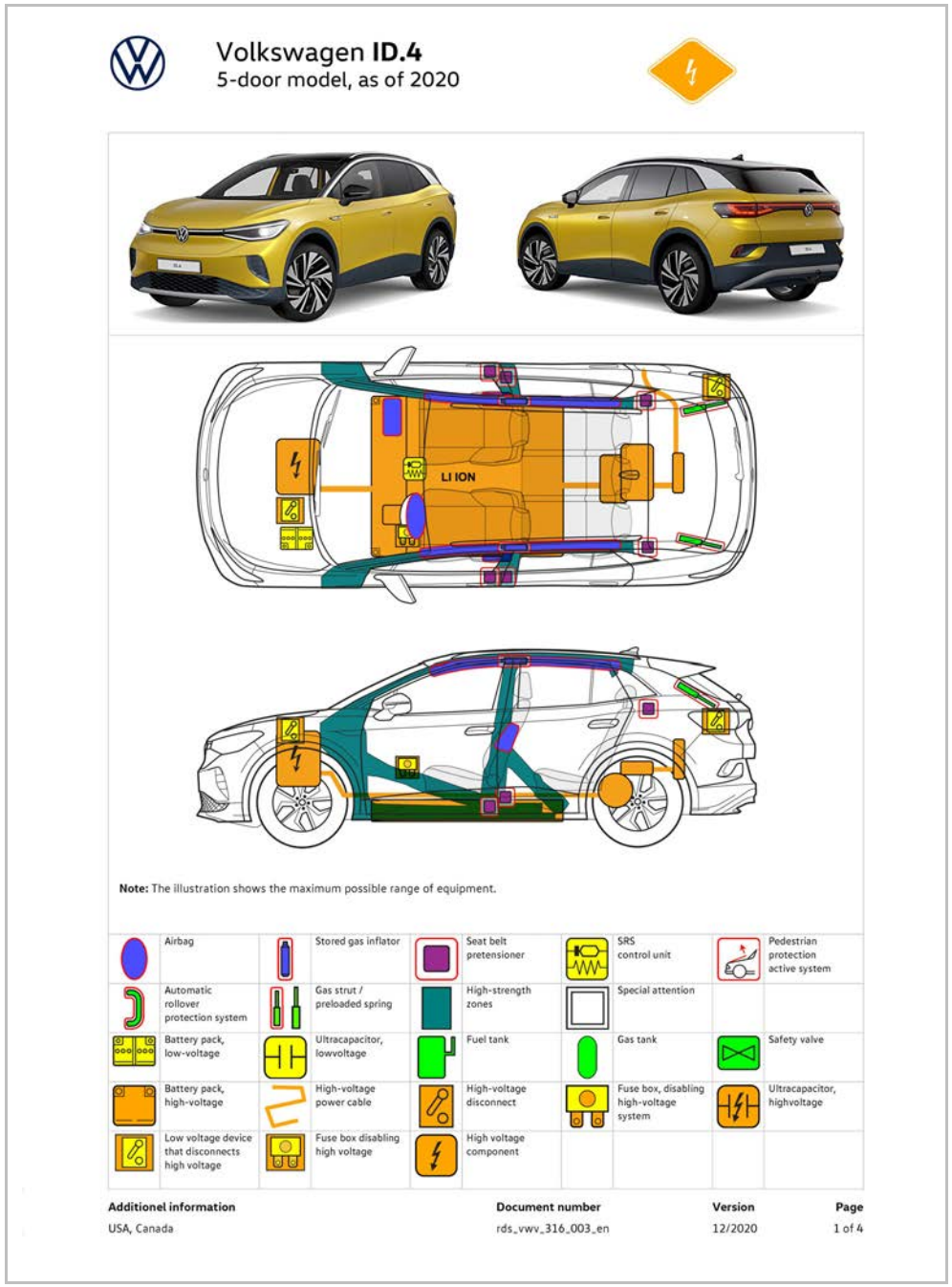
Version dated: 11/2021

Volkswagen provides rescue cards for all models and vehicle variants.

A model overview (https://www.volkswagen.de/de/besitzer-und-nutzer/wichtige-kundeninformationen/rechtliches/rescue-data.html) lists all models of the Volkswagen and Volkswagen Commercial Vehicles brands. The individual rescue cards can be downloaded directly from the model overview.

The illustration shown here is an example of the first page from the rescue card of the Volkswagen ID.4 as per ISO 17840-1:2015.

	The rescue cards for all vehicles launched from 2020 onwards must have the layout specified in ISO 17840. For previous vehicles, the rescue cards are designed according to the manufacturer's layout.



Area of application

This Emergency Response Guide is valid for all vehicles made by the Volkswagen brand.

There is a wide variety of Volkswagen brand vehicle models, ranging from small cars to light commercial vehicles. These models include petrol and diesel engines, natural gas, gasoline hybrid, and purely electric drives.

Current Volkswagen model range

	**ID.3** Electric
	**ID.4** Electric
	**Golf** Gasoline Diesel Natural gas Plug-in hybrid

Current Volkswagen model range

	**Golf Estate** Gasoline Diesel Natural gas
	**Tiguan/Tiguan Allspace** Gasoline Diesel Plug-in hybrid
	**Passat** Gasoline Diesel Plug-in hybrid
	**Passat Estate** Gasoline Diesel Plug-in hybrid

Current Volkswagen model range

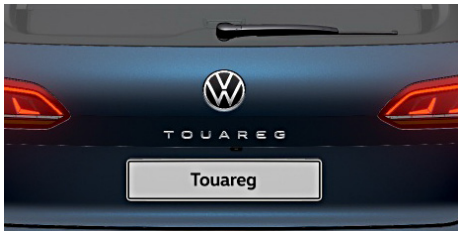
	**Arteon** Gasoline Diesel Plug-in hybrid
	**Arteon Shooting Brake** Gasoline Diesel Plug-in hybrid
	**Touareg** Gasoline Diesel Plug-in hybrid

1. Identification / recognition

Distinguishing features of Volkswagen Models

Along with the Audi logo with the four rings, the individual models can also be identified by the respective body shape, body size, and the individual vehicle design. In addition, the model name and the technology lettering on the rear of the vehicle can also help with identification. The lettering is not there, however, if its removal was requested upon purchase, or it was subsequently removed.

Volkswagen Logo

	Logo in the radiator grille
	Logo on the rear lid

Modell name

	Model name on the rear of the vehicle

Volkswagen model range with high-voltage drive

After an accident, high-voltage vehicles pose different hazards to emergency and recovery services than those of vehicles with a conventional drive. This is why it is important for such services to identify these vehicles as early as possible.

Volkswagen offers a variety of vehicle models with a combination of combustion engine and electric drive as hybrid vehicles, and purely electric vehicles as electric models.

The hybrid models can be divided into two basic variants:

- Hybrid vehicles with external charging socket for the high-voltage battery (plug-in hybrid, PHEV)
- Hybrid vehicles without external charging (full hybrid, HEV)

Since 2013, with the e-up! Volkswagen has offered the first fully electrically driven series vehicle in the Group. This range has been expanded with the e-Golf and is currently rounded off with the ID. family. The ID. family was newly developed on the basis of the modular electric drive matrix (MEB).
When emergency and recovery services are on duty, in the case of a traffic accident, for example, it is of crucial importance to immediately identify high-voltage vehicles in order to assess the hazards at the site and take appropriate measures.
The labeling of high-voltage vehicles has changed over the last few years and also differs among the various manufacturers and vehicle models.

	The electric drive motor is silent. The display in the instrument cluster (power meter) indicates whether the electric drive is switched “OFF” or “READY” for operation.

Distinguishing features of high-voltage vehicles

1. Features on the outside of the vehicle

- Lettering on the radiator grille, side panels and rear 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 in the side of the vehicle body)
- Country-specific charging sockets
- No visible exhaust system (tailpipe, exhaust pipe)

Distinguishing features on the outside of the vehicle

	Charging socket flap on the Golf GTE from 2020 on
	GTE lettering on the rear lid
	eHYBRID lettering

Distinguishing features on the outside of the vehicle

	EU CCS charging socket
	EU Combo charging socket
	NAR South Korea Combo DC charging socket
	NAR South Korea type 1 charging socket

Distinguishing features on the outside of the vehicle

	Japan ChaDemo charging socket
	Japan type 1 AC charging socket

2. Features in the engine compartment

- Orange high-voltage cables
- Internationally standardized warning labels for high-voltage technology
- High-voltage components marked with a warning message

Features in the engine compartment

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

3. Features in the vehicle interior

In current Volkswagen models with a high-voltage drive, the “drive-ready” is activated by pressing the “START STOP” button. A high-voltage vehicle can be identified by the following features:

- Specific displays for electric vehicles in the instrument cluster, such as charging displays (power meter, “READY” for drive-ready)
- “E-mode” button in center console
- Sport program button (GTE)
- Hybrid or GTE lettering, e.g. on the cockpit and/or steering wheel

Features in the vehicle interior

	Digital instrument cluster with power meter and “OFF” or “READY” display shown here using the ID. family as an example.
	No conventional gearshift lever in center console and the parking brake on the steering column switch (example ID. family).

2. Immobilization / stabilization / lifting

With the increasing range of vehicle equipment, the number of energy consumers is also increasing and thus the demand for multiple energy storage devices.

This also affects the emergency services, because especially when deactivating the vehicle electrical system (switching off the ignition, disconnecting the vehicle batteries), additional points must be considered.

Deactivating the vehicle electrical system reduces the risk of fire due to short circuits, but also the risk of subsequent activation of airbags, belt tensioners or the Automatic Rollover Support System. When the vehicle electrical system is deactivated, it must also be ensured that the power supply of any trailers present is disconnected and any solar elements in the sliding sunroof are covered.

	In the case of a disconnected 12-volt vehicle battery, all vehicle electrical system functions are out of operation (in particular the hazard warning lights and electric seat adjustment). See further information in section 4 “Access to occupants” and section 9 “Important additional information”.

Preventing the vehicle from rolling away

Volkswagen models can be equipped with a manual gearbox or an automatic gearbox (automatic torque converter or dual clutch gearbox).
To secure the vehicle against rolling away or unintentional drive-off, first move the gear lever to “Neutral” (for the manual gearbox) or position “P” for the automatic gearbox.

1. Locate electric or mechanical parking brake.
2. Activate parking brake.

Electric parking brake in center console of the Tiguan from 2020 on.

Switching off the ignition

Turn the ignition key to “off” and remove it. Many Volkswagen models are equipped with a “START STOP” button. This can be found on the steering column, in the center console or in the dash panel.

The following options must be taken into account:

- The vehicle has either a classic ignition lock or has Keyless Access, a system where the ignition key can be located anywhere in the vehicle to activate the vehicle (e.g. in the driver’s pocket or in a handbag in the vehicle). It is also possible to manage the vehicle using an app.
- Use the ignition key, if present, to set the vehicle to “off”.

If the vehicle has a “START STOP” button that can be used to deactivate the vehicle, press it.

Do not press the foot brake or clutch to switch off the ignition.

„START STOP“-Taste in der Mittelkonsole des Tiguan ab 2020.

	Instead of a remote control key, it is also possible to use a key card or a smartphone app. Remove the remote control key, key card or smartphone from the vehicle (to a minimum distance of five meters).
	Caution! When you press the “START STOP” button and press the brake pedal at the same time, the vehicles can switch to drive-ready mode! Observe the information on the rescue cards!
	The exact position of the “READY” display is described in the respective rescue cards.
	The exact position of the “READY” display is described in the respective rescue cards.

Lifting the vehicle

Vehicle-specific points for lifting and prohibited points are indicated on the rescue cards.

	For deformed vehicles, the emergency and recovery services on site decide at which points the vehicle may be lifted.
	If possible, lift the vehicle at the indicated lifting points.

3. Disable direct hazards / safety regulations

Many emergency and recovery personnel are uncertain about the hazards of accidents involving high-voltage vehicles.

Cut-off points for deactivating the high-voltage system

The cut-off points are specially designed by the manufacturers to give emergency services an easily accessible option so that the high-voltage system can be safely deactivated.

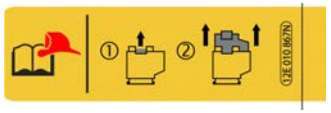
In the event of accidents where airbags are triggered, the high-voltage system is automatically deactivated. The high-voltage system is de-energized approx. 20 seconds after deactivation.

	Disconnecting the high-voltage system and the vehicle electrical system voltage is only necessary if the vehicle can no longer drive on its own power.

Because, depending on the accident, the engine compartment may not be accessible (e.g. in the event of a car driving under a truck), there are usually at least two cut-off points, one under the bonnet and one in the luggage compartment or the interior.

These cut-off points, indicated by yellow flags, only carry the 12-volt vehicle electrical system voltage and can therefore be safely disconnected by the emergency services in accordance with the procedure described on the flags.
The form and representation of the yellow flags for indicating high-voltage cut-off points are currently being adapted and should have a standardized layout for all manufacturers from 2023 onwards.

	Disconnecting a marked cut-off point deactivates only the high-voltage system. Safety systems such as airbags or belt tensioners are still supplied with voltage by the 12-volt vehicle electrical system.
	The positions of the cut-off points and the procedure for deactivating the vehicle are indicated on the Volkswagen rescue cards.

	Indicates the emergency cut-off point in the passenger compartment (fuse on fuse carrier)
	Indicates the emergency cut-off point in the engine compartment
	Indicates the emergency cut-off point in the luggage compartment or the rear of the vehicle

Disconnecting the high-voltage system from the vehicle

	Electric vehicles and hybrid vehicles run extremely quietly in electric mode. This means that when a high-voltage vehicle is stationary, the vehicle's drive system cannot be detected by engine noise as with normal combustion engines. For this reason, it is particularly important to deactivate high-voltage vehicles. Observe the information on the respective rescue cards.

There are at least two cut-off points in the current Volkswagen models. One is in the vehicle front end and the second is installed in the fuse carrier.

Depending on the vehicle type and equipment, different procedures may be necessary here. The way in which the vehicle is deactivated depends on the accident situation and the vehicle equipment.

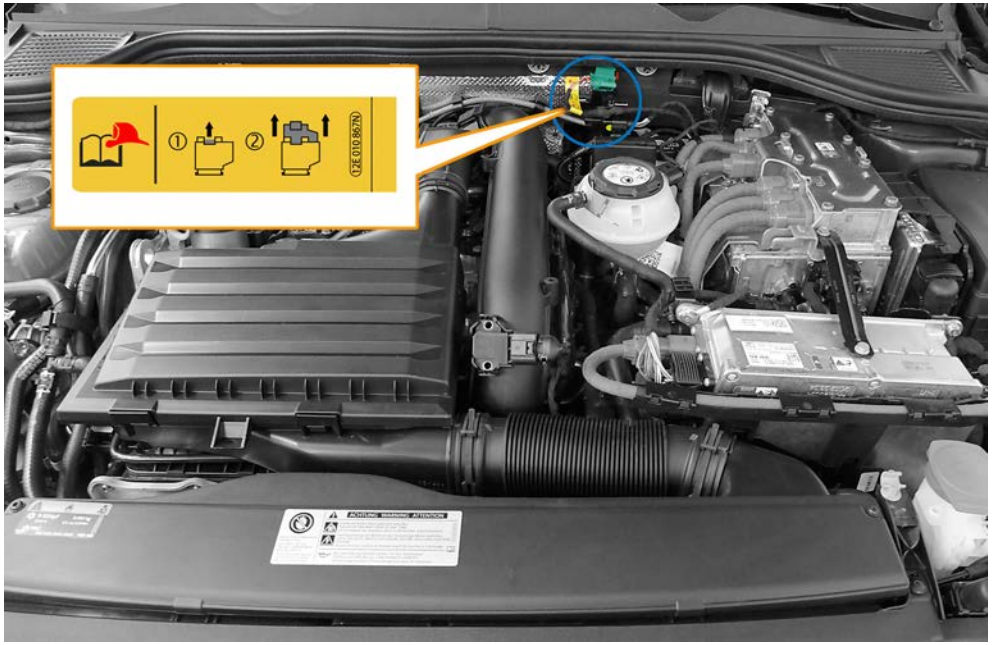
	The required procedures can be found on the Volkswagen rescue cards.
	The greatest possible certainty that the vehicle and, above all, the high-voltage system has been deactivated is only achieved when an emergency cut-off point specified by the manufacturer has been disconnected and the 12-volt onboard supply battery has been disconnected or the airbag control unit has detected the accident and disconnected the system.

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

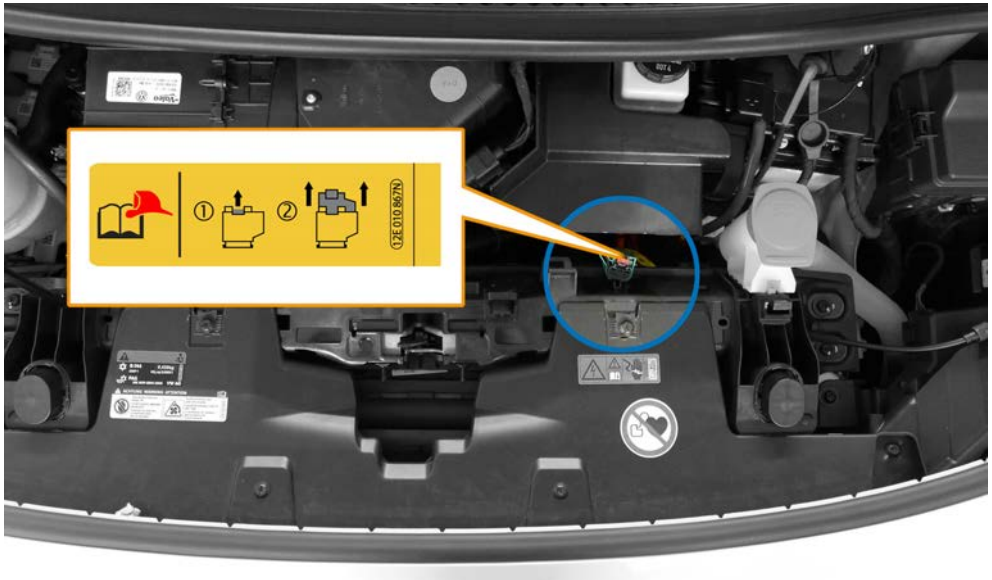
Regardless of whether a hybrid or electric vehicle is involved, the following points generally apply to emergency operations on high-voltage vehicles.

	Incorrect handling of high-voltage components poses a risk to life due to the high voltage and the resulting possible flow of current through the human body.
	Work must not be carried out on badly damaged high-voltage components. One of the accessible emergency cut-off points can also be opened. If the airbags have not deployed, the vehicle must be deactivated by the emergency and recovery services via an emergency cut-off point. After approx. 20 seconds, the high-voltage components have been deactivated. If the airbags have deployed, a high-voltage switch-off has already taken place; no further waiting time is necessary for the emergency and recovery services.
	Even after deactivation of the high-voltage system, there is still voltage inside the high-voltage battery. The high-voltage battery must therefore not be damaged or opened during the emergency measures. If the high-voltage battery has been damaged by the accident, avoid contact with the high-voltage battery or with fluids and vapors escaping from the high-voltage battery.
	Do not touch, cut or open high-voltage components or the high-voltage battery! Cover damaged components with suitable equipment, e.g. insulating blankets.

Disconnect high voltage device in the engine/motor compartment



Disconnect high voltage device in the engine compartment of hybrid vehicles (Golf GTE from 2020)



Disconnect high voltage device in the engine compartment of electric vehicles (ID.3)

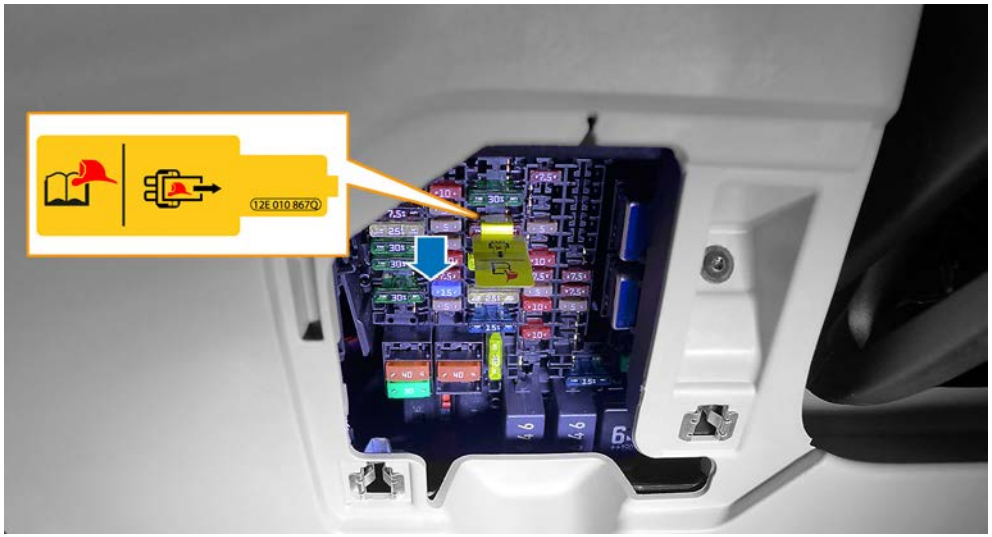
Pull out red tab

Pull out black plug

Disconnect high voltage device in the passenger compartment

Depending on the vehicle model, a cut-off point can also be installed on one of the fuse carriers (e.g. in the interior near the dash panel) and marked with a yellow flag. In this case, the high-voltage system is disconnected and thus deactivated by pulling the fuse marked in this way from its holder.

In both cases, the safety relays in the high-voltage battery open and disconnect it from the rest of the high-voltage system, which is then de-energized after 20 seconds.



Disconnect high voltage device in passenger compartment; dash panel on the fuse carrier

Disconnect high voltage device in the vehicle rear

On vehicles in the ID. family, there may be an additional cut-off point in the rear of the vehicle. Identify the cable that is marked by a yellow flag to be be cut through.

The high-voltage cut-off point was installed behind the luggage compartment trim up to production date 01/2021; from 01/2021 onwards behind the right tail light cluster.

Variant 1: Disconnect high voltage device in luggage compartment (example ID.3) behind the side panel trim up to the end of 2020. The yellow flag indicates the cut-off point.

Variant 2: Cut-off point in the rear of the vehicle behind the right tail light cluster from the start of 2021.

Disconnect 12-volt vehicle battery

Depending on the vehicle type and equipment, one or more 12-volt vehicle batteries may be installed.

	The necessary procedure for deactivating the 12-volt vehicle electrical system voltage is described on the Volkswagen rescue cards.

Disconnect from the charging station (emergency release)

Because high-voltage vehicles are usually charged when parking, there may be high-voltage charging stations to which a vehicle is connected in public car parks, private carports or public or private garages.
The more high-voltage vehicles there are on the market, the more public and private high-voltage charging stations will appear. This must be taken into account by emergency and recovery services for emergency and fire deployments when assessing the situation and defining the measures to be taken.

	Public charging stations for the energy supply may be connected to the public high-voltage network with a voltage of more than 1,000 V. If this is the case, correspondingly larger safety distances must be ensured when dealing with a fire.

	The necessary procedure for emergency release from the charging station is described on the Volkswagen rescue cards.

Another difference is the type of charging voltage. There are systems that charge with alternating voltage and systems that charge with direct voltage.

In a system with direct voltage (DC), the battery is supplied directly via the charging socket. If alternating voltage (AC) is used to charge the high-voltage battery, the battery charger in the vehicle assumes the function of the voltage converter.

	Observe existing regional and country-specific deployment plans for emergency and recovery services for public charging stations.
	The charging sockets and the appearance of public and private charging stations differ depending on the manufacturer and country. See also section 1 “Identification / recognition”.

For vehicles with 48 V technology: battery disconnection for mid-hybrid vehicles (MHEV)

Today's vehicles have intelligent drive systems and a large number of assistance systems. Depending on the model type and equipment, along with the 12 V vehicle electrical system, an additional 48 V vehicle electrical system is installed and operated using a lithium-ion battery.

A number of examples of use are:

- Roll stabilization
- Advanced start/stop mode using a belt-driven start-alternator

These vehicles are in the mild hybrid electric vehicle (MHEV) category. The mild hybrid vehicles with vehicle electrical system voltages of up to 48 V DC are not high-voltage vehicles.

	In the event of accidents involving airbag deployment, the 48 V vehicle electrical system is automatically deactivated.

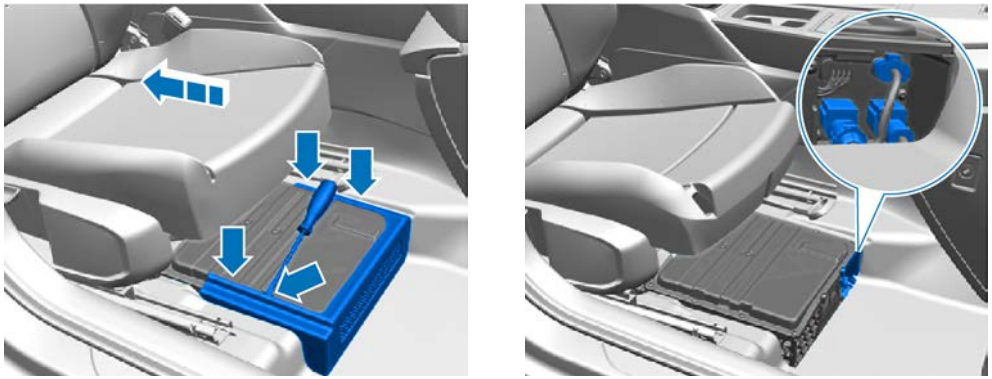
In all other cases, along with the 12 V lead battery, the 48 V lithium-ion battery must be disconnected to deactivate the entire vehicle electrical system.

	The ignition must be switched off before disconnecting the batteries!

	The exterior of the vehicles with 48 V technology does not differ from the 12 V version of the respective model.
	The installation position and the procedure when disconnecting the terminals of the 48 V battery is described in the rescue sheets.

To minimize the risk of an electric arc, the following procedure is recommended:

After locating the batteries (see rescue sheet), the negative terminal of the 12 V lead battery must be disconnected in the first step. Only after this is the lithium-ion battery disconnected in a second step. In this case, disconnecting the communication connector before disconnecting the negative terminal is recommended.



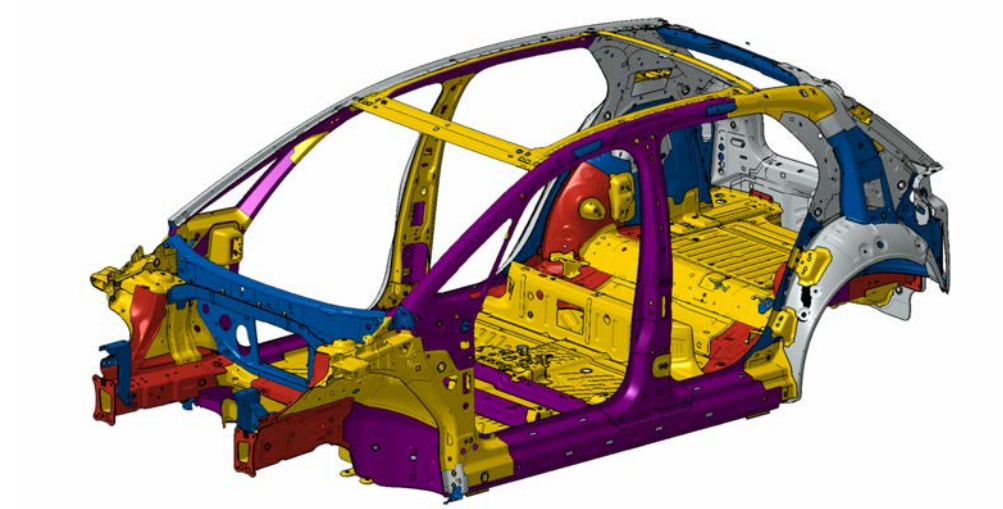
Disconnection of the 48 V vehicle electrical system for the Audi A3 Sportback.

4. Access to the occupants

Body reinforcements

Greater safety for the vehicle occupants can be achieved, in particular, by designing the passenger compartment to be rigid.

In vehicle body construction, higher-strength and hot-formed steels, greater wall thicknesses and a multi-shell body are used. These areas must be mainly avoided in state-of-the-art vehicles when rescuing occupants involved in accidents, and correspondingly high-performance hydraulic cutting devices must be used.



	Hot-formed steel can be cut through with high-performance cutting tools.
	Information on the position of reinforcements can be found on the vehicle-specific rescue cards.

The A-pillar

In convertibles in particular, the body is additionally reinforced in order to achieve corresponding rigidity in the body even without a roof. Tube reinforcements are installed at various points of the vehicle, including in the A-pillar, in order to improve the protective space together with the rollover support system should the vehicle overturn.

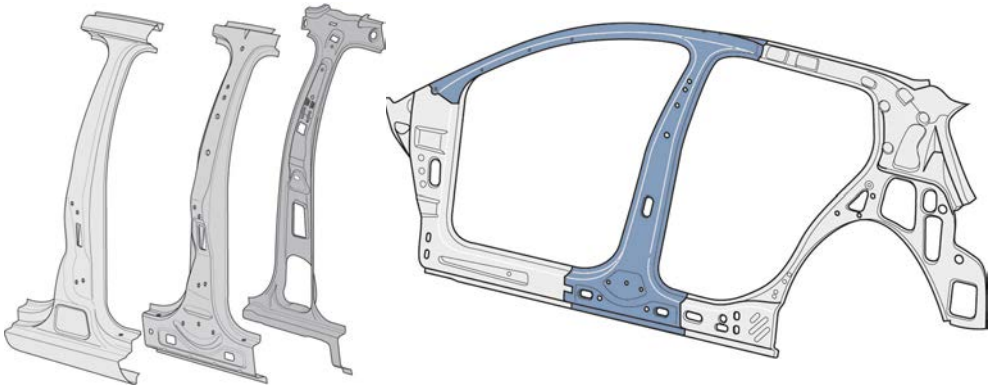
It may also be possible to open the convertible roof (usually designed as a fabric roof) by conventional means or by pushing up the roof with a rescue cylinder.

	It is possible to cut through the A-pillar in the area of the A-pillar reinforcement with high-performance rescue devices.
	The position of particular reinforcement measures in the individual vehicles can be found on the rescue cards! The reinforcements are shown as follows:
	Indicator for high-strength areas as per ISO 17840 on the rescue cards.

The B-pillar

The B-pillar in particular is reinforced by the use of higher-strength and hot-formed sheet metal and a multi-shell structure. In addition, state-of-the-art B-pillars have a larger cross-section.

The pillar is additionally reinforced in the area of the belt guide, making it more difficult to cut through. Therefore, these areas should be specifically circumvented.



	It is easiest to cut through vehicle pillars in the area above the belt height adjuster! The lower part of the pillar can also be cut through, but it should be noted that the cross-section of the pillar is very large, and that the belt tensioner is usually located here.
	Always observe the rescue cards!

The side members

Special steels are used in state-of-the-art vehicles to reinforce the side members. These are used to increase safety in the event of side collisions, especially in the event of a pole collision.

Side impact protection

The side impact protection consists of steel tubes or steel profiles in vehicles of the Volkswagen Group. The tubes or profiles are arranged horizontally or diagonally behind the outer door panels.

These high-strength profiles can be cut with high-performance cutting devices.

	The position of particular reinforcement measures in the individual vehicles can be found on the rescue cards! The side impact profiles are shown as follows:
	Color indicating high-strength areas as per ISO 17840 on the rescue cards.

Glazing

The windows in Volkswagen Group vehicles are made of toughened and laminated safety glass. The windscreen is always laminated glass and the side and rear windows are toughened safety glass, depending on the equipment. In Volkswagen vehicles, the side and rear windows can also be equipped with laminated glass.

Toughened safety glass

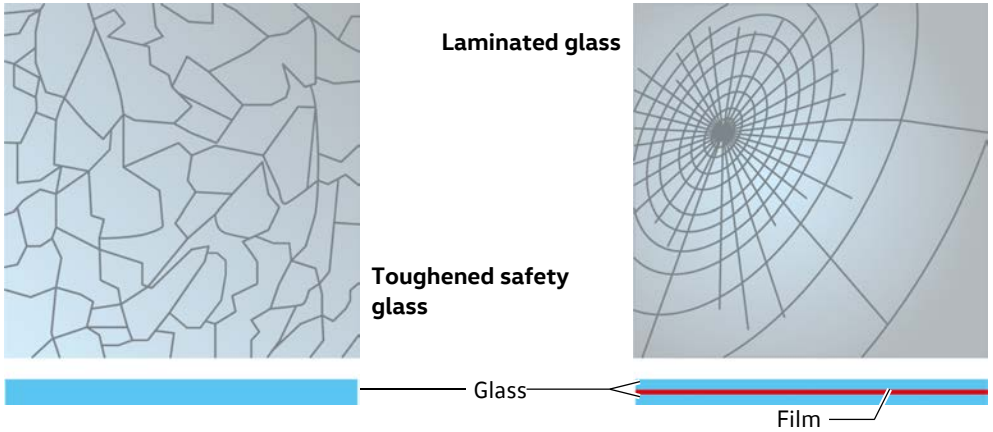
Toughened safety glass is thermally pre-treated glass that can withstand high loads. If the load is too high, it bursts into many pieces. Toughened safety glass is used for side windows, rear windows and the sliding sunroof.

	Intact windows can suddenly burst during rescue work on the vehicle. Depending on the accident situation and the scope of the rescue work, the windows should be removed first. Windows can be removed by means of a spot-shaped load, e.g. with a spring center punch or an emergency hammer. The windows should be secured first.

Laminated glass

Laminated glass consists of two glass panes and an intermediate layer of film. The glass panes remain largely intact when damaged. They are used for windscreens and, if necessary, for side windows. The windscreens are bonded to the body.

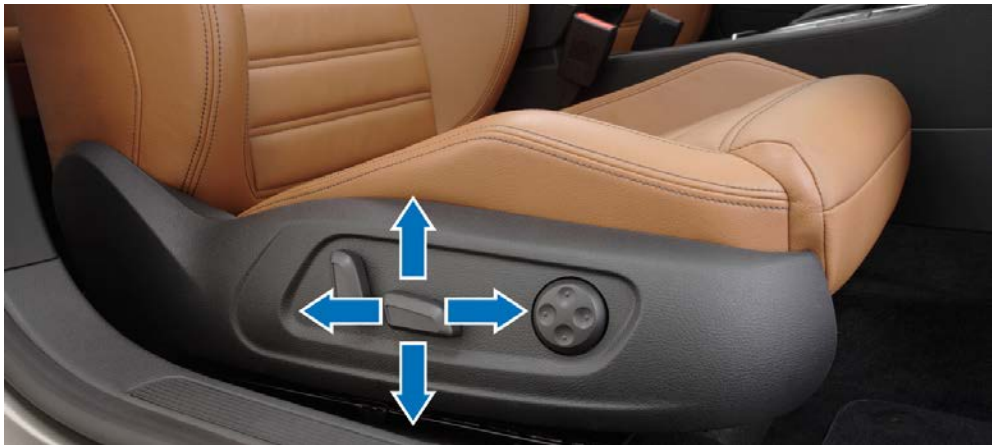
	As laminated glass windows cannot suddenly burst, they only have to be removed if it is necessary for the rescue work. Laminated glass windows can be removed using special glass saws or hooligan tools.



	Protect the occupants from shards of glass before removing the glass panes.
	Information on installed laminated glass (except for windscreen) can be found on the respective rescue cards.

Driver seat and steering wheel adjustment mechanisms

The seats and steering columns in the Volkswagen vehicle models can be operated mechanically or electrically.



Electric convenience systems

Depending on the model series and vehicle equipment, Volkswagen AG vehicles have a whole range of electrically operated convenience systems, e.g.:

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

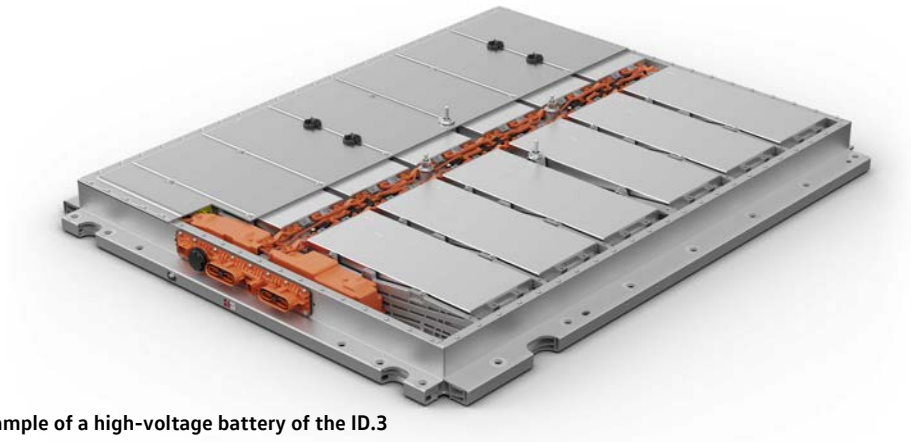
After the low-voltage power supply is disconnected, these systems can no longer be operated!

	In the case of accidents involving airbag deployment, electrically operated doors and flaps are automatically unlocked.
	If possible, the electrical convenience systems should be used before disconnecting the battery for rescue purposes!
	The battery should only be reconnected to the vehicle electrical system by workshop personnel.

5. Stored energy / liquids / gases / solids

Only if you recognize a danger while working can you react appropriately and take suitable prevention measures.

For this reason, part of the safety concept of, for example, high-voltage vehicles is the use of comprehensive and internationally standardized warning labels.



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

Warning labels for high-voltage components

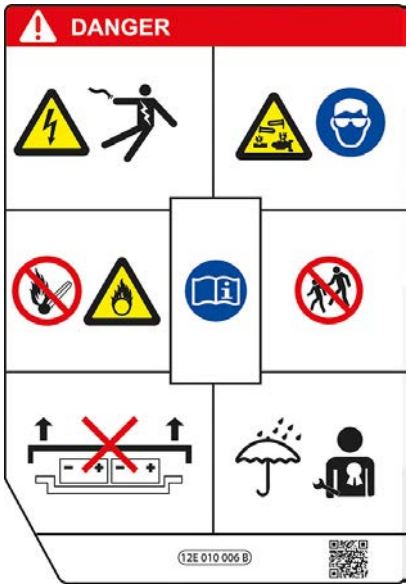
All high-voltage components are identified with clear warning stickers.
The high-voltage cables are excluded from this; the orange warning color of the wire sheathing makes them immediately visible.

Three types of warning stickers are used:

- Yellow stickers with the warning symbol for electrical voltage
- Stickers with the "Danger" lettering on a red background
- Stickers with special warnings for persons with pacemakers

The yellow stickers indicate the high-voltage components that are installed near the sticker or hidden under covers.

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



Examples of warning stickers in high-voltage vehicles.

What does “high voltage” mean?

Definition of terms used in vehicle construction (example of Volkswagen)

- Low voltage: of up to 60 V DC (usually 12 and 48 V for passenger cars and 24 V for trucks/commercial vehicles)
- High voltage: from 60 V DC to approx. 800 V DC

	Even though the terms are based on the level of voltage, the actual danger in direct contact with electrical energy is in the current rating with which the closed electrical circuit flows through the human body. This means that even at a low voltage, contact with electrical energy can be fatal if the current is correspondingly large.
	Do not touch, cut or open high-voltage components or the high-voltage battery! Wear appropriate protective equipment!
	Only a few electrical components in high-voltage vehicles are operated with a high voltage (e.g. high-voltage battery, high-voltage cables, power electronics, electric drive motor/alternator, air conditioner compressor, external charging connection). All other electrical components, such as lighting, vehicle electronics, etc., are supplied via the 12-volt vehicle electrical system voltage (passenger cars) or the 24-volt vehicle electrical system voltage (trucks).

The high-voltage battery

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

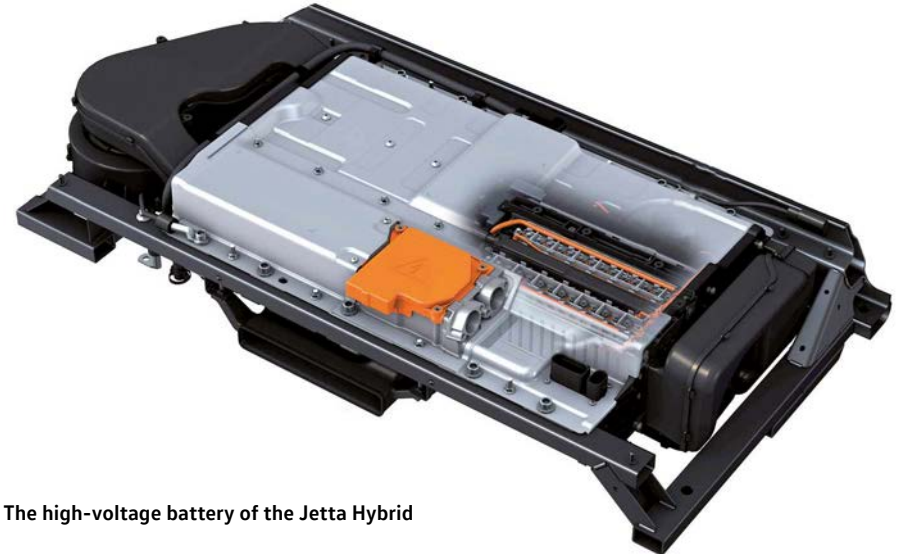
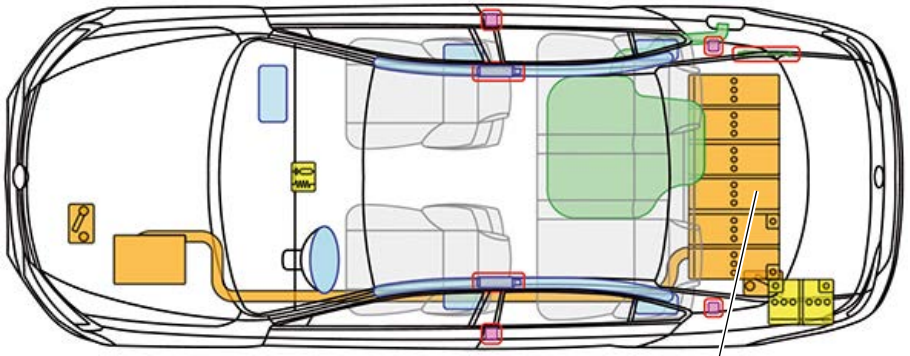
The following battery concepts are currently used:

- below almost the entire underbody
- under the underbody in front of the rear axle
- between the axles

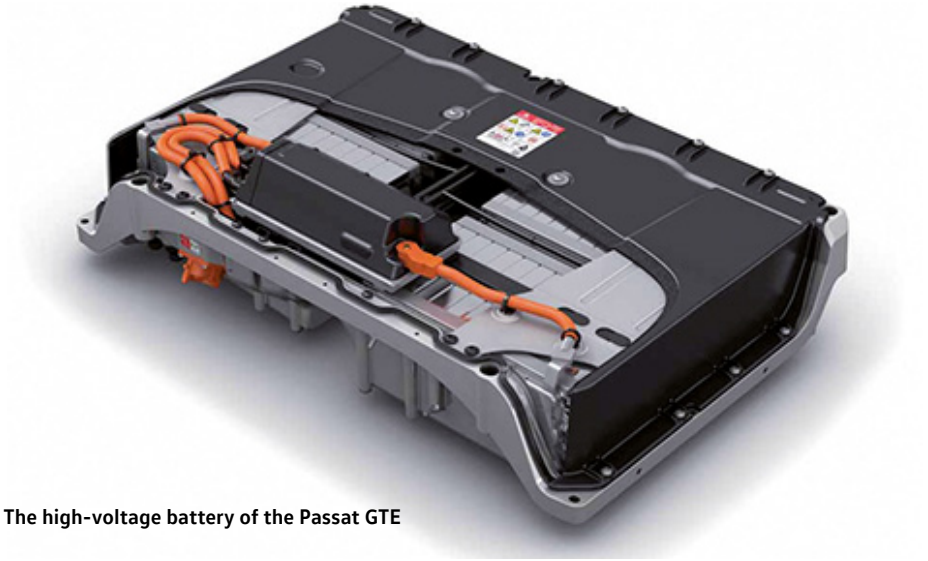
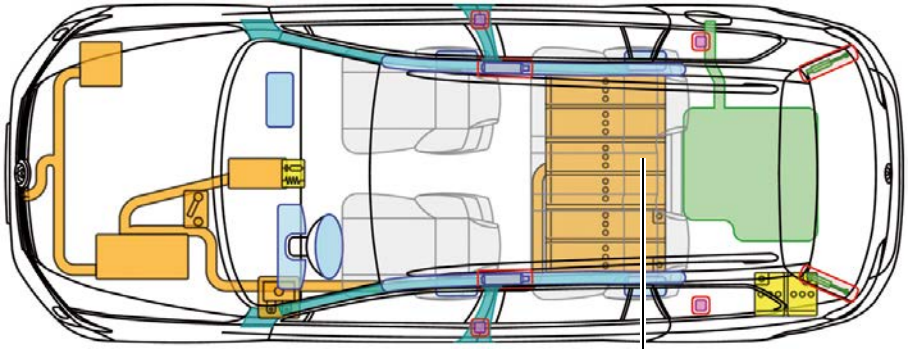
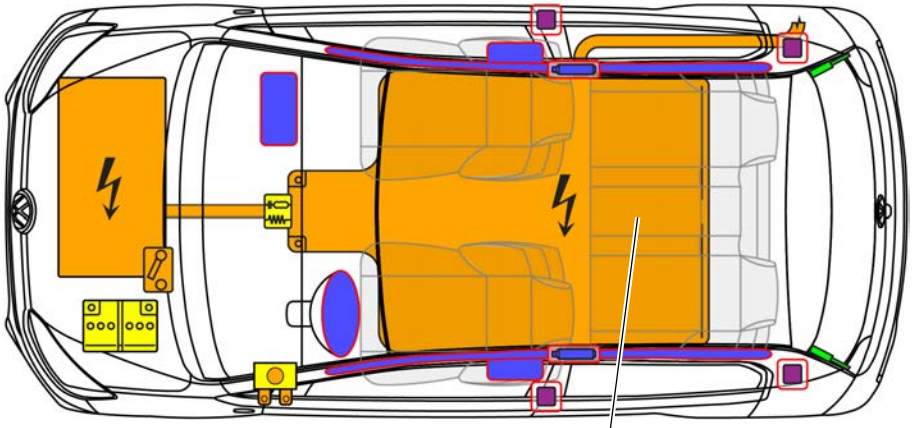
A high-voltage battery consists of a large number of battery modules, which in turn are made up of the actual battery cells.
All high-voltage batteries are protected by design in order to reduce the escape of electrolyte in the event of defective battery cells, for example, after an accident.
In the event of an accident, the high-voltage battery is mechanically protected by a battery housing. This directs the impact energy largely into the vehicle structure.

	In addition to the high-voltage battery, Volkswagen electric vehicles also have one or more 12-volt onboard supply batteries.
	Due to the large number of different battery types with their different chemical components, and due to continuous improvement in accumulator technology, this guide cannot address the specific hazards and possible behavior of all these batteries.

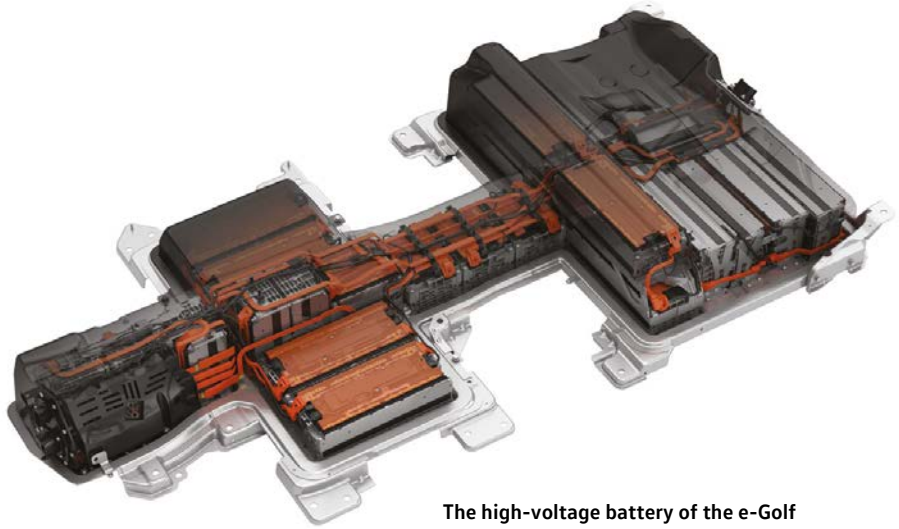
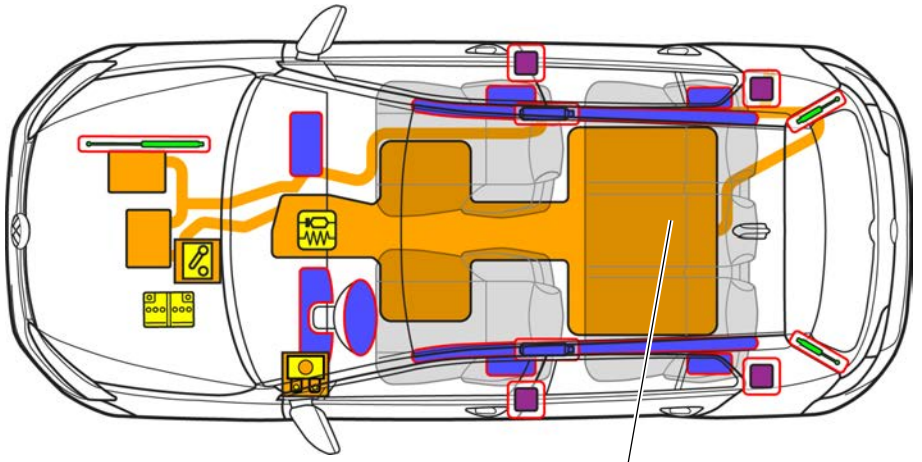
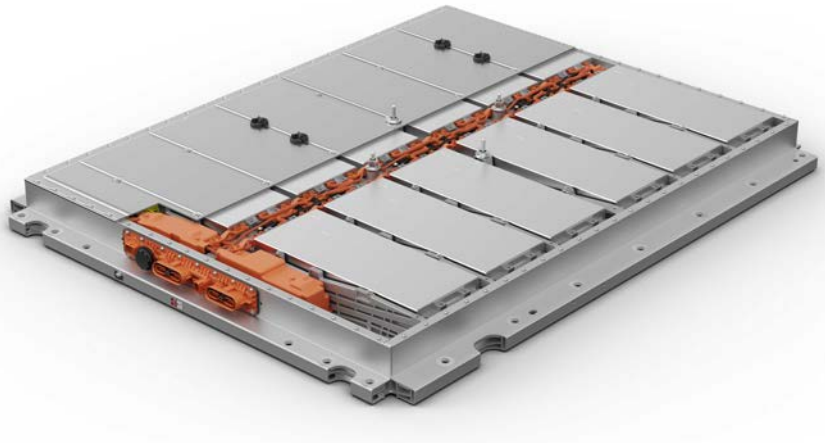
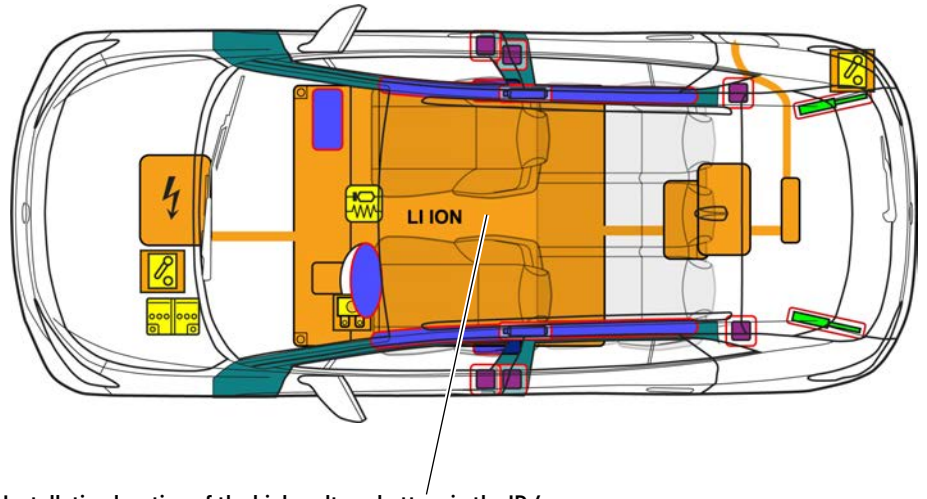
Battery concepts

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

Battery concepts

Battery type	Installation location
 The high-voltage battery of the Passat GTE	 Installation location of the high-voltage battery in the Passat GTE. (The illustration does not correspond to the current ISO 17840-1.)
 The high-voltage battery of the e-up!	 Installation location of the high-voltage battery in the e-up!

Battery concepts

Battery type	Installation location
 The high-voltage battery of the e-Golf	 Installation location of the high-voltage battery in the e-Golf.
 The high-voltage battery of the ID.4 (MEB)	 Installation location of the high-voltage battery in the ID.4

Air conditioning system

Coolants R134a, R1234yf, R744 and CO_2 are used for the air conditioning systems.
More information on different coolants can be found on the following page:
https://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index.jsp

Compressed air tank

Some Volkswagen models have pressure accumulators for e.g. air suspension or air conditioning systems. Do not damage these pressure accumulators and never open them with force.
The installation position is indicated on the rescue cards for the vehicle models.

Flammable materials

These include, for example:

- Plastics
- Electrolytes
- Resins
- Magnesium
- Gases or other combustible fluids

Resins are used for connecting carbon fibers, magnesium components are found in the engine compartment, and gases can be produced when the high-voltage battery is outgassed.

Battery information, general first aid measures and environmental protection aspects:

In the event of normal and proper use, there is no risk of exposure to the content of the battery.

	If coolant 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!
	Persons who have received an electric shock must be handed over to the rescue service.
   	Avoid skin contact and inhaling electrolyte vapors as electrolytes are combustible, corrosive and irritant.
	Contaminated extinguishing water is handled according to the country-specific procedure for emergency and recovery services.

6. In case of fire

General information on vehicle fires

In the event of a vehicle fire, all country-specific regulations, work instructions, authorities, and firefighting associations guidelines must always be observed and followed. If possible, the fire must be prevented from spreading to energy storage devices (fuel tanks, battery).

All common and familiar extinguishing agents such as water, foam, CO_2 or powder can be used.

The extinguishing agent and method to use can only be decided at the site and depend greatly on the given situation and available equipment.

	If the airbags did not deploy in the accident, they may do so if the vehicle catches fire.
	Further information can be found on the rescue cards.

Fires in high-voltage vehicles

High-voltage vehicles are generally no more dangerous to deal with than gasoline or diesel vehicles, but some aspects may be different. Knowing these differences can be important for emergency operations following car accidents.

In the event of fires involving high-voltage vehicles, a distinction must be made:

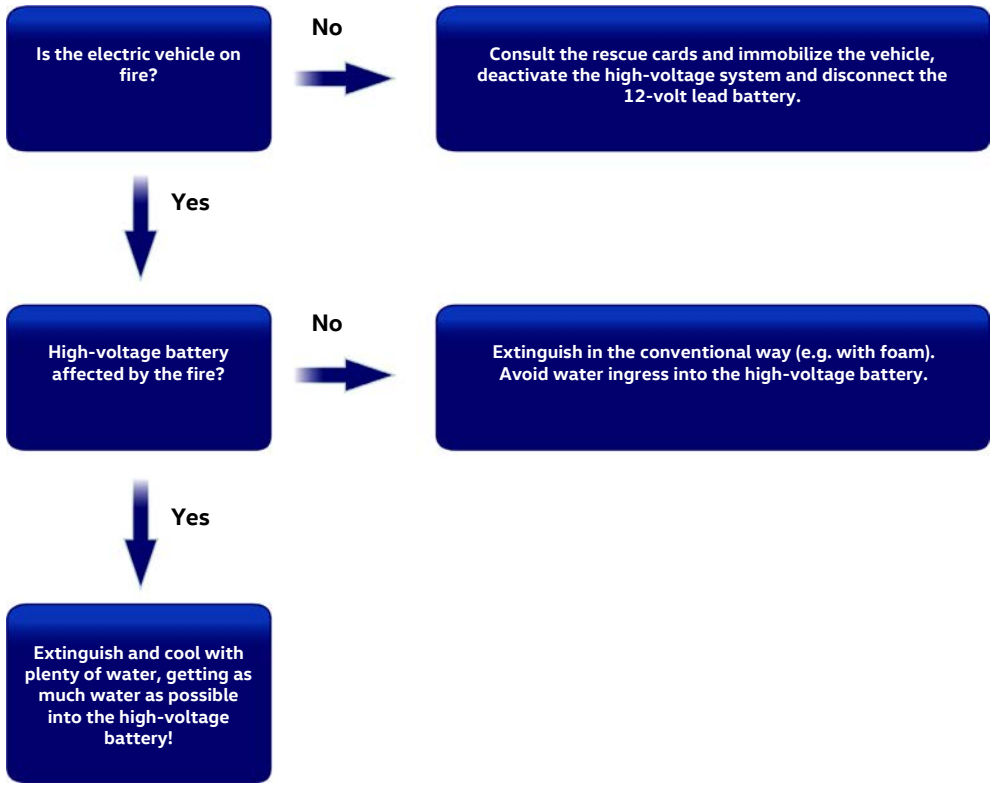
Vehicle fire that has not spread to the high-voltage battery

Just like a conventionally powered passenger car, a “regular” fire in a hybrid or electric vehicle (HEV or BEV, where thehigh-voltage battery is not on fire) can be extinguished with all conventional and familiar extinguishing agents, such as water, foam, CO_2 or powder, as required

Vehicle fire that has spread to the high-voltage battery

Smoke, sparks or flames from the battery can indicate that the lithium-ion battery is also on fire. If a high-voltage battery is on fire, use water to extinguish and cool the battery. In this case make sure to use plenty of water and try to get water into the high-voltage battery through the openings caused by the fire or collision. The water jet should be aimed directly at the battery. Theinstallation position of the high-voltage battery is shown on the rescue card for the model in question.

The decision for suitable measures should be made by the firefighters at the scene, since the appropriate action depends greatly on the given situation (e.g. how the fire has spread and the time arrival time of the firefighters) as well as the available equipment.



Flow chart for fires in electric vehicles

A severely damaged lithium-ion battery(for example with a crushed, broken or cracked housing) may react quickly to the effects of water or fire, or it may take some time. Therefore, when working on an accident vehicle with a lithium-ion battery, always look out for signs of a reaction (smoke, heat, noises, sparks,etc.).

Protective and counter-measures must be taken if there is a reaction in the lithium-ion battery. Just as with conventional vehicles, harmful smoke is produced when electric/ hybrid vehicles catch fire. Therefore suitable protective equipment is recommended.

6. In case of fire

Due to its safety technology, the entire high-voltage battery will not explode.

If the high-voltage battery catches fire, it is likely to emit gas because it has mechanical safety devices that open, for example, when the temperature and pressure increase due to a fire, thus allowing a controlled "outgassing" to relieve the pressure.

Fires in vehicles with a high-voltage battery can be extinguished, as can fires in the high-voltage battery itself. According to theVDA accident rescue and recovery guide, water should preferably used as the extinguishing agent, which is no different fromfighting a fire in aconventionally powered vehicle.

If the undamaged high-voltage battery is involved in a fire, then large amounts of water are required to cool or extinguish a reactive battery.

After a reaction, the lithium-ion battery must be cooled with water down to approximately the ambient temperature. We recommend using a thermal imaging camera or an infrared thermometer.

	After the fire is extinguished, dangerous voltages may still be present.
	Batteries that have not completely burnt out may ignite again. Vehicles in which a fire has been extinguished must be taken to a suitable storage site and monitored.
	Keep a sufficiently safe distance away. Appropriate self-contained breathing equipment must be worn!
	Evaporations and gases can be suppressed by spraying a jet of water.

	Exposed or defective cells may burst and cause an exothermic reaction.
	A fire may break out some time after the accident, because the residual risk of delayed ignition cannot be eliminated.This applies in particular to damaged high-voltage energy storage devices (see also section 8 "Towing / transport / storage"). An electrical hazard is also still possible. High-voltage componentsmustnot be touchedand suitable protective equipment must be worn. High-voltage cables mayhave been damaged by the heat.
	Further information can be found on the rescue cards.

7. In case of submersion

Vehicle under water

A vehicle immersed in water must be treated in the same way as a damaged, post-accident vehicle.

The safety regulations must be observed and the procedure for the removal of direct hazards must be followed, see section 3.

High-voltage vehicle under water

- In the water, the high-voltage system does not present an increased risk of electric shock.
- The same information as described in section 3 “Eliminating direct hazards / safety regulations” applies.
- The recovery procedure is identical to the one for conventional vehicles. This also applies to bodies made of carbon fiber composite materials.

Source: German Association of the Automotive Industry (VDA), Accident Assistance & Rescue for vehicles with high-voltage systems, FAQ.

	When water enters the high-voltage battery, electrolysis can be set in motion, which can lead to oxyhydrogen deflagration. If necessary, deactivate the high-voltage system (see section 3 “Eliminating direct hazards / safety regulations”). Wear appropriate protective equipment!

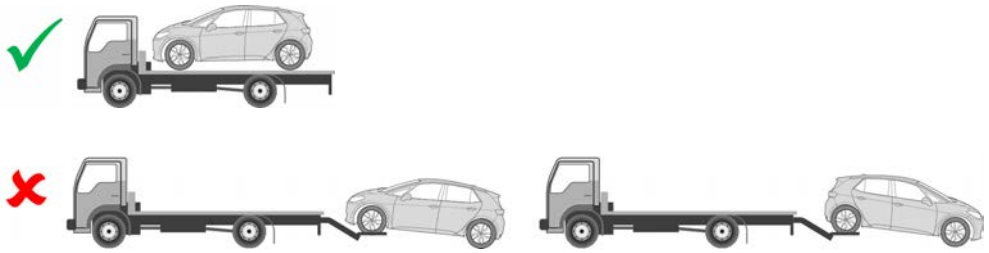
8. Towing / transport / storage

Recovering vehicles involved in accidents

When loading, transporting and storing, the information on the rescue cards must be observed.

Recovering high-voltage vehicles involved in accidents from hazardous areas

When loading, transporting and storing, the information on the rescue cards must be observed. Vehicles with high-voltage batteries should always be transported on flatbed trucks.



The high-voltage system must be deactivated before transport; see section 3 “Eliminating direct hazards / safety regulations”.

Before the vehicle is transported (e.g.by atowing company), the condition of the lithium-ion batterymust be checked again.The vehicle may only be loaded and transported if the vehicle does not show any signs of a reaction in the area of the lithium-ion battery for an extended period of time, see the flow chart on the next page.

In case of a vehicle with a damaged lithium-ion battery, the vehicle may not be loaded until the reaction has subsided sufficiently that it cannot be expected to start up again during transport.

Choose the shortest and least dangerous route possible. Avoid going though tunnels. If required or in case of doubt, the tow truck may have to be accompanied by a fire engine.

Vehicles with a damaged high-voltage battery should be transported to a safe place. After transport, electric or hybrid vehicles that have been in accidents should be parked outside and not in enclosed buildings, at a sufficient distance from other vehicles, buildings, combustible objects or flammable surfaces.

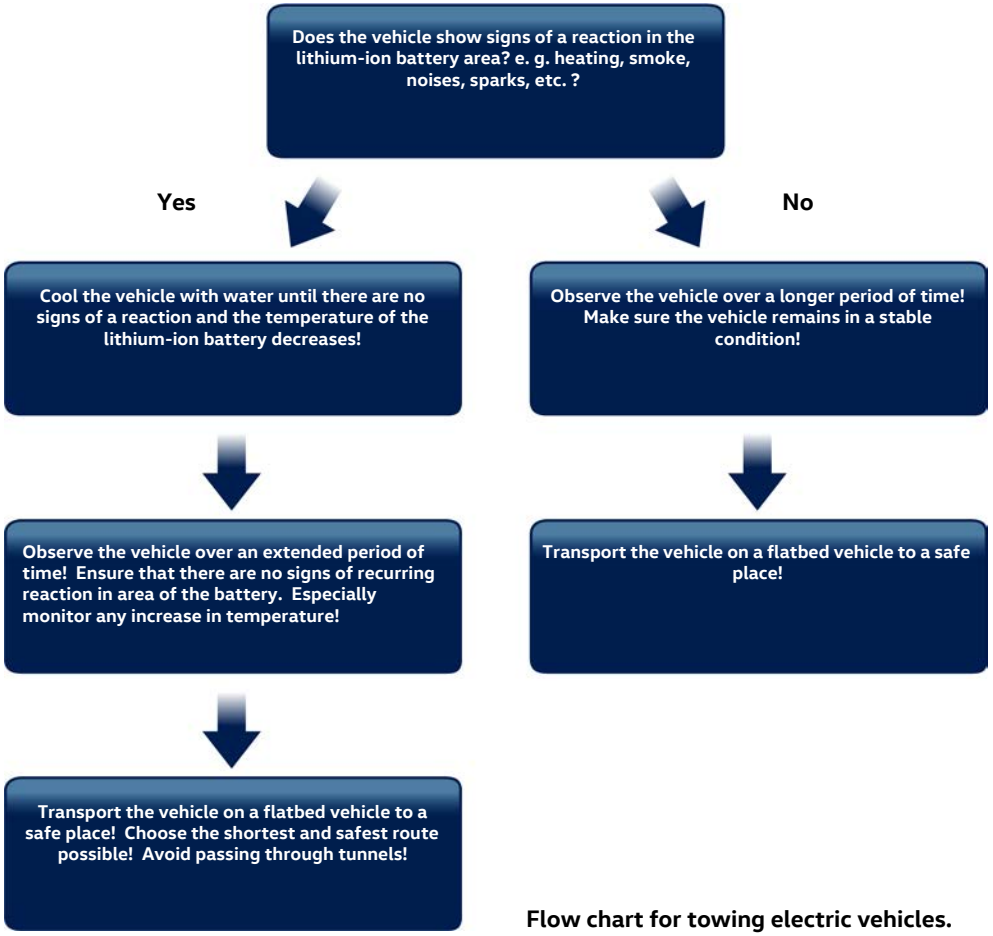
Designated “quarantine areas” at the storage site should preferably be used. Because there is still a theoretical risk that the lithium-ion battery may react, the accident vehicle must be taken to a suitable outdoor site. The parking site must be marked accordingly (signs/ barriers).
There must be a distance of at least five meters from other vehicles, buildings or combustible objects. The distance can be less if appropriate measures such as a fire wall are in place.
Those responsible atthetowing company,repair workshops and, if necessary, the disposal company mustbe told about the characteristics and hazards of the vehicle!

	Lithium-ion batteries can ignite again after the fire has been extinguished!
	If the vehicle has been in an accident or if the high-voltage battery is damaged or in an abnormal condition, deactivate the high-voltage system (see section 3). Park the vehicle at a safe distance at least 5 m away from buildings and other vehicles (quarantine area).
	When loading, take care not to damage the high-voltage components. If possible, lift the vehicle at the indicated lifting points.
	Vibration during transport can cause high-voltage batteriesto re-ignite again.

	Recommendations for specific vehicles are described on the rescue cards.

The condition of the lithium-ion battery shall be checked before the vehicle is removed.

Manage or addresses "stranded energy"



Flow chart for towing electric vehicles.

	Monitor the temperature with suitable devices such as an infrared camera for a an extended period if possible!
	A large metal receptacle such as a container is recommended for transporting a high-voltage battery or parts thereof that have been disconnected from the vehicle. The condition of the high-voltage battery must be monitored(e.g. for smoke, noises, sparks, heat) and it must be ensured that the metal container can be quickly flooded with water.
	For more information, see section 5 “Stored energy/fluids/gases/ solids” (lithium-ion battery separated from the vehicle).

9. Important additional information

Depending on the vehicle type and equipment version, today's vehicles can feature extensive passenger protection systems.

Airbag

A current and maximally equipped vehicle (example: the Golf from 2020 onwards) includes the main components of the passenger protection system:

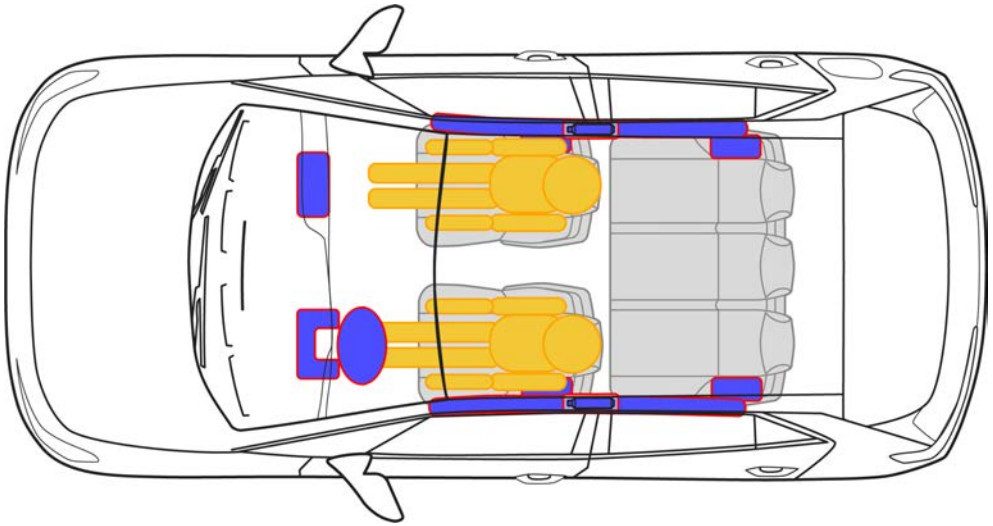
- Airbags
- Airbag control unit
- Sensors
- Belt tensioners and
- in convertibles, components that trigger the rollover bar

Pre-tensioned springs or pyrotechnics are deployed. The purpose of the electronics integrated in the airbag control unit is to detect vehicle deceleration and acceleration and to identify whether it is necessary to trigger protection systems.

In addition to the sensors in the airbag control unit, sensors (e.g. crash sensors in the front doors) are used to detect vehicle deceleration or acceleration during an accident. Only once the information from all sensors has been evaluated do the electronics in the airbag control unit decide whether and when safety components are activated. Depending on the nature and severity of the accident, only the belt tensioners, for example, are deployed, or the belt tensioners in combination with the airbags.

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

	Indicator for airbag control unit as per ISO 17840



Airbags in state-of-the-art vehicle models.

Only those safety systems that have a protective function in the specific accident situation are triggered.

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

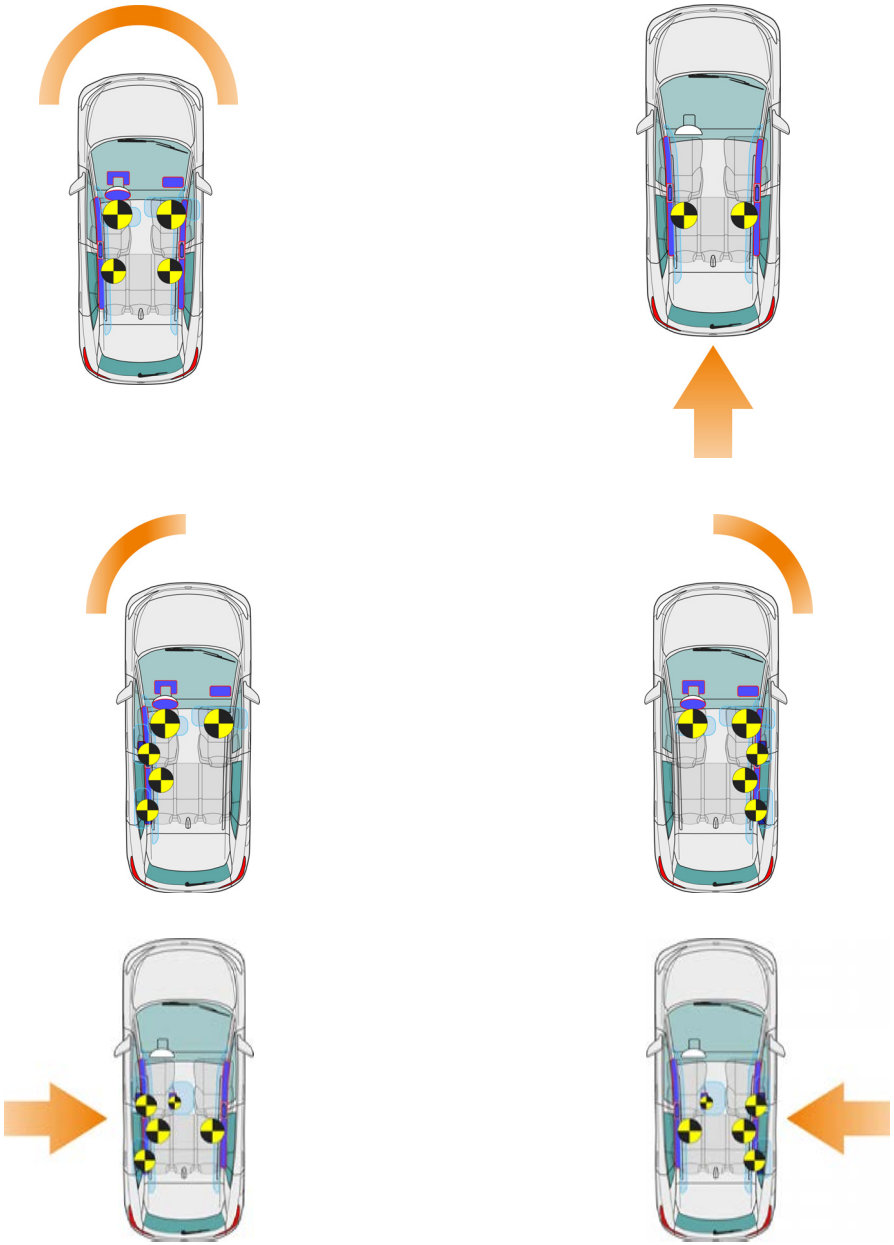
- Emergency release for central locking
- Switching on the interior lighting
- Switching off the fuel pump
- Switching on the hazard warning lights
- Forwarding a signal for sending the e-call

Gas generators generate the quantity of gas required to fill the airbags and thus inflate the airbags within milliseconds. The inflated airbags protect the seat-belted occupants from impacting on interior body contours (e.g. the steering wheel, the dash panel, etc.) in the event of a serious accident.

Depending on the installation location and requirements, gas generators are used in different designs or with different operating principles.

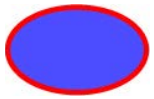
9. Important additional information

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 on the rescue cards as symbols or contours as follows:

	Identification of driver airbag, front passenger airbag, side or center airbag, knee airbag and curtain airbag in accordance with ISO 17840.
	Both side and curtain airbags are deployed by the airbag control unit when a limit stored there is reached. A side impact is detected by lateral acceleration sensors or pressure sensors in the doors.

Front airbags

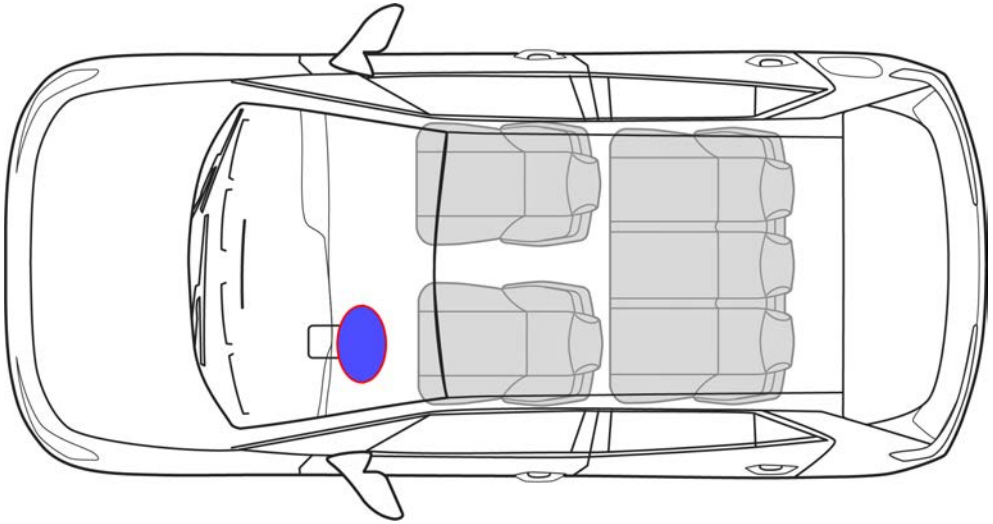
Driver airbag

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

The airbag folds together under the cap and is designed in shape and size to provide protection between the driver and the steering wheel when filled.

The driver airbag is inflated by a gas generator. The folding airbag opens the cap on the steering wheel on a predetermined tear line and is filled with gas in a very short time. The entire process from the ignition of the gas generator to the inflated airbag takes a few milliseconds.

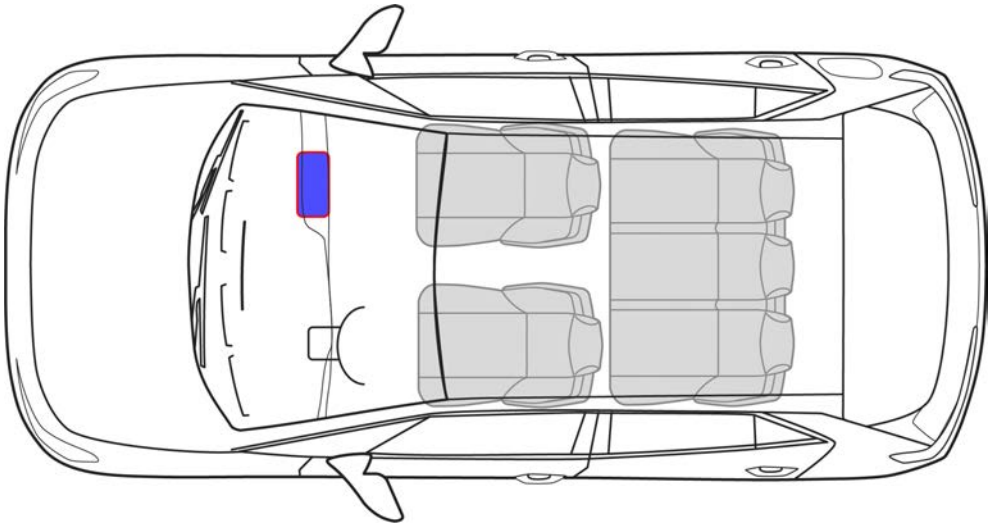
Vents on the side facing the driver are used to reduce the kinetic energy when the upper body is immersed by emitting the filler gas evenly.



Front passenger airbag

The airbag unit for the front passenger is located in the dash panel in front of the passenger seat. Due to the greater distance between the airbag unit and the occupant, the front passenger airbag has a significantly larger volume.

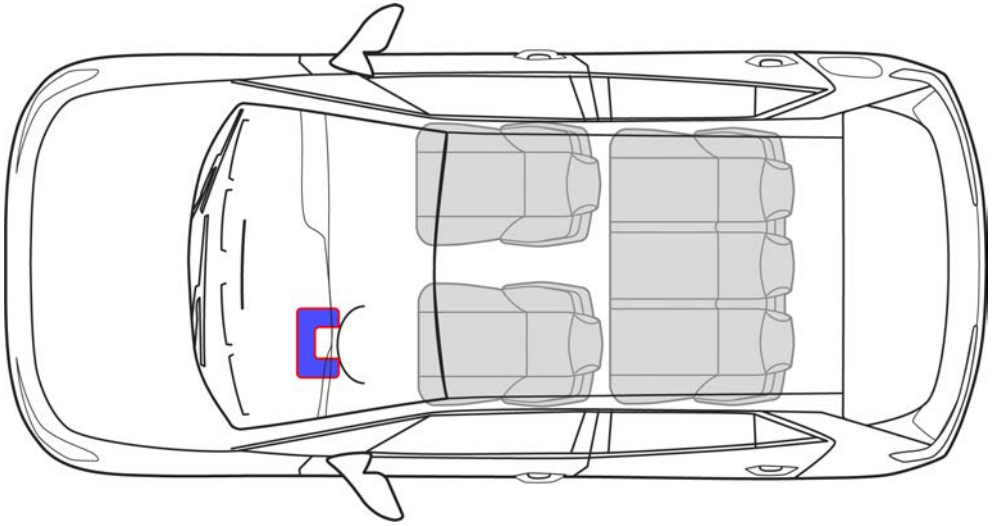
The effect of the front passenger airbag, how it functions and the sequence of events are comparable to those of the driver airbag.



Knee airbag
The knee airbag is located in the footwell trim below the dash panel.

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

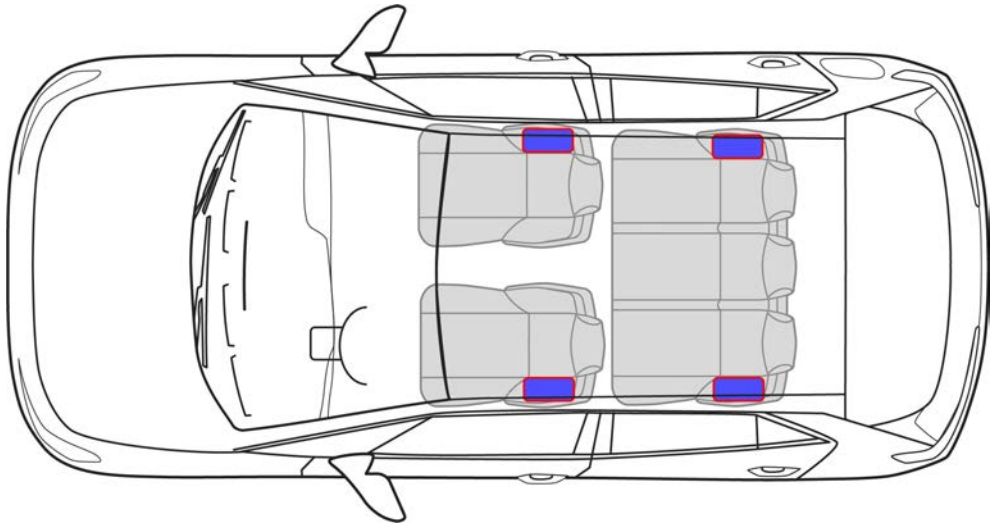
The ignition of the knee airbag reduces the risk of injury in the knee and leg area of the occupants, and the occupant is coupled to the vehicle decelerations earlier.



Side airbag

In the event of side accidents, side airbags protect the vehicle occupants' thorax and pelvis on the impacted side of the vehicle and reduce the impact on them. They inflate at the side between the upper body and the penetrating trim parts and thus distribute the loads more evenly on the occupants, who are thereby coupled to the intrusion movement at an early stage.

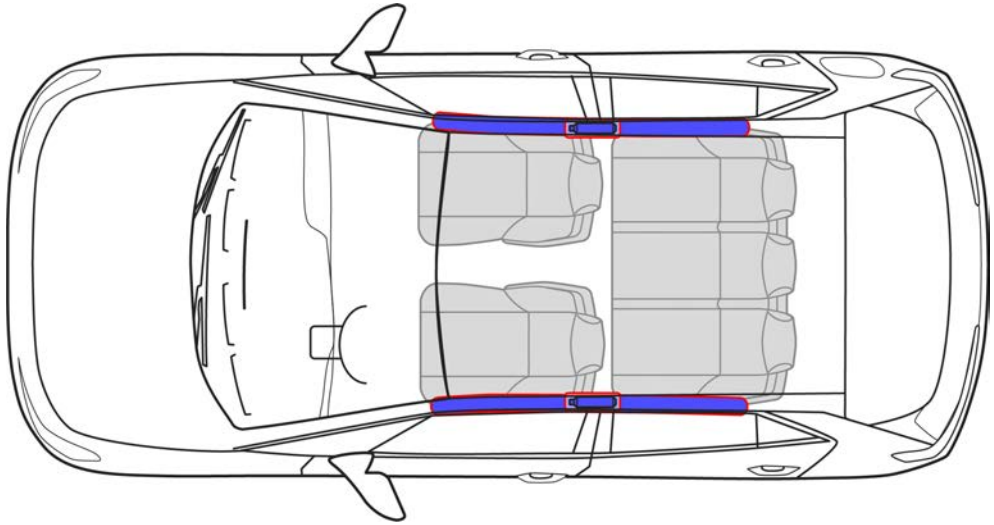
The side airbags are located in the backrests of the driver and front passenger seats, and on some Volkswagen models on the outer seats of the 2nd seat row. This ensures a constant distance from the occupant in every seat position.



Head / thorax airbags

The head / thorax airbags for the driver and front passenger are integrated into the respective backrests of the front seats. Their design and function are comparable to those of a side airbag.
It extends from the vehicle occupant's ribcage to their head and is installed especially in convertibles where a curtain airbag is not possible.

Curtain airbags



Curtain airbags protect the head in the event of a side impact. They consist of a large airbag that usually extends along the top of the vehicle from the A-pillar to the C-pillar.

Depending on the vehicle model, the gas generators may be installed in the roof area on the B-pillar or between the B- and C-pillars, between the C- and D-pillars, or 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 deployment, in order to provide a protective effect even in subsequent vehicle overturns or secondary collisions.

While Volkswagen passenger cars generally use one curtain airbag with a gas generator on each side of the vehicle, the curtain airbag in the Transporter from model year 2003 onwards, for example, is split into:

- a curtain airbag in the driver's compartment
- a curtain airbag in the passenger compartment

and therefore has two gas generators on each side of the vehicle.

Airbag gas generators

Solid propellant generators

The solid propellant generators consist of a housing in which a solid propellant charge with an ignition unit is integrated. After the solid propellant is ignited, the filling gas that is non-hazardous for the vehicle occupants is produced.

Procedure:

- The igniter is activated by the airbag control unit.
- The propellant charge is ignited and burns off suddenly.
- The gas produced flows through the metal filter into the airbag.

Hybrid gas generators

The hybrid gas generators consist of a housing that combines a gas stored under high pressure and a solid propellant charge with an ignition unit. The design and shape of the generator housing are adapted to the installation conditions. These generators are usually tube-shaped. The main components are the pressure vessel with the airbag filler gas and the propellant charge integrated into the pressure vessel or flange-mounted on it (solid propellant). The solid propellant is in tablet or ring form. The stored compressed gas is a mixture of inert gases, e.g. argon and helium. Depending on the design of the gas generators, it is under between 200 bar and 800 bar of pressure.

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

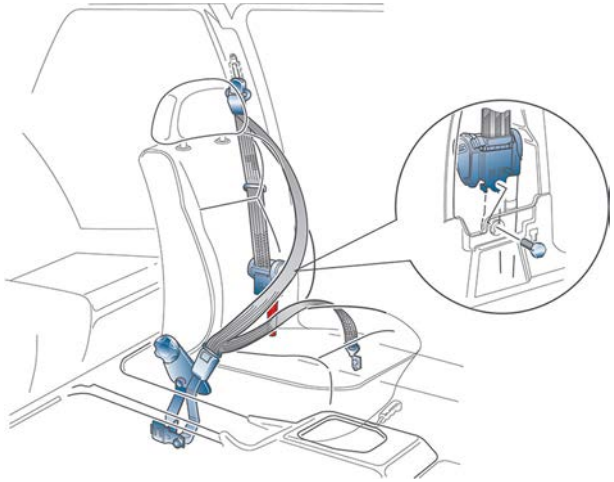
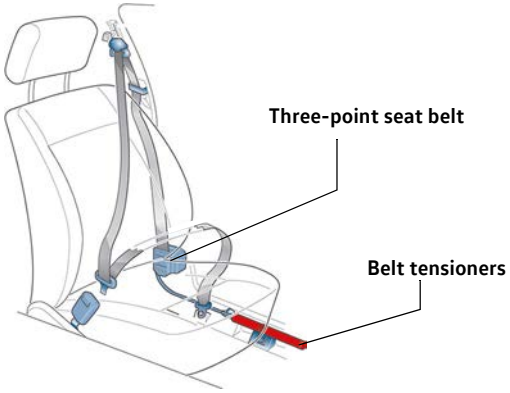
	Do not damage the gas generators during rescue work. The compressed gas in the pressure vessel and the pyrotechnic fuels can pose a potential danger to the emergency services and the occupants.

Belt tensioners

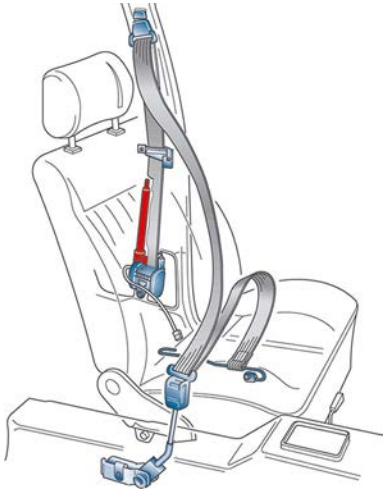
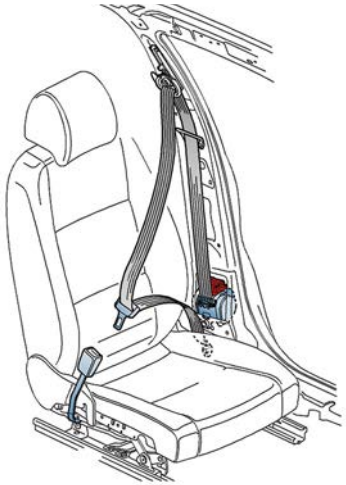
In the event of a crash, belt tensioners wind the belt in the opposite direction to its pull, thus reducing the slack (play between the seat belt and the body). This prevents vehicle occupants at an early stage from moving forwards (relative to the movement of the vehicle). A belt tensioner can retract the seat belt by up to approx. 200 mm within approx. 10 ms. The belt tensioners are integrated inside the belt system. However, they may be installed differently depending on the vehicle type (e.g. in the B-pillar, in the side member next to the seat, or on the outside of the rear seat) and have different functioning principles. If necessary, two belt tensioners are even used on one seat.

	If possible, belt tensioners should not be damaged with rescue equipment. Avoid hitting this area!
	The belt also locks when the vehicle is tilted severely, is upside down, or if the belt tensioner has been damaged by the accident.
	Non-triggered belt tensioners with mechanical activation can still be triggered even after disconnecting the battery.
	If the situation allows, the seat belt should be removed or cut off as early as possible.
	Indicator for belt tensioners as per ISO 17840

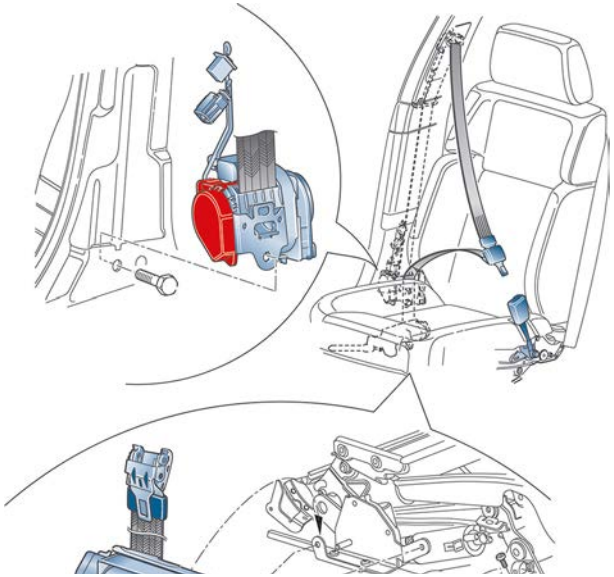
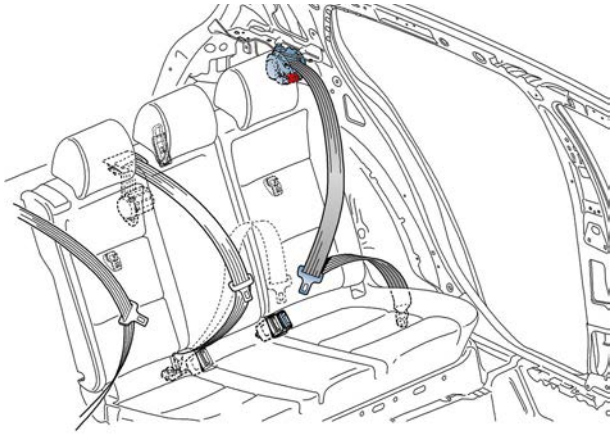
Installation variants for belt tensioners

Variant	Installation location
	**Variant 1** The front three-point seat belt with the cylindrical belt tensioner and mechanical or electric ignition trigger form a single unit and are either: a) in the B-pillar below the belt retractor b) as external components next to the side member or c) in the B-pillar above the belt retractor. **Installation variant 1a – belt tensioner in the B-pillar below the belt retractor**
	**Installation variant 1b – belt tensioner as external components next to the side member**

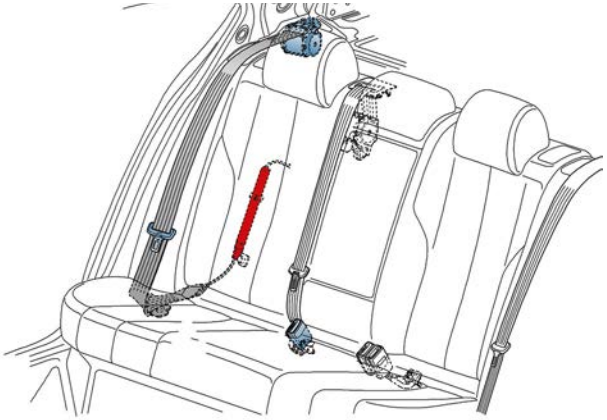
Installation variants for belt tensioners

Variant	Installation location
	**Installation variant 1c – belt tensioner in the B-pillar above the belt retractor**
	**Variant 2** In the front compact tensioner, the three-point 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**

Installation variants for belt tensioners

Variant	Installation location
	**Variant 3** In the front double tensioner, the shoulder belt section with a compact belt tensioner and the lap belt section with a cylindrical belt tensioner form a functional unit. The electric ignition trigger of the shoulder belt section is located in the B-pillar and in the lap belt section it is installed on the seat frame. **Installation variant 3 – double belt tensioner in the B-pillar and seat frame**
	**Variant 4** In the rear compact tensioner, the three-point 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**

Installation variants for belt tensioners

Variant	Installation location
	**Variant 5** Three-point seat belt and belt 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 tensioner in the wheel housing / C-pillar area**
	**Variant 6** The three-point seat belt and lap belt tensioner are installed independently of each other. The lap belt tensioner with electric ignition trigger is installed on the side member / B-pillar. **Installation variant 6 – lap belt tensioner in the area of the side member / B-pillar**

Automatic Rollover Support System

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

The following functions apply to a dynamic system:

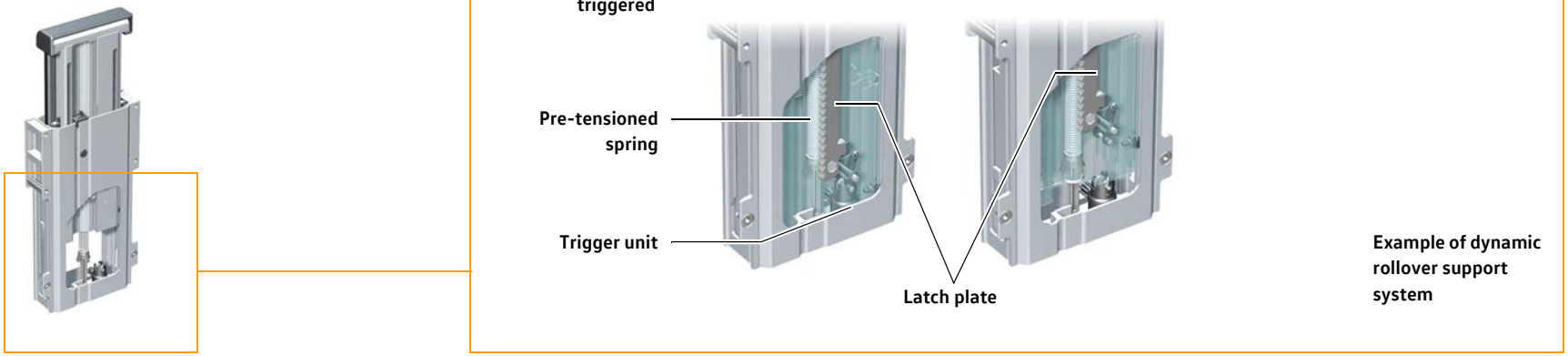
- There is a sensor in the airbag control unit for detecting an impending rollover.

Together with other sensors installed in the control unit, the severity of the accident is determined and the rollover support system and belt tensioners are triggered.

The rollover support system is also deployed as a precaution in the event of a higher impact on the front, side or rear as soon as a belt tensioner or airbag is ignited.

It is deployed via a rollover support system trigger unit. By means of a pre-tensioned spring, the bracket is moved to the protective position within 0.25 sec. and locked with the latch plate when extended.

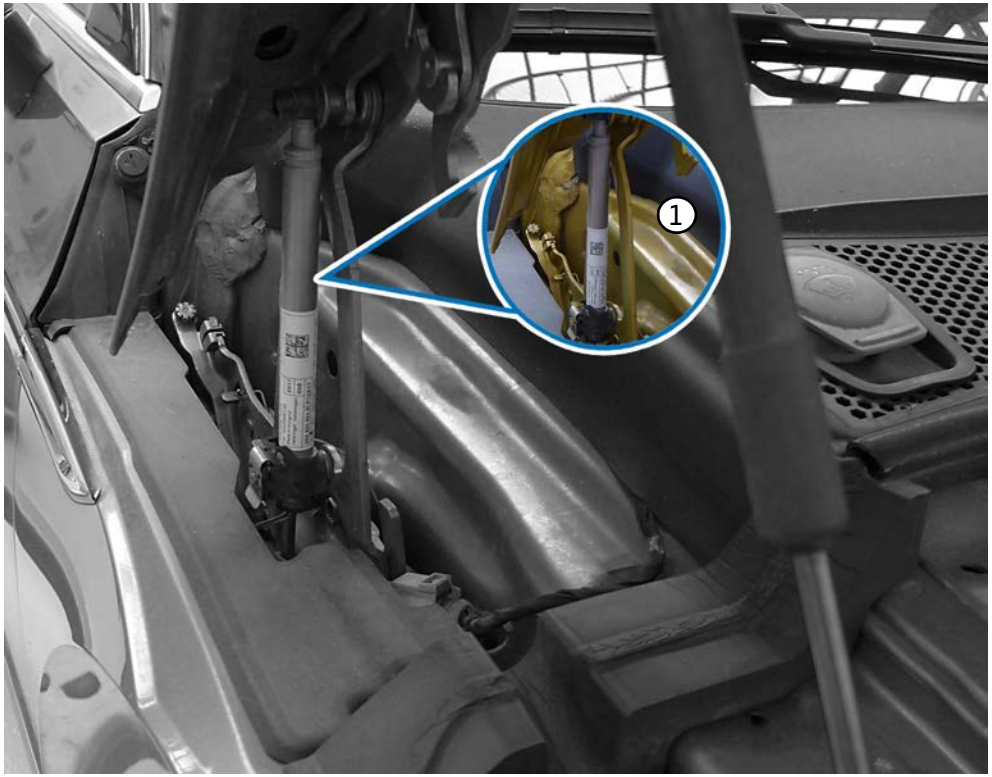
	If the rear window is still intact when the rollover support system is triggered, the rollover bar will not break it. If the window is removed as part of the rescue operation, the rollover bar is pushed up another 10 cm. In the process, emergency and recovery services could be hit and glass splitters propelled around.
	Indicator for rollover support system as per ISO 17840



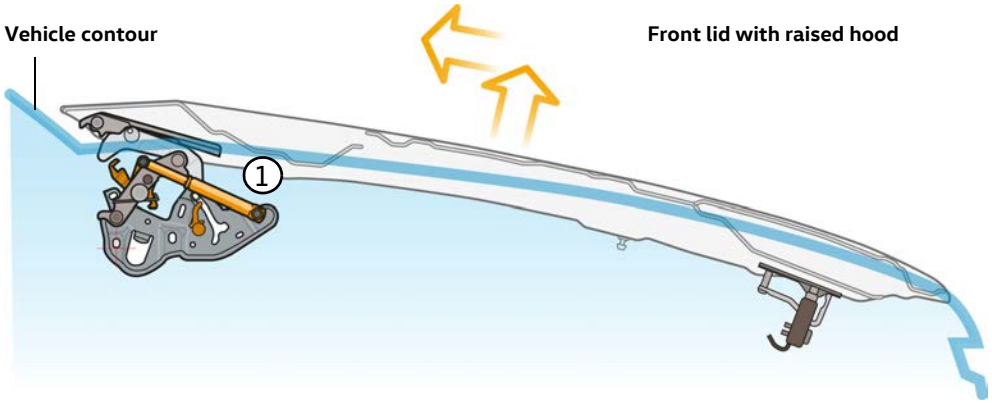
Re-active hood

Some Volkswagen models are equipped with a re-active hood for pedestrian protection.

In the event of a collision with a pedestrian in the front or rear area, the re-active hood is raised by pre-tensioned gas struts and pyrotechnic fuels. This increases the distance between the hood and the engine. The hood can absorb more impact energy in this position, thereby reducing the severity of injury from the engine.



Example of a re-active hood with pyrotechnic actuator.



	Do not damage the gas generators during rescue work. The compressed gas in the pressure vessel and the pyrotechnic fuels can pose a potential danger to the emergency services and the occupants.
	Indication on the rescue card as per ISO 17840: re-active hood

Sources, further information

- VDA: Accident Assistance & Rescue for vehicles with high-voltage systems and 48 V systems
- DGUV: Instructions for lithium-ion battery firefighting in vehicle fires (FBFHB 024)

10. Explanation of pictograms used

Components/functions/actions that shall be considered during the rescue procedure are represented by dedicated pictograms.

The pictograms are used:

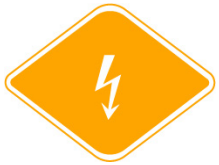
- to indicate the location of the respective components/functions in the vehicle, in conjunction with the rescue sheet illustration
  (for details, see ISO 17840-1 and ISO 17840-2)
- to communicate a specific function or danger, for use under the rescue sheet additional pages headings and ERG headings
- to communicate the recognition of propulsion type; and
- to indicate the extinguish measures.

Level of importance:
1 = Crucial information for the rescue operations, as applicable to the vehicle type/model; and
2 = Optional information, to further assist the rescue procedures

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

	Some pictograms may be modified to reflect the actual size and shape. A combination of simple shapes can also be used.

Pictograms concerning recognition



Examples of propulsion type recognition

Reference: ISO 17840-4

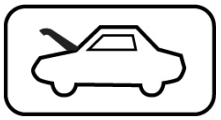
Level of importance: 1

To be used in/on:
- Rescue sheet illustration
- ERG under heading 1.

Note: Examples of pictograms for gasoline and electric drives are shown. See ISO 17840-4 for principles and other drive pictograms.

10. Explanation of pictograms used

Pictograms concerning access to the components

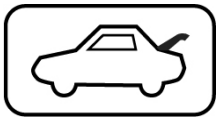


Title/Meaning/Referent:
Bonnet; hood

Function/description:
To identify the control that opens the compartment located outside the passenger area in the front of the vehicle. A frame may be used to separate the pictogram from the background as needed.

Level of importance: 2

To be used in/on:
- Rescue sheet illustration
- ERG under heading 3



Boot; Trunk

To identify the control that opens the compartment located outside the passenger area in the rear of the vehicle. A frame may be used to separate the pictogram from the background as needed.

Level of importance: 2

To be used in/on:
- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 3;
- ERG under heading 3

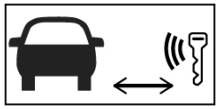
Pictograms concerning disabling of the vehicle (excluding high voltage)

Device to shut down power in vehicle

Shutdown power in vehicle, in all forms, by means of:
- Ignition key;
- Push button;
- Operation in engine compartment;
- Operation on dashboard;
- Battery switch;
- Other

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 3;
- ERG under heading 3



Remove smart key /starter key

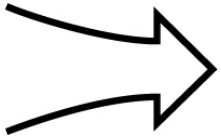
To indicate that the smart key should be removed from the vehicle to prevent accidental starting of the vehicle. A safe distance may optionally be indicated.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 3
- ERG under heading 3

10. Explanation of pictograms used

Pictograms concerning disabling of the vehicle (excluding high voltage)



Air intake

To identify the air intake where CO_2 can be blown to stop the engine.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 3
- ERG under heading 3

Pictograms concerning disabling of the vehicle high voltage (EV, HEV, PHEV, FCEV)

— Orange = High Voltage (Class B Voltage)
— Yellow = Controlling the High Voltage by Low Voltage
— Orange frame = Procedure for disabling High Voltage vehicle

Dangerous voltage

To indicate hazards arising from dangerous voltages.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading where needed;
- ERG under heading where needed.

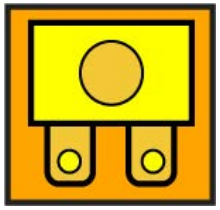
Pictograms concerning disabling of the vehicle high voltage (EV, HEV, PHEV, FCEV)

Vehicle induction charging

To indicate the vehicle is connected to an electromagnetic induction source for charging the high voltage traction batteries. To identify the location of the induction charging system or components.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 3
- ERG under heading 3



Fuse box disabling high voltage

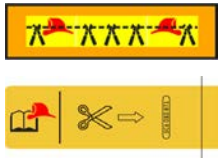
To identify the low voltage fuse that controls the high voltage.

Level of importance: 1

- Rescue sheet illustration and secondary pages under heading 3.
- ERG under heading 3

10. Explanation of pictograms used

Pictograms concerning disabling of the vehicle high voltage (EV, HEV, PHEV, FCEV)



Cable cut

To identify the cable to cut that disconnect high voltage and SRS components. To show that two separate places in the same cable shall be cut. Size and proportions can be adjusted to fit the intended purpose.

Level of importance: 1

- Rescue sheet illustration and additional pages under heading 3;
- ERG under heading 3.

Disconnect high voltage device (e.g. service plug)

To identify the high voltage device that disconnects the high voltage, where appropriate PPE is needed for the action.

Level of importance: 1

Verwendung für:
- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 3;
- ERG under heading 3

Pictograms concerning disabling of the vehicle high voltage (EV, HEV, PHEV, FCEV)

Disconnect high voltage device

To identify the low voltage device that disconnects the high voltage.

Level of importance: 1

Verwendung für:
- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 3;
- ERG under heading 3

Pictograms concerning access to the occupants

Steering wheel, tilt control

To identify the control that allows adjustment of the steering wheel by tilting up or down. A frame may be used to separate the pictogram from the background as needed.

Level of importance: 2

- ERG under heading 4

10. Explanation of pictograms used

Pictograms concerning access to the occupants

Seat height adjustment

To identify the control that moves the entire seat upward or downward. A frame may be used to separate the pictogram from the background as needed.

Level of importance: 2

- ERG under heading 4

Seat adjustment, longitudinal

To identify the control that moves the entire seat forward or rearward. A frame may be used to separate the pictogram from the background as needed.

Level of importance: 2

- ERG under heading 4

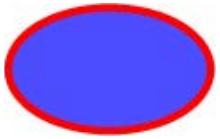
Lifting point; central support

To identify the locations on the equipment where a lifting jack or support device can be used.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 2;
- ERG under heading 2

Other vehicle related pictograms



Airbag

To identify an airbag.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 9

Pictogram can be adjusted to represent the actual size and form.
Different types of airbag-related occupant protection systems can be shown using the airbag pictogram with an appropriate size and form, e.g.:

- Driver / front passenger airbag
- Side airbag
- Curtain airbag
- Knee airbag
- Belt airbag
- Center airbag

Other vehicle related pictograms

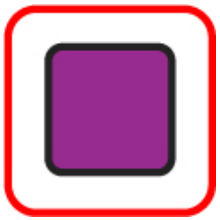
Airbag inflator/stored gas inflator

To identify an airbag inflator/stored gas inflator.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 9

Pictogram is used to show the location of the stored gas inflator for e.g. inflatable curtains or pedestrian protection active system.
This pictogram should not be shown for conventional airbag systems with integrated gas inflator, such as frontal airbag in the steering wheel or in the dashboard, side airbag, knee airbag.



Seat belt pretensioner

To identify a seat belt pretensioner.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 9

If a seating position has more than one pretensioner (e.g. for lap and shoulder belt), each pretensioner location shall be indicated by pictogram.

Other vehicle related pictograms

Gas strut, preloaded spring

To identify a gas strut, preloaded spring.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 9

Red surrounding is used only if the device is triggered.

Pedestrian protection active system

To identify the pedestrian protection active system.

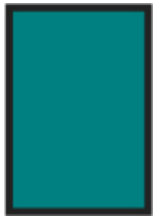
Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 9

Pictogram for pedestrian protection active system shall be used to inform that the vehicle is equipped with a system that can deploy, e.g. the bonnet/hood.
The pictogram background is white by default but can alternatively be using the colour of the activation mechanism.
The pictogram can be combined with or connected to the activation mechanism (airbag, gas inflator, gas strut, preloaded spring) for deploying the system, e.g. the bonnet/hood.

10. Explanation of pictograms used

Other vehicle related pictograms

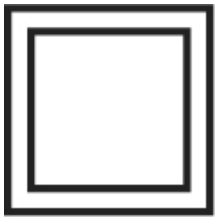


High strength zone

To identify a high strength zone.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 9



Zone requiring special attention

To identify the zone requiring special attention.

Level of importance: 1

- Rescue sheet illustration and secondary pages under heading 5;
- ERG under heading 5

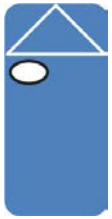
Carbon structure

To indicate that carbon is used in the chassis structure. To inform about risks of inhalation, appropriate PPE is needed.

Level of importance: 1

- Rescue sheet illustration and secondary pages under heading 5;
- ERG under heading 5

Other vehicle related pictograms



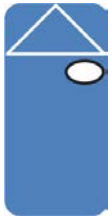
Left hand drive

To identify a left-hand drive vehicle.

Level of importance: 1

- Rescue sheet illustration

For use in the header of the rescue sheet.
The colour can be adjusted to contrast with the background of the header.



Right hand drive

To identify a right-hand drive vehicle.

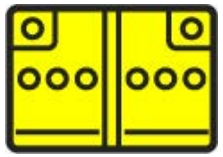
Level of importance: 1

Rescue sheet illustration

For use in the header of the rescue sheet.
The colour can be adjusted to contrast with the background of the header.

10. Explanation of pictograms used

Other vehicle related pictograms



Battery, low-voltage

To identify a low voltage battery.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 5;
- ERG under heading 5.

For class A voltage application.
It shall be accompanied with the technology of the battery (e.g Li-Ion or Ni-MH) if different from a conventional battery type.

Ultra-capacitor, low-voltage

To identify a low voltage ultra-capacitor.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 5;
- ERG under heading 5.

Solar Panel

To identify a solar panel.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages;
- ERG under heading 3

Other vehicle related pictograms

SRS control unit

To identify a SRS control unit.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 9

Battery pack, high-voltage

To indicate a high voltage battery pack.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 3;
- ERG under heading 3.

Pictogram can be adjusted to represent the actual size and form.
It shall be accompanied with the technology of the battery (e.g. Li-Ion or Ni-MH).
Optionally, the nominal voltage value of the battery may be added.

10. Explanation of pictograms used

Other vehicle related pictograms

High voltage ultra-capacitor

To indicate an ultra-capacitor pack.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages;
- ERG under heading 3

High voltage component

To indicate a high voltage component.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages;
- ERG under heading 3

Flash may be omitted in case of space constraints.

Other vehicle related pictograms

High voltage power cable

To identify a high voltage power cable.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 3

It can optionally have a black contour line. HV components should be possible to differentiate from HV battery pack.
Legend and pictogram graphics should correspond with regard to the use of contour line concept.

Fuel tank content Diesel

To indicate the content of the tank by using a defined colour.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 5;
- ERG under heading 5

10. Explanation of pictograms used

Other vehicle related pictograms

Fuel tank content gasoline/ethanol

To indicate the content of the tank by using a defined colour.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 5;
- ERG under heading 5

Air tank

To indicate an air tank.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 5

Other vehicle related pictograms

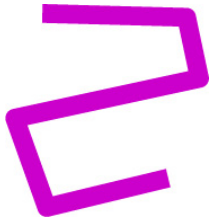
Air-conditioning component

To indicate an air conditioning component by using a defined colour.
Type of coolant shall be mentioned in additional pages and rescue sheet (e.g. CO_2, fluor-carbon based chemistry).

Level of importance: 1

Rescue sheet illustration;
Rescue sheet secondary pages under heading 5;
ERG under heading 5

Snow flake may be omitted in case of space constraints.



Air-conditioning line

To indicate an air-conditioning line by using a defined colour.
Type of coolant or name shall be mentioned (e.g. CO_2, fluor-carbon based chemistry).

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 5

10. Explanation of pictograms used

Pictograms related to fire fighting and safety

General warning sign

To signify a general warning.

Level of importance: 1

- Rescue sheet secondary pages under heading where necessary;
- ERG under heading where necessary

Warning, Electricity

To warn of electricity and dangerous voltage.

Level of importance: 1

- Rescue sheet secondary pages under heading where necessary;
- ERG under heading where necessary

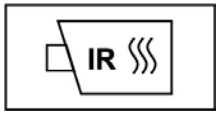
Warning; low temperature

To indicate the dangers concerning low tempera tures, e.g. frost bites due to cold gas (e.g. LNG, air-conditioning gas)

Level of importance: 1

- Rescue sheet secondary pages under headings 5, 6, 8;
- ERG under headings 5, 6, 8, 9

Pictograms related to fire fighting and safety



Use thermal Infrared camera

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

Level of importance: 2

- Rescue sheet secondary pages under heading 6;
- ERG under heading 6

Automatic fire suppression system

To indicate an automatic fire suppression system in the vehicle.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 6;
- ERG under heading 6

Special battery access

Special access to put water in the HV battery of an EV vehicle.

Level of importance: 1

- Rescue sheet illustration;
- Rescue sheet secondary pages under heading 6;
- ERG under heading 6

10. Explanation of pictograms used

Pictograms related to fire fighting and safety

Use water to extinguish the fire

To indicate that water shall be used to extinguish the fire.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 6

Use wet foam to extinguish the fire

To indicate that wet foam shall be used to extinguish the fire.
System in which a foam concentrate and air are continuously added under pressure to the water being discharged from a fire-fighting pump (CAFS).
Wet foam operation is defined by a nominal foam solution/air volume ratio between 1:3 and 1:10, being mixed in the CAFS.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 6

Pictograms related to fire fighting and safety

Use dry foam to extinguish the fire

To indicate that dry foam shall be used to extinguish the fire.
System in which a foam concentrate and air are continuously added under pressure to the water being discharged from a fire-fighting pump (CAFS).
Dry foam operation is defined by a nominal foam solution/air volume ratio greater than 1:10, being mixed in the CAFS.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 6

Use ABC powder to extinguish the fire

To indicate that ABC powder shall be used to extinguish the fire.

Level of importance: 1

- Rescue sheet illustration;
- ERG under heading 6

Do not extinguish with water

To prohibit using water to extinguish a fire.

Level of importance: 1

- Rescue sheet secondary pages under heading 6;
- ERG under heading 6

10. Explanation of pictograms used

Globally harmonized symbols	
	**Explosive** To indicate the risk of an explosion. Level of importance: 1 - Rescue sheet secondary pages under headings 5, 6, 8, 9; - ERG under headings 5, 6, 8, 9
	**Flammable** To indicate the risk of flammability. Level of importance: 1 - Rescue sheet secondary pages under headings 5, 6, 8, 9; - ERG under headings 5, 6, 8, 9
	**Gases under pressure** To indicate the risk of gases under pressure. Level of importance: 1 - Rescue sheet secondary pages under headings 5, 6, 8, 9; - ERG under headings 5, 6, 8, 9

Globally harmonized symbols	
	**Oxidizer** To indicate the risk of oxidizing material/substances. Level of importance: 1 - Rescue sheet secondary pages under headings 5, 6, 8, 9; - ERG under headings 5, 6, 8, 9
	**Corrosives** To indicate the risk of corrosive material/substances. Level of importance: 1 - Rescue sheet secondary pages under headings 5, 6, 8, 9; - ERG under headings 5, 6, 8, 9
	**Hazardous to the human health** To indicate the risk of damaging human health. Level of importance: 1 - Rescue sheet secondary pages under headings 5, 6, 8, 9; - ERG under headings 5, 6, 8, 9

10. Explanation of pictograms used

Globally harmonized symbols

Acute toxicity

To indicate the risk of acute toxicity.

Level of importance: 1

- Rescue sheet secondary pages under headings 5, 6, 8, 9;
- ERG under headings 5, 6, 8, 9

Environmental hazard

To indicate the risk of environmental hazard.

Level of importance: 1

- Rescue sheet secondary pages under headings 5, 6, 8, 9;
- ERG under headings 5, 6, 8, 9

Symbols used in these guidelines

Note

General information