

# VOLKSWAGEN

AKTIENGESELLSCHAFT



## Operating manual

Adapter cable set VAS 671 001



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V00	09.09.2020	First edition
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## Legal notice

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### Image sources

Symbols for warnings, prohibitions, mandatory actions and standards are taken from publicly accessible sources, such as the Internet. CAD product images and product photos are provided by the manufacturer. Images showing the product in use are provided with a reference to the source.

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## Preliminary information

Read through this operating manual carefully before using the product.

The product is delivered with a USB stick containing the operating manual in various languages. You can find the current version and additional languages on our homepage.

The operating manual is an essential part of the product and must be kept together with the product. If you sell or transfer ownership of the product, the operating manual must be handed over to the new operator.

In addition to this operating manual, you must observe all relevant regulations for diagnostics or fault finding of intrinsically safe high-voltage systems in road vehicles. This includes but is not limited to: instructions for the vehicle manufacturer's diagnostics systems, company-specific safety requirements and the state of the art for working with high-voltage systems.

## Validity of the declaration of conformity

The declaration of conformity applies to the product described in the operating manual. Any changes, modifications or extensions shall void the declaration of conformity and the risk assessment.

## Manufacturer specifications

Since its founding, our company has focused on groundbreaking solutions for electromobility. STODIA GmbH develops and produces custom solutions for the automotive industry, the energy storage sector, repair shops and special vehicle fleets.

Our core products are innovative energy storage systems, both stationary and mobile, which are essential technologies for advancing the energy revolution and energy autonomy. STODIA's portfolio also includes smart charging and battery technology, diagnostic systems, battery and cell management, and vehicle-wide measurement and diagnostic technology.

With experience in both software and hardware development, STODIA GmbH is your dependable partner at every production stage, from prototyping to series production.

This operating manual is only valid for the following product:

Item number 22101599

Designation Adapter cable set VAS 671 001

## Warning levels

This chapter provides information about the warning levels used in this operating manual.

### DANGER

Failure to observe the safety instructions WILL result in death or serious injury!

### WARNING

Failure to observe with the safety instructions CAN result in death or serious injury!

### CAUTION

Failure to observe the safety instructions CAN result in minor physical injury!

### CAUTION

Failure to observe the safety instructions can lead to damage to the product!

## Important safety instructions

This chapter contains the safety instructions that must be observed when handling the product.



### DANGER

#### Danger of fatal electric shock

The electrical voltage in other systems is lethal and will cause death by electric shock.

- Do not use the product for measurements on utility power circuits!
- Never attempt to power other devices with the product!



### WARNING

#### Danger of fatal electric shock

The electrical voltage in high-voltage systems is lethal and can cause death by electric shock.

Liquids, condensation and high humidity can cause short circuits!

- Do not let the product come into contact with liquids!
- Use the product only in dry and enclosed spaces!

**WARNING****Danger of fatal electric shock**

The electrical voltage in the product is dangerous and can cause serious injury or death from electric shock.

Defective and damaged products cannot guarantee protection against electrical voltage.

- Do not let the product come into contact with chemicals!
- Replace a defective or damaged product immediately!
- Never attempt to repair or tamper with the product!

## Intended use

Use the product only in accordance with this operating manual; otherwise the electrical hazard protection provided by the product can no longer be guaranteed.

The product is used to perform diagnostics on high-voltage battery systems when removed from the vehicle. The product enables the connection of the high-voltage lines and communication lines and the pilot line for the removed traction battery to the electric vehicle. The product must be used only for the “Drive ready” function test.

The product is compatible with the following vehicle models:

- Volkswagen e-Up!
- Volkswagen e-Golf
- Volkswagen Golf GTE
- Volkswagen XL1
- Volkswagen Passat GTE

The product is not used to test that the circuit is de-energized.

Use only the plug connections on the vehicle that the manufacturer has specified in the guided fault finding.

In this operating manual, vehicle manufacturers are exclusively defined as vehicle manufacturers in the Volkswagen Group.

Any use beyond what is listed here is prohibited.

## Requirements for the target group

Only qualified personnel may work with this product!

In this operating manual, qualified personnel is defined as personnel meeting all requirements for working on high-voltage systems applicable in the country of operation, as defined by:

- Regulations applicable in the country of operation
- Qualification according to DGUV 200-005 level 2 or higher, or equivalent
- Specifications from the vehicle manufacturer and/or the operator.

At all times while using the product, staff must wear the personal protective equipment prescribed by the vehicle manufacturer for work on high-voltage systems.

## Duties of the operator

The operator is responsible for ensuring that all staff working with the adapter cable set fulfills the requirements for the target group.

Furthermore, the operator is responsible for ensuring the following:

- All the adapter cable set components are always in perfect working order.
- The regular inspection periods for all the adapter cable set components are observed and logged.

## Scope of delivery

Immediately check the condition of the product and the completeness of the delivery. If anything is missing or defective, please contact the manufacturer immediately.



- (1) Carrying case (VAS 671001/8)
- (2) High-voltage test adapter (VAS 671001/1)
- (3) Diagnostic cable, 21-pin (for Volkswagen e-Golf) (VAS 671001/3)
- (4) Diagnostic cable, 14-pin (for Volkswagen e-Up!) (VAS 671001/2)
- (5) Ground cable (VAS 671001/4)
- (6) Pilot line bypass plug for Volkswagen e-Up! (VAS 671001/5)
- (7) Pilot line bypass plug for Volkswagen e-Golf (VAS 671001/6)
- (8) Hook and loop strap (VAS 671001/8)
- (9) USB stick with operating manual



## Design

### High-voltage test adapter

**VAS 671001/1**

Product design:



(1) Plug

(2) Socket

### Diagnostic cable, 14-pin

**VAS671001/2**

Product design:



(1) Plug, 14-pin

(2) Socket, 14-pin

## Diagnostic cable, 21-pin

**VAS 671001/3**

Product design:






- (1) Plug, 21-pin
- (2) Socket, 21-pin

## Symbols and connections

The following symbols are shown on the product:

Symbol	Meaning
	General warning symbols
	Electrical hazard! Read the operating manual!
	The serial number is used in conjunction with the manufacturer part number to identify the product.
	The manufacturer part number is used in conjunction with the serial number to identify the product.
	Date of manufacturer's test
	The disposal instructions prohibit disposal of the product with household waste. Always dispose of the product in accordance with all local disposal regulations.
	The CE marking certifies that the product complies with all applicable European regulations and has been subjected to the prescribed conformity assessment procedure.
	This label certifies that the product complies with the limits of GB/T 26572-2011 ("China-ROHS").

Symbol	Meaning
	The cTÜVus mark indicates that the product has been tested and certified by an NRTL in accordance with applicable standards.
	The test seal identifies the product as having been approved for use in workshops and production facilities belonging to the vehicle manufacturer.
CAT I U <sub>max</sub> = 1.000V CAT II U <sub>max</sub> = 600V CAT III U <sub>max</sub> = 300V	Indicates which measurement categories the product is intended for according to IEC 61010-31.
	QR code for accessing the operating manual on mobile devices.

## Technical data

### High-voltage test adapter

VAS 671001/1

Rated data	Values
Manufacturer number	22102050
Maximum rated voltage	CAT I: DC 1000 V CAT II: DC 600 V CAT III: DC 300 V
Maximum rated current	50 A
Protection class	II / double insulated
Weight	~ 4510 g
Dimensions L/H/W	~ 180 mm/125 mm/50 mm
Cable length	5000 mm

## Diagnostic cable, 14-pin

**VAS 671001/2**

Rated data	Values
Manufacturer number	22102051
Maximum rated voltage	48 VDC
Maximum rated current	5 A
Weight	~ 500 g
Cable length	5000 mm

## Diagnostic cable, 21-pin

**VAS 671001/3**

Rated data	Values
Manufacturer number	22102225
Maximum rated voltage	48 VDC
Maximum rated current	5 A
Weight	~ 470 g
Cable length	5000 mm

## Ground cable

**VAS 671001/4**

Rated data	Values
Manufacturer number	22102224
Maximum rated voltage	DC 1000 V
Maximum rated current	50 A
Protection class	II / double insulated
Weight	~ 1460 g
Cable length	5000 mm

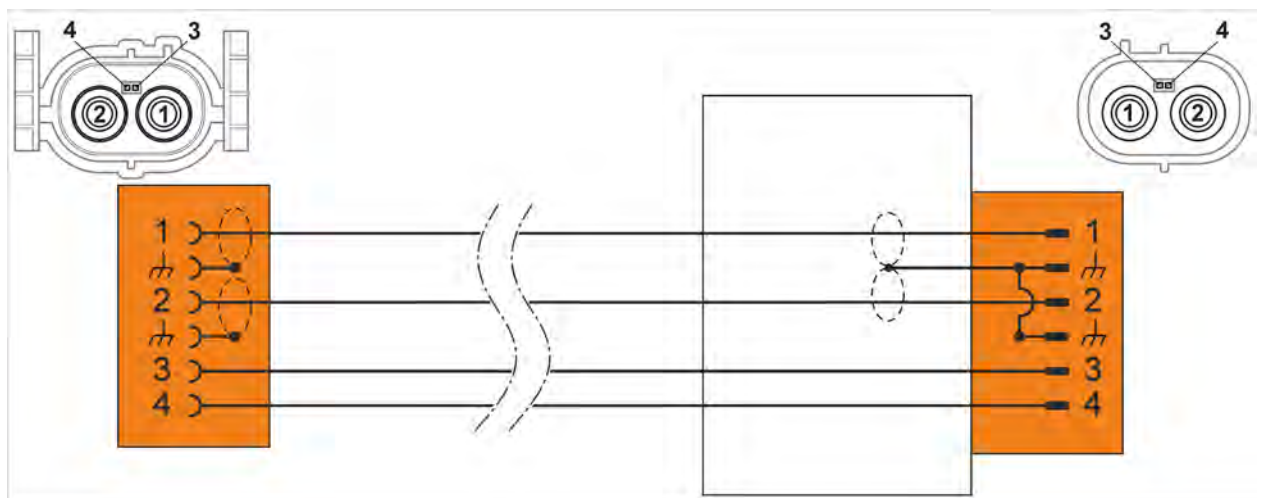
## Ambient conditions

Ambient conditions	Operation	Storage	Transportation
Temperature	5 °C to 40 °C	-20 °C to 60 °C	-20 °C to 60 °C
Elevation above sea level	Max. 2000 m	No limitation	
Humidity	Max. 80% up to 31 °C, decreasing linearly to 50% at 40 °C.	Max. 85%	
Pollution rating	2		
Condensation	Not permitted. Maximum permissible relative humidity: 60% in environments with corrosive gas/air.		

## Wiring diagram

### High-voltage test adapter

VAS 671001/1



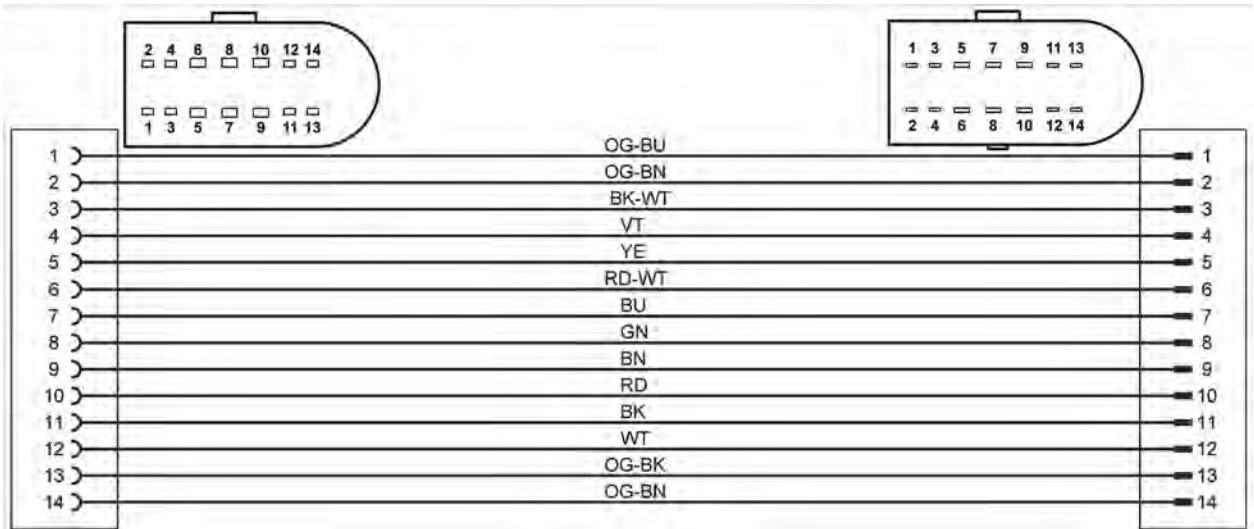
### Ground cable

VAS 671001/4



## Diagnostic cable, 14-pin

VAS 671001/2



## Diagnostic cable, 21-pin

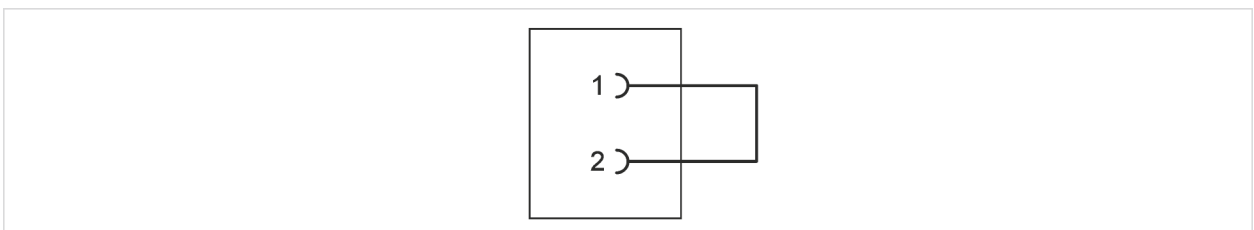
VAS 671001/3



## Bypass plug

VAS 671001/5, VAS 671001/6

The wiring diagram is identical for all bypass plugs.



## Startup



### WARNING

#### Danger of fatal electric shock

The electrical voltage in high-voltage systems is lethal and can cause death by electric shock.

- Use the product only for the applications intended by the vehicle manufacturer!



### CAUTION

#### Risk of damage!

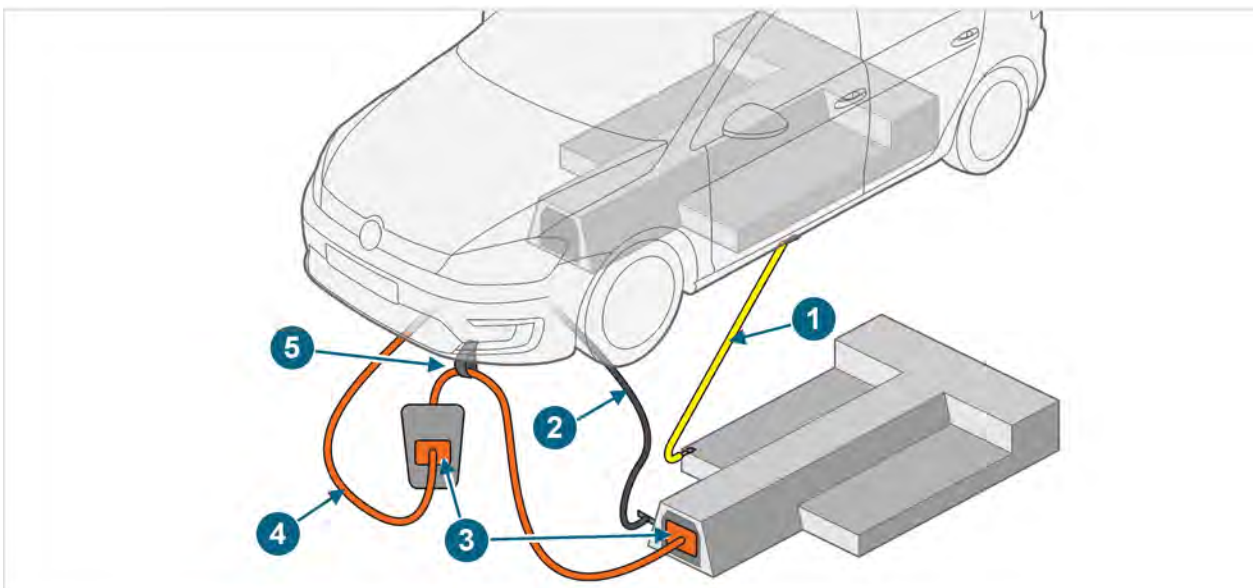
Plug connections lock into place when attached.

- Unlock the plug connections before detaching them! (see the chapter “Detaching the plug connections”)

This chapter shows you the order in which you must connect the product components to the high-voltage battery and the vehicle.

The image below simply illustrates the principle and is suitable for all applications scenarios.

Connect the components in the following order:



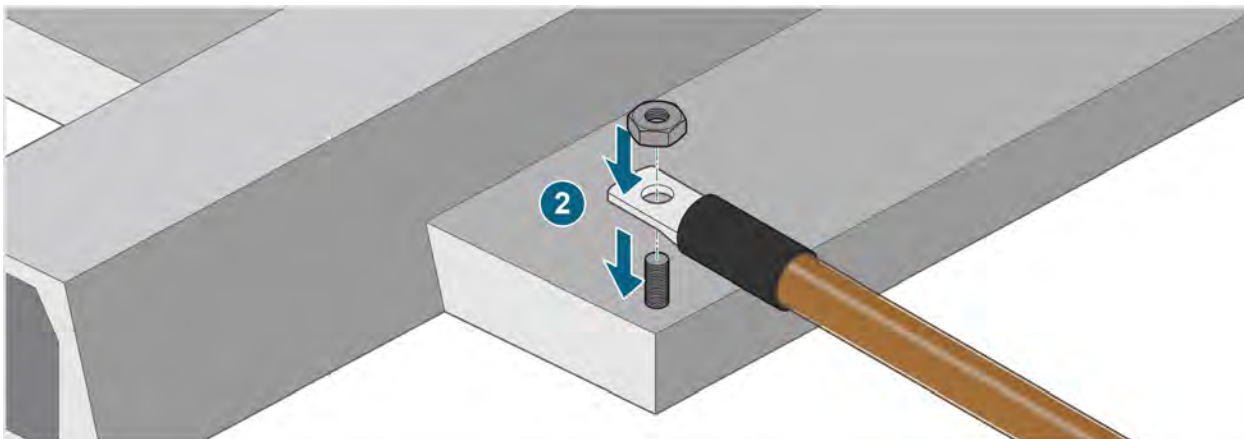
1. Connect the ground cable
2. Connect the diagnostic cable
3. Bypass the pilot line
4. Connect the high-voltage test adapter
5. Secure the cables with a hook and loop strap

## Connecting the ground cable

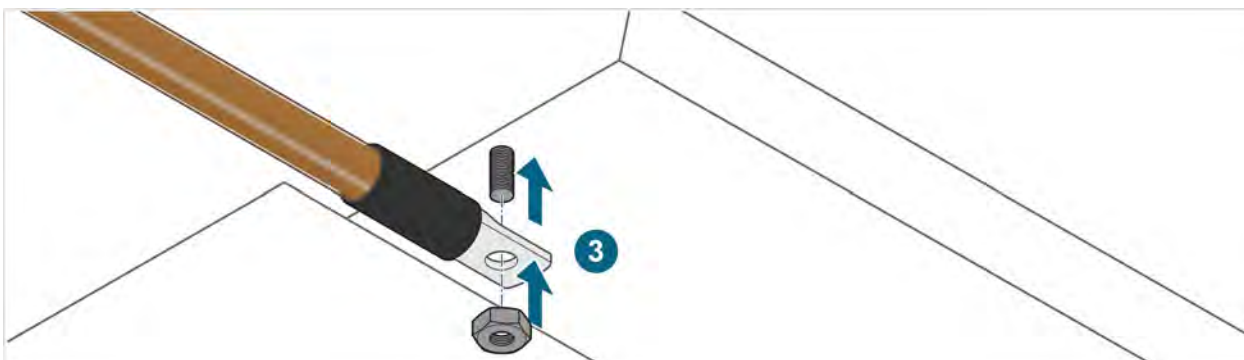
1. Follow the safety instructions.



2. Connect the ground cable to the traction battery at the point specified in the guided fault finding. Observe the screw tightening torques specified by the vehicle manufacturer.



3. Connect the ground cable to the vehicle body at the point specified in the guided fault finding. Observe the screw tightening torques specified by the vehicle manufacturer.



- ✓ You can now connect the diagnostic cable.

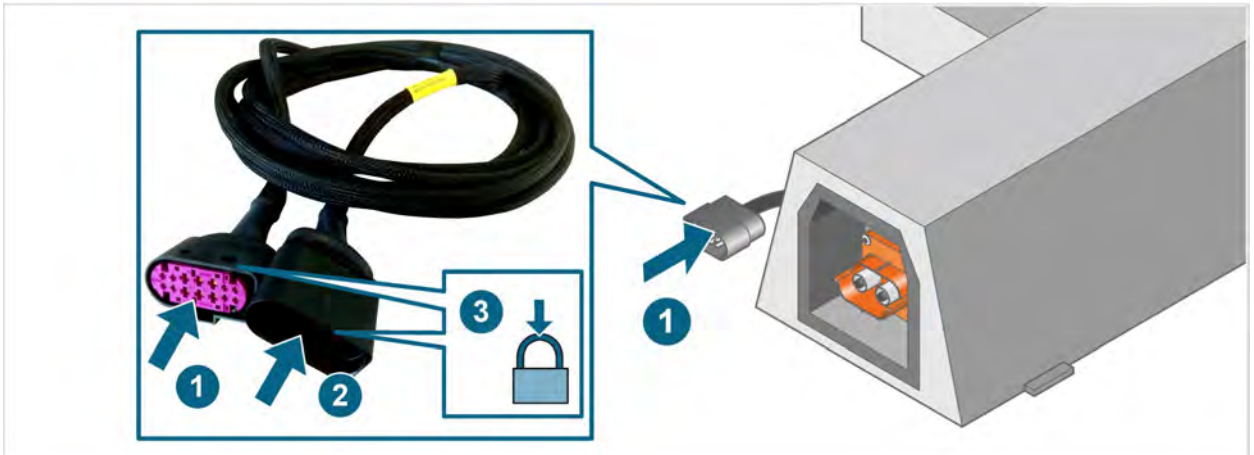


## Connecting the diagnostic cable

Depending on the vehicle to be connected, you must connect the 14-pin or 21-pin diagnostic cable.

### Diagnostic cable (14-pin)

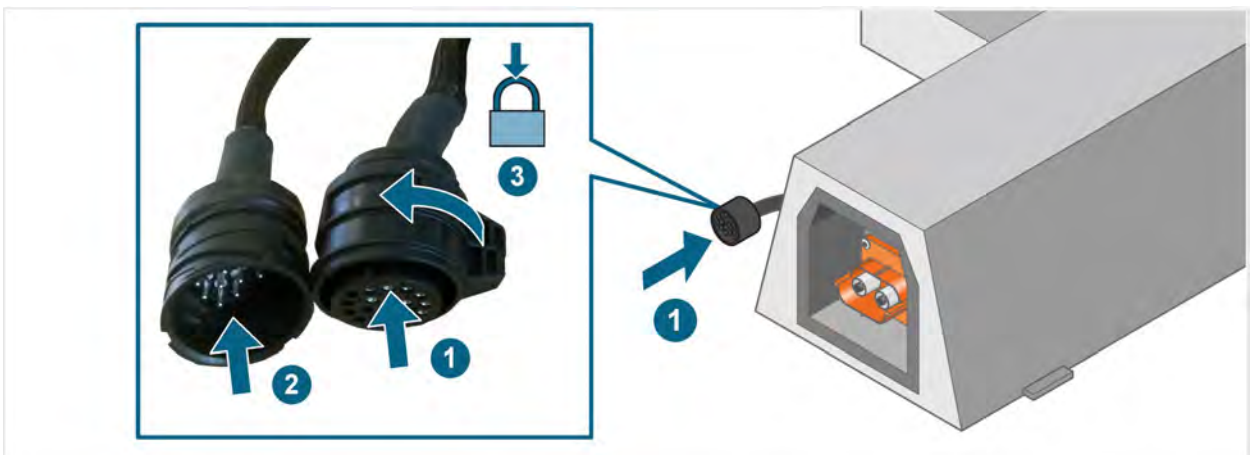
1. Connect the diagnostic cable socket to the plug of the battery management system for the traction battery.
2. Connect the plug of the diagnostic cable to the socket on the vehicle.
3. Make sure that the plug connections audibly click to lock them in place.



✓ You can now bypass the pilot line.

### Diagnostic cable (21-pin)

1. Connect the diagnostic cable socket to the plug of the battery management system for the traction battery.
2. Connect the plug of the diagnostic cable to the socket on the vehicle.
3. Twist the socket housing to lock the plug connection.



✓ You can now bypass the pilot line.

## Bypassing the pilot lines



### DANGER

**Danger of fatal electric shock**

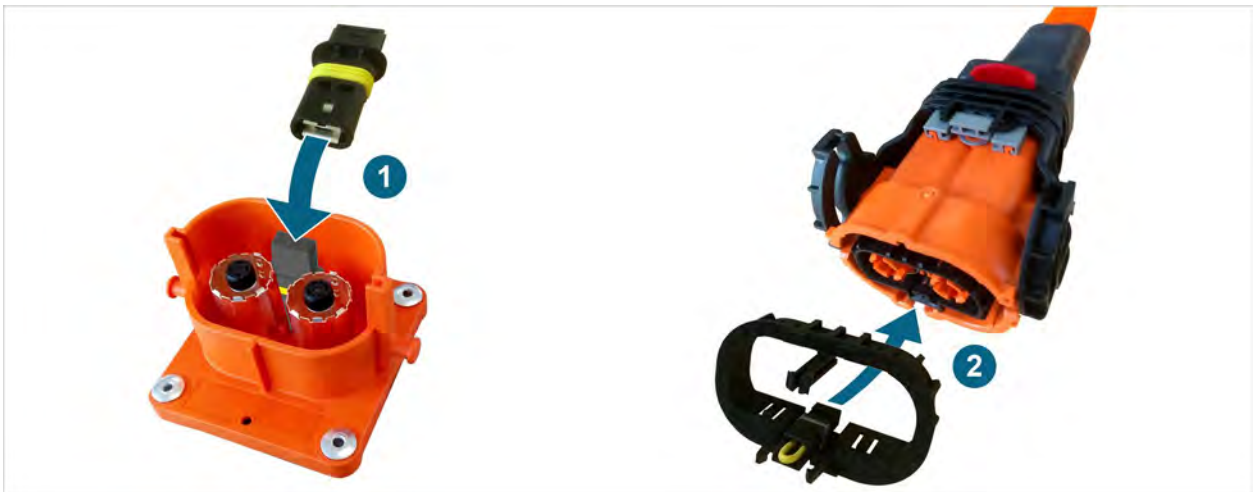
**Risk of explosion due to electric arcs**

When the vehicle-side and battery-side pilot lines are bypassed, the safety relay in the high-voltage battery may sometimes remain closed even when the connection for the high-voltage cables are disconnected. Electric arcs may be produced when disconnecting the connection.

- Never bypass the vehicle-side and battery-side pilot lines at the same time!
- Never disconnect the high-voltage cables when the vehicles have not been properly de-energized!

Depending on the vehicle in question, different bypass plugs are used for the pilot line.

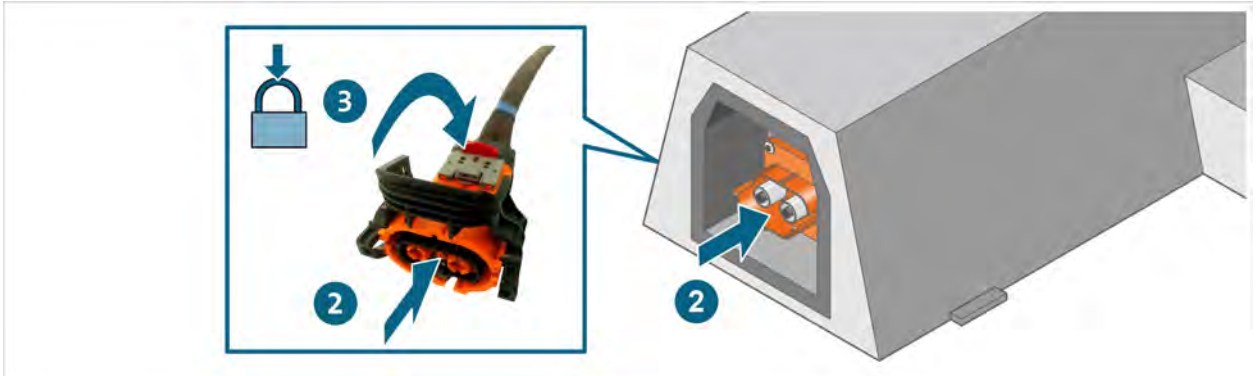
1. Plug the bypass plug into the high-voltage plug for the connection to be bypassed (vehicle model: Volkswagen e-Up!).
2. Plug the bypass plug into the high-voltage socket for the connection to be bypassed (vehicle model: Volkswagen e-Golf). While connecting the bypass plug, ensure that it is aligned correctly.



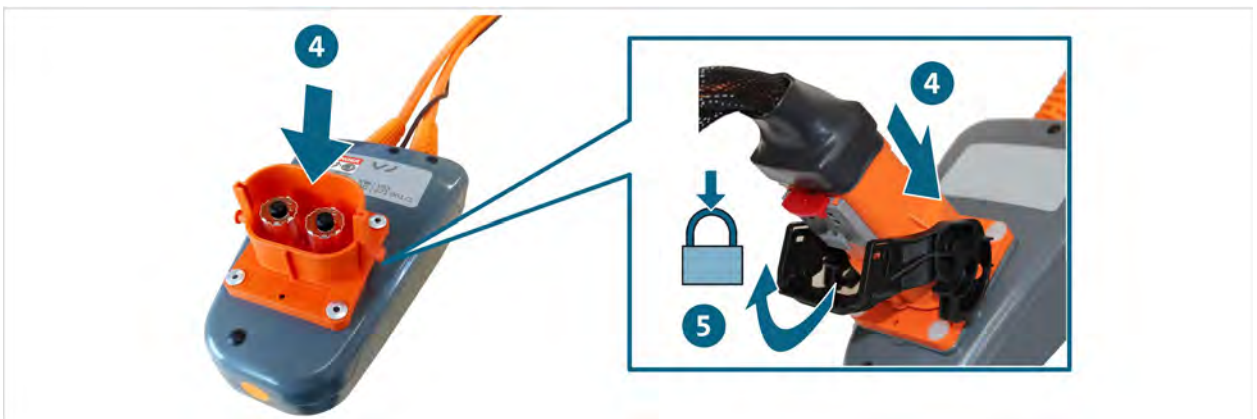
- ✓ The pilot line is bypassed.
- ✓ You can now connect the high-voltage test adapter.

## Connecting the high-voltage test adapter

1. Follow the safety instructions.
2. Connect the socket to the plug on the traction battery.
3. Lock this connection.



4. Connect the vehicle's high-voltage cable to the plug.
5. Lock this connection.

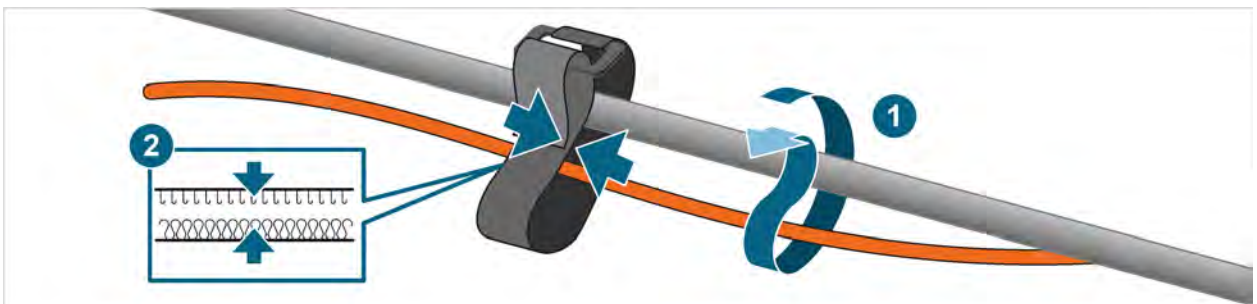


- ✓ The high-voltage test adapter is connected correctly.

## Securing the cables with a hook and loop strap

Several hook and loop straps are included with the product. Use them to secure the cables to the vehicle body parts in regular intervals.

1. Loop the hook and loop strap around the cable to be secured and around a suitable vehicle body part and then thread it through the eyelet at the start of the hook and loop strap.
2. Press the end of the hook and loop strap together with its opposite side.



- ✓ You have secured the cables.
- ✓ You can now perform measurements in accordance with the guided fault finding.

## Detaching the plug connections



### DANGER

**Danger of fatal electric shock**

**Risk of explosion due to electric arcs**

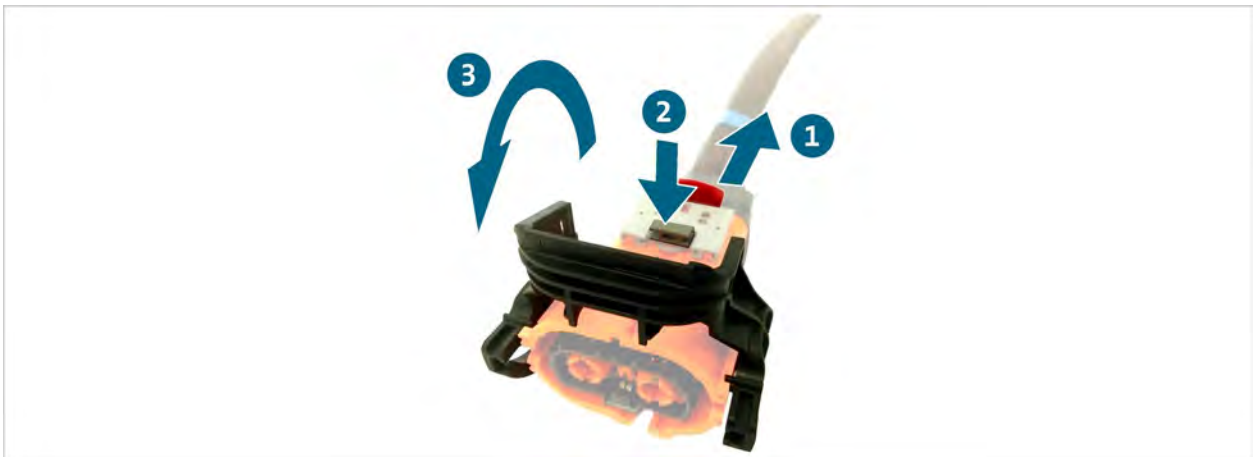
When the pilot line is bypassed, high-voltage cables may still be live even when the connection is disconnected. Electric arcs may be produced when disconnecting the connection.

- Never disconnect the high-voltage cables when the vehicles have not been properly de-energized!

### Detaching the high-voltage plug connection

The plug connections have an automatic locking mechanism. To detach a plug connection:

1. Make sure that the lever (red) is pulled out.
2. Push in and hold the locking mechanism (gray).
3. Swivel the clip (black) upward. This motion pushes the plug connection apart.



- ✓ The plug connection is now detached.

## Detaching the plug connection for the diagnostic cable (21-pin)

The plug connections have a bayonet locking mechanism. To detach a plug connection:

1. Twist the socket housing to unlock the connection.
2. Pull the plug connection apart.



✓ The plug connection is now detached.

## Detaching the plug connection for the diagnostic cable (14-pin)

The plug connections have an automatic locking mechanism. To detach a plug connection:

1. Push in and hold the locking mechanism.
2. Pull the plug connection apart.



✓ The plug connection is now detached.

## Cleaning



### **DANGER**

#### **Danger of fatal electric shock**

The electrical voltage in high-voltage systems is lethal and will cause death by electric shock.

- Disconnect the product from all power sources before cleaning the product!

Observe the safety instructions!

Use only a dry cloth to clean the product.

## Storage

Store and transport the product only in the carrying case (see the “Scope of delivery” section).

## Disposal

Observe the safety instructions!

Always dispose of the product in accordance with all local disposal regulations.

## Maintenance

Observe the safety instructions!

National and local requirements for regular testing must be observed!

Test the product for proper function at intervals of no more than 24 months.

Contact the manufacturer to have a professional function test performed.

## Warranty

STODIA GmbH grants a warranty period of 24 months from the date of purchase. The warranty is valid for demonstrable defects in functional material and workmanship.

Further information on the warranty conditions can be found in the terms and conditions on the manufacturer's website.

## Customer service

Always include the item number and, if available, the serial number with any product queries. Both numbers are found on the product.

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