



B 60 W EP, B 60 W BP

Service Manual



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1 Preface

Good service work requires extensive and practice-oriented training as well as well-structured training materials.

Hence we offer regular basic and advanced training programmes covering the entire product range for all service engineers.

In addition to this, we also prepare service manuals for important appliances - these can be initially used as instruction guides and later on as reference guides.

Apart from this, we also regular information about product enhancements and their servicing.

If you should require supplements, have corrections or questions regarding this document, please address these citing the following subject to:

international-service @de.kaercher.com

Subject: **Fall 114251**

The responsible product specialist will take care of your issue.

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2 Safety instructions

2.1 Hazard levels

△ Danger

Immediate danger that can cause severe injury or even death.

△ Warning

Possible hazardous situation that could lead to severe injury or even death.

Caution

Possible hazardous situation that could lead to mild injury to persons or damage to property.

3 Technical Features

The scrubber vacuum is used for wet cleaning or polishing of level floors.

Working width

B 60 W EP:

- BR version: 450 mm +550 mm
- BD version: 430 mm +510 mm

B 60 W BP:

- BR version: 550 mm +650 mm
- BD version: 550 mm +650 mm
- S65 (Swing)

Filling quantities

- Fresh water tank: 60 l
- Waste water reservoir: 60 l

Drive

Model B 60 W BP is self-moving; the drive motor is powered by four batteries.

Device variants

The scrubber vacuums are offered in the following model series:

- 240 V, 1~, 50/60 Hz
- 24 V DC

Key

KIK System (KÄRCHER INTELLIGENT KEY)

Standby

The control will go to standby after a predefined time period in idle.

- After 30 minutes if no controls are actuated.
- After 10 minutes if RFID is not activated.

The control needs to be switched off and back on again using the programme selector switch.

Maintenance interval display

Maintenance intervals are displayed for the operator at defined times to achieve the best cleaning results.

Display after 10 hours:

- Check the suction lip!
- Clean turbine sieve!

Display after 20 hours:

- Clean the vacuum bar!

Display after 50 hours:

- Clean the fresh water filter!

Display after 100 hours:

- Check the wear on the brush!

after 200 hours:

- Service timer

The display can be reset by pressing the I button.

Chassis

- The chassis is independent of the brush head.
- Innovative control system for even easier operation (KIK-KÄRCHER INTELLIGENT KEY)
- Reduced sound level.
- Colour coding of the control and maintenance elements.

The operating elements for the cleaning process are yellow.

The controls for the maintenance and service are light gray.

Suction turbine

Encapsulated quiet turbine.

Wastewater reservoir

- Wastewater reservoir rinsing system
- Coarse dirt sieve
- Tank closure venting function

Vacuum bar

The following vacuum bars are available:

Straight length suction bars

- 850 mm
- 940 mm

Curved length suction bars

- 850 mm
- 940 mm

Floor head quick exchange system

- Simple - no tools required
- The following brush heads are available:

B 60 EP:

D51

R55

B 60 BP:

D 55 + D 65

R 55 + R 65

S 65 (Swing) to remove and grind polymer coatings.

Brush contact pressure

The brush contact pressure can be set as required.

Floor head drive

- With model B 60 W, both brushes rotate in the same direction.

Charger

- All battery-powered scrubber vacuums are equipped with a charger with a wide-range voltage power supply (100-240 V 50-60 HZ).
- The charger parameters can be adapted to the integrated battery.

Battery

- The package appliances are also equipped with batteries.
- The appliances can be operated with 105 Ah, 170 Ah and 180 Ah batteries

Homebase System

- Different options are offered, i.e. to carry a mop, cloths and detergent bottles with you.

Auto Fill-In

- Automatic fresh water tank fill.

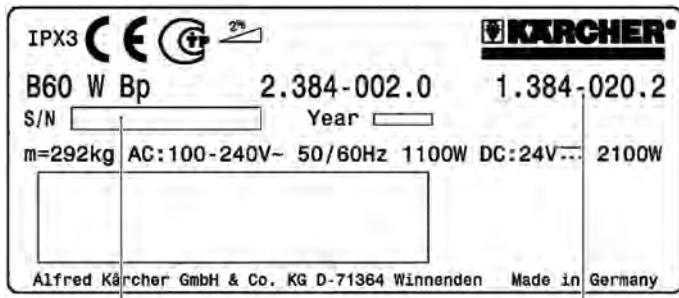
3.1 Type plate

The type plate shows whether the appliance was configured or confectioned.

Type plate configured

The appliance was manufactured in the plant according to customer specifications.

The part number is issued automatically during the configuration process.



1

1 Serial number

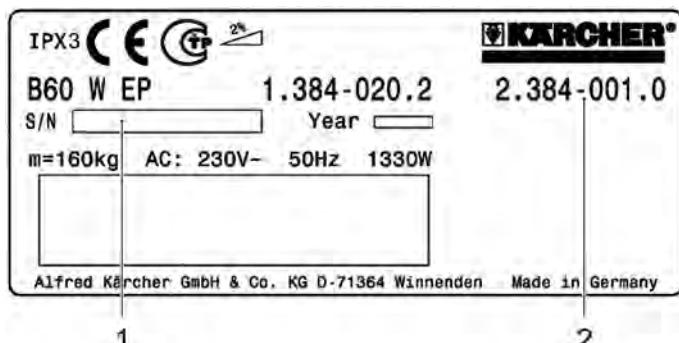
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2 Part number

The serial number refers to the part number 1.384-020.2.

Type plate confectioned

The appliance consists solely of a rump unit. The appliance can be assembled with the different assemblies on site.



1

1 Serial number

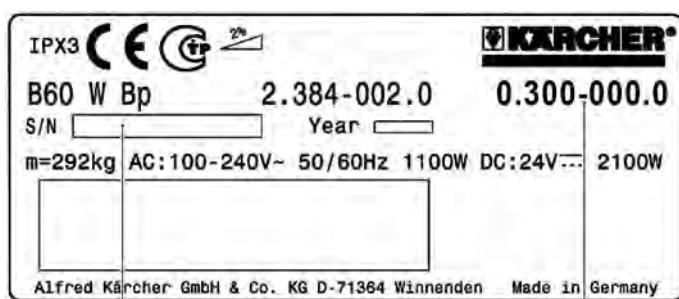
2

2 Part number

The serial number refers to the part number of the rump unit 2.384-001.0.

Type plate material model

Complete appliances as requested by the market are preproduced under this part number.



1

1 Serial number

2

2 Part number

The serial number refers to the part number 0.300-000.0.

The part number 0.3xx-xxx.x and the serial number S/N are required for technical enquiries.

DISIS

Base appliance 2.xxx-xxx.x must be entered into the search box of the DISIS.

4 Parts of the system

4.1 Front view



- | | |
|---|--------------------------------|
| 1 Cover dirt water reservoir | 15 Vacuum bar |
| 2 Detergent hose | 16 Fresh water tank |
| 3 Cleaning agent container | 17 Lid cap |
| 4 Fresh water reservoir filler neck | 18 Strip to attach accessories |
| 5 Brush head suspension | 19 Handle with travel switch |
| 6 Brush head (BR model) | |
| 7 Scraper roller | |
| 8 Water distribution bar | |
| 9 Brush roller holder | |
| 10 Unlocking device for brush roller holder | |
| 11 Cover, drive belt | |
| 12 Dirt receptacle | |
| 13 Drive wheel | |
| 14 Steering roller | |

4.2 Rear view

4.2.1 B 60 W BP



- | | |
|---|--|
| 1 Info button | 16 Suction hose |
| 2 Display | 17 Suction lips |
| 3 Travel switch, forward/reverse (B 60 W BP)
Safety switch (B 60 EP) | 18 Support roller, vacuum bar |
| 4 Program selection switch | 19 Vacuum lip mounting |
| 5 Operator console | 20 Scraper roller |
| 6 Cable hook, rotating | 21 Star handle screw |
| 7 Lever to raise and lower the vacuum bar | 22 Star handle screw for adjusting the height of the
vacuum bar |
| 8 Mains cable of charger | 23 Rotary handle to incline the vacuum bar |
| 9 Auto Fill-In | 24 Fresh water hose |
| 10 Fresh water level display | 25 Screw-on lid, fresh water drain with sieve |
| 11 Electronics cover | 26 Tank lock |
| 12 Cable hook, rotating | 27 Dirt water drain hose |
| 13 Pedal for brush contact pressure | 28 Rotating button for drive speed |
| 14 Pedal for raising/lowering the brush head | 29 Intelligent Key |
| 15 Wing screw of suction bar support | |

4.2.2 B 60 W EP



- 1: Fuse, brush motor (7A)
- 2: Safety switch
- 3: Water volume dosing valve
- 4: Program selection switch
- 5: Auto Fill-In
- 6: Suction bar lift
- 7: Fresh water level display
- 8: Electronics cover
- 9: Pedal for brush contact pressure
- 10: Pedal for brush head lift
- 11: Support roller, vacuum bar
- 12: Wing screw of suction bar support
- 13: Suction hose
- 14: Suction lips
- 15: Vacuum bar
- 16: Star handle screw for adjusting the height of the vacuum bar
- 17: Vacuum lip mounting
- 18: Deflector

- 19: Star handle screw
- 20: Screw-on lid, fresh water drain with filter sieve
- 21: Cable hook, rotating
- 22: Power cord
- 23: Dirt water drain hose

4.3 Inside view

Swivel the tank upward

Caution

The appliance can tip over backwards if no brush head is installed.

Push the appliance forward about 2 m so that the steering rollers point toward the rear.

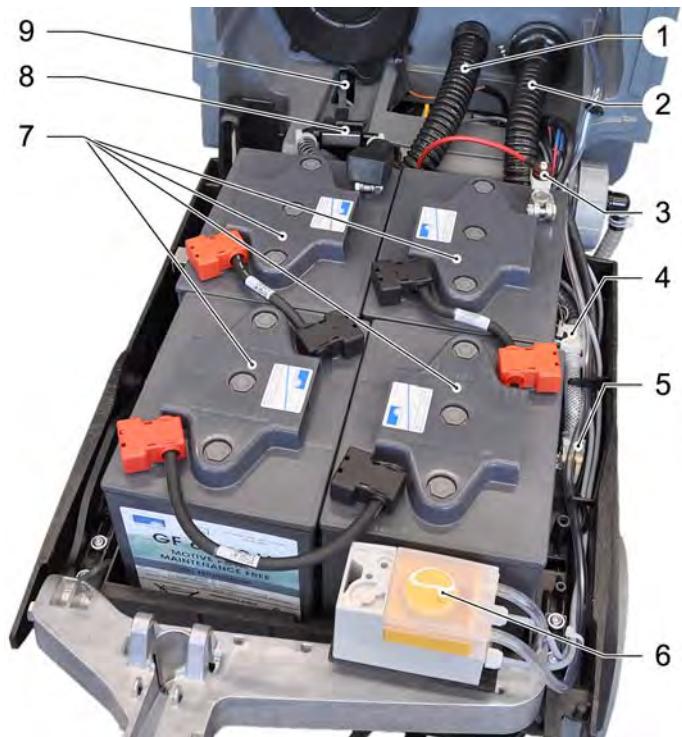


- 1 Tank lock
- 2 Tank fuse
- 3 Screw
- Loosen screws.
- Remove the tank fuse.



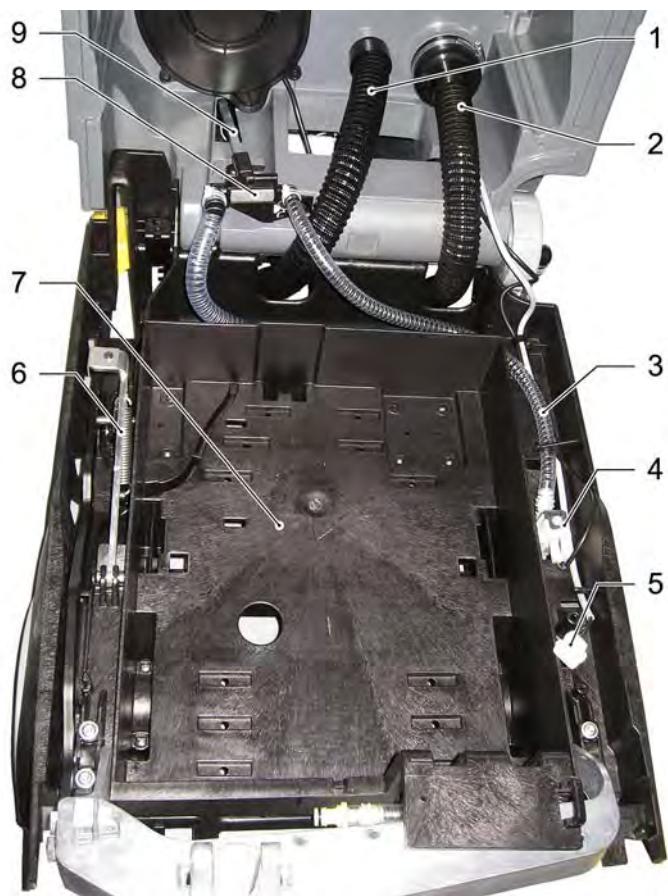
- 1 Tank lock
- Pull the tank release out.
- Swivel the tank upward.

4.3.1 Bottom part of B 60 W BP

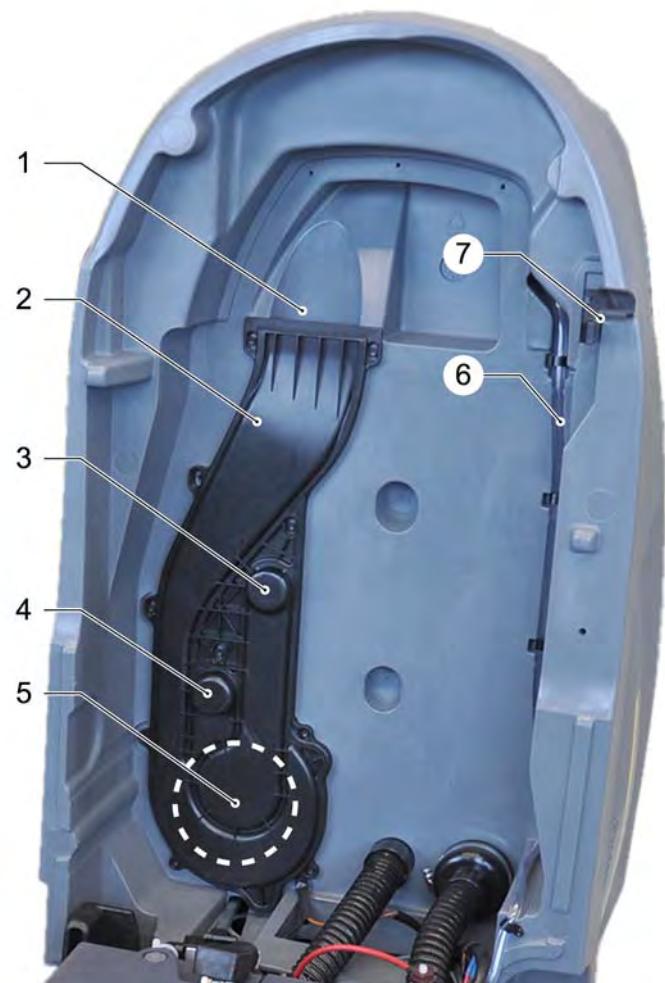


- 1 Suction hose
- 2 Dirt water drain hose
- 3 Battery pole fuse
- 4 Flowmeter
- 5 Solenoid valve
- 6 Detergent dosing pump (DOSE)
- 7 Battery set
- 8 Water volume dosing valve
- 9 Square to the regulating knob for water volume

4.3.2 Bottom of B 60 W EP



4.3.3 Top of appliance



- 1 Suction hose
- 2 Dirt water drain hose
- 3 Hose to the brush head
- 4 Water dosing valve
- 5 Plug
- 6 Pedal for brush head lift
- 7 Space for weights
- 8 Water volume dosing valve
- 9 Square to the regulating knob for water volume

- 1 Wastewater tank exhaust air outlet
- 2 Suction channel cover
- 3 Cooling air inlet, suction turbine motor
- 4 Cooling air outlet, suction turbine motor
- 5 Suction turbine
- 6 Detergent hose
- 7 Locking the tank

4.3.4 Wastewater reservoir



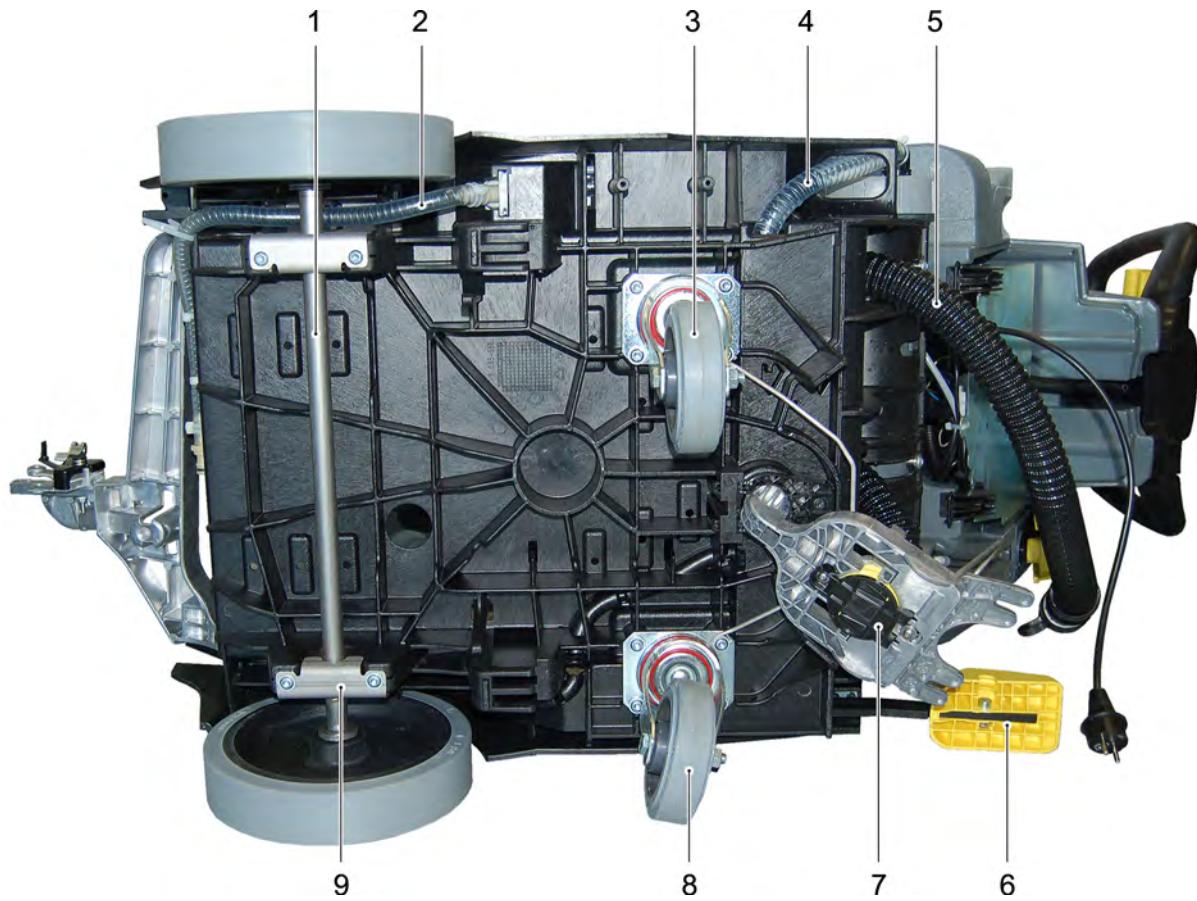
- 1 Wastewater stub
 - 2 Coarse dirt sieve
 - 3 Dirt water reservoir
 - 4 Fluff filter
- Suction turbine air channel



- 1 Seal of cover of wastewater reservoir
- 2 Nozzles
- 3 Opening in suction channel, connection for air channel of suction turbine
- 4 Fluff filter
- 5 Float
- 6 Hose ring
- 7 Protective cover

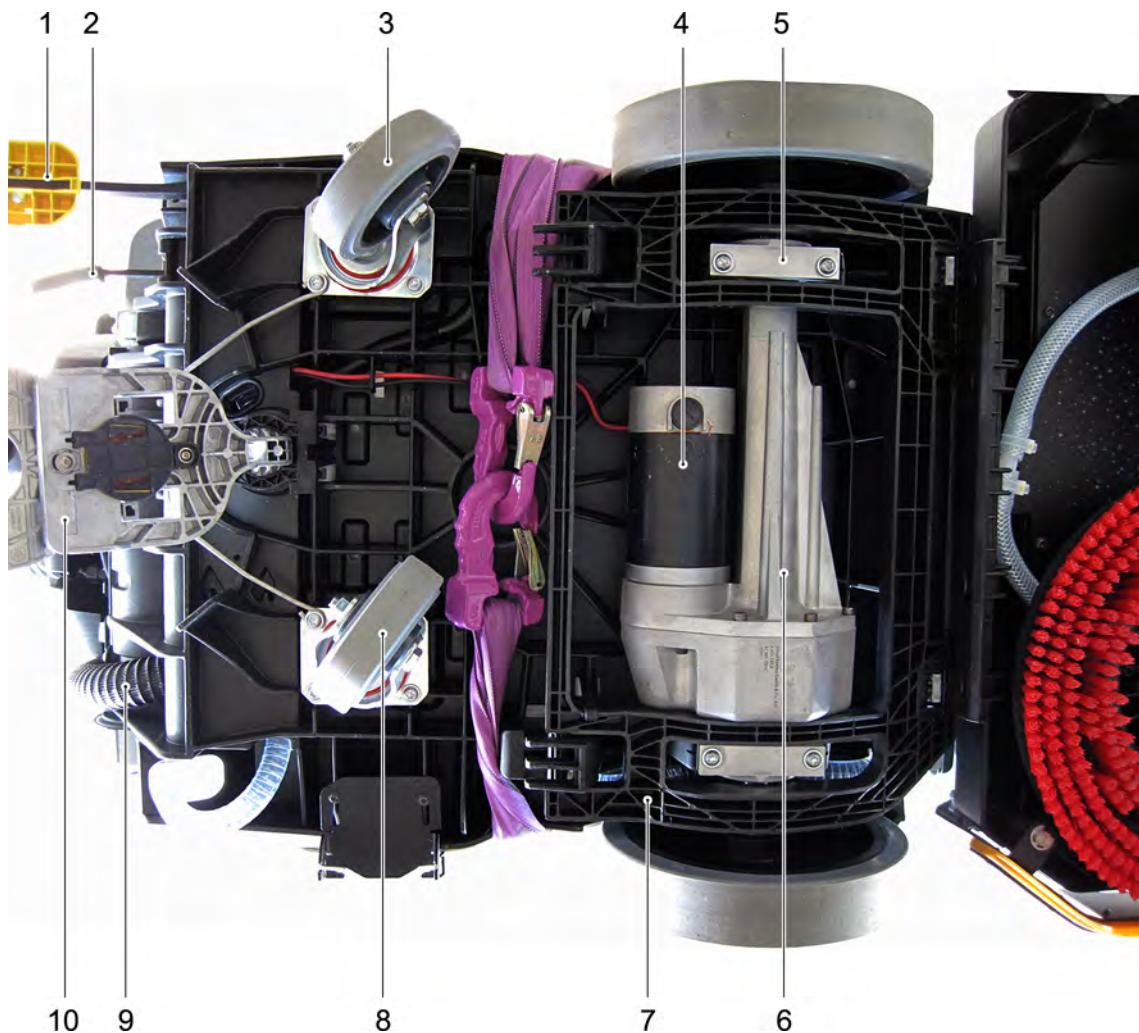
4.4 Bottom view

4.4.1 B 60 W EP



- 1 Axle
- 2 Fresh water hose
- 3 Steering roller, left
- 4 Fresh water hose
- 5 Dirt water drain hose
- 6 Pedal for brush head lift
- 7 Vacuum bar mount
- 8 Steering roller, right
- 9 Axle mount

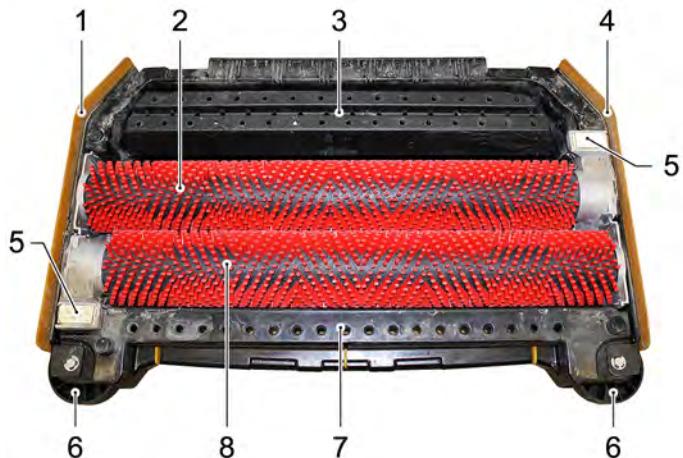
4.4.2 B 60 W BP



- 1 Pedal for brush head lift
- 2 Pedal for brush contact pressure
- 3 Steering roller, right
- 4 Drive motor
- 5 Axle mount
- 6 Gear axle
- 7 Push rod, brush head
- 8 Steering roller, left
- 9 Dirt water drain hose
- 10 Vacuum bar mount

4.5 Brush heads

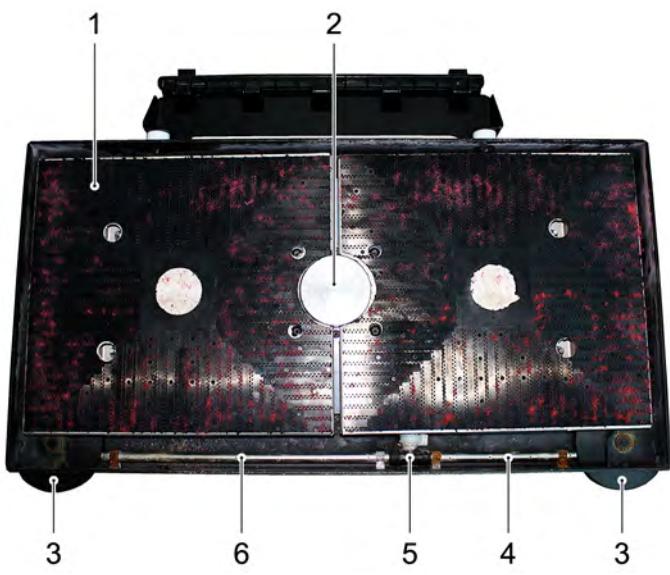
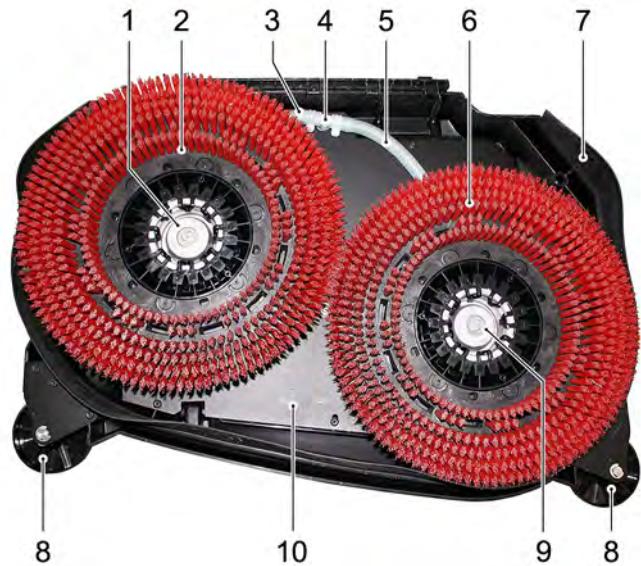
4.5.1 BR cleaning head EP model



4.5.3 S 65 (Swing)



4.5.2 BD cleaning head



- 1 Pick-up, grinding pad
- 2 Eccentric
- 3 Scraper roller
- 4 Water distributor pipe, right
- 5 T-piece
- 6 Water distributor pipe, left

4.6 Accessories



1 Basket

To carry detergent bottles and cleaning supplies.



1 Clip

To attach broom and mop.

2 Hook

To hang up cleaning accessories.

3 Hook

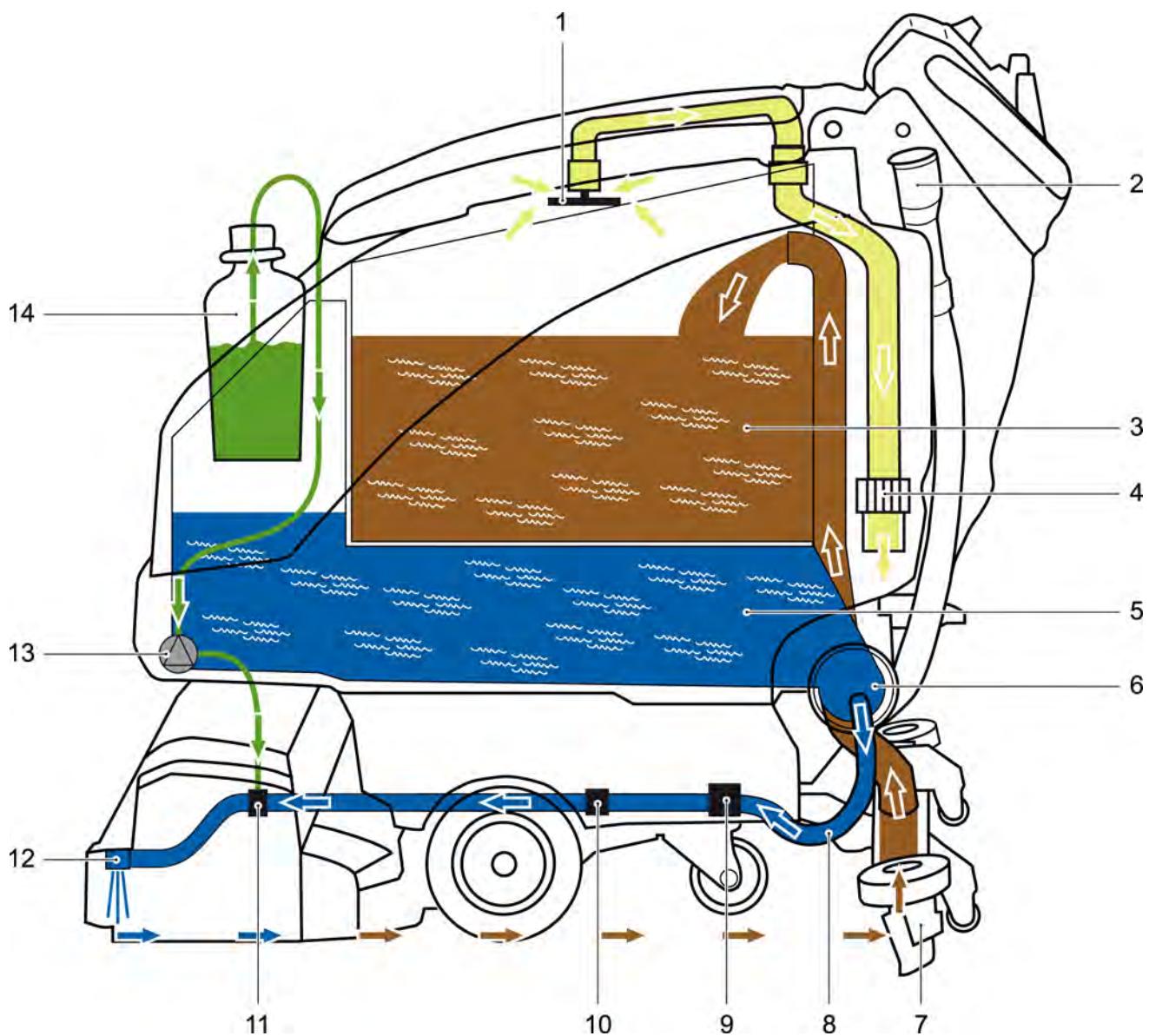
To hang up cleaning accessories.



Homebase - application example

5 Function

5.1 Functional diagram



- 1 Float
- 2 Dirt water discharge hose
- 3 Dirt water reservoir
- 4 Suction turbine
- 5 Fresh water tank
- 6 Screw-on lid, fresh water drain with filter sieve
- 7 Vacuum bar
- 8 Fresh water hose
- 9 Water volume dosing valve
- 10 Flowmeter
- 11 Detergent injector
- 12 Water distribution bar
- 13 Detergent dosing (DOSE)
- 14 Cleaning agent container

5.2 Operator console

5.2.1 B 60 W BP



- 1 Info button
- 2 Display
- 3 Drive switch, forward/reverse
- 4 Program selection switch

5 Polishing mode

Polishing the floor without the application of liquid.

6 Vacuum mode

Suck in the dirt fleet.

7 Intense mode

Wet clean the floor and allow the detergent to react.

8 Normal mode

Wet clean the floor and vacuum up dirt water.

9 Eco mode

Wet clean the floor (with reduced brush speed) and vacuum up wastewater (with reduced suction and reduced suction force).

10 Transport mode

Driving to the Place of Use.

11 OFF

Device is switched off

12 Rotating button for drive speed

13 Intelligent Key

Info button

In connection with the grey and red intelligent keys, the info button can be used to access menus and appliance settings. You can set different adjustments on the appliance, depending on the use and the conditions on site. Depending on the access rights, appliance-specific data can be shown.

Display

The display will show all menus and appliance settings that were retrieved via the info button, as well as the battery status, fault messages and maintenance interval information.

Drive switch

You can use the drive switch to select the driving direction. By pressing your thumb on the top tilting section of the drive switch, you will drive the appliance forward. If you pull on the top tilting section, the appliance will move backwards. The drive speed is regulating by the force of pressure on the switch.

Program selection switch

The appliance is switched on and off by rotating the programme selector switch and the different cleaning programmes can be selected.

Rotary knob for drive speed

You can use the rotary knob for drive speed, you can steplessly adjust the maximum speed, which the appliance is to drive during its use.

Battery balance



The balance indicates mandatory information regarding the existing battery power. The battery indicator shows the available battery capacity, which is calculated from the supplied power of the battery charger to the battery and the power consumed by the battery.

The battery balance is shown as bars and the last 2 minutes in minute steps.



If the battery of the appliance is disconnected and re-connected, the battery indicator shows the battery voltage. This can be read by the dot next to the letter F.

This display is less accurate and is calculated from the battery voltage. After the empty battery is completely charged, the battery indicator will display the battery balance once again.

5.2.2 B 60 W EP



- 1 Operator console
- 2 Overload fuse on brush motor
- 3 Safety button
- 4 Program selection switch

5 Polishing mode

Polishing the floor without the application of liquid.

6 Vacuum mode

Suck in the dirt fleet.

7 Intense mode

Wet clean the floor and allow the detergent to react.

8 Normal mode

Wet clean the floor and vacuum up dirt water.

9 OFF

Device is switched off

Overload fuse on brush motor

The overload fuse of the brush motor is triggered, when the brush motor is overloaded and blocked.

The fuse can be reset by pushing it.

Safety button

The brush motor is switched on in the cleaning programme when the safety switch is pushed to the front/rear.

Program selection switch

The appliance is switched on and off by rotating the programme selector switch and the different cleaning programmes can be selected.

5.2.3 Programme settings

- | | |
|--|--|
| | Programme selection switch position "OFF".
The appliance is switched off. |
| | Programme selector switch position "Transport mode" - driving.
Drive the appliance to the work site.
Cleaning programmes are not active. |
| | Programme selector switch position "Eco mode" - wet cleaning the floor and vacuuming up the wastewater.
In Eco mode, the current pickup on the brush motor and the suction turbine is reduced.
The brushes rotate; water is dispensed to the brushes according to the setting. Suction turbine is running. |
| | Programme selector switch position "Normal mode" - wet cleaning the floor and vacuuming up the wastewater.
The brushes rotate; water is dispensed to the brushes according to the setting. Suction turbine is running. |
| | Programme selector switch position "Intense mode" - wet cleaning the floor and allow the detergent to react.
The brushes rotate; water is dispensed to the brushes according to the setting. |
| | Programme selector switch position "Vacuum mode" - vacuum dirt.
Suction turbine is running. |
| | Programme selector switch position "Polish mode" - polishing the floor without the application of liquid.
Brushes rotate without water. |

5.3 Intelligent Key

User-specific releases are saved in the intelligent key. The appliance can only be put into operation after the intelligent key has been inserted. There are three different key types with different colours and their corresponding user groups.

Key colour	User group
Yellow	Operator
Grey	Supervisor / Facility Manager (M)
Red	Service technician (S)

5.3.1 Yellow intelligent key



Appliance functions cannot be modified. The user can work with preset programmes at the start of his day via programme selector switches. No adjustment possibility.

5.3.2 Grey Intelligent Key



The Supervisor/Facility Manager can define access rights/releases of appliance functions for the yellow user key.

The Supervisor/Facility Manager has access to almost all relevant appliance functions, but not to service parameters.

5.3.3 Red intelligent key



The service technician has access to all parameters and appliance functions.

The service technician can also issue rights for the yellow user key.

Note

There is a description of the software and parameters at the end of the service manual, following the circuit diagrams.

Note

If two intelligent keys are used at the same time, faults can be caused in the control electronics. Always use the intelligent keys individually.

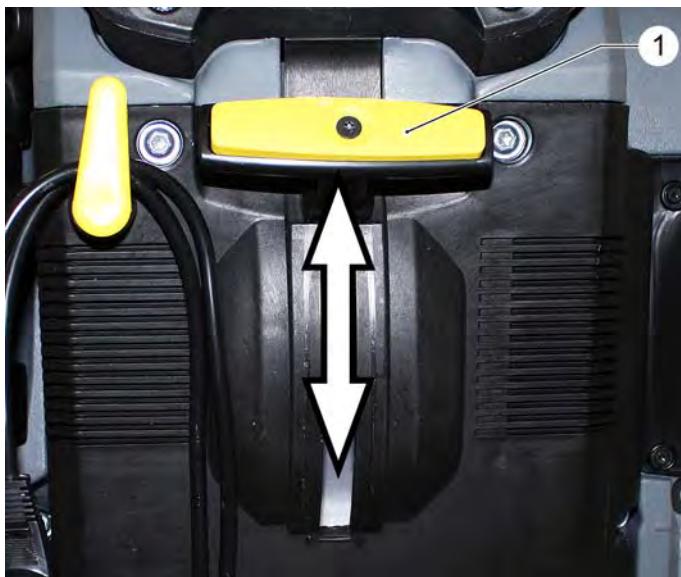
5.4 Water volume dosing



- 1 Setting range
- 2 Max. water volume
- 3 Rotary knob, water volume setting
- 4 Min. water volume

The water volume to be routed to the brush head for cleaning is adjusted via the rotary knob of the water volume dosing valve.

5.5 Raise/lower vacuum bar



- 1 Lever to raise and lower the vacuum bar

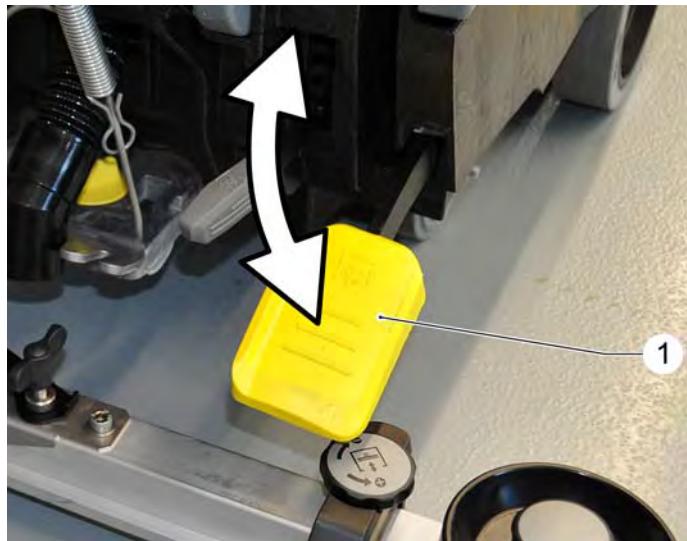
Lower the vacuum bar

Pull the lever to raise and lower the vacuum bar back slightly and then release downwards.

Raise the vacuum bar

Pull the lever to raise and lower the vacuum bar up and lock.

5.6 Raise/lower brush head



- 1 Pedal for brush head lift

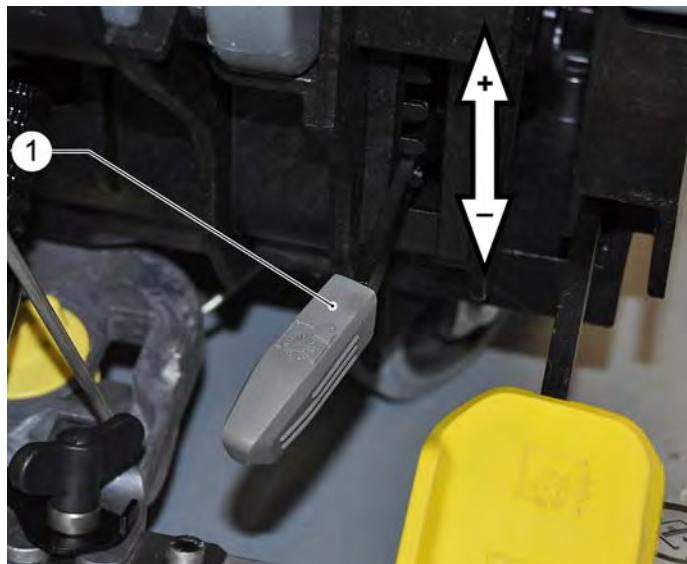
Lower the brush head

Press the brush head lift pedal downward and slightly towards the left. Release the pedal slowly upwards.

Raise the brush head

Press the brush head lift pedal downward and slightly towards the right. Let the pedal lock in on the left, then take foot off pedal.

5.7 Adjusting the brush contact pressure



- 1 Pedal for brush contact pressure

Increase contact pressure.

Press the brush head lift pedal slightly towards the right. Release the pedal slowly upwards and lock it toward the left when the desired setting is reached.

Reduce contact pressure.

Press the brush head lift pedal slightly towards the right. Press the pedal downward and lock it towards the left when the desired setting is reached.

5.8 Auto Fill-In



1 Connection of water supply hose

2 Safety overflow

For the quick filling of the fresh water tank.

If the automatic shut-off does not react, the water will flow out of the safety overflow.

→ Connect the water hose with the quick coupling.

→ Open the water tap.

The fill process stops automatically as soon as the tank is full.

→ Turn off tap.

→ Pull off the water hose.

Function

The water will run into the tank via the quick coupling and the water filter through the valve.

Here, the water flows through the small diaphragm bore, pushes the diaphragm back at the same time and opens the valve.

The float is pressed upwards once the fresh water tank is full.

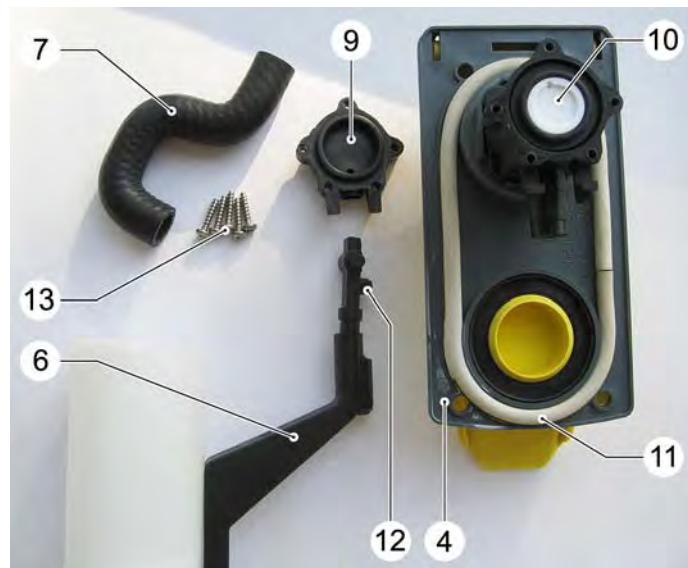
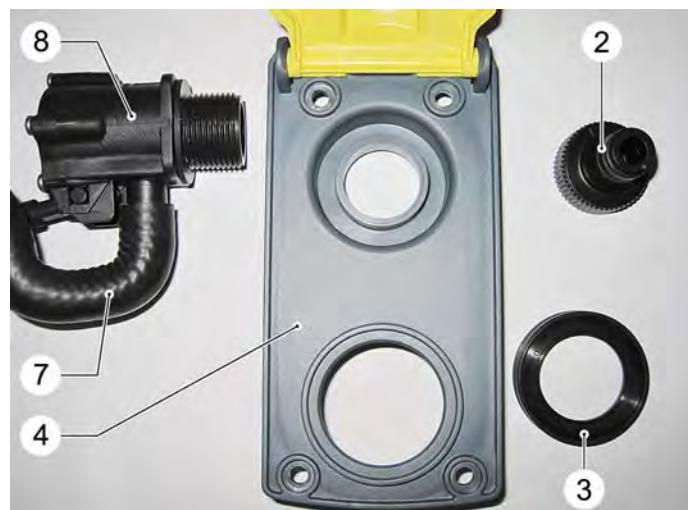
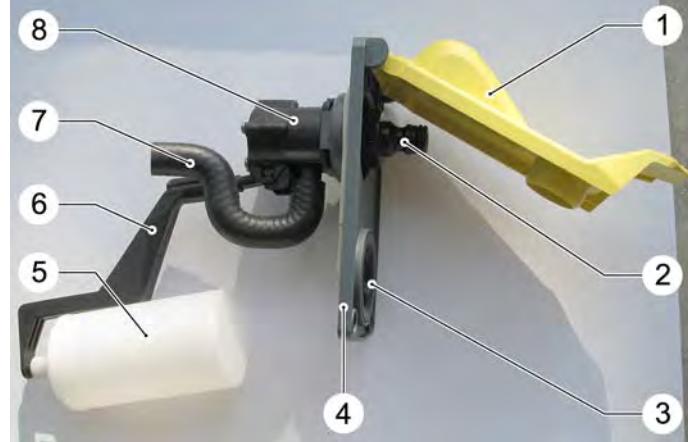
After the seal of the float linkage closes the outlet opening, a stronger water pressure builds up behind the diaphragm and closes the valve.

Note

If the form hose is not installed, water will spray out of the safety overflow opening during the tank filling process.

Notes regarding removal

- The water filter cannot be replaced.
- The cover is clamped on and can be pushed out.
- The seal of the safety overflow can be pushed out of the front plate.
- The O-ring seal can be taken out of the front plate.





- 1 Cover
- 2 Quick coupling
- 3 Seal of safety overflow
- 4 Front plate
- 5 Float
- 6 Float linkage
- 7 Form hose
- 8 Valve
- 9 Cover
- 10 Diaphragm
- 11 O-Ring
- 12 Seal of float linkage
- 13 Screws
- 14 Water filter

5.9 Fresh water drain



- 1 Screw-on lid, fresh water drain with filter sieve
 - 2 Fresh water hose
- Large fresh water drain for a quick drain of the fresh water tank. If needed, you can use the water hose to rinse the fresh water tank via the large opening.



1 Filter sieve

In order to protect all components from contamination, there is a filter sieve installed between the tank and the screw-on lid.

5.10 Tank lid ventilation system

To ventilate and dry out the wastewater tank.



1 Lid cap

2 Intake

→ To ventilate the tank, press the lid lock toward the inside and insert it into the pick-up.

5.11 Tank rinsing system



- 1 Hose connection
- 2 Protective cover
- 3 Hose ring
- 4 Nozzles

Note

The protective cap prevents wastewater from entering the tank rinse system.

If the protective cap is not attached to the hose coupling, it will function as a spacer between the tank and the lid during tank rinsing.



- 1 Protective cover
- 2 Water pipes

The wastewater tank is cleaned after the cleaning process via the nozzle system.

- Remove the protective cap.
- Connect the water hose via the quick coupling.
- Place the wastewater drain hose over a suitable drain and open the locking cap.
- Open the water tap and rinse the tank.

5.12 Suction turbine



- 1 Suction turbine

The suction turbine has a trailing time of 5 seconds after the programme selector switch has been set to a programme without suctioning.

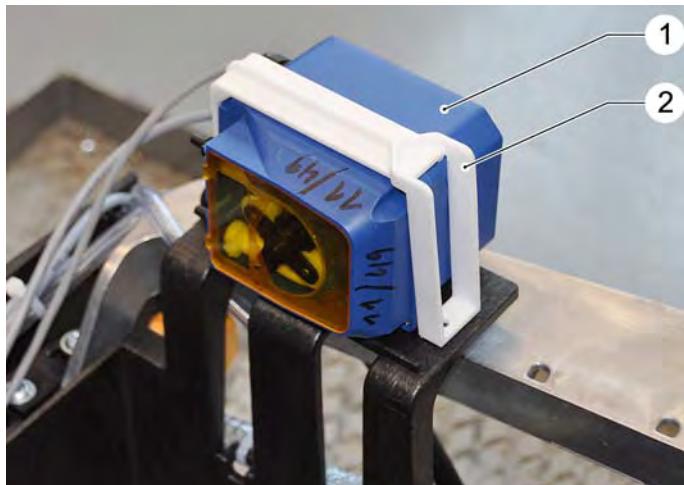
5.13 Charger control electronics



- 1 Charger
- 2 Ground point
- 3 Relay
- 4 Connecting cable for charger
- 5 Control electronics

The charger is controlled by the control electronics. The necessary charger parameters for the built-in battery are selected in the control electronics.

5.14 Acuation of detergent dosing



B 60 W EP

1 Detergent dosing pump (DOSE)

2 Holding bow

The detergent dosing is actuated from 0.....3% in 0.5% increments as per the set up dosing.

The actuation is running if:

- the brush is running,
- there is water flow,
- the dosing is set up.

6 Basic settings and service procedures

⚠ Danger

Risk of injury! Before working on the appliance, remove the Intelligent Key and the mains plug of the charger.

Drain and dispose of the dirt water and the residual fresh water.

⚠ Risk of electric shock

Switch the appliance off and unplug the mains plug prior to performing any service work.

With battery-operated appliances, disconnect the battery at the negative terminal.

6.1 Replace the fuse



- 1 Wrench
- 2 Nut with flange
- 3 Positive cable
- 4 Fuse F1 (125 A)

Note

Press the positive cable against the nut with flange while unscrewing the nut. The flange must not be damaged, as this would render the fuse useless.

→ Tilt the tank rearward.

→ Unscrew the nut.

→ Remove the positive cable.

→ Replace the fuse.



- 1 Nut with flange
- 2 Fuse F1 (125 A)

6.2 Operator console

6.2.1 Replace the programme selector switch



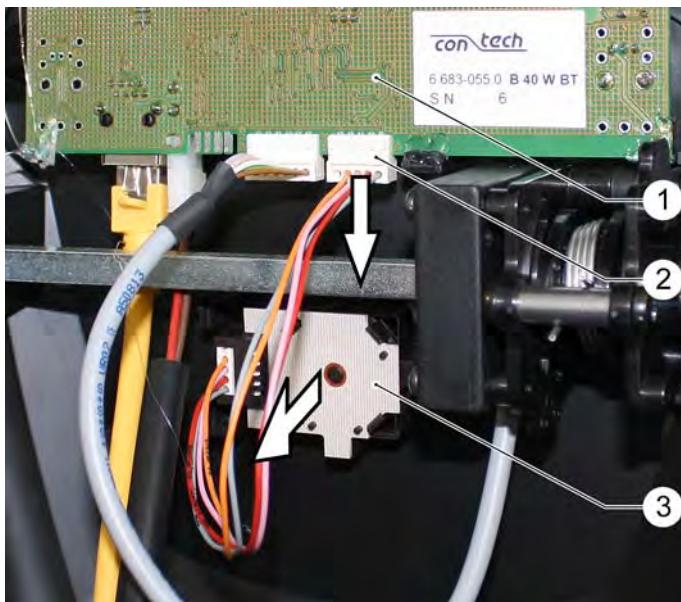
- 1 Rotary knob, programme selector switch
 - 2 Screws, operator console
- Pull off the rotary knob of the programme selector switch.
→ Loosen screws.



- Unscrew the screws on the left and right side of the control panel.
→ Tilt the operating panel forward.



- 1 Screws, casing halves of the control panel
→ Loosen the screws and separate the casing halves.

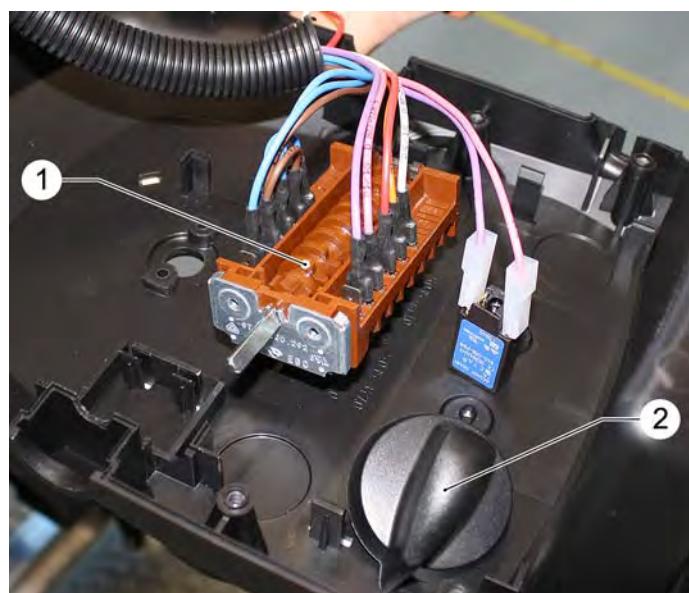


Programme selector switch B 60 W BP

- 1 Operating panel board
2 Plug, programme selector switch
3 Program selection switch
→ Pull out the plug on the printed circuit board on the operating panel and remove the programme selector switch.



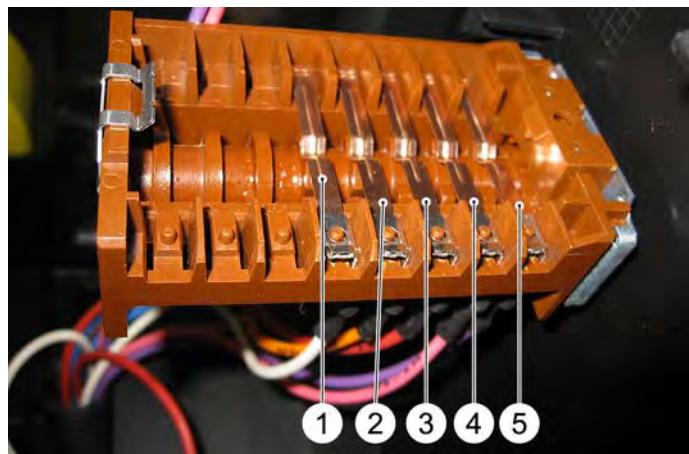
- 1 Screws, programme selector switch
→ Loosen screws.



Programme selector switch B 60 W EP

- 1 Program selection switch
2 Rotary knob, programme selector switch
→ Pull the plug from the programme selector switch.

6.2.2 Check the programme selector switch contacts



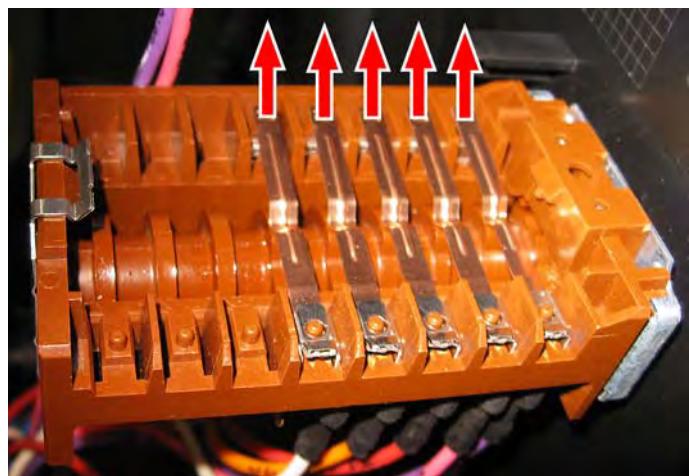
- 1 Contact suction turbine
- 2 Contact suction turbine
- 3 Contact solenoid valve
- 4 Contact brush motor
- 5 Contact brush motor

- Perform a visual inspection of the contacts.
The contacts of the programme selector switch must be clean.
- If the contacts are burnt, the programme selector switch must be replaced.

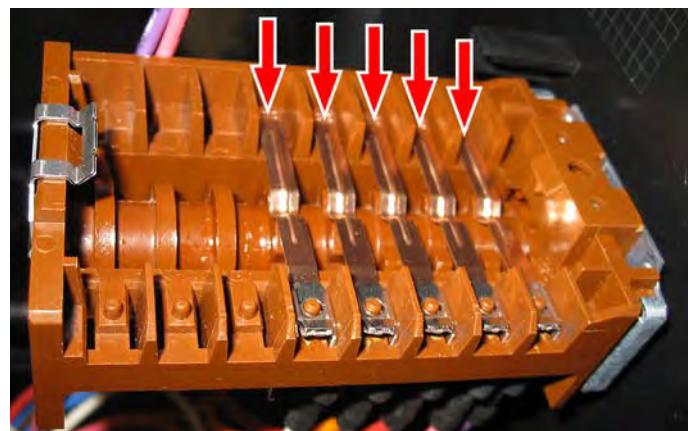
6.2.3 Contact settings in the programme selector switch

The arrows show the respective setting of the contacts when a certain programme selector switch setting is chosen:

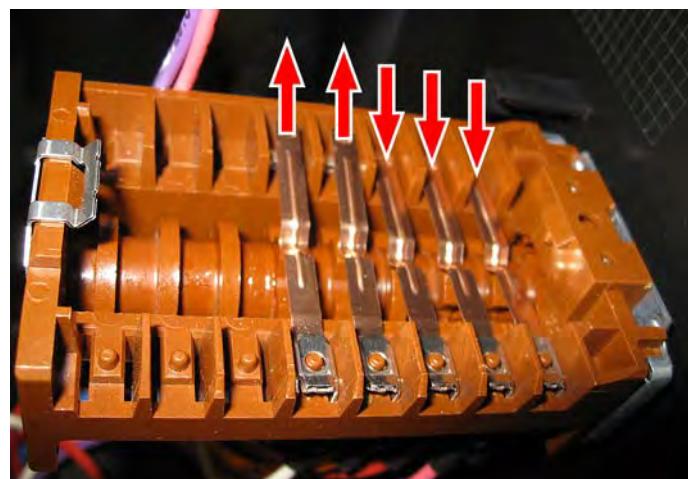
→ OFF



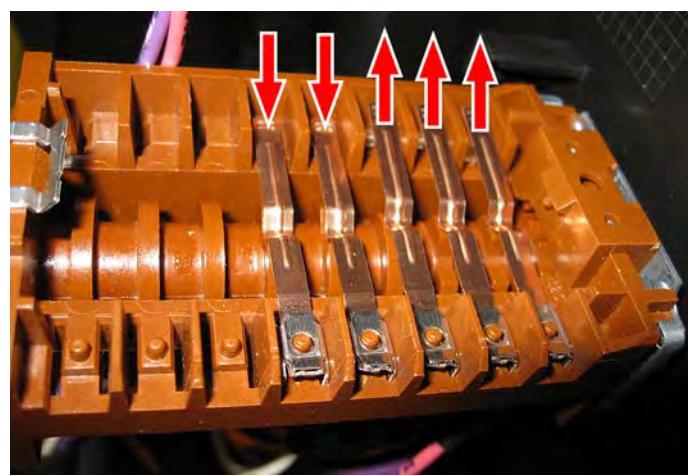
→ Normal mode



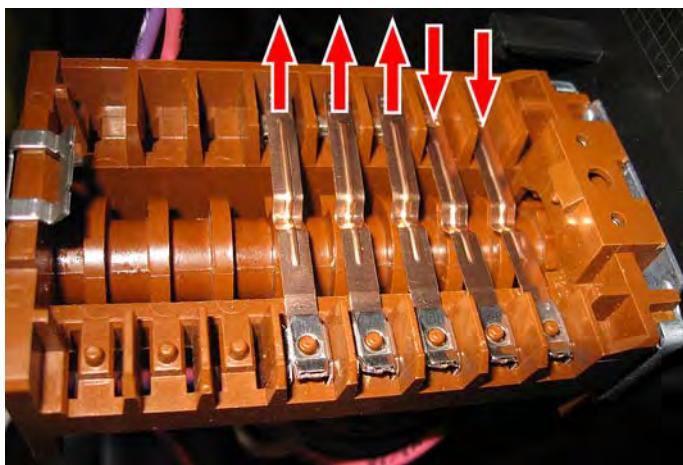
→ Intense mode



→ Vacuum mode



→ Polishing mode



6.2.4 Check the programme selector switch



1 Program selection switch

2 Resistance measuring gauge

3 Plug

→ Connect the resistance measurement device to the plug connections of the respective coloured cables.

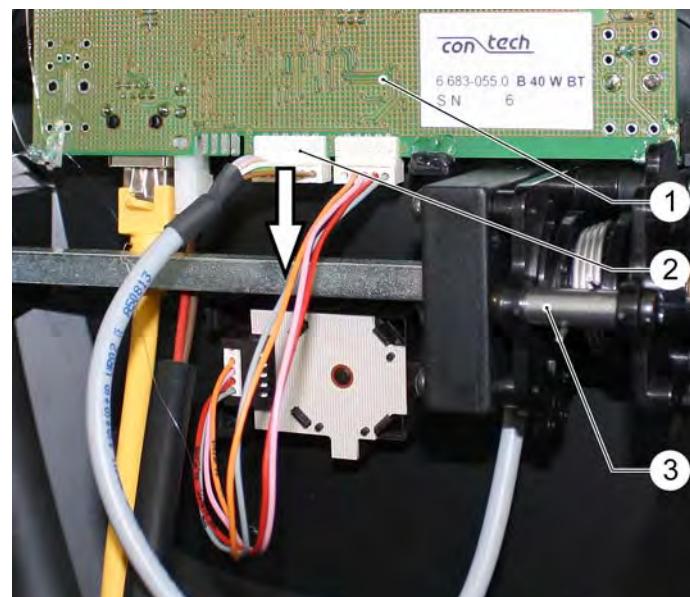
See table below.

B 60 W BP, with traction motor

Switch setting	Resistance measurement between		Nominal value in Ohm
OFF	grey		—
Driving	grey	pink	<50
Eco operation	grey	pink orange	<50
Wet clean and vacuum up wastewater	grey	orange	<50
Wet cleaning	grey	orange red	<50

Switch setting	Resistance measurement between		Nominal value in Ohm
Vacuum the wastewater	grey	pink red orange	<50
Polishing	grey	red pink	<50
Free switch setting	grey	red	<50

6.2.5 Check the travel switch (B 60 W BP)



1 Operating panel board

2 Plug, drive switch

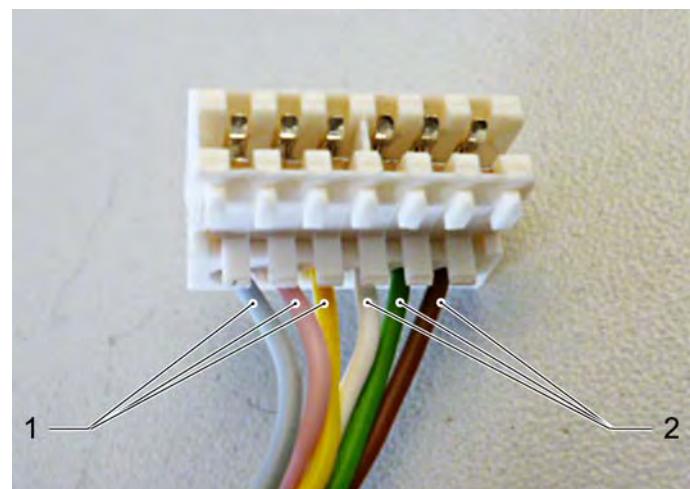
3 Drive switch

Note

The potentiometer is tested in debug mode or with the measuring gauge on the operator panel board.

→ Open the operating panel.

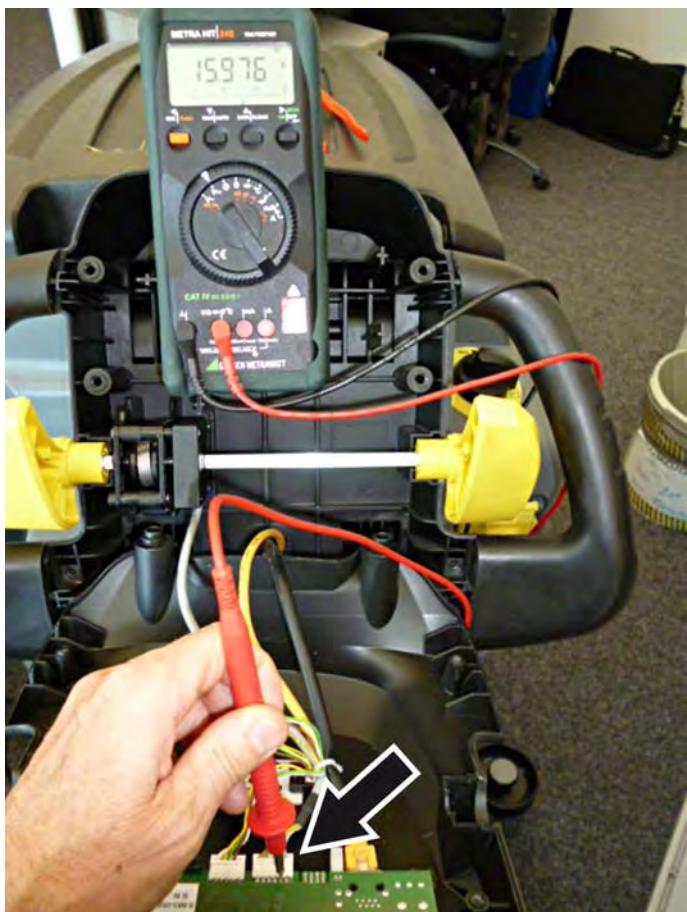
→ Pull out the plug on the control panel board.



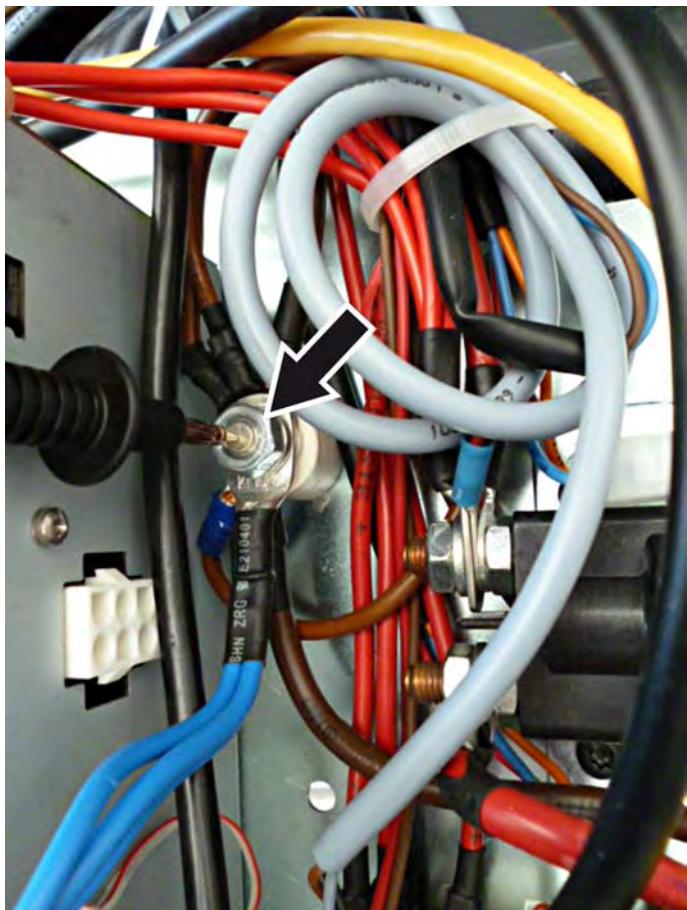
1 Travel direction switch forward/reverse (grey, pink, yellow)

2 Speed (white, green, brown)

Check the travel switch.



Control panel board plug terminal X3



Control electronics negative point

→ Turn the device on and set it to transport mode.

Measur- ment be- tween the negative point and ...	Note / switch position	Result in VDC
pink	Unplug the plug for the travel switch from the control panel board and measure on the pink plug terminal X3 of the control panel board.	~ U/batt negative 1 V
pink	Leave the travel switch plug on terminal connector X3 of the control panel board in place.	~ 15 V

Conduct all subsequent measurements with the plug in place.

→ Plug in the travel switch plug on terminal connector X3 of the control panel board.

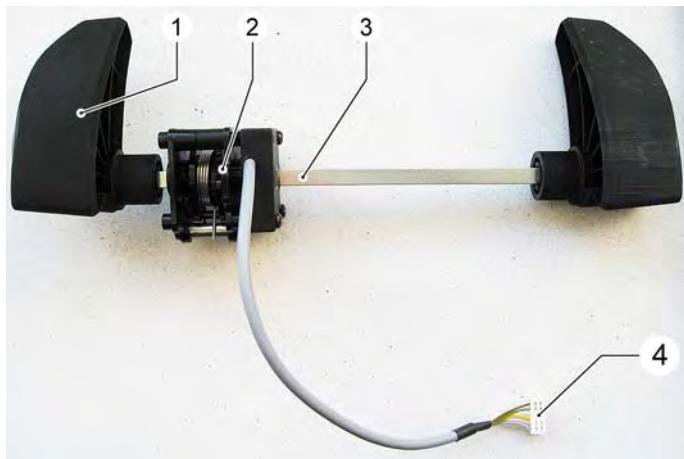
Measur- ment be- tween the negative point and ...	Note / switch position	Result in VDC
grey	Travel regulator 0 position	0 V
grey	Travel regulator forward	~ 15 V
yellow	Travel regulator 0 position	0 V
yellow	Travel regulator reverse	~ 15 V

Check the speed potentiometer

Measur- ment be- tween the negative point and ...	Note / switch position	Result in VDC
white	Travel regulator 0 position	~ 2 V
brown	Travel regulator 0 position	0 V
green	Travel regulator max. forward drive	< 2 V
green	Travel regulator max. reverse drive	< 2 V

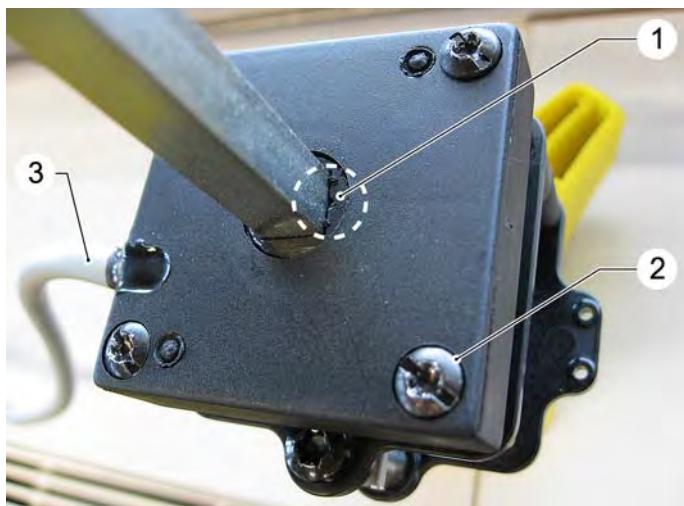
6.2.6 Replace the travel switch (B 60 W BP)

- Open the operating panel.
- Pull out the plug on the printed circuit board on the operating panel and remove the drive switch with drive lever.



- 1 Driving lever
- 2 Drive switch
- 3 Square
- 4 Plug, drive switch

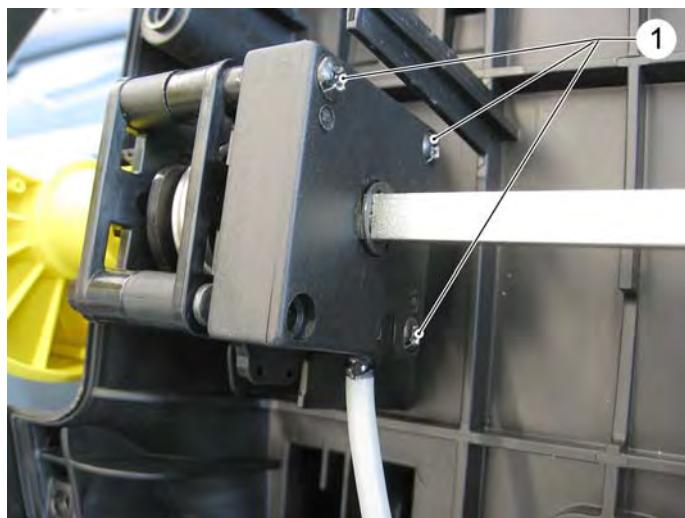
Observe during installation:



- 1 Notch
 - 2 Countersunk bore
 - 3 Connecting cable
- The notch in the small bushing must be across from the connecting cable.

Note

The notch will not be visible until the safety ring is removed.



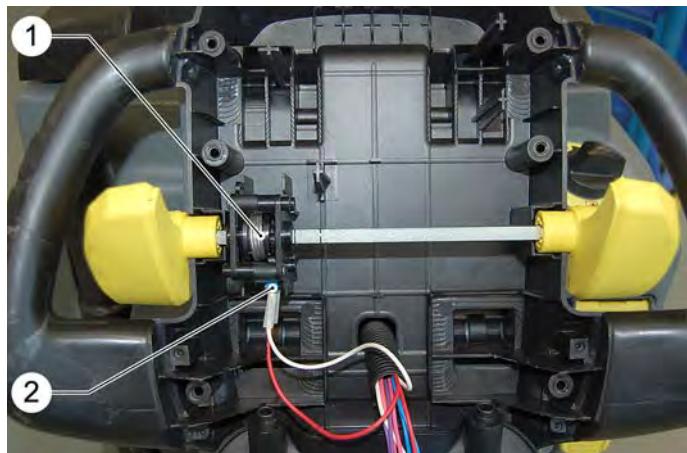
1 Countersunk bores

- Install the potentiometer so that the countersunk bores point toward the screw head.

The following faults can occur in case of incorrect installation:

- The appliance is moving backwards instead of forward.
- The display shows "Release gas pedal" even though it has not been pressed.

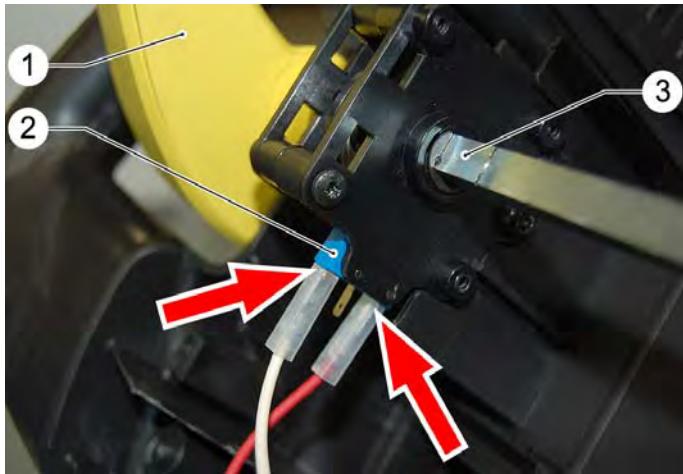
6.2.7 Replace safety switch (B 60 W EP)



1 Safety button

2 Plug

- Open the operating panel.
- Pull out the plug on the safety switch remove the safety switch with drive lever.



- 1 Driving lever
- 2 Micro switch
- 3 Square

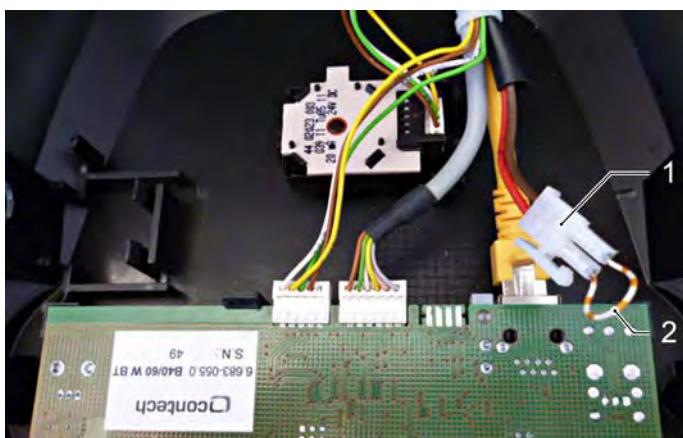
→ Install the new safety switch in reverse order.

Note

*If not actuated, the microswitch is closed.
Arrows show the connection population.*

6.2.8 Check the self-test

Check whether a fault is present at the control panel board or the control electronics.



- 1 Plug (K0), connection to control electronics
- 2 Jumper

→ Open the operating panel.

→ Remove the plug.

→ Bridge plug contacts.

If there is no fault on the control panel board, the device will switch on immediately, even if no KIK key has been inserted.

The battery indicator is displayed when the KIK key is inserted.

None of the device's functions are available.

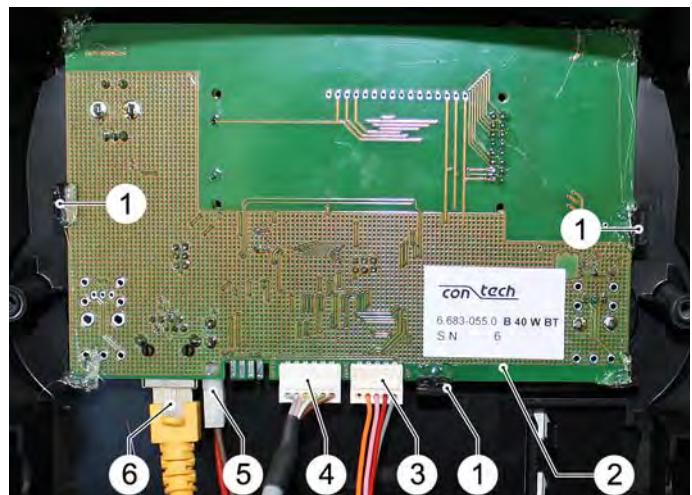
Caution

If the polarity is reversed (positive and negative terminals), the control electronics are destroyed.

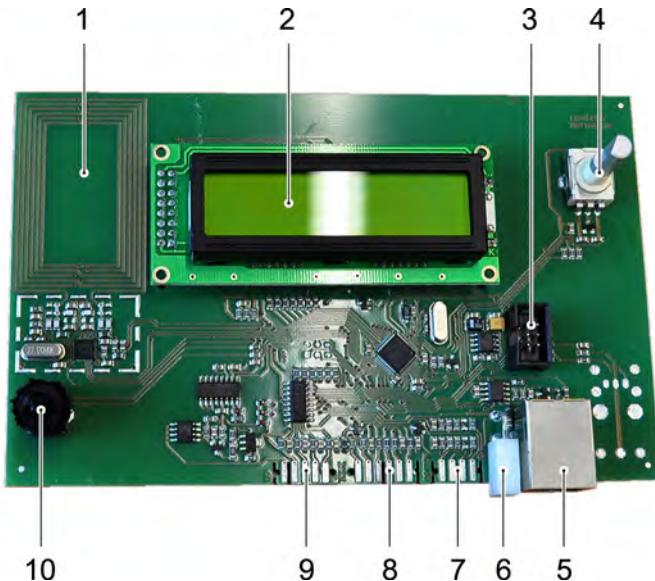
6.2.9 Replace the control panel board (B 60 W BP)



- 1 Intelligent Key
 - 2 Rotating button for drive speed
 - 3 Info button
- Remove the Intelligent Key.
→ Open the operating panel.
→ Pull off the info button and the rotary knob for the drive speed.

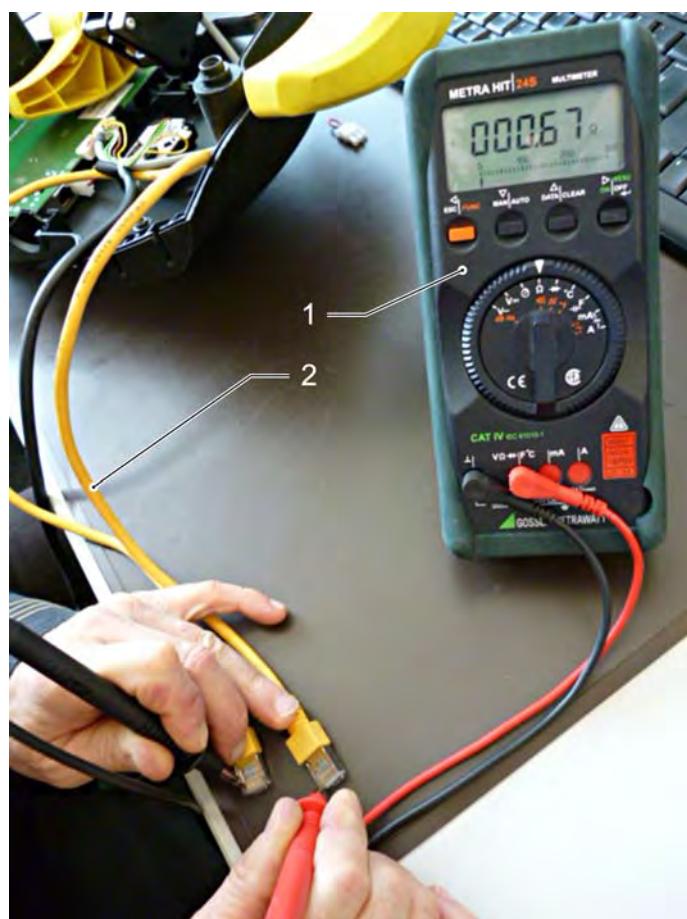


- 1 Holder, operating panel PCB
 - 2 Operating panel board
 - 3 Plug, programme selector switch
 - 4 Plug, drive switch
 - 5 Plug, CAN-BUS to control electronics
 - 6 Plug, (K0), connection to control electronics
- Disconnect all plugs from the operating panel PCB.
→ Press the holder of the operating panel PCB slightly toward the outside and remove the operating panel PCB.



- 1 Antenna for key signals
- 2 Display
- 3 Interface for production
- 4 Info button
- 5 Plug, CAN-BUS to control electronics
- 6 Plug (K0), connection to control electronics
- 7 Blank plug
- 8 Plug, drive switch
- 9 Plug, programme selector switch
- 10 Potentiometer travel speed

6.2.11 Check the CAN bus cable



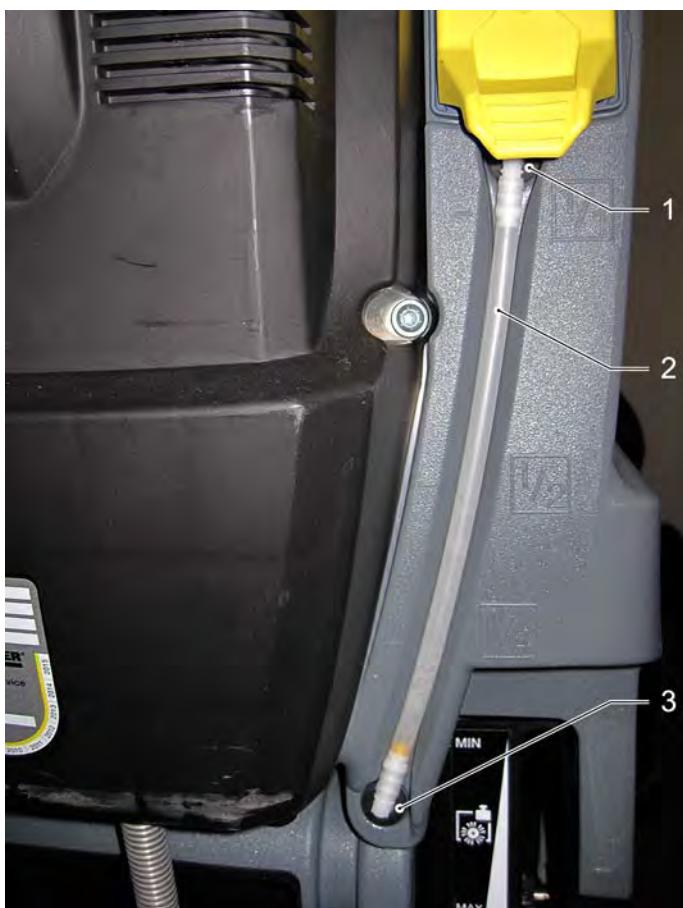
Example for a continuity test on the CAN bus cable

- 1 Measuring device
 - 2 CAN bus cable
- Open the operating panel.
 - Pull the CAN bus cable plug from the control panel board.
 - Open the control electronics.
 - Pull the CAN bus cable plug from the control electronics.
 - Connect the measuring gauge on the same terminal of the plugs.
 - Perform the continuity test.
- If the measuring gauge does not display a resistance value, the bus cable is defective and must be replaced.

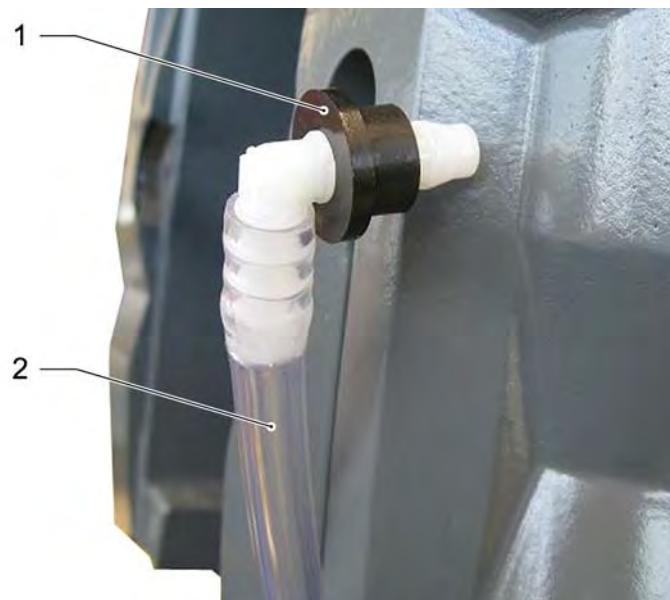


- 1 Plug
 - 2 Fuse, brush motor (7A)
 - 3 Cap
- Open the operating panel.
 - Unscrew the cap from the fuse.
 - Remove the plug.

6.3 Replace the fill level indicator



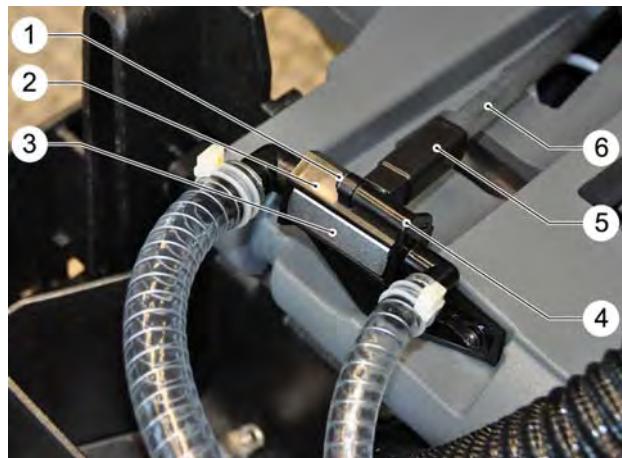
- 1 Top rubber grommet
- 2 Filling level display
- 3 Bottom rubber grommet



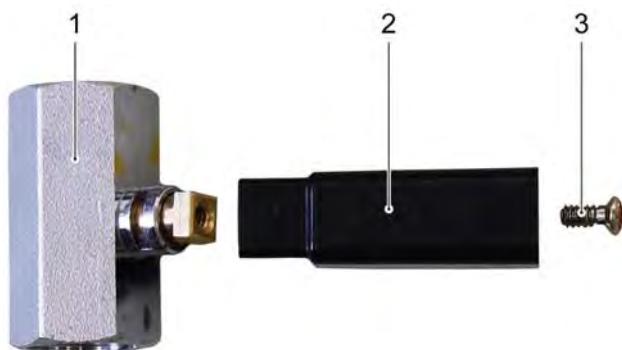
- 1 Rubber grommet
- 2 Filling level display
- Remove the rubber grommets with a screwdriver.

6.4 Replace water dosing valve

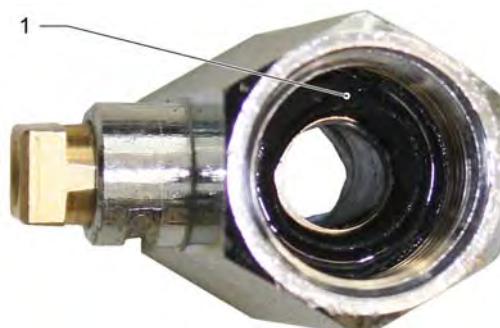
If the water dosing valve leaks, the ball tap or the seal must be replaced.



- 1 Fastening screws, casing halves
- 2 Left casing half
- 3 Ball tap
- 4 Right casing half
- 5 Connecting sleeve
- 6 Square to the regulating knob for water volume
- Swivel the tank upward.
- Unscrew the screws.
- Pull the casing halves apart and remove the ball tap toward the bottom.



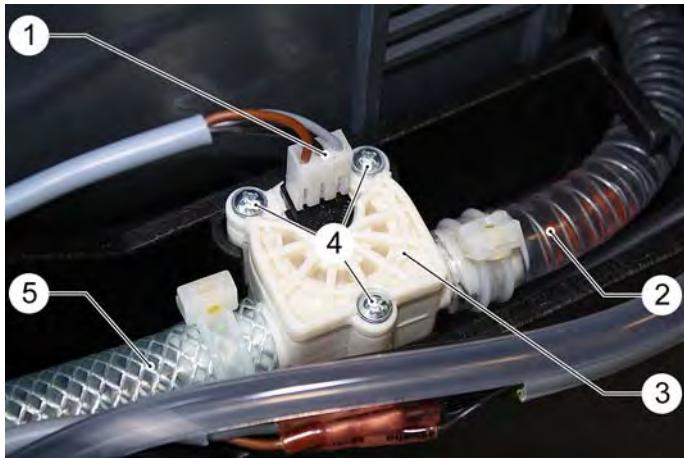
- 1 Ball tap
- 2 Connecting sleeve
- 3 Screw
- Loosen screws.



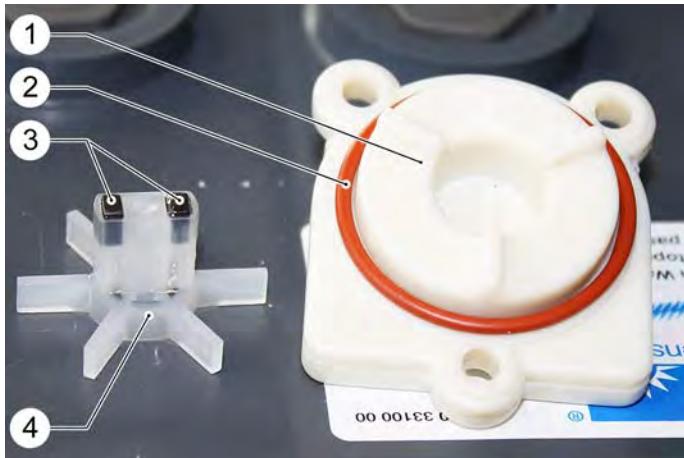
- 1 Seal
- Test the ball tap and replace the seal or the entire ball tap as needed.

6.5 Clean the flowmeter

If the flowmeter is contaminated, the flow volume of the fresh water can no longer be measured accurately. The flowmeter must be cleaned.



- 1 Cable plug
- 2 Fresh water hose from the fresh water tank
- 3 Flowmeter
- 4 Screws
- 5 Fresh water hose to the brush head
 - Swivel the tank upward.
 - Remove the cable plug.
 - Unscrew the screws.



- 1 Lid, flowmeter
- 2 Seal ring
- 3 Magnets
- 4 Rotor
- Remove the lid and the rotor from the flowmeter.



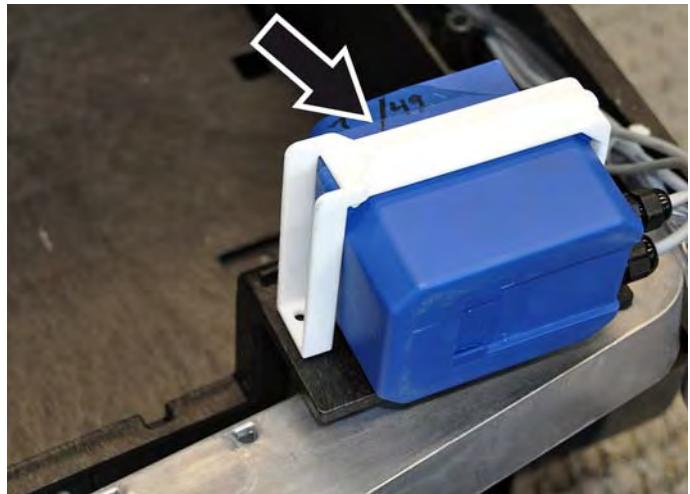
1 Rotor axis

→ Clean the rotor axle and the interior.

6.6 Detergent dosing (DOSE)

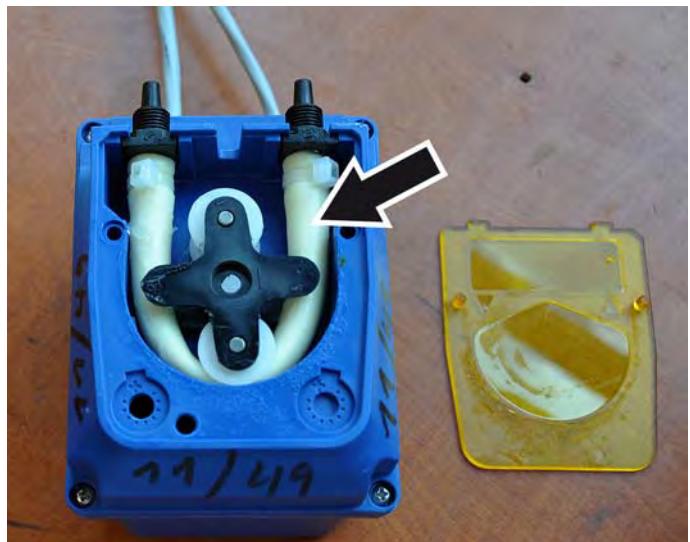
6.6.1 Check the detergent dosing pump (B 60 W BP)

If too little or no detergent is applied, the detergent dosing pump must be checked.

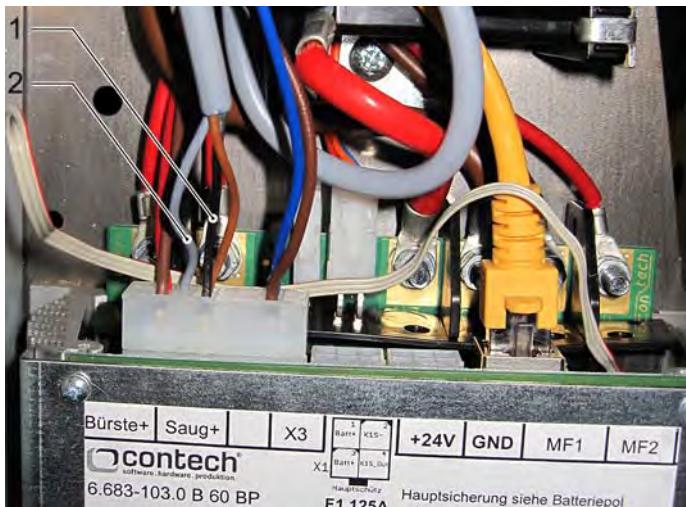


→ Check cables for corrosion and moisture.

→ Check cables for tight fit.



→ Check the detergent hose in the detergent dosing pump for damages.



1 Black wire (negative X6/5)

2 Grey wire (signal X6/14)

→ Measure the AC voltage between the black wire (negative X6/5) and the gray wire (signal X6/14).

The AC voltage depends on the battery voltage and changes with different detergent doses.

Indicative values:

Battery voltage	Dosing amount	AC voltage
25 Volt DC	0,5 %	~ 4.5 Volt AC
25 Volt DC	3,0 %	~ 10.0 Volt AC

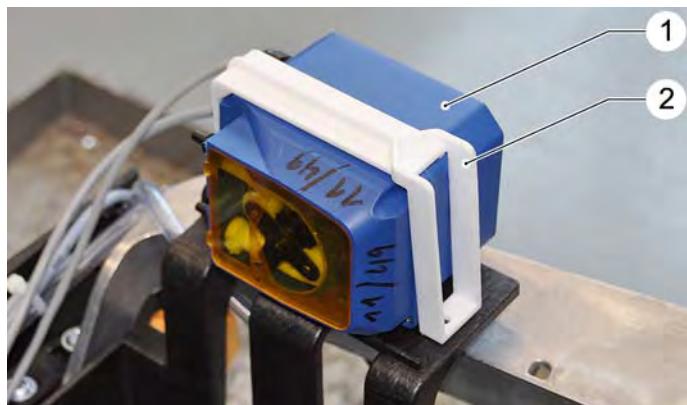
If the battery voltage is low, the AC voltage is lower with the same dosing volume.

Note

If the water volume is set too low, the flowmeter will not function properly.

At least 1 l/min must flow through the flowmeter to make it function properly.

6.6.2 Replace the detergent dosing pump (B 60 W BP)



1 Detergent dosing (DOSE)

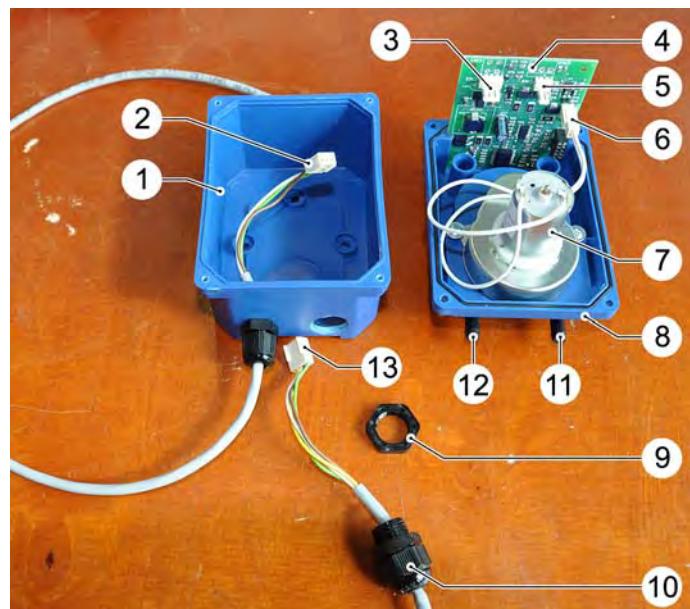
2 Holding bow

→ Remove the support bow.

→ Remove the detergent hoses from the detergent dosing.

Hold the detergent hoses up and secure them to prevent detergent from leaking out.

→ Remove the cable.



Detergent dosing open

1 Casing bottom

2 Signal cable from flowmeter

3 Plug contact supply/control cable

4 Control chip

5 Plug contact signal cable

6 Motor connection

7 Motor

8 Housing top

9 PG screw connection, nut

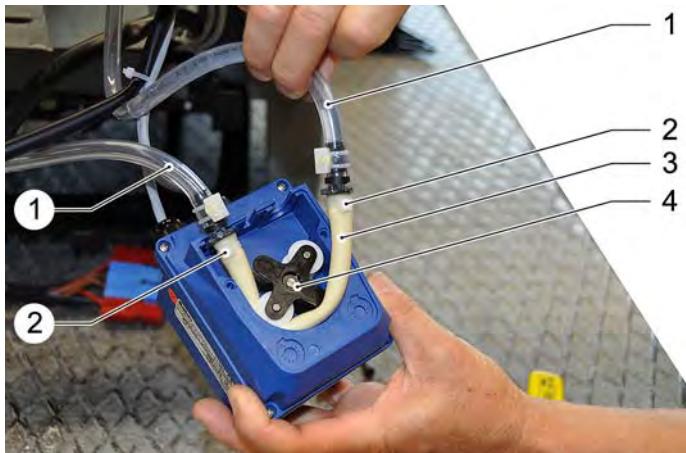
10 PG screw connection

11 Hose connection, detergent hose from the detergent container

12 Hose connection, detergent hose to the fresh water hose

13 Supply/control cable

6.6.3 Replace the pump hose (B 60 BP)



1 Detergent hose
2 Cable connector

3 Pump hose

4 Pump wheel

→ Remove the lid.

→ Rotate the pump wheel and remove the pump hose from the pump wheel.

→ Remove the cable ties.

→ Remove the pump hose.

→ Install the pump hose in reverse order.

→ Check the function of the pump.

6.7 Tank rinsing system

6.7.1 Replace the hose ring with nozzles



1 Protective cover

2 Hose connection

3 Hose ring

4 Nozzles

5 Hose fastening



1 Hose ring

2 Screw

3 Nozzle with holder

→ Remove the protective cap.

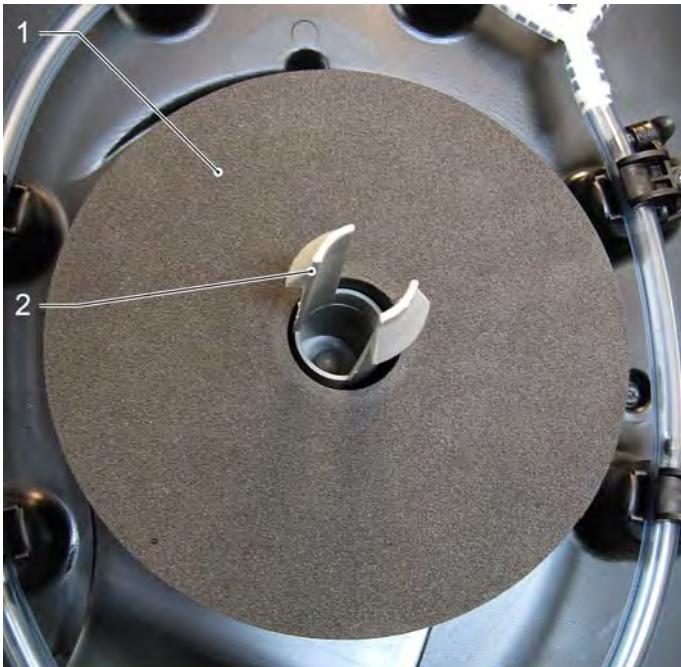
→ Loosen screws.

→ Remove the screws from the hose clamp.

→ Remove the hose ring with nozzles.

6.8 Float

6.8.1 Replace the float



- 1 Float
2 Pickup mandrel
→ Compress the pickup mandrel.
→ Remove the float.

6.8.2 Replace the lint sieve



- 1 Fluff filter
→ Compress the pickup mandrel.
→ Remove the float.
→ Rotate the lint sieve counter-clockwise and remove it.
→ Clean or replace the lint sieve if necessary.

6.9 Replace suction hose.



- 1 Suction hose
→ Pull out the suction hose from the vacuum bar.



- 1 Suction hose
→ Empty the dirt water reservoir.
→ Empty the fresh water reservoir.
→ Swivel the tank upward.
→ Pull out the suction hose off of the wastewater reservoir.

6.10 Replace the wastewater drain hose



- 1 Hose clip
2 Dirt water drain hose
→ Empty the dirt water reservoir.
→ Empty the fresh water reservoir.
→ Swivel the tank upward.
→ Loosen the hose clip.
→ Wastewater drain hose off of the wastewater reservoir.



- 1 Dirt water drain hose
→ Remove the wastewater drain hose.

6.11 Battery and battery charger

6.11.1 Removing the batteries

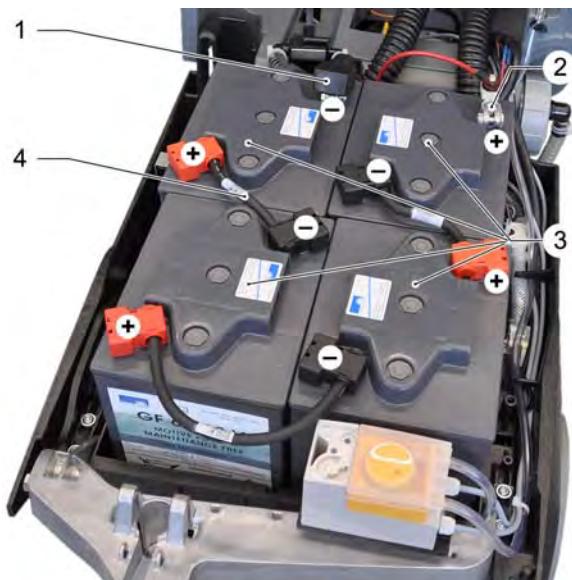
Caution

Danger of tipping. The appliance can tip over backwards.

Prior to removing the batteries, the tank must be tilted back all the way until the push handle rests on the floor.



- Empty the wastewater and fresh water tank.
→ Unscrew the stop screw.
→ Tilt the tank backwards and carefully place it on the floor.
→ After completing the service work, tilt the tank forward and screw in the stop screw.



- 1 Negative terminal (under the protective cap)
2 Positive terminal
3 Batteries
4 Battery terminal connector
→ Loosen the terminal screw connections and remove them from the terminals.
→ Remove the batteries.

Note

The battery terminals must always be clean the terminal screw connection must be tight.

Do not use terminal grease!

6.11.2 Check the maintenance-free batteries

The battery must be fully charged prior to the inspection to obtain a reliable result.

The following checks must then be made:

Measurement of the idle voltage

The idle voltage provides a measure for the charging status of a maintenance-free battery.

If this value is below a certain limit, this indicates that the battery is not charged.

You can estimate the approximately available charge from the idle voltage.

The following values apply with:

Exide gel batteries

6 volt block battery	Charge approx.
> 6,42 Volt	100 %
> 6,30 Volt	75 %
> 6,20 Volt	50 %
> 6,00 Volt	25 %
> 6,00 Volt	Deep discharge

The idle voltage should reach at least 6.15 Volts.

If these values are not met, the battery must be charged first.

Hoppecke AGM Fleece Batteries

6 volt block battery	Charge approx.
> 6,46 Volt	100 %
> 6,30 Volt	75 %
> 6,15 Volt	50 %
> 6,00 Volt	25 %
> 5,85 Volt	Deep discharge

The idle voltage should reach at least 6.36 Volts.

If these values are not met, the battery must be charged first.

6.11.3 Check the maintenance-free batteries

The battery must be fully charged prior to the inspection to obtain a reliable result. The reason for this is that the acid layer is not removed until the charge is depleted due to the initiated electrolysis.

Measuring the acid density during charging is prohibited.

Check the battery fluid level and refill distilled water if necessary. If water is refilled, a charge must be conducted before measuring the idle voltage.

The following checks must then be made:

Measuring idle voltage (quick test)

6 volt block battery	6,36-6,45	6,18	5,91	<5,91
Charge condition about (%)	100%	50%	20%	Deep discharge

The idle voltage should reach at least the limit value of 6.10 Volts.

If these values are not met, the battery must be charged first.

Measuring the acid density with the battery acid meter (quick test)

Acid density (kg/l)	1,29	1,21	1,13	<1,13
Charge condition about (%)	100%	50%	20%	Deep discharge

The difference between the battery blocks/battery cells should not exceed 0.04 kg/l. If a battery block / a battery cell is outside this tolerance, this battery block / battery cell must be replaced.



Battery acid meter

Practice:

The above mentioned values are guide values at 30 °C temperature.

In practice, the battery temperature influences the acid density and the voltage.

Rule of thumb:

1. 15 °C deviation from 30 °C changes the measuring value of the density by 0.01 kg/l.

2. Acid density + 0.84 ~ idle voltage of battery cell.

Measuring the battery under load

With all measurements, the different must not exceed the following voltage under load:

Exide batteries:

- between the 6 volt battery blocks 0.1 volts

Hoppecke batteries:

- between the 6 volt battery blocks 0.2 volts

If the difference between the battery blocks/battery cells is larger, the battery block/battery cell with the lowest voltage must be replaced.

6.11.4 Measuring the battery voltage under load

Note

The battery terminals must be checked prior to the load test.

The battery terminals must always be clean and tight.

- Switch the appliance on and take the suction turbine and the cleaning head into operation on an insensitive floor.

Important: The consumers must run continuously during this test.

The load test can also be performed while the suction turbine is turned on.

- Use a voltmeter / multimeter to measure and record the battery voltage of every individual battery block.

Measure the current using a clip-on ammeter during the voltage measurement and record it.

- The battery block with the lowest battery voltage must be replaced if it is outside the tolerance values.

See item "Limit value of battery voltage between the individual battery blocks".

If this procedure still does not indicate clearly that there is a faulty cell, the third measurement must be performed after the second load test.

6.11.5 Measuring the battery voltage under load until the appliance shuts off

- Use a voltmeter / multimeter to measure and record the battery voltage of every individual battery block.

Measure the current using a clip-on ammeter during the voltage measurement and record it.

- Operate the appliance until the discharge end voltage / the total discharge protection shuts the appliance off.

Result

In case of a problem, one or more battery blocks / battery cells will be significantly different from each other so that the fault can be pinpointed without doubt.

Limit value – battery voltage between the individual battery blocks for maintenance-free and low-maintenance batteries.

With all measurements, the difference must not exceed the following voltage under load:

Exide batteries

- between the 6 volt battery blocks 0.1 volts

Hoppecke batteries

- between the 6 volt battery blocks 0.2 volts

Battery measuring log - maintenance-free battery

1. Measurement - idle voltage

Measure the idle voltage with charged battery without consumers.

Battery block	1	2
	3	4

2. Measurement - load test

Measure the battery voltage several times while the turbine is turned on.

Battery block	1	2
	3	4

3. Measurement - load test

Measure the battery voltage while the turbine is turned on, shortly before the discharge end voltage is triggered.

Battery block	1	2
	3	4

Record further machine data

Appliance type:	Battery type:		
Order number of appliance:	Manufacturer:		
Serial number:	Part number:		
Purchase date:			
Operating hours of appliance:	Hours		
Have the pole clamps been tightened?			
Are damages visible on the battery?			
Current pickup	Drive motor		Ampere
	Suction turbine		Ampere
	Brush motor		Ampere
	All consumers during cleaning.		Ampere
Discharge end voltage	When does the discharge end voltage get triggered.		Volt
Runtime indication	How long was the customer able to work with the appliance when the batteries were still fully functional?		Hours / minutes
Battery date	Is indicated near the battery terminal on the battery.		Date or code
How long / how often is the appliance used per day / per week?		Hours / day	Hours / week

6.11.6 Notes regarding the battery

Replacing a maintenance-free battery due to old age

If the 6 volt battery blocks have reached more than 100 loading cycles or if they have been in use for more than 6 months, replacing the battery block with a new one is no longer worth it. We recommend replacing the entire battery set.

Taking out of operation

If batteries are not to be used for a while, the following must be observed when storing them:

- Disconnect the negative battery connection on the battery and store the cable so that it cannot inadvertently come into contact with the negative terminal of the battery.
- Only store batteries while charged.
- The storage location should be as cool and dry as possible (the self-discharge rates will be lower).

Maintenance-free batteries:

- Recharge once the battery capacity is lower than 60%.

Maintenance-free batteries:

- Monthly test of the acid density.
- Recharge once the density has fallen below 1.23 kg/l.

Discharge end voltage or total discharge protection

The settings of the discharge end voltage must be checked to ensure that the runtime of the machine is not limited and that the battery cannot deeply discharge.

6.11.7 Check the final discharge voltage

Final discharge voltage with variable value

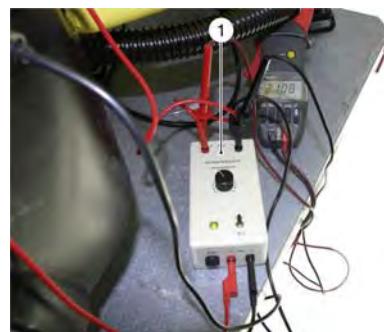
The final discharge voltage is variable and is regulated automatically, so that the max. admissible battery capacity can be taken out without damaging the batteries.

If a lot of current is taken, the final discharge voltage is deeper than with smaller current volumes.

The variable value can be monitored in debug mode. What is important, is that the correct battery is set up in the battery manager.

Function of the final discharge voltage

All units are operated until the variable value is reached. The brush motor shuts off with a time delay of 60 seconds and "Battery depleted" is displayed on the display. The suction turbine continues to run until the trailing time has elapsed and then shuts off. The drive motor can be used until the voltage has reached the set value of 18 volts. This will also shut the drive motor off.



1 Voltage regulator

Checking the fixed value with the voltmeter.

- Swivel the tank upward.
- Connect the voltage regulator in the power circuit.
- Plug in the Intelligent Key.
- Turn the programme selection switch to Programme 4 - intense mode - wet floor cleaning.
Do not press the drive lever.
- Reduce the voltage slowly to the discharge voltage that is defined in the setup menu.

Target value:

See Table for Shut-off voltage in chapter "Battery menu" ($A = 10 \text{ A}$).

Note

The switching off takes place with a 60 second delay. As an alternative, you can check the total discharge protection using the voltmeter or the voltage tester.

- Connect the voltmeter directly to the battery and operate the appliance until the display shows "Battery depleted".
- At that moment, read the battery voltage.

In this case, the brush motor and the turbine shut off.

The drive motor is still active.

Important: The voltage test must take place under load.

- Then charge the battery.

6.11.8 Test the charger

- Connect the charger to the batteries.
- Connect the voltage meter and clip-on ammeter to the batteries.
- Plug in mains connector and switch on charger.
- Determine the current and voltage measuring values after switching on the charger and record them.
- Determine the current and voltage measuring values after about 10 minutes and record them.

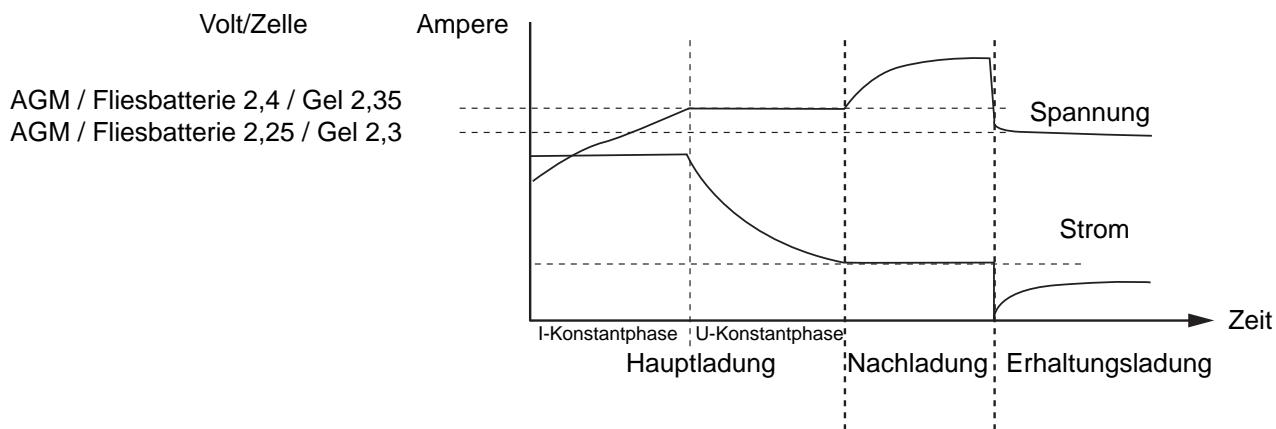
The measuring result of the I constant phase in the main charge must be close to the manufacturer's values of the charger.

See typeplate of charger.

Charger data:

Appliance type:	Charge:	
Manufacturer	daily:	
Order number of appliance:	After each use:	
Serial number:	Weekly:	
Purchase date:	When was the last charge:	
Are damages visible on the battery?		
Performance values of the charger with the battery connected immediately after the start of the charging process (maximum, continuous current value):		
Charge voltage:	Volt	
Charge current (constant current!):	Ampere	
Performance values of the charger with the battery connected after approx. 10 minutes:		
Charge voltage:	Volt	
Charge current (constant current!):	Ampere	

Regulated charge ID line IUI charger for maintenance-free batteries



IUIa means:

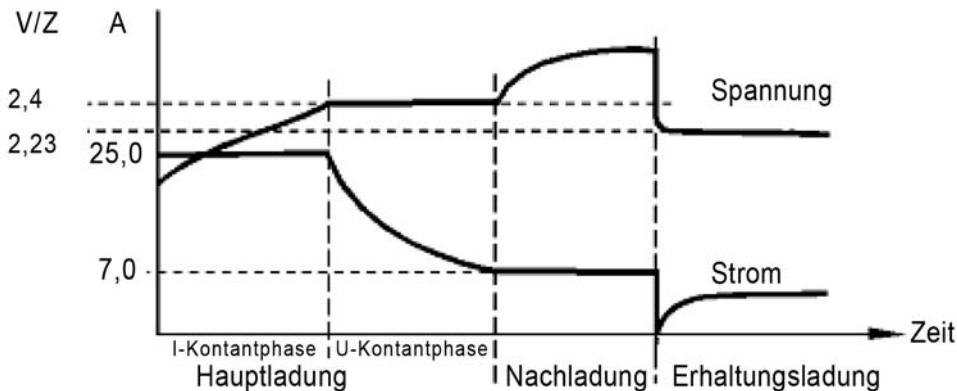
I = constant current line

U = constant voltage line

I = constant current line recharging

a = automatic switch-off (transition to maintenance charge)

Regulated charge ID line IUI charger for low-maintenance batteries



IUIa means:

I = constant current line

U = constant voltage line

I = constant current line recharging

a = automatic switch-off (transition to maintenance charge)

- During the I constant phase, the charger is charged with the nominal current (see typeplate on charger) and the charge voltage will increase slower or faster depending on the charge condition. After that, the charger will switch to U constant phase.
- In the U constant phase, the voltage remains constant and the current sinks continuously. After that, the charger will switch to I constant phase.
- In the I constant recharging phase, the voltage will rise to the values indicated in the diagrams and the current value remains constant. After that, the charger will switch to maintenance charge.
- The recharging phase serves to achieve the complete transformation of the active mass in all cells.
- During the maintenance charge, the fully charged battery status remains at constant voltage. The maintenance charge has no time limits.

Display shows charging process



During the battery charging process, the battery type that is being charged is shown on the display.

In case of battery problems, you must always ensure that the correct battery has been set up.

When the battery is being charged, the bar display flashes if balancing is active.

If the bar display is not flashing, battery voltage is active.

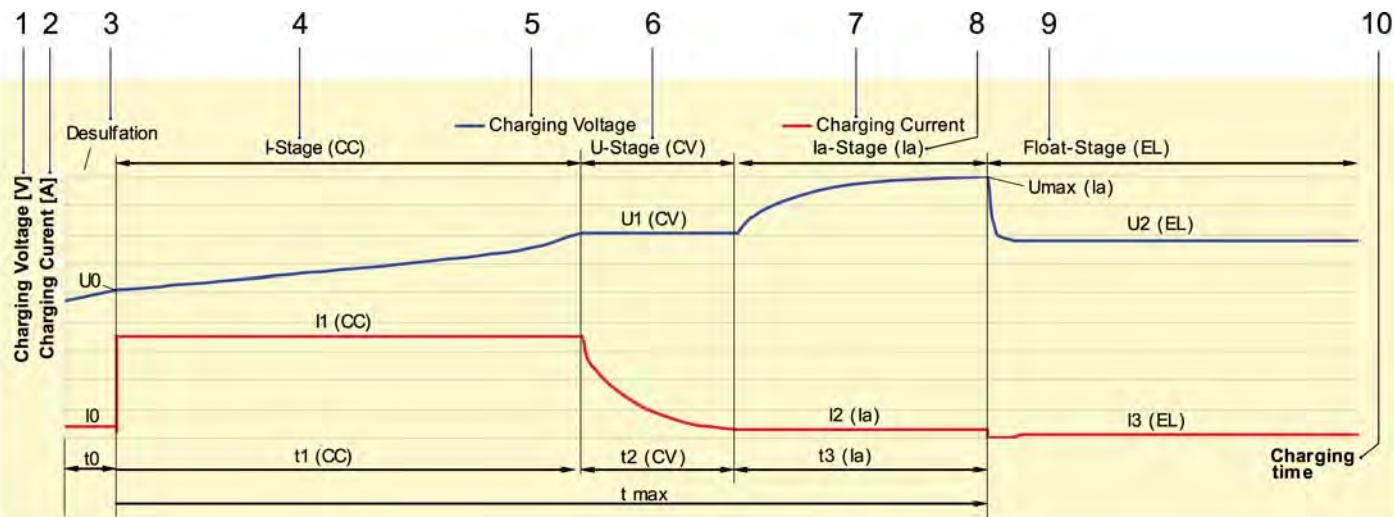
The display indicates "Charging complete" when the battery has been completely charged.

6.11.9 Charger characteristics

Different charging characteristics are saved in the control electronics, belonging to the respective batteries.

If a battery is to be used, for which there is no suitable charging characteristic, you must contact the battery manufacturer.

The following depicts the saved charging characteristics, which can be remedied with the battery manufacturer.



Charging characteristics, status of Feb. 3, 2012

- 1 Charge voltage [V]
- 2 Charge current [A]
- 3 Sulphating
- 4 I phase (CC)
- 5 Charge voltage

- 6 U phase (CV)
- 7 Charging current
- 8 Ia phase (Ia)
- 9 Retention charging (EL)
- 10 Charging time

Parameter	Battery	EXIDE GF12105V GEL	HOPPECKE 6TB170 AGM	EXIDE GF06 180V GEL	EXIDE GF06 240V GEL	EXIDE FT06 180 Wet WET
	Part number:	6.654-141.0	6.654-242.0	6.654-130.0	6.654-119.0	6.654-086.0
$t_{0\text{max}}$	Max. time of the desulphating phase [min]	60	60	60	60	60
U_0	Top threshold for the desulphating phase [V]	20,4	20,4	20,4	20,4	20,4
I_0	Current in the desulphating phase [A]	1,4	1,7	2,3	4,8	3,6
$t_{1\text{min}}$	Minimum time for the I phase [min]	10	10	10	10	10
$t_{1\text{max}}$	Maximale Zeit für die I-Phase [min]	540	540	540	540	420
I_1	Current in the I phase [A]	18	27	27	35	28
$t_{12\text{max}}$	Minimum time for the I+U phase [min]	720	840	720	720	600
U_2	Conversion voltage from I to U phase [U]	28,2	28,8	28,2	28,2	28,8
$t_{3\text{min}}$	Minimum time for the Ia phase [min]	60	120	60	60	60

Parameter	Battery	EXIDE GF12105V GEL	HOPPECKE 6TB170 AGM	EXIDE GF06 180V GEL	EXIDE GF06 240V GEL	EXIDE FT06 180 Wet WET
	Part number:	6.654-141.0	6.654-242.0	6.654-130.0	6.654-119.0	6.654-086.0
t3max	Maximum time for the Ia phase [min]	240	300	240	240	240
t3 – Factor	Recharging time = (t1+t2)*t3 factor	1,0	0,5	1,0	1,0	0,6
I3	Current in the Ia phase [A]	1,6	2,3	2,3	3,1	9,0
Umax	Max. voltage in the Ia phase [U]	36	36	36	36	36
U4	Voltage during the retention charge [U]	27,6	27	27,6	27,6	26,8
I4	Maximum current during the retention charge [I]	1,6	2,7	2,3	3,1	9



Shut-off voltage of device, status of Feb. 3, 2012

1 Voltage [V]

2 Discharge voltage [A]

3 Voltage

4 discharge current

5 Switch-off voltage

Parameter	Battery	EXIDE GF12105V GEL	HOPPECKE 6TB170 AGM	EXIDE GF06 180V GEL	EXIDE GF06 240V GEL	EXIDE FT06 180 Wet WET
	Part number:	6.654-141.0	6.654-242.0	6.654-130.0	6.654-119.0	6.654-086.0
	Discharge voltage [A]	Shut-off voltage [V]				
Low Batt A	20	23,4	23	23,5	23,6	23,2
Low Batt B	40	21,1	22,8	23,1	23,3	22,1
Low Batt C	60	19,6	22,7	22,3	22,9	21,1
Low Batt D	80	19,4	22,6	20,8	22,3	19,8
Low Batt E	100	19,2	22,5	19,9	21,3	19,6

6.12 Brush head BR model B 60 W BP

6.12.1 Replace the brush head

If the brush head is defective or being replaced, the BR brush head must be removed.

Caution

Danger of tipping. The appliance can tip over backwards.

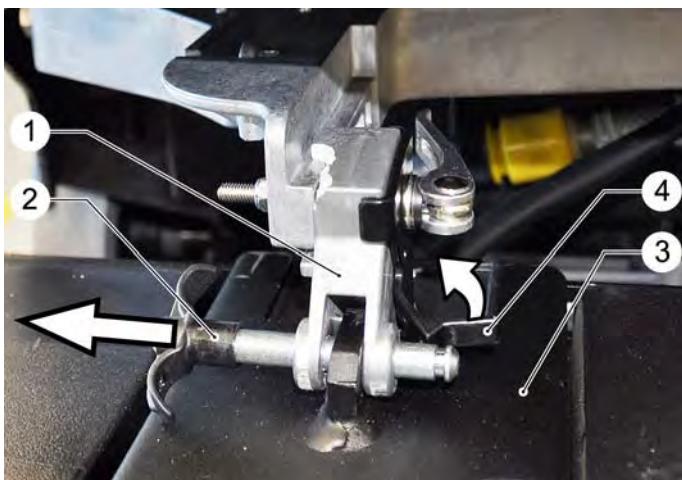
Push the appliance forward about 2 m so that the steering rollers point toward the rear!

Prior to removing the brush head, the tank must be tilted back all the way until the push handle rests on the floor.



1 Stop screw

- Empty the wastewater and fresh water tank.
- Unscrew the stop screw.
- Tilt the tank backwards and carefully place it on the floor.
- After completing the service work, tilt the tank forward and screw in the stop screw.



1 Suspension

2 Holding pin

3 Brush head

4 Lock

→ Push the lock back slightly and pull out the holding bolt.

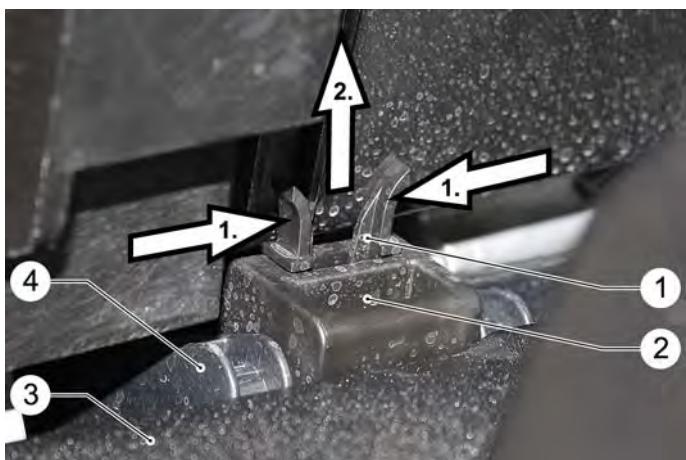
→ Raise the pick-up.



1 Lid, plug for mains connection

2 Connection cable of brush head

→ Remove the lid of the power connection.



1 Retaining clip

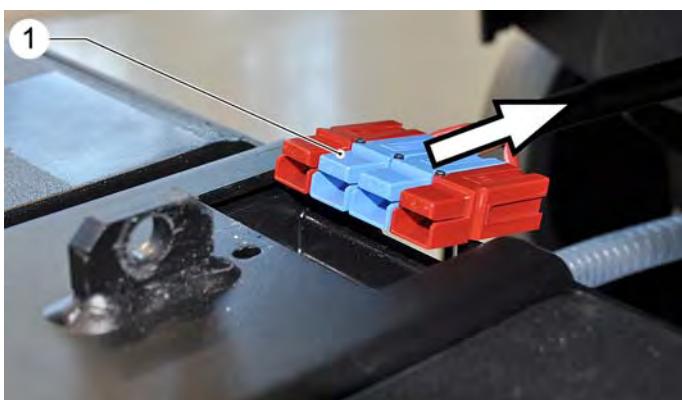
2 Brush head pick up on the push bar

3 Brush head

4 Push bar

→ Lower the brush head.

- 1. Compress the holding clamp.
- 2. Pull the holding clamp all the way up and out.



1 Brush head plug

→ Remove the plug of the brush head.



1 Hose coupling

→ Disconnect the hose coupling.

→ Pull the brush head out toward the front.

Sequence of brush head installation:

1. Push the brush head in all the way to the push bar.
2. Insert the fastening clamps into the brush head pick-ups on the push bar.
3. Open the quick tensioner on the suspension.
4. Position the brush head under the suspension.
5. Place the brush head pedal towards the top.
6. Slide in holding bolt.
The holding bolt must be able to move easily without pressure.
7. Move the brush head back and forth slightly to remove any tension.
8. Close the quick tensioner.

Caution

Close the quick tensioner.

The suspension can break if the quick tensioner is not closed.

Tighten the tension nut on the quick tensioner lever to 6 Nm.

9. Raise the brush head via the brush head pedal.

6.12.2 Replacing the drive belt of the brush drive

If the drive belt on the brush drive is worn or torn, it must be replaced.



1 Cover, drive belt

2 Screws

→ Unscrew the screws and remove the lid.



1 Motor screws

2 Gear casing screws

3 Pulley

4 Drive belt

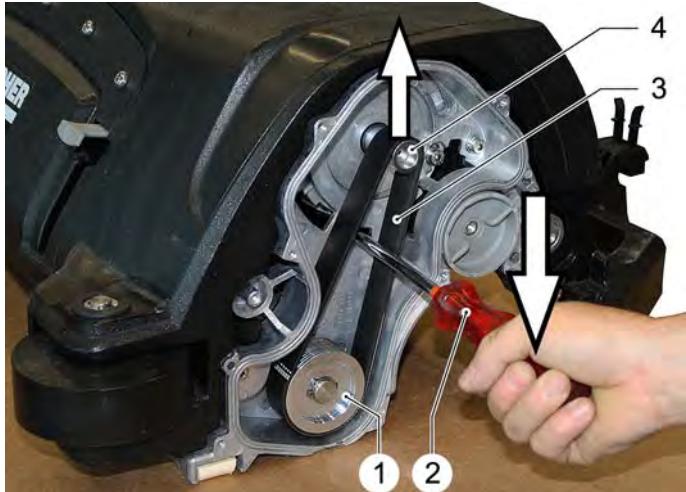
5 Drive pinion

6 Gear housing

→ Loosen the fastening screws on the motor.

→ Remove the drive belt.

→ Insert a new drive belt.



1 Pulley

2 Screwdriver

3 Drive belt

4 Drive pinion

→ Lift the motor up with a screwdriver and tension the drive belt.

→ Tighten the screws on the motor.

6.12.3 Replace the pulley



1 Safety ring

2 Pulley

→ Remove the drive belt.

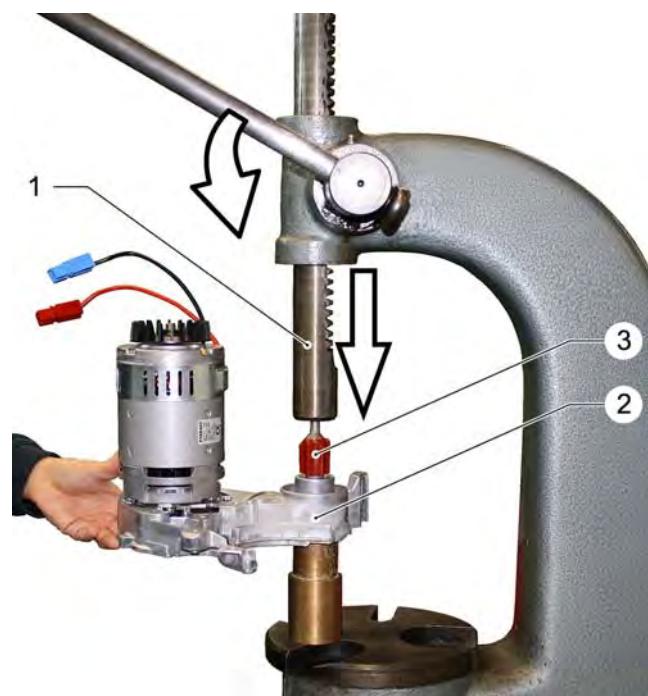
→ Remove the safety ring.



1 Puller tool

2 Pulley

→ Remove the pulley and replace it.



1 Press-in tool

2 Gear housing

3 Brush pick-up

→ Press the pulley onto the brush pick-up by means of a press-in tool.

→ Insert the safety ring.

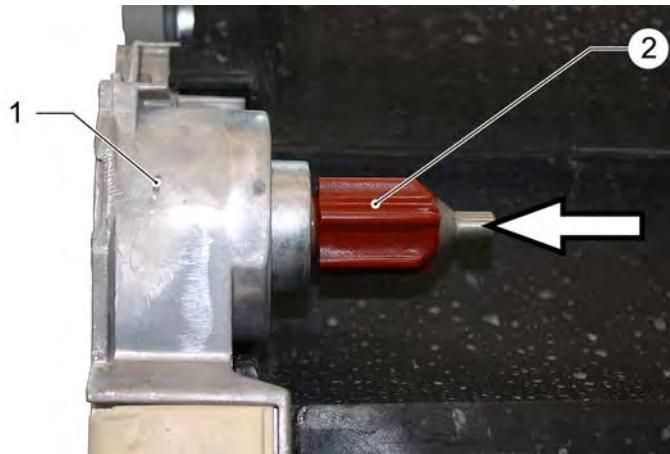
6.12.4 Replace the axle on the brush intake



- 1 Safety ring
 2 Axle
 → Remove the brush rollers from the brush head.
 → Remove the pulley.
 → Remove the safety ring.



- 1 Rubber nose on the brush roller pick-up
 2 Washer ring
 The rubber nose is used to balance the brush length and floor head width tolerances.
 There is a seal ring on the ball bearing that prevents water from entering the ball bearing.



- 1 Gear housing
 2 Axle with brush roller intake
 → Lightly strike the axle with a rubber hammer. Drive the axle out of the casing.
 → Replace the axle and reinstall it in reverse order.



- 1 Axle with brush roller intake
 2 Ball bearing
 3 Fitting key
 4 Pulley
 5 Safety ring
 6 Safety ring

6.12.5 Replace the brush motor



1 Cover of brush head plug

2 Screws

→ Unscrew the screws.

→ Remove the cover.

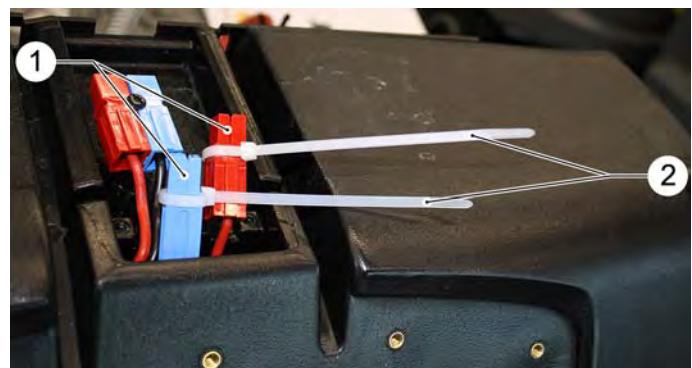


1 Motor screws

→ Unscrew the screws.

→ Remove the motor from the gear casing.

Installation aid

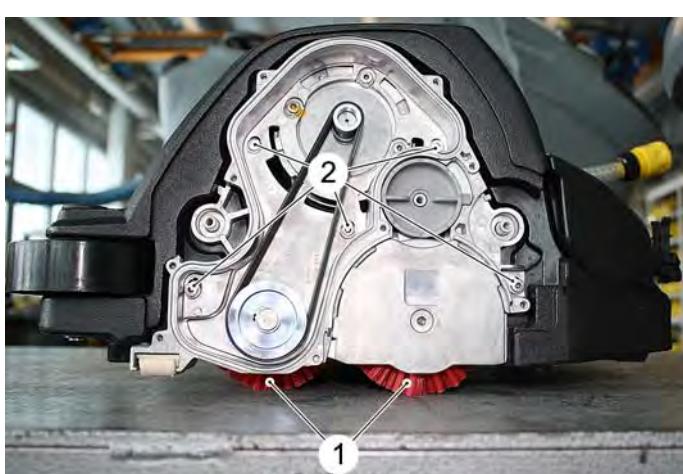


1 Plug elements

2 Cable connector

→ Install a cable tie as a guide aid on every plug element.

The plug elements can be guided through the opening on the brush head easier by using cable ties.



1 Brushing rollers

2 Screws

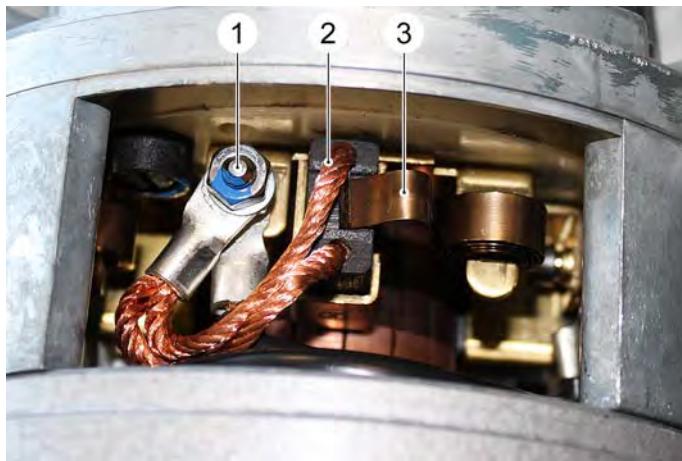
→ Remove the brush rollers.

→ Unscrew the screws and remove gear casing from the brush head.

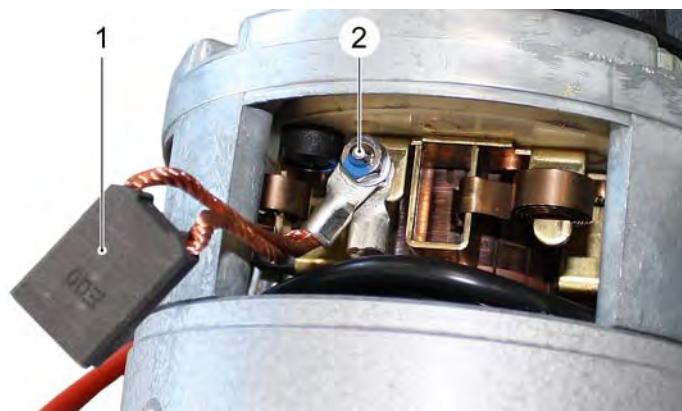
6.12.6 Replace the glide contacts on the brush motor



- 1 Screw
- 2 Cover, glide contacts
- Remove the brush motor.
- Loosen screws.
- Remove the cover of the glide contacts.



- 1 Fastening nut, glide contact
- 2 Glide contact
- 3 Press spring
- Lift the contact spring and pull the glide contact out of the chute.
- Carefully place the contact spring onto the chute.



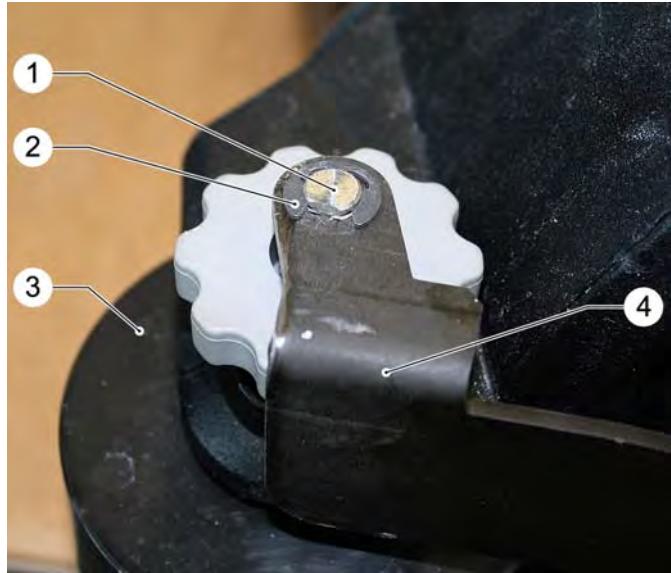
- 1 Glide contact
- 2 Fastening nut, glide contact

→ Unscrew the nut and replace the glide contact.

→ Perform this procedure on both glide contacts.

→ Install the new slide contacts in reverse order.

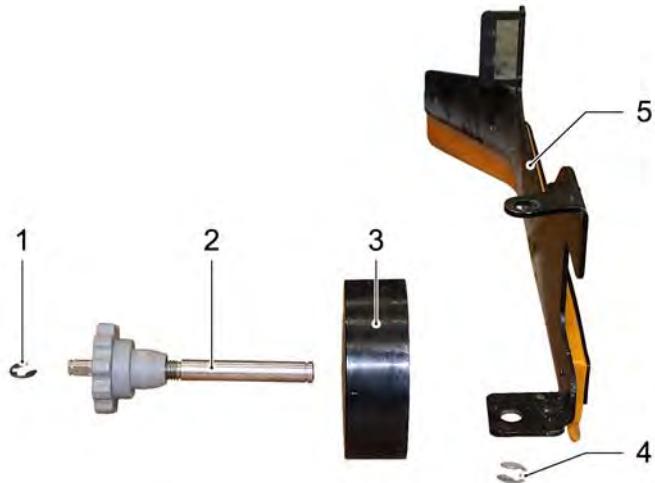
6.12.7 Replace the bow with sealing lip and deflector roller (BR model "S" only)



- 1 Axle bolt with star handle
- 2 Safety ring
- 3 Scraper roller
- 4 Bow with seal lip
- Remove the safety ring.



- 1 Axis pins
- 2 Safety ring
- Remove the safety ring.
- Remove the bow with seal lip from the axle bolt.
- Remove the axle bolt.

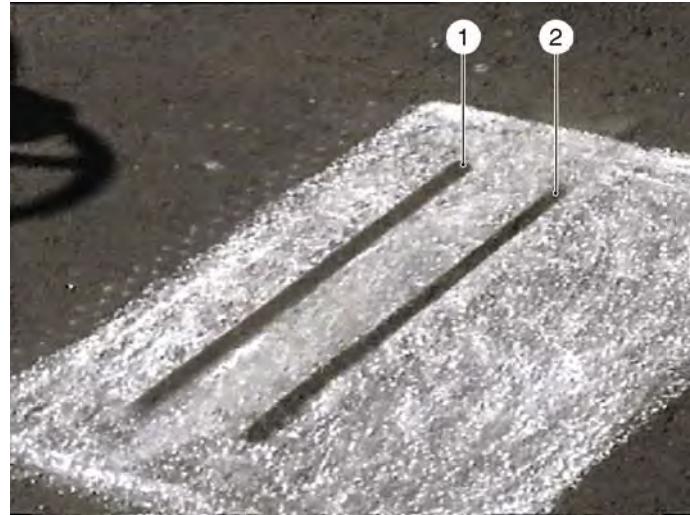


- 1 Safety ring
- 2 Axle bolt with star handle
- 3 Scraper roller
- 4 Safety ring
- 5 Bow with seal lip

6.12.8 Setting the brush head



- 1 Brushing rollers
 - 2 Screws
 - 3 Gear housing
- Insert new brush rollers.
 → Place the brush head on an even surface.
 → Loosen the screws on both gear casings.
 → Shake the brush head briefly for the brush rollers to settle.
 → Tighten the screws.
 → Install the brush head.
 → Coat a corresponding area of the floor with chalk and drive the brush head over it.
 → Switch on the brush head, lower it and briefly brush the chalk-coated area.
 → Raise the brush head and remove it from the chalk-coated area.



- 1 Sweeping track, rear brush
 - 2 Sweeping track, front brush
- Check the sweeping track of the two brushes. They must run at the same width and parallelly.
 If this is not the case, the sweeping mirror can be adjusted as follows:



- 1 Lifter
 - 2 Rear brush head pick-up
 - 3 Quick tensioning lever
 - 4 Front brush head pick-up
- Open the quick tensioning lever.
 → Move the brush head pick-up.
 → Close the quick tensioning lever.
 → Check the brush mirror and adjust the brush head pick-up if required.
 → Balance uneven brush roller imprints by moving the brush head.

6.13 Brush head BR model B 60 W EP

6.13.1 Replace the brush head

If the brush head is defective or being replaced, the BR brush head must be removed.

Caution

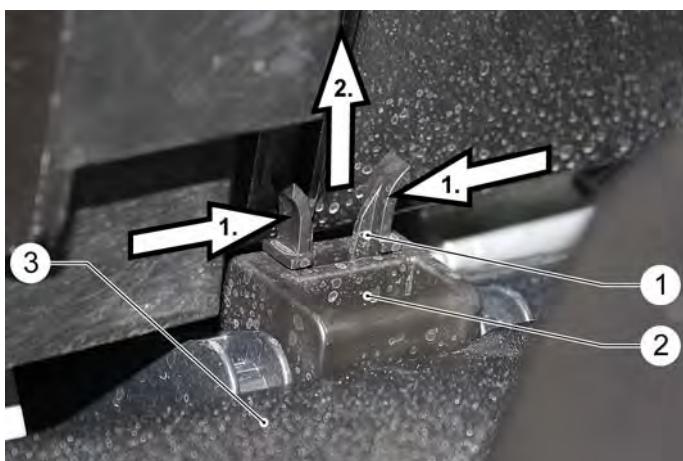
Danger of tipping. The appliance can tip over backwards.

Push the appliance forward about 2 m so that the steering rollers point toward the rear!

Prior to removing the brush head, the tank must be tilted back all the way until the push handle rests on the floor.



- 1 Stop screw
- Empty the wastewater and fresh water tank.
- Unscrew the stop screw.
- Tilt the tank backwards and carefully place it on the floor.
- After completing the service work, tilt the tank forward and screw in the stop screw.



- 1 Retaining clip
- 2 Brush head intake
- 3 Brush head
- Lower the brush head.
- 1. Compress the holding clamp.
2. Pull the holding clamp all the way up and out.



1 Suspension

2 Brush head

3 Holding pin

4 Angle sheet intake with glider

→ Pull out the holding bolt.

Caution

The glider is only pushed onto the angle sheet intake. The glider can become lost if the brush head is removed.



1 Lid, plug for mains connection

2 Screw

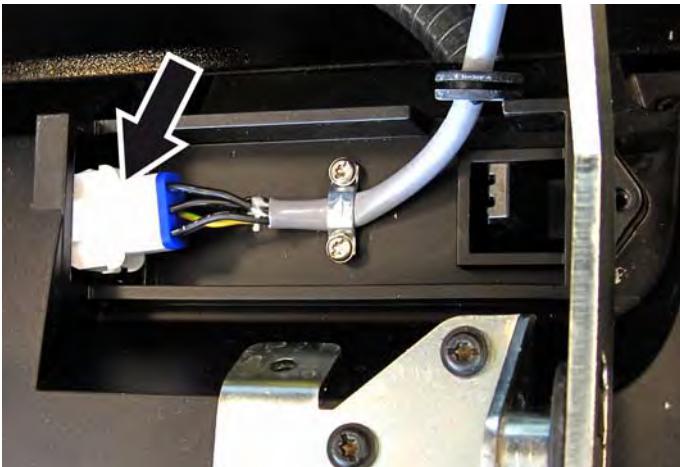
3 Brush head

→ Loosen screws.

→ Remove the cover of the mains connection toward the top.

Caution

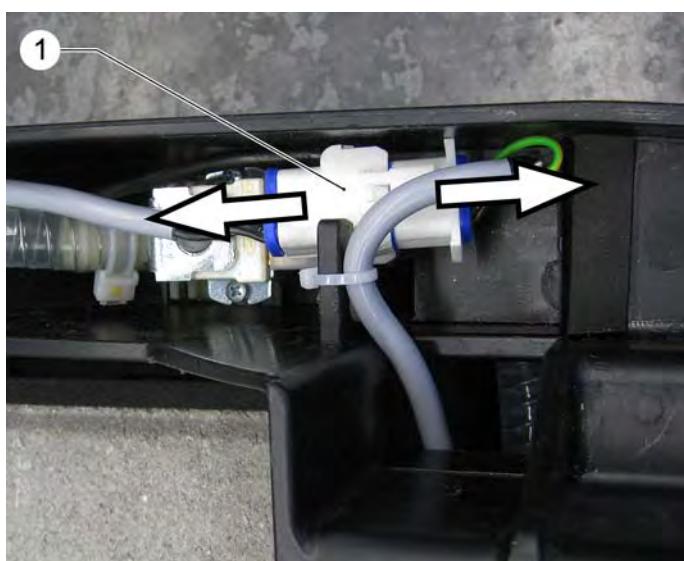
Risk of damage! Open the cover only when dry.



Brush head plug

Note

To remove the brush head, disconnect the plug under the tank.



Plug underneath the tank, brush head B 60 W EP

1 Brush head plug

→ Disconnect the brush head plug.

Note

The brush head connection is located in the appliance next to the solenoid valve.



1 Hose coupling

2 Fresh water hose from the solenoid valve

3 Brush head

4 Fresh water hose to the brush head

- Disconnect the hose coupling.
- Pull the brush head out toward the front.
- Install the brush head in the reverse order.

6.13.2 Replace the toothed belt of the brush drive



1 Screws

2 Cover, toothed belt

→ Unscrew the screws and remove the lid.



1 Pulley, rear

2 Pulley, front

3 Nut

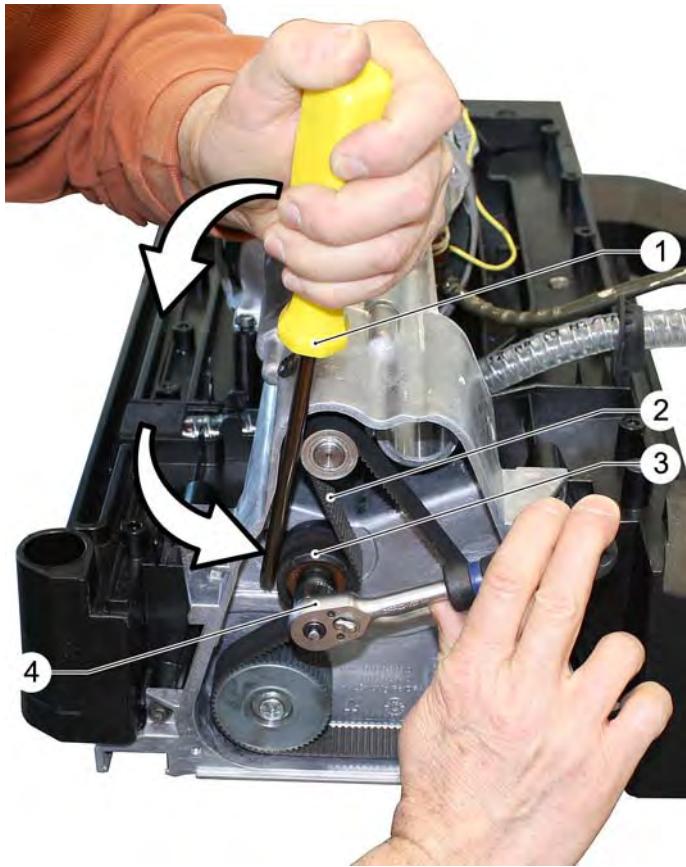
4 Tension pulley

5 Gear belt

6 Drive pinion

→ Loosen the nut.

→ Remove the toothed belt.



- 1 Screwdriver
 2 Gear belt
 3 Tension pulley
 4 Wrench
- Tightly tension the toothed belt on the idler pulley using a screwdriver.
 → Tighten the nut.
- ### 6.13.3 Replace the pulley



- 1 Pulley
 2 Screw
- Remove the toothed belt from the pulley.
 → Loosen the screw.



- 1 Axle
 2 Screw
 3 Pulley
- Remove the pulley and replace it.
 → Install the new pulley in reverse order.

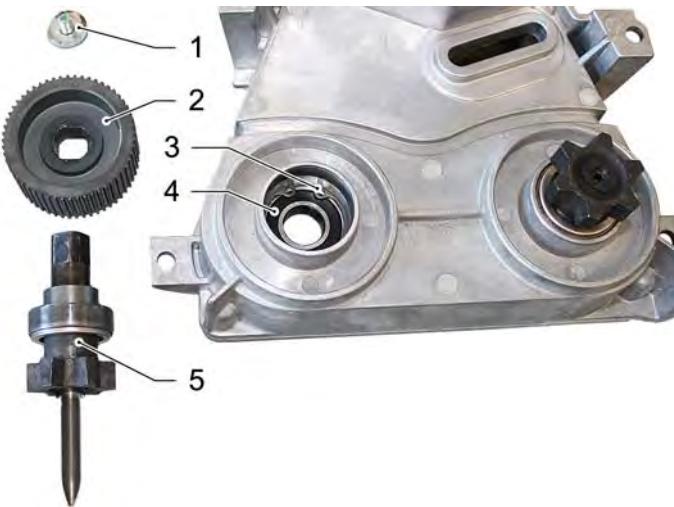
Note

Glue the screw in with soluble metal glue.

6.13.4 Replace the axle on the brush intake

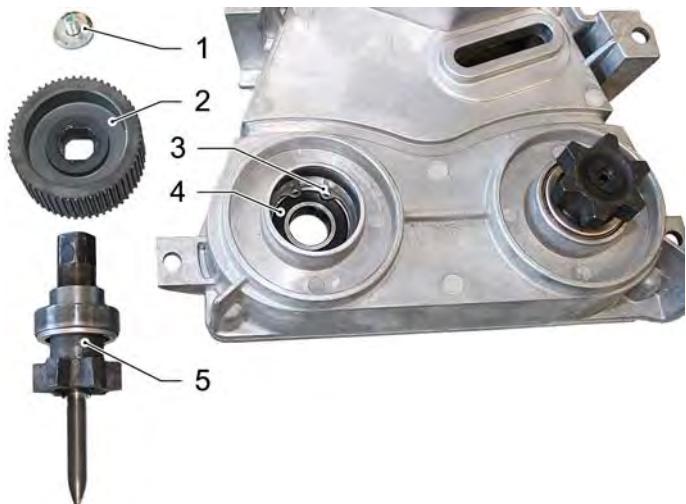


- 1 Ball bearing
 2 Axle
- Remove the brush rollers from the brush head.
 → Remove the pulley.
 → Lightly strike the axle with a rubber hammer. Drive the axle out of the casing.



1 Screw
2 Pulley
3 Safety ring
4 Ball bearing
5 Axle with brush roller intake

6.13.5 Replace the ball bearing on the axle on the brush intake

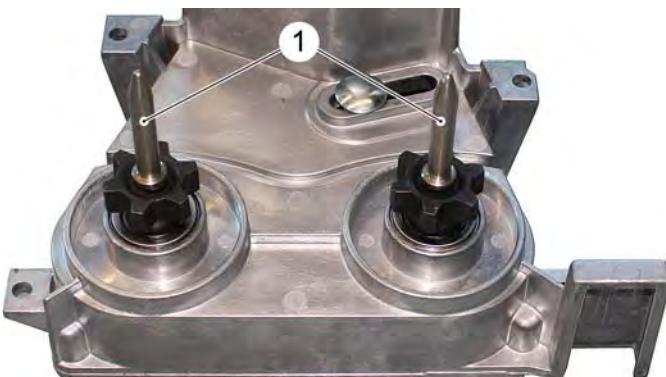


1 Screw
2 Pulley
3 Safety ring
4 Ball bearing
5 Axle with brush roller intake
 ➔ Remove the axle with brush roller intake.
 ➔ Remove the locking ring with a ring pliers.
 ➔ Carefully drive the ball bearing out of the casing.

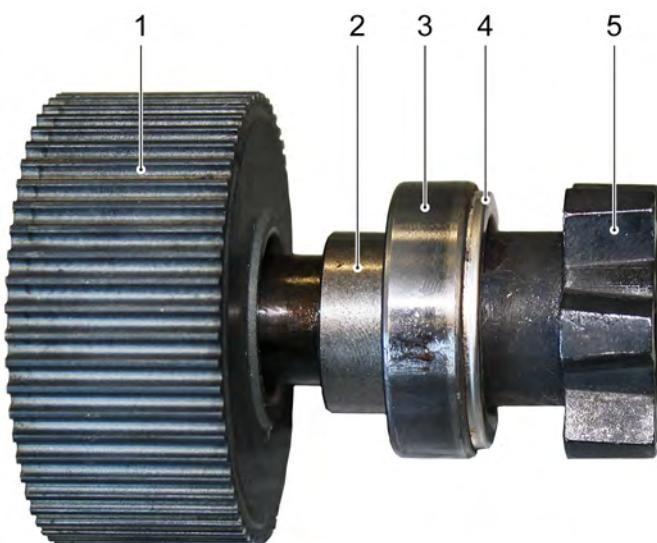
6.13.6 Replace the brush motor B 60 EP



1 Screws
 ➔ Remove the cover of the toothed belt.
 ➔ Unscrew the screws.



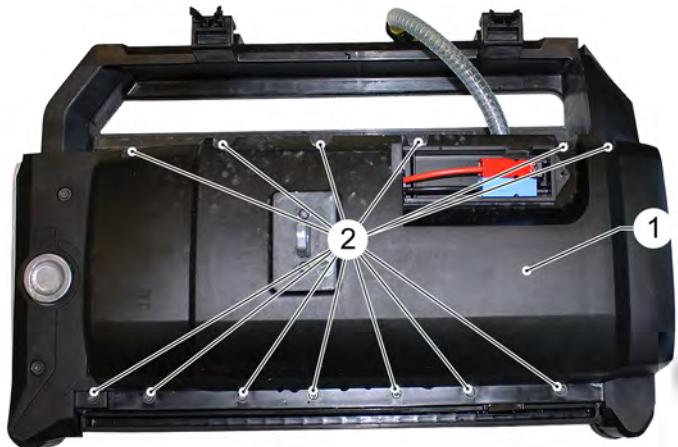
1 Pickup mandrels



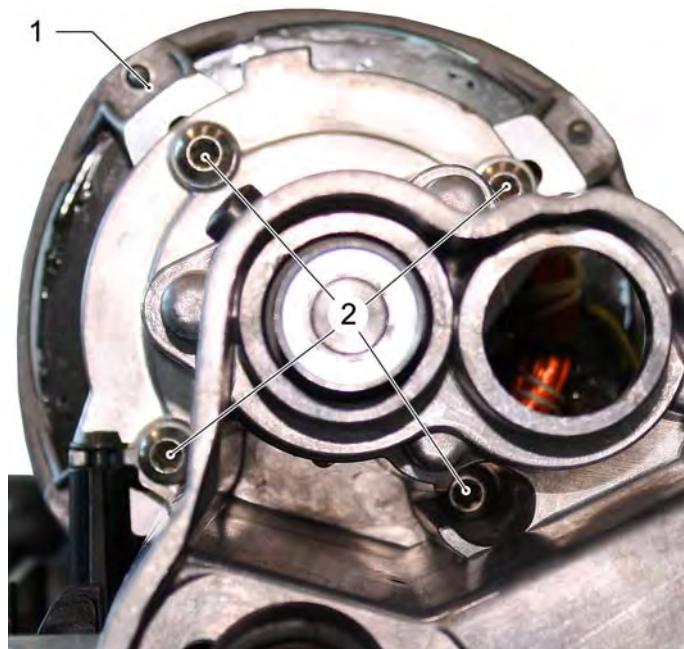
1 Pulley
2 Bushing
3 Ball bearing
4 Rotation seal
5 Brush roller pickup



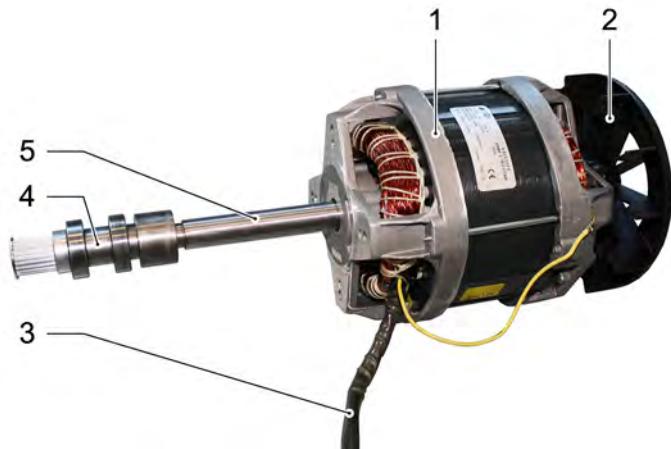
- 1 Water distribution channel
 2 Cover, water distribution channel
 → Remove the cover of the water distribution channel.



- 1 Casing top, brush head
 2 Screws
 → Unscrew the screws and remove the top part of the casing.

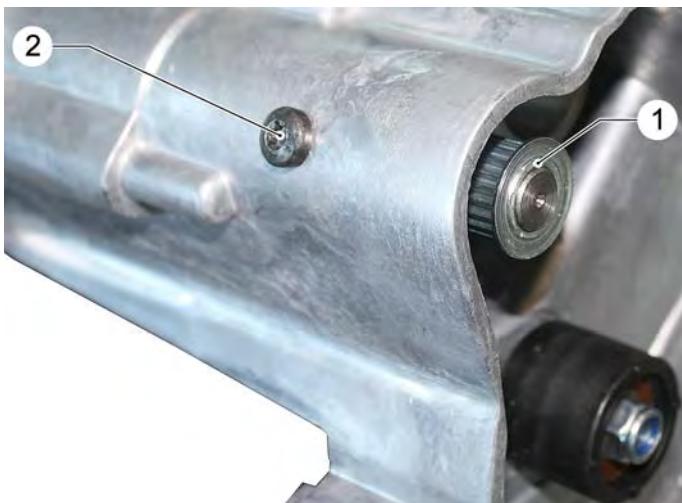


- 1 Brush motor
 2 Screws
 → Unscrew the screws.
 → Remove the gear casing from the motor.

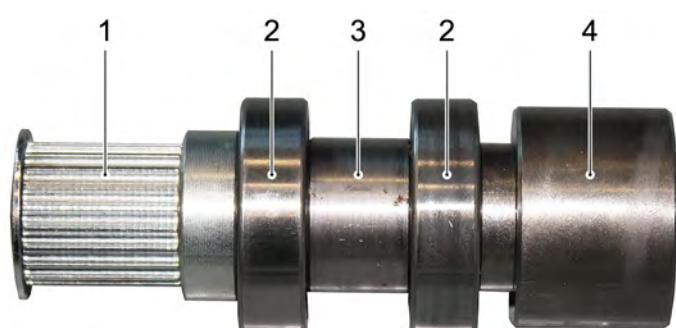


- 1 Brush motor
 2 Ventilator wheel, motor cooling
 3 Connecting cable
 4 Drive pinion, complete
 5 Motor axle
 → Replace the connecting cable.
 → Replace the brush motor.

6.13.7 Replace the drive pinion B 60 EP

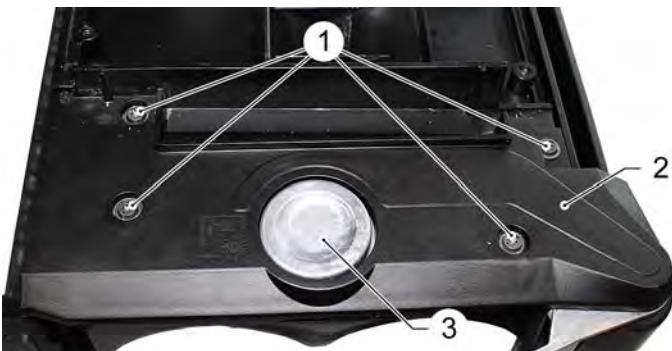


- 1 Drive pinion
 2 Screw to mount the drive pinion
 → Unscrew the screw to mount the drive pinion.
 → Remove the drive pinion from the gear casing.



- 1 Drive pinion
 2 Ball bearing
 3 Axle
 4 Motor axle intake

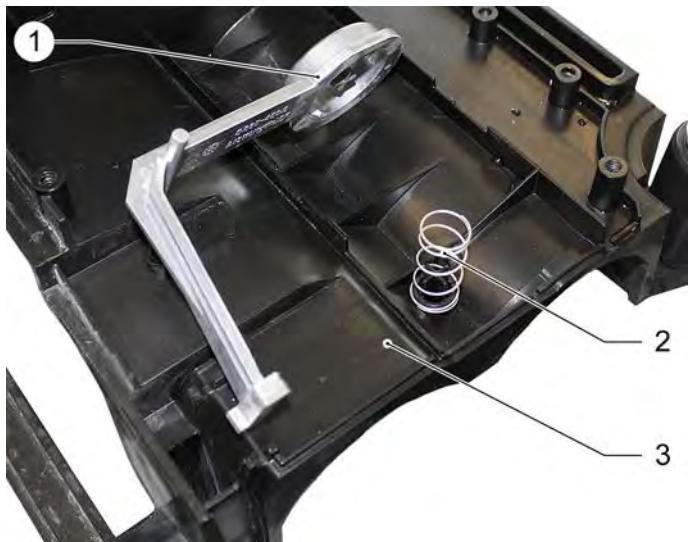
6.13.8 Replace the release button of the bearing cover



- 1 Screws
2 Cover
3 Unlocking key, storage cover
→ Remove the top of the casing from the brush head.
→ Unscrew the screws and remove the lid.



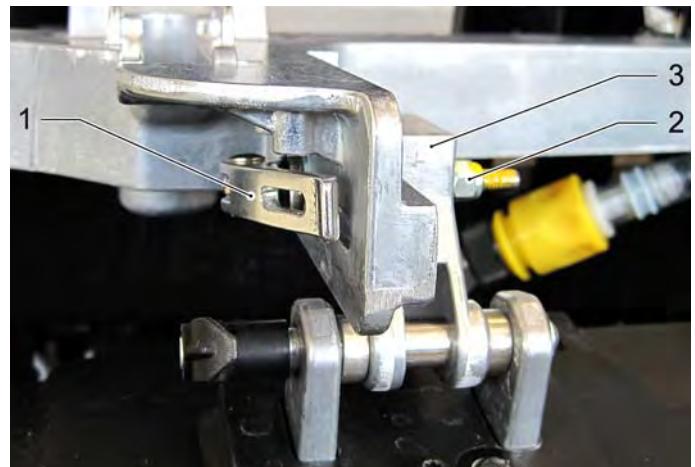
- 1 Unlocking key, storage cover
→ Remove the release button toward the top.



- 1 Unlocking key, storage cover
2 Spring
3 Brush head casing
→ Replace the release button and install in reverse order.
Ensure the correct seating of the spring during installation.

6.13.9B 60 W EP brush head suspension

To attach different brush heads, the brush head pick-up must be adjusted according to the pick-up points on the brush head.



- 1 Quick tensioning lever
2 Tension nut
3 Brush head intake
→ Close the quick tensioning lever.
→ Tighten the tension nut to 6 Nm.

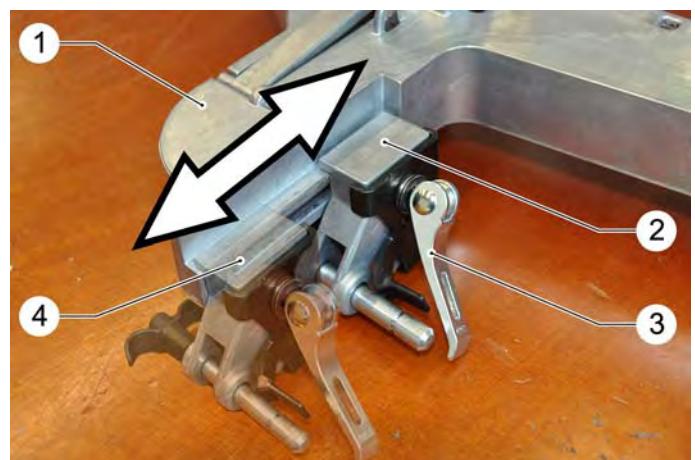
Caution

The quick tensioning lever must be closed tightly and resting on the end stop.

If the device is operated with a loose quick tensioner, the brush head pick-up can break.

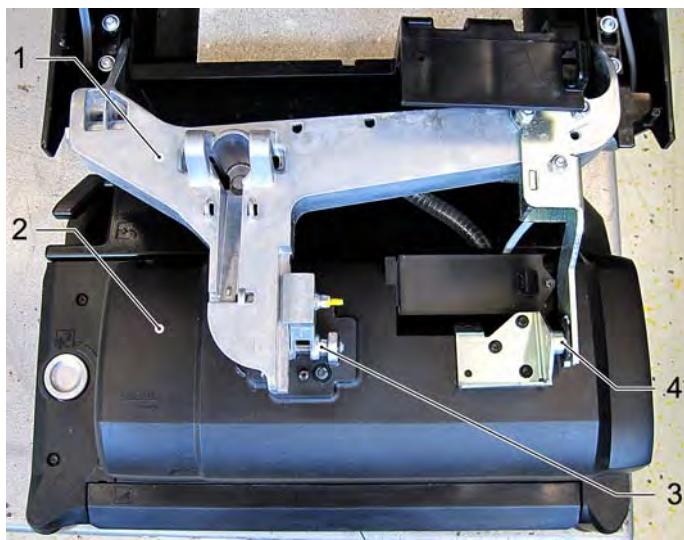
6.13.10B 60 W BP brush head suspension

To attach different brush heads, the brush head pick-up must be adjusted according to the pick-up points on the brush head.



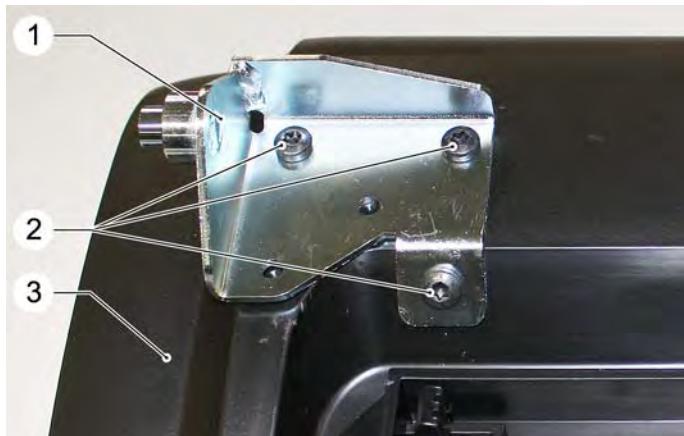
- 1 Lifter
2 Rear brush head pick-up
3 Quick tensioning lever
4 Front brush head pick-up
→ Open the quick tensioning lever.
→ Push brush head toward the back against the push handle.
→ Close the quick tensioning lever.
→ Check the brush mirror and adjust the brush head pick-up if required.

6.13.11 Brush head suspension



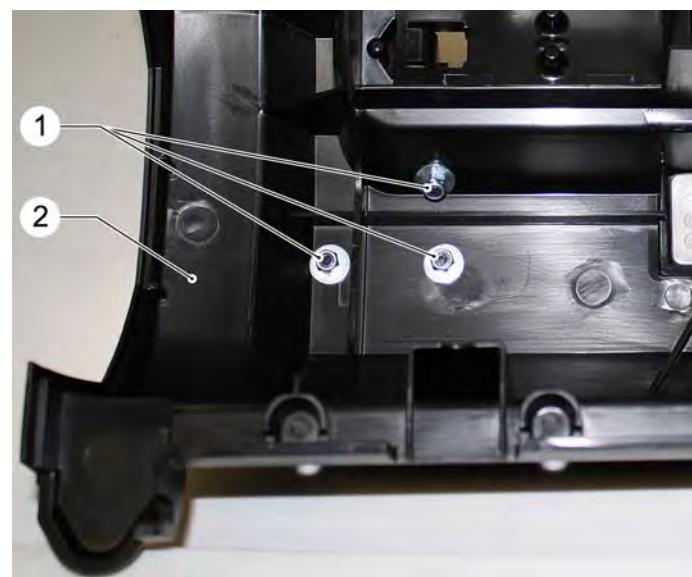
- 1 Suspension
- 2 Brush head
- 3 Holding pin
- 4 Angle sheet intake with glider

View of screw connection from the exterior:



- 1 Angle sheet intake
- 2 Screws
- 3 Brush head

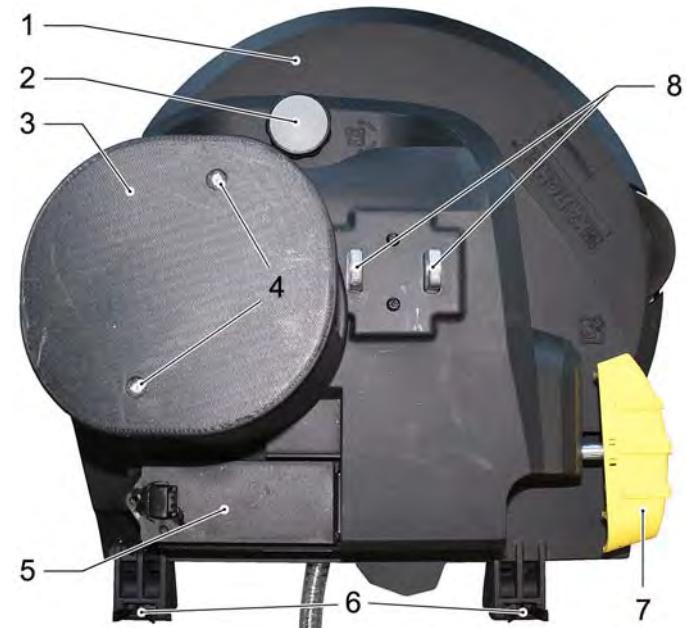
View of screw connection from the interior:



- 1 Nuts with washers
- 2 Brush head

6.14 Brush head BD model B 60 W EP

6.14.1 Overview of brush head



- 1 BD brush head
- 2 Adjustment screw, brush contact pressure
- 3 Lid of brush motor exhaust air
- 4 Screws
- 5 Lid, plug for mains connection
- 6 Rear brush head intakes
- 7 Foot pedal, disc brush unlock
- 8 Top brush head intake



- 1 Disc brush
- 2 Sealing lip
- 3 Fresh water hose to the brush head

6.14.2 Replace the brush head

If the brush head is defective or being replaced, the BD brush head must be removed.

Caution

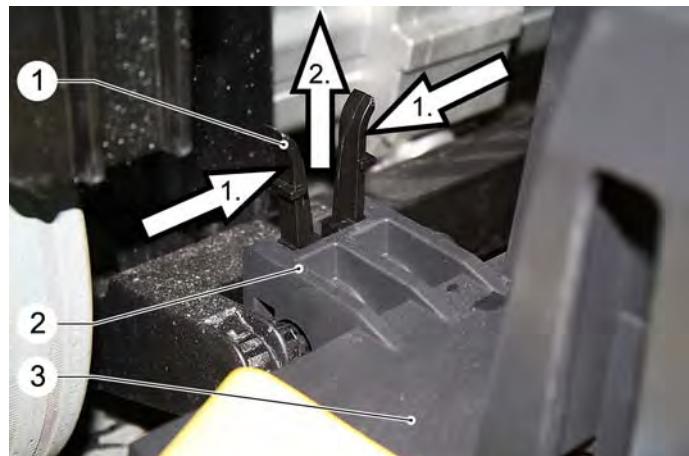
Danger of tipping. The appliance can tip over backwards.

Push the appliance forward about 2 m so that the steering rollers point toward the rear!

Prior to removing the brush head, the tank must be tilted back all the way until the push handle rests on the floor.



- 1 Stop screw
- Empty the wastewater and fresh water tank.
- Unscrew the stop screw.
- Tilt the tank backwards and carefully place it on the floor.
- After completing the service work, tilt the tank forward and screw in the stop screw.



- 1 Retaining clip
- 2 Brush head intake
- 3 Brush head
- Lower the brush head.
- 1. Compress the holding clamp.
- 2. Pull the holding clamp all the way up and out.



- B 60 W BP*
- 1 Holding pin
 - 2 Brush head
 - 3 Lock
 - Raise the lock slightly and pull out the holding bolt.



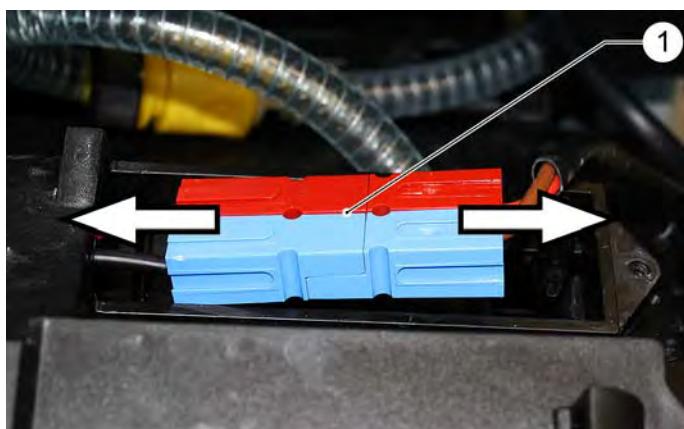
- B 60 W EP*
- 1 Holding pin
 - 2 Safety ring
 - Remove the safety ring.
 - Pull out the holding bolt.



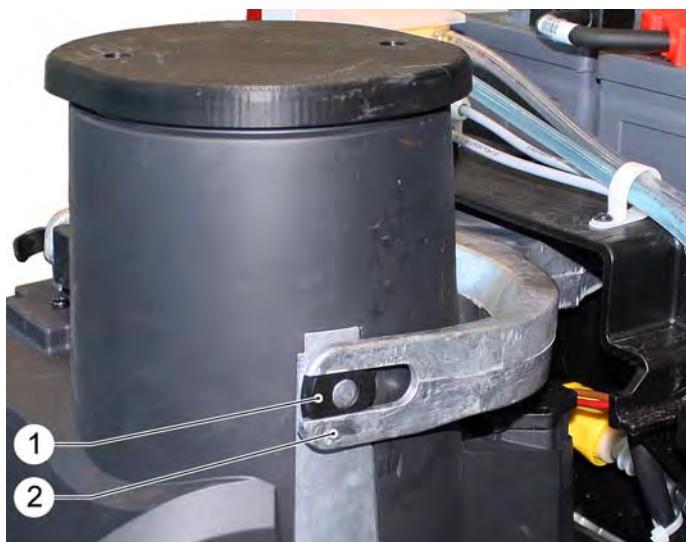
- 1 Brush head
2 Screw
3 Lid, plug for mains connection
- Loosen screws.
→ Remove the cover of the mains connection toward the top.



- 1 Hose coupling
2 Fresh water hose from the solenoid valve
3 Brush head
4 Fresh water hose to the brush head
- Disconnect the hose coupling.
→ Pull the brush head out toward the front.
→ Install the brush head in the reverse order.



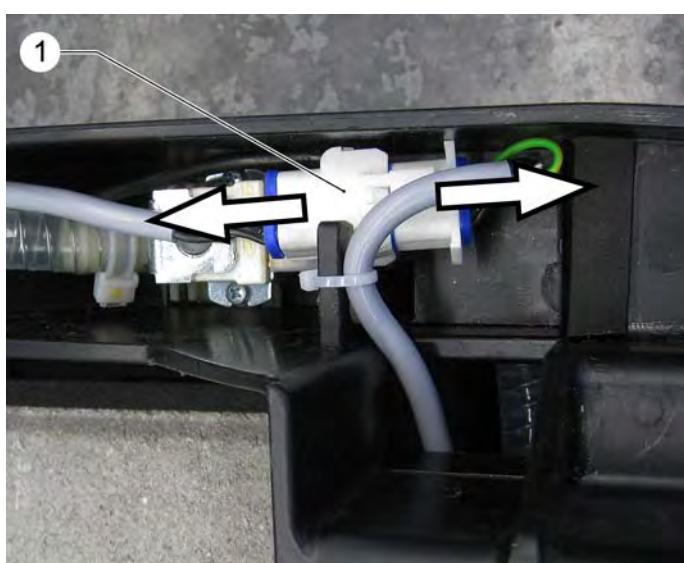
Brush head plug in B 60 W BP



- 1 Glider
2 Suspension
- Ensure that the glider is completely installed in the suspension.

Caution

The glider is only pushed onto the angle sheet intake. The glider can become lost if the brush head is removed.



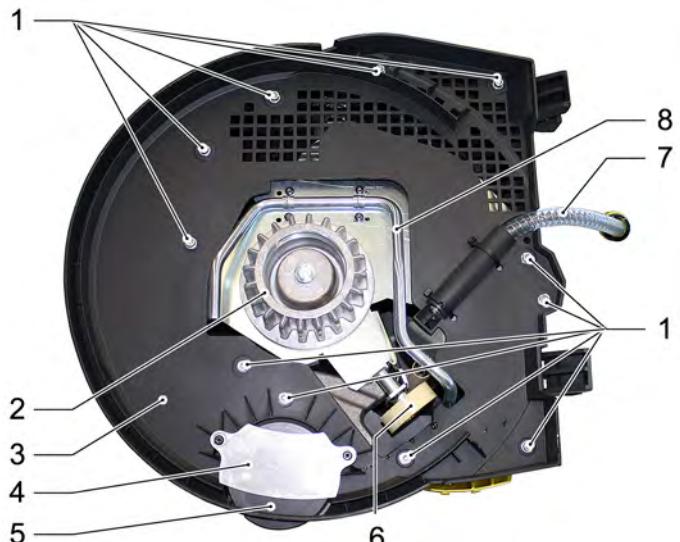
Brush head plug in B 60 W EP

- 1 Brush head plug
- Disconnect the brush head plug.

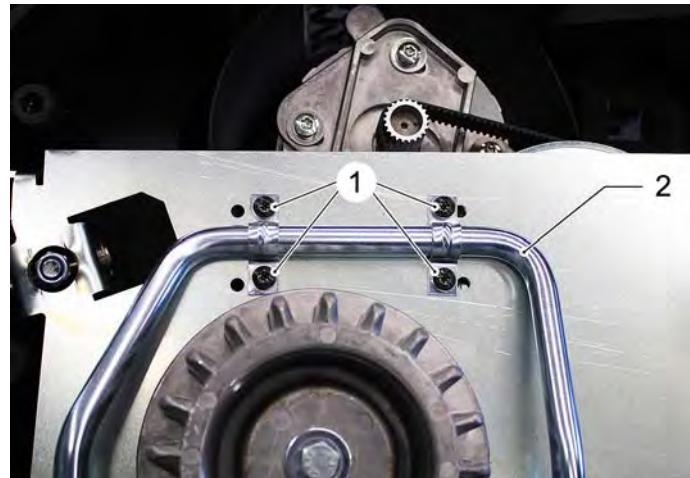
Note

The brush head connection is located in the appliance next to the solenoid valve.

6.14.3 Remove the motor with drive (B 60 W EP)



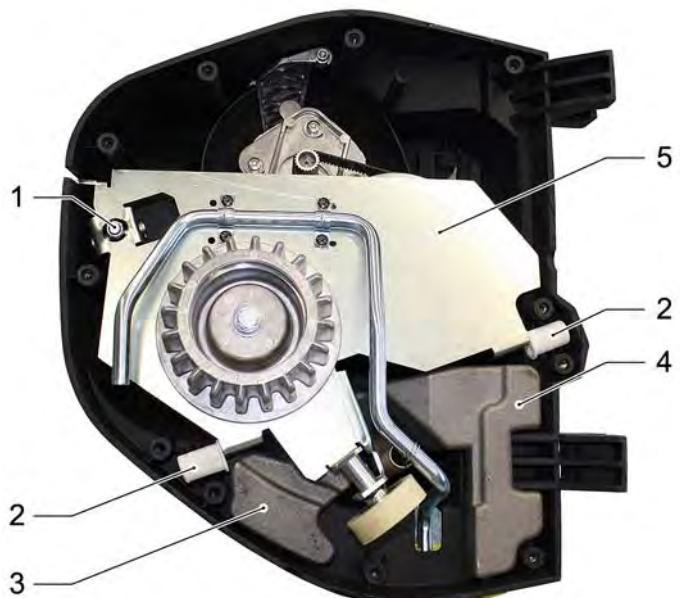
- Remove the brush head.
- Remove the disc brush.
- Unscrew the screws.
- Remove the floor plate.



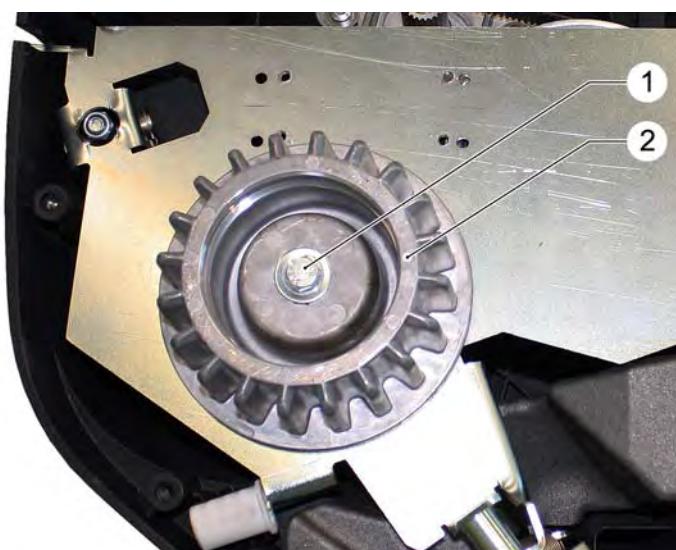
- 1 Screws
2 Bow to release the disc brush
→ Unscrew the screws.



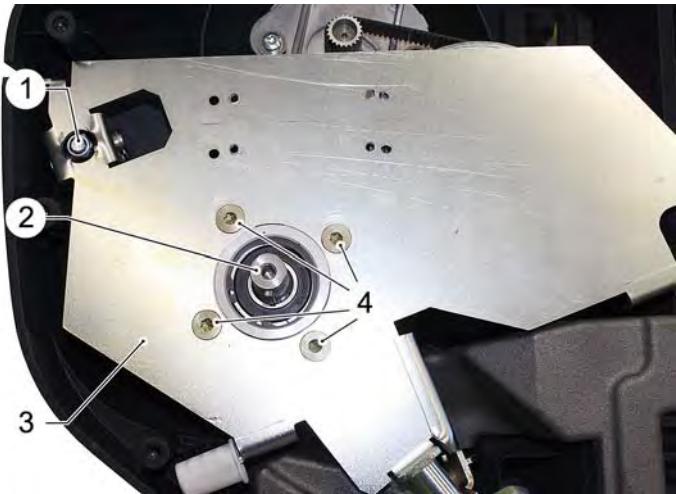
- 1 Bow to release the disc brush
2 Spring
→ Unhook the spring.
→ Remove the bow.



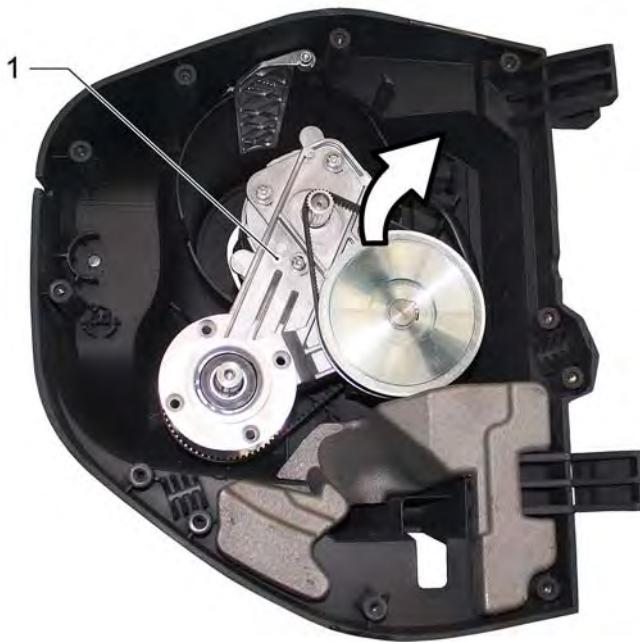
- 1 Nut, adjustment screw contact pressure
- 2 Base plate bearing
- 3 Weight, small
- 4 Weight, large
- 5 Base plate



- 1 Screw
2 Disc brush intake
→ Loosen the screw.
→ Remove the disc brush intake.

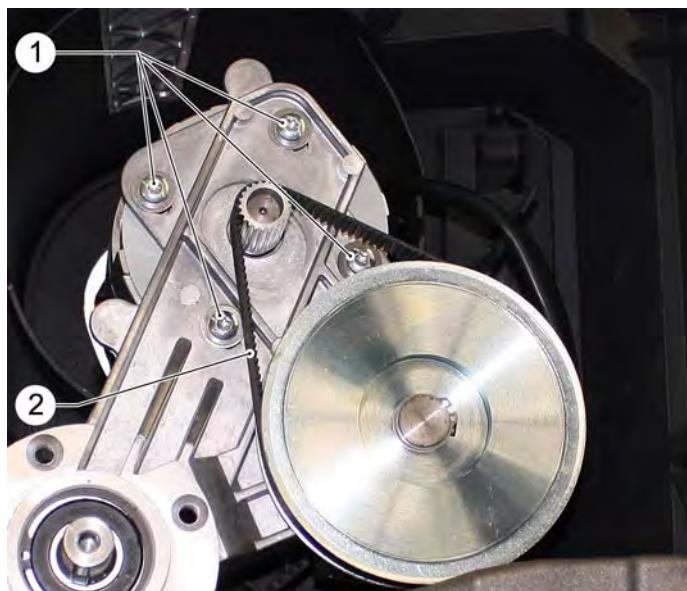


- 1 Nut, adjustment screw contact pressure
 2 Mount, disc brush intake
 3 Base plate
 4 Screws
- Unscrew the nut on the contact pressure adjustment screw.
 → Unscrew the screws.
 → Remove the base plate.

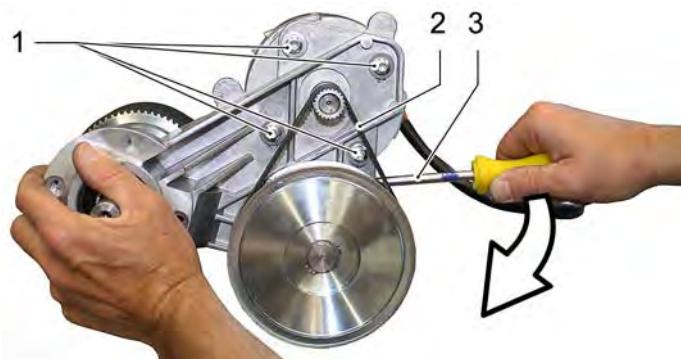


- 1 Motor with gear
- Remove the motor with gear from the brush head.

6.14.4 Replace the drive belt



- 1 Screws
 2 Drive belt
- Remove the motor with gear
 → Loosen the screws.
 → Replace the drive belts.



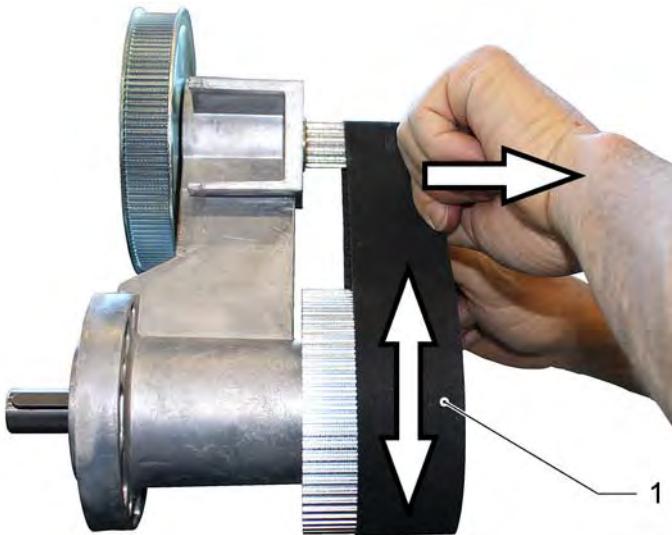
- 1 Screws
 2 Drive belt
 3 Screwdriver
- Insert the screwdriver underneath the motor and lever upwards.
 The drive belt (2) is tensioned.
 → Tighten the screws.
 → Install the motor with gear into the brush head.

6.14.5 Replace the toothed belt of the brush drive

If the toothed belt on the brush drive is worn or torn, it must be replaced.



- 1 Screw with disc
→ Remove the motor with gear
→ Loosen the screw.
→ Remove the disc.

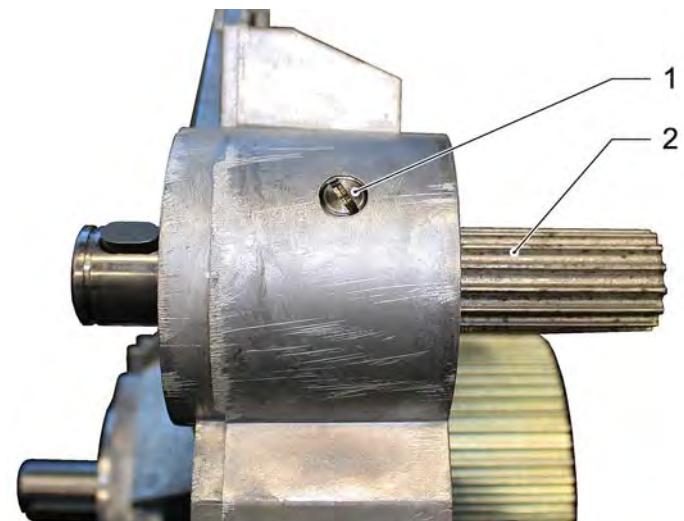


- 1 Toothed belt of the brush drive
→ Pull the toothed belt from the toothed gears by simultaneously rotating and pulling on them.
→ Place a new toothed belt and slide it onto the pulley by rotating and pushing simultaneously.

6.14.6 Replacing the drive pinion with axle



- 1 Pulley
2 Safety ring
→ Remove the motor with gear
→ Remove the drive belt.
→ Remove the safety ring.
→ Remove the pulley.

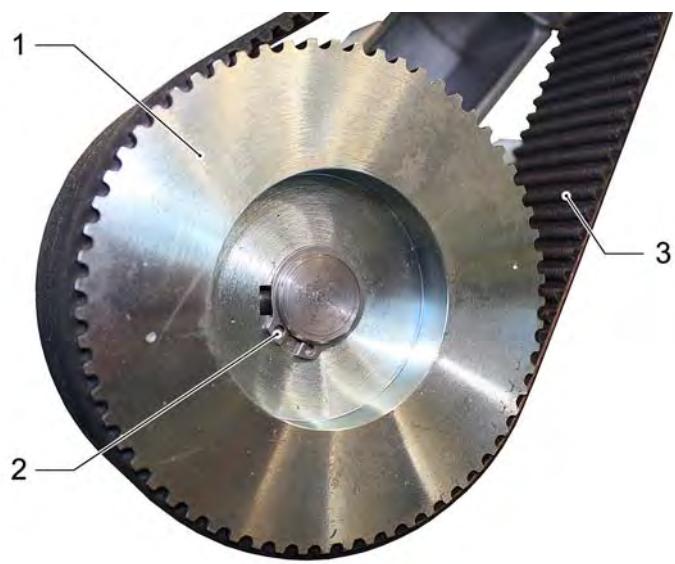


- 1 Screw to secure the axle
2 Drive pinion with axle
→ Loosen screws.

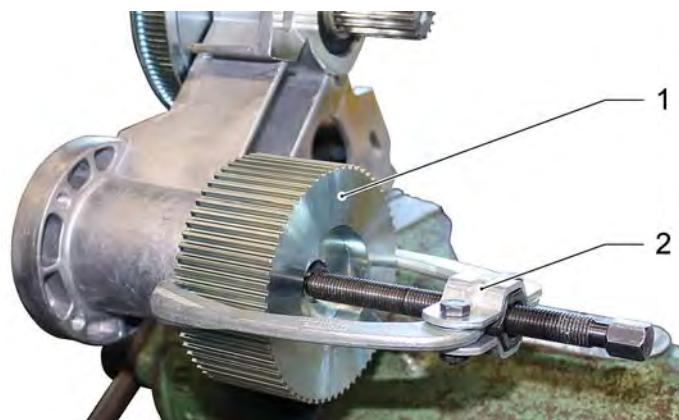


- 1 Rubber mallet
- 2 Drive pinion with axle
- 3 Gear block
- ➔ Carefully drive the drive pinion with axle from the gear block using a rubber mallet.

6.14.7 Replace the axle on the disc brush intake



- 1 Toothed disc
- 2 Safety ring
- 3 Toothed belt of the brush drive
- ➔ Remove the motor with gear
- ➔ Remove the toothed belt of the brush drive.
- ➔ Remove the safety ring.
- ➔ Remove the pulley.



- 1 Toothed disc
- 2 Puller tool
- ➔ Pull the toothed wheel off with a puller tool.

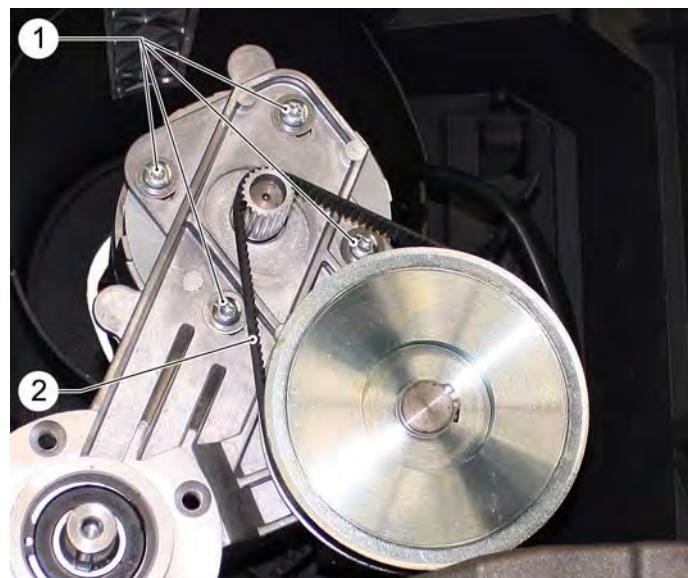


- 1 Drive pinion with axle
- 2 Gear block
- 3 Screw to secure the axle
- 4 Safety ring
- 5 Pulley

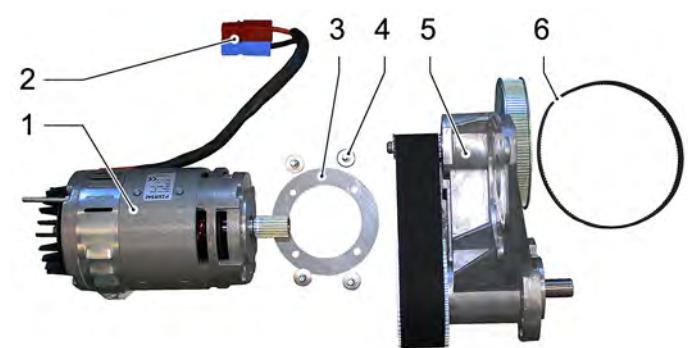


- 1 Safety ring
- ➔ Remove the safety ring.

6.14.8 Replace the brush motor



- 1 Screws
 2 Drive belt
 ➔ Remove the motor with gear
 ➔ Unscrew the screws.



- 1 Brush motor
 2 Connection plug
 3 Spacer disc
 4 Screws
 5 Gear block
 6 Drive belt

1 Rubber mallet

2 Driving tool

3 Gear block

4 Axle

➔ Carefully drive the drive pinion with axle from the gear block using a rubber mallet.

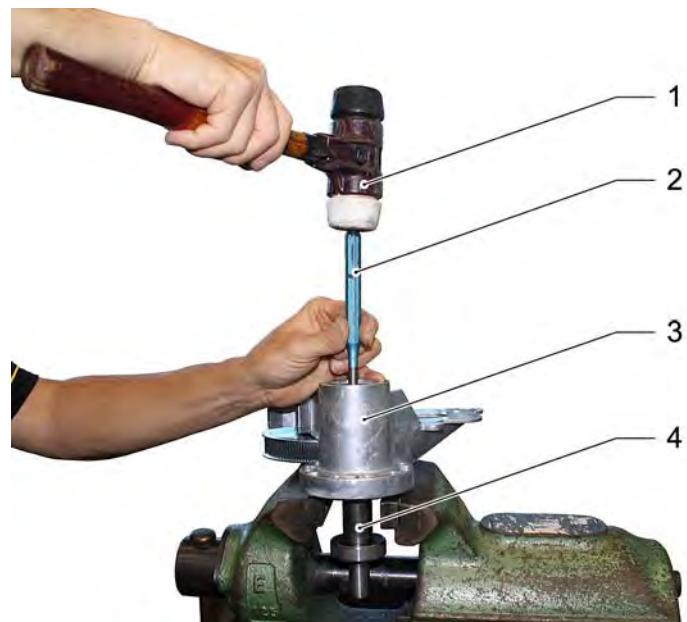
1 Gear block

2 Safety ring

3 Safety ring

4 Toothed disc

5 Axle



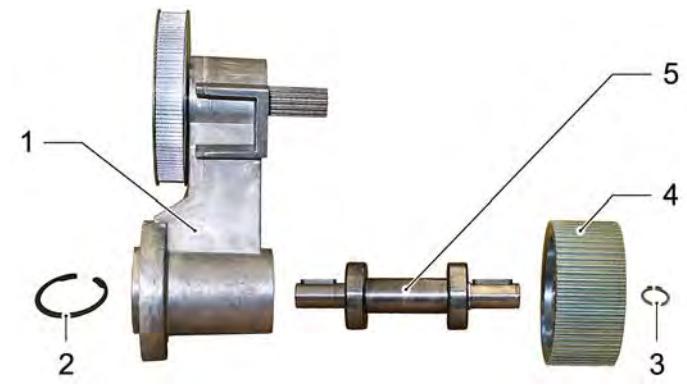
1 Rubber mallet

2 Driving tool

3 Gear block

4 Axle

➔ Carefully drive the drive pinion with axle from the gear block using a rubber mallet.



1 Gear block

2 Safety ring

3 Safety ring

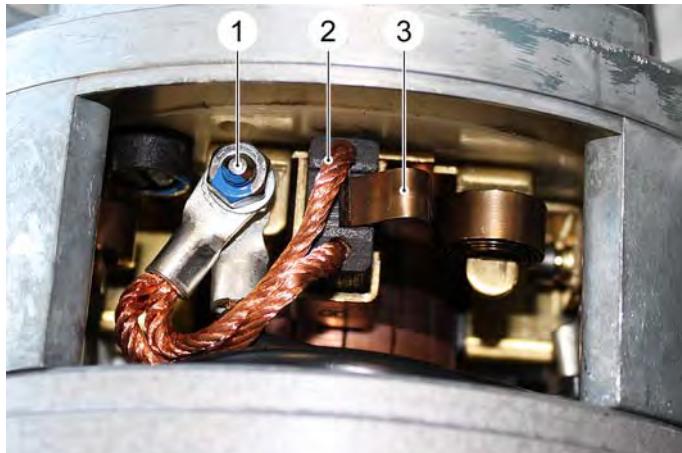
4 Toothed disc

5 Axle

6.14.9 Replace the glide contacts on the brush motor



- 1 Screw
2 Cover, glide contacts
→ Remove the brush motor.
→ Loosen screws.
→ Remove the cover of the glide contacts.



- 1 Nut, glide contact
2 Glide contact
3 Press spring
→ Lift the contact spring and pull the glide contact out of the chute.
→ Carefully place the contact spring onto the chute.



- 1 Glide contact
2 Nut, glide contact
→ Unscrew the nut and replace the glide contact.
→ Blow out the chute with compressed air.
→ Perform this procedure on both glide contacts.
→ Install the new slide contacts in reverse order.

6.14.10 Replace the foot pedal of the disc brush unlock



- 1 Foot pedal, disc brush unlock



- 1 Screws
2 Floor plate
3 Bow to release the disc brush
→ Remove the floor plate.



- 1 Screws
2 Bow to release the disc brush
→ Unscrew the screws.



1 Bow to release the disc brush

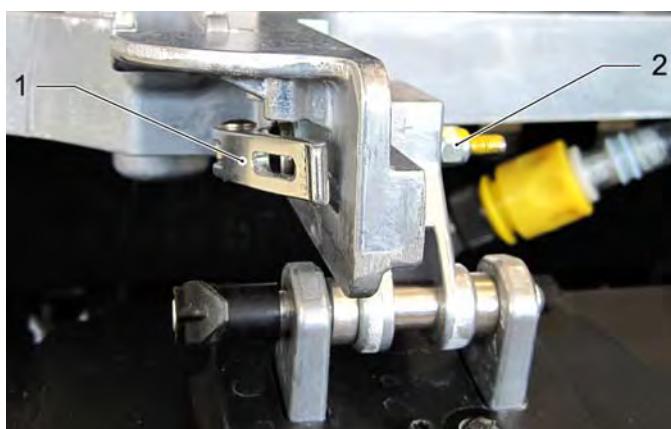
2 Spring

→ Unhook the spring.

→ Remove the bow.

→ Installation in reverse order.

6.14.11 Setting the brush head



1 Quick tensioning lever

2 Tension nut

3 Brush head intake

→ Close the quick tensioning lever.

→ Tighten the tension nut to 6 Nm.

If the appliance pulls strongly to the side, the adjustment must be altered.

Caution

The quick tensioning lever must be closed tightly and resting on the end stop.

If the device is operated with a loose quick tensioner, the brush head pick-up can break.

6.14.12 Replace the sealing lip



1 Sealing lip

2 Edge trim

→ Remove the sealing lip from the edge trim.

6.14.13 Replacing the deflector roller



1 Halting plate

2 Scraper roller

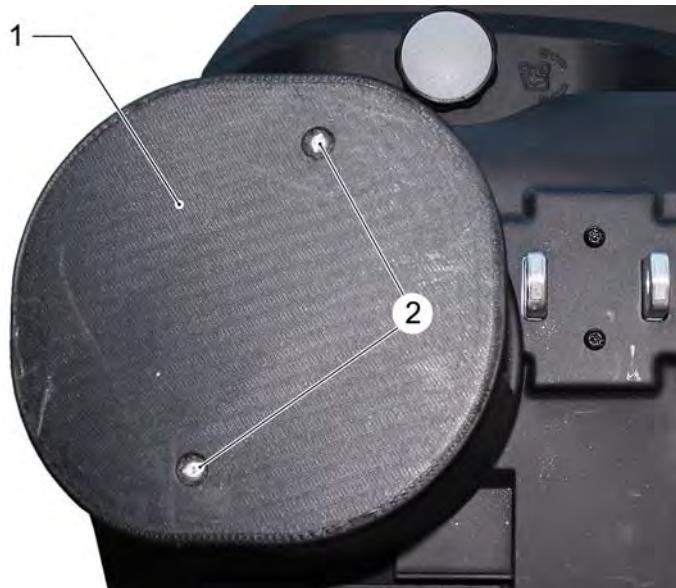
3 Screws

→ Unscrew the screws.

→ Remove the holding plate.

→ Remove the scraper roller.

6.14.14 Replace the air guide of the brush motor



1 Lid of brush motor exhaust air

2 Screws

→ Loosen screws.

→ Remove the lid.

Note

The air guide is only included in the brush heads D 43 EP and D 51 EP.



1 Air guidance

→ Remove the air guide toward the top.

→ Installation in reverse order.

6.15 Brush head BD model B 60 W BP

6.15.1 Replace the brush head

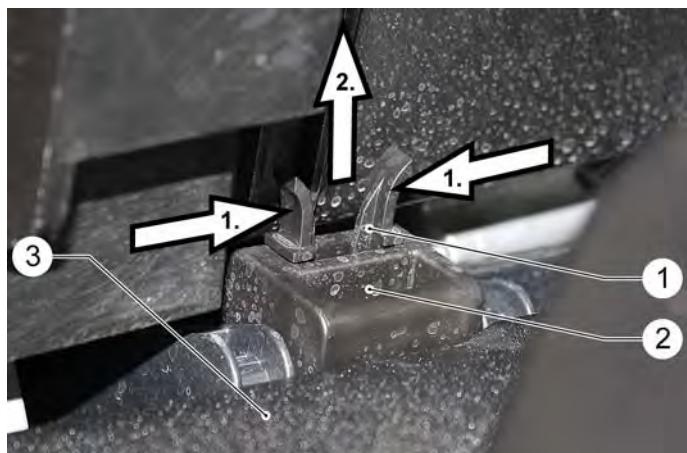
If the brush head is defective or being replaced, the BD brush head must be removed.

Caution

Danger of tipping. The appliance can tip over backwards.

Push the appliance forward about 2 m so that the steering rollers point toward the rear!

Prior to removing the brush head, the tank must be tilted back all the way until the push handle rests on the floor.



1 Retaining clip

2 Brush head pick up on the push bar

3 Brush head

→ Lower the brush head.

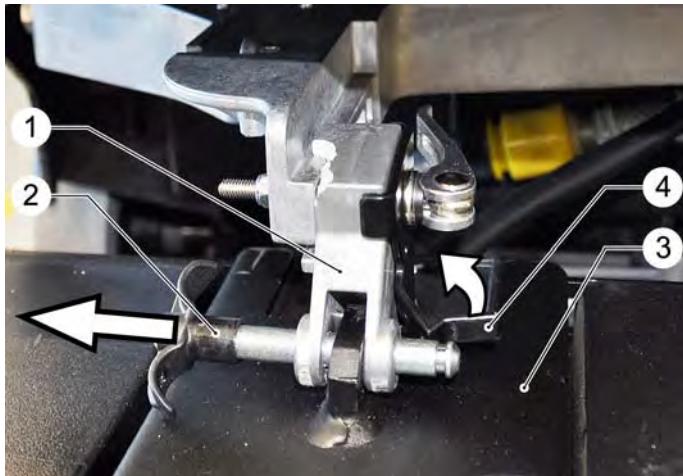
→ 1. Compress the holding clamp.

2. Pull the holding clamp all the way up and out.



1 Air guidance

2 Brush motor



- 1 Suspension
2 Holding pin
3 Brush head
4 Lock
- Push the lock back slightly and pull out the holding bolt.
→ Raise the pick-up.

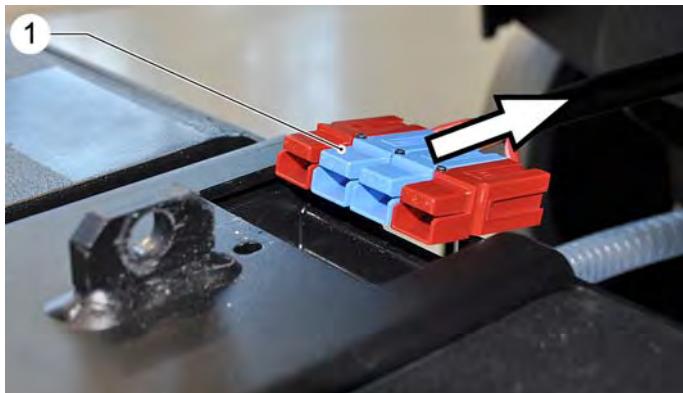


- 1 Hose coupling
→ Disconnect the hose coupling.
→ Pull the brush head out toward the front.
- Sequence of brush head installation:**

1. Push the brush head in all the way to the push bar.
2. Insert the fastening clamps into the brush head pick-ups on the push bar.
3. Open the quick tensioner on the suspension.
4. Position the brush head under the suspension.
5. Slide in holding bolt.
The holding bolt must be able to move easily without pressure.
6. Move the brush head back and forth slightly to remove any tension.
7. Close the quick tensioner.

Note

Also see chapter "Adjust the brush head pick-up on the lifter".



- 1 Brush head plug
→ Remove the plug for the power connection.

6.15.2Replacing the disc brush pick-up



- 1 Water distribution hose, left
- 2 Bow to release the disc brush, left
- 3 Disc brush pick-up left
- 4 Floor plate
- 5 Bow to release the disc brush, right
- 6 Disc brush pick-up, right
- 7 Sealing lip
- 8 Water distribution hose, right

6.15.3Replace the bow to release the disc brush

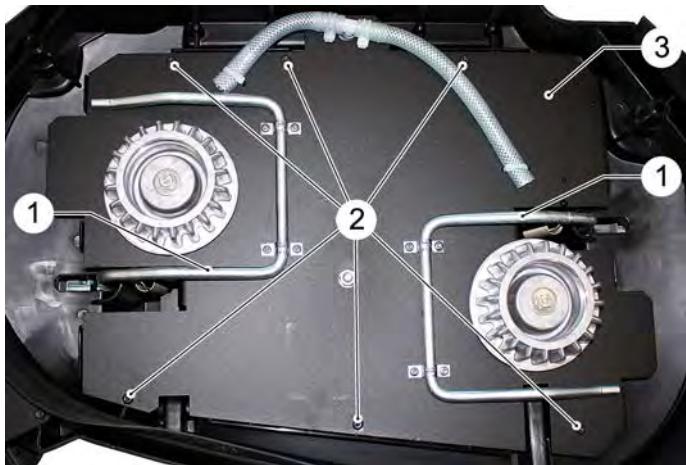


- 1 Bow to release the disc brush, left
 - 2 Bow guide
 - 3 Spring
 - 4 Bow holder
- Unscrew the screws on the holders.
→ Unhook the springs.
→ Remove the bow through the guides.

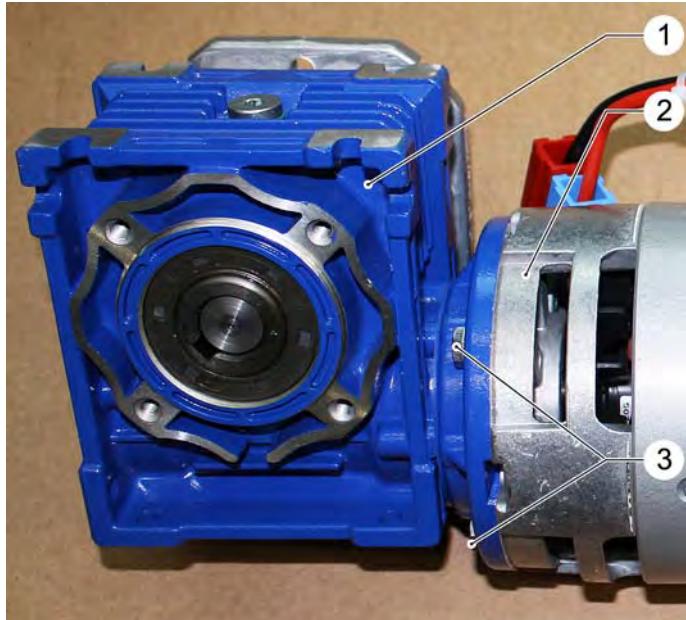


- 1 Disc brush intake
 - 2 Screw
- Loosen the screw.
→ Remove the disc brush intake.

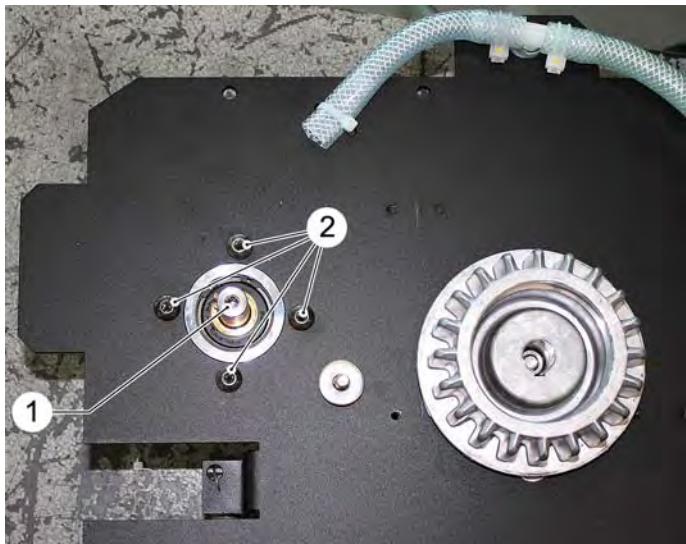
6.15.4 Removing the motor with gear



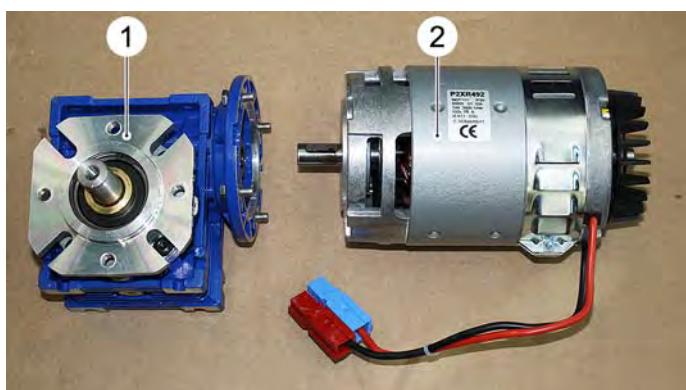
- 1 Bow to release the disc brush
 2 Screws
 3 Floor plate
 → Unscrew the screws.
 → Remove the floor plate.
 → Remove the disc brush pick-up.



- 1 Gear
 2 Motor
 3 Screws
 → Unscrew the screws.
 → Installation in reverse order.

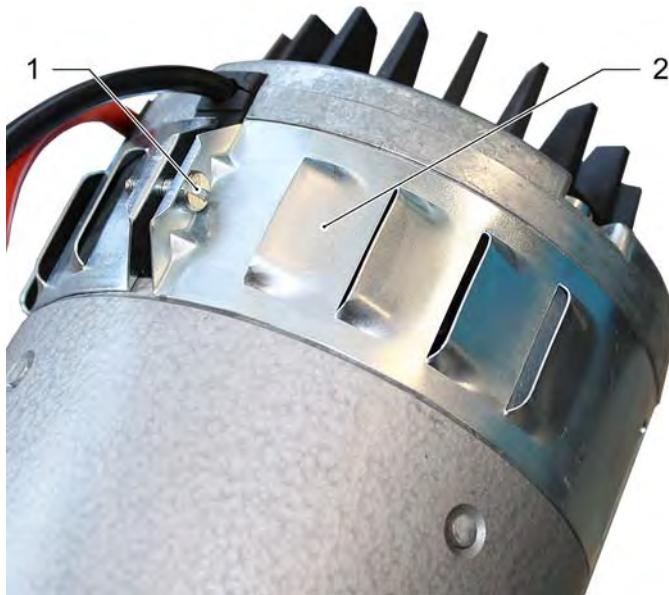


- 1 Gear axle
 2 Screws
 → Unscrew the screws.
 → Remove the gear with motor.



- 1 Gear
 2 Motor

6.15.5 Replace the glide contacts on the brush motor



1 Glide contact

2 Nut, glide contact

→ Unscrew the nut and replace the glide contact.

→ Perform this procedure on both glide contacts.

Note

Blow out the chute with compressed air prior to installing the glide contacts.

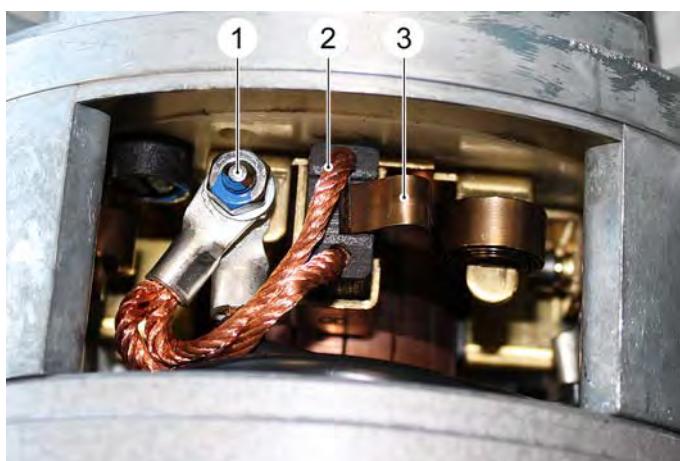
1 Screw

2 Cover, glide contacts

→ Remove the brush motor.

→ Loosen screws.

→ Remove the cover of the glide contacts.



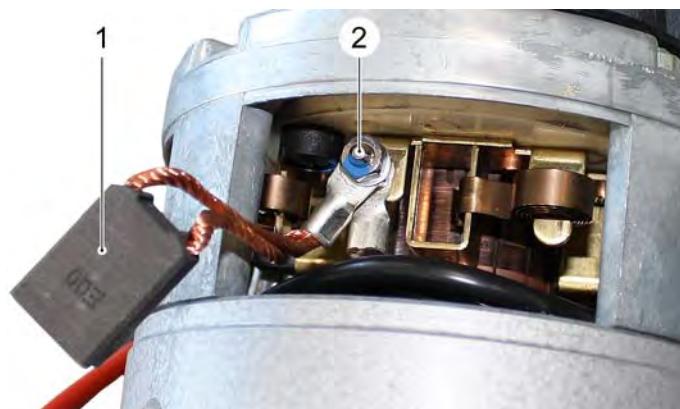
1 Nut, glide contact

2 Glide contact

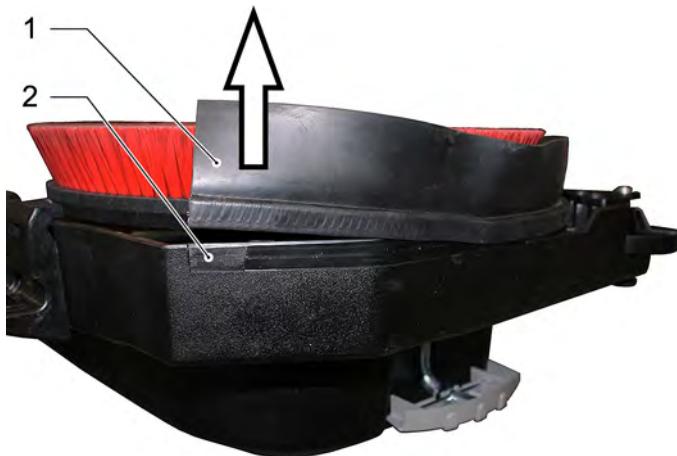
3 Press spring

→ Lift the contact spring and pull the glide contact out of the chute.

→ Carefully place the contact spring onto the chute.



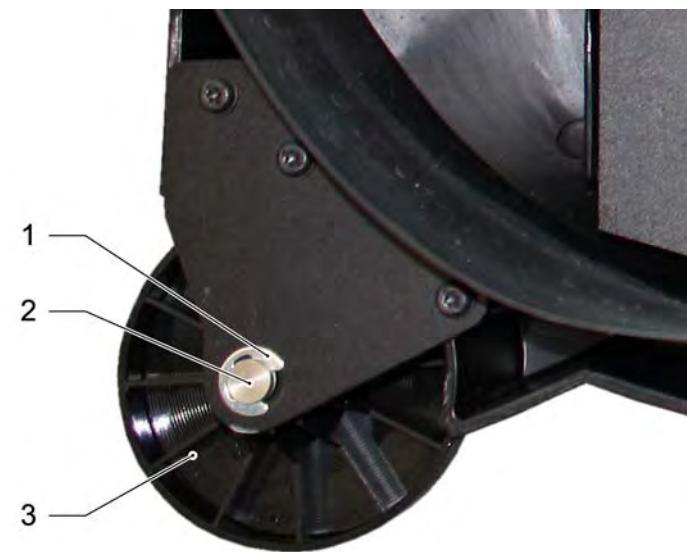
6.15.6 Replace the sealing lip



- 1 Sealing lip
2 Edge trim

→ Remove the sealing lip from the edge trim.

6.15.7 Replacing the deflector roller



- 1 Safety ring
2 Axis pins
3 Scraper roller

→ Remove the safety ring.

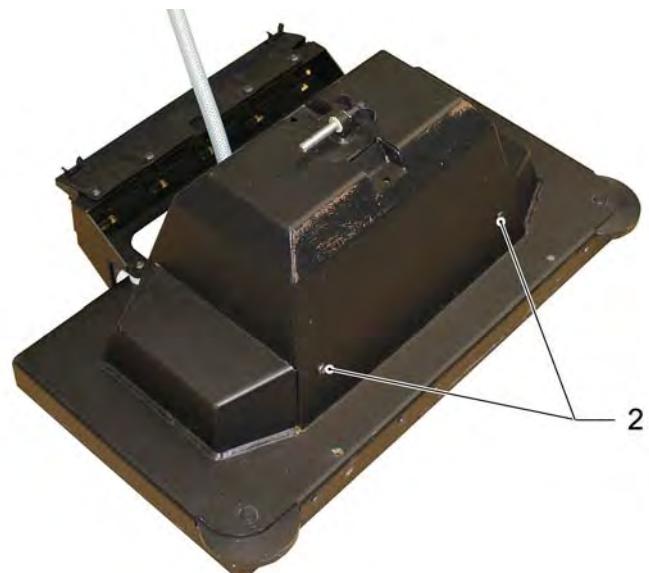
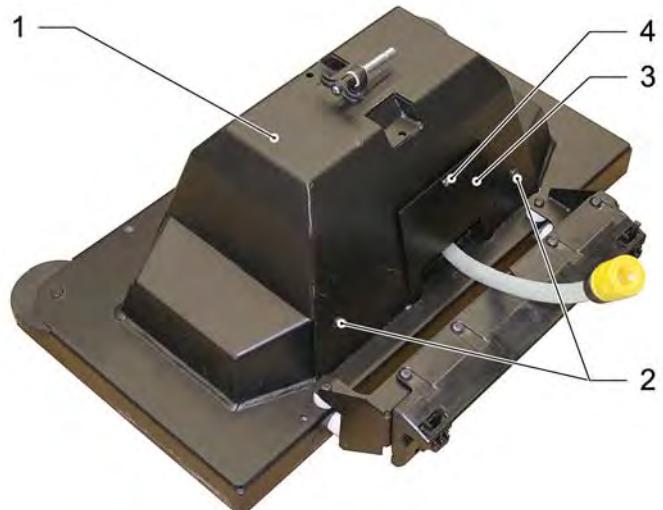
→ Take the pivot pin out of the holder.

6.16 Brush head S 65 (Swing)

6.16.1 Replace the brush head

The replacement takes place just like with the brush head BR model.

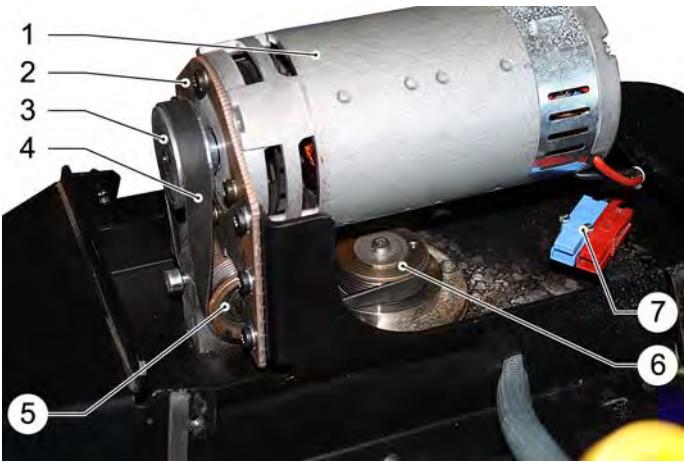
6.16.2 Remove the housing lid.



- 1 Covering lid
2 Screws
3 Lid, plug for mains connection
4 Screw

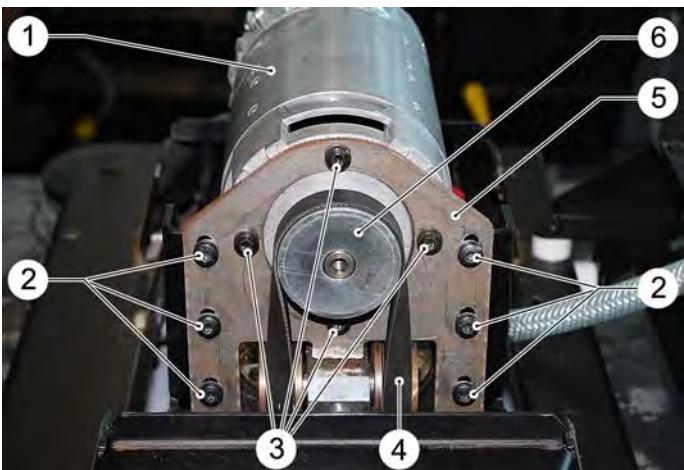
→ Unscrew the screws.

→ Remove the housing cover.

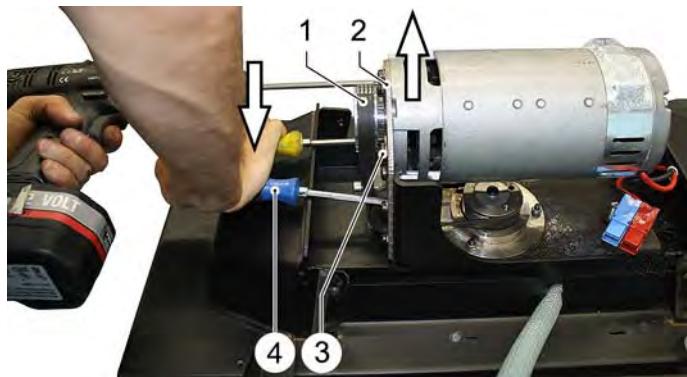


- 1 Brush motor
2 Motor plate
3 Pulley, drive
4 Drive belt
5 Reversal rollers
6 Pulley, excenter
7 Power connector plug

6.16.3 Replace the drive belt

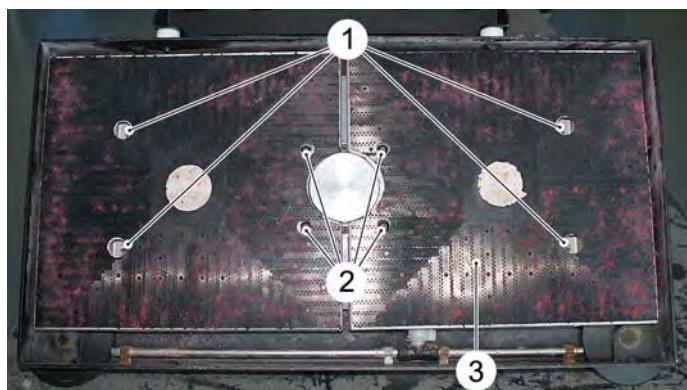


- 1 Brush motor
2 Motor plate screws
3 Screws, brush motor
4 Drive belt
5 Motor plate
6 Pulley, drive
→ Remove the casing lid.
→ Loosen the motor plate screws.
→ Remove the drive belt.
→ Install a new drive belt.



- 1 Drive belt
2 Motor plate
3 Motor plate screws
4 Screwdriver
→ Lift the motor plate up with two screwdrivers and tension the drive belt.
→ Tighten the motor plate screws.

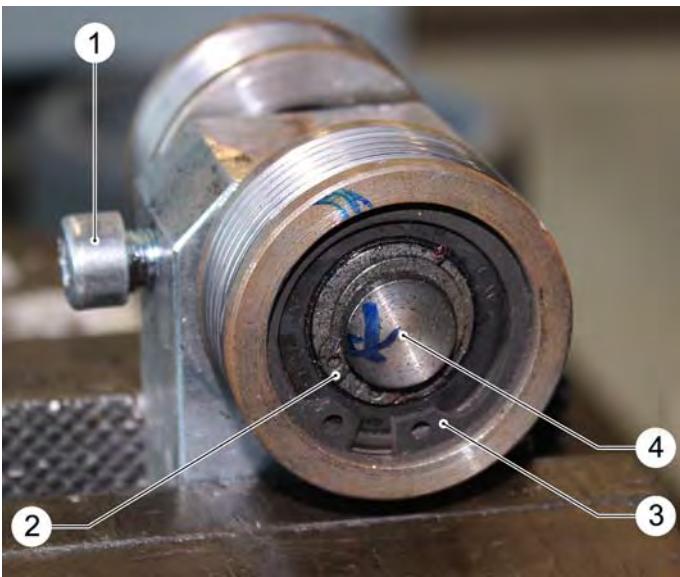
6.16.4 Replace deflection pulleys



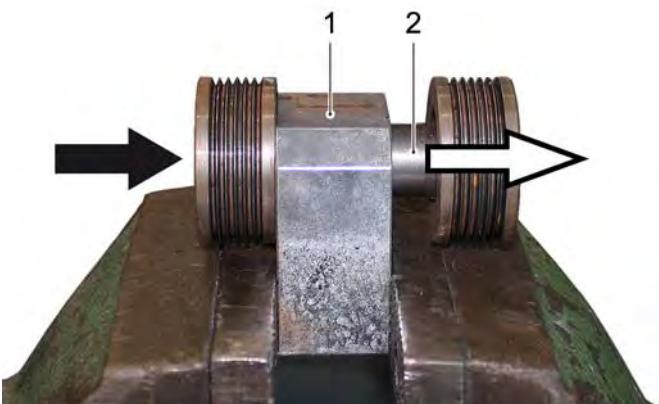
- 1 Nuts, pad pick-up
2 Screws, pad pick-up
3 Pad pick-up
→ Remove the casing lid.
→ Remove the drive belt.
→ Loosen the mounting nuts.
→ Unscrew the screws.
→ Remove the pad pick-up.



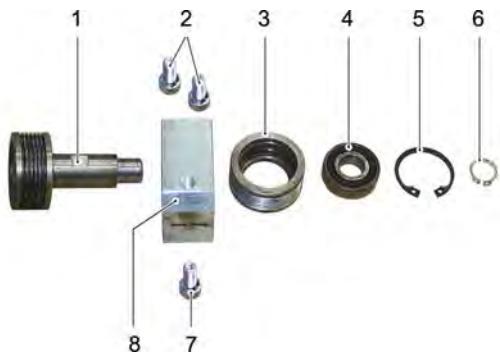
- 1 Screws, base
→ Unscrew the screws.
→ Remove the base with the deflection pulleys.



- 1 Screw, axle mount
2 Safety ring, interior
3 Safety ring, exterior
4 Axle
→ Remove the interior safety ring.

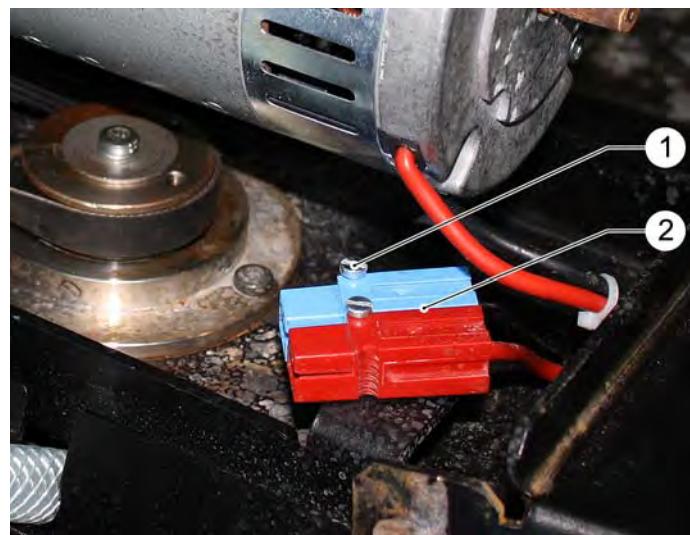


- 1 Base
2 Axle
→ Drive the axle out of the base with a driver tool.

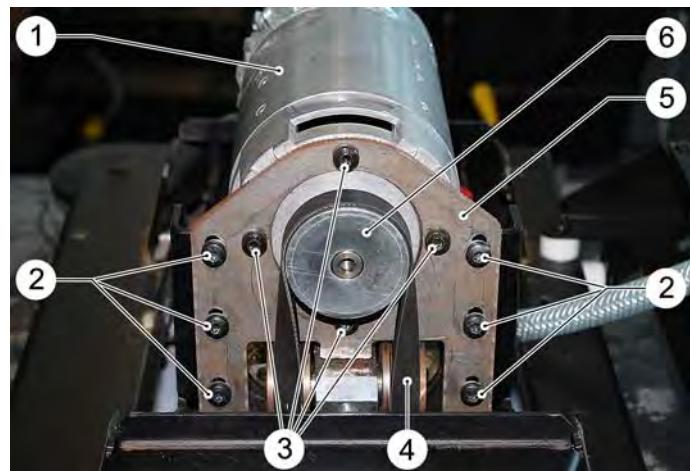


- 1 Axle with deflector pulley
2 Screws
3 Pulley
4 Ball bearing
5 Safety ring, exterior
6 Safety ring, interior
7 Screw, axle mount
8 Base

6.16.5 Replace the motor.



- 1 Screw
2 Power connector plug
→ Remove the casing lid.
→ Loosen the screw.



- 1 Brush motor
2 Motor plate screws
3 Screws, brush motor
4 Drive belt
5 Motor plate
6 Pulley, drive
→ Loosen the motor plate screws.
→ Remove the drive belt.
→ Unscrew the screws of the motor.
→ Remove the motor.

6.16.6 Replace the glide contacts on the brush motor

The replacement takes place just like with the brush head BR model.

6.16.7Replacing the pulley on the excenter



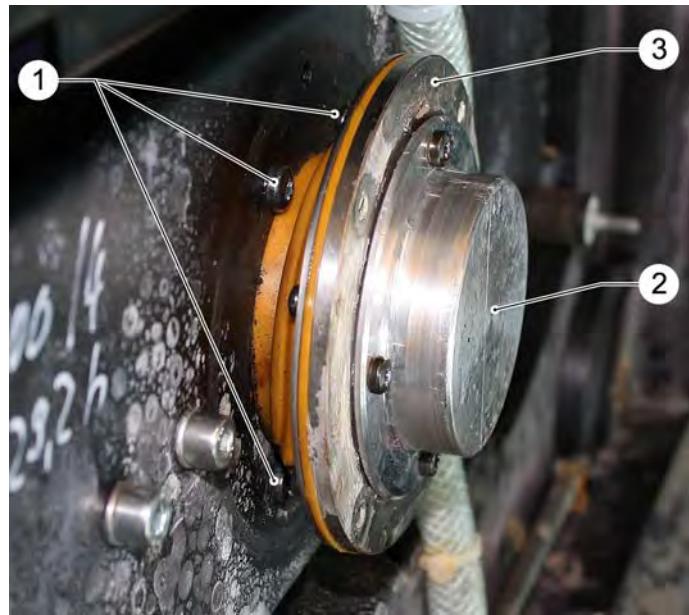
- 1 Screw
 - 2 Disc
 - 3 Pulley
- Remove the motor.
→ Loosen the screw.



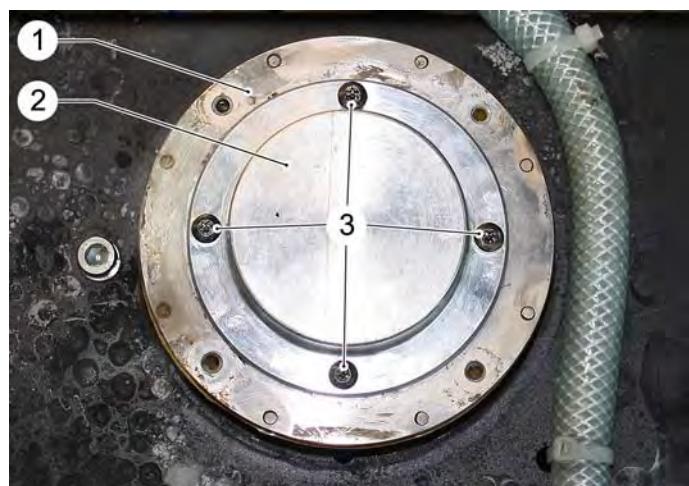
Sample picture, excenter removed

- 1 Puller tool
 - 2 Screw
 - 3 Pulley
- Screw the screw into the pulley.
→ Attach the puller tool and remove the pulley.

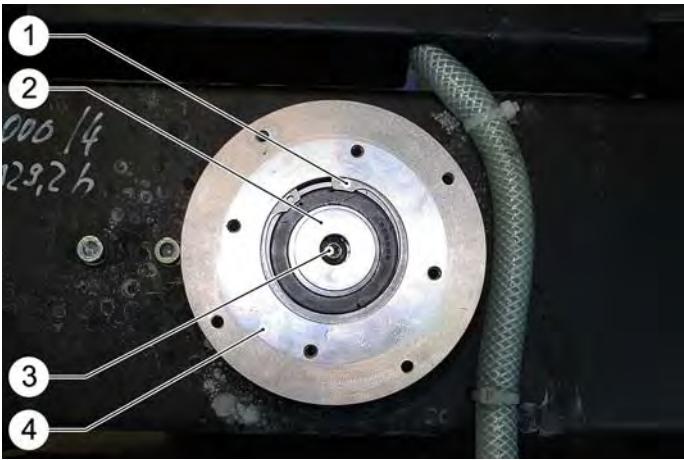
6.16.8Replacing the excenter



- 1 Excenter screws
- 2 Carrier lid
- 3 Excenter disc with rubber collar

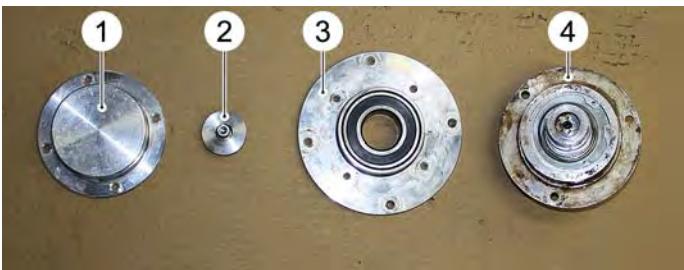


- 1 Excenter disc with rubber collar
 - 2 Carrier lid
 - 3 Screws
- Remove the casing lid.
→ Remove the drive belt.
→ Remove the pad pick-up.
→ Unscrew the screws.
→ Remove the carrier lid.



- 1 Safety disc
2 Disc
3 Screw
4 Excenter disc with rubber collar

→ Loosen the screw.
→ Remove the excenter disc.
→ Unscrew the excenter screws.
→ Remove the excenter from the brush head.

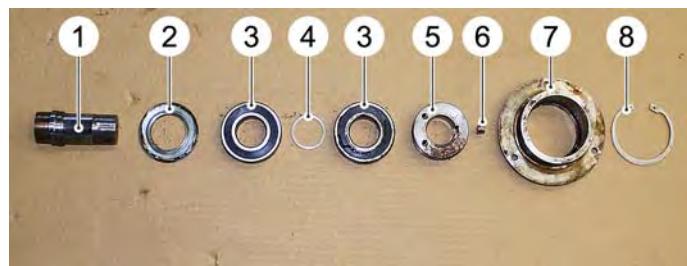


- 1 Carrier lid
2 Screw with disc
3 Excenter disc with rubber collar
4 Excenter with pulley



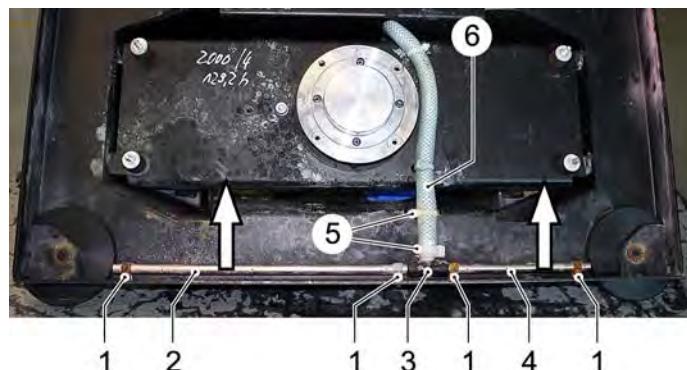
1 Rubber collar

Excenter setup

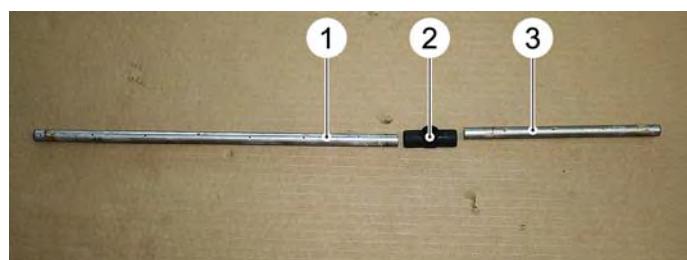


- 1 Excenter axis
2 Seal disc
3 Ball bearing
4 Spacer ring
5 Pulley
6 Fitting key
7 Excenter sleeve
8 Safety ring

6.16.9 Replace water distribution pipes



- 1 Retaining clip
2 Water distributor pipe, left
3 T-piece
4 Water distributor pipe, right
5 Cable connector
→ Remove the pad pick-up.
→ Remove the cable ties.
→ Pull water distribution pipes off of the holding clamps.



- 1 Water distributor pipe, left
2 T-piece
3 Water distributor pipe, right

6.16.10Replacing the deflector roller



1 Scraper roller

2 Axis pins

3 Safety ring

→ Remove the pad pick-up.

→ Remove the axle bolt.

→ Remove the scraper roller.

6.17 Brush head suspension

6.17.1Overview of lifter



1 Support right

2 Lifter

3 Support left

4 Brush head pick-up

5 Quick tensioning lever

6 Brush head adjustment

6.17.2Removing the lifter



1 Lifter

2 Screws

→ Remove the brush head.

→ Unscrew the screws on the left and right side of the lifter as well as the holder.



1 Lifter

2 Raise and lower the lever rod, brush head

3 Screws

→ Unscrew the screws.

→ Remove the lifter.

→ Install the new lifter in reverse order.

6.17.3 Adjust the quick tensioning lever on the lifter



- 1 Quick tensioning lever
2 Tension nut
→ Close the quick tensioning lever.
→ Tighten the tension nut to 6 Nm.

Note

Tighten the tension nut so that the end stop can be felt when the quick tensioning lever is closed.

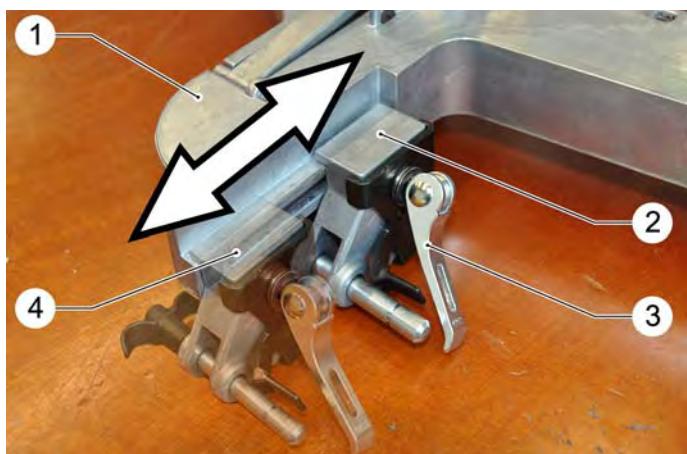
Caution

The quick tensioning lever must be closed tightly and resting on the end stop.

If the device is operated with a loose quick tensioner, the top brush head pick-up can break.

6.17.4 Adjust the brush head pick-up on the lifter

To attach different brush heads, the brush head pick-up must be adjusted according to the pick-up points on the brush head.



- 1 Lifter
2 Rear brush head pick-up
3 Quick tensioning lever
4 Front brush head pick-up
→ Open the quick tensioning lever.
→ Move the brush head pick-up:
Front adjustment: BD
Rear adjustment: BR
→ Close the quick tensioning lever.

6.18 Drive and wheels

6.18.1 Replace the drive motor with gear axle (B 60 W)

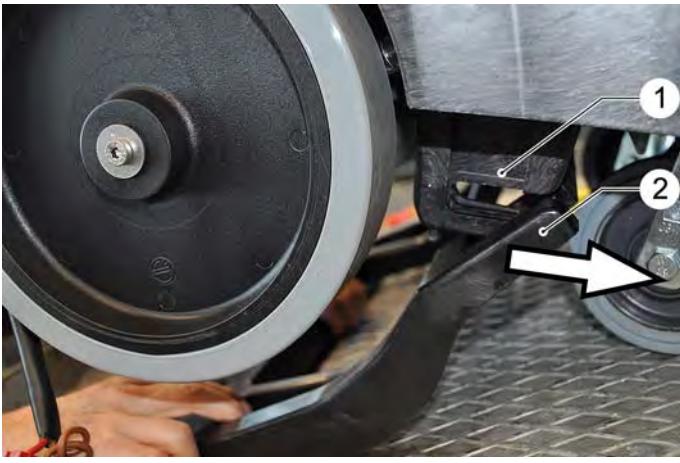
The drive motor and the gear axle can only be replaced as one unit if they are defective.



- 1 Holder, gear axle
2 Screws
3 Gear axle with drive motor
→ Remove the brush head.
→ Remove the batteries.
→ Tilt the appliance to the side and rest it.
→ Unscrew the screws and remove the holder.



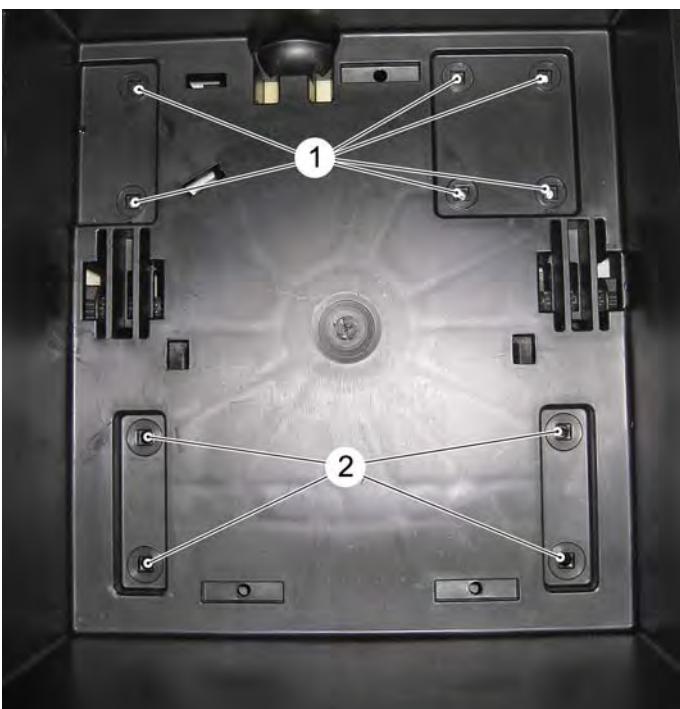
- 1 Push rod, brush head
2 Lock hook
→ Press the hook on the push rod slightly toward the middle of the appliance until the push rod can be pivoted toward the bottom.



- 1 Pick-up, push bar
2 Push rod, brush head

→ Press the push rod all the way down and remove it with the pick-up.
→ Remove the gear axle with drive motor toward the bottom.
→ Remove the connecting cable on the control electronics.
→ Install the new gear axle with drive motor in reverse order.

Repair solution



- 1 Steering roller mount
2 Drive motor mount B 60 W BP

Axle mount B 60 W EP

If you should not be able to mount from the bottom anymore, you can install long M8 carriage bolts from the top.

→ In this case, drill the bores to 8.5 mm.
→ Install the steering roller/drive motor/wheel axle and fasten it from the bottom with self-locking hex nuts.

6.18.2 Replacing the glide contacts in the drive motor



1 Drive motor

2 Floor pan

→ Swivel the tank upward.
→ Remove the battery terminal of the battery in front on the right.
→ Remove the battery.

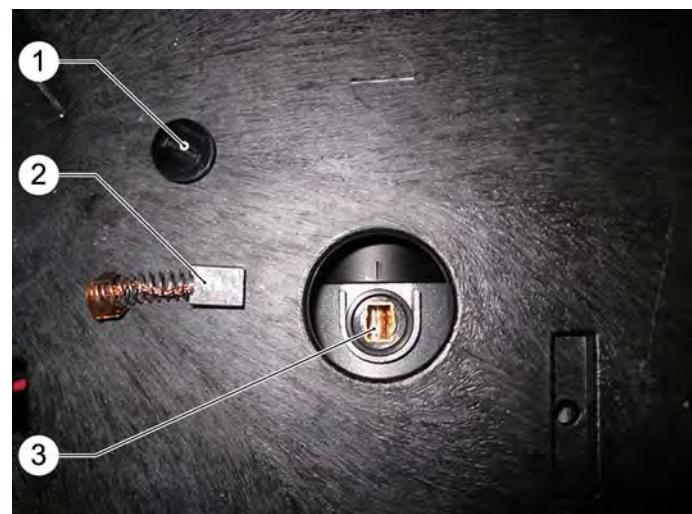


1 Drive motor

2 Glide contact chute lock

3 Floor pan

→ Open the lock and remove it from the drive motor.



1 Glide contact chute lock

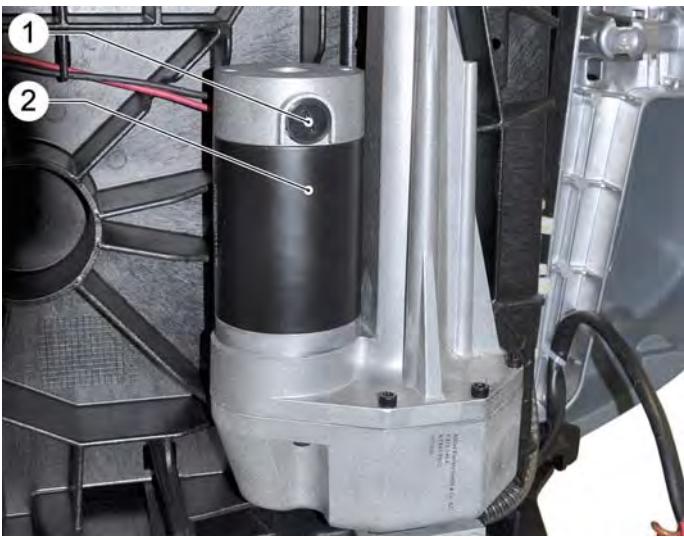
2 Glide contact

3 Glide contact chute

→ Replace the glide contact.
→ Repeat the process on the bottom side of the drive motor.

Note

Blow out the chute with compressed air prior to installing the glide contacts.



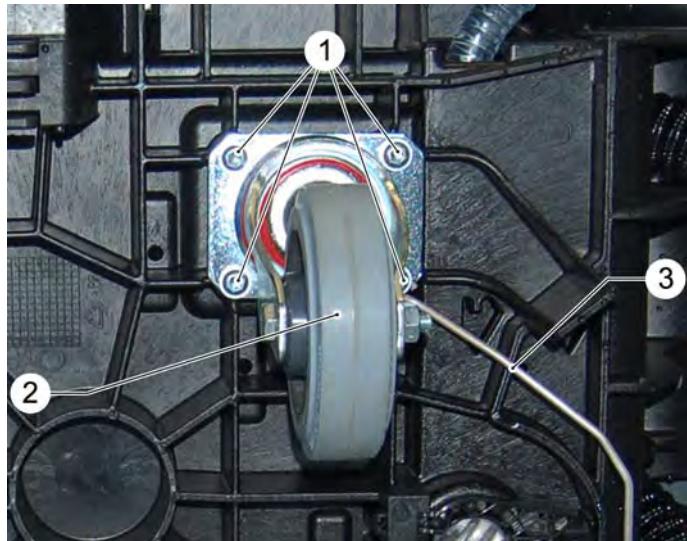
- 1 Glide contact chute lock
2 Drive motor

6.18.4 Replace the wheel

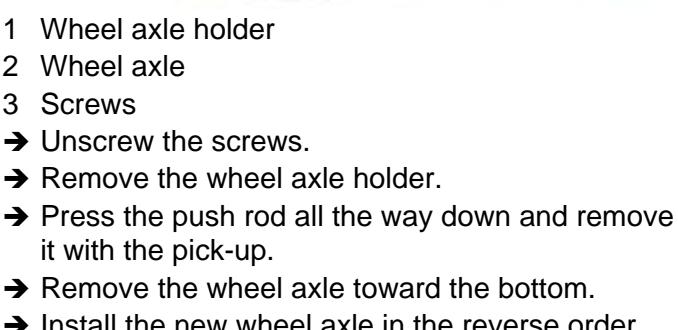


- 1 Wheel
2 Screw
→ Loosen the screw.
→ Pull the wheel off the axle.
→ Install the new wheel onto the greased axle in the reverse order.

6.18.5 Replacing the steering roller



- 1 Screws
2 Steering roller
3 Bow, vacuum bar suspension
→ Unscrew the screws.
→ Remove the steering roller and replace it.
→ Attach the bow for the vacuum bar suspension.



- 1 Wheel axle holder
2 Wheel axle
3 Screws
→ Unscrew the screws.
→ Remove the wheel axle holder.
→ Press the push rod all the way down and remove it with the pick-up.
→ Remove the wheel axle toward the bottom.
→ Install the new wheel axle in the reverse order.

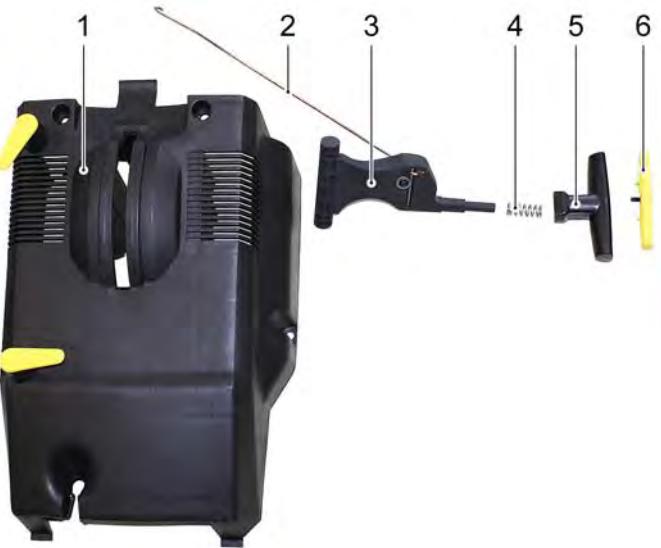
6.19 Suction system

6.19.1 Replace the lever of the vacuum bar lowering.

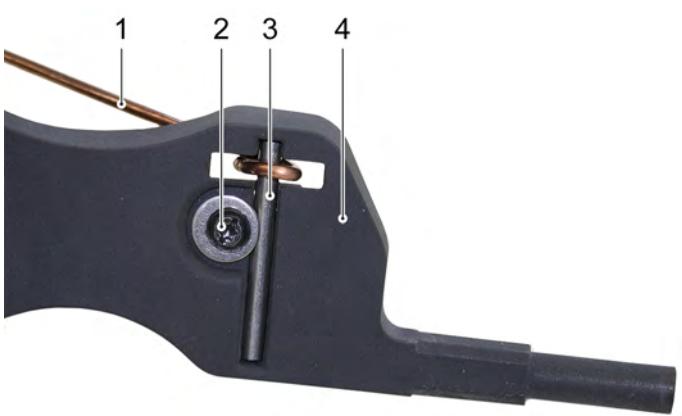
If you can no longer operate the vacuum bar properly using the vacuum bar lowering lever, you must remove this lever and check the individual components; replace if necessary.



- 1 Screws
 - 2 Appliance cover, rear
 - 3 Vacuum bar lowering lever
- Unscrew the screws.
→ Remove the rear appliance cover.



- 1 Casing, vacuum bar lowering lever
 - 2 Drawbar
 - 3 Holder, drawbar
 - 4 Spring
 - 5 Handle
 - 6 Handle insert with screw
- Unhook the drawbar on the bow of the vacuum bar suspension.
→ Remove the holder of the drawbar from the casing.
→ Loosen the screw on the handle insert.



- 1 Drawbar
 - 2 Screw with washer
 - 3 Bolts
 - 4 Holder, drawbar
- Loosen the screw.
→ Pull the bolt out of the drawbar and remove the drawbar.
→ Assemble and install the lever in the reverse order.

- 1 Casing, vacuum bar lowering lever

2 Screws
- Unscrew the screws and remove the casing.

6.19.2 Replace the vacuum bar suspension

If the vacuum bar suspension or parts of it are defective, they must be replaced.



- 1 Holder, vacuum bar suspension holder
- 2 Screw, vacuum bar suspension holder
- 3 Vacuum bar suspension

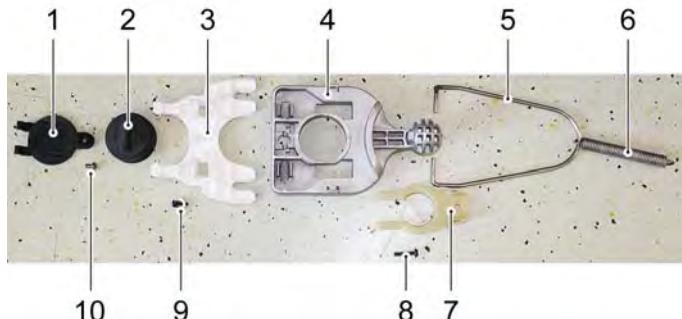
→ Unscrew the screw from the holder.



- 1 Bow, vacuum bar suspension
 - 2 Screw on the rotary handle.
 - 3 Rotary handle to incline the vacuum bar
 - 4 Screw on the rotary handle with washer
 - 5 Spring
- Remove the vacuum bar suspension with holder.
→ Unscrew both screws on the rotary handle and disassemble the vacuum bar suspension.

When disassembling the vacuum bar suspension make sure you will remember how to reassemble them. This will facilitate the assembly process.

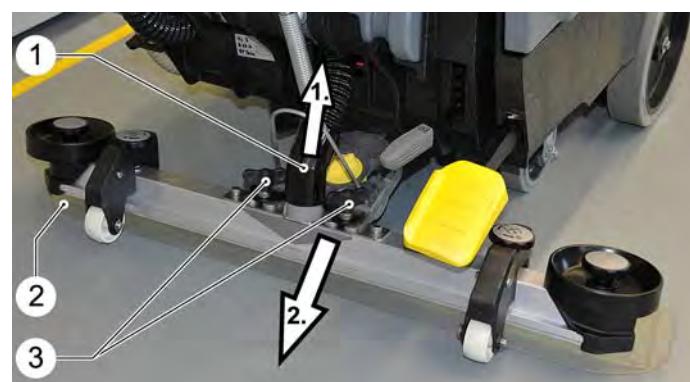
The bow of the vacuum bar suspension is intended to hold the vacuum bar in a horizontal position while raised.



- 1 Rotary handle, bottom
 - 2 Rotary handle, top
 - 3 Vacuum bar pick-up
 - 4 Vacuum bar suspension
 - 5 Bow
 - 6 Spring
 - 7 Holder, vacuum bar suspension holder
 - 8 Screw, vacuum bar suspension holder
 - 9 Screw on the rotary handle with washer
 - 10 Screw on the rotary handle.
- Replace defective parts and assemble the vacuum bar suspension in the reverse order.

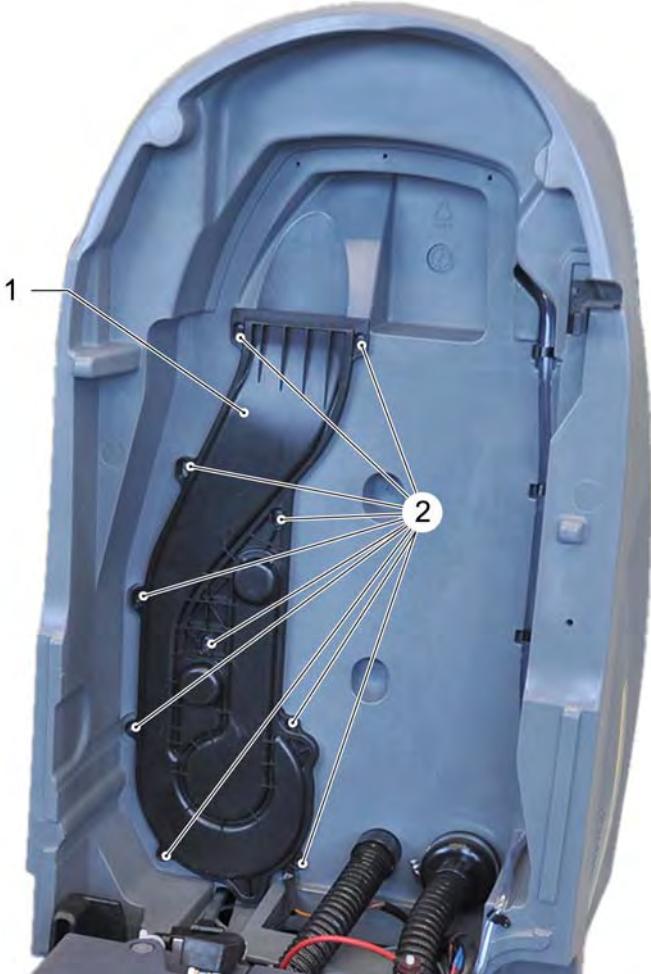
6.19.3 Replace the vacuum bar.

If the vacuum bar is defective, it must be replaced.



- 1 Suction hose
 - 2 Suction lips
 - 3 Wing screws of suction bar support
- Pull out the suction hose from the vacuum bar.
→ Loosen the wingscrews of the vacuum bar suspension and pull the vacuum bar out of the intake.
→ Install the new vacuum bar in reverse sequence.

6.19.4 Replacing the suction turbine



1 Suction channel cover

2 Screws

→ Swivel the tank upward.

→ Unscrew the screws.



1 Connecting cable, suction turbine

→ Remove the connecting cable.

→ Replace the suction turbine.

Note

If the suction turbine is damaged by water entering, the float in the wastewater reservoir cover must be checked for its functionality.



1 Screws

2 Holder, suction turbine

3 Suction turbine

4 Connecting cable, suction turbine

→ Unscrew the screws.

→ Remove the holder with the suction turbine and separate the holder from the suction turbine.

6.19.5 Replacing the glide contacts of the suction turbine

→ Perform this procedure on both glide contacts.

→ Install the new slide contacts in reverse order.

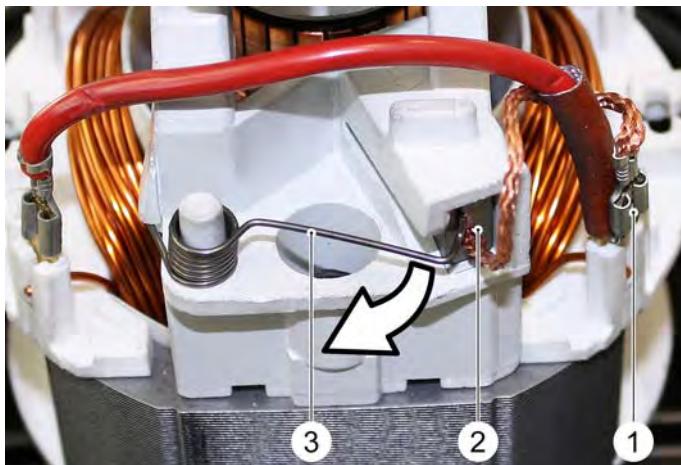
Note

Blow out the chute with compressed air prior to installing the glide contacts.



1 Cover cap, glide contact

→ Pull out the cover cap from the suction turbine toward the top.

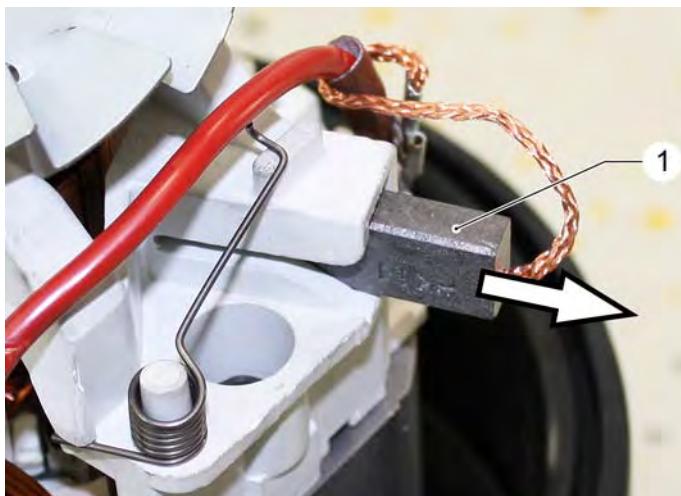


1 Connection plug, glide contact

2 Glide contact

3 Press spring

→ Lift the contact spring.



1 Glide contact

→ Pull the glide contact out of the chute.

→ Carefully place the contact spring onto the chute.

→ Pull out the connecting plug.

6.20 Control electronics/charger

6.20.1 Open the control electronics

The control electronics must be opened to perform voltage measurements.

Caution

Risk of destruction by electrostatic discharge (ESD)!

The following measures must be taken prior to working on electronic components to avoid damages:

- Wear ESD shoes.
- Touch one of the battery terminals with your hand for equipotential.
- Do not remove the electronics from their packaging until you are ready to start the installation.

Note

The factory settings must be loaded prior to replacing the control or the charger.

Please check the device as to whether this measure has solved the fault.

- Disconnect the battery for 1 minute and then reconnect the battery (reset).
- Check battery voltage under load.
- Check the voltage input to the control electronics under load.
- Transfer the current software to the control electronics and the control panel board.

Note

After replacing the control, you must set up the correct battery type in the battery menu; otherwise, the battery may be damaged!

The charge parameters are derived from the set up battery type and are only present in the control and not in the charger.

Check the language and the brush head used and adjust if necessary.



1 Screw

2 Support plate, control electronics

→ Remove rear appliance cover.

→ Unscrew the screw and open the support plate toward the bottom.



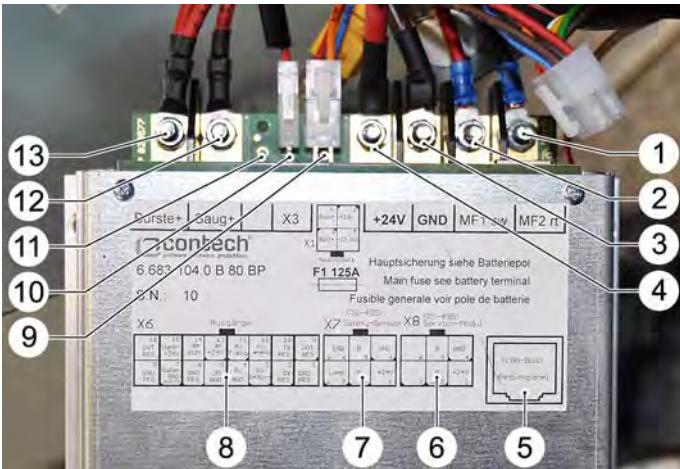
1 Charger

2 Ground point

3 Relay

4 Connecting cable for charger

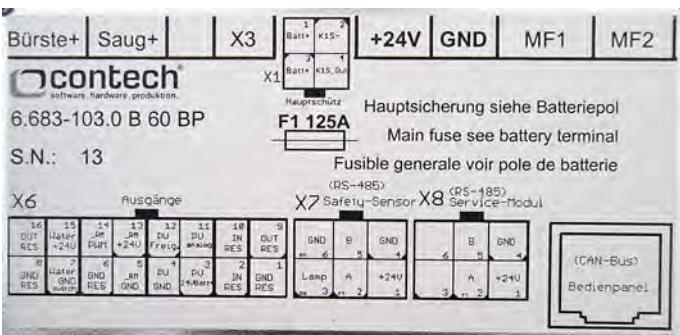
5 Control electronics



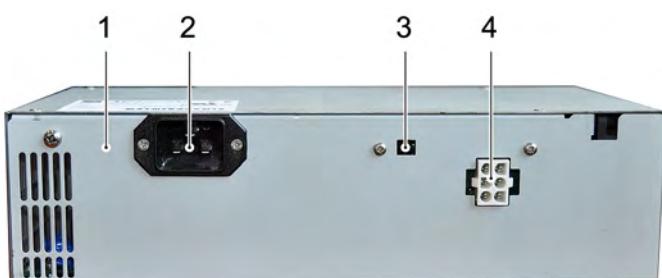
Terminals of the control electronics

- 1 Terminal MF2 rt, drive motor
- 2 Terminal MF1 sw, drive motor
- 3 Connection (GND)
- 4 Connection +24V
- 5 Connection CAN-BUS operating panel
- 6 Terminal X8, service module
- 7 Terminal X7, safety sensor
- 8 Terminal X6, output
- 9 Terminal X1
- 10 Terminal X3
- 11 Not assigned
- 12 Terminal vacuum+, suction turbine
- 13 Terminal brush+, brush motor

6.20.2 Overview of connections on the control electronics

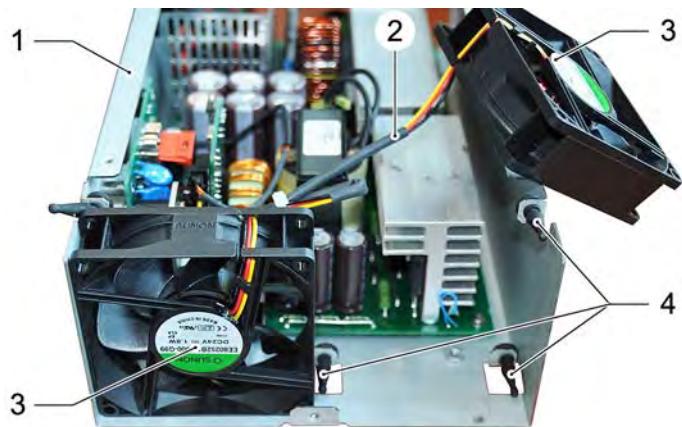


6.20.3 Charger



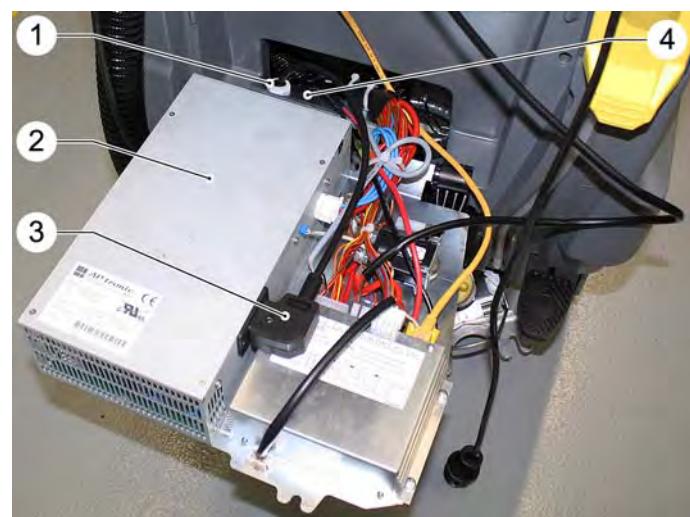
- 1 Charger
- 2 Connecting cable for charger
- 3 Terminal data transfer cable (patch cable)
- 4 Terminal charge cable

6.20.4 Replace fan



- 1 Charger
 - 2 Connecting cable, fan
 - 3 Fan
 - 4 Flexible holder
- Remove the top part of the casing.
→ Pull the ventilator off of the flexible holders.
→ Pull the connecting cable of the fan off the PCB.

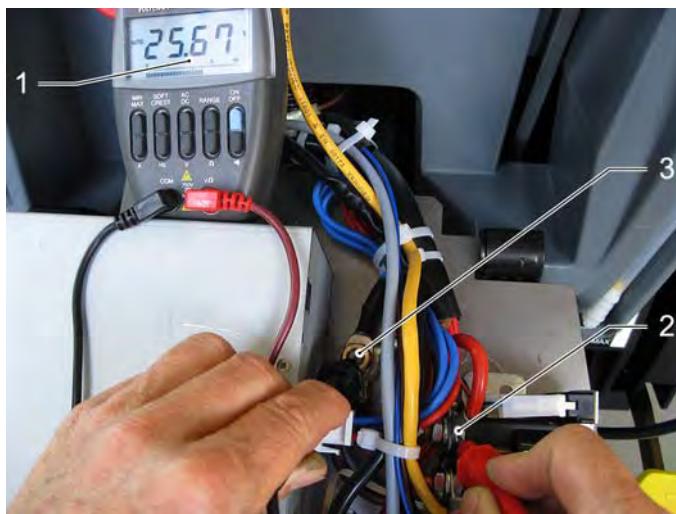
6.20.5 Replace the mains cable of charger



- 1 Cable screw connection
 - 2 Charger
 - 3 Mains cable of charger
 - 4 Support plate
- Remove rear appliance cover.
→ Open the support plate by folding it toward the bottom.
→ Unplug the mains cable from the charger.
→ Loosen the cable screw connection and remove it from the support plate.

6.21 Voltage measurements (B 60 W BP)

6.21.1 Voltage measurement on the relay after a self-test



1 Voltage measuring device

2 Connection, relay

3 Negative point

→ Plug in the Intelligent Key.

→ Set the programme selector switch to transport mode and wait until the self-test on the operating panel display is completed.

→ Connect the voltage measuring unit to the negative terminal and the relay as shown in the illustration.

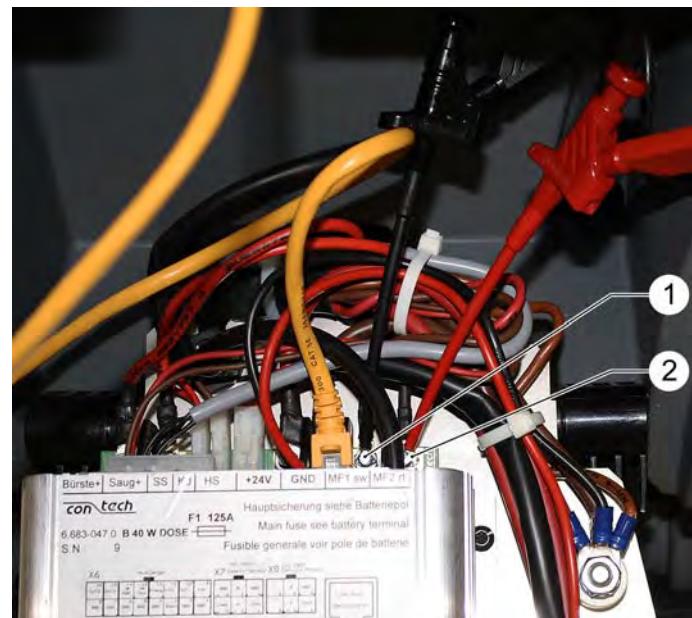
Display on the voltage measuring unit, approx. battery voltage.

Note

During the self-test, the relay increases briefly and then decreases again. After a successful self-test it will be high continuously.

→ Connect the voltage measuring unit to the blue and the orange cable.

6.21.2 Voltage measurement transport drive under full load



1 Voltage measuring device

2 Connection, MF1 sw

3 Connection, MF2 rt

→ Plug in the Intelligent Key.

→ Set the programme selector switch to transport mode and wait until the self-test on the operating panel display is completed.

→ Connect the voltage measuring unit to connections "MF1 sw" and "MF2 rt" as shown in the illustration.

→ Set the rotary knob for drive speed to "MAX".

→ Press the drive lever completely.

Display on the voltage measuring unit, approx. 20 V.

6.21.3 Battery voltage



- Plug in the Intelligent Key.
- Set the programme selector switch to transport mode and wait until the self-test on the operating panel display is completed.
- Connect the voltage measuring unit to connections "GND" and +24V.

Display on the voltage measuring unit, approx. battery voltage.

6.21.4 Voltage measurement suction turbine under full load



- 1 Programme selector switch, normal mode
- 2 Voltage measuring device
- Plug in the Intelligent Key.
- Set the programme selector switch to normal mode and wait until the self-test on the operating panel display is completed.
- Connect the voltage measuring unit to connections "GND" and "Vacuum+".

Display on the voltage measuring unit, approx. battery voltage -1 V.

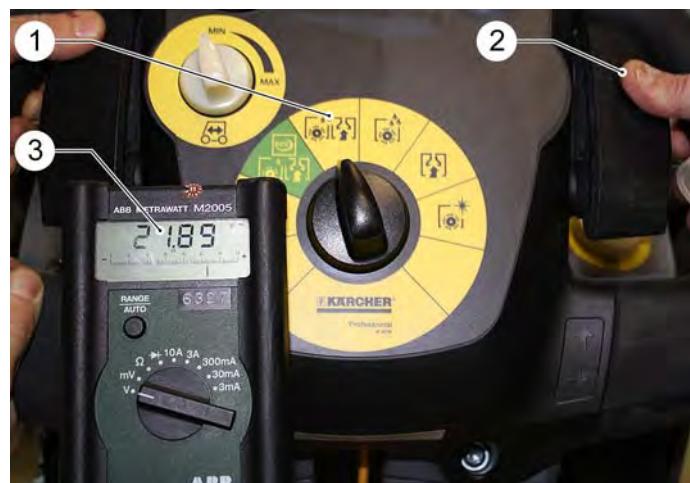
6.21.5 Voltage measurement suction turbine in Eco mode



- 1 Programme selector switch, Eco mode
- 2 Voltage measuring device
- Plug in the Intelligent Key.
- Set the programme selector switch to Eco mode and wait until the self-test on the operating panel display is completed.
- Connect the voltage measuring unit to connections "GND" and "Vacuum+".

Display on the voltage measuring unit, approx. 15 V.

6.21.6 Voltage measurement brush motor under full load



- 1 Programme selector switch, normal mode
- 2 Drive switch
- 3 Voltage measuring device
- Plug in the Intelligent Key.
- Set the programme selector switch to normal mode and wait until the self-test on the operating panel display is completed.



1 Connection (GND)

2 Brush connection+

→ Connect the voltage measuring unit to connections "GND" and "Brush+".

→ Lower the brush head.

→ Press the drive lever completely.

Display on the voltage measuring unit, approx. battery voltage -2 V.

6.21.7 Voltage measurement brush motor Eco mode



1 Programme selector switch, Eco mode

2 Drive switch

3 Voltage measuring device

→ Plug in the Intelligent Key.

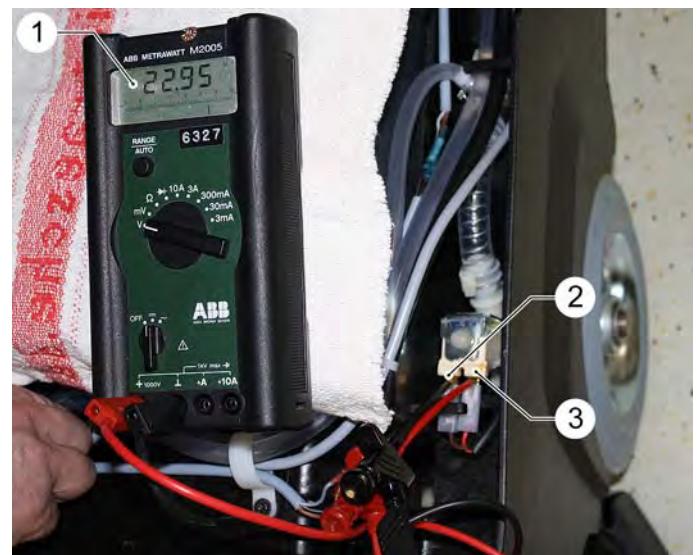
→ Set the programme selector switch to Eco mode and wait until the self-test on the operating panel display is completed.



1 Connection (GND)

2 Brush connection+

- Connect the voltage measuring unit to connections "GND" and "Brush+".
 - Lower the brush head.
 - Press the driving lever completely to the front.
 - Display on the voltage measuring unit, approx. 12 V.
- 6.21.8 Voltage measurement on the solenoid valve**



1 Voltage measuring device

2 Connection of solenoid valve, brown cable

3 Connection of solenoid valve, red cable

→ Plug in the Intelligent Key.

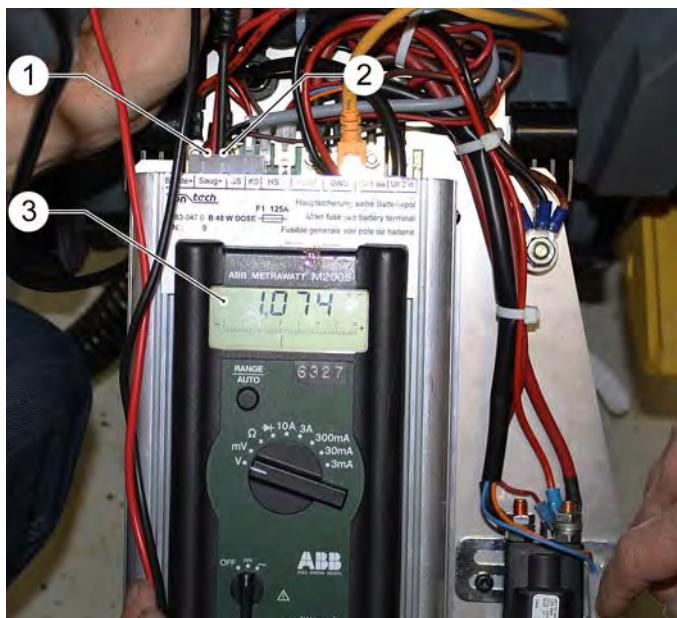
→ Set the programme selector switch to normal mode and wait until the self-test on the operating panel display is completed.

→ Connect the voltage measuring unit to the connections on the solenoid valve as shown in the illustration.

→ Press the driving lever completely to the front.

Display on the voltage measuring unit, approx. battery voltage 24 V.

6.21.9 Voltage measurements of the dosing pump



- 1 Connection X6, Pin 14
- 2 Connection X6, Pin 6
- 3 Voltage measuring device

Note

For this test, water must flow through the flowmeter to activate the pump.

- Plug in the Intelligent Key.
- Set the programme selector switch to normal mode and wait until the self-test on the operating panel display is completed.
- Connect the voltage measuring unit to connections "X6-Pin 14" and "X6-Pin 6" as shown in the illustration.

Display on the voltage measuring unit, approx. 1 V.

6.21.10 Check the drive motor current



- 1 Drive motor cable
 - 2 Measuring device
- Plug in the Intelligent Key.
 - Set the programme selector switch to transport mode and wait until the self-test on the operating panel display is completed.

→ Connect the measuring device to the drive motor cable as shown in the illustration.

→ Actuate drive lever/safety switch.

→ Measure the current.

6.21.11 Current measurement on the brush motor and the suction turbine

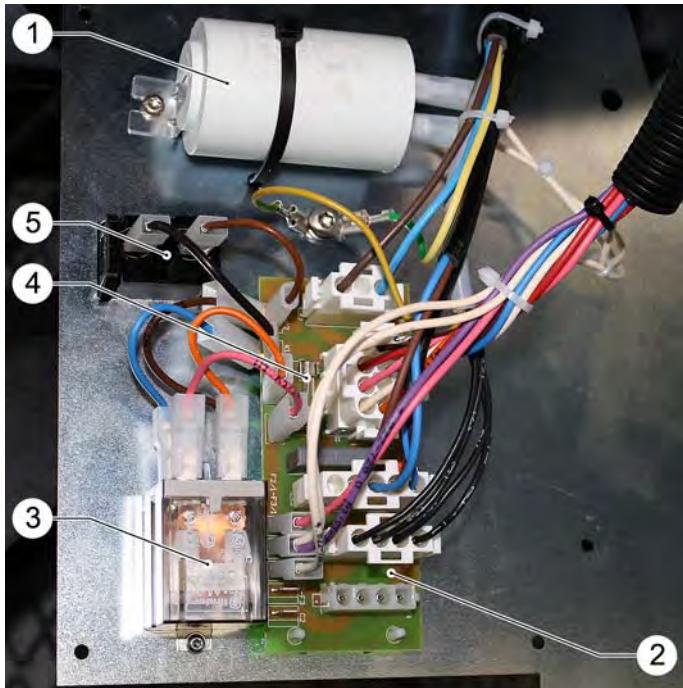


- 1 Battery cable/brush motor cable/suction turbine cable
 - 2 Measuring device
- Plug in the Intelligent Key.
 - Set the programme selector switch to the respective programme (brush motor and/or suction turbine) and wait until the self-test on the control panel display is completed.
 - Connect the measuring device to the battery cable/brush motor cable/suction turbine cable as shown in the illustration.
 - Actuate drive lever/safety switch.
 - Measure the current.

6.22 Control electronics B 60 C EP

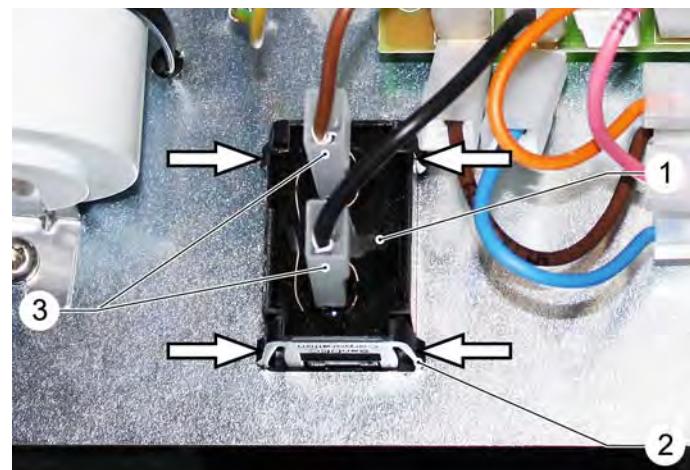


- 1 Screw
- 2 Support plate, control electronics
- 3 Operating hour counter
- Remove rear appliance cover.
- Unscrew the screw and open the support plate toward the bottom.



- 1 Operating capacitor
- 2 Printed board
- 3 Brush drive relay
- 4 Fuse
- 5 Operating hour counter

6.22.1 Replace hourmeter



1 Operating hour counter

2 Locking noses (4x)

3 Plug

→ Remove the plug.

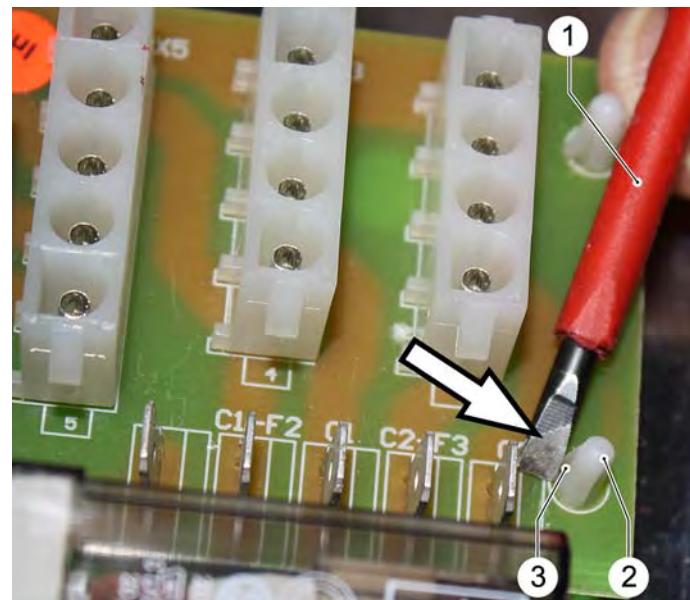
→ Press the locking nose in the direction of the arrow.

→ Remove the hourmeter from the support plate.

Note

The hourmeter works in a 6 minute cycle.

6.22.2 Replace PCB



1 Screwdriver

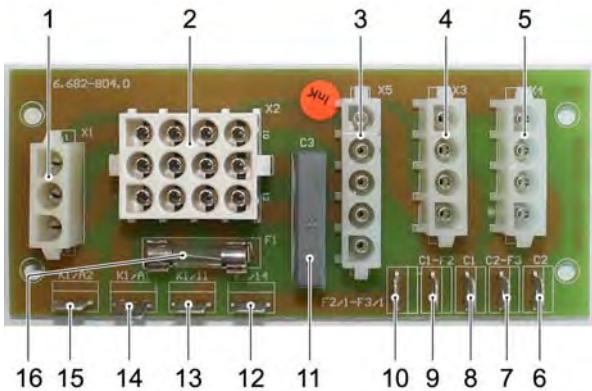
2 Push pin

3 Locking nose

→ Remove all plugs.

→ Push the locking nose into the push pin.

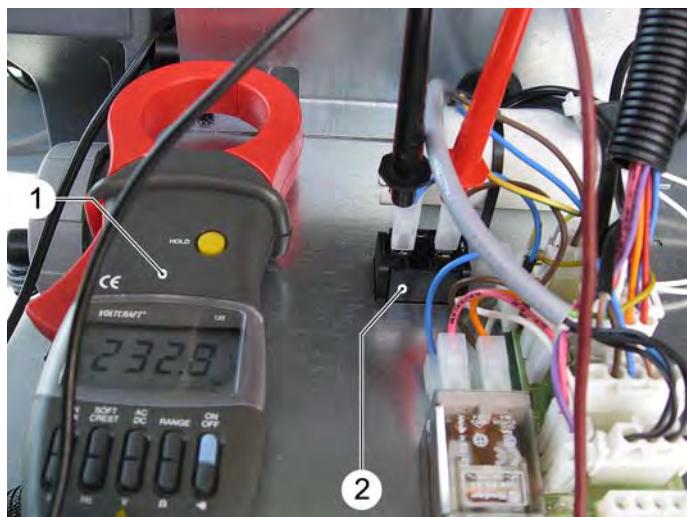
→ Remove the PCB toward the top.



1	Connector plug	X1
2	Connector plug	X2
3	Connector plug	X5
4	Connector plug	X3
5	Connector plug	X4
6	Plug-in location	C2
7	Plug-in location	C2-F3
8	Plug-in location	C1
9	Plug-in location	C1-F2
10	Plug-in location	F2/1-F3/1
11	Capacitor	C3 (0,22µF)
12	Plug-in location	K1/14
13	Plug-in location	K1/11
14	Plug-in location	K1/A1
15	Plug-in location	K1/A2
16	Fuse	F1 (3A)

6.23 Voltage measurements on the B 60 C EP

6.23.1 Voltage measurement on the hourmeter



1 Voltage measuring device

2 Operating hour counter

Note

The hourmeter works in a 6 minute cycle.

The hourmeter can only be used while the brush motor is running.

→ Plug in the Intelligent Key.

→ Set the programme selector switch to a brush motor programme and wait until the self-test on the operating panel display is completed.

→ Connect the voltage measuring unit to the connections on the hourmeter as shown in the illustration.

→ Actuate drive lever/safety switch.

Display on the voltage measuring unit = mains voltage.

6.22.3 Replace the brush drive relay



1 Plug

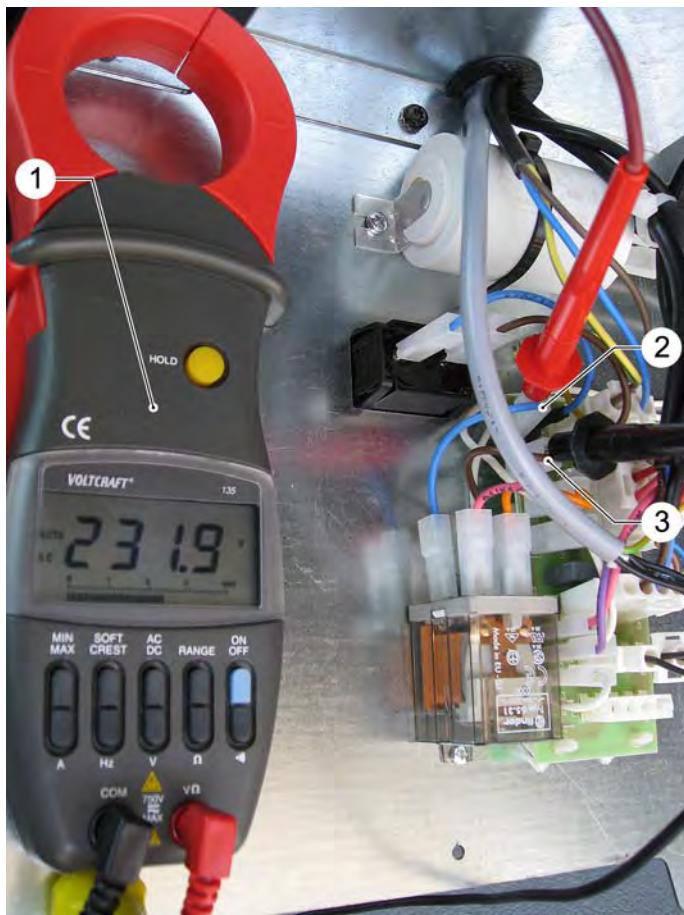
2 Brush drive relay

3 Screw

→ Pull the plug off the relay.

→ Loosen the screw.

6.23.2 Voltage measurement of the relay spool on the brush drive relay



- 1 Voltage measuring device
- 2 Plug contact on PCB, blue cable
- 3 Plug contact on PCB, brown cable

The relay is functional if the fuse F2 is closed and the programme selector switch is switched to a brush motor programme.

- Plug in the Intelligent Key.
 - Set the programme selector switch to a brush motor programme and wait until the self-test on the operating panel display is completed.
 - Connect the voltage measuring unit to the connections on the PCB as shown in the illustration.
 - Actuate drive lever/safety switch.
- Display on the voltage measuring unit = mains voltage.

6.23.3 Current measurement on the brush motor and the suction turbine



- 1 Mains cable/brush motor cable/suction turbine cable
 - 2 Measuring device
- Plug in the Intelligent Key.
 - Set the programme selector switch to the respective programme (brush motor and/or suction turbine) and wait until the self-test on the control panel display is completed.
 - Connect the measuring device to the mains cable/brush motor cable/suction turbine cable as shown in the illustration.
 - Actuate drive lever/safety switch.
 - Measure the current.

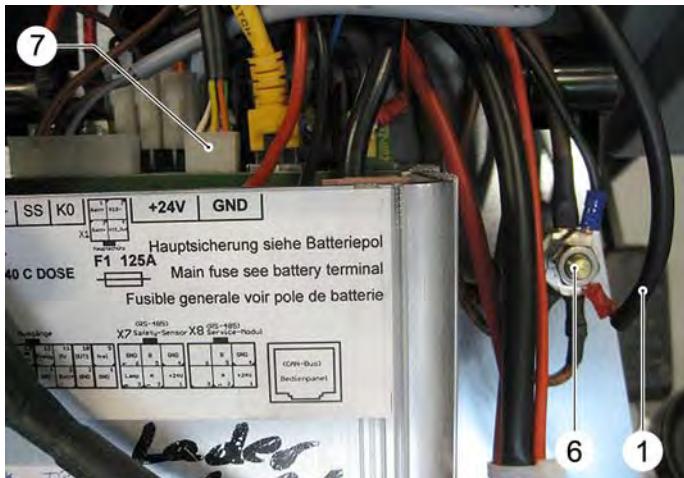
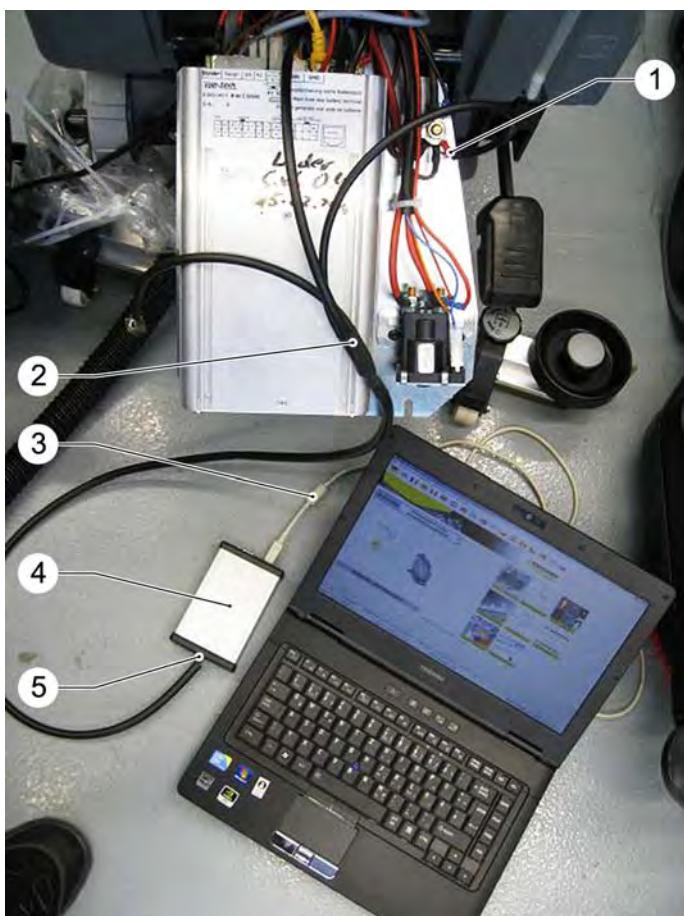
6.24 Connect the service module

Note

A prerequisite is the service programme software version 5.0.

The service programme software is available at Kärcher Inside.

The service module A9 must be updated with the latest version of the service module software.



- 1 Ground wire
- 2 Y split service bus cable
- 3 USB interface cable between A9 and laptop
- 4 Service module A9
- 5 AMP bushing
- 6 Negative terminal
- 7 Connection, service module A9 into the module bus

- Turn off the appliance.
- Integrate the service module A9 into the module bus of the machine (you will only need the white bus plug).
- Connect the black AMP bushing of the Y split service bus cable to the black AMP plug of A9.
- Tightly connect the ground wire of the Y split service bus cable to the ground connection of the machine. This is important as the service module or the control electronics might get damaged otherwise.
- Connect the PC/laptop to the service module A9 via the USB interface.
- Plug in the Intelligent Key.
- Set the programme selector switch of the machine to position 1.
- Start the service programme.
- Perform automatic scanning to recognize the device automatically.
- If the device is not recognised, the selection must be repeated.
- LED blinks on service module.
Transfer the new software
- Select the update software.
Select the software, transfer it to the device and follow the programme instructions.

Do not interrupt the download!

Note

The display of the device is switched off during the software transfer.

The successfully transferred software can be displayed on the device.

After transferring the software, the following settings must be made using the grey or red KIK key.

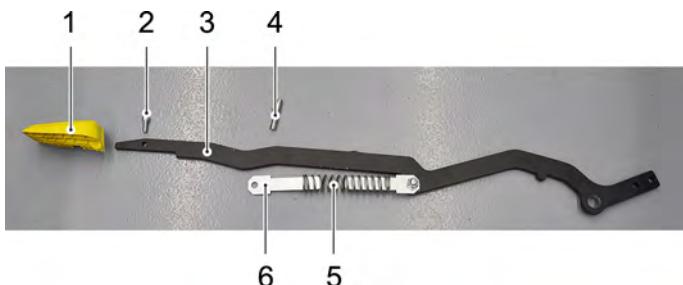
- Load the factory settings.
- Adjust the used brush head to "R or D".
- Set up the charge curve for the installed battery used in the battery menu.
- Turn the device off and back on.

The device can be started after all the settings have been made.



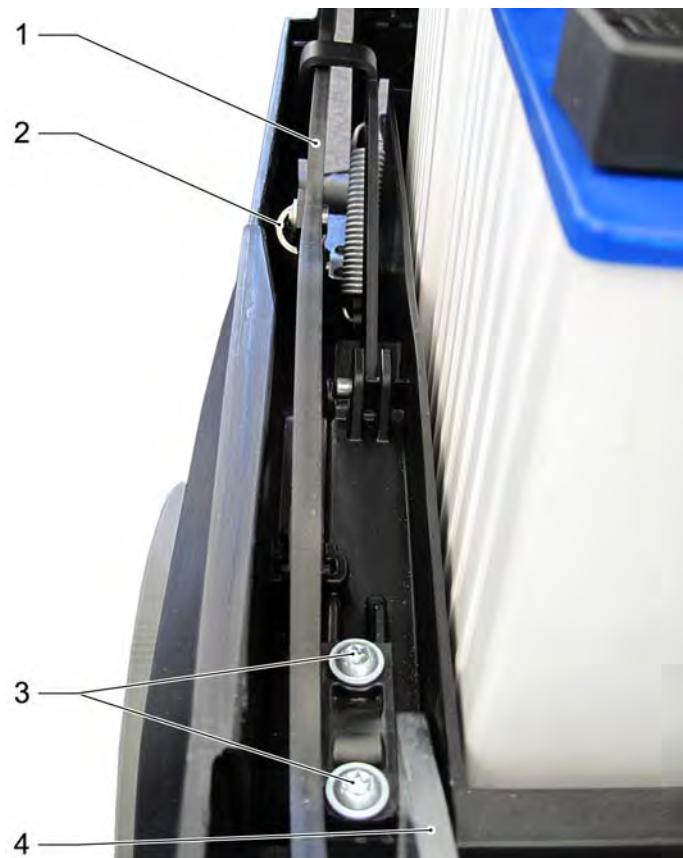
Service programme for floor cleaners and sweepers 5.0

6.25 Replacing the pedal of the brush head lift



- 1 Foot pedal
2 Screw
3 Linkage for raising and lowering the brush head
4 Bolts
5 Pressure spring
6 Tab, spring mount
- Remove the foot lever.
→ Remove the brush head lifter.
→ Pull out the linkage toward the brush head.

Installation



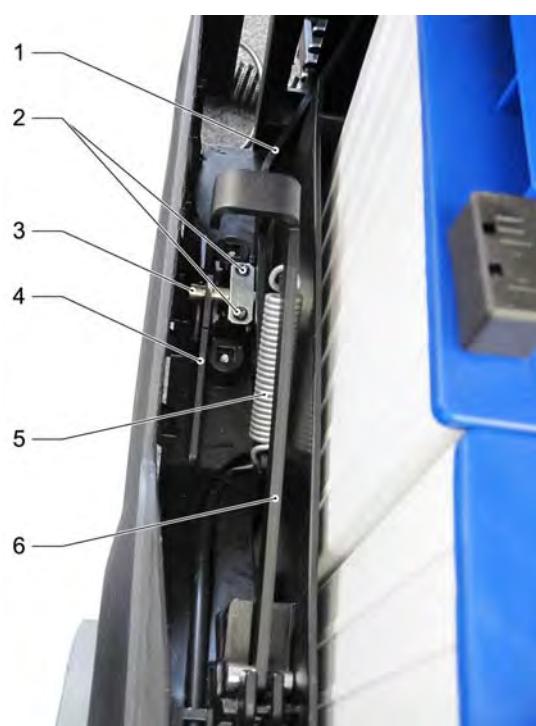
- 1 Linkage for raising and lowering the brush head
2 Pressure spring
3 Screws
4 Lifter

Note

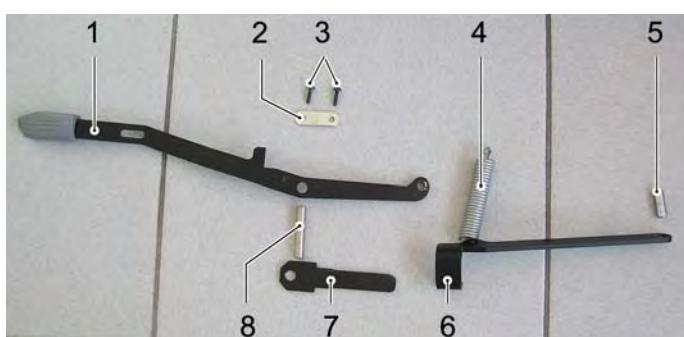
Proceed as follows to install the lifter:

- Press the linkage against the spring with the lifter.
→ Unscrew the screws on the left and right side of the lifter.

6.26 Replacing the pedal of the brush contact pressure

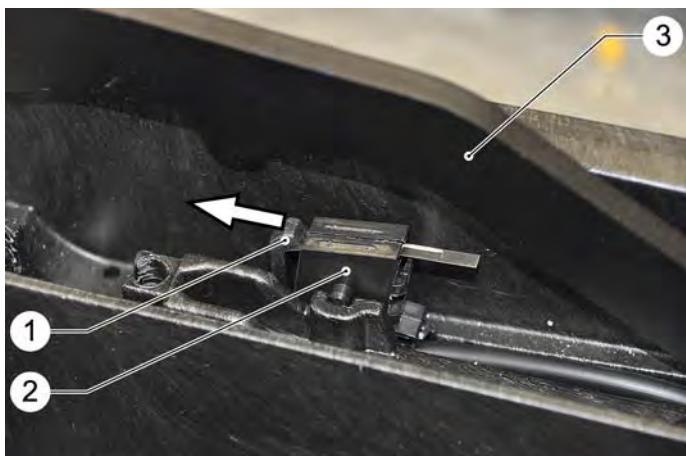


- 1 Lever, contact pressure adjustment
2 Screws
3 Bolts
4 Tab, spring mount
5 Spring
6 Lever
- Unscrew the screws.
→ Lift the lever of the contact pressure adjustment and remove the bolt.
→ Remove the spring.
→ Remove the lever of the contact pressure adjustment toward the top.



- 1 Lever, contact pressure adjustment
2 Halting plate
3 Screws
4 Spring
5 Bolt, short
6 Lever
7 Tab, spring mount
8 Bolt, long

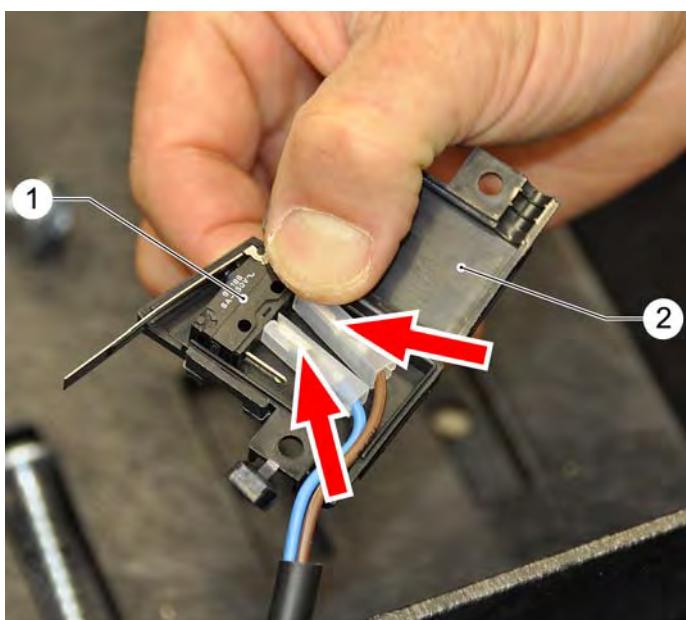
6.27 Replace the brush motor switch



1 Clip
2 Switch
3 Linkage for raising and lowering the brush head

The switch is now open when not actuated.

- Open the clip.
- Remove the micro switch.



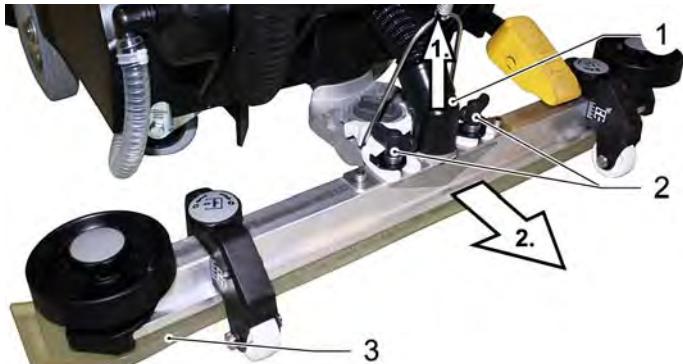
- 1 Micro switch
2 Casing
- Remove the cable plug.
 - Installation in reverse order.

7 Maintenance and care

7.1 Replacing the suction lips

If the suction lips are worn down by about 1 cm, they must be reversed.

If the suction lips are worn out or defective, they must be replaced.



1 Suction hose

2 Wing screws of suction bar support

3 Wear indicator

→ Pull out the suction hose from the vacuum bar.

→ Loosen the wingscrews of the vacuum bar suspension and pull the vacuum bar out of the intake.



1 Suction lip holder

2 Rear vacuum lip

3 Front vacuum lip

4 Star handle screw

5 Sleeve

6 Deflector disc

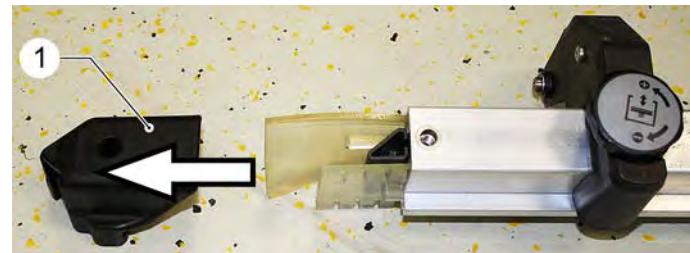
→ Remove the deflector discs.



1 Star handle screw

2 Deflector disc

→ Loosen the star handle screws on both sides of the vacuum bar.



1 Suction lip holder

→ Pull the suction lip holder off on both sides.



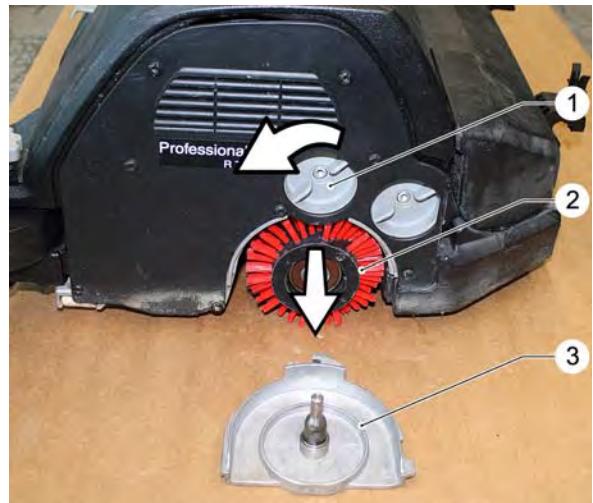
1 Rear vacuum lip

2 Front vacuum lip

→ Pull the suction lips out on the side, replace if required

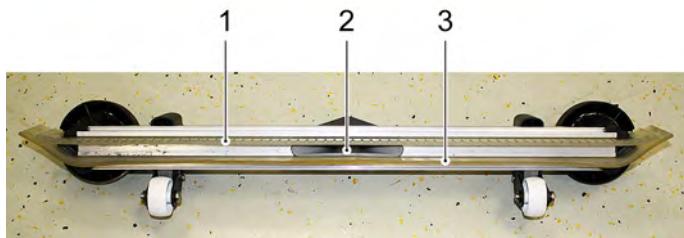
→ Install the suction lips in reverse order.

R55 + 65



- When assembling the vacuum bar ensure the correct seating of the sleeve.

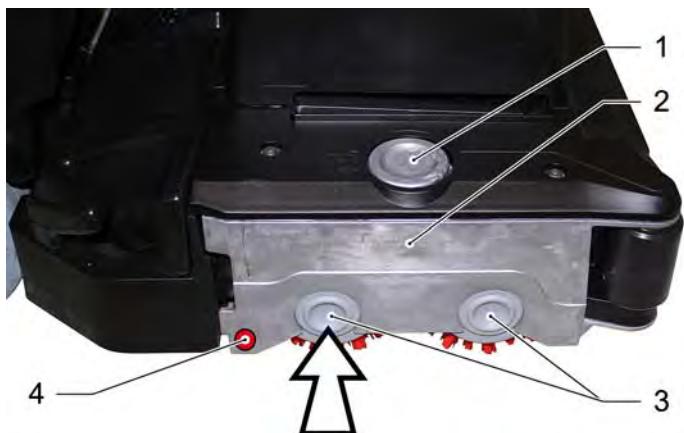
7.2 Clean the vacuum bar



- 1 Front vacuum lip
2 Suction support
3 Rear vacuum lip
→ Clean the suction lips.
→ Clean the contamination off the vacuum stub.

7.3 Replacing the brush rollers

BR model 550 mm + 650 mm



- 1 Unlocking key, storage cover
2 Bearing lid
3 Brushing rollers
4 Close the pressure point of the bearing cover
→ Move the brush head into the top position
→ Press the release button of the bearing cover and remove the brush rollers from the brush head.

1 Unlock, bearing lid

2 Brush roller

3 Bearing lid

- Move the brush head into the top position
→ Press the release button of the bearing cover and remove the bearing covers from the brush head.
→ Pull the brush roller out of the brush head.



1 Brush roller

→ Check the bristle length.

Replace the brush roller if the bristles are shorter than 10 mm.

7.4 Check seal on the cover of the waste-water tank / replace.



1 Seal

2 Cover dirt water reservoir

- Check the seal for contamination and defects.
Clean or replace if necessary.

8 Troubleshooting

8.1 Faults without display on the console

Fault	Remedial action
Appliance cannot be started	<ul style="list-style-type: none"> - Check whether the intelligent key has been inserted. - Check if the mains plug is connected (Ep only). - The appliance is in standby mode. Set the programme selector switch to position "1" (drive / OFF) and then to the desired programme (Bp only). - Connect / check / charge batteries (Bp only). - Check battery charger (Bp only). - Check / replace the fuse (Bp only). - Check / replace programme selector switch. - Check /replace the appliance switch with motor protection switch (Ep only) - Check/replace the circuit board (A1). - Check if the charger is connected / unplug (Bp only). - Check / replace the charger (Bp only).
Appliance will not drive (W Bp Pack only)	<ul style="list-style-type: none"> - Check if the charger is connected / unplug. - Check/replace the fuse. - Check / replace programme selector switch. - Check/replace the circuit board (A1). - Check/replace drive motor.
No or insufficient water supply	<ul style="list-style-type: none"> - Check / fill up fresh water reservoir. - Unscrew the lock of the fresh water reservoir. Remove and clean the fresh water filter. Insert the filter and screw in the lock. - Check / clean the water supply. - Check / clean / replace the solenoid valve for the water supply. - Check the water distribution channel.
Insufficient vacuum performance	<ul style="list-style-type: none"> - Clean / check / replace the seal between wastewater reservoir and cover and check for tightness. - Check / replace the float. - Check / clean the lint trap. - Check / clean / replace the vacuum lips on the suction bar. - Check if the suction hose is chocked / remove obstruction if required - Check whether the cover on the wastewater drain hose is closed. - Check the setting of the vacuum bar. - Check/replace the suction turbine.
Insufficient cleaning result	<ul style="list-style-type: none"> - Check / clean / replace the brushes for wear and tear and contamination. - Check / fill up fresh water reservoir. - Check / clean the water supply. - Check / clean / replace the solenoid valve for the water supply.
Detergent is not getting mixed in	<ul style="list-style-type: none"> - Check the content of the cleaning agent container - Check / replace the detergent pump. - Check the detergent hose. - Increase the water volume.

Fault	Remedial action
Brushes do not turn	<ul style="list-style-type: none"> - If the over-current switch in the electronics system has been triggered, remove the intelligent key and reinsert it. Switch on/off the appliance again. - Check the electrical connection on the brush motor. - Check whether the brush rollers / disc brush is blocked / remove foreign matters / replace brush rollers / disc brushes. - Check/replace the toothed belt. - Check /replace the appliance switch with motor protection switch (Ep only) - Check / replace control PCB. - Check/replace the micro switch brush S1.
Charger is not working ventilator on charger does not start up	<ul style="list-style-type: none"> - Wiring "W9" between the control and the charger is interrupted. - Check/replace the mains cable.
The appliance has a short run-time.	<ul style="list-style-type: none"> - The charger parameters in the control electronics are adjusted incorrectly. - Check / replace the batteries.
Tank cannot be filled with water valve (Quick fill in)	<ul style="list-style-type: none"> - Sieve contaminated / clean / replace.
Water valve (Quick fill in) does not shut off	<ul style="list-style-type: none"> - Diaphragms plugged / clean / replace.
Faults with display	<ul style="list-style-type: none"> - Switch on/off the appliance again. - Check battery voltage (> 22.0 V) - Disconnect the battery for 2 minutes. - Take the appliance into operation again
Appliance with BD head pulls to one side	<ul style="list-style-type: none"> - Change the brush head settings.
Charger only briefly charges the discharged batteries and shows "Charge complete" in the display.	<ul style="list-style-type: none"> - Wiring "W5" and "W7" (10 mm², red) on contactor 1 incorrectly connected / connect properly.

8.2 Faults with display

Display shows	Description / cause	Remedy
ERR_U_BATT_001	Battery voltage too low.	Charge, replace battery.
ERR_K1_002	Check if the contact of the main contactor is stuck.	Replace main contactor.
ERR_ZK_2V_003 ERR_ZK_10V_004	Internal fault of control electronics.	<ul style="list-style-type: none"> - Switch on/off the appliance again. - Check the battery connection. - Measure the battery voltage (>22V). - Disconnect the load connections to the different consumers to detect possible short circuits. - Check cables to the drive motor, the brushes and the suction turbine motor for short circuits.
ERR_5V_005	Fault in 5 V supply voltage.	<ul style="list-style-type: none"> - Switch on/off the appliance again. - Internal fault. - Replace control electronics.
ERR_U_H1_006 ERR_U_H2_007 ERR_U_H3_008 ERR_U_H4_009	Internal fault of control electronics.	<ul style="list-style-type: none"> - Switch on/off the appliance again. - Check battery voltage (>22V). - Disconnect the battery for 2 minutes. - If the fault is still present, conduct further testing: <ul style="list-style-type: none"> - Disconnect the drive motor MF+ and MF- and switch the appliance on. If the faults persist, replace the control electronics. - If the fault disappears, check the wiring of the drive motor. - Disconnect the suction turbine and the brush motor and switch the appliance on. If the faults persist, replace the control electronics. - If the error does no longer occur, check the wiring of the drive motor.
ERR_K1_010	Diagnosis of the main contactor and its actuation.	<ul style="list-style-type: none"> - Switch on/off the appliance again. - Check battery voltage (>22V). - Disconnect the battery for 2 minutes. - Check/replace the main contactor. - Replace control electronics.
ERR_K1_011 ERR_K1_012 ERR_K1_013	Diagnosis of the main contactor and its actuation.	<ul style="list-style-type: none"> - Switch on/off the appliance again. - Check battery voltage (>22V). - Check the cables to the main contactor. - Replace main contactor.
ERR_K1_014	Diagnosis of the watchdog and its actuation.	<ul style="list-style-type: none"> - Switch on/off the appliance again. - Check battery voltage. - Replace control electronics.
ERR_U_H3_016	Fault occurs when the device is switched on, if the brush head is not connected.	<ul style="list-style-type: none"> - Connect the brush head.

Display shows	Description / cause	Remedy
ERR_I_H3_015	Power is provided to the brush motor, although no output is switched.	<ul style="list-style-type: none"> – Switch on/off the appliance again. – Check battery voltage (>22V). – Disconnect the battery for 2 minutes. – Check the brush motor cables. – Replace control electronics.
ERR_U_H3_016	Short circuit detected on brush drive.	<ul style="list-style-type: none"> – Disconnect the cables to the brush motor, then turn the appliance on. – If the fault disappears, find the cable fault and check the brush motor. – If the fault persists, replace the brush motor or the control electronics.
ERR_I_H4_017	Power is applied to the suction turbine, although no output is switched.	<ul style="list-style-type: none"> – Switch on/off the appliance again. – Check battery voltage (>22V). – Disconnect the battery for 2 minutes. – Check the cables of the suction turbine. – Replace control electronics.
ERR_U_H4_018	Short circuit detected on suction turbine drive.	<ul style="list-style-type: none"> – Disconnect the cables to the suction turbine, then turn the appliance on. – If error no longer occurs, search for cable fault and check suction turbine motor. – If the fault recurs, replace the suction turbine or control electronics.
ERR_FR_022	Voltage on the drive switch outside permissible range.	<ul style="list-style-type: none"> – Switch on/off the appliance again. – Check the drive switch. – Check the operating field cables. – Replace the drive switch. – Replace the operating panel PCB.
ERR_FR_024	Directional switch in the drive switch, illogical status.	<ul style="list-style-type: none"> – Check the operating field cables. – Replace the drive switch. – Replace the operating panel PCB.
ERR_STL_026 until ERR_STL_043	Internal fault of control electronics.	<ul style="list-style-type: none"> – If the battery has charged over 23 V and the ambient temperature is below 40°C, there is a fault in the control electronics. – Check the software status of the control electronics and operating panel PCB. Update if necessary. – Replace control electronics.
ERR_U_BATT_044	Check battery voltage.	<ul style="list-style-type: none"> – Check battery voltage (>22V).
ERR_TEMP_045 until ERR_TEMP_048	Overtemperature in the performance jumpers.	<ul style="list-style-type: none"> – Take appliance to an ambient temperature of +10 to +30°C too cool it off.
ERR_I_BÜRSTE_049	Overcurrent of the brush motors.	<ul style="list-style-type: none"> – Remove possible blockage of the brush drive. – Check the cables to the brush motor (insulation error). – The selection of the brushes might not be suitable for the floor surface?

Display shows	Description / cause	Remedy
ERR_I_TURB_050	Overcurrent of the suction turbine.	<ul style="list-style-type: none"> – Remove possible blockage of the suction turbine. – Check the suction turbine for ease of movement. – Check the cables for damage. – Replace the suction turbine.
ERR_PWM_FM_051	Fault in the travel drive.	<ul style="list-style-type: none"> – Check the cables to the travel drive. – Check the drive motor for damages. – Disconnect the transaxle on MF1 and MF2, measure the voltage on MF 1 and MF2 in driving mode. – Replace the drive motor.
ERR_PWM_TB_052	Fault in the brush or suction turbine drive.	<ul style="list-style-type: none"> – Check the cables to the drive. – Check the motor for damages. – Replace the motor.
ERR_BT53	Fault in CAN bus to control part.	<ul style="list-style-type: none"> – Check the CAN bus cable (yellow) between the control electronics and the control panel board replace if necessary. – Replace the operating panel PCB. – Replace control electronics.
ERR_U_BATT_054	Battery voltage more than 30 VDC during operation, not during charging process.	<ul style="list-style-type: none"> – Turn on/off the appliance. – If the fault persists, replace the control electronics.
DaliErr:_000 ERR_CS 051 ERR_TO 051	No communication with the charger.	<ul style="list-style-type: none"> – Check the connecting cable. – Replace the charger.
DaliErr:_000 Err:CSXXX_TOXXX	Number of checksum faults / time-out faults. CS: Fault appears > if 50 consecutive faults have occurred. TO: Fault appears > if 50 consecutive faults have occurred.	<ul style="list-style-type: none"> – Check the ventilator of the charger. – Check / replace the charger.
Bat full	Charging process terminated.	<ul style="list-style-type: none"> – Incorrect polarity on the relay coil K1. Check the positive and negative cables.

8.3 Warning messages

Display shows	Description	Remedy
Warning temp	Warning temperature >80 °C reached. The actuation of the suction turbine or the brush motor is only occurring with 2/3 of the nominal PWM	<ul style="list-style-type: none"> - Check the suction turbine and the brush motor for overload.
Hindernis Ignor.	Safety sensor active.	<ul style="list-style-type: none"> - Check/replace the safety sensor if an obstacle is not the cause.
Bus Error Lader	Charging process interrupted by communication fault to charger.	<ul style="list-style-type: none"> - Check/replace the three-prong cable between the charger and the control. - Check / replace the charger.
Charging fault	Charging characteristic could not be adhered to.	<ul style="list-style-type: none"> - Check/replace the battery set. - Check / replace the charger
Charging complete	Charging process completed successfully.	
FR Loesen	Drive regulator actuated during startup.	<ul style="list-style-type: none"> - Release drive regulator. - Test/replace the drive regulator.
ERR_BTSTL_001 ERR_BTSTL_002 ERR_BTSTL_003 ERR_BTSTL_004 ERR_BTSTL_005 ERR_BTSTL_006 ERR_BTSTL_007 ERR_BTSTL_008 ERR_BTSTL_009 ERR_BTSTL_010 ERR_BTSTL_011 ERR_BTSTL_012 ERR_BTSTL_013 ERR_BTSTL_014 ERR_BTSTL_018	Internal fault of control panel board.	<ul style="list-style-type: none"> - Transfer the current control panel board software to the control panel board via the service module. - If the fault persists, replace the control panel board.
ERR_BTSTL_019	Can bus fault	<ul style="list-style-type: none"> - Check the CAN bus cable (yellow) between the control electronics and the control panel board replace if necessary. - Replace operating panel PCB.
ERR_BTSTL018	Bus cable defective. Voltage supply to the control panel board incorrect.	<ul style="list-style-type: none"> - Check/replace the bus cable. - Replace operating panel PCB. - Replace control electronics.

9 Technical specifications

9.1 B 60 W BP

	BR appliance		BD appliance			
	R 55	R 65	R 75	D 55	D 65	D 75
Power						
Nominal voltage	V	24				
Battery capacity	Ah (5h)	105, 170, 180				
Average power consumption	W	2100				
Drive motor output (rated output)	W	300				
Suction engine output	W	580				
Brush engine output	W	2 x 600				
Vacuuming						
Vacuum power, air volume (max.)	l/s	22				
Vacuuming power, negative pressure (max.)	kPa	16,7				
Cleaning brushes						
Brush speed	1/min	600 - 1300		180		
Dimensions and weights						
Theoretical surface cleaning performance	m ² /h	3300	3900	4500	3300	3900
Slope max.	%	2				
Fresh/dirt water reservoir volume	l	60/60				
Max. water temperature	°C	60				
Transport weight	kg	232 (with batteries 180 Ah)				
Total weight	kg	292 (with batteries 180 Ah)				
Values determined as per EN 60335-2-72						
Total oscillation value	m/s ²	0,3				
Uncertainty K	m/s ²	0,2				
Sound pressure level L _{pA}	dB(A)	70				
Uncertainty K _{pA}	dB(A)	2				
Sound power level L _{WA} + Uncertainty K _{WA}	dB(A)	83				
Current pickup						
Drive speed, forward	km/h	0,5 - 6				
Drive speed, reverse	km/h	0,5 - 4,5				
Brush motor, unloaded	A	6 - 14		9 - 11		
Brush motor loaded on concrete plate, drive motor running and vacuum bar lowered, fresh water tank contains 60 l of water	A	25-35		20-30		
Brush motor, overload after 10 to -20 seconds delay at:	A	80				
Suction turbine	A	20 - 23				

Drive motor, duration	A	up to 20
Max. drive motor	A	30
Drive motor: Within 8 minutes, for a duration of 2 minutes:	A	20 - 30
After that, limited to	A	20
Charger		
Load current during the charging of a depleted battery	A	max. 35
Load current in the recharging phase at: maintenance-free batteries	A	0,5-1
low-maintenance battery	A	4-5
Flow rate of fresh water volume		
Water quantity	l/min	>3,0
Detergent pump		
Max. flow rate	l/min	>0,05
Detergent pump at max. flow volume	A	0,5
Battery total discharge protection		
The drive motor is shut off at a battery voltage of < 18 V.		

Batteries

Kärcher part number	Nominal voltage	Nominal capacity	Battery type	Runtime (h) at power pickup (A)						Load cycles at medium load
				plain		medium		rough		
[V]	[Ah]	[h]	[A]	[h]	[A]	[h]	[A]	[h]	[A]	
6.654-068.0	4 x 6	180	FT...WET wa	2,6	55	2,3	65	1,7	80	650 - 700
6.654-124.0	4 x 6	180	GIV wf	2,6	55	2,1	65	1,7	80	350-400
6.654-141.0	2 x12	105	GIV wf	1,4	55	1,2	65	0,9	80	350-400
6.654-242.0	4 x 6	170	AGM wf	2,3	55	1,8	65	1,5	80	350-400

9.2 B 60 W EP

	BR appliance	BD appliance
	R 55	D 51
Power		
Nominal voltage	V	230 - 240 (1~, 50/60 Hz)
Average power consumption	W	1450
Suction engine output	W	500
Brush engine output	W	600
Vacuuming		
Vacuum power, air volume (max.)	l/s	22
Vacuuming power, negative pressure (max.)	kPa	12
Cleaning brushes		
Brush speed	1/min	1100
Dimensions and weights		
Theoretical surface cleaning performance	m ² /h	2200
Slope max.	%	2
Fresh/dirt water reservoir volume	l	60/60
Max. water temperature	°C	60
Transport weight	kg	100
Total weight	kg	160
Values determined as per EN 60335-2-72		
Total oscillation value	m/s ²	0,3
Uncertainty K	m/s ²	0,1
Sound pressure level L _{pA}	dB(A)	71
Uncertainty K _{pA}	dB(A)	2
Sound power level L _{WA} + Uncertainty K _{WA}	dB(A)	88
Current pickup / water volume		
Brush motor, unloaded	A	2 - 4
Brush motor loaded on concrete plate, vacuum bar lowered, fresh water tank contains 20 l of water	A	2,5-5,5
Brush motor, overload after 10 to -20 seconds delay at:	A	10-20
Suction turbine	A	1,5-3,5
Water quantity	l/min	>1,6

9.3 Exchange times

Part designation	Exchange time
Operating field	20
Programme selector switch (EP version)	15
Fuse (EP version)	15
Electronics performance part (BP version)	30
Relay	15
Electronics (EP version)	15
Charger	15
Mains cable - charger	10
Mains cable, EP model	10
Potentiometer drive lever	20
Microswitch - safety switch	15
Reservoir cover	10
Seal profile of wastewater tank cover	10
Water filter fresh water	5
Drain hose	10
Suction hose	5
Swivel casters	20
Wheel D200 (both)	15
Drive wheels	15
Drive motor	35
Carbon brushes drive motor	25
Suction turbine	20

Part designation	Exchange time
Carbon brush suction turbine	20
Detergent dosing pump blue	15
Detergent dosing pump orange	20
Detergent dosing pump hose	5
Flowmeter	10
Water dosing valve	15
Solenoid valve - water	15
Float of wastewater tank	1
Lint trap turbine	1
Coarse dirt sieve, wastewater tank	1
Brush head	10
Brush head steering	15
Brush head suspension	20
Vacuum bar holder	15
Scraper roller of suction bar	10
Rubber lip set	10
Battery fuse	10
Batteries	10
Disc brush (both)	3
Brush roller (both)	3
Gear belt	15
Ball bearing, brush drive	30
Scraper roller, floor head	15
Brush motor	30

9.4 Technical Documentation

Appliance type	Appliance no.	Circuit diagram	operating instructions	Spare parts list
B 60 W EP	2.384-001.0	0.089-425.0	5.964-314.0	5.971-419.0
B 60 W BP	2.384-002.0	0.089-424.0	5.964-162.0	5.971-419.0
B 60 W BP DOSE	2.384-003.0	0.089-424.0	5.964-162.0	5.971-419.0

9.5 Special tools

Intelligent Key, red	5.035-337.0
Voltage regulator	6.803-025.0
Multimeter	6.803-022.0
Torque wrench	6.815-090.0
Set service module	2.816-117.0
Molex puller tool	6.816-086.0
Hebe acid meter for low-maintenance batteries	6.803-015.0

9.6 Torques

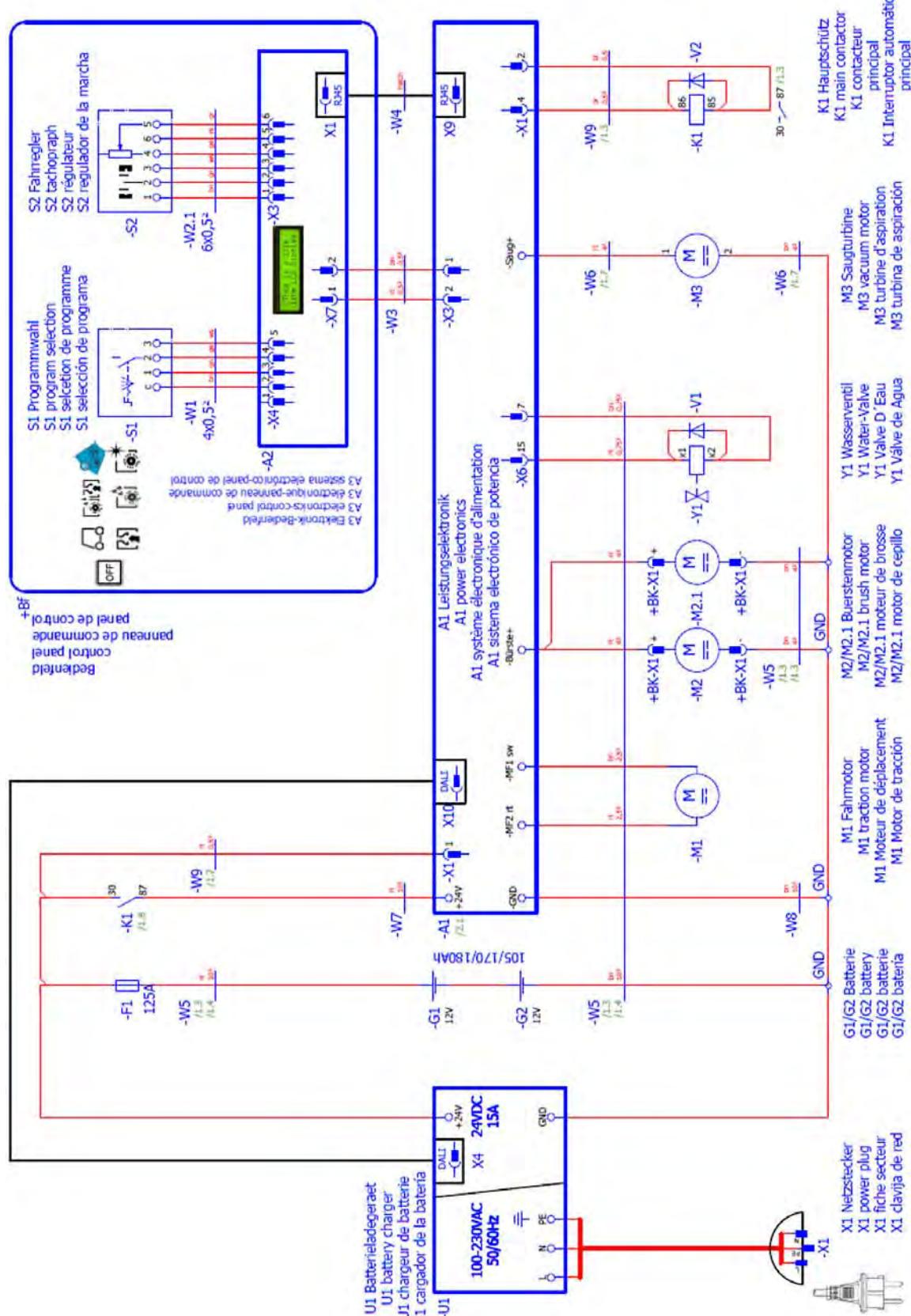
Locknut brush head pickup with the quick tensioning lever closed	6 Nm
--	------

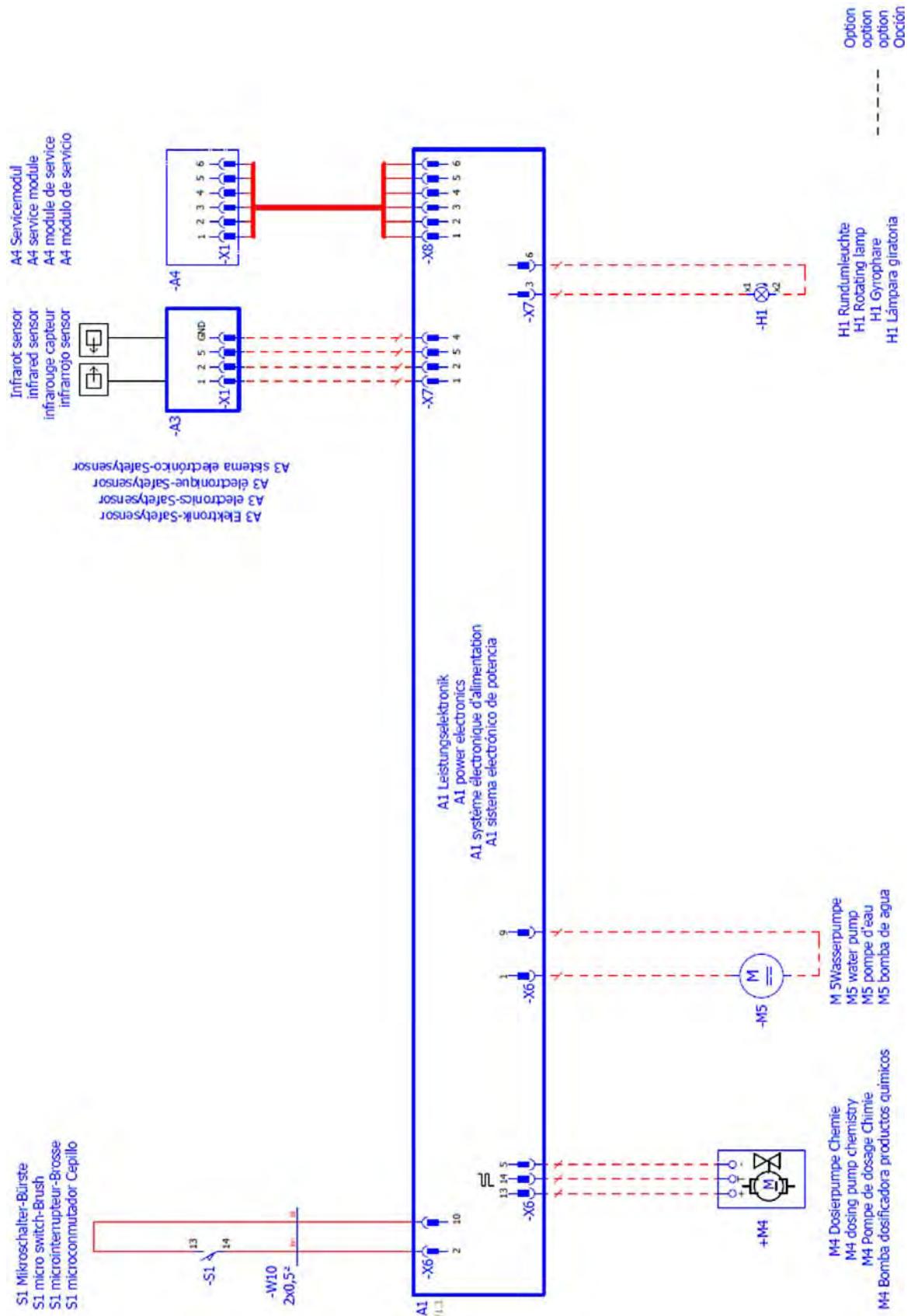
10 Circuit diagram

The current technical specification sheets and circuit diagrams will be included in the next version of the spare parts CD DISIS/DISIPlus and in the kaercher-inside (<https://kaercher-inside.com>).

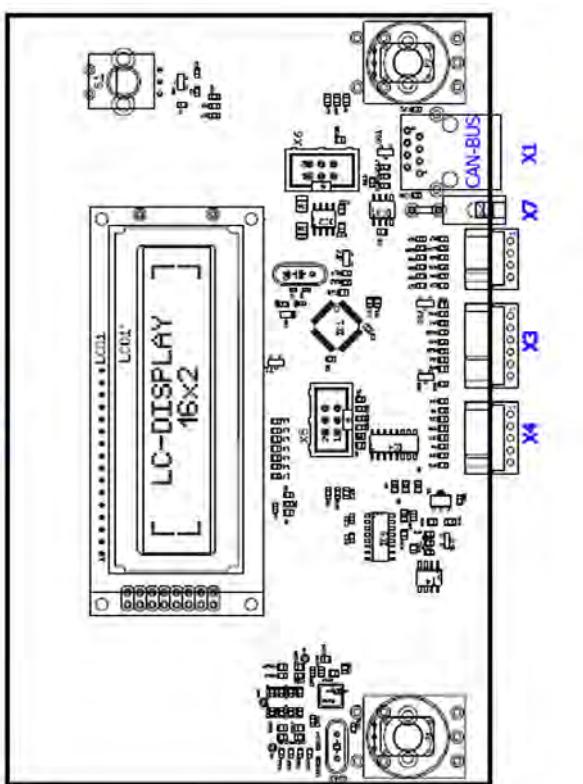
Please always use the current circuit diagram.
The circuit diagram in the service manual is not updated.

10.1 B 60 W Bp 0.089-424.0

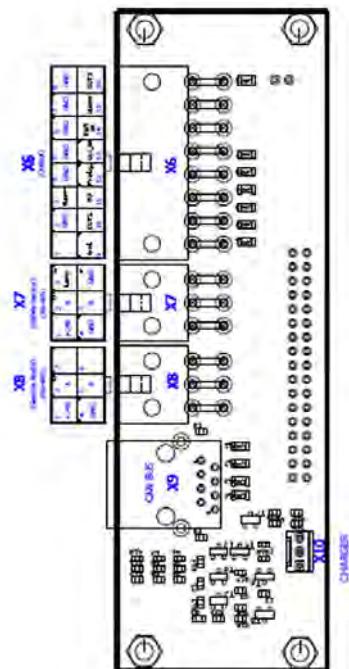
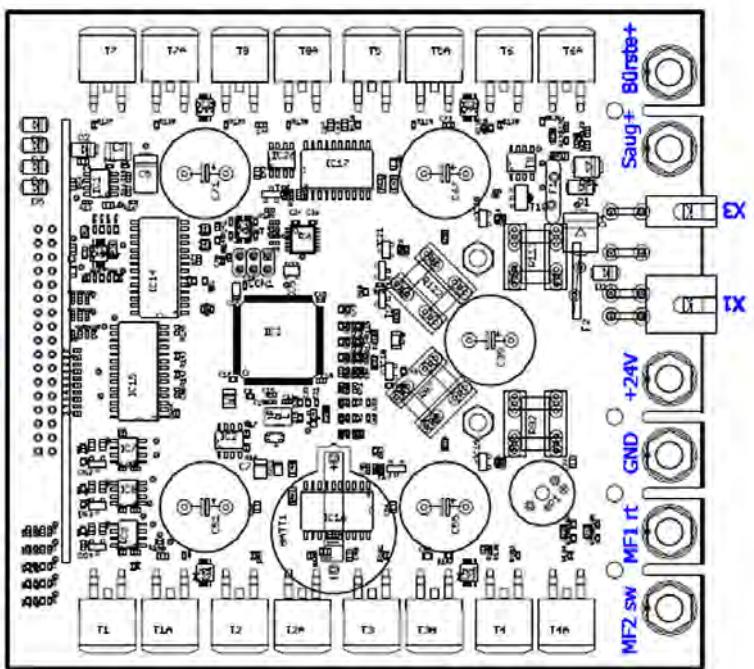




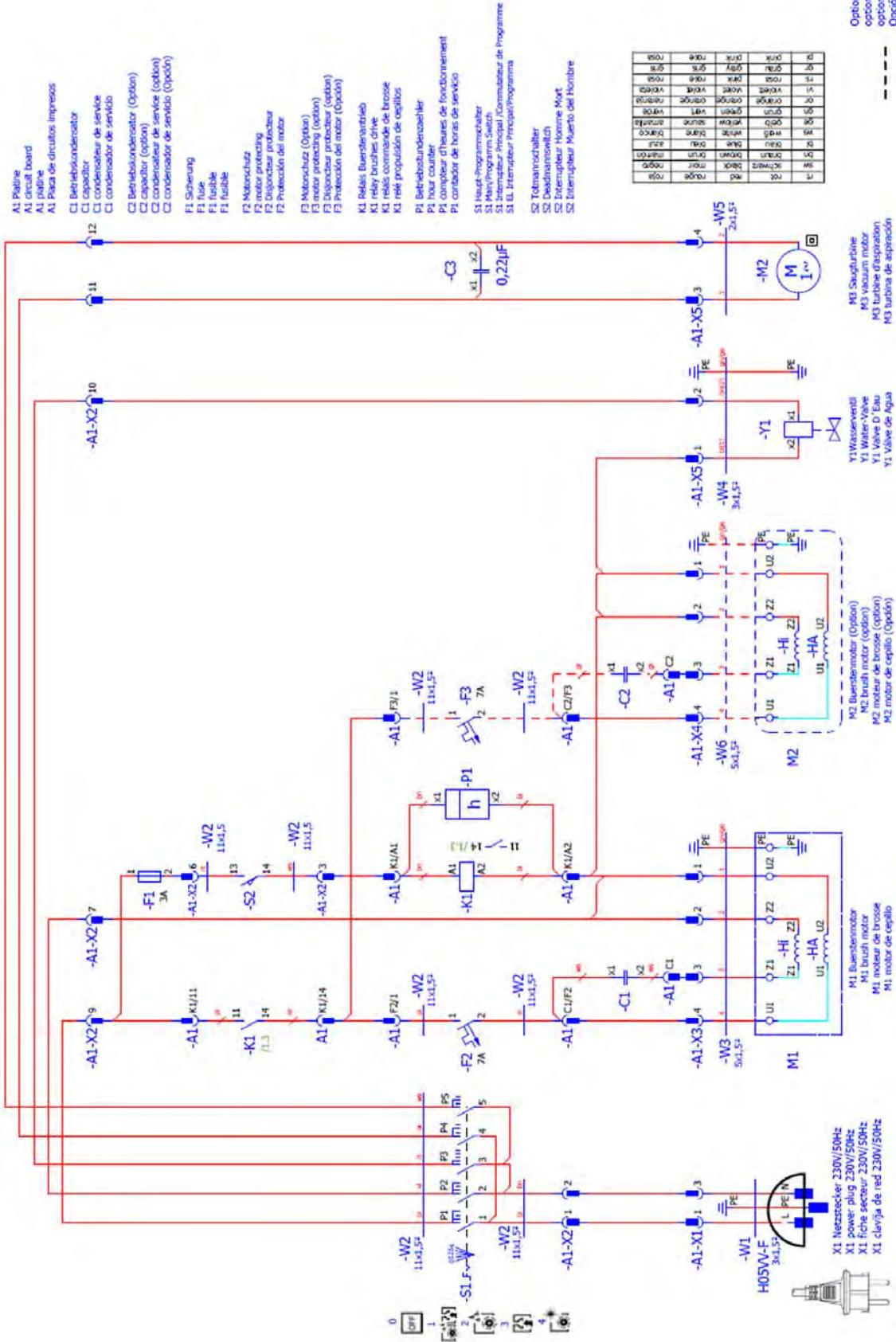
A2



A1



- A1 Performance electronics
- A2 Display
- A3 Electronics safety sensor
- A4 Service module
- F1 Fuse 125A
- G1 Battery, e. g. 12V/105/170/180 Ah
- G2 Battery, e. g. 12V/105/170/180 Ah
- H1 Beacon lamp
- K1 Main contactor
- M1 Drive motor
- M2 Brush motor
- M3 Suction turbine
- M4 Dosing pump
- M5 Water pump
- S1 Program selection switch
- S2 Drive regulator
- U1 Battery charger
- X1 Mains plug
- Y1 Water valve



- A1 Printed board
- C1 Operating capacitor
- C2 Operation capacitor (option)
- F1 Fuse 3A
- F2 Fuse of motor protection 7A
- F3 Fuse of motor protection 7A (option)
- K1 Brush drive relay
- M1 Brush motor
- M2 Brush motor (option)
- M3 Suction turbine
- P1 Operating hour counter
- S1 Program selection switch
- S2 Safety button
- X1 Mains plug 230V/50Hz
- Y1 Water valve

11 Software diagram and parameter overview

11.1 Menu navigation

The menu is navigated via the information button (info button).

→ Rotate the info button to select the parameter.



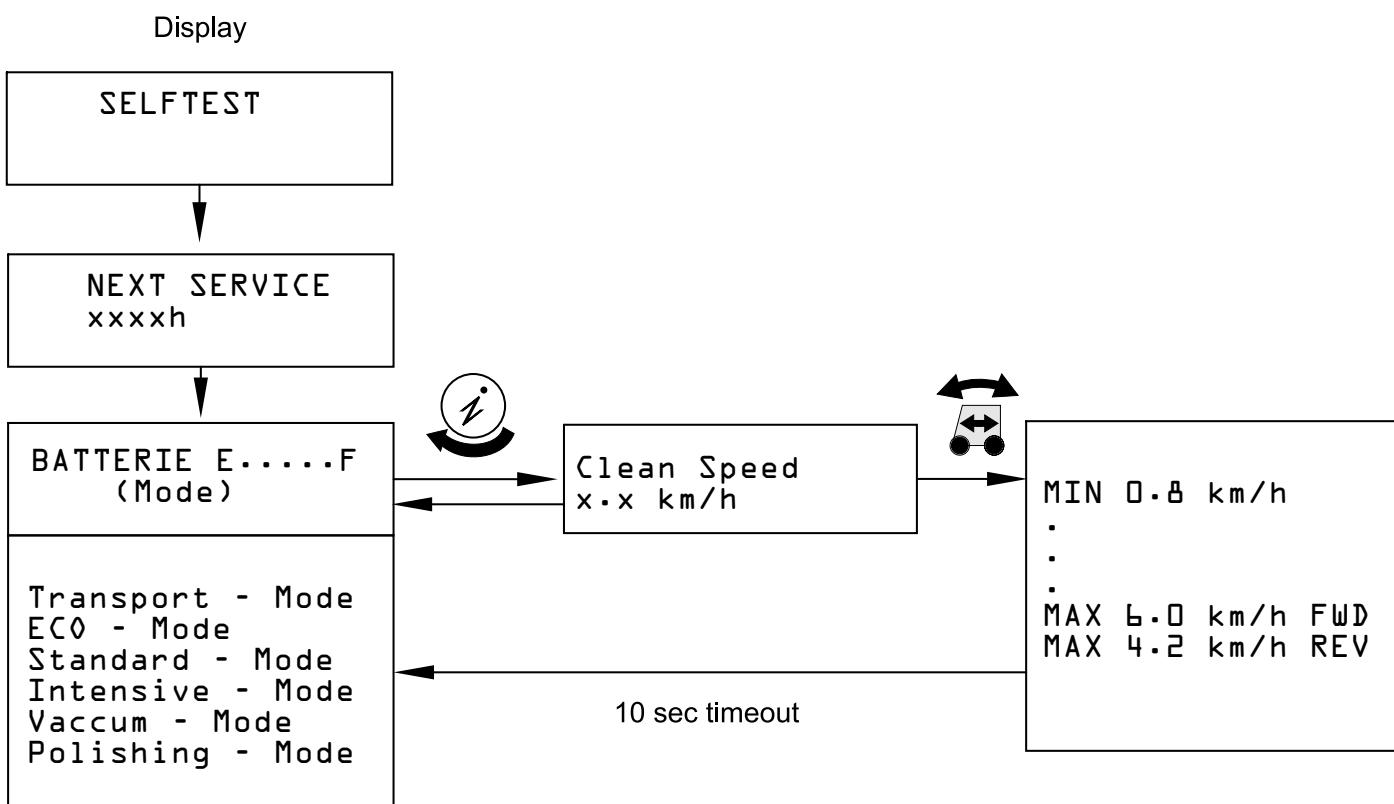
→ Press the info button to confirm the selection.

11.2 Software diagram

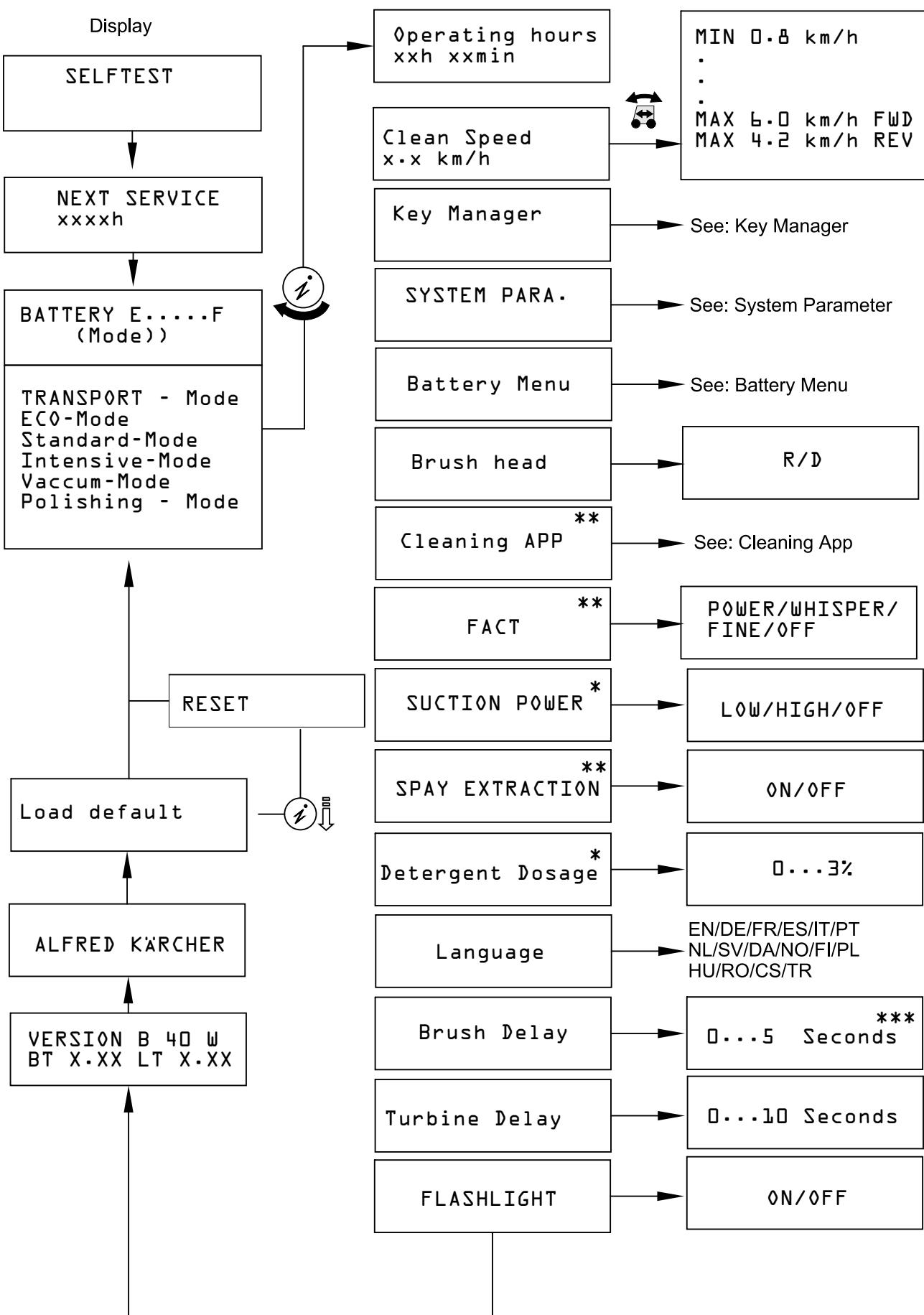
Note

*The menus displayed relative to the selected mode.
The diagram shows all available menus as an overview.*

11.2.1 Function overview of the yellow intelligent key



11.2.2 Function overview of the grey intelligent key

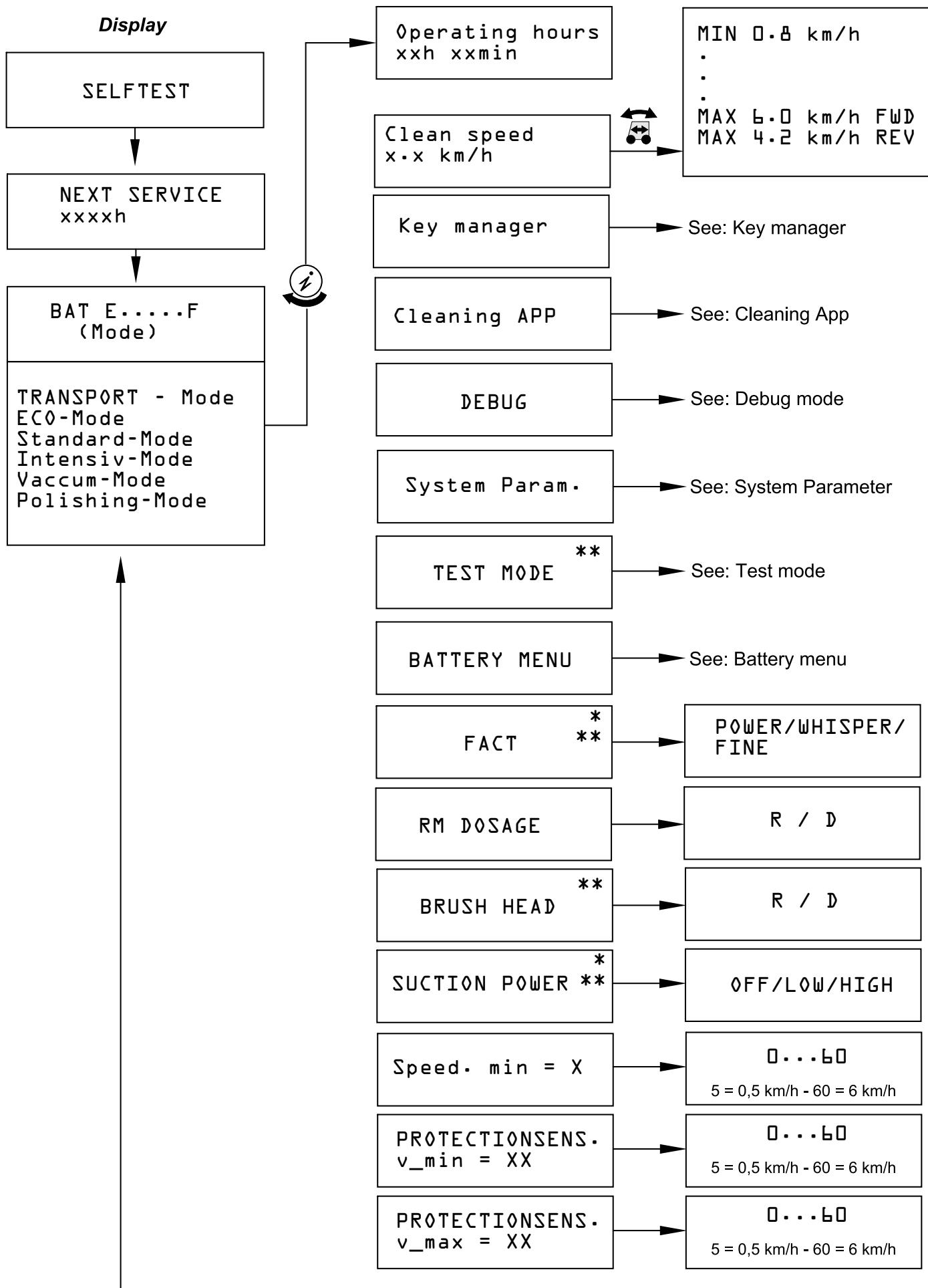


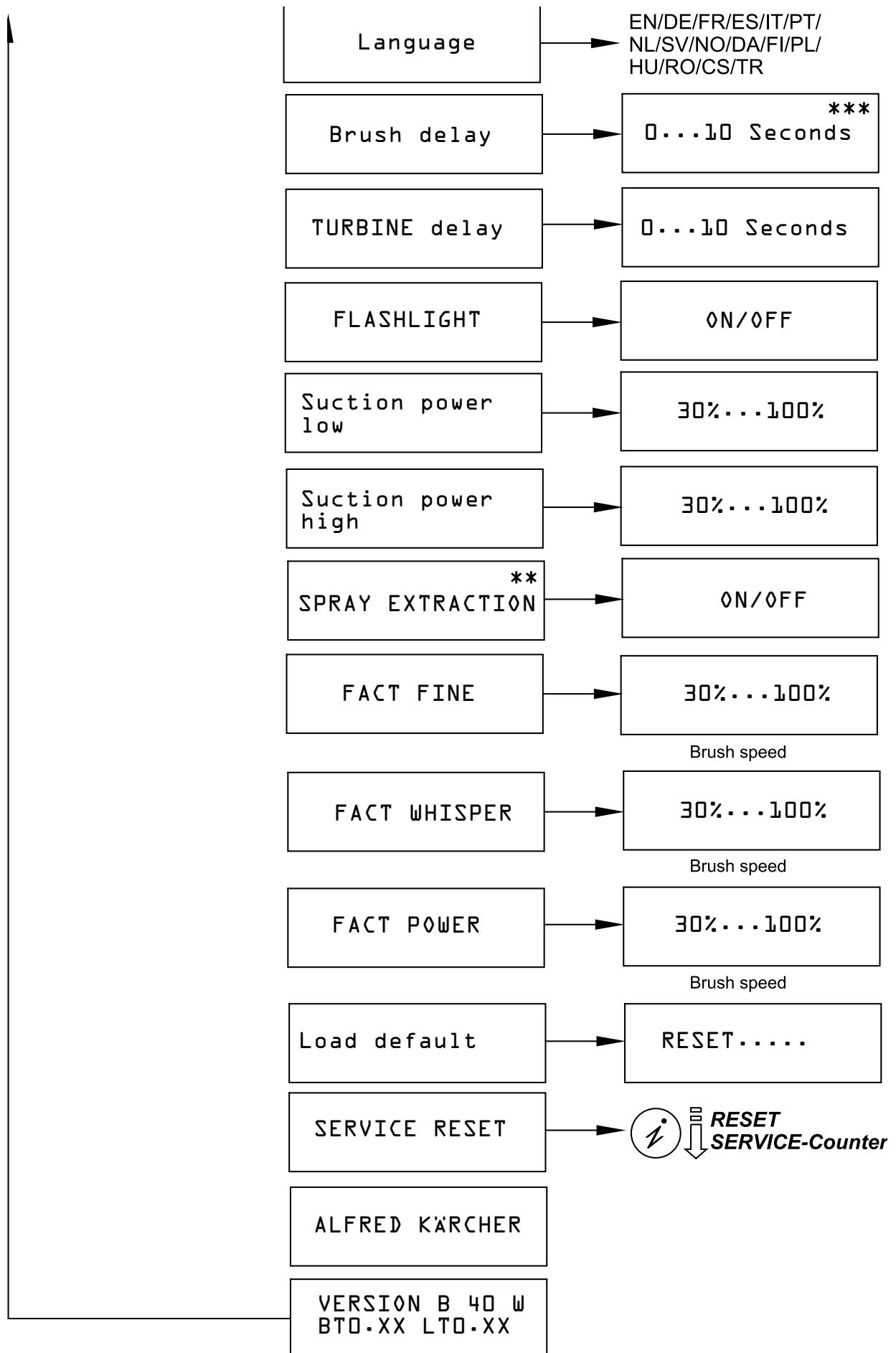
*Selection not permanent. The setting will be lost if the programme selector switch is adjusted.

*** 60 seconds can be set for service, permanent storage not possible.

**Selection depends on programme selector switch setting

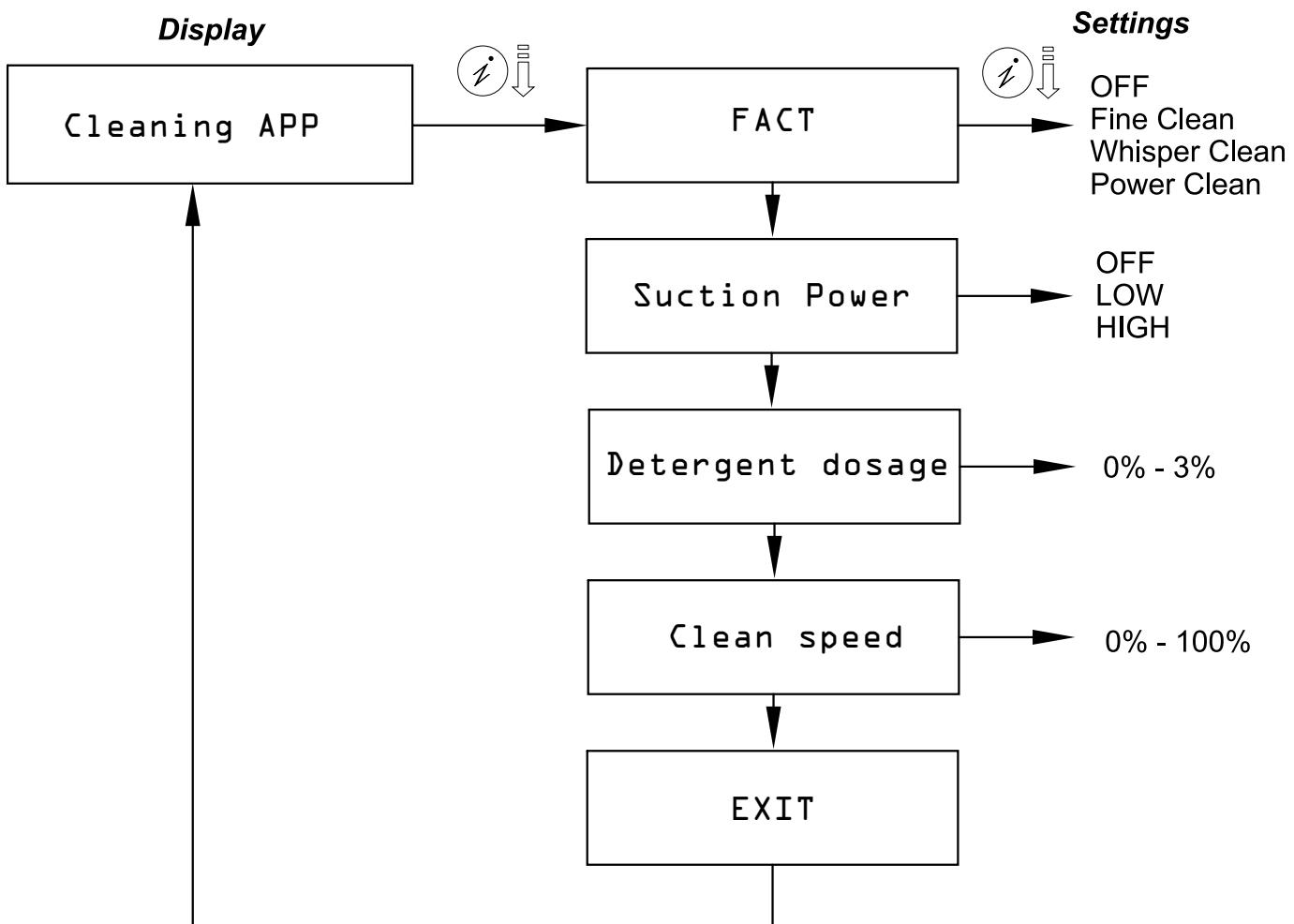
11.2.3 Function overview of red intelligent key





11.3 Special submenus

11.3.1 Menu cleaning app

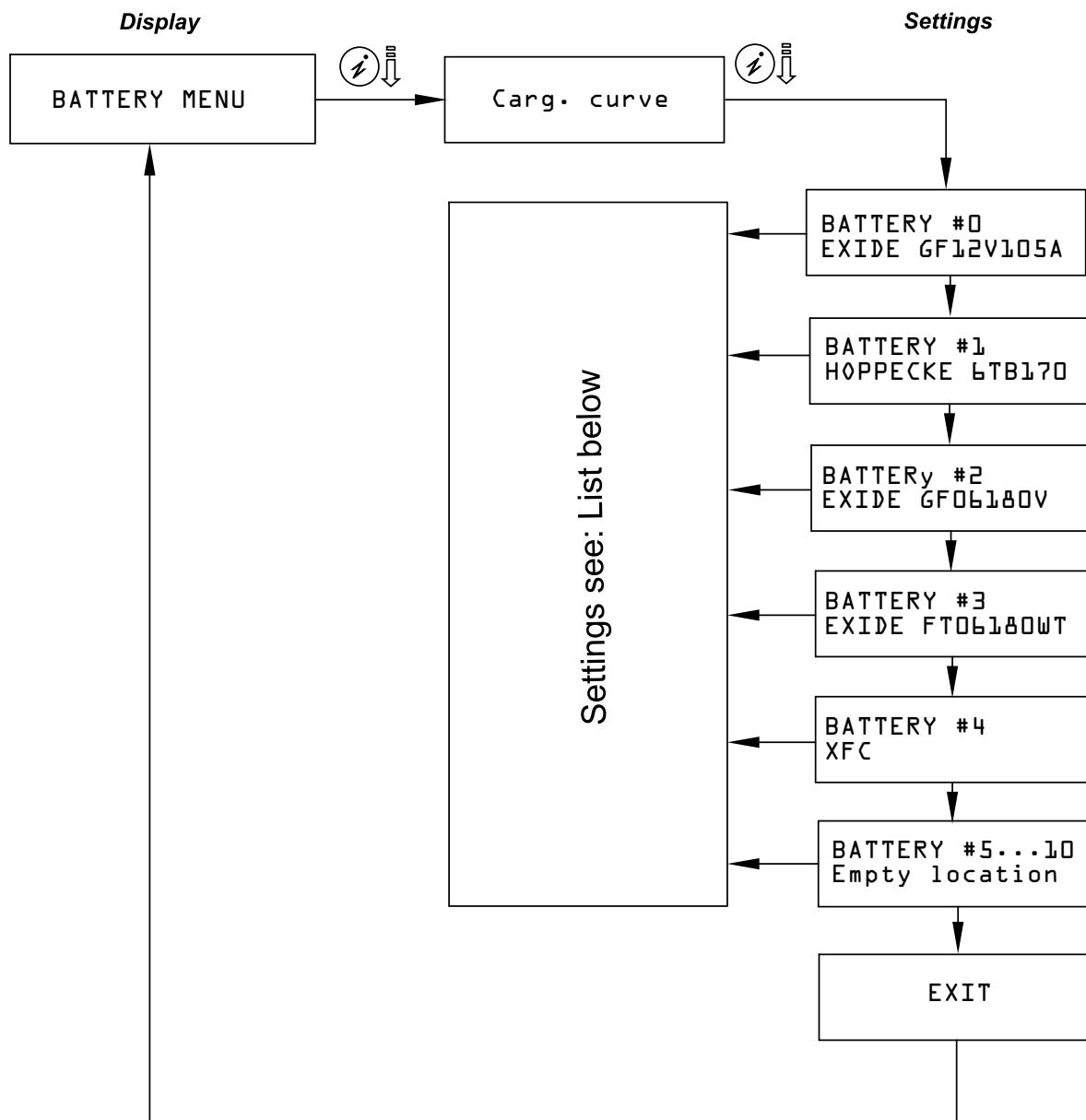


The cleaning app menu can only be selected in the cleaning programmes.

Note

The values set up here are only active, if the yellow user key does not have modification rights. If the factory settings are loaded into the menu, all APP programmes are reset and must be set up again.

11.3.2 Battery menu



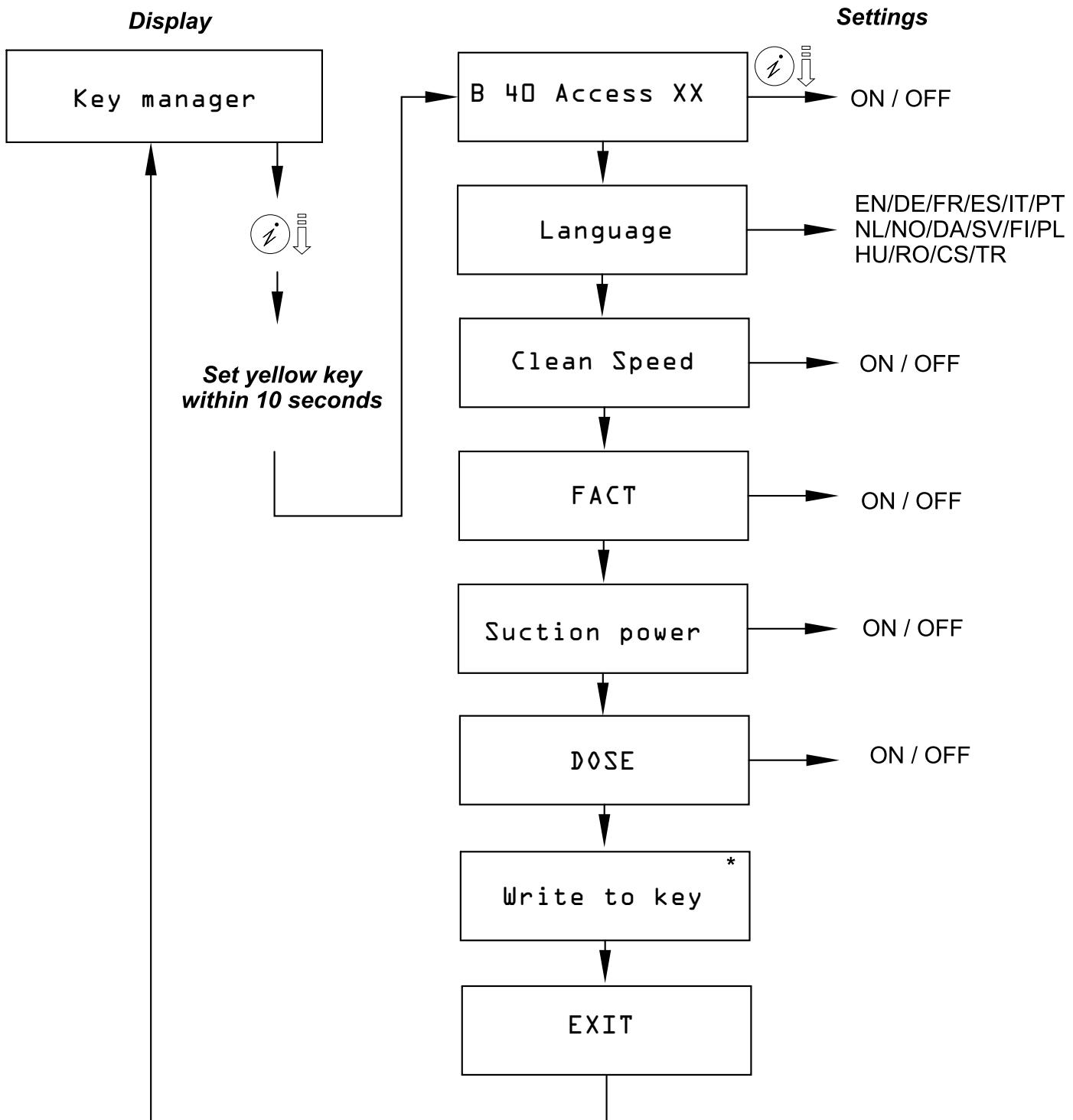
Version LT 1.0k and higher

Switch-off voltage	Battery I	Battery II	Battery III	Battery IV	Battery V	Battery VI-X
Low Batt...	EXIDE GF12V105A	HOPPECKE 6TB170	EXIDE GF06180V	EXIDE FT06180WT	XFC rapid charge capable, external charger	External charger, customisable
A = 10 A	23.4 V	23.0 V	23.5 V	23.2 V	23.5 V	23.5 V
B = 30 A	21.1 V	22.8 V	23.1 V	22.1 V	23.5 V	23.5 V
C= 50 A	19.6 V	22.7 V	22.3 V	21.1 V	23.5 V	23.5 V
d = 60 A	19.4 V	22.6 V	20.8 V	19.8 V	23.5 V	23.5 V
E = 70 A	19.2 V	22.5 V	19.9 V	19.6 V	23.5 V	23.5 V

These values refer to the switch-off of the brush motor and suction turbine units. The switch-off differs with the current pickup.

The switch-off takes place after 60 seconds plus turbine trailing time.
Switch-off of drive motor at 18 V.

11.3.3 User key menu



*Additional yellow keys can be described using the set up parameters.

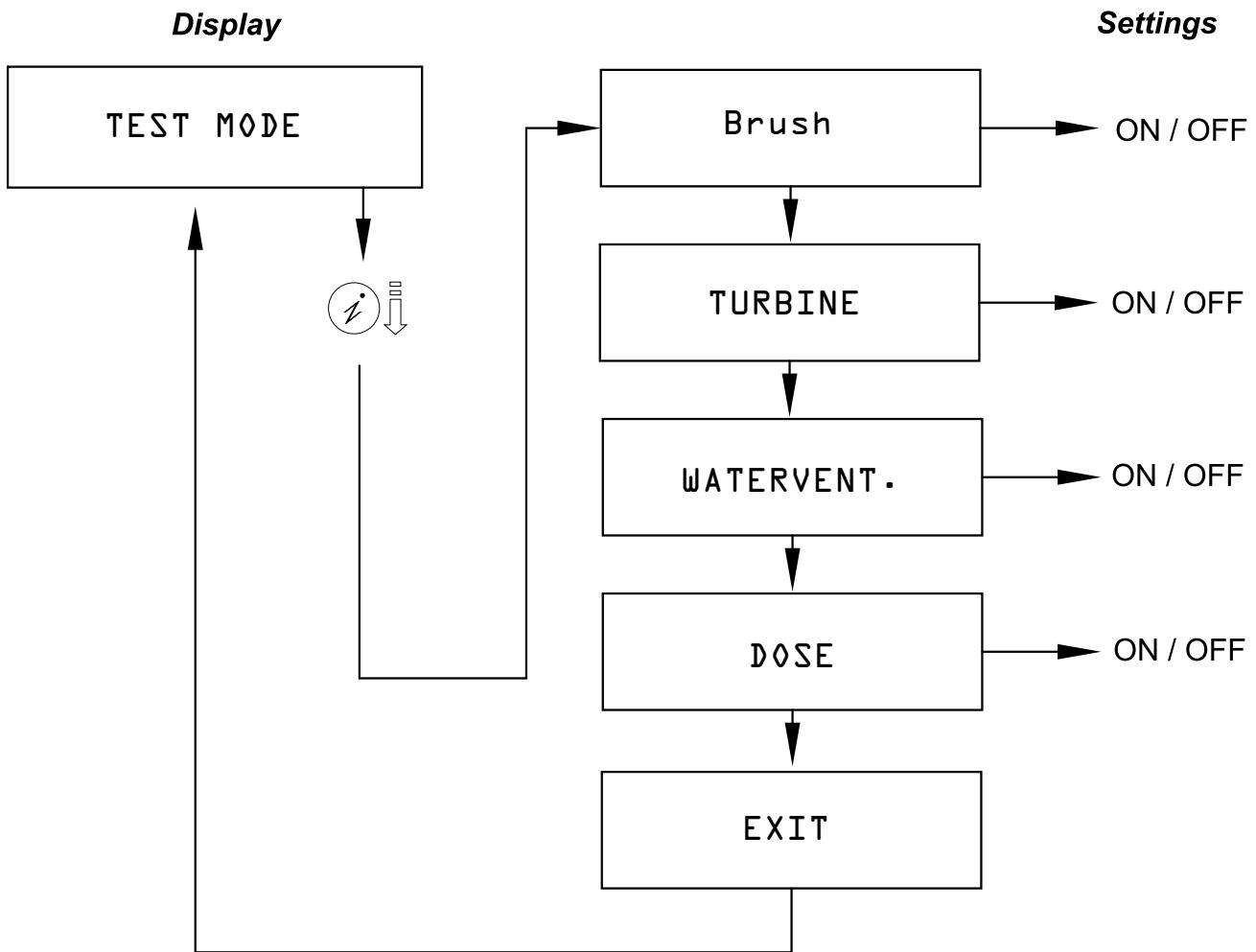
Note

This menu allows the user of the yellow user key additional settings with the I button.

The user can only use the released programmes.

Parameter are active immediately and until a new cleaning programme is selected via the programme selector switch. After that, the standard values are restored.

11.3.4 Test mode menu



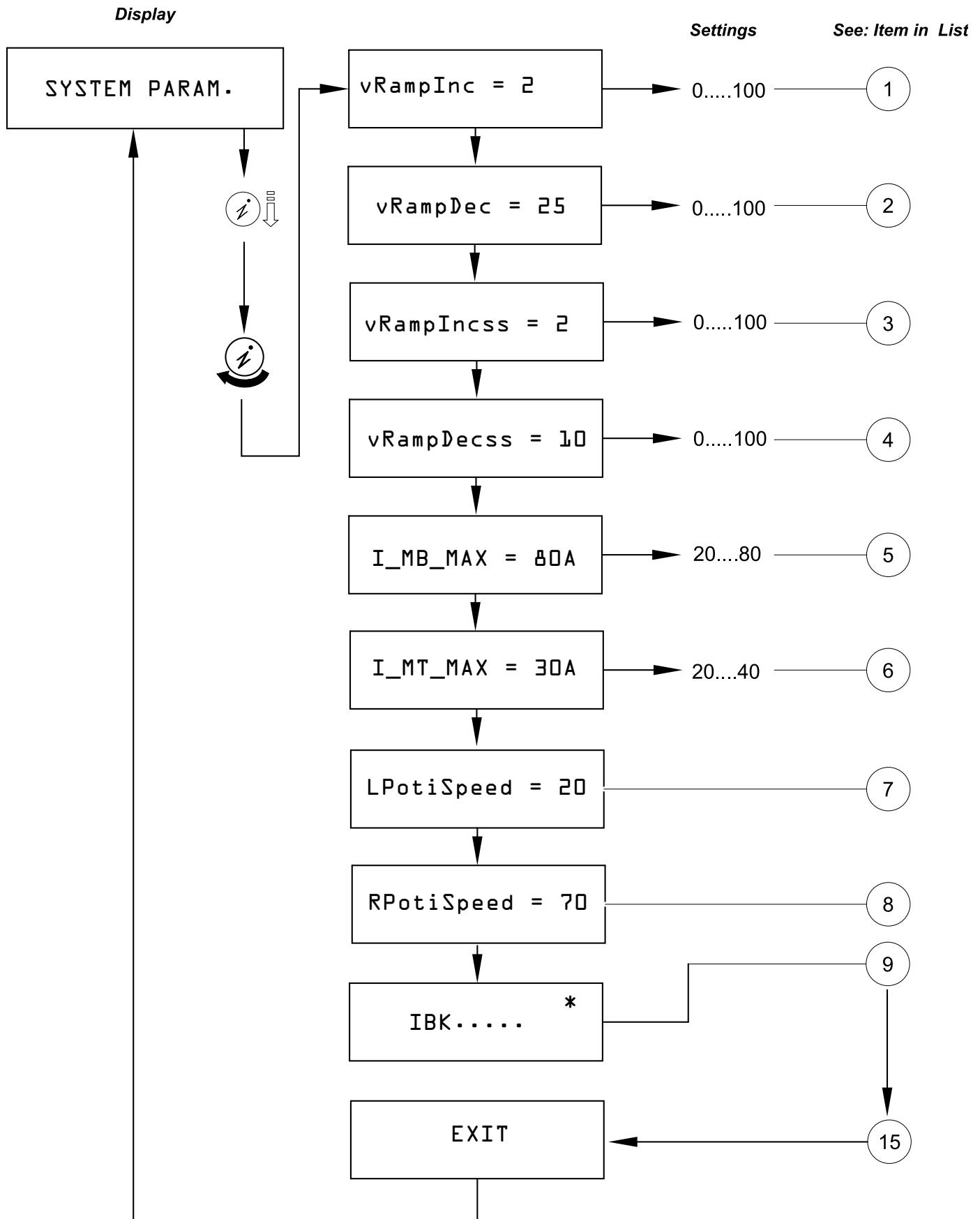
Note

Programme sequence faults if not all units are correctly connected during test mode operation.

The test mode operation can only be selected in transport mode for the B 60 W.

In the test mode "DOSE", water must flow through the flowmeter for the water pump to start up. The water volume valve must be open during this test. The solenoid valve opens automatically.

11.3.5 System parameter menu



* visible with grey intelligent key.

Explanation of the parameters

No.	Parameter / factory setting	Important	level
1	vRamp Inc = 2	Acceleration ramp, larger numbers means faster acceleration.	1 - 100
2	vRamp Dec = 25	Brake ramp, higher numbers means stronger braking	1 - 100
3	vRamp Incss = 2	Acceleration ramp, if safety sensor is installed, larger numbers means faster acceleration.	1 - 100
4	vRamp Decss = 10	Brake ramp, if safety sensor is installed, higher numbers means stronger braking	1 - 100
5	I_MB_MAX = 80 A	Maximum permanent current of the brush drive	20 - 80
6	I_MT_MAX = 30 A	Maximum permanent current of the suction turbine	20 - 40
7	LPotiSpeed = 20	Left stop position of the potentiometer (driving speed)	see below
8	RPotiSpeed = 70	Left stop position of the potentiometer (driving speed)	see below
9	IBKBoostD = 80 A	I = current, BK = brush head, Boost = short-term overload, D = D head	5 - 120
10	IBKmaxD = 80 A	I = current, BK = brush head, max. = max. permanent current, D = D head	5 - 80
11	IBKBoostR = 120 A	I = current, BK = brush head, Boost = short-term overload, R = R head	5 - 120
12	IBKmaxR = 80 A	I = current, BK = brush head, max. = max. permanent current, R = R head	5 - 80
13	IBKBoostS = 120 A	I = current, BK = brush head, Boost = short-term overload, R = R head	5 - 120
14	IBKmaxS = 80 A	I = current, BK = brush head, max. = max. permanent current, R = R head	5 - 80

11.3.6 Setting the potentiometer stop positions

- Move the potentiometer's rotary knob into the left stop position.
- Press the I button.
- Press the I button to confirm.
- The value is adopted.
- Move the potentiometer's rotary knob into the right stop position.
- Press the I button.
- Press the I button to confirm.
- The value is adopted:

11.4 Factory setting

Note

Many faults result from incorrect settings. Load the factory settings for troubleshooting!

The factory settings can be restored in the menu of the grey and red intelligent key.

Note

After loading the factory settings, switch off the programme selector switch so that the new parameters can be applied. After that, the following parameters must be set up:

- the language
- Brush head
- Battery menu
- Cleaning app

11.5 Overview of special functions and basic settings

11.5.1 Summary and basic setting of key menu

Program	Transport			Eco			Normal		
	Key			Key			Key		
	yellow	grey	red	yellow	grey	red	yellow	grey	red
Operating hours		X	X		X	X		X	X
Speed	X	X	X	X	X	X	X	X	X
Key menu		X	X		X	X		X	X
System param.		X	X		X	X		X	X
Cleaning app					X	X		X	X
Debug			X			X			X
Test mode			X						
Battery menu		X	X		X	X		X	X
Brush head D/R		GB	GB						
FACT					Whisper Clean		Power Clean		
Cleaning power					reduced		maximum		
Spray suction ON / OFF									
RM dosing					0,5%		1%		
min. speed			5			5			5
Protection sensor V min			5			5			5
Protection sensor V max			30			30			30
the language		en	en		en	en		en	en
Brush trailing		2	2		2	2		2	2
Turbine trailing time		10	10		10	10		10	10
Flash light ON / OFF		OFF	OFF		OFF	OFF		OFF	OFF
Suction performance reduced by 70%			70%			70%			70%
Max. suction performance 100%			100%			100%			100%
Fact fine 30%			30%			30%			30%
Fact whisper 60%			60%			60%			60%
Fact power 100%			100%			100%			100%
Factory setting		X	X		X	X		X	X
Service reset			X			X			X
Alfred Kärcher		X	X		X	X		X	X
Software version		X	X		X	X		X	X

Program	intensive			Vacuuming			Polishing		
	Key			Key			Key		
	yellow	grey	red	yellow	grey	red	yellow	grey	red
Operating hours		X	X		X	X		X	X
Speed	X	X	X	X	X	X	X	X	X
Key menu		X	X		X	X		X	X
System param.		X	X		X	X		X	X
Cleaning app		X	X		X	X		X	X
Debug			X			X			X
Test mode									
Battery menu		X	X		X	X		X	X
Brush head D/R									
FACT		Power Clean						Power Clean	
Cleaning power					maximum				
Spray suction ON / OFF					OFF	OFF			
RM dosing		3%							
min. speed			5			5			5
Protection sensor V min			5			5			5
Protection sensor V max			30			30			30
the language		en	en		en	en		en	en
Brush trailing		2	2		2	2		2	2
Turbine trailing time		10	10		10	10		10	10
Flash light ON / OFF		OFF	OFF		OFF	OFF		OFF	OFF
Suction performance reduced by 70%			70%			70%			70%
Max. suction performance 100%			100%			100%			100%
Fact fine 30%			30%			30%			30%
Fact whisper 60%			60%			60%			60%
Fact power 100%			100%			100%			100%
Factory setting		X	X		X	X		X	X
Service reset			X			X			X
Alfred Kärcher		X	X		X	X		X	X
Software version		X	X		X	X		X	X

11.5.2 Debug Mode

Menu entry		Description	Information
S000 G000 vs 0.0 vi 0.0	S+G	in % depending on the drive switch actuation	Nominal and regulated value of the speed control. Set the rotary knob for drive speed to max. speed.
	vs	Setpoint speed	
	vi	Actual speed	
H1: 0.0V 0.0A H2: 0.0V 0.0A	H1 H2	during forward drive during reverse drive	Drive motor voltage and drive motor current.
T018 018 018 018	T	Temperatures to the MOSFET.	Normal = all values are approximately the same.
T 0.0A M 0.0A P000 B 0.0A M 0.0A P000	T	Suction turbine motor current	Active current.
	M	permissible max. current	
	P	Speed in %	
	B	Brush motor current	
	M	permissible max. current	
	P	Speed in %	
IM 0A 1200/4500 QS 0.0V Qi 0.0V	IM	Motor current of drive motor Overcurrent timer 2 minutes / overcurrent timer 8 minutes	1200 equals 12 A 4500 equals 45 A The drive motor current must be between 12 and 45 A no longer than 2 minutes in an 8 minute period. Then, the current is reduced to 12 A.
	QS	Motor nominal source voltage	24 V at max. drive speed setting on the potentiometer.
	Qi	Motor actual source voltage	Actual voltage to drive motor.
U_5V : 5.00V Ubatt: 24.1V	U	Internal 5 V supply voltage	
	Ubatt	Battery voltage	
AhCnt: 360000As AhMin: 36000As		Current consumption counter [As]	Calculate battery capacity: AhCnt - AhMin / 3600 = momentary residual capacity
		Non-removable capacity with drained battery pack [As]	
Ibatt: 000A LowBatt: 22.0V		Active total current	The low voltage limit changes depending on the switched on consumer.
		Low voltage limit with active loading current	
S:00/36.0V/00.0A 000 24.0V/00.0A		Charge status / nominal charge voltage / nominal charge current	Charge status S:1x Desulfating / Refreshphase S:2x I constant phase S:3x U constant phase S:4x I post charge phase S:5x A maintenance charge
		Charge timer / actual charge voltage / actual charge current	
Dali Err 000		Number of faults during the charge process	Check the cable to the charger.
ERR: CSXXX T0XXX		Number of checksum faults	Information for developers.
		Number of timeout faults	
Exit the menu		Back to main menu	