

 **KÄRCHER**[®]

BRC 50/70 W 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 109915
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The responsible product specialist will take care of your issue.

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www.kaercher.com

2 Safety instructions

The machine has been approved for use on surfaces with gradients of up to 2%.

The appliance may only be operated when the hood and all lids are closed.

2.1 Safety Devices

Safety devices serve to protect the user and must not be rendered inoperational or their functions by-passed.

2.1.1 Emergency-stop button

To put all functions out of operation immediately.

2.2 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 appliance is used for the wet cleaning of carpets. This appliance can perform different cleaning functions:

- Intermediate cleaning: Applying and brushing in of a detergent solution, which is vacuumed up together with the bound dirt after drying.
Basic cleaning: Applying, brushing and vacuuming up the detergent solution in one work cycle.
- The device is self-moving; the drive motor is feed by three batteries.
- The batteries can be charged using a charger connected to a 230 V socket.
- With model Bp, the battery is already integrated.
- A charger is included with model Bp.

Note

The appliance can be equipped with various accessories depending on the cleaning task. Please request our catalogue or visit us on the Internet at www.kaercher.com.

3.1 Drive

- Two front wheels driven by DC motor with differential drive.
- 2 rear swivel casters.
- Forward and reverse drive possible.
- The appliance brakes automatically if the driver releases both contact handles.
- Power supply via three 12-volt batteries (= 36 volt), maintenance free or low maintenance.

3.2 Water System

The detergent is applied to the floor from separate reservoirs via nozzles in front of the brushes.

3.3 Vacuuming operations

The suction turbines (M4 and M4.1) create a vacuum in the wastewater reservoir.

The waste water is thus pumped from the vacuum bar into the waste water reservoir through the suction hose.

If the wastewater reservoir is full, the float closes the suction opening.

The waste water reservoir is emptied by opening the cover of the waster water discharge hose.

Note

The suction turbines (M4 and M4.1) do not switch off automatically when the waste water reservoir is full. The suction turbines (M1) become overheated if they do not suck in air for a long time.

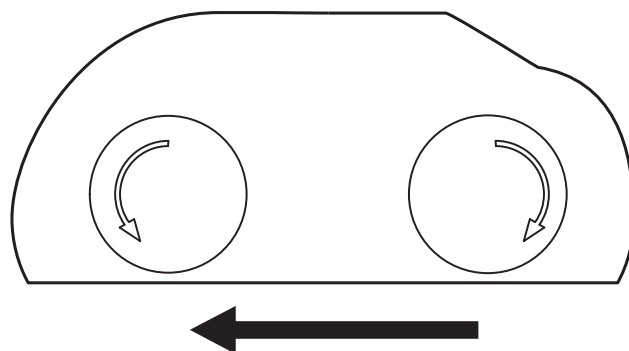
The vacuum bar will not be lifted until 20 seconds after the appliance has been switched off to suck in the remaining water from the floor under the vacuum bar (trailing time).

After the appliance has been switched off, the suction turbines (M4 and M4.1) will continue to run for approx. 30 seconds to suck in the remaining dirt from the suction hose (trailing time).

3.4 Cleaning operations

The brush rollers are switched off automatically if the brush motors are overloaded, e.g., due to too high contact pressure or blockage of the brush rollers.

- Cleaning head with quick brush change system.
- Brush drive system with toothed belt.



The brush rotation direction is in opposite directions.

3.5 Electrical system

The control and electronic system are located behind the operator console.

- Operator console with EMERGENCY-STOP switch.
- 4-level programme selector switch.
- Battery control display.
- Controllable drive speed.

4 Setup and function

4.1 Front view



1 Front panel

2 Cover of accessory tool

3 Rest

4 Cover dirt water reservoir

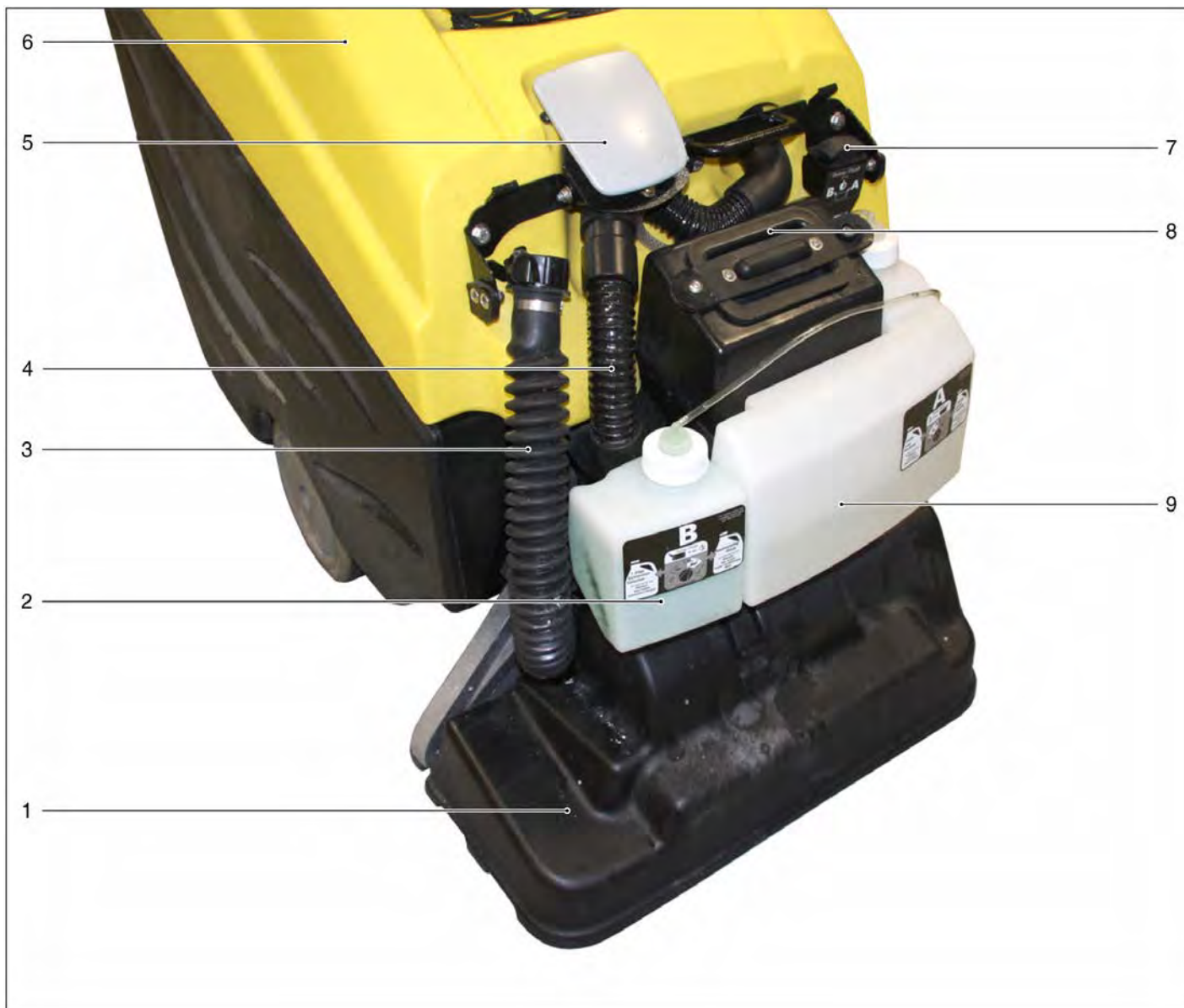
5 Dirt water reservoir

6 Fresh water tank

7 Vacuum bar

8 Cleaning head

4.1.1 Front cover removed



- 1 Cleaning head
- 2 Detergent tank B
- 3 Dirt water discharge hose
- 4 Suction hose
- 5 Cover of accessory tool

- 6 Dirt water reservoir
- 7 Ventilation switch
- 8 Filling nozzle for fresh water tank
- 9 Detergent tank A

The front cover is inserted and is pulled off toward the top.

4.1.2 Hood open



- 1 Lifting motor
- 2 Battery
- 3 Battery socket
- 4 Water filter

4.1.3 Close the hood

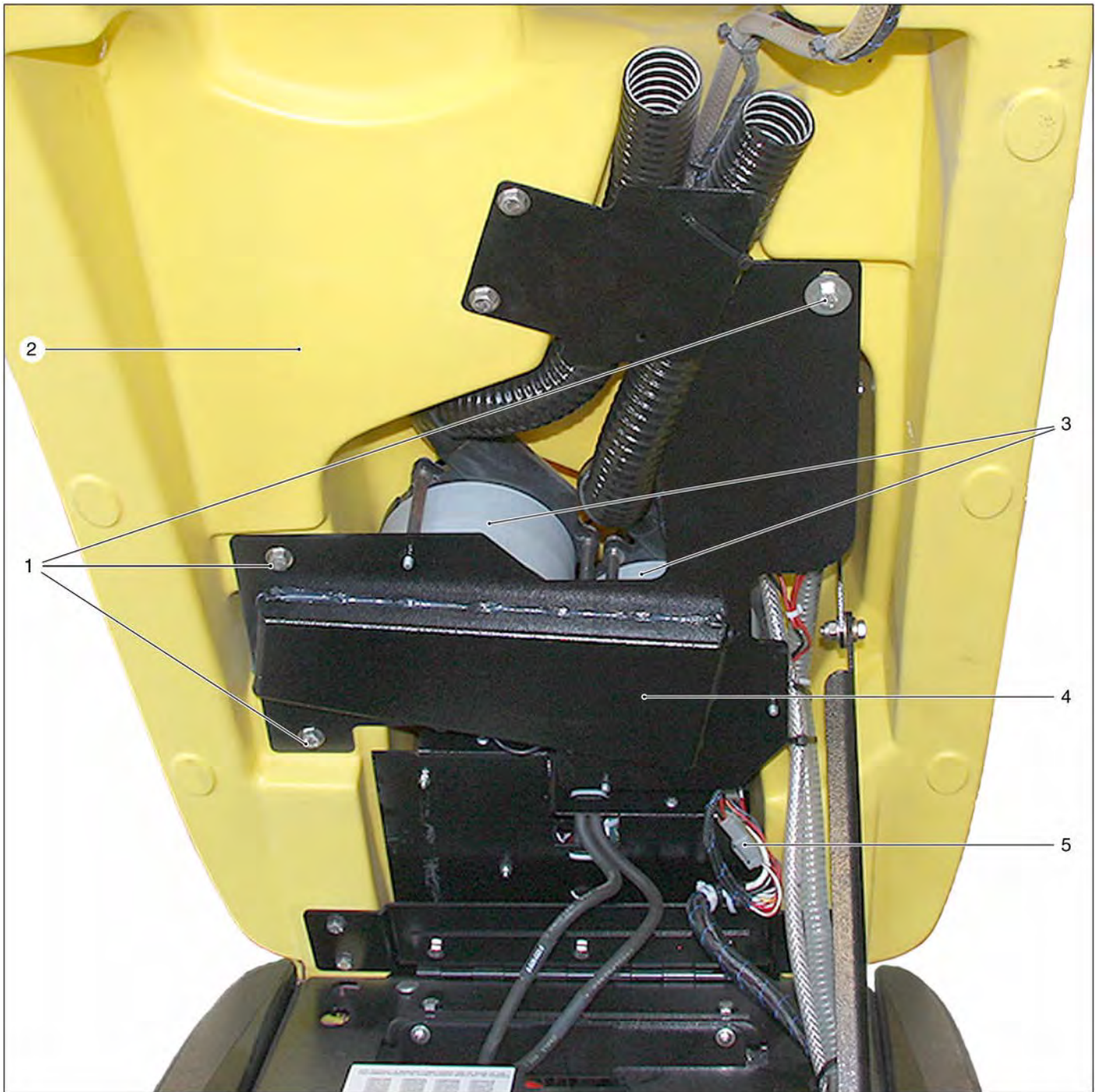


- 1 Unlocking lever

In order to close the hood again, you must proceed as follows:

- Lift the hood.
- Press down the unlock lever.
- Close the hood slowly.

4.1.4 Inside lid



- 1 Fastening screws
- 2 Dirt water reservoir
- 3 Suction turbine

- 4 Halting plate
- 5 Connection plug water pump

4.2 Rear view



- 1 Drainage hose for fresh water
- 2 Battery socket
- 3 Operator console

- 4 Emergency-stop button
- 5 Sliding handle
- 6 Key switch

4.3 Control terminal



- | | |
|--|--|
| 1 Program selection switch | 8 Fuse for controls |
| 2 Sliding handle with drive switch | 9 Key switch |
| 3 Rotating button for drive speed | 10 Fuse for traction drive |
| 4 Battery control display | 11 Fuse for suction turbine |
| 5 Switch for reverse drive | 12 Fuse for brush drive |
| 6 Control lamp to apply detergent solution | 13 Emergency-stop button (turn to release) |
| 7 Key to apply detergent solution | 14 Operating hour counter |

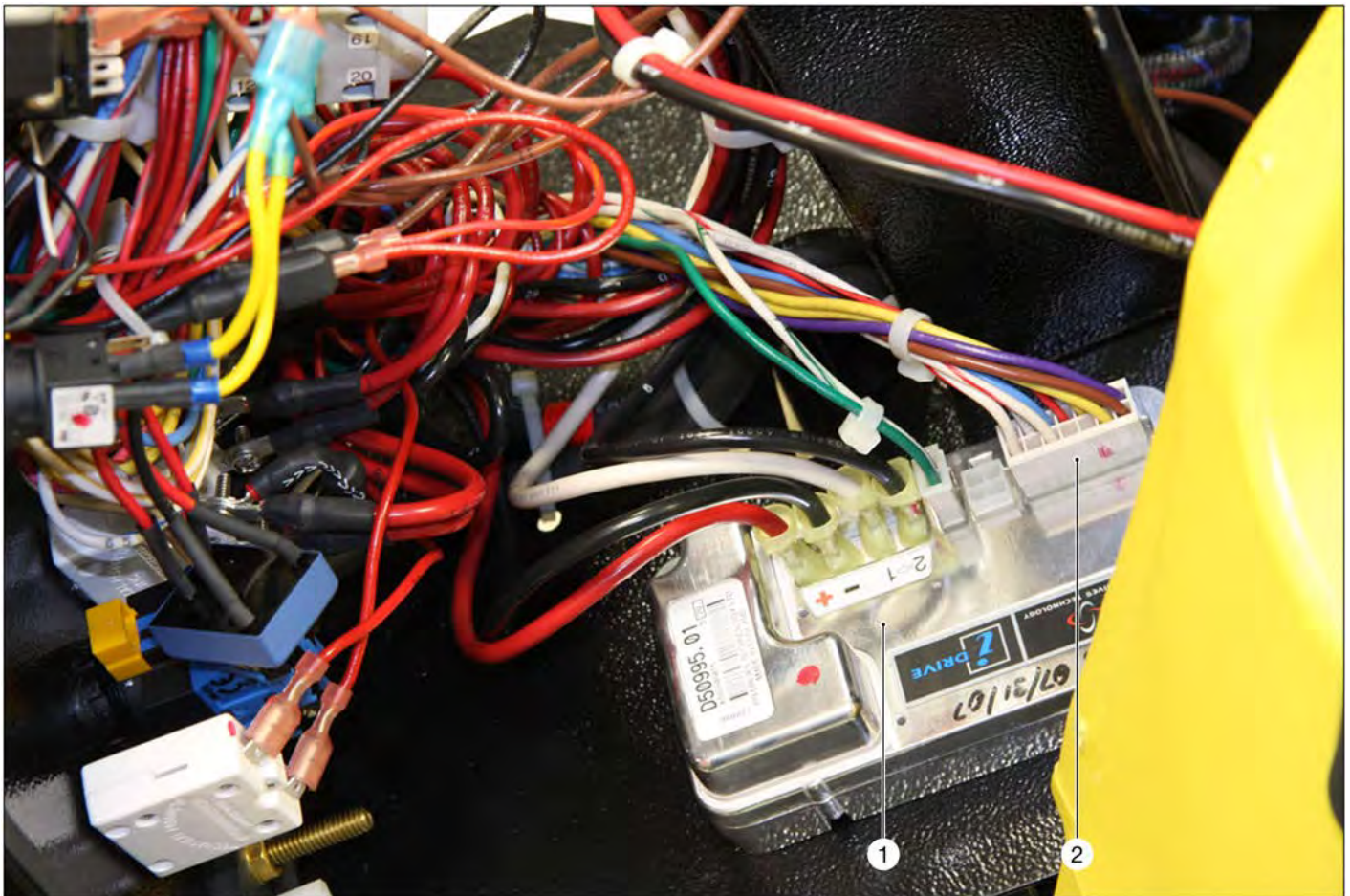
4.3.1 Key switch function

The key switch is the master key. The appliance is deactivated when the key switch is on "0".

The brush rollers are switched off automatically and the suction turbines (M4 and M4.1) with a trailing time of 30 seconds, when the appliance is switched off with the key switch during the cleaning operation.

The vacuum bar will return to its original position after a 20 second trailing time.

4.3.2 Control of driving programme



- 1 Control of driving programme
- 2 Connection plug

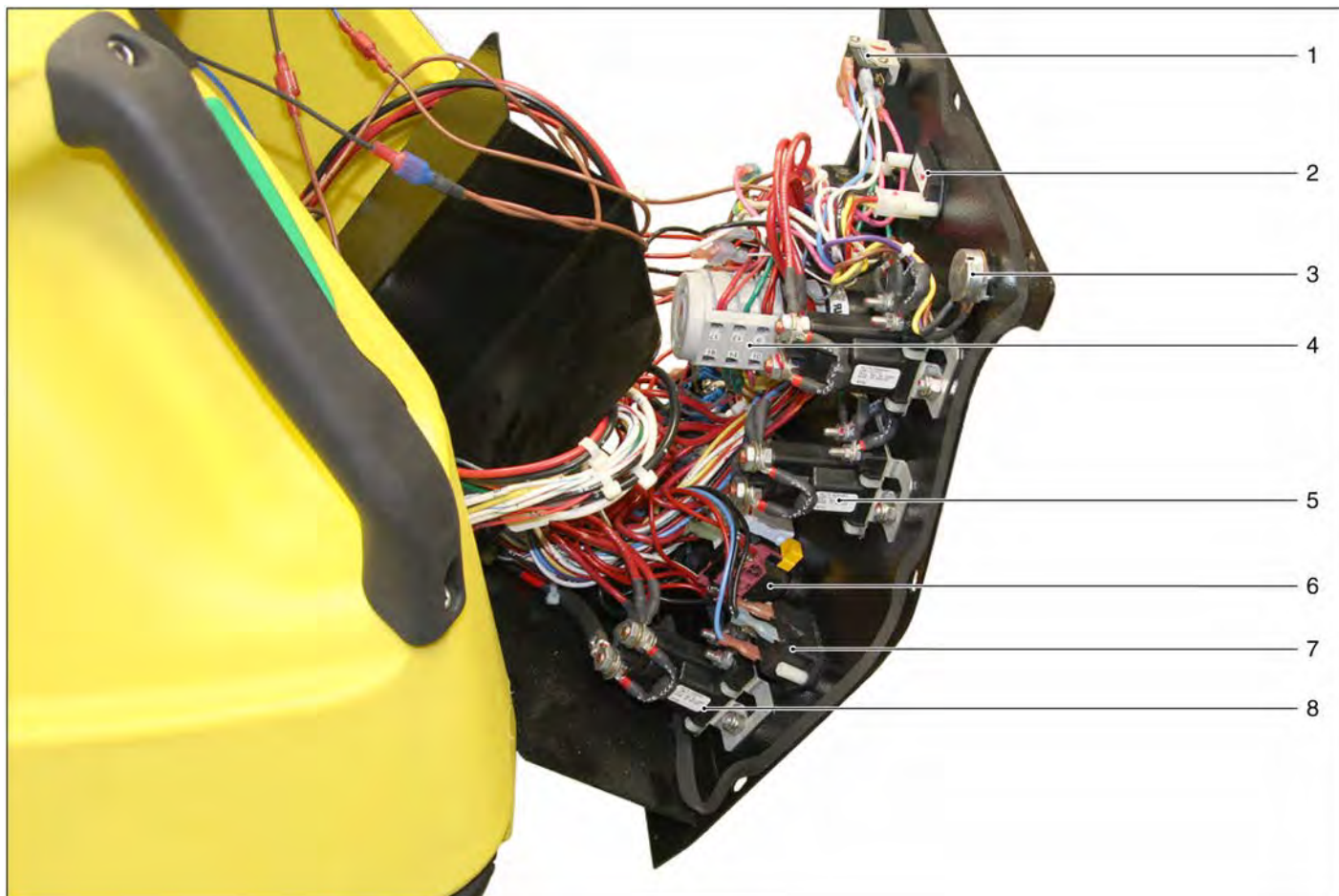
Standby Mode

If no function is performed for 10 minutes while the appliance is turned on, the control electronics switches to standby mode.

Pressing the directional key ends the standby mode and the appliance is ready to operate again.

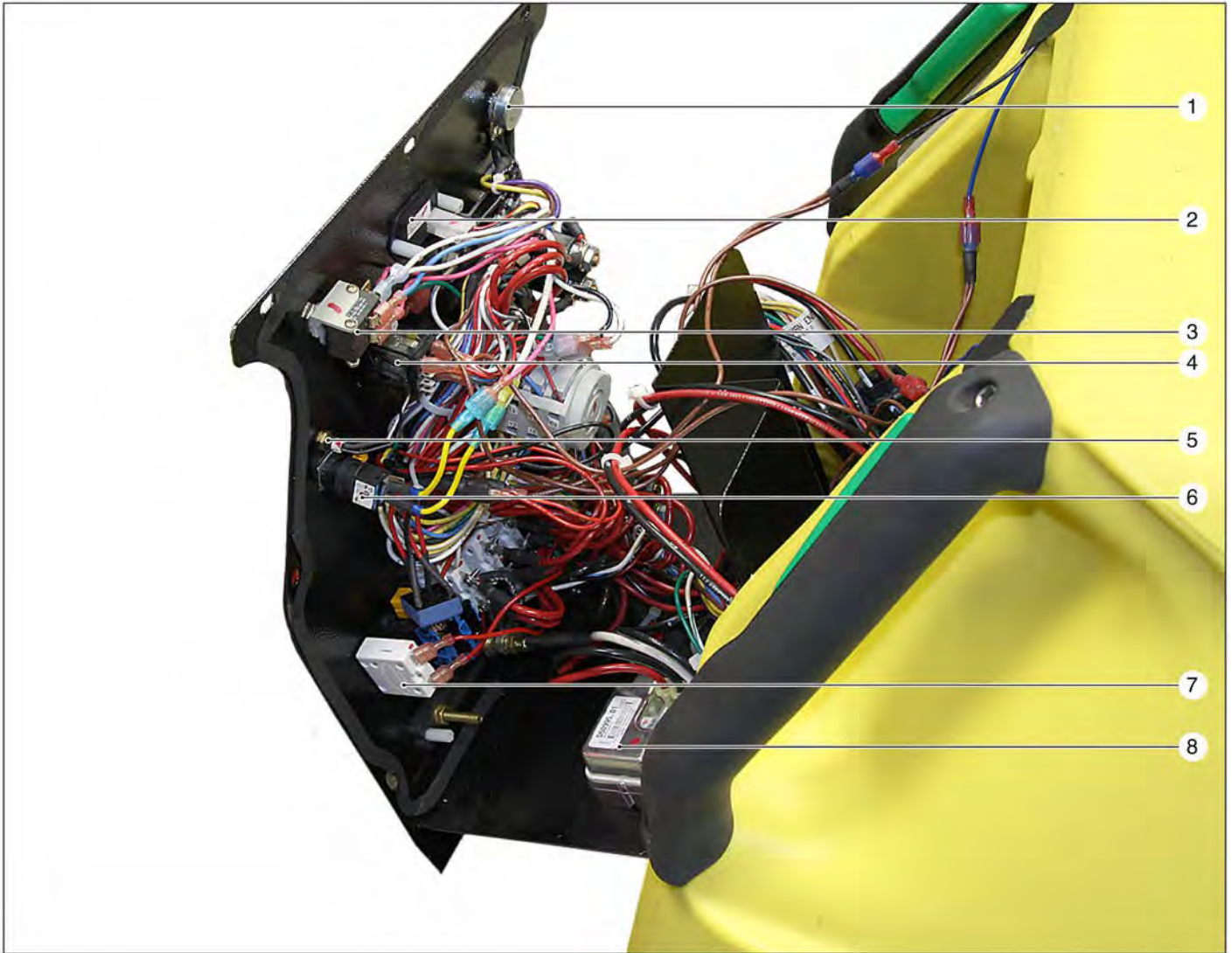
4.4 Electronics system

4.4.1 Overview of operator console inside



- 1 Key for reverse drive
- 2 Battery control display
- 3 Rotating button for drive speed
- 4 Program selection switch

- 5 Brush motor relay
- 6 Emergency-stop button
- 7 Operating hour counter
- 8 Main relay



- 1 Rotating button for drive speed
- 2 Battery control display
- 3 Key for reverse drive
- 4 Drive relay

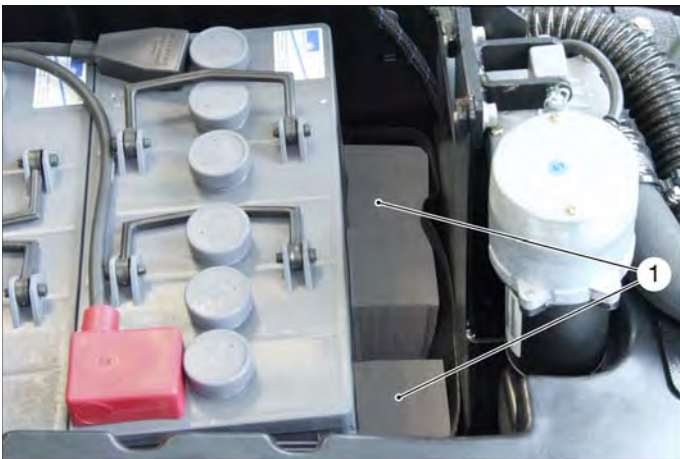
- 5 Control lamp to apply detergent solution
- 6 Key to apply detergent solution
- 7 Fuse for controls
- 8 Control of driving programme

4.5 Battery



- 1 Connecting cable of battery (-)
- 2 Battery plug (X1)

- 3 Connecting cable of battery (+)



- 1 Distance blocks

The batteries are seated tightly by means of distance blocks.

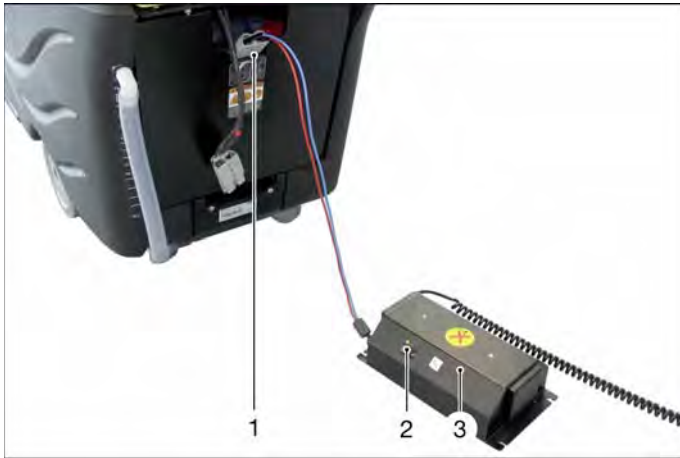
If larger batteries are installed, the distance blocks can be removed.

4.5.1 Battery charger

Note

With the BAT Pack machine, the battery (G1) (3 x 12 V / 105 Ah) is maintenance-free.

An external battery charge is connected to the plug of the battery on the battery side.



- 1 Battery socket
- 2 Charger indicator light
- 3 Battery charger

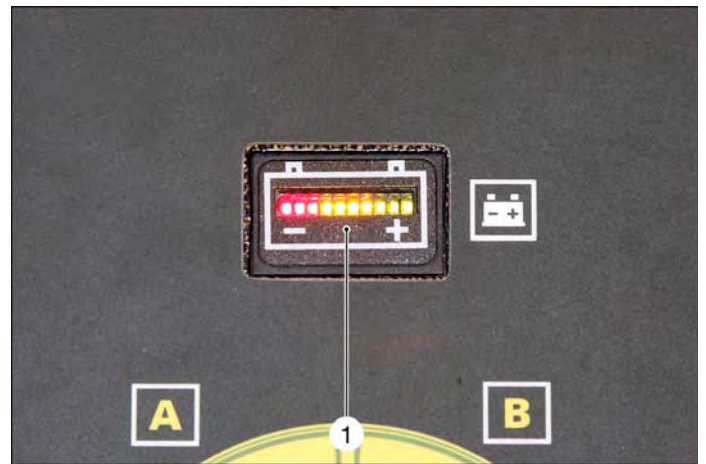
If the battery charger is properly connected, the yellow charging indicator lamp lights up during the charging process.

Once the battery is completely charged, the green charging indicator lamp will light up.

All the electrical components of the device are connected to the block battery via the battery plug.

The total system is devoid of current if the battery plug is pulled out.

4.5.2 Battery control display



- 1 Battery control display

The load status of the battery is displayed with leds on the battery control display.

Deep battery discharge is indicated as follows:

- The leds on the left side of the display are blinking on the battery control display.
- A warning beeps if a drive switch is pressed.

Protection against deep discharge:

- Switch the suction turbine and the side brushes off.
- Drive the machine directly to the charging station; avoid any steep gradients in the process.

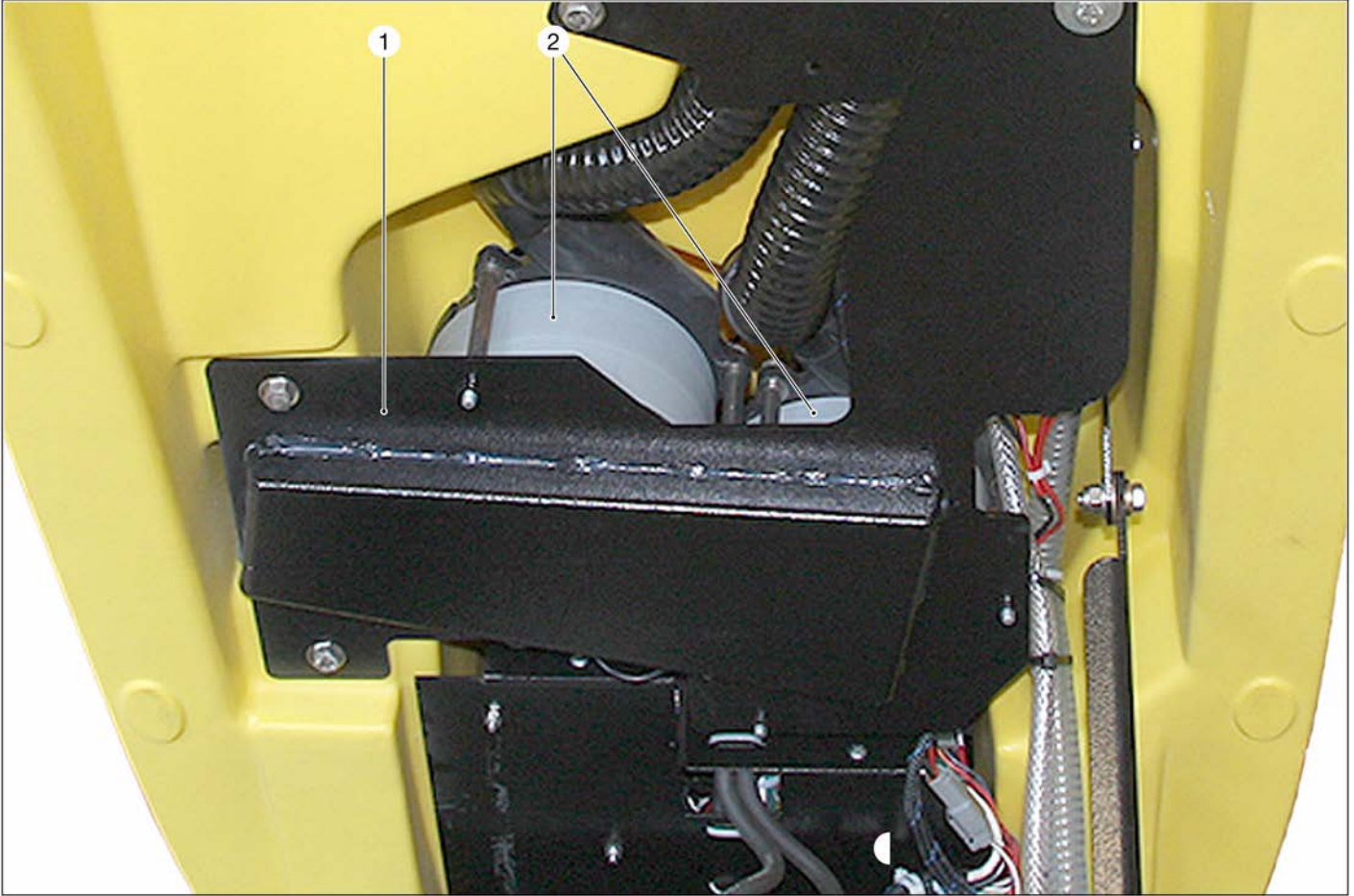
Note

The battery control display is also used for the output of fault codes, see chapter "Faults with display".

4.6 Suction turbine

Note

The suction turbines are located in the lid, underneath a holding sheet.



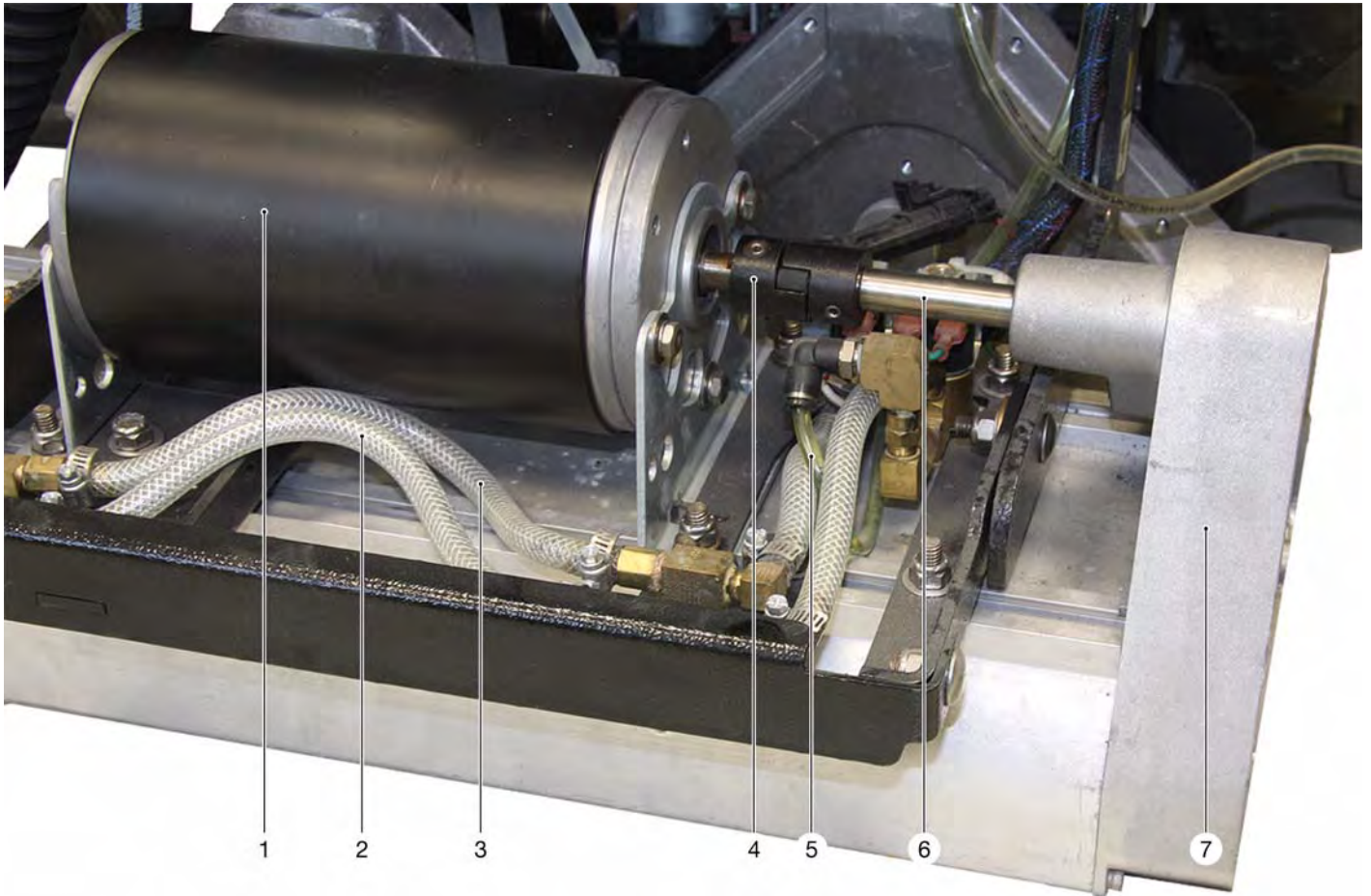
- 1 Halting plate
- 2 Suction turbine

Note

The suction turbines trail with a delay of approx. 30 seconds after switching off the appliance.

The vacuum bar is raised after 20 seconds after switching off the appliance.

4.7 Cleaning head



- 1 Brush motor
- 2 Supply hose detergent A/B
- 3 Supply hose for fresh water
- 4 coupling

- 5 Supply hose detergent
- 6 Drive shaft
- 7 Toothed belt drive cover

4.8 Fresh water tank



- 1 Fresh water tank
- 2 Fresh water reservoir filler neck
- 3 Detergent tank A
- 4 Detergent tank B

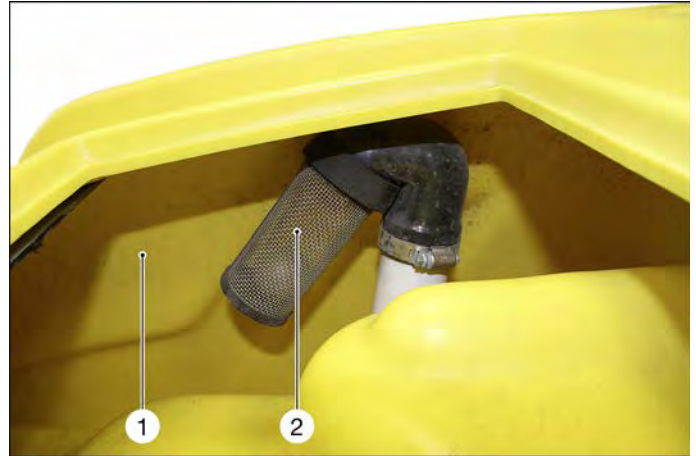


- 1 Drainage hose for fresh water
- 2 Fresh water level display
- 3 Battery socket

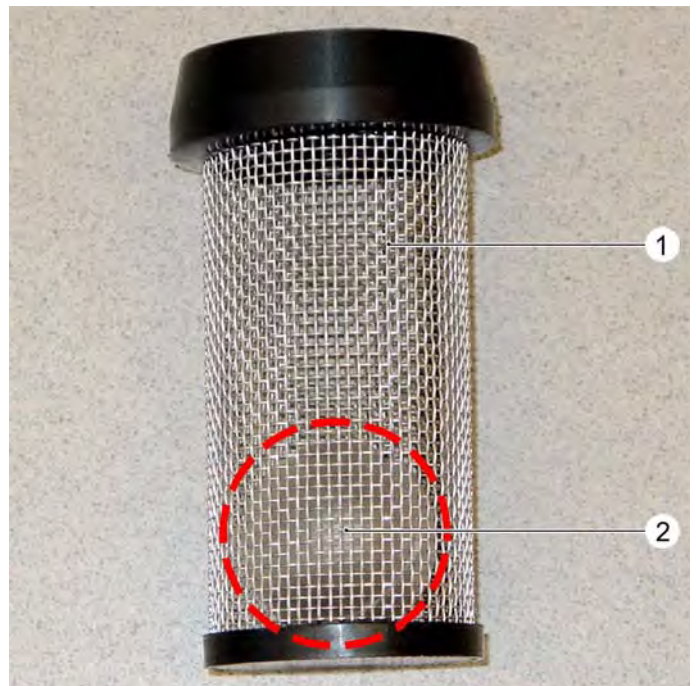
4.8.1 Function

The water is brought from the fresh water reservoir via the cleaning head onto the floor to be cleaned.

4.9 Wastewater reservoir



- 1 Dirt water reservoir
- 2 Rough dirt filter with swimmer ball



- 1 Rough dirt filter
- 2 Swimmer ball

4.9.1 Function

The suction turbines create a vacuum in the wastewater reservoir. The waste water is thus pumped from the vacuum bar into the waste water reservoir through the suction hose. If the wastewater reservoir is full, the float closes the suction opening. The waste water reservoir is emptied by opening the cover of the waste water discharge hose.

4.10 Discharge hoses

In order to drain fresh water from the fresh water reservoir or wastewater from the wastewater reservoir, the respective drain hose must be opened.

4.10.1 Drainage hose for fresh water



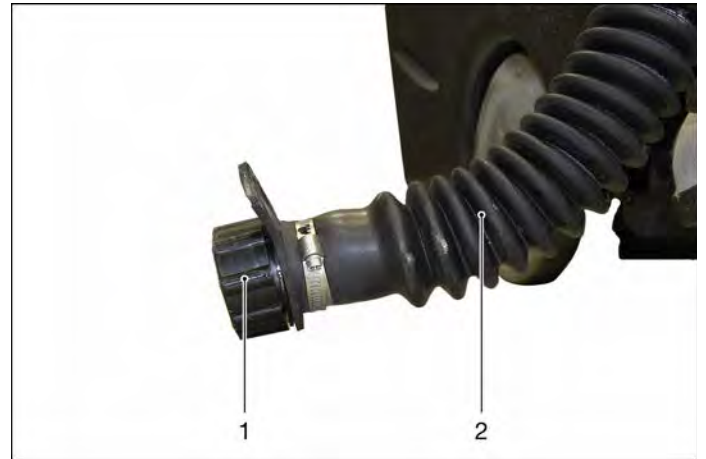
- 1 Drainage hose for fresh water
- 2 Fresh water level display
- 3 Battery socket

Note

The fresh water drain hose is also used as a fill level display.

The fresh water that has been mixed with detergent must be disposed of according to the detergent manufacturer's instructions.

4.10.2 Dirt water discharge hose

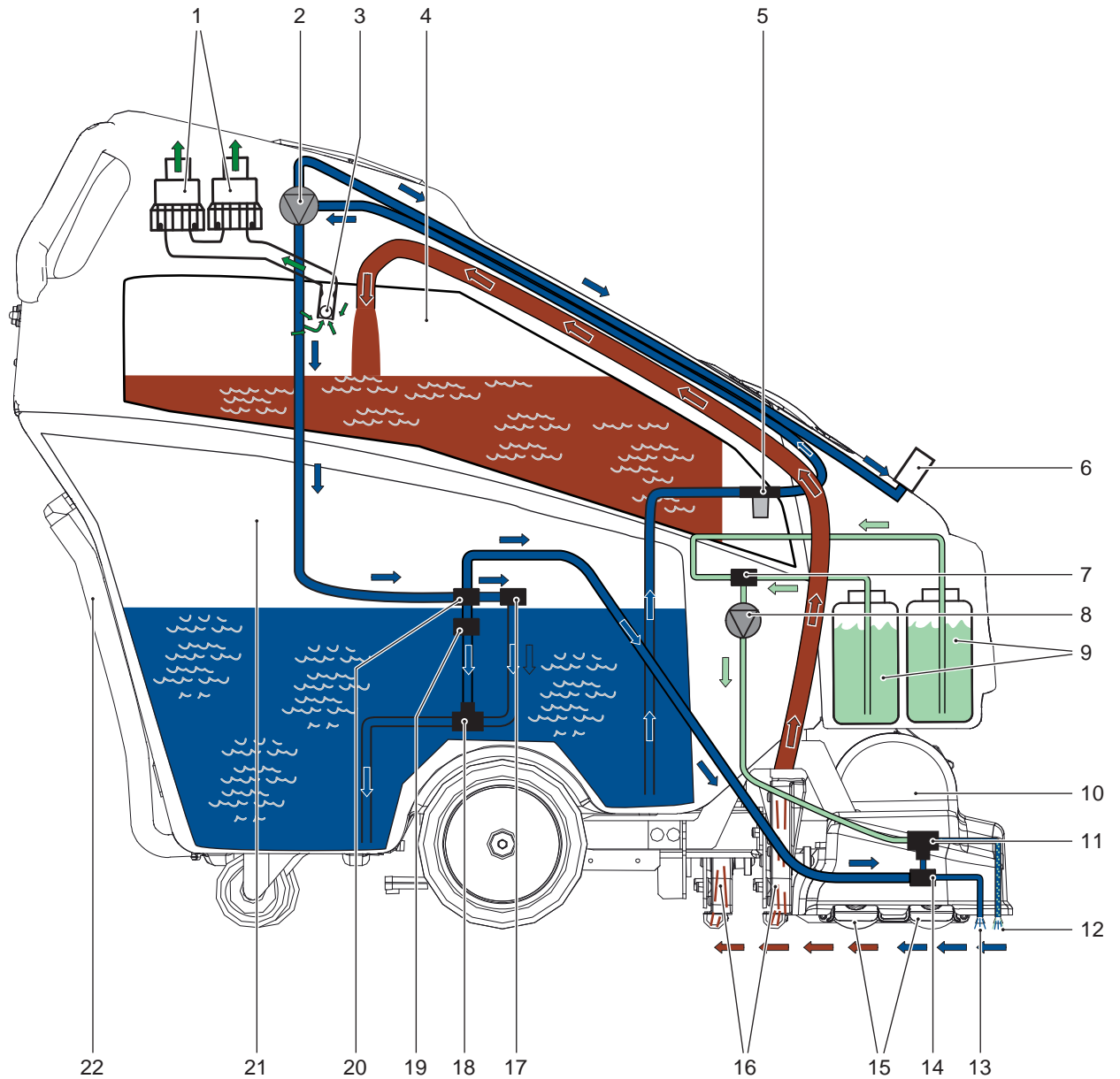


- 1 Drain hose lid for wastewater
- 2 Dirt water discharge hose

Note

For environmental protection reasons, the wastewater must be disposed of according to its type of contamination.

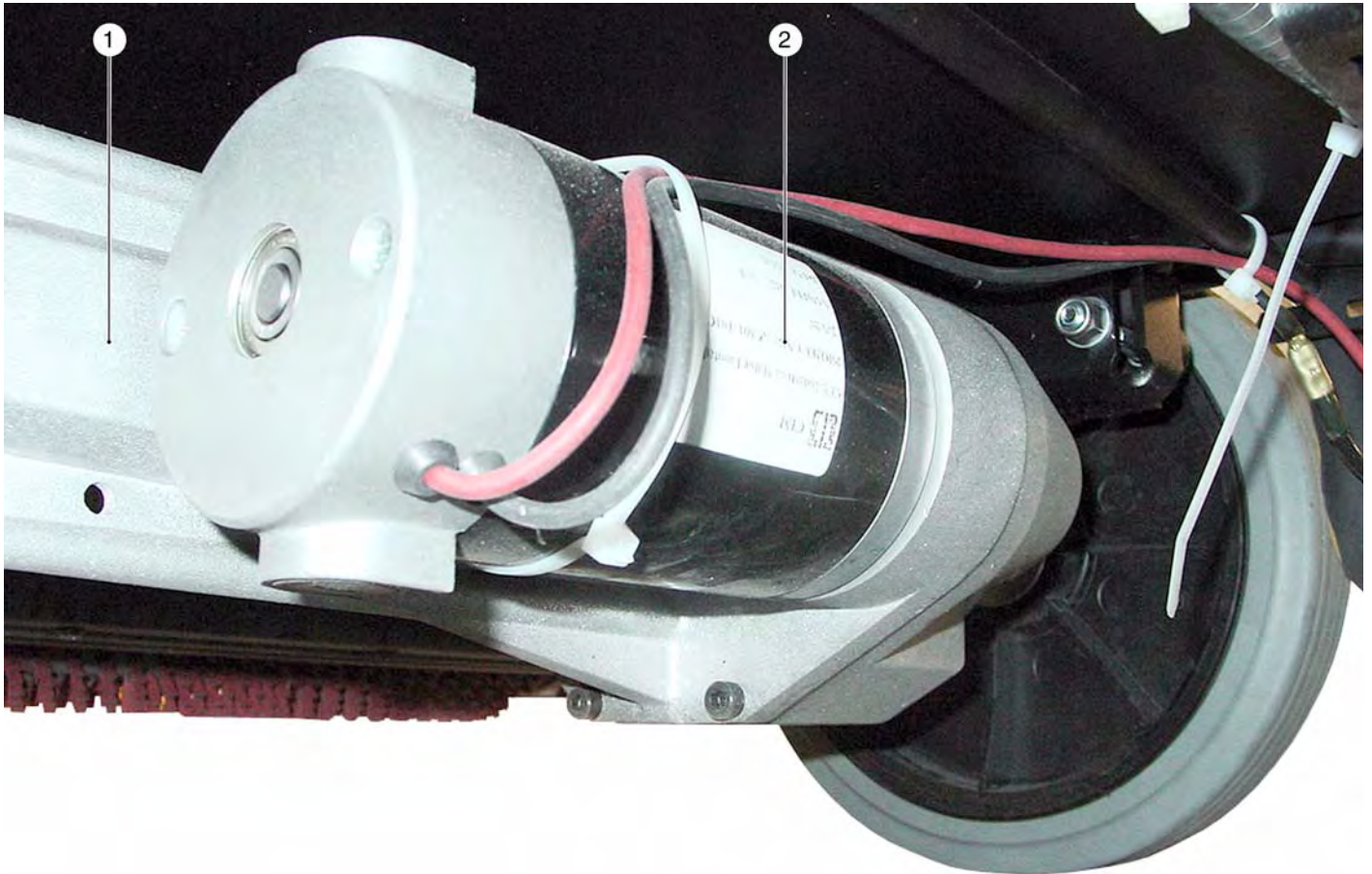
4.11 Water function diagram



- 1 Suction turbine (M4 and M4.1)
- 2 Water pump (M7)
- 3 Swimmer ball
- 4 Dirt water reservoir
- 5 Waterfilter
- 6 Connection for external accessories
- 7 Solenoid valves detergent A / B
- 8 Detergent pump
- 9 Cleaning agent container
- 10 Cleaning head
- 11 Solenoid valve for detergent

- 12 Cleaning nozzle for detergent
- 13 Cleaning nozzle for fresh water
- 14 Solenoid valve fresh water
- 15 Brushing rollers
- 16 Vacuum bar
- 17 Solenoid valve ventilation
- 18 T-connection
- 19 Bypass valve
- 20 Pressure switch
- 21 Fresh water tank
- 22 Drainage hose for fresh water

4.12 Drive unit



- 1 Differential gear
- 2 Drive motor

The drive unit consists of a differential gear and an attached drive motor.

5 Service tasks

5.1 Remove operating panel

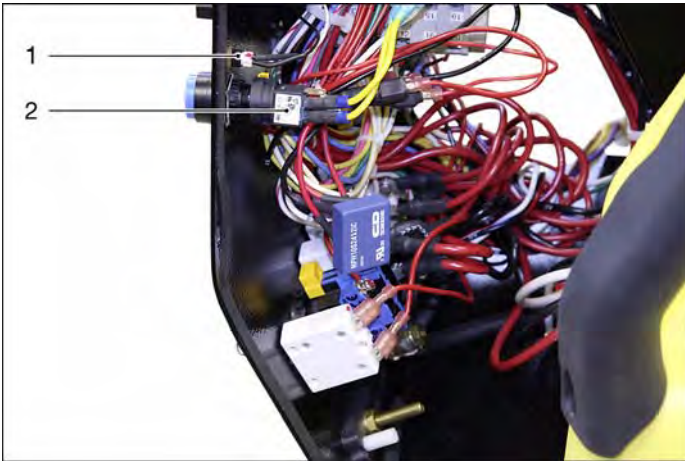


- 1 Fastening screws
- 2 Operator console

- ➔ Pull out the battery plug.
- ➔ Unscrew locking screws.
- ➔ Take out the operator console carefully toward the rear and store.

5.2 Electronics system

5.2.1 Check the water pump switch



- 1 Water pump switch
- 2 Connection plug

- ➔ Dismantle operator console (refer to "Dismantle operator console").
- ➔ Remove the connector plug from the water pump switch.
- ➔ Connect the resistance measurement device to the plug connections to the switch on the water pump.

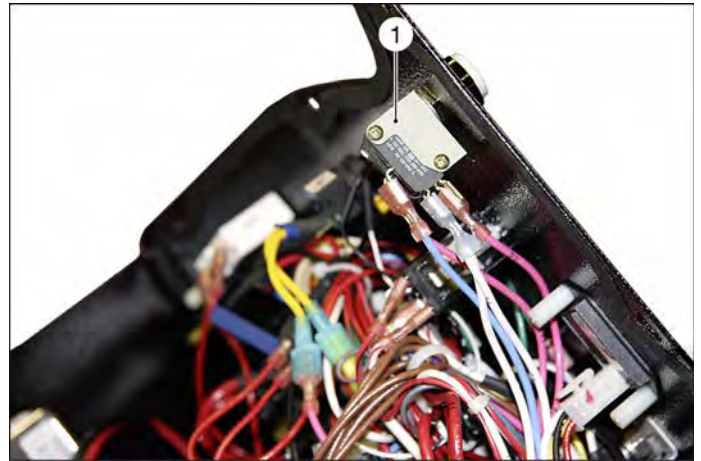
Nominal values:

- Switch pressed
 - < 2 Ohm
- Switch not pressed
 - > 1 MOhm

If one of the values is not reached, the switch is defective and must be replaced.

Installation in reverse order

5.2.2 Check the reverse drive switch



- 1 Key for reverse drive

- ➔ Dismantle operator console (refer to "Dismantle operator console").
- ➔ Remove the blue and white connector plug from the reverse drive switch.
- ➔ Connect the resistance measurement device to the plug connections to the reverse drive switch.

Nominal values:

- Switch pressed
 - < 2 Ohm
- Switch not pressed
 - > 1 MOhm

- ➔ Install the blue and white connector plug on the reverse drive switch.
- ➔ Remove both purple connector plugs from the reverse drive switch.
- ➔ Connect the resistance measurement device to the plug connections to the reverse drive switch.

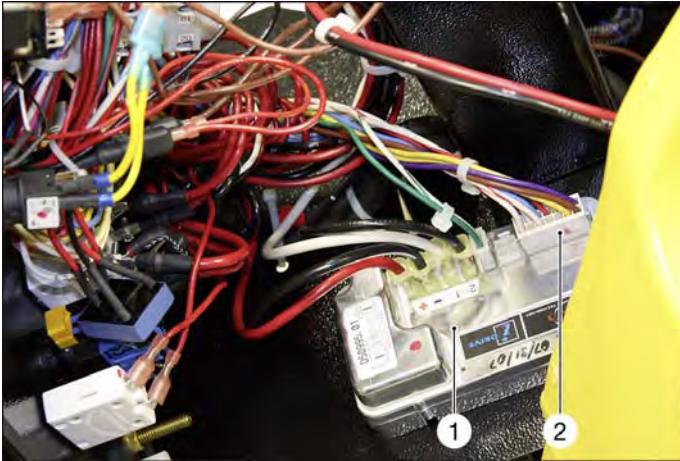
Nominal values:

- Switch pressed
 - > 1 MOhm
- Switch not pressed
 - < 2 Ohm

If one of the values is not reached, the switch is defective and must be replaced.

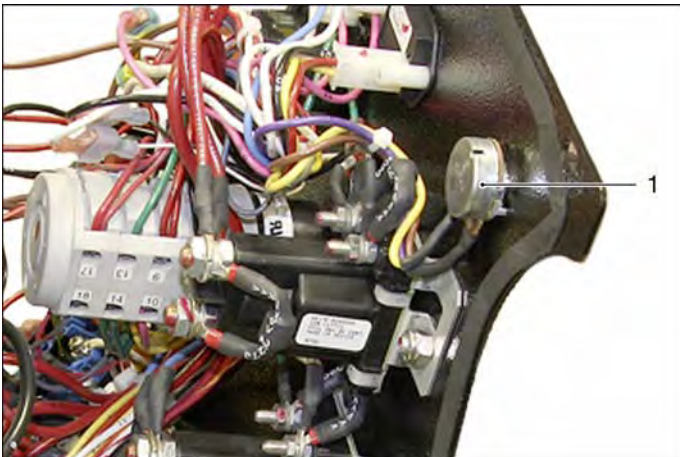
Installation in reverse order

5.2.3 Check the speed potentiometer



- 1 Control of driving programme
- 2 Connection plug

- Dismantle operator console (refer to "Dismantle operator console").
- Pull the connection plug off the drive programme control.



- 1 Speed potentiometer

- Connect the resistance measurement device to the speed potentiometer on the brown and violet connection line.

Regulator position	Target value	
OFF	5,0	Ohm
MIN	1,4	kOhm
Start B	2,1	kOhm
Between B and A	2,6	kOhm
End A	3,3	kOhm
MAX	5,0	kOhm

- Connect the resistance measurement device to the speed potentiometer on the brown and yellow connection line.

Regulator position	Target value	
OFF	5,0	kOhm
MIN	3,4	kOhm
Start B	2,7	kOhm
Between B and A	2,2	kOhm
End A	1,4	kOhm
MAX	5,0	Ohm

If the values are not reached or if they are offset from the regulator position, the speed potentiometer must be adjusted.



- 1 Speed potentiometer

- Turn the rotary knob of the speed potentiometer all the way to the right in the MAX direction.



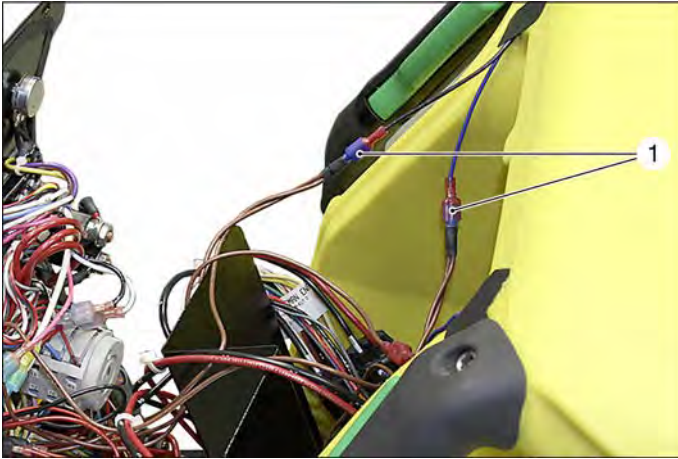
- 1 Speed potentiometer
- 2 Turning handle
- 3 Fastening screw
- 4 Cover flap

- Remove the cover cap.
- Loosen the fastening screws.
- Slightly attach the cover cap (watch for correct positioning).
- Turn the rotary knob clockwise until the mark is set to MAX.
- Remove the cover cap.
- Hold the rotary knob and tighten the fastening screw.
- Affix the cover cap tightly.
- Recheck the values.

If these values are still not reached, the speed potentiometer is defective and must be replaced.

Installation in reverse order

5.2.4 Check / replace contact switch handles



1 Connection plug

- Dismantle operator console (refer to "Dismantle operator console").
- Remove the connection plug of the contact switch.
- Connect the resistance measurement device to the plug connections to the contact switch.

Nominal values:

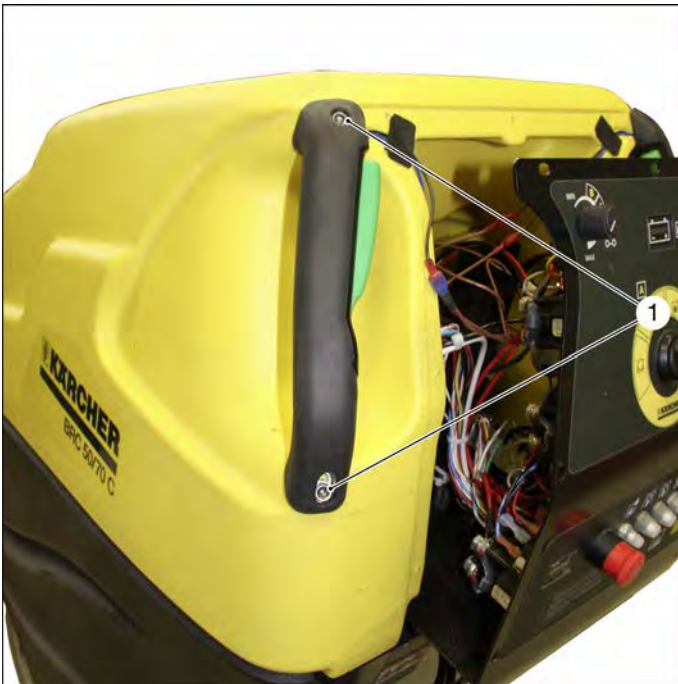
Switch pressed

- < 2 Ohm

Switch not pressed

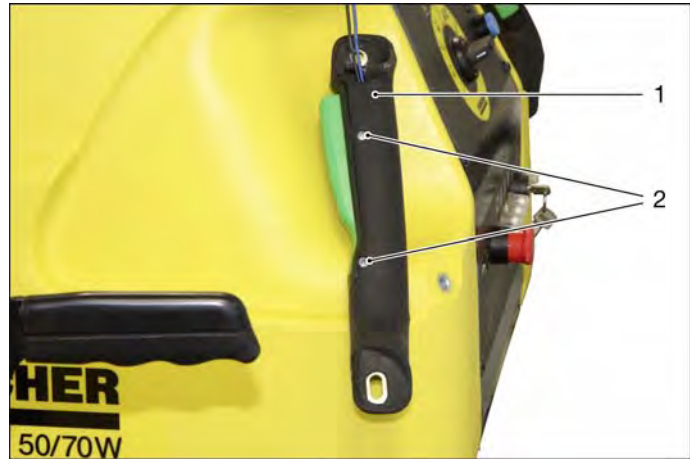
- > 1 MOhm

If one of the values is not reached, the contact switch is defective and must be replaced as follows:



1 Fastening screw

- Unscrew the fastening screws of the slide handle.
- Remove the connection plug of the contact switch.



1 Handle piece of contact switch

2 Fastening screw

- Unscrew the fastening screws of the handle piece of the contact switch.
- Take out the handle piece.



1 Contact switch

2 Fastening screw

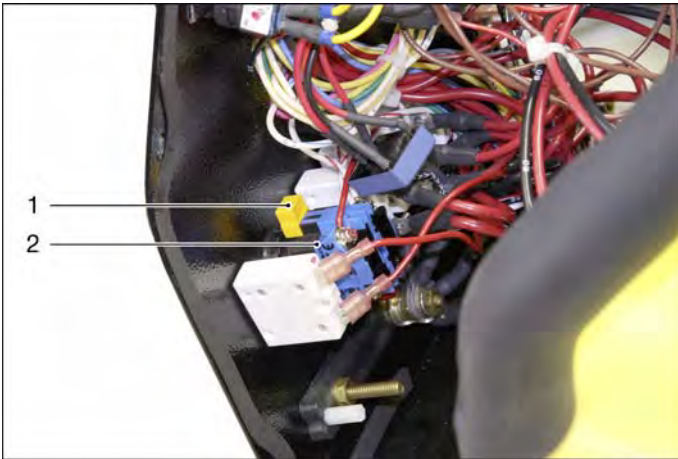
- Remove the fastening screw from the contact switch.
- Take out the contact switch.

Note

During installation, make sure that the contact tab does not get bent.

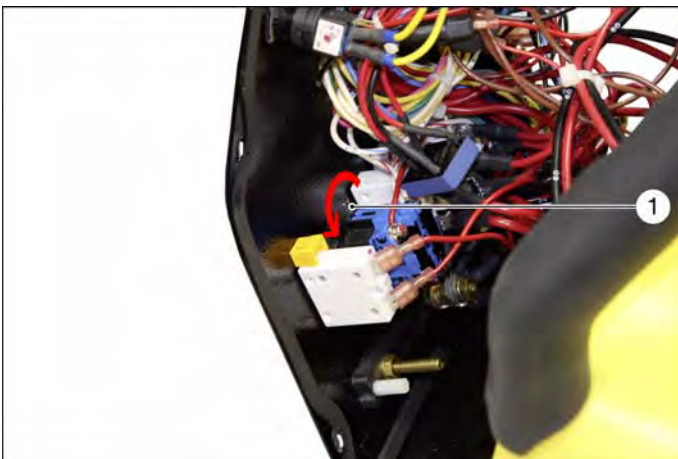
Installation in reverse order

5.2.5 Replace off the key switch



- 1 Lock
- 2 Key switch

- ➔ Dismantle operator console (refer to "Dismantle operator console").
- ➔ Replace the connecting cable.
- ➔ Pull the lock off the key switch.

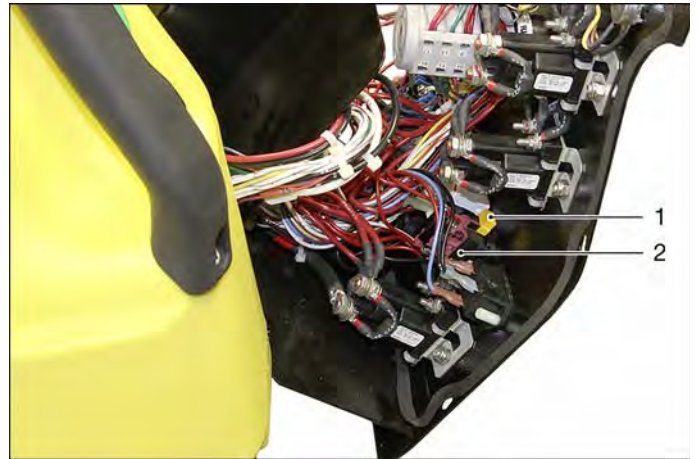


- 1 Plate

- ➔ Turn the tab in the direction of the arrow and pull the key switch.

Installation in reverse order

5.2.6 Replace emergency-stop button



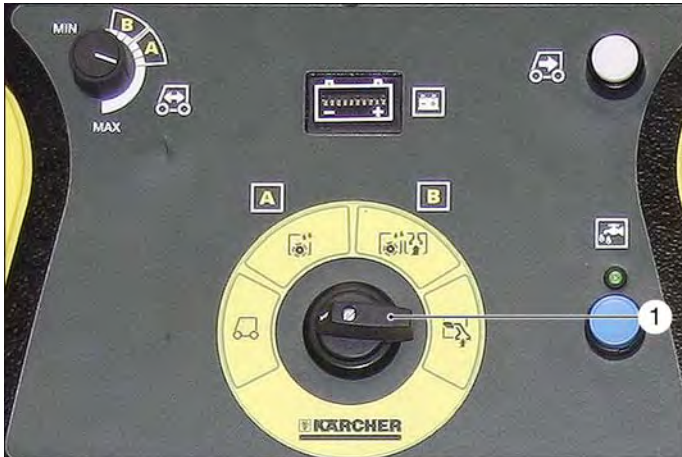
- 1 Lock
- 2 Emergency-stop button

- ➔ Dismantle operator console (refer to "Dismantle operator console").
- ➔ Replace the connecting cable.
- ➔ Pull the lock off the emergency stop button.
- ➔ Turn the tab counter-clockwise and pull the emergency stop button off.

Installation in reverse order

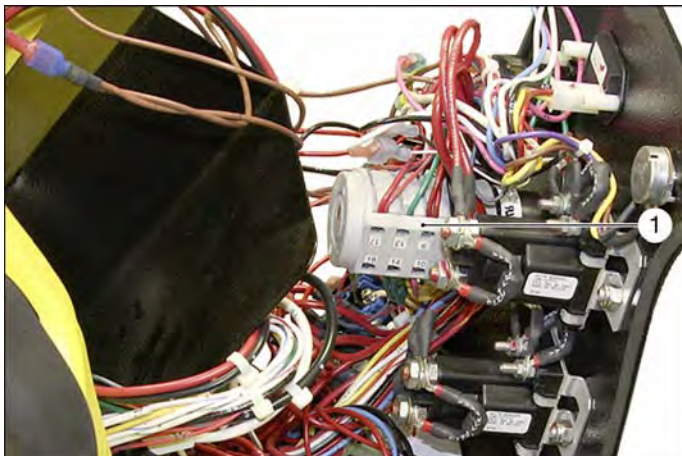
5.2.7 Replace the programme selector switch

Removal

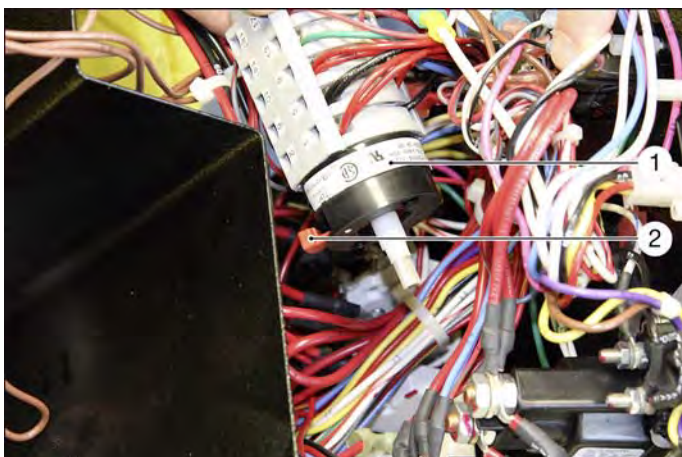


1 Turning handle

- Unscrew the rotary knob of the programme selector switch.
- Dismantle operator console (refer to "Dismantle operator console").



1 Program selection switch

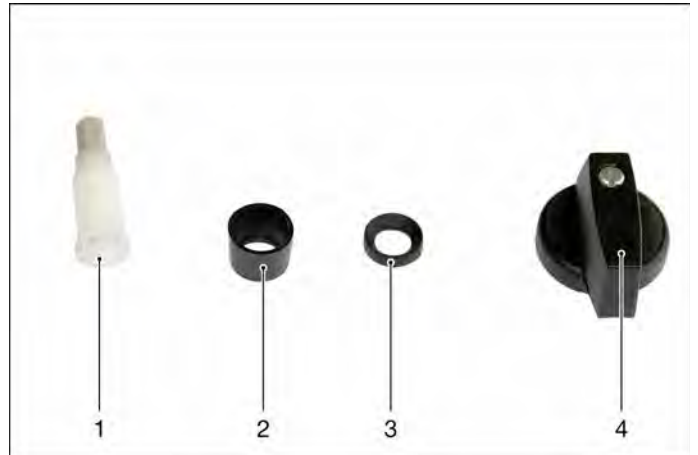


1 Program selection switch
2 Locking

- Replace the connecting cable.

- Turn the lock and remove the programme selector switch.

Installation



- 1 Extension piece
- 2 Distance cover
- 3 Washer
- 4 Turning handle

- Guide the extension through the opening.
- Tighten the rotary handle.
- Connect the connecting cable.
- Slide in the programme selector switch and lock it.
- Install the operating panel.

5.3 Battery / total discharge protection

5.3.1 Check battery

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.

12 volt block battery	6 volt block battery	Charge approx.
> 12.80 Volt	> 6.42 Volt	100 %
> 12.55 Volt	> 6.30 Volt	75 %
> 12.32 Volt	> 6.20 Volt	50 %
> 12.18 Volt	> 6.00 Volt	25 %
> 12.00 Volt	> 6.00 Volt	Deep discharge

The idle voltage should reach at least the following limit value:

- 12 volt block battery = min. 12.30 volts

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

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.

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 for battery voltage between the individual battery blocks

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

Exide batteries

- between the 12 volt battery blocks 0.2 volts

Hoppecke batteries

- between the 12 volt battery blocks 0.4 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	5	6
2. Measurement - load test			
Measure the battery voltage several times while the turbine is turned on.			
Battery block	1	2	3
	4	5	6
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	5	6

Record further machine data			
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	

5.3.2 Notes regarding the battery

Replacing a battery due to old age

With 12 volt battery blocks, the complete battery set must be replaced in case of damage.

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 cool (the self-discharge rates will be lower).
- Recharge once the battery capacity is lower than 60%.

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.

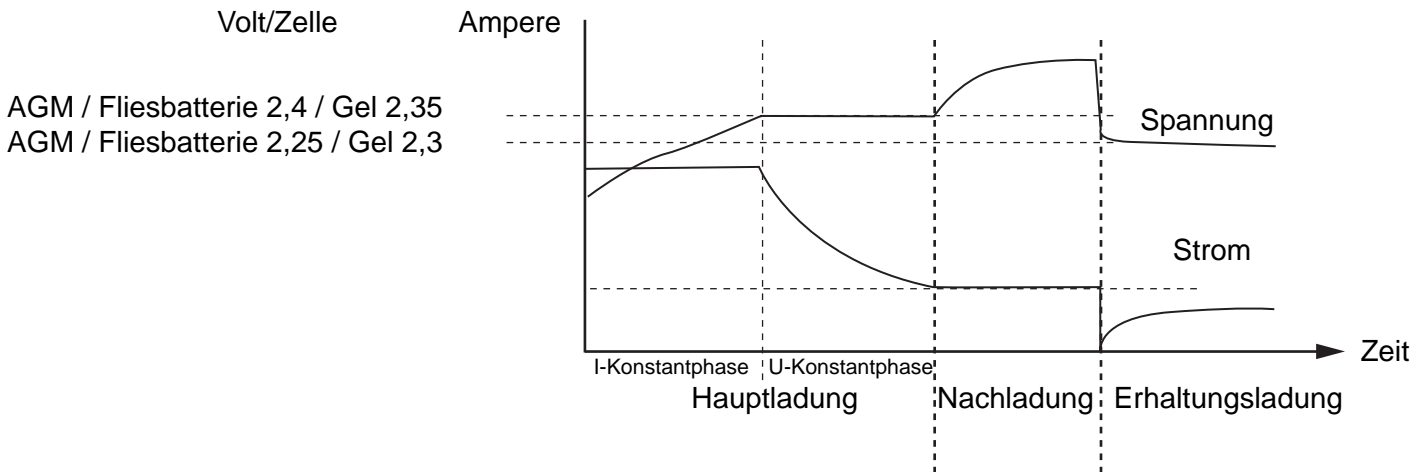
5.3.3 Test the charger

- 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.

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)

- 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.

Meaning of the charging indicator lamps

Population with 4 LEDs

	Yellow LED lights up	Battery is being charged.
	Green LED lights up	Battery full.
	Red LED glows	Charger is defective. Battery defective. Call service.
	Yellow LED lights up	Charger is only suited for maintenance-free batteries.
	Buttons	Press 1x: Charge process interrupted. Press again: The charge is resumed.
	No LED illuminated	Supply voltage failed. Battery not connected to the charger. Please call service.

Note

If the battery is to be disconnected during the charge process, the switch must be used first.

Population with 3 LEDs

	Yellow LED lights up	Battery is being charged.
	Green LED lights up	Battery full.
	Red LED glows	Charger is defective. Battery defective. Call service.

Note

If the battery is to be disconnected during the charge process, the plug must be pulled from the charger.

5.3.4 Checking the total discharge protection

Connect the voltmeter directly to the battery and operate the appliance until the consumers are shut off automatically.

At that moment, read the battery voltage.

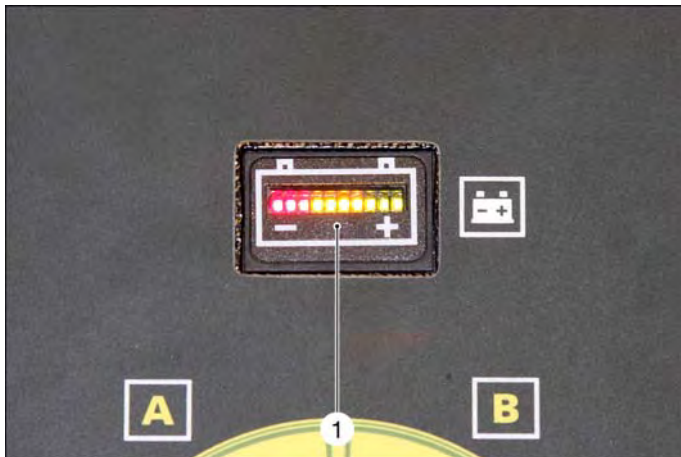
Important: The voltage test must take place under load.



1 Voltage measuring device

2 Display on voltage measuring device

The low voltage disconnect is initiated at 33.5 Volts.



1 Battery control display

The total discharge protection is activated when the voltage has fallen below the set value for about 30 seconds.

Total discharge protection during operation

If the total discharge protection becomes active during operation, the brush head and the vacuum bar will be lifted up.

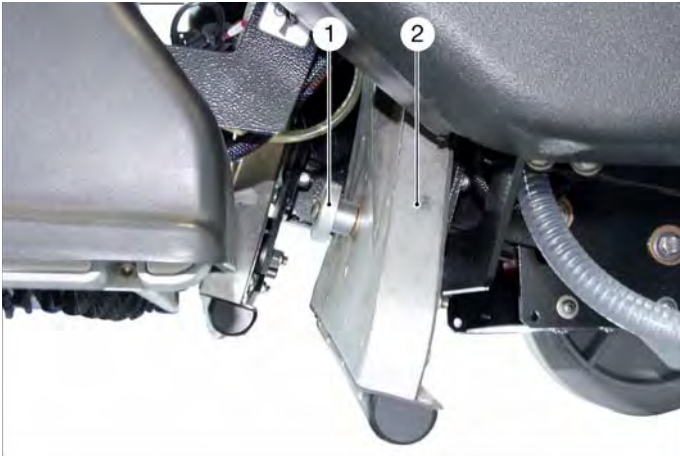
The suction turbine and the side brushes will shut off. The only drive operation possible is the one needed to drive to the next battery charging station.

→ Charge the batteries.

5.4 Vacuum bar

The appliance has two suction bars, which are arranged offset from one another.

5.4.1 Dismantling the vacuum bar

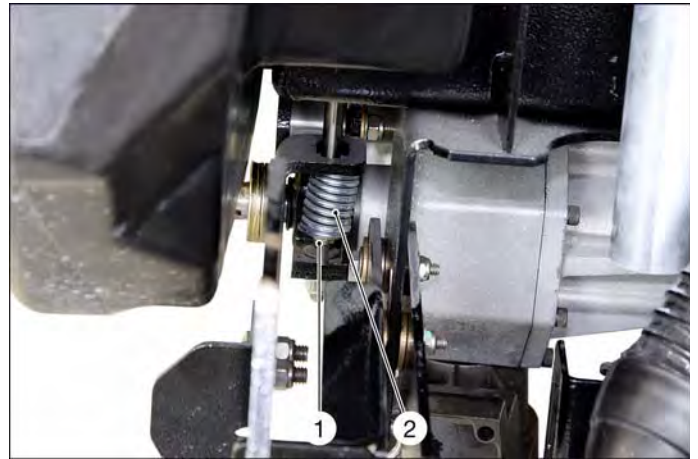


- 1 Knurled head screw
- 2 Vacuum bar

- Set key switch to "0" with the cleaning head raised.
- Unscrew the knurled-head screw.
- Pull out the suction hose from the vacuum bar.
- Pull out the vacuum bar.

Installation in reverse order

5.4.2 Setting the vacuum Bar



- 1 Fastening nut
- 2 Spring

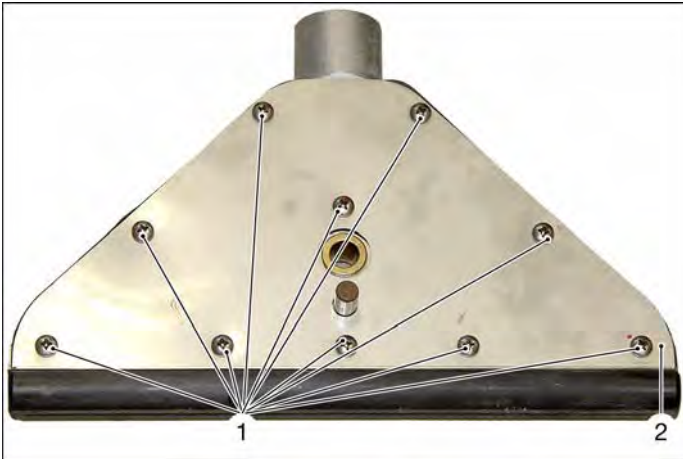
- Tighten the fastening nut of the suction bar intake.

The contact pressure of the suction bar is caused by the dead weight and is limited by the built-in spring.

5.4.3 Replace the slide shoes

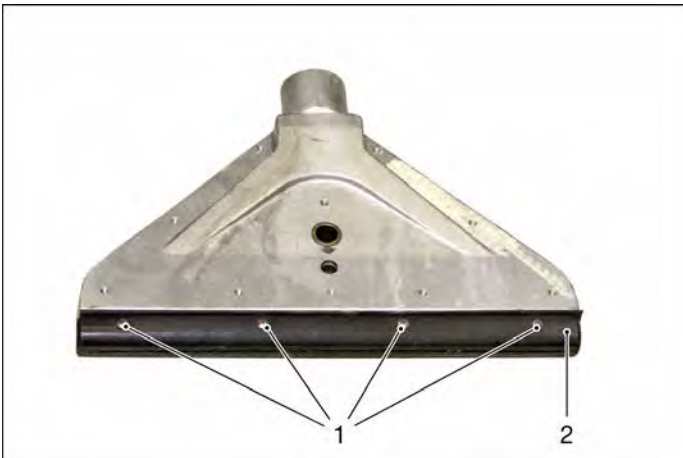
If the cleaning effect subsides, this can be caused by worn slide shoes on the suction bar.

→ Remove suction bar (see "Removing the suction bar")



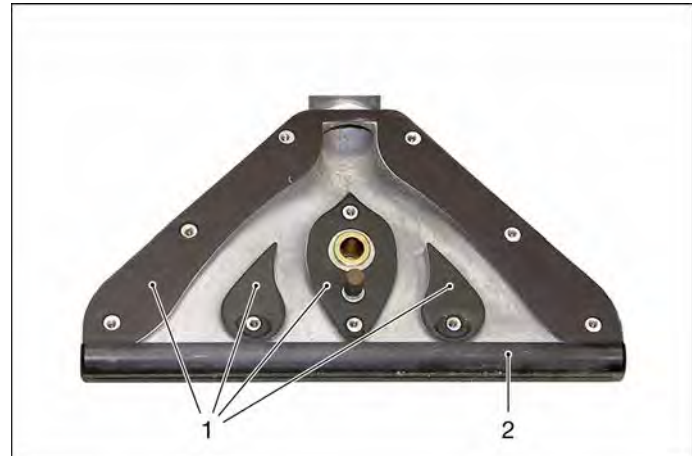
- 1 Fastening screw
- 2 Cover

→ Unscrew the fastening screws of the cover.
→ Remove the lid.



- 1 Fastening screw
- 2 Slide shoe

→ Unscrew the fastening screws of the slide shoe.



- 1 Seal
- 2 Slide shoe

→ Remove the slide shoe and the seals.
→ Clean the vacuum bar.
→ Install the new slide shoe and the seals.

Installation in reverse order

5.5 Suction turbine

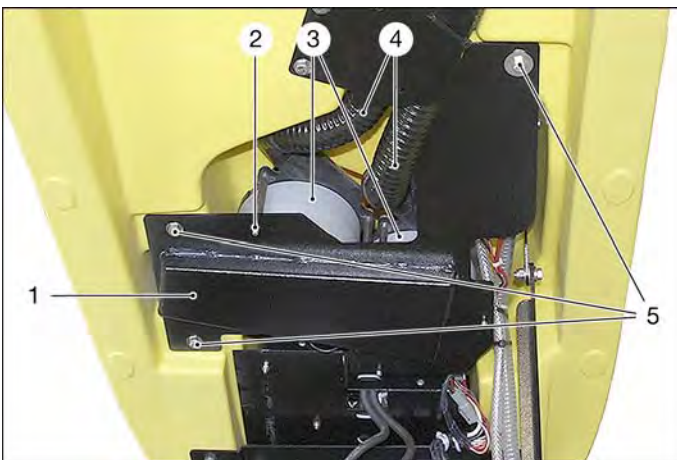
5.5.1 Check/replace the suction turbine

Test

- Disconnect the connecting plug from the suction turbine.
- Set the programme selector switch to scrubbing vacuum.
- Check the voltage on the connecting plug using a voltmeter.
- Target value: > 33.5 V.

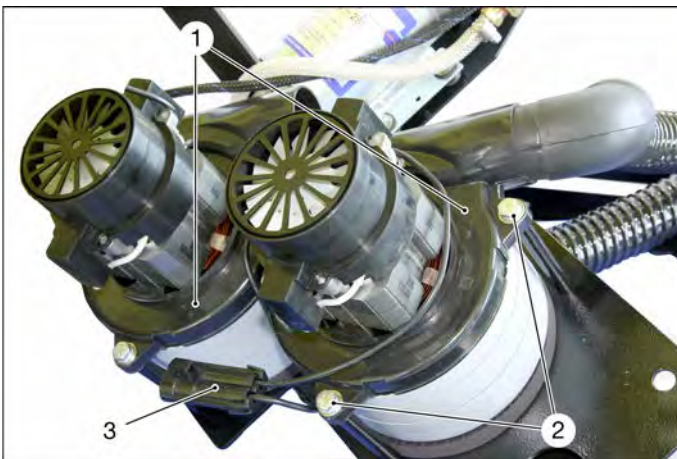
If the voltage is reached, but the turbine motor is not running, the suction turbine must be replaced.

Replace



- 1 Support
- 2 Fastening nut
- 3 Suction turbine
- 4 Suction hose
- 5 Fastening screw

- Lift the wastewater reservoir
- Unscrew the fastening screws of the holder.



- 1 Suction turbine
- 2 Fastening screw
- 3 Connection plug

- Disconnect the connecting plug from the suction turbine.
- Pull the suction hose from the suction turbine.
- Remove the fastening screws of the suction turbine.
- Remove the suction turbine.

Installation in reverse order



- 1 Dirt water reservoir
- 2 Seal

Note

While installing the holder, please ensure that the seal is properly seated on the suction turbine. The steel plate on the seal must point upward to the wastewater reservoir. An improperly installed or damaged seal decreases the suction performance.

5.5.2 Replacing the abrasive coals of the suction turbine

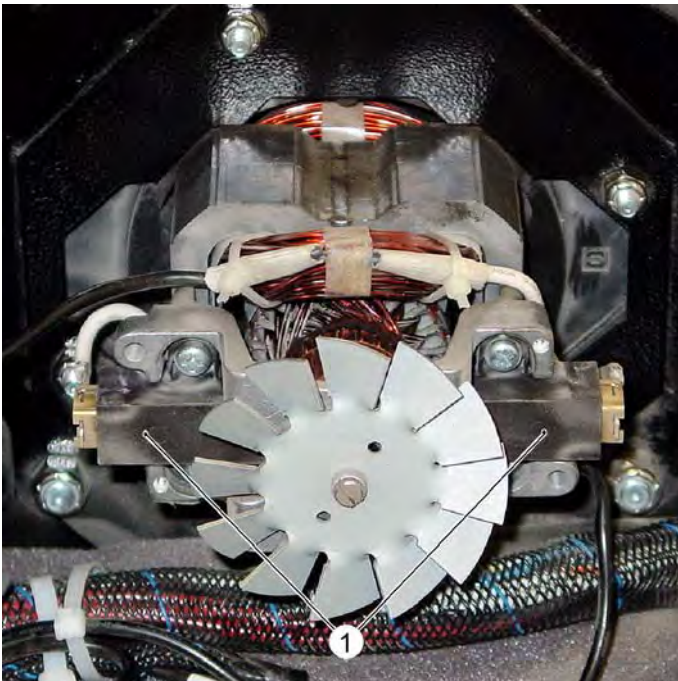
If the carbon brushes in the suction turbine motor are defective or worn out, you can replace them as follows:

→ Remove the suction turbine.

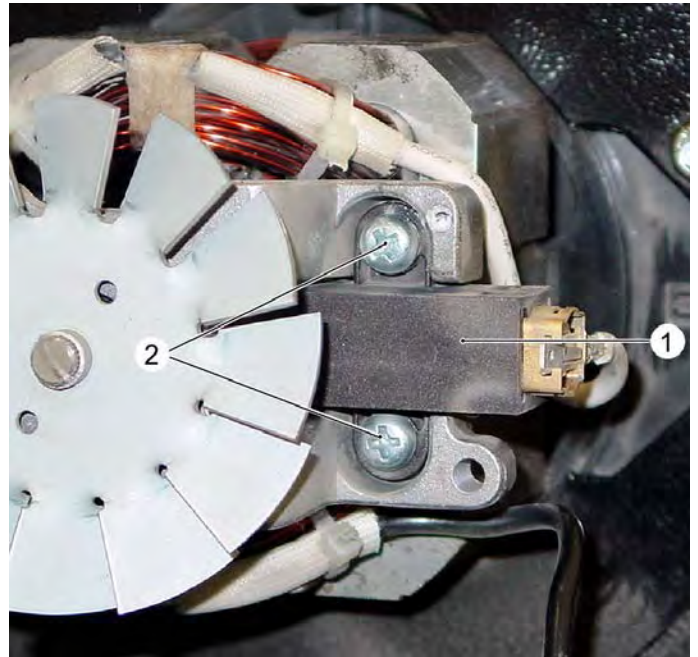


- 1 Cover, suction turbine motor
- 2 Fastening screw

→ Unscrew locking screws.
→ Remove the cover of the suction turbine motor.

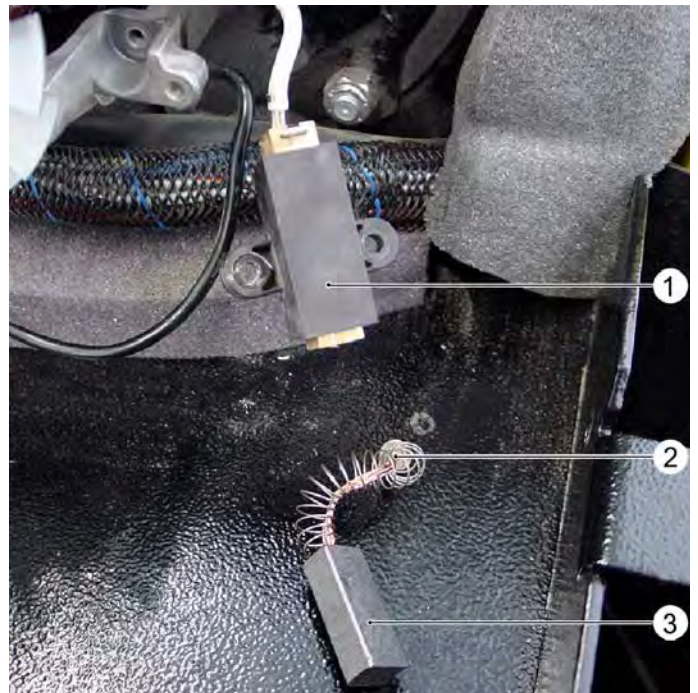


- 1 Carbon brush housing



- 1 Carbon brush housing
- 2 Fastening screw

→ Unscrew locking screws.
→ Remove the carbon brush housing.



- 1 Carbon brush housing
- 2 Press spring
- 3 Carbon brush

→ Pull the carbon brush with press spring out of the carbon brush housing.

Install the new carbon brush in reverse order.

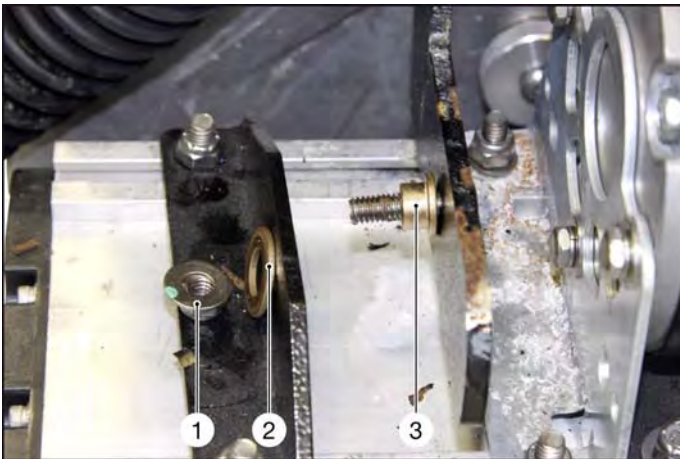
5.6 Cleaning head

5.6.1 Dismantling the cleaning head



- 1 Cover
- 2 Retaining clip

- Remove the front cover.
- Lower the cleaning head.
- Loosen the holding clamp of the cleaning head cover.
- Remove the cleaning head cover.



- 1 Fastening nut
- 2 Washer
- 3 Spacer

- Disconnect all water hoses and electrical connection cables from the cleaning head.
- Loosen the fastening nuts of the cleaning head.
- Remove the fastening nut of the holder on both sides.
- Slide the holder of the cleaning head to the side.
- Remove the cleaning head.

Installation in reverse order

5.6.2 Adjust the cleaning head

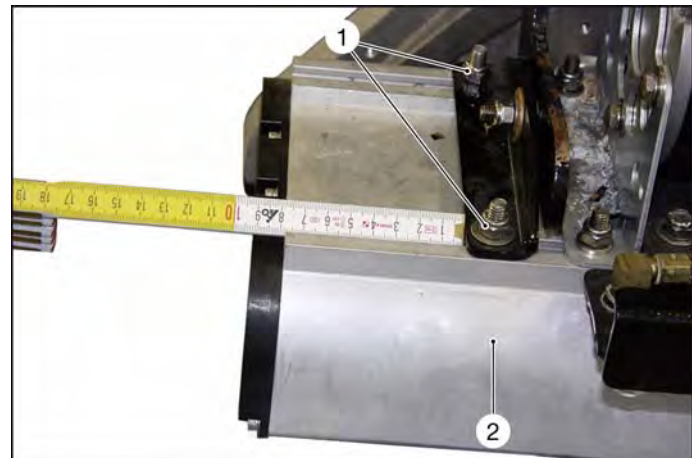
Note

To achieve an optimum cleaning result, the exact position of the cleaning head must be set.



- 1 Cover
- 2 Retaining clip

- Remove the front cover.
- Lower the cleaning head.
- Loosen the holding clamp of the cleaning head cover.
- Remove the cleaning head cover.



- 1 Fastening nut
- 2 Cleaning head

- Loosen the fastening nuts of the cleaning head.
- Set the distance between the right holder of the cleaning head to the outside edge of the aluminum casing to approx. 8 cm.
- Tighten the fastening nuts of the cleaning head.
- Replace the cleaning head cover and tighten.

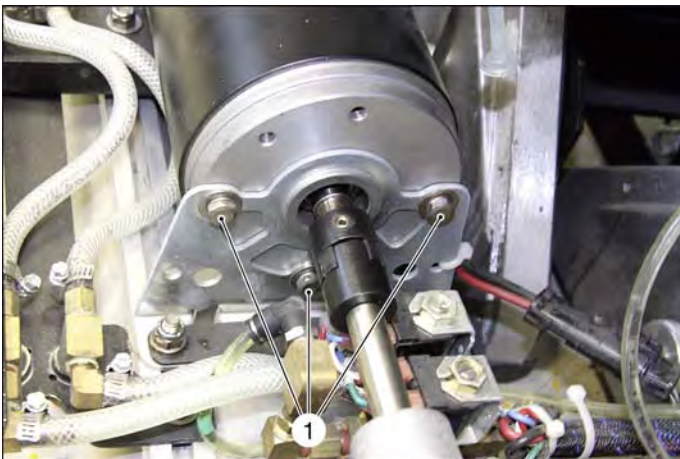
5.6.3 Dismantling the brush roller motor.

If a new brush roller motor must be installed, the old one must be removed as follows:



- 1 Cover
- 2 Retaining clip

- Remove the front cover.
- Lower the cleaning head.
- Loosen the holding clamp of the cleaning head cover.
- Remove the cleaning head cover.



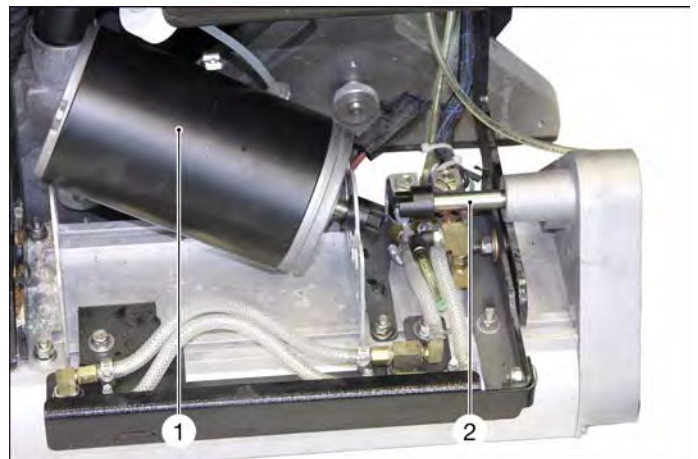
- 1 Fastening screw

- Unscrew the fastening screws from the front of the brush roller motor.



- 1 Fastening screw of the holder
- 2 Fastening screw of brush roller motor

- Unscrew the fastening screws from the rear of the brush roller motor.
- Unscrew the fastening screws of the holder.
- Remove the brush roller motor.



- 1 Brush roller motor
- 2 Drive shaft

- Disconnect the connection plug.
- Pull the brush roller motor off the side of the drive shaft.

Installation in reverse order

5.6.4 Repair brush roller drive



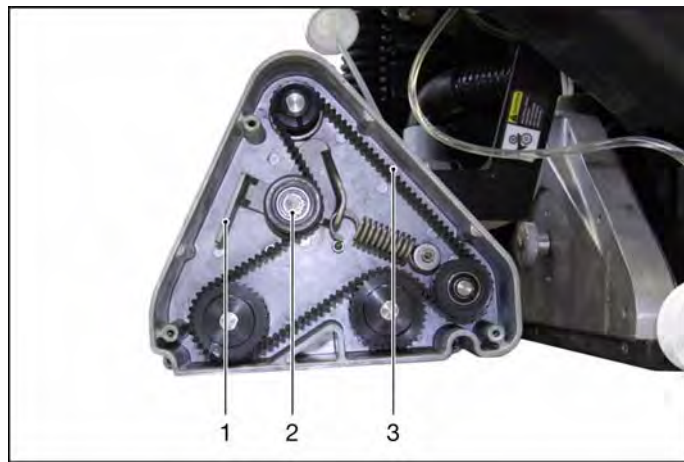
- 1 Cover
- 2 Retaining clip

- ➔ Remove the front cover.
- ➔ Lower the cleaning head.
- ➔ Loosen the holding clamp of the cleaning head cover.
- ➔ Remove the cleaning head cover.



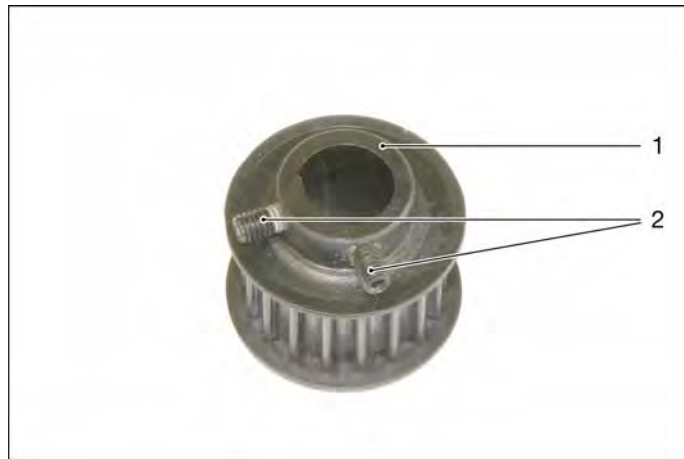
- 1 Fastening screw
- 2 Brush roller drive cover

- ➔ Unscrew the fastening screws of the cover.
- ➔ Remove cover.



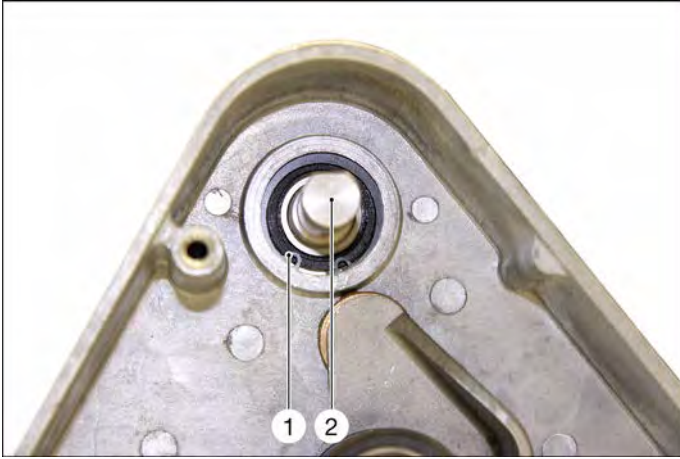
- 1 Tension roller holder
- 2 Tension pulley
- 3 Gear belt

- ➔ Pull the lever on the tension roller toward the outside.
- ➔ Pull the toothed belt from the tension roller and remove it.



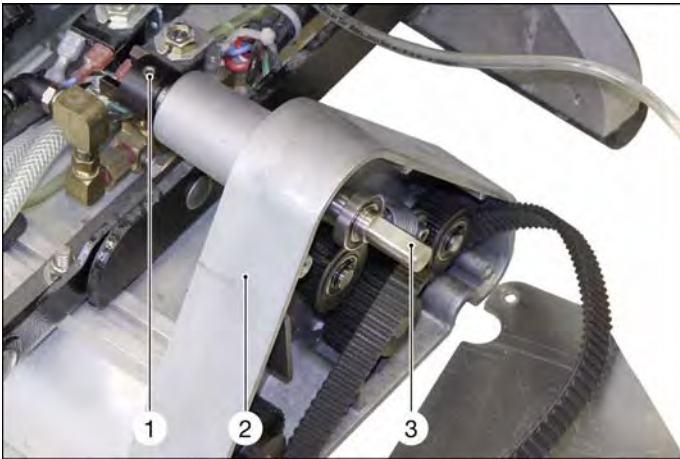
- 1 Toothed gear
- 2 Socket screw

- ➔ Loosen the socket screws from the top toothed wheel.
- ➔ Carefully remove the top toothed wheel.



- 1 Safety ring
- 2 Drive shaft

→ Remove the safety ring.



- 1 Fastening screw
- 2 Brush roller drive casing
- 3 Drive shaft

→ Remove the fastening screw from the driver.

→ Pull out the drive shaft.

Installation in reverse order

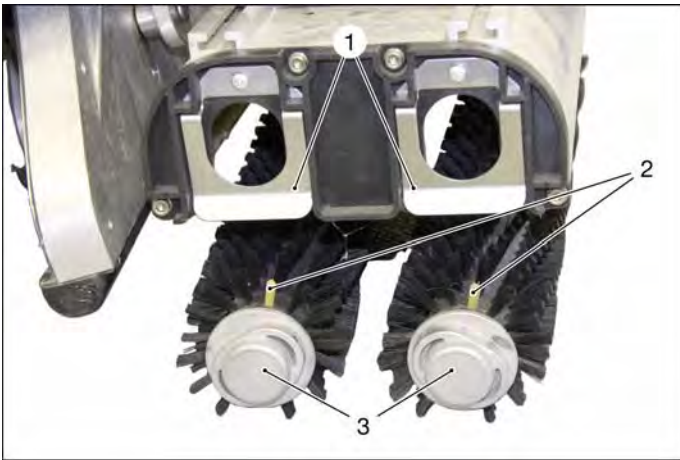
5.6.5 Replacing the brush rollers

If the bristles are as long as the indicator bristles, they must be replaced.



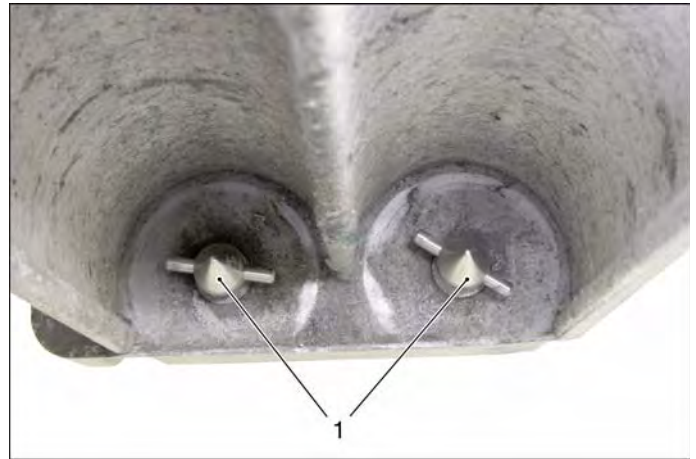
- 1 Cover
- 2 Retaining clip

- Remove the front cover.
- Lower the cleaning head.
- Loosen the holding clamp of the cleaning head cover.
- Remove the cleaning head cover.
- Lift the cleaning head.



- 1 Retaining clip
- 2 Indicator bristles
- 3 Brushing rollers

- Carefully pull the holding clamps outwards.
- Pull out the brush rollers.

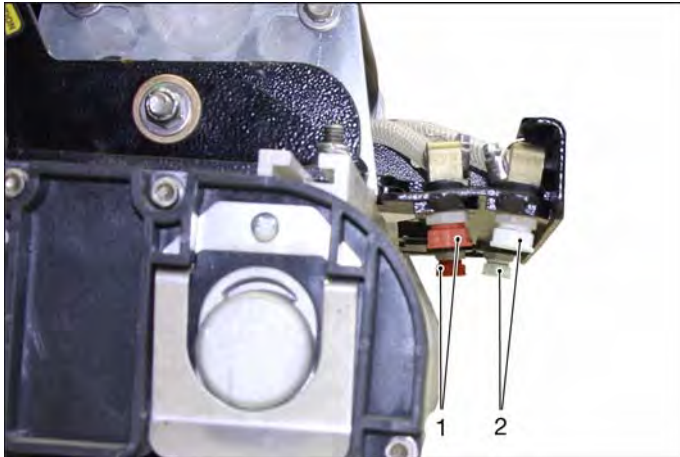


- 1 Brush roller driver

- Slide the brush rollers onto the drivers.
- Push the brush rollers up until they arrest in the holding clamps.
- Fasten the cleaning head cover.

5.6.6 Replace cleaning nozzles

The cleaning nozzles are merely inserted in the cleaning head, alas, they can be easily replaced or cleaned.

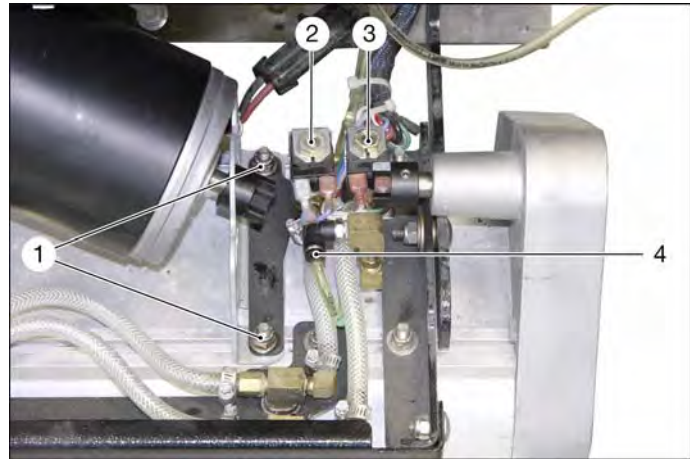


- 1 Red cleaning nozzle for water
- 2 White cleaning nozzle for detergent

Note

There are different cleaning nozzles for different types of detergents, please take this into consideration when you replace them.

5.6.7 Replace the solenoid valves for detergent.



- 1 Fastening nut
- 2 Solenoid valve fresh water
- 3 Solenoid valve for detergent
- 4 Supply hose detergent

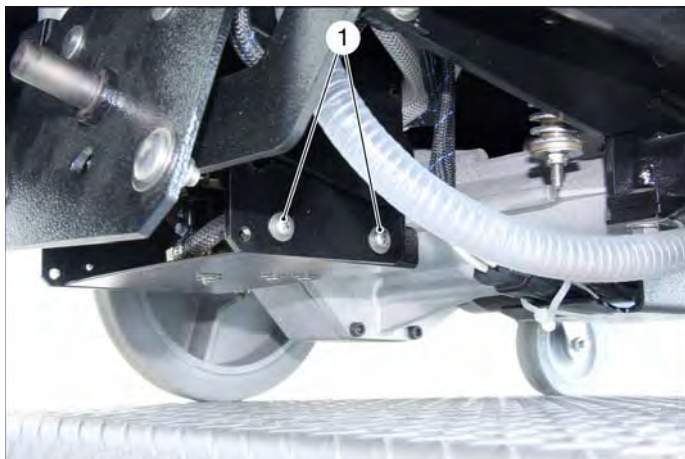
Note

In the solenoid valve for detergent, fresh water is mixed with detergent and transported to the cleaning nozzles.

- Disconnect the electrical connection cables.
- Loosen the supply hose for detergent and pull it off.
- Loosen the hose clamps and pull the fresh water hoses off.
- Unscrew the fastening nuts and remove the holder.
- Unscrew the solenoid valve from the holding plate.

Installation in reverse order

5.6.8 Replace the solenoid valve for fresh water.



1 Fastening screw

- Remove the fastening screws of the holder on both sides.
- Lower the holder.
- Disconnect the electrical connection cables.
- Loosen the hose clamps and pull the fresh water hoses off.



1 Pressure switch
2 Solenoid valve ventilation
3 Bypass valve

- Unscrew the solenoid valve or pressure switch from the holding plate.

Installation in reverse order

Note

The bypass valve is open if the programme selector switch is set to position A or B.

This will allow excess water to flow back into the fresh water reservoir and will prevent excess pressure on the cleaning nozzles.

The pressure switch is required to ventilate the water pump.

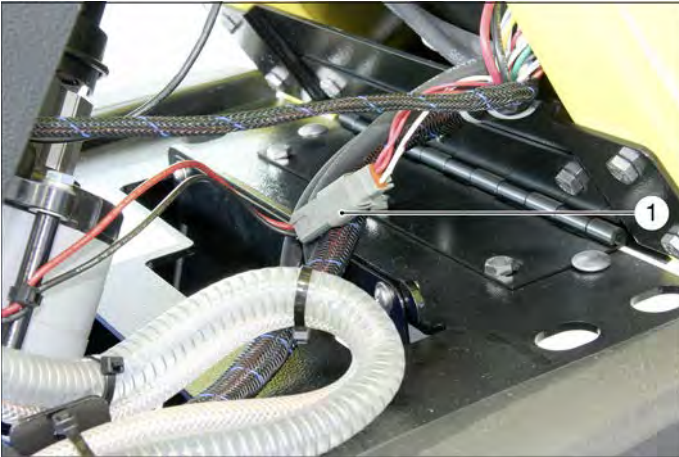
During the ventilation, the solenoid valve for ventilation is activated.

Once the water pump has built up sufficient pressure, the pressure switch is activated and closes the solenoid valve for ventilation.

5.7 Fresh water system

5.7.1 Check/replace the water pump

Test

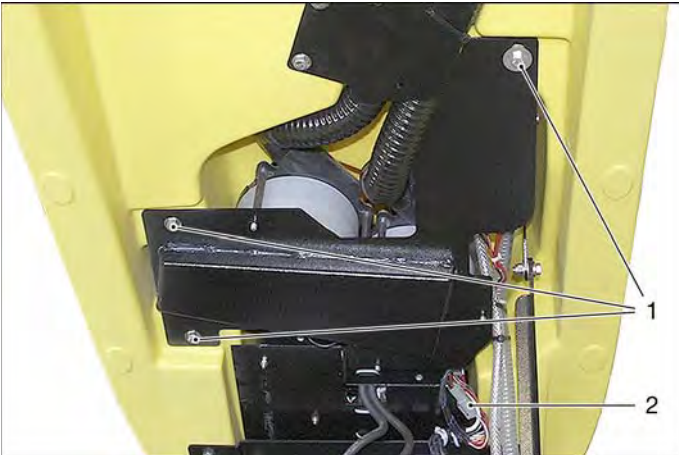


1 Connection plug

- Lift the wastewater reservoir.
- Disconnect the connecting plug of the water pump.
- Set programme selector to wet scrubbing.
- Check the voltage on the connecting plug using a voltmeter.
- Target value: > 33.5 V.

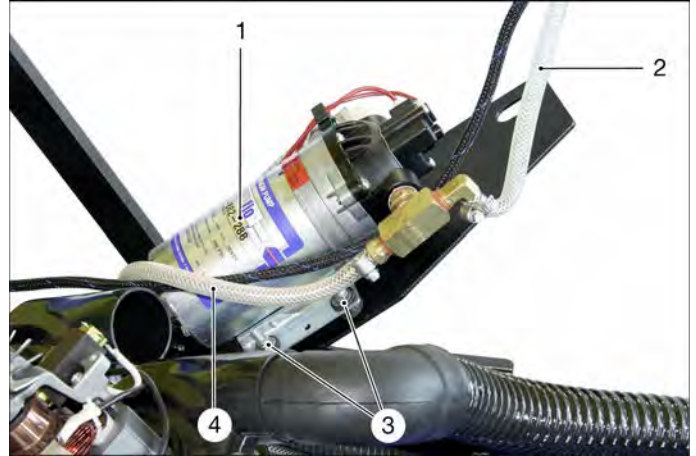
If the voltage is reached, but the pump motor is not running, the water pump must be replaced.

Replace



1 Fastening screw
2 Connection plug

- Unscrew the fastening screws of the holder.
- Disconnect the connecting plug of the water pump.

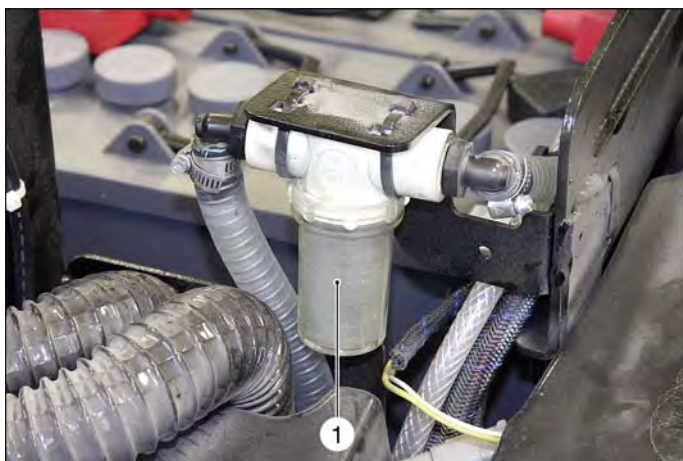


1 Water pump
2 Fresh water hose for external accessories
3 Fastening screw
4 Fresh water hose cleaning head

- Loosen the hose clips and pull out the water hoses from the water pump.
- Remove the fastening screws of the water pump on both sides.
- Remove the water pump.

Installation in reverse order

5.7.2 Clean/replace the water filter



1 Water filter

- Unscrew the filter cup.
- Take out the filter inlay.
- Clean filter insert or replace if too dirty.
- Install and tighten filter pot.

5.8 Replace the fresh water reservoir / waste water reservoir

To replace the fresh water or wastewater reservoir, the entire appliance must be disassembled.

5.9 Cleaner

5.9.1 Replace detergent container



- 1 Fresh water tank
- 2 Fresh water filler neck
- 3 Detergent reservoir A
- 4 Detergent container B

- Remove the front cover.
- Unscrew the lids of the detergent container
- Remove the detergent container toward the top.

Installation in reverse order

5.9.2 Clean the filter sieve



- 1 Filter sieve

- Remove the front cover.
- Unscrew the lids of the detergent container
- Clean the filter sieve.

Installation in reverse order

If the filter sieve is excessively dirty, it must be replaced.

5.9.3 Replace ventilation switch

Note

The lines of the detergent system can be ventilated via the ventilation switch.

This will ensure that the detergent arrives at the detergent nozzles immediately.

In order to prevent detergent residue and occlusions, the system should be rinsed with clear water after work.

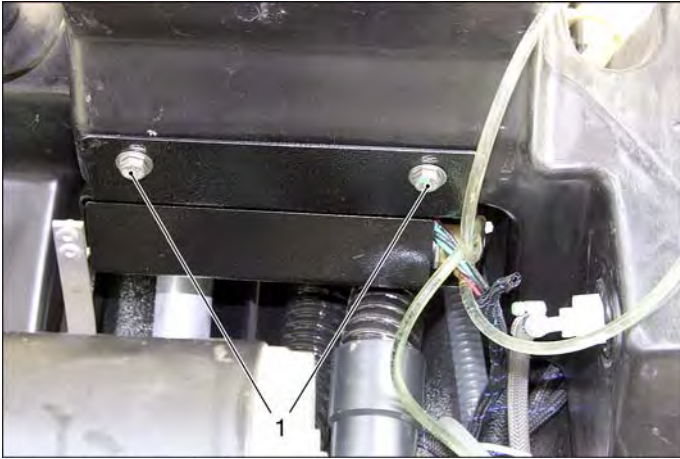


- 1 Ventilation switch
- 2 Fastening screw

- ➔ Remove the front cover.
- ➔ Loosen the fastening screw of the ventilation switch.
- ➔ Disconnect the electrical connection cables.
- ➔ Press the fastening latches together and remove the switch.
- ➔ Loosen the hose clamps and pull the fresh water hoses off.

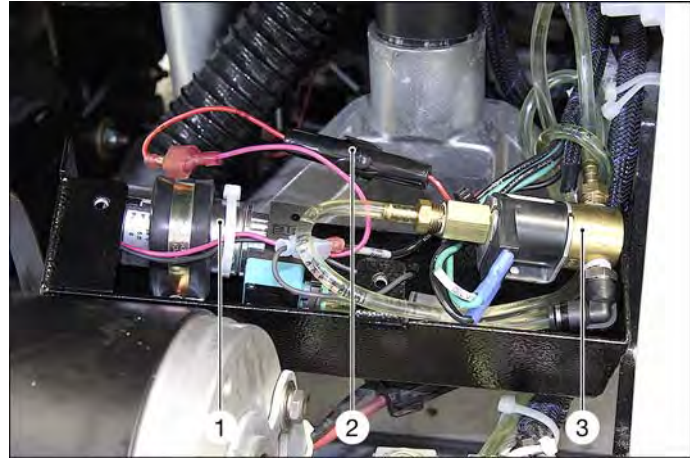
Installation in reverse order

5.9.4 Replace detergent pump



1 Fastening screw

- Remove the front cover.
- Remove the detergent container (refer to "Removing the detergent container").
- Unscrew the fastening screws of the holder.



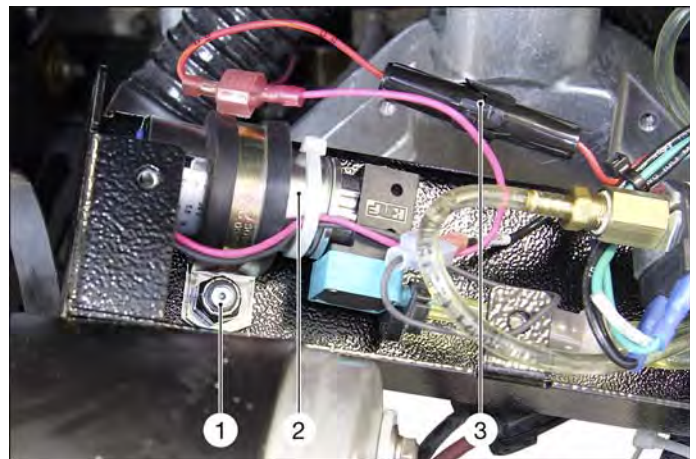
1 Detergent pump
2 Fuse of detergent pump
3 Solenoid valves detergent A / B

- If the detergent pump is not working, check the fuse first.



1 Fastening screw

- Unscrew the fastening screws of the cover.
- Remove the lid.

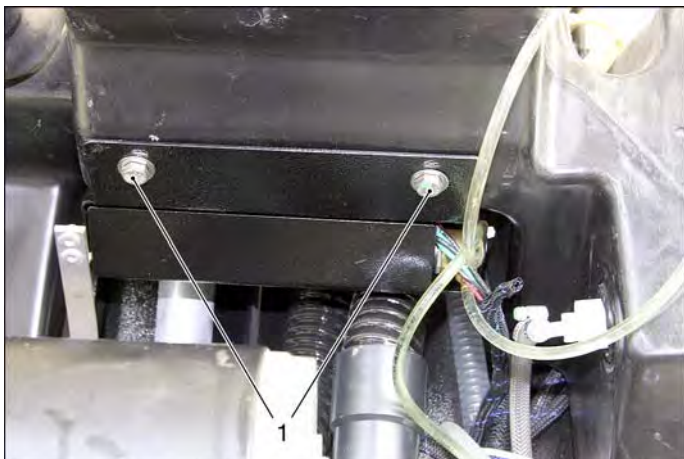


1 Fastening screw
2 Detergent pump
3 Fuse of detergent pump

- Loosen the fastening screw.
- Disconnect the electrical connection cables.
- Remove the detergent hoses.
- Remove the detergent pump.

Installation in reverse order

5.9.5 Replace the solenoid valve detergent A / B



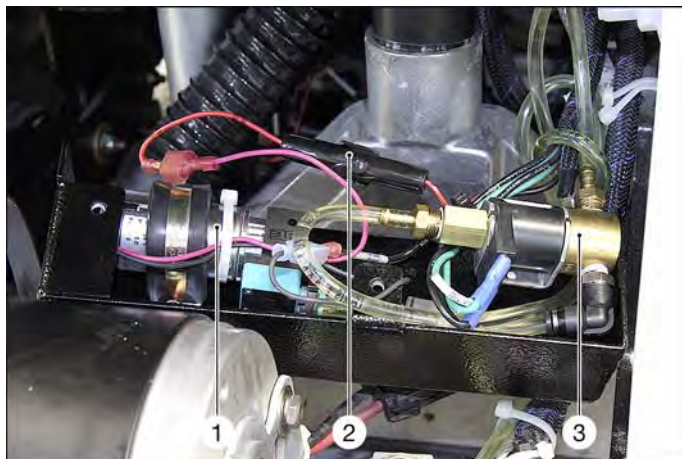
1 Fastening screw

- Remove the front cover.
- Remove the detergent container (refer to "Removing the detergent container").
- Unscrew the fastening screws of the holder.

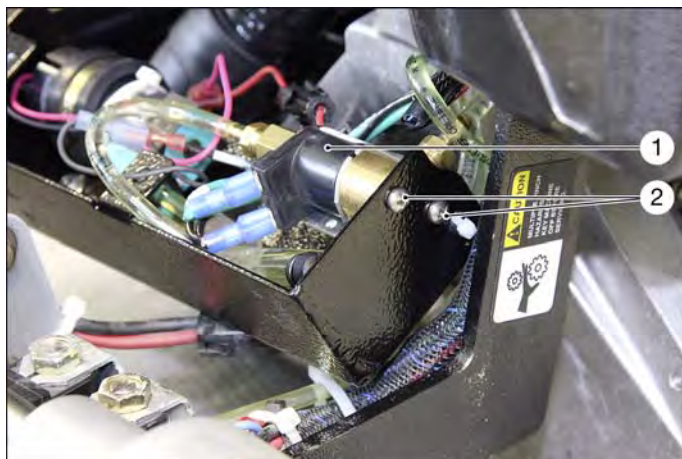


1 Fastening screw

- Unscrew the fastening screws of the cover.
- Remove the lid.



1 Detergent pump
2 Fuse of detergent pump
3 Solenoid valves detergent A / B



1 Solenoid valves detergent A / B
2 Fastening screw

- Unscrew locking screws.
- Disconnect the electrical connection cables.
- Remove the detergent hoses.
- Remove the solenoid valve detergent A / B.

Installation in reverse order

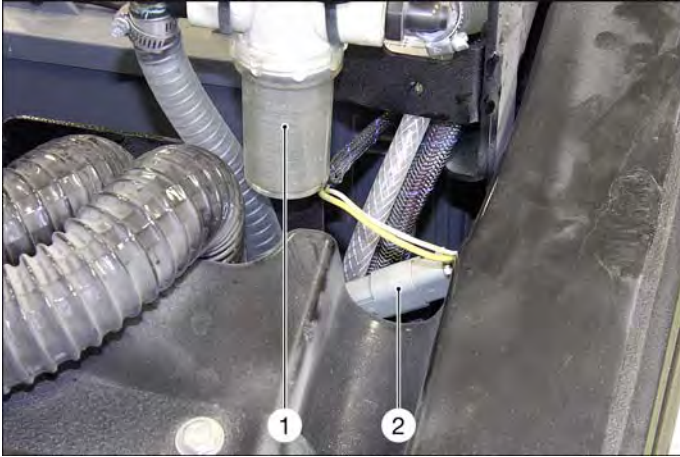
5.10 Lifting motor

5.10.1 Dismantling the lifting motor

Note

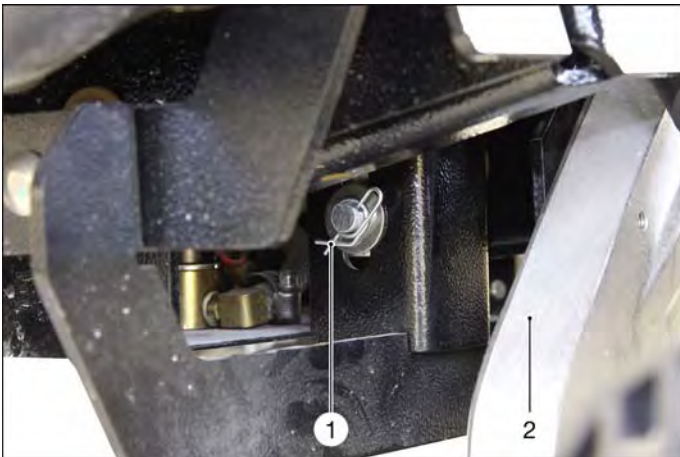
The cleaning head is moved directly via a spindle of the lifting motor.

The suction bars are moved along with it via the suspension of the cleaning head.



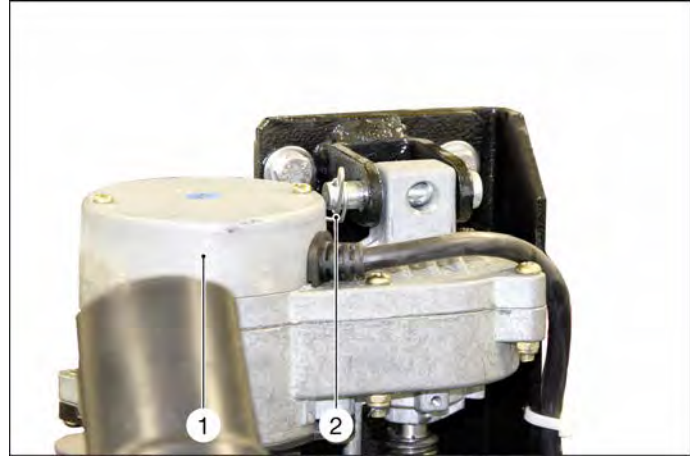
- 1 Water filter
- 2 Socket plug connection

→ Disconnect the connector of the connecting cable.



- 1 Splint
- 2 Vacuum bar

→ Pull the splint from the screw.
→ Pull the bolt from the guide.



- 1 Lifting motor
- 2 Splint

→ Pull the splint from the top of the bolt.
→ Pull the bolt from the guide.
→ Remove lifting motor.

Install the new lifting motor in the reverse order.

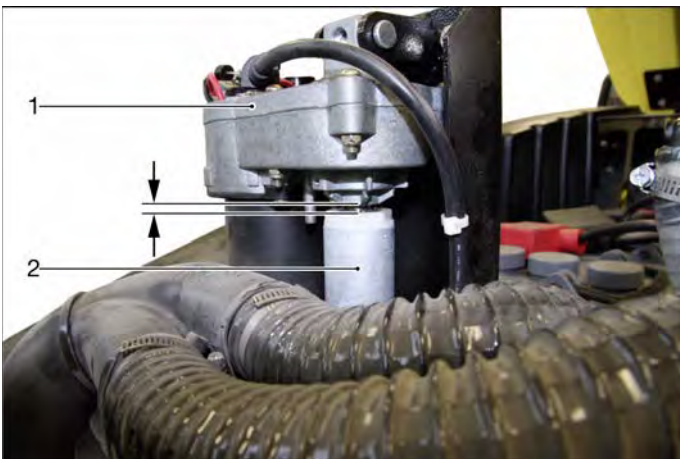
5.10.2 Setting the lifting motor

If a new lifting motor is installed or if the installed motor has lost its alignment, it must be checked and set as follows:



- 1 Switch cam
- 2 Micro switch
- 3 Lifting motor

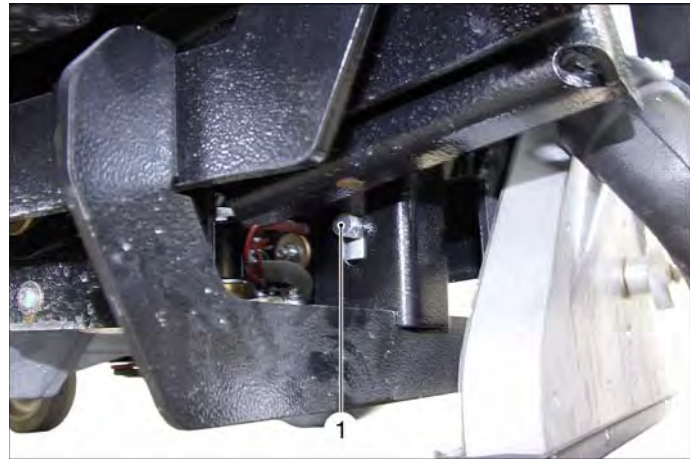
→ Bring the lifting motor all the way up, until the bottom microswitch is activated.



- 1 Lifting motor
- 2 Spindles

The distance between the spindle and the lifting motor must be 5 -10 mm.

If this is not the case, it must be adjusted as follows:



- 1 Bolts

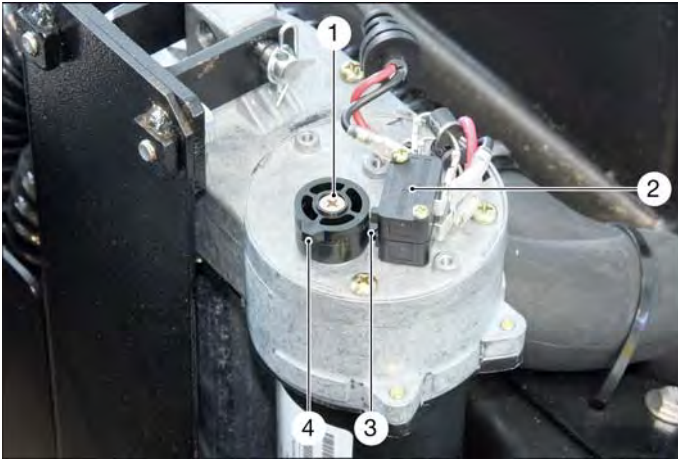
Note

For a more clear illustration, the splint and the washer were removed in this picture.

- Remove the lower splint pin and the bolt.
- Rotate the spindle so that there is a distance between the spindle and the lifting motor of approx. 5 -10 mm.
- Fit the bolt and the splint.
- Bring the lifting motor all the way down, until the top microswitch is activated.

The bolt must now be located in the bottom third the elongated hole.

If the bottom adjustment is not correct, it must be adjusted as follows:

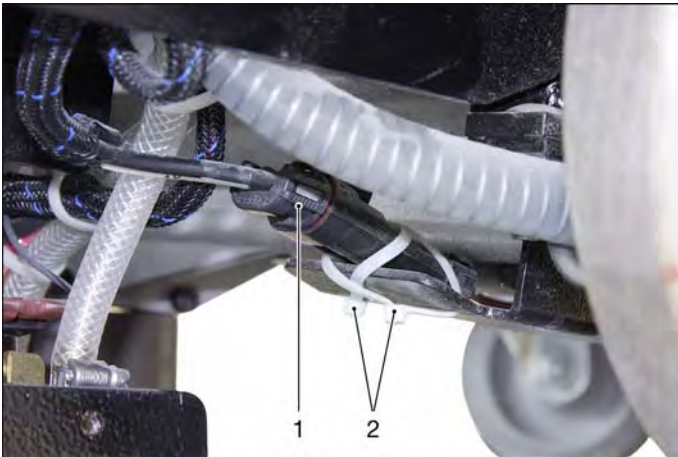


- 1 Fastening screw
- 2 Micro switch
- 3 Actuating plate of the lifting motor top
- 4 Actuating plate of the lifting motor bottom

- Drive the lifting motor all the way up.
- Loosen the fastening screws of the actuating plates.
- Bolt too high: Offset the actuating plate of the lifting motor one notch clockwise.
- Bolt too low: Offset the actuating plate of the lifting motor one notch counter-clockwise.
- Tighten the fastening screw.
- Check the bottom setting once again.

5.11 Replacing the drive unit

The drive unit consists of a differential gear and an attached drive motor.



- 1 Connection plug
- 2 Cable connector

- Raise the appliance with suitable tools until the wheels no longer touch the ground (do not lift by the drive unit).
- Make sure not to drop the unit.
- Remove the cable ties from the connecting plug.
- Disconnect the connection plug.



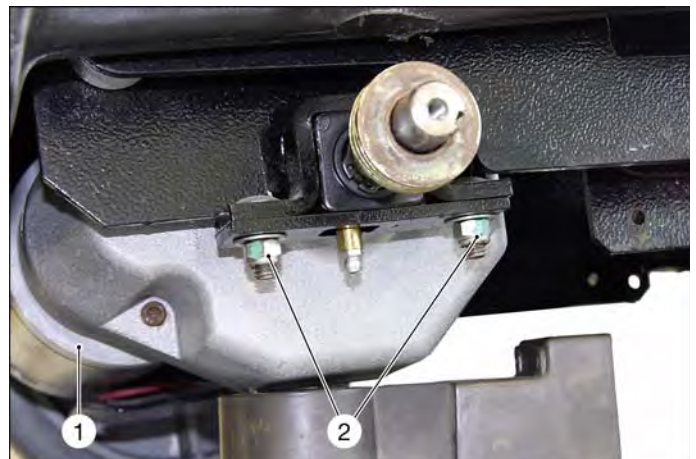
- 1 Wheel screw

- Unscrew the wheel screw.



- 1 Worm screw

- Loosen the worm screw.
- Remove the wheel.



- 1 Drive unit
- 2 Fastening screw

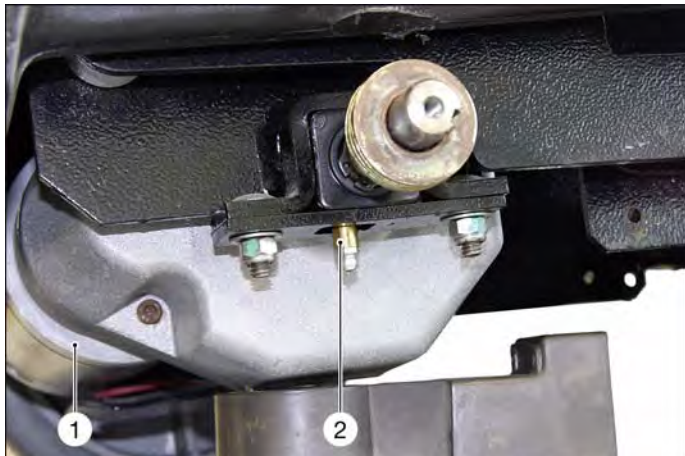
- Support the drive unit and secure it against falling down.
- Remove the fastening screws from the left and right bearing block.
- Remove the drive unit.

Installation in reverse order

5.12 Lubricate the drive unit

Note

The wheel does not need to be removed to lubricate the drive unit.



- 1 Drive unit
- 2 Lubrication nipple

Use a grease press to lubricate the lubricating nipple at the bearings.

6 Exchange times

Wear part	Part number	Exchange time in minutes
Operating unit		
Potentiometer 50 kOhm	8.600-631.0	10
Indicator lamp	8.602-601.0	10
Indicator lamp, red	8.630-990.0	10
Battery monitoring	8.601-267.0	15
Microswitch for reverse travel	8.625-718.0	10
Operating hour counter	8.600-553.0	10
Horn	8.623-150.0	10
Water pump switch	8.625-715.0	10
Program selection switch	8.625-718.0	15
Relay	8.625-136.0	10
	8.625-141.0	10
Key switch	8.600-719.0	10
Fuse 3 A	8.600-200.0	10
Fuse 30 A	8.600-191.0	10
Fuse 25 A	8.600-192.0	10
Fuse 22A	8.623-008.0	10
Emergency-stop button	8.600-718.0	10
Anti-interference filter	8.630-014.0	10
Controls	8.601-291.0	10
Switch	8.625-723.0	15
Device		
Ventilate the detergent pump switch	8.600-721.0	15
Dirt water discharge hose	8.600-426.0	10
Adapter manual nozzle	8.631-030.0	10
Waterfilter	8.601-276.0	5
Solenoid valve	8.601-303.0	30
Filter detergent tank	8.623-659.0	10
Lift motor cleaning head	8.601-180.0	60
Fuse 250 V 500 mA in detergent pump casing		15
Detergent pump, hand tool	8.600-610.0	20
3-way valve	8.629-372.0	30
RM pump	8.629-782.0	30
Solenoid valve (in the drive motor area)	8.601-303.0	60
Pressure switch (in the drive motor area)	8.629-783.0	60
Drive motor	8.631-513.0	90

Wear part	Part number	Exchange time in minutes
Wheel	8.622-604.0	15
Steering roller	8.629-374.0	15
Battery	6.654-141.0	20
Charger	6.651-229.0	5
Suction turbine	8.625-848.0	20
Seal suction turbine	8.600-376.0	15
Suction hose of the suction turbine	8.629-760.0	10
Hose lines	8.600-442.0	15
Suction hose, suction bar	8.621-914.0	10
Suction hose, suction bar	8.623-988.0	10
Suction unit	8.625-998.0	10
Seal suction bar	8.623-795.0	10
Disassemble and clean the suction bar	8.630-640.0	45
Startup capacitor 50 uF		20
Operation capacitor 6 µF		20
Cleaning head		
Brush motor	8.622-213.0	30
Brush drive bearing, complete	8.601-279.0 8.622-411.0	60
Gear belt	8.621-525.0	10
Nozzle red 11 004	8.601-320.0	5
Nozzle white 11 001	8.601-255.0	5
Brush roller	8.623-068.0	5

7 Troubleshooting

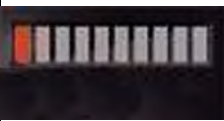









7.1 Faults without display

Fault	Remedy	By whom
Appliance cannot be started	Insert the battery plug on the device.	Operator
	Release emergency-stop button by turning it; check / replace.	Operator
	If battery is low, charge the battery.	Operator
	Check battery cable for correct sitting.	Operator
	Check battery cable for corrosion; clean, if required.	Operator
	Check/replace key switch.	Operator
	Check the fuse for the control.	Operator
	Check the programme selector switch.	Operator
Device does not drive or drives only slowly	Reset fuse of travel drive.	Operator
	If battery is low, charge the battery.	Operator
	The appliance was switched on while a drive key was pressed. Release the drive switch.	Operator
	Control system overheated; switch off device and let it cool down.	Operator
	Check / replace the speed potentiometer.	Operator
	Check / replace travel drive.	Operator
	Check the travel drive fuse.	Operator
	Check the programme selector switch.	Operator
Insufficient vacuum performance	Empty the dirt water reservoir.	Operator
	Clean the seals between dirt water reservoir and cover and check for tightness, replace if required.	Operator
	Check suction hose for blockages; clean if required.	Operator
	Check connection between suction hose and suction bar and suction hose and appliance.	Operator
	Check the suction hose for tightness; replace if required.	Operator
	Check if the cover on the dirt water discharge hose is closed	Operator
	Clean the floater in the dirt water tank.	Operator
	Reset fuse of suction turbine.	Operator
	Check / replace the suction turbines.	Operator
	Check the programme selector switch.	Operator
	If battery is low, charge the battery.	Operator
	Check control / defective.	Operator

Fault	Remedy	By whom
Insufficient cleaning result	Check the brushes for wear, replace if required.	Operator
	Check brushes for wear and tear, clean.	Operator
	If battery is low, charge the battery.	Operator
	Check / replace the lifting motor.	Operator
	Checking the lifting motor setting.	Operator
	Check detergent solution.	Operator
	Incorrect cleaning nozzles, check usability	Operator
Brushes are rotating slowly or not at all	Reset fuse of brush drive.	Operator
	Check the brushes for blockage due to foreign particles, remove them if found.	Operator
	If battery is low, charge the battery.	Operator
	Check the the brush drive.	Operator
	Check the brush motor.	Operator
	Check the programme selector switch.	Operator
	Check control / defective.	Operator
No or very little detergent solution gets added	Check detergent level in the fresh water reservoir and the detergent reservoir, refill tank if necessary.	Operator
	Turn on the key Apply detergent solution - the control lamp must illuminate.	Operator
	Check nozzles for blockages; clean if required.	Operator
	Check fresh water filter; clean if required.	Operator
	Check the pipe system for the detergent and water.	Operator
	Check the solenoid valves.	Operator
	Check he detergent pump.	Operator
	Check the programme selector switch.	Operator
Do not add detergents	Refill detergent tank.	Operator
	Press the ventilation switch for the respective tank for 30 seconds.	Operator
	Flush the pipe system for the detergent with water.	Operator
	Check the solenoid valves.	Operator
	Check he detergent pump.	Operator
	Check the programme selector switch.	Operator
The cleaning head cannot be raised/lowered	Reset fuse of control system.	Operator
	Check / replace the lifting motor.	Operator
Battery LEDs run up and down	Switch the key switch off and back on.	Operator
	Control indicates faults; see fault code table.	Operator

7.2 Faults with display

The battery indicator lamp will blink if a fault occurs.

Number of indicator lamps	Fault	Measure
	Low battery voltage.	The battery must be charged or it is not connected properly. Check the battery connections. If the connections are OK, try charging the battery.
	Connection to drive motor interrupted.	The motor is not properly connected. Check all the connections and cables between the drive motor and the control of the drive programme.
	Triggered by motor cables.	The drive motor has a short circuit with one of the batteries. contact customer service.
	Full discharge protection active, brush motor switched off.	The charge condition of the battery has fallen below the threshold for battery shutoff and the control of the drive motor no longer permits certain appliance functions. Charge battery.
	Not used.	-
	Appliance will not run, charger is still connected (only integrated chargers).	The drive function of the control of the drive programme is locked. Disconnect the charger.
	Triggered by contact handles.	Ensure that the contact handles are in idle position prior to switching on the appliance.
	Faults in the control of the drive programme.	Check all the connections of the drive programme control.
	Triggered by parking brake.	Bad contact on the parking brakes. Check the connections of the parking brakes and the drive motor. Ensure that all the connections on the drive programme control are tight.
	High battery voltage.	An overvoltage was placed on the drive programme control. The most common cause for this are bad battery connections. Check the condition of the battery.
-	Display blinks every 5 seconds.	Energy saving mode, perform key switch reset.

8 Technical specifications

Power		
Nominal voltage	V	36
Battery capacity (Pack model)	Ah (5h)	105
Average power consumption	W	1926
Drive motor output (rated output)	W	375
Suction engine output	W	2 x 560
Brush motor performance	W	375
Vacuuming		
Suction turbine current pickup with raised suction bar	A	25 - 29
Cleaning power, air quantity	l/s	29
Cleaning power, negative pressure	kPa	17
Cleaning brushes		
Current pickup, no load	A	2,5 - 4,5
Working width	mm	500
Brush diameter	mm	85
Brush speed	1/min	1080 - 1180
Brush contact pressure	stored in a suspended position	
Spray system		
Current pickup water pump	A	2,5 - 3,5
Flow volume with max. water volume	l/min	> 0,6
Pressure	MPa	0,69
Apply detergent solution (position A)	l/min	0,9
Apply detergent solution (position B)	l/min	4
Mixing ratio of fresh water/detergent A		16:1
Mixing ratio of fresh water/detergent B		64:1
Dimensions and weights		
Drive motor current pickup at max. speed forward / reverse	A	2 - 4
Drive speed (max.)	km/h	4,6
Drive speed (position A)	km/h	2
Drive speed (position B)	km/h	1
Max. brake path	m	< 0,9
Climbing capability (max.)	%	2
Theoretical surface performance (position A).	m ² /h	920
Theoretical surface performance (position B)	m ² /h	460
Fresh/dirt water reservoir volume	l	74/66
Volume detergent tank A	l	4,6
Volume detergent tank B	l	1,25
Max. water temperature	°C	60
Weight (with/ without battery)	kg	295/172
Working weight max.	kg	421
Surface load	kPa	3500
Length	mm	1400

Width	mm	700
Height	mm	1100
Installation compartment batteries	mm	600x400x420
Noise emission		
Sound pressure level (EN 60704-1)	dB(A)	69,5
Machine vibrations		
Vibration total value (ISO 5349)	m/s ²	0,3

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

The operating instructions and the spare parts list can be requested in paper form with the respective part numbers from our spare parts service department.

9 Special tools

Description	Part no.:
Inner hexagon wrench (inch)	6.815-032.0
Tool box (inch)	6.816-079.0

10 Circuit diagram

10.1 Circuit diagram for operating panel

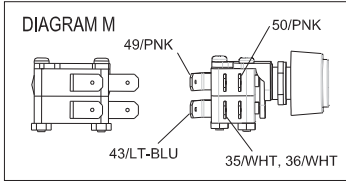
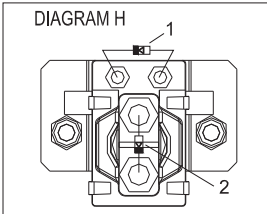
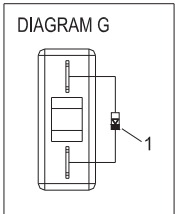
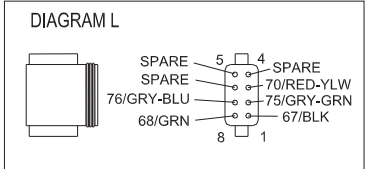
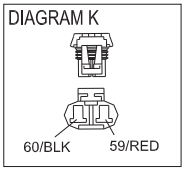
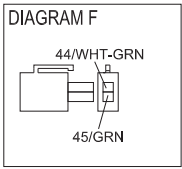
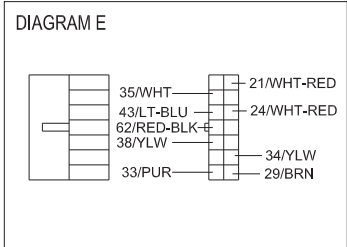
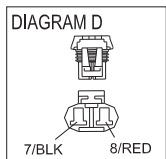
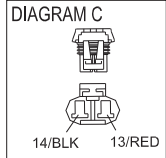
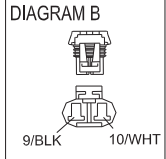
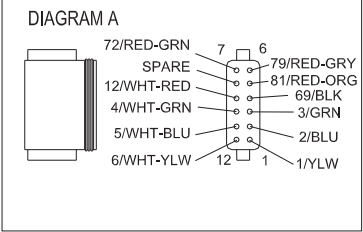
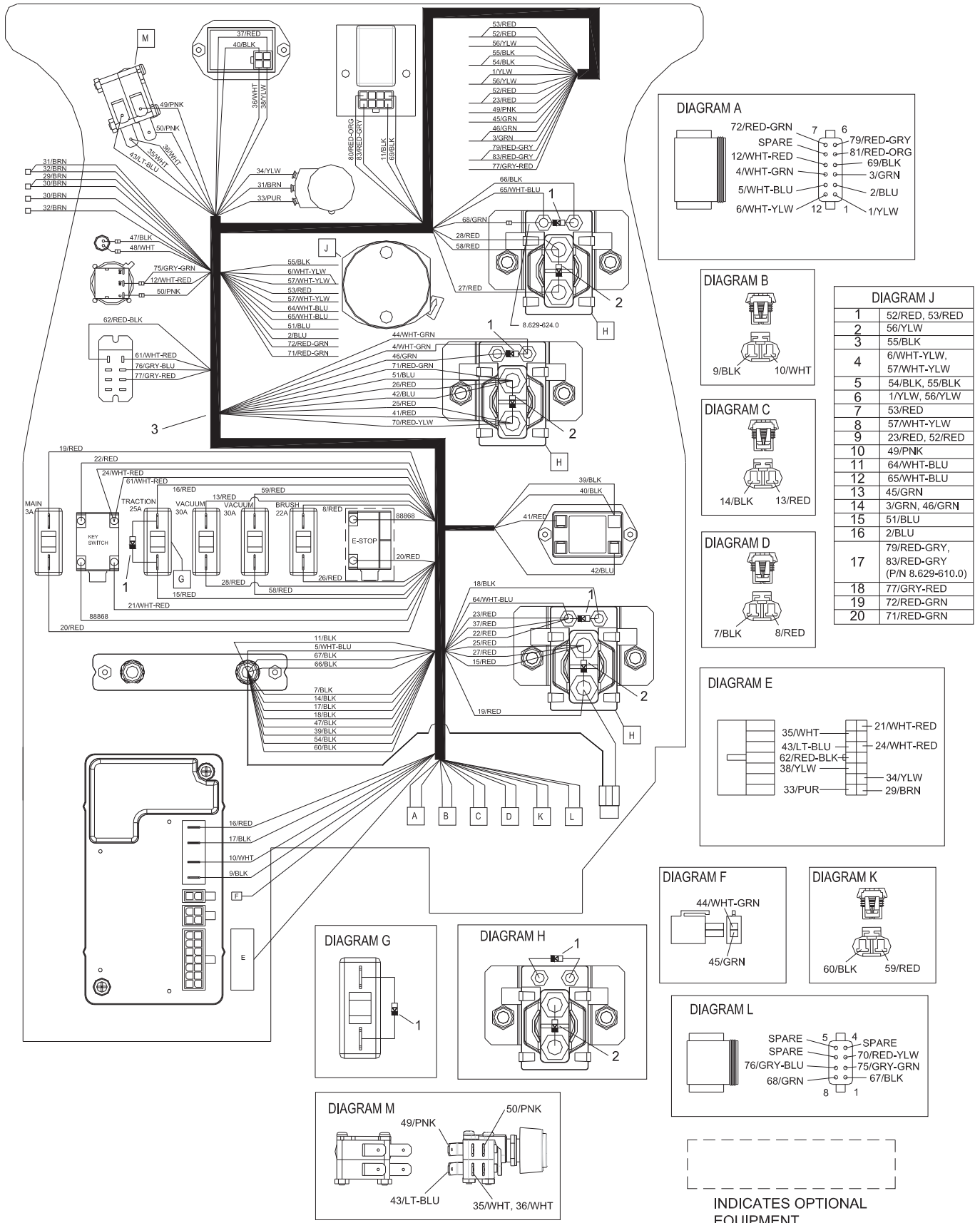


DIAGRAM J

1	52/RED, 53/RED
2	56/YLW
3	55/BLK
4	6/WHT-YLW, 57/WHT-YLW
5	54/BLK, 55/BLK
6	1/YLW, 56/YLW
7	53/RED
8	57/WHT-YLW
9	23/RED, 52/RED
10	49/PNK
11	64/WHT-BLU
12	65/WHT-BLU
13	45/GRN
14	3/GRN, 46/GRN
15	51/BLU
16	2/BLU
17	79/RED-GRY, 83/RED-GRY (P/N 8.629-610.0)
18	77/GRY-RED
19	72/RED-GRN
20	71/RED-GRN

INDICATES OPTIONAL EQUIPMENT

10.2 Circuit diagram main cable string

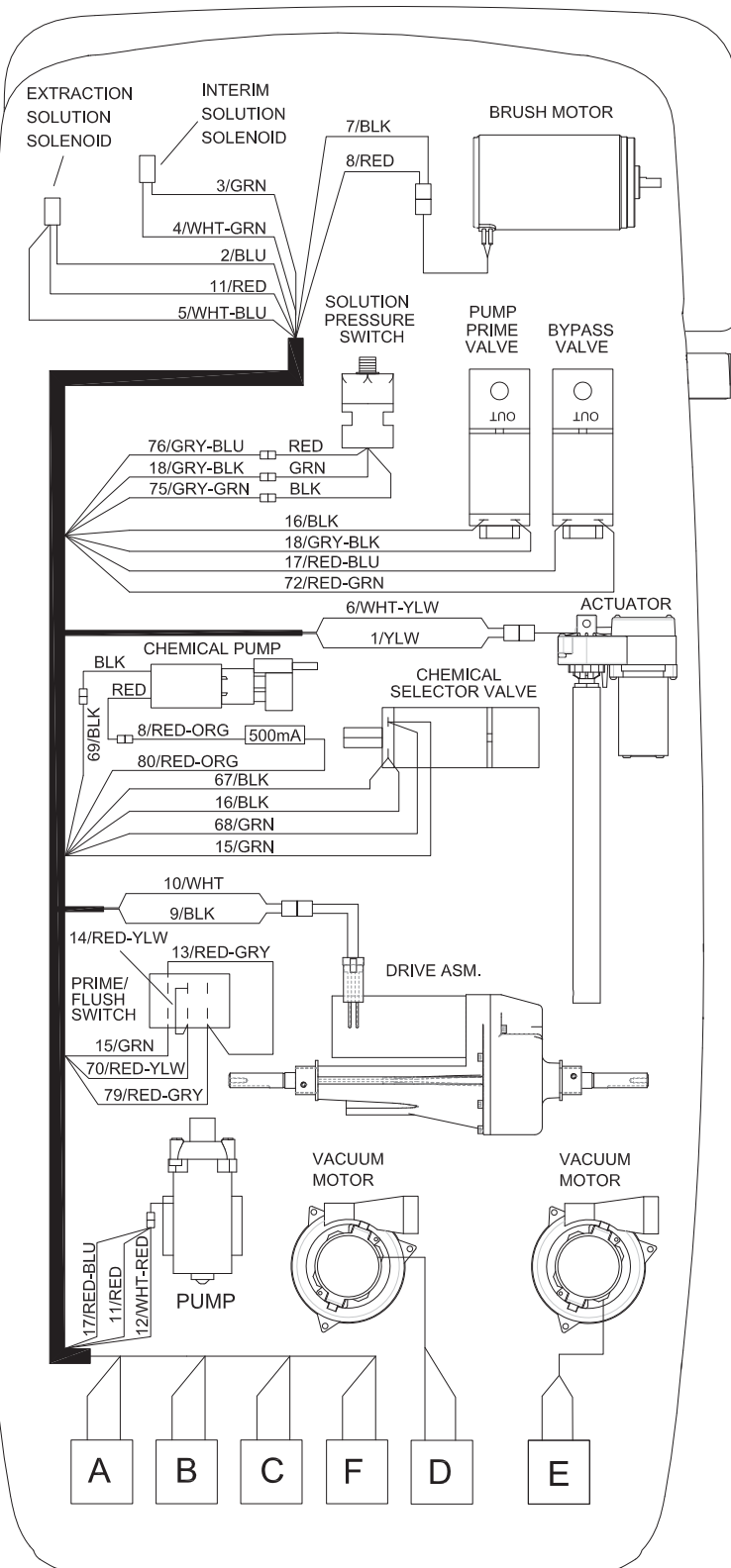


DIAGRAM A

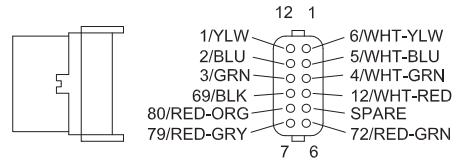


DIAGRAM B

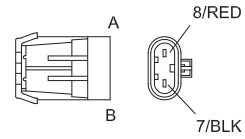


DIAGRAM C

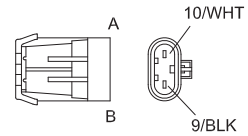


DIAGRAM D

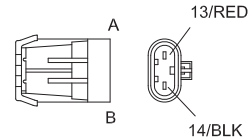


DIAGRAM E

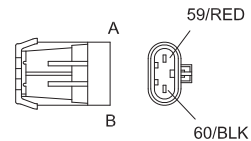
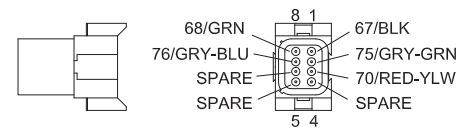
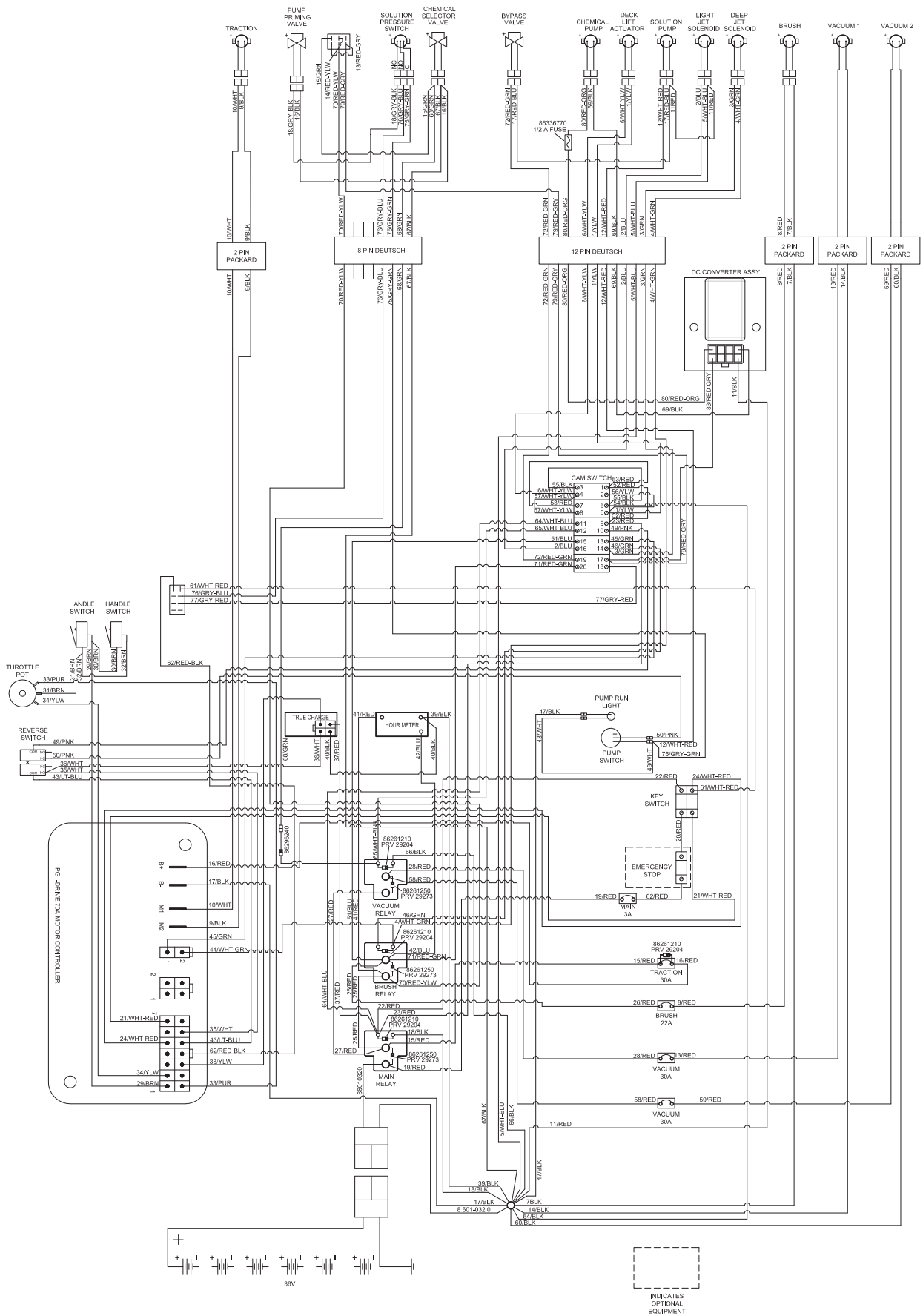


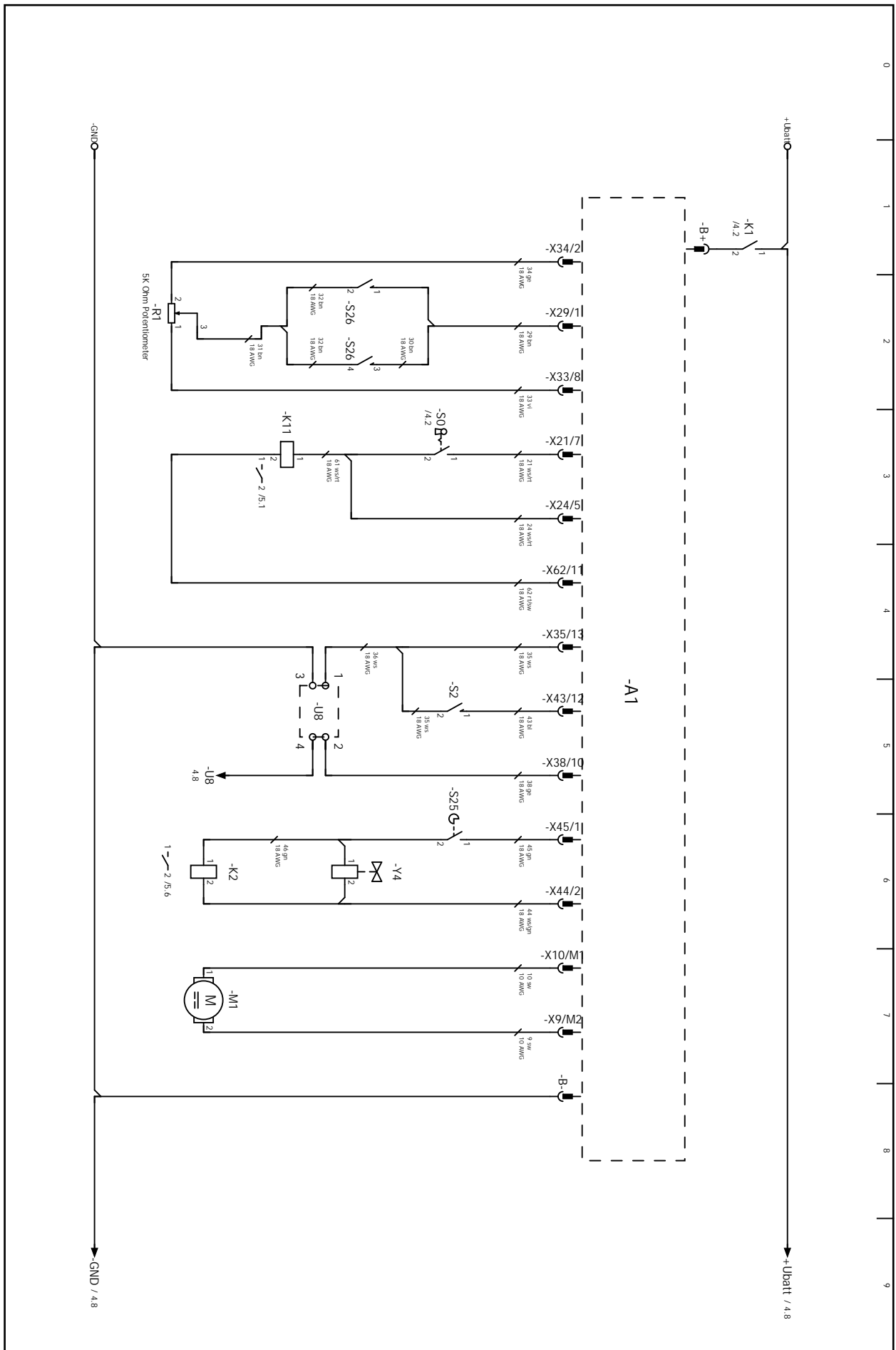
DIAGRAM F

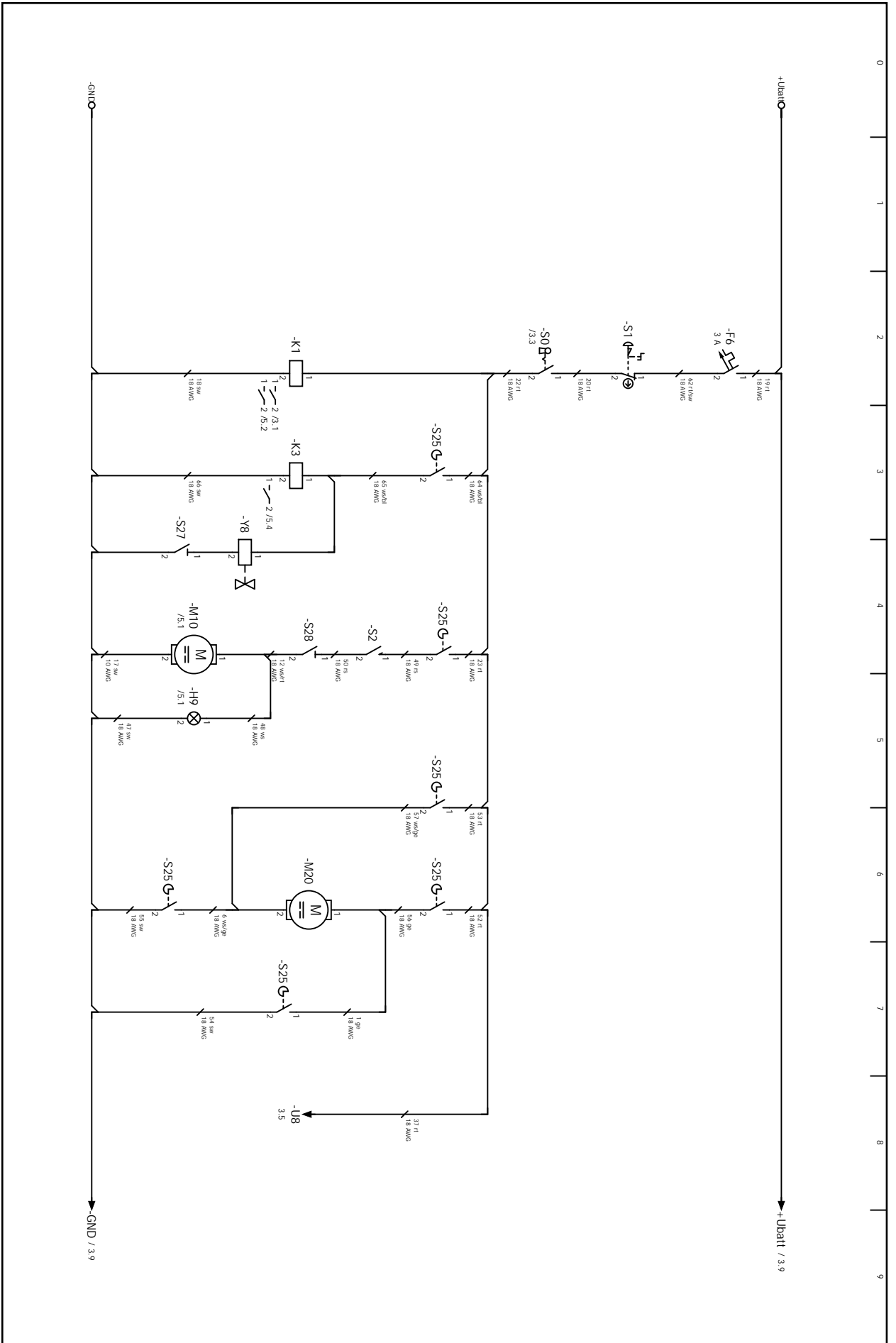


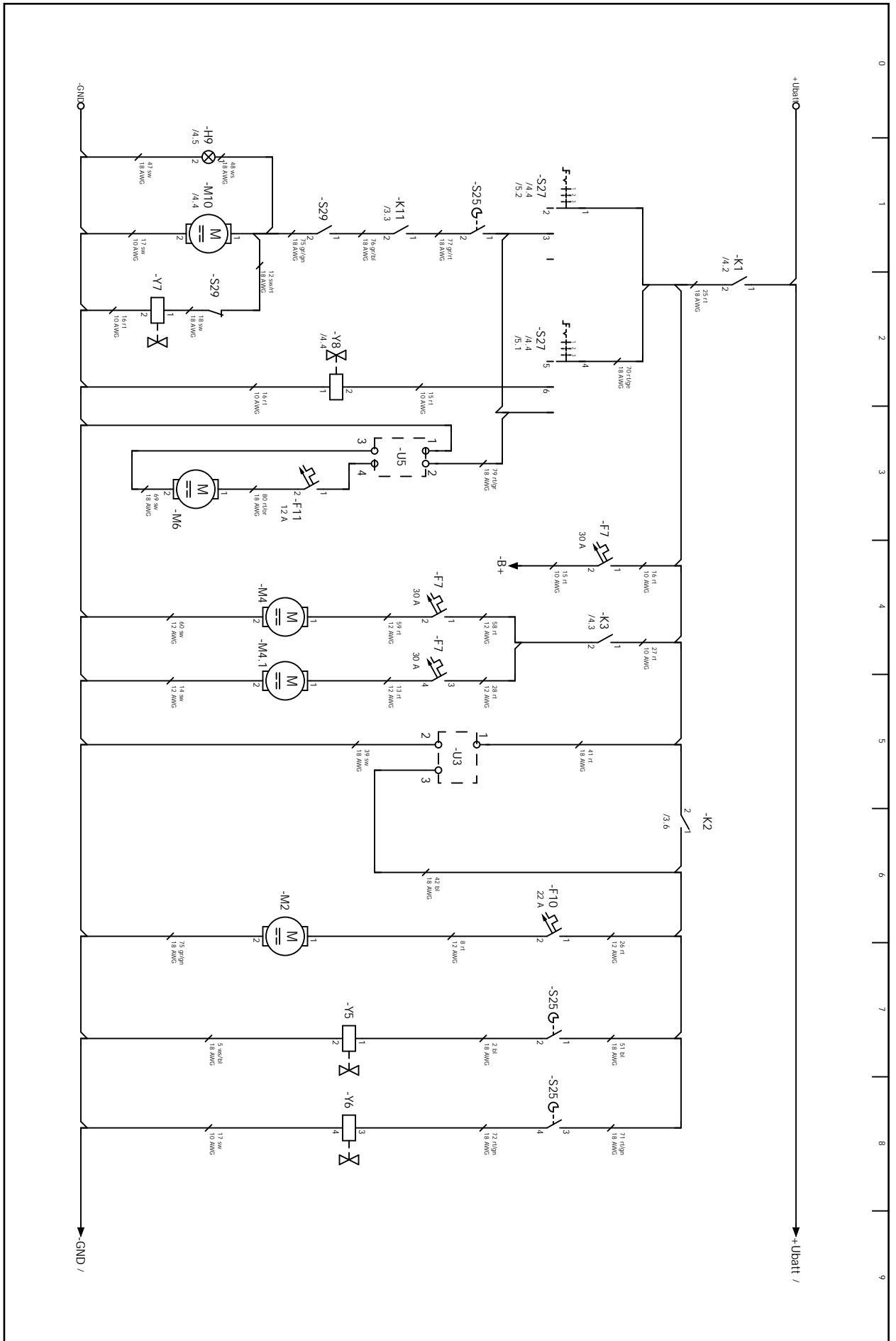
10.3 Circuit diagram, entire appliance



10.4 Circuit diagram 1,008-610







10.5 Legend of circuit diagrams

Code	English	German
A1	MASTER MODULE	Control of driving programme
F6	3AMP BREAKER	3 A-fuse
F7	30AMP BREAKER	30 A-fuse
F10	22AMP BREAKER	22 A-fuse
F11	12AMP BREAKER	12 A-fuse
H9	PUMP RUN LIGHT	LED pump in operation
K1	MAIN RELAY	Main relay
K2	BRUSH RELAY	Brush motor relay
K3	VACUUM RELAY	Relay suction turbine
K11	PUMP RELAY	Relay pump motor
M1	TRACTION MOTOR	Drive motor
M2	BRUSH MOTOR	Brush motor
M4	VACUUM MOTOR	Suction turbine
M4.1	VACUUM MOTOR 2	Suction turbine 2
M6	CLEANING/CHEMICAL PUMP	Detergent pump
M10	SOLUTION PUMP MOTOR	Water pump
M20	LIFTING MOTOR UP/DOWN	Lifting motor
P1	BATTERY METER	Battery control display
P2	HOUR METER	Operating hour counter
R1	5K POTENTIOMETER	5K POTENTIOMETER
S0	KEY SWITCH	Key switch
S1	FORWARD SWITCH	Switch forward drive
S2	REVERSE SWITCH	Key for reverse drive
S25	CAM SWITCH (COMMODORE ONLY)	Cam switch
S26	HANDLE SWITCH	Contact switch handle
S27	PRIME SWITCH	Ventilation switch
S28	PUMP SWITCH	Pump switch
S29	SOLUTION PRESSURE SWITCH	Pressure switch
Y4	DEEP JET	Solenoid valve
Y5	LIGHT JET	Solenoid valve
Y6	BYPASS VALVE	Bypass valve
Y7	PUMP PRIME	Deaeration valve
Y8	CHEMICAL SELECT	Solenoid valve for detergent