

USE AND MAINTENANCE MANUAL



ULTRA120 B

ED. 05-2011

EN

ORIGINAL
INSTRUCTIONS
Doc. 10029463
Ver. AA



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Symbols used in the manual



Open book symbol with an "i"
Indicates the need to consult the instruction manual



Open book symbol
Used to tell the operator to read the manual before using the machine



Warning symbol
Carefully read the sections marked with this symbol and observe the indications, for the safety of the operator and the machine



Warning symbol
Indicates danger of gas exhalation and leakage of corrosive liquids



Warning symbol
Indicates operator should take safety measures to avoid damage to limbs.



Warning symbol
Indicates the danger of fire
Do not go near with free flames



Warning symbol
Indicates that the packed product should be handled with suitable lifting means that comply with the legal requirements



Disposal symbol
Carefully read the sections marked with this symbol for the disposal of the machine



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On consignment of the machine

When the machine is delivered to the customer, an immediate check must be performed to ensure all the material mentioned in the shipping documents has been received, and also to check the machine has not been damaged during transportation. If this is the case, the carrier must ascertain the extent of the damage at once, informing our customer service office. It is only by prompt action of this type that the missing material can be obtained, and compensation for damage successfully claimed.

Introduction

The ULTRA120B is a floor scrubbing machine which, by means of the mechanical action of the rotating brush and the chemical action of a water/detergent solution, can clean any type of flooring. As it advances, it also collects any removed dirt as well as the detergent solution not absorbed by the floor.

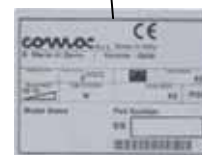
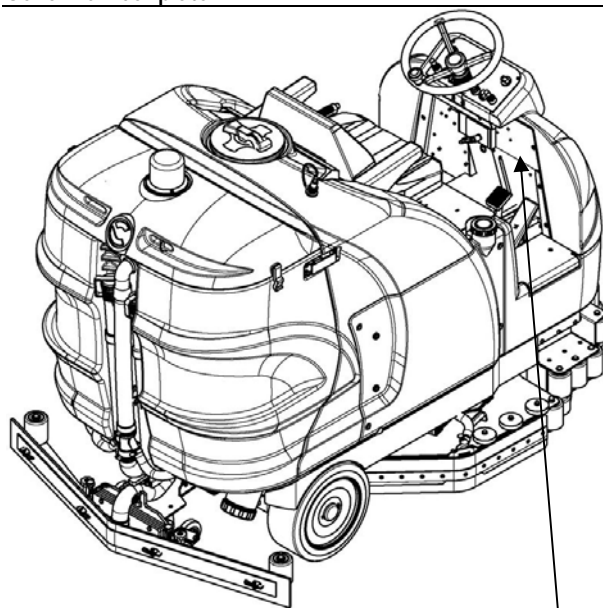
The machine must only be used for this purpose. Even the best machines will only work well if used correctly and kept in good working order. We therefore suggest you read this instruction booklet carefully and read it again whenever difficulties arise while using the machine. If necessary, remember that our customer assistance service (organised in collaboration with our dealers) is always available for advice or direct intervention.

Intended use

The scrubbing machine is designed exclusively for the professional cleaning of surfaces and floors in industrial, commercial and public environments. The machine is only suitable for use in closed (or at least covered) places.

The machine is not suitable for use in the rain, or under water jets. It is **FORBIDDEN** to use the machine in places with a potentially explosive atmosphere, for picking up dangerous dusts or inflammable liquids. In addition, it is not suitable as a means of transport for people or objects.

Serial number plate

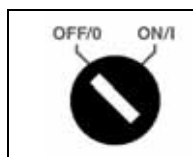




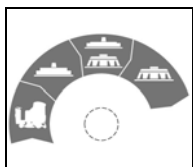
TECHNICAL DESCRIPTION	UM	ULTRA120 B
Working width	mm	1205
Squeegee width	mm	1265
Work capacity, up to	m ² /h	9600
Disk brush	No. / Ø mm	2 / 610
Brush rotations	rpm	115
Brush motor	V/W	36/2000
Maximum pressure on the brushes	kg	95
Traction motor	V/W	36/2000
Traction wheel	Ø mm	310 x 100
Maximum forward speed	km/h	8
Maximum gradient with full load	%	10%
Suction motor	No./(V/W)	2/(36/670)
Suction vacuum	mbar	190
Rear elastic wheels	Ø mm	370 x 140
Solution tank	l	280
Recovery tank	l	285
Detergent tank (CDS version only)	l	15
Steering diameter	mm	3420
Machine length	mm	2030
Machine height	mm	1560
Machine width (without squeegee)	mm	1280
Battery compartment (l x L x h)	mm	880x600x450
Rated battery voltage	V	36
Battery weight (max)	kg	510
Machine weight (empty and without batteries)	kg	760
Gross weight in running order (machine + batteries + water + operator)	kg	1630
Noise level (in compliance with IEC 704/1)	dB (A)	-
Hand vibration level	m/s ²	-
Body vibration level	m/s ²	-



SYMBOLS USED ON THE MACHINE



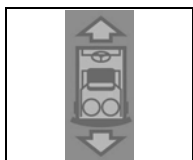
Main switch symbol (key switch)
Used on the instrument panel, to indicate the key switch for machine operation on (ON-I) or off (OFF-O)



Base/squeegee operating symbols
Used to indicate the I-DRIVE programs selector



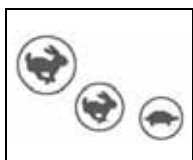
Symbol denoting pressure applied to the brushes
Used to indicate the knob for increasing the brush pressure



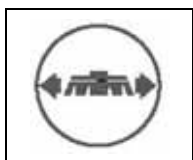
Label showing the direction of movement - forward or reverse
Used to indicate the direction of the machine



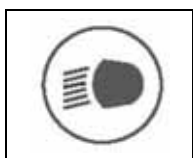
Symbol denoting acoustic alarm
Used to indicate the acoustic alarm button



Symbol denoting forwards and backwards speed selector
Used on the instrument panel, to indicate the speed of the forwards or backwards movements of the machine



Symbol denoting sideways movement of brush base
Used on the instrument panel, to indicate the lever of the brush base. Sideways movements of the lever correspond with sideways movements of the base.



Symbol denoting front/rear lights
Used on the instrument panel, to indicate the lights control switch



Symbol denoting ammeter check of the brush motor
Used on the instrument panel, for the red indicator light showing the brush motor is under pressure (force)



SYMBOLS USED ON THE MACHINE



Symbol denoting incorrect functioning
Used on the instrument panel to indicate the red warning light showing incorrect machine functioning



Symbol denoting brake
Used on the instrument panel to indicate the red warning light showing the absence of oil in the work braking system



Symbol denoting parking brake
Used on the instrument panel to indicate the red warning light showing parking brake on



Symbol denoting solution tank empty
Used on the instrument panel to indicate the red warning light showing a low level of water/detergent solution in the solution tank



Symbol denoting full recovery tank
Used on the instrument panel to indicate the red warning light showing that the dirty water level has reached a critical level



Symbol indicating main switch is on
It is used on the instrument panel to indicate the green warning light showing that the main key switch is in operation



Symbol indicating lights are on
Used on the instrument panel to indicate the green warning light showing that the front lights are on



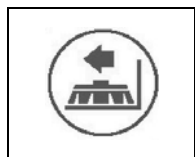
Symbol denoting solenoid valve open
Used on the instrument panel to indicate the green light showing operation of the solenoid valve



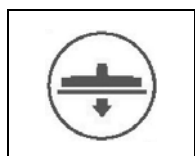
Symbol indicating brush motor in operation
Used on the instrument panel to indicate the green warning light showing the brush motor is in operation



SYMBOLS USED ON THE MACHINE



Symbol denoting sideways movement of brush base
Used on the instrument panel to indicate the green warning light showing the brush head has returned to its normal position.



Symbol indicating movement of the squeegee unit
Used on the instrument panel to indicate the green warning light showing the brush head has reached its operating position.



Symbol denoting left-hand suction motor
Used on the instrument panel to indicate the green warning light showing that the left-hand suction motor is in operation



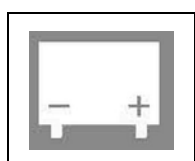
Symbol denoting right-hand suction motor
Used on the instrument panel to indicate the green warning light showing that the left-hand suction motor is in operation



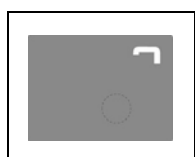
Label warning that squeegee should be cleaned every day



Label warning that recovery tank and solution tank should be cleaned every day



Symbol indicating position for inserting battery charger connector



Symbol denoting tap regulation
Used on the central panel of the steering cover, to indicate the tap lever to regulate the water



Label warning operator to take safety measures to avoid damage to limbs



SYMBOLS USED ON THE MACHINE



Label indicating the position of the suction motor thermal circuit breakers



Label indicating the position of the quick release coupling for filling the solution tank



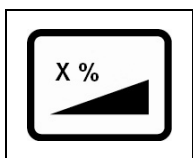
Label indicating the maximum temperature of the water used to fill the solution tank



Label indicating the position of the solution tank drain pipe



Label indicating the position of the recovery tank drain pipe



Indicates the maximum machine operating gradient



Indicates the display service screen confirmation button



Indicator showing battery charge level on the upper line and hour-counter on the lower line



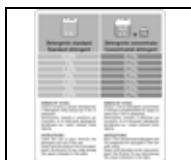
Indicator showing the type of hour-counter (total) on the upper line and the type of service (none) on the lower line



SYMBOLS USED ON THE MACHINE



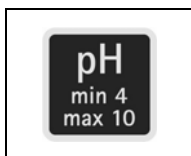
Indicator showing the type of technology of the batteries used (lead)



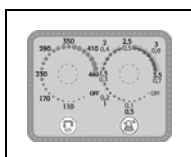
Label with instructions for the use of standard or concentrated detergents (CDS system only)



Label with warnings on the type of detergent to use (CDS system only)



Label with Ph value of the detergent to use (CDS system only)



Symbol indicating regulation of water and detergent quantity (CDS system only)
Used on the left-hand panel, to indicate the knobs for adjusting the percentage level of detergent dissolved in the water, and the level of water distributed on the brushes



Detergent symbol (CDS system only)
Used on the detergent tank cap, to indicate the presence of chemical substances



GENERAL SAFETY REGULATIONS

The following rules must be carefully followed in order to avoid injury to the operator and damage to the machine.

- Read the labels on the machine carefully. Do not cover them for any reason and replace them immediately if they become damaged.
- The machine must be exclusively used by authorised, trained personnel.
- The machine is designed for dry use only and should not be used or kept outdoors in damp conditions.
- Disconnect from the mains/battery before performing cleaning or maintenance operations on the machine.
- If the machine is used where there is a risk of falling objects, the machine must be equipped with protections against falling objects.
- During the working of the machine, pay attention to other people and especially to children.
- The machine is not suitable for cleaning carpets.
- Do not mix different types of detergent as this may produce harmful gases.
- Do not place any liquid containers on the machine.
- The storage temperature must be between -25°C and +55°C; do not store outdoors in damp conditions.
- Conditions of use: room temperature between 0°C and 40°C with relative humidity between 30 and 95%
- Do not use the machine in an explosive atmosphere.
- Do not use the machine as a means of transport.
- Do not use acid solutions that could damage the machine and/or harm people.
- Do not vacuum inflammable liquids.
- Do not use the device to collect dangerous powders.
- In the event of a fire, use a powder extinguisher. Do not use water.
- Do not knock against shelving or scaffolding, where there is a danger of falling objects. Use protective devices (helmet).
- Adapt the speed to the adhesion conditions.
- Do not use the machine on surfaces with an inclination greater than the one shown on the plate.
- When the machine is in parking mode, remove the key and engage the parking brake.
- If you notice any damage to the battery charger cable, contact a **COMAC** technical assistance centre immediately.
- The machine is designed to carry out the washing and drying operations simultaneously. Different operations should only be carried out in areas where the passage of unauthorised persons is prohibited. Signal the presence of damp floors with suitable signs.
- If the machine does not work properly, check this is not caused by failure to carry out routine maintenance. Otherwise, request the intervention of the **COMAC** technical assistance centre.
- If you need to replace any components, request the ORIGINAL spare parts from a **COMAC** dealer and/or Authorised Retailer.
- Use original **COMAC** brushes only indicated in the paragraph "CHOOSING AND USING THE BRUSHES".
- In the event of danger, activate the emergency lever (connector placed under the operator's seat) immediately.
- Before carrying out any maintenance work, switch off the machine and disconnect the battery connector.
- Restore all electrical connections after any maintenance interventions.
- Do not remove any protection devices which require the use of tools in order to be removed.
- Do not wash the machine with direct water jets or with pressurised water, nor with corrosive substances.
- After at least every 200 hours of operation, have the machine checked by a **COMAC** assistance centre
- To prevent scaling in the solution tank filter, do not fill the tank with detergent solution many hours before using the machine.
- Before using the machine, check that all the hatches and covers are positioned as shown in this Use and Maintenance Manual.
- Make sure the recovery tank is empty before lifting.
- When disposing of consumption materials, observe the laws and regulations in force.
- The machine does not cause harmful vibrations.
- When your **COMAC** machine has reached the end of its long working life, dispose of the materials it contains (especially oils, batteries and electronic components) in an appropriate manner, and bearing in mind that the machine itself was constructed using 100% recyclable materials.
- The batteries must be removed from the machine before its disposal.
- The batteries must be disposed of in a safe manner, fully observing the laws and regulations in force.
- The machine is not suitable for use by children and persons with reduced physical, mental and sensory capabilities, or people who lack experience and knowledge.
- Children must be supervised to ensure they do not play with the device.
- When the machine is left unattended, engage the parking brake for safety against unintentional movements.



MACHINE PREPARATION

1. HANDLING THE PACKAGED MACHINE

The machine is contained in specific packaging with a pallet for the handling with fork trucks. The packages cannot be placed on top of each other.

The total mass of the machine with packaging is 770 kg (without batteries).

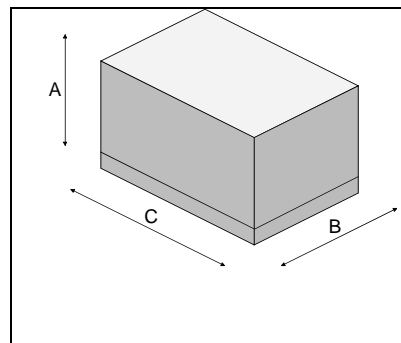
The dimensions of the packaging is as follows:

ULTRA120 B

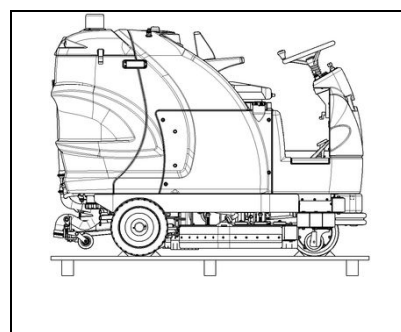
A : 1760 mm

B : 1335 mm

C : 2135 mm



1. Remove the outer packaging.
2. The machine is fixed to the pallet with wedges which block the wheels.
3. Remove the wedges.
4. Use a chute to get the machine down from the pallet, pushing it backwards. Do not assemble the rear squeegee before unloading the machine, and avoid violently jolting the brush base. To assemble the squeegee, read the "ASSEMBLING THE SQUEEGEE" paragraph.



5. Keep the pallet for any future transport needs.

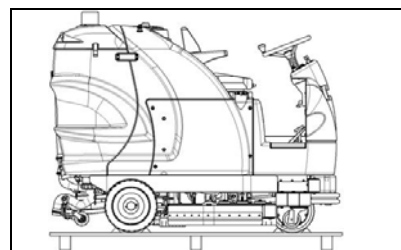


ATTENTION: if the product is delivered in cardboard containers, handle the packed product with suitable lifting means that comply with the legal requirements.

WARNING: During this operation, check there are no people or objects near the machine

2. HOW TO MOVE THE MACHINE

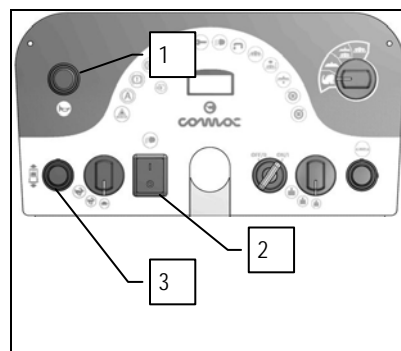
1. Make sure the solution tank and the recovery tank are empty
2. Make sure that the detergent can is empty (CDS version)
3. Check that the brush head and squeegee are in the raised position
4. Place it on a pallet using a chute
5. Check that the key switch is in the "0" position and remove the key
6. Engage the parking brake
7. Secure the machine to the pallet using wooden wedges



3. INSTRUMENT PANEL COMPONENTS

The instrument panel components are identified as follows:

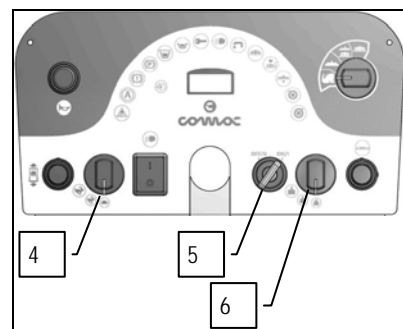
1. Horn button
2. Toggle switch for turning the machine lights on/off
3. Knob to control direction of machine movement (forward/reverse)



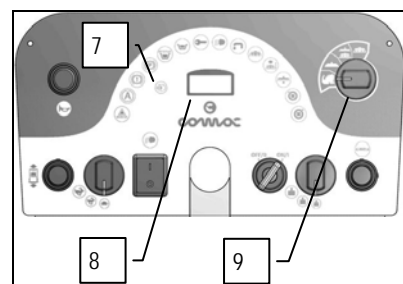


MACHINE PREPARATION

- 4. 3-way switch to set working speed
- 5. Main key switch
- 6. 3-way switch to set force applied to brushes during operation

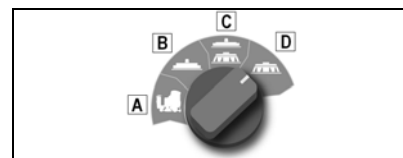


- 7. Display service confirmation button
- 8. Battery level / hour-counter display
- 9. Working program adjustment switch, I-Drive device

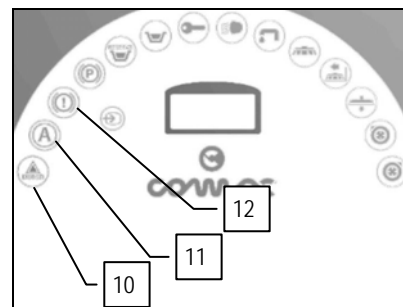


Choose the desired operating program with the I-Drive device:

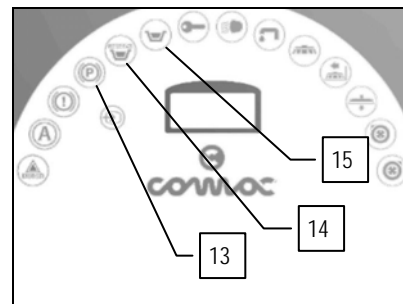
- A. Transfer: movement of the machine without working
- B. Drying: use the squeegee only
- C. Washing / Drying: use both the brushes and the squeegee
- D. Washing only: use brushes only



- 10. Red warning light indicating that the motor brush head is working under pressure (force)
- 11. Red warning light indicating that there is a malfunction in the machine traction
- 12. Red warning light indicating low brake oil level (down to reserve)



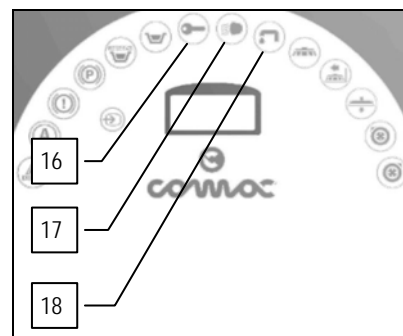
- 13. Red warning light indicating that the parking brake is on
- 14. Red warning light indicating that the level of detergent solution (version without CDS) or the water level (version with CDS) is low (down to reserve)
- 15. Red warning light indicating that the level of dirty water in the recovery tank has reached a critical level for correct operation of the suction motors



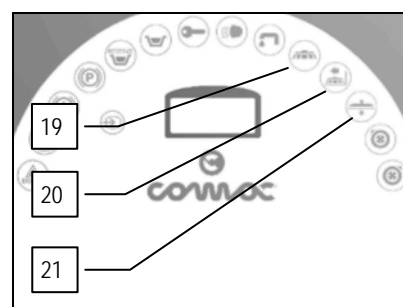


MACHINE PREPARATION

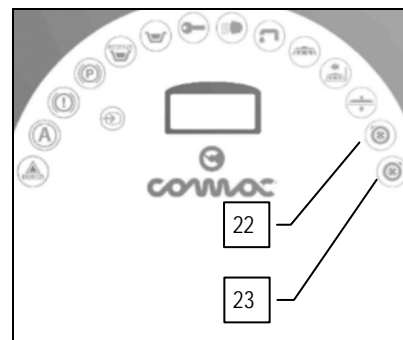
- 16. Green warning light indicating that the main switch of the machine is active
- 17. Green warning light indicating that the machine headlights are on
- 18. Green warning light indicating that the solenoid valve is in operation



- 19. Green warning light indicating that the brush head motor is in operation
- 20. Green warning light indicating that the brush head unit has returned to the normal position
- 21. Green warning light indicating that the squeegee unit has reached its operating position



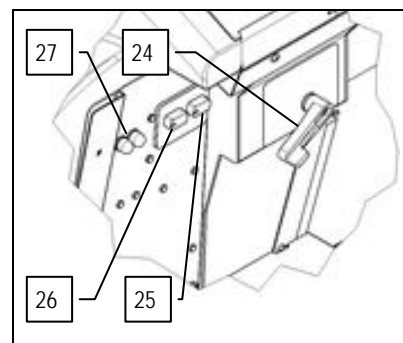
- 22. Green warning light indicating that the left-hand suction motor is in operation
- 23. Green warning light indicating that the right-hand suction motor is in operation



4. STEERING COLUMN COMPONENTS

The steering column components are identified as follows:

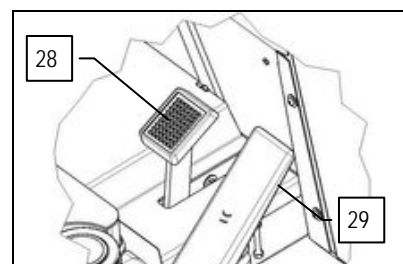
- 24. Solution/water control lever
- 25. Detergent adjustment knob (CDS version)
- 26. Water adjustment knob (CDS version)
- 27. Suction motor thermal circuit breakers



5. FOOTBOARD COMPONENTS

The components at the front right of the footboard are identified as follows:

- 28. accelerator pedal
- 29. Brake pedal



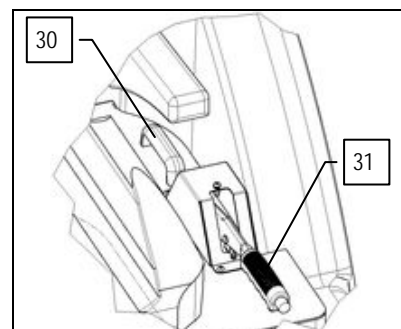


MACHINE PREPARATION

6. SEAT MOUNTING PLATE COMPONENTS

The seat mounting plate components are identified as follows:

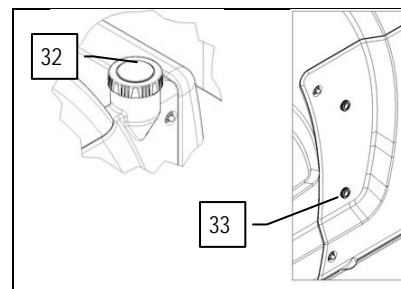
- 30. Handle for raising seat plate
- 31. Parking brake lever



7. MACHINE'S SIDE COMPONENTS

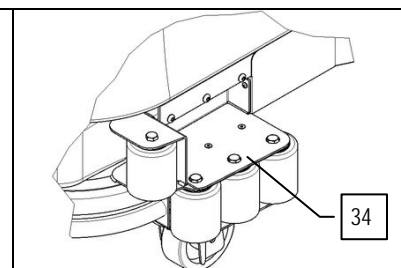
The components on the right-hand side of the machine are identified as follows:

- 32. Detergent filler cap (CDS version)
- 33. Detergent level warning light (CDS version)



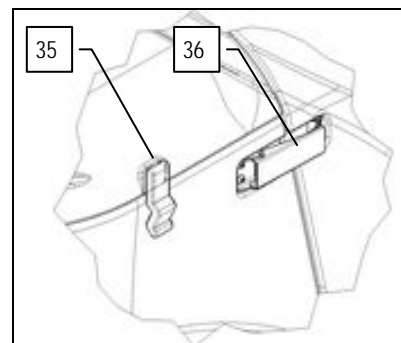
The components on the front/side of the machine are identified as follows:

- 34. Step to assist getting on to machine



The components on the rear/side of the machine are identified as follows:

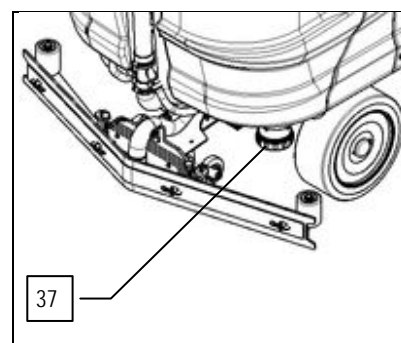
- 35. Suction cover release hinge
- 36. Recovery tank release hinge



8. MACHINE'S REAR COMPONENTS

The rear components of the machine are identified as follows:

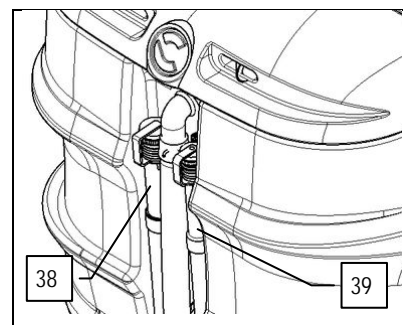
- 37. Solution tank drainage cap



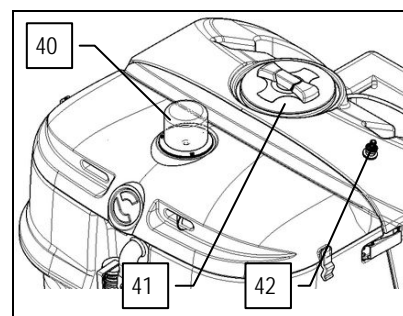


MACHINE PREPARATION

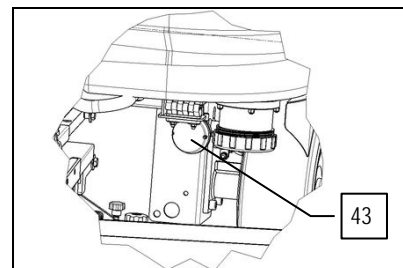
- 38. Recovery tank drain pipe
- 39. Solution tank drain pipe



- 40. Flashing warning light
- 41. Water/detergent solution filler cap
- 42. Rapid refill kit (optional)



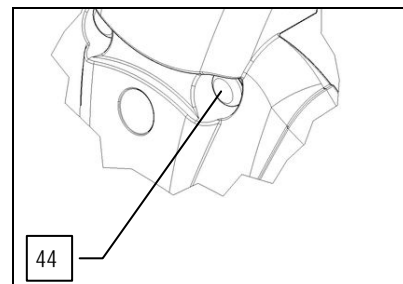
- 43. Rear lights



9. MACHINE'S FRONT COMPONENTS

The front components of the machine are identified as follows:

- 44. Headlights



10. TYPE OF BATTERY

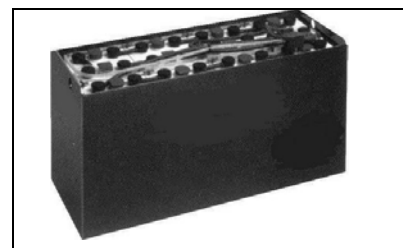
To power the machine it is necessary to use:

- liquidelectrolyte lead traction batteries;
- sealed traction batteries with gasrecombination or gel technology.

OTHER TYPES MUST NOT BE USED.

The batteries must meet the requirements laid out in the norms: CEI EN 60254-1:2005-12 (CEI 21-5) + CEI EN 60254-2:2008-06 (CEI 21-7).

For a good working performance, we suggest the use of four 18V/480 Ah batteries





MACHINE PREPARATION

11. BATTERY MAINTENANCE AND DISPOSAL

For maintenance and recharging, comply with the instructions provided by the battery manufacturer. Particular attention must be paid when choosing the battery charger, if not supplied, since there are different kinds according to the type and capacity of the battery. When the battery reaches the end of its working life, it must be disconnected by expert, trained personnel, then lifted (using the grips and suitable lifting devices) to remove it from the battery compartment. **DEAD BATTERIES ARE CLASSIFIED AS DANGEROUS WASTE AND MUST BE DELIVERED TO THE AUTHORISED BODIES FOR CORRECT DISPOSAL.**



WARNING: you are advised to always wear protective gloves, to avoid the risk of serious injury to your hands



WARNING: You are advised to only lift and move the batteries with lifting and transportation means suitable for the specific weight and size

12. HANDLING - INSERTING BATTERIES

The batteries must be housed in the special compartment beneath the seat mounting plate. They should be handled using lifting equipment that is suitable in terms of both weight and method of lifting. They must also satisfy the requirements of the CEI 21-5 standard. The dimensions of the battery compartment are: 879 mm x 599 mm x H450 mm.



WARNING: For battery maintenance and daily recharging, you must carefully follow the instructions provided by the manufacturer or retailer. All installation and maintenance operations must be carried out by specialised personnel.

To insert batteries proceed as follows:

1. Immobilise the machine with the parking brake
2. Make sure the main switch is in the "0" position
3. Remove the right-hand cover (1) by unscrewing the nuts (2)

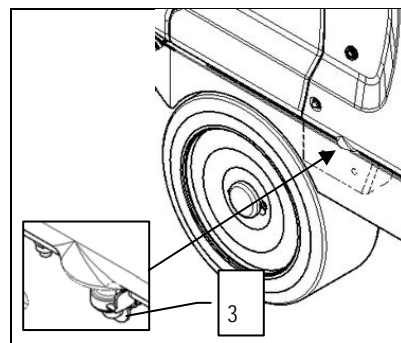
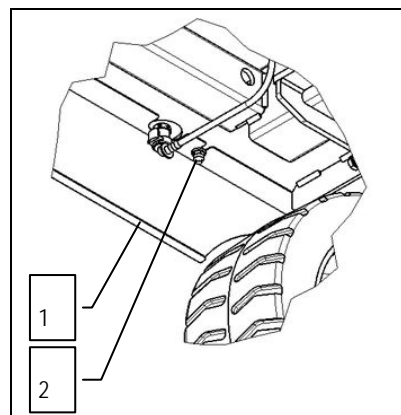


WARNING: you are advised to use airtight batteries only, to avoid the leakage of acids!



ATTENTION: you are advised to always wear protective gloves, to avoid the risk of serious injury to your hands

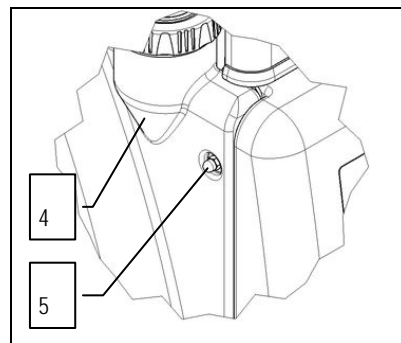
4. Disconnect the quick release coupling (3) located behind the side cover, to prevent damage to the coupling itself (CDS version)



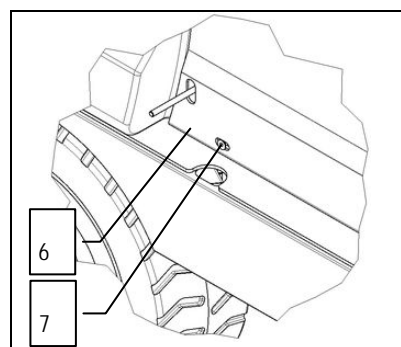


MACHINE PREPARATION

5. Remove the detergent tank (4) by unscrewing the nuts (5)



6. Remove the battery compartment cover (6) by unscrewing the nuts (7)
7. Grip the handle at the side of the seat to raise the seat mounting plate, move it to the end of travel stop
8. Place the batteries inside the battery compartment using transport and handling equipment suitable for the weight and size of the batteries
9. Place the batteries in the battery compartment with the "+" and "-" poles opposite each other



ATTENTION: You are advised to only lift and move the batteries with lifting and transportation means suitable for the specific weight and size

13. BATTERY CONNECTION AND BATTERY CONNECTORS

1. Connect the batteries in series to the "+" and "-" poles using the supplied jumper cable
2. Connect the battery connector cable to the "+" and "-" poles in order to obtain a voltage of 36V at the connection terminals
3. Connect the battery connector cable to the machine connector



ATTENTION: you are advised to have the electric connections made by a qualified, COMAC-trained technician



ATTENTION: you are advised to always wear protective gloves, to avoid the risk of serious injury to your hands

14. CONNECTING THE BATTERY CHARGER

In order not to cause permanent damage to the batteries it is essential to avoid their complete discharge: arrange the recharge within a few minutes of the switching on of the flashing "discharged batteries" signal.



ATTENTION: never leave the batteries completely discharged, even if the machine is not being used. Check the battery charger is suitable for the batteries installed, in terms of both capacity and type.



MACHINE PREPARATION

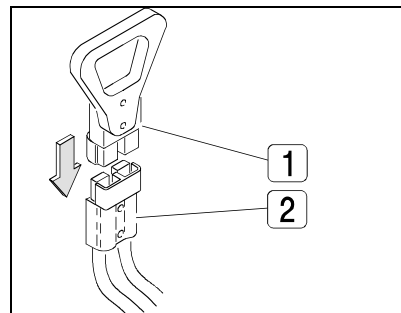
To connect the battery charger you must:

1. Move the machine near to the battery charger
2. Make sure that the key switch in the "0" position
3. Engage the parking brake
4. Grip the handle at the side of the seat to raise the seat mounting plate
5. Disconnect the electrical system connector (1) from the battery connector (2)
6. Connecting the battery charger cable connector

The coupling connector of the battery charger is supplied inside the bag containing this instruction booklet, and must be fitted to the battery charger cables as shown in the instructions.



ATTENTION: this process must be carried out by qualified personnel. Incorrect connection of the connector may cause machine malfunctions.



7. Connect the rewired cable to the external battery charger
8. After the charging cycle is complete, the battery connector (2) must be reconnected to the electrical system connector (1)



ATTENTION: Carefully read the use and maintenance instructions of the battery charger that is used for charging.



WARNING: Keep the seat mounting plate raised for the whole duration of the battery recharging cycle to allow gas fumes to escape



ATTENTION: danger of exhalation of gas and leakage of corrosive liquids



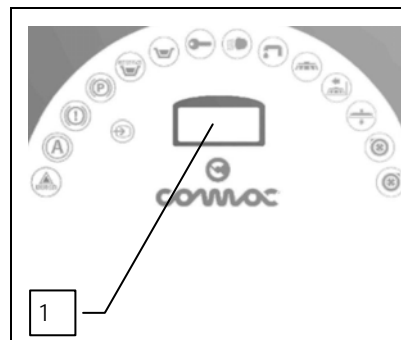
ATTENTION: danger of fire: do not go near with free flames

15. BATTERY CHARGE LEVEL INDICATOR

On the instrument panel of the machine there is a monitor (1) indicating (amongst other things) the battery charge status. If the upper line contains 8 light indicators, the battery charge level is 100%. If the edges of the indicators are flashing, this means the batteries are run down.



ATTENTION: a few seconds after the last indicator on the monitor has flashed, the brush motor will automatically switch off. With the remaining charge it is possible to complete the drying process before recharging

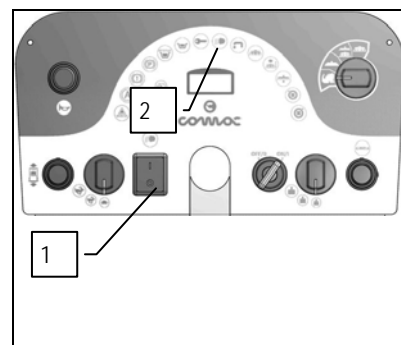




MACHINE PREPARATION

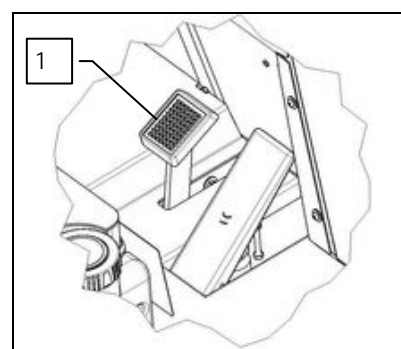
16. TURNING LIGHTS ON/OFF

The machine is equipped with two headlights and a rear spotlight, to help the operator to work in low light. To switch on the headlights simply turn the switch (1) located on the instrument panel to the "I" position and the green indicator light (2) on the instrument panel will immediately illuminate; the lights will remain on until you again operate the switch.

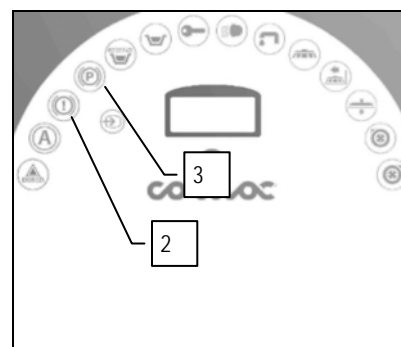


17. SERVICE BRAKE – PARKING BRAKE

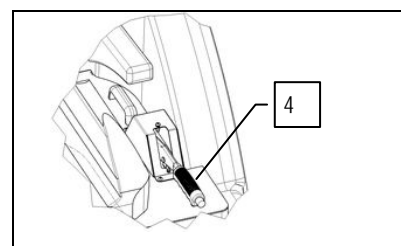
The machine has an electronic braking system. To brake, in normal conditions, just remove your foot from the accelerator pedal. If this service brake is working badly, or if necessary, activate the brake pedal (1) pushing it downwards.



In case of lack of oil in the braking system, the red warning light (2) on the instrument panel will come on; check the level in the brake oil tank located behind the vehicle nose.

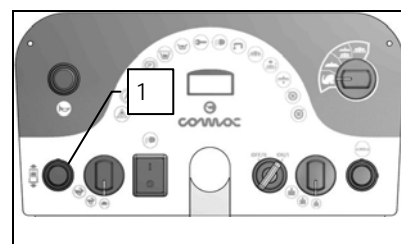


To engage the parking brake pull the lever (4) located near the seat, the red warning light (3) on the instrument panel will come on.



18. WORKING FORWARD SPEED

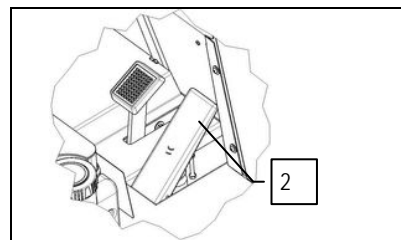
This machine is equipped with electronic traction control. To move the machine, after turning the ignition key to "ON - I", you must select the direction of movement by operating the switch (1) located on the instrument panel.





MACHINE PREPARATION

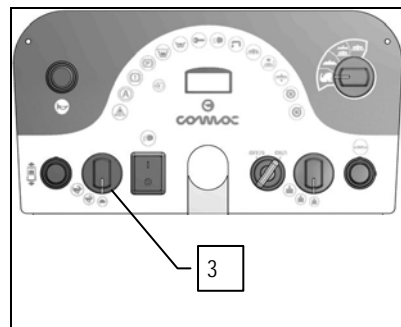
To set the machine in motion, simply depress the accelerator pedal (2); the machine speed is controlled by varying the pressure on the pedal.



The machine has three preset speed levels, to select them simply operate the switch (3) on the instrument panel; the forward speed during operation depends on the amount of dirt to be removed and the type of floor to be cleaned.

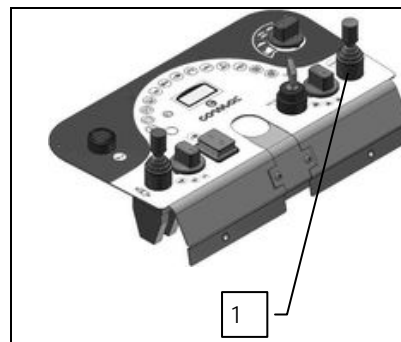


ATTENTION! The reverse speed is lower than the forward speed to comply with current health and safety standards.



19. MOVEMENT OF THE BRUSH HEAD UNIT

This machine is able to move the brush head unit towards the right-hand side of the machine; simply move the knob (1) on the instrument panel to the right, to move the brush head back move the knob (1) to the left.



20. INCREASING THE PRESSURE ON THE BRUSH HEAD UNIT

This machine can increase the pressure on the brushes via the knob (1) located on the instrument panel; it has three different settings:

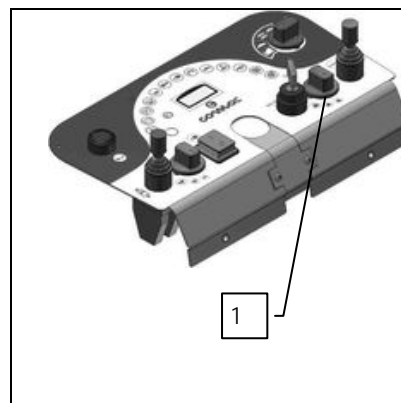
Step01: the weight exerted on the floor is 133 kg.

Step02: the weight exerted on the floor is 150 kg.

Step03: the weight exerted on the floor is 168 kg.



ATTENTION! The pressure must be chosen according to the type of floor and the amount of dirt. Increasing the pressure results in greater wear and tear on the brushes and higher power consumption (for further information, read "CHOOSING AND USING THE BRUSHES")





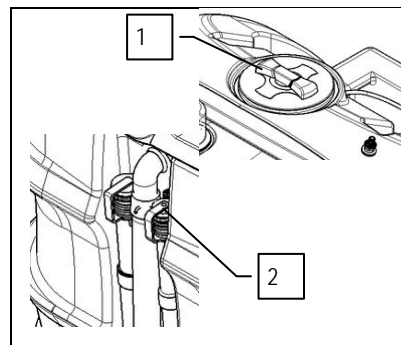
MACHINE PREPARATION

21. SOLUTION TANK

Remove the filler plug (1) at the back of the seat and check that the solution filter is installed properly. Check that the drain pipe cap (2) located at the rear of the machine is properly closed.



WARNING: The recovery tank must be completely empty each time the solution tank is filled.

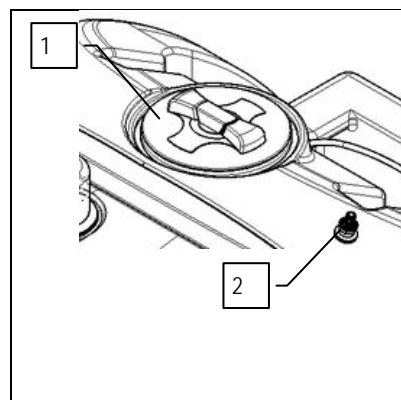


22. FILLING THE DETERGENT/SOLUTION TANK (VERSION WITHOUT CDS)

Proceed as follows to fill the solution tank:

1. Check that the recovery tank is empty, otherwise empty it.
2. Turn the main switch key anticlockwise to the "0" position
3. Engage the parking brake
4. Remove the filler cap (1) and check that the solution filter is fitted correctly
5. Fill it with clean water at a temperature not exceeding 50°C.

It is possible to fill the tank without having to constantly watch the water level, using the optional rapid filling system (2); this system is fitted with a float to control overflow. The water pipe (previously modified) is inserted into the quick release coupling; remember to unscrew the cap (1) to allow proper air venting.



The solution tank has a maximum capacity of about 280 litres. Add the liquid detergent to the tank in the concentration and manner indicated on the detergent manufacturer's label. The formation of excess foam could damage the suction motors, so only use the minimum amount of detergent needed.



ATTENTION: always use detergents whose manufacturer's label indicates their suitability for scrubbing machines. Do not use acid or alkaline products or solvents without this indication.
In addition, you are advised to always use low foam detergents.
Do not use pure acids or detergents with a stronger gradation than that indicated on the label supplied.



ATTENTION: Protective gloves should always be worn before handling detergents or acidic or alkaline solutions to avoid serious injury to hands.



ATTENTION: always use low foam detergent. To avoid the production of foam, before starting to clean, put a minimum quantity of antifoam liquid into the recovery tank. Do not use pure acids.



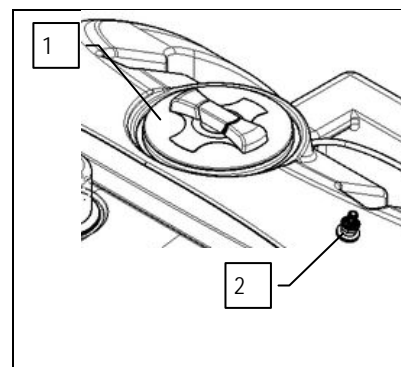
MACHINE PREPARATION

23. FILLING THE DETERGENT/SOLUTION TANK (VERSION WITH CDS)

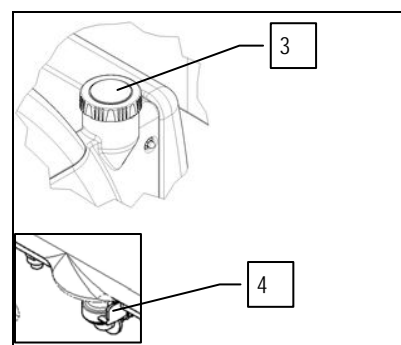
Proceed as follows to fill the solution tank:

1. Turn the main switch key anticlockwise to the "0" position
2. Engage the parking brake
3. Remove the filler cap (1) and check that the solution filter is fitted correctly
4. Fill it with clean water at a temperature not exceeding 50°C.

It is possible to fill the tank without having to constantly watch the water level, using the optional rapid filling system (2); this system is fitted with a float to control overflow. The water pipe (previously modified) is inserted into the quick release coupling; remember to unscrew the cap (1) to allow proper air venting.



5. Unscrew the cap (3) of the tank on the right-hand side of the machine and fill with liquid detergent as indicated on the label supplied with the machine. Make sure you properly close the screw cap to avoid liquid leakage during the operation; also check that the quick release coupling (4) under the detergent tank is properly fitted.



To regulate the water/detergent mixture, carefully read the "REGULATING THE DETERGENT WITH THE CDS SYSTEM" paragraph.

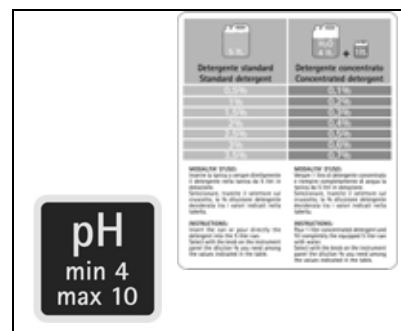


ATTENTION: The DS automatic dosing system is designed to work with any liquid detergent. For this reason, the percentage of detergent in the solution is subject to a maximum error of 5% compared with the nominal value selected.



WARNING: The dosing system is suitable for frequent maintenance cleaning. Acid or alkaline maintenance detergent tank be used with pH values between 4 and 10 and that do not contain: oxidising agents, chlorine or bromine, formaldehyde, mineral solvents.

The detergents used must be suitable for use with scrubbing machines. Wash the circuit with water after use if the system is not used daily. The system is excludable. In case of sporadic use of detergents with pH between 1-3 or 11-14, use the scrubbing machine in the traditional way by adding the detergent in the clean water tank and excluding the dosing circuit.



ATTENTION: always use detergents whose manufacturer's label indicates their suitability for scrubbing machines. Do not use acid or alkaline products or solvents without this indication.

In addition, you are advised to always use low foam detergents.

Do not use pure acids or detergents with a stronger gradation than that indicated on the label supplied.



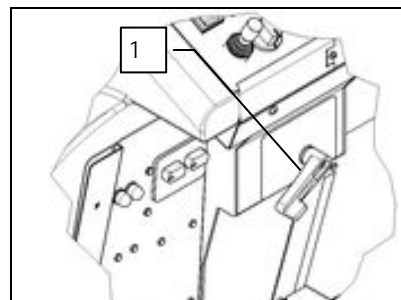
ATTENTION: Protective gloves should always be worn before handling detergents or acidic or alkaline solutions to avoid serious injury to hands.



MACHINE PREPARATION

24. DETERGENT REGULATION (VERSION WITHOUT CDS)

First, fully open the tap in the rear part of the machine by turning the lever (1) anticlockwise. Choose the required work programme using the I-Drive device; press the accelerator pedal to operate the brushes, the machine starts to move and the detergent solution starts to come out. In the first few metres, check that the quantity of solution is sufficient to wet the floor, but not so much that it goes beyond the splash guard. The amount of detergent released can be adjusted by turning the lever (1): turn it clockwise to reduce the flow and anticlockwise to increase it. If turned fully to the right the flow of detergent is stopped. Bear in mind that the correct amount of solution is always depends on the nature of the floor, the degree of dirt and the forward speed.

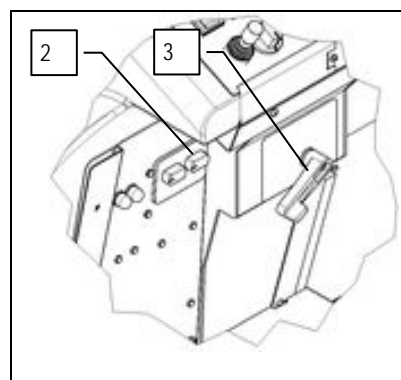
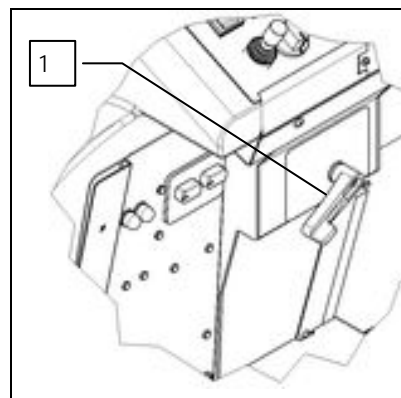


25. DETERGENT REGULATION (VERSION WITH CDS)

First, fully open the tap in the rear part of the machine by turning the lever (1) anticlockwise. Choose the required work programme using the I-Drive device; press the accelerator pedal to operate the brushes, the machine starts to move and the detergent solution starts to come out. During the first few metres make the following adjustments:

1. Regulate the flow of detergent solution to the brushes by rotating the upper knob (2) clockwise. The quantity of solution varies from a minimum of 30 litres/hour to a maximum of 75 litres/hour, with 7 set measurement points. The right solution flow should be proportional to the degree of dirt on the floor. In addition, remember that the time available for continuous working depends on the quantity of water in the tank: for example, working endurance with a full tank (about 48 litres) and the selector (2) on 30 is about 1.5 hours.
2. Regulate the percentage of liquid detergent in the solution by rotating the lower knob (3) clockwise. The lower value is equal to 0.5% (for standard detergents) or 0.1% (for a concentrated detergent, diluted as indicated on the label supplied with the machine), while the higher value is equal to 3.5% or 0.7%, with 7 set points. Use high detergent percentages to remove very greasy dirt from the floor.

To avoid any tampering with the set regulation, you can remove the two switches and cover the two holes with the plastic caps supplied with the machine.

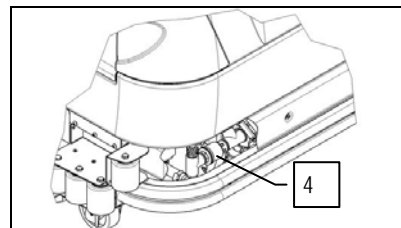


WARNING: Verify that the tap lever (1) is fully open; the lever is located at the rear of the steering column.

WARNING: If the CDS system fails to work, or you want to clean without using this device, operate the tap (4) fitted to the brush head near the motor, turning the lever 180° as shown in the figure. Also turn the knobs (2) and (3) anticlockwise, to the "OFF" position.

ATTENTION: before regulating the solution, check there is detergent in the inner can, and that the side water tap is turned on.

To resolve any malfunctioning of the CDS system, contact the COMAC assistance centre.

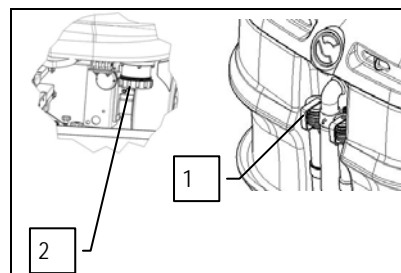


26. RECOVERY TANK

Make sure the recovery tank is empty, otherwise empty it completely.

Check the cap of the drainage tube (1) (on the rear of the machine) is correctly closed.

Check that the drain pipe cap (2) at the rear of the machine is correctly closed.





MACHINE PREPARATION

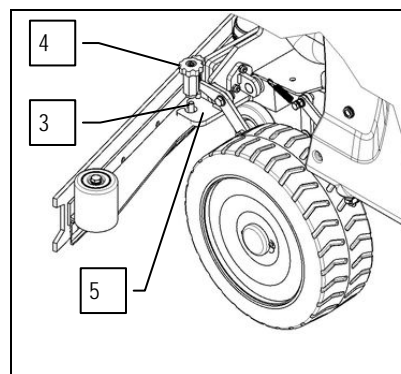
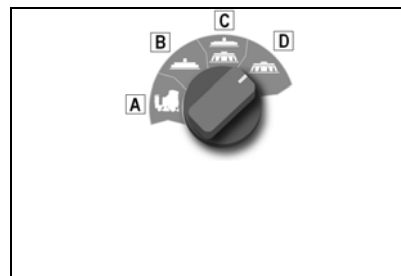
27. ASSEMBLING THE SQUEEGEE

The squeegee, that for reasons of packaging comes disassembled from the machine, must be assembled while assembling the machine. Proceed as follows for assembly:

1. Make sure the squeegee unit is raised, and that the selected work programme is "Transport" (position A).
 2. Turn the main switch key anticlockwise to the "0" position
 3. Engage the parking brake located on the left side of the machine
 4. Remove the key from the instrument panel
5. First insert the right-hand pin of the squeegee (3) into the right-hand slot of the squeegee support and screw the stud (4) on to the pin, making sure they fit tightly into their seats on the squeegee support (5)
 6. Insert the left-hand pin of the squeegee into the left-hand slot of the squeegee support and screw the stud on to the pin, making sure they fit tightly into their seats on the squeegee support
 7. Insert the suction hose into the squeegee coupling and secure it with the clamp; also verify correct insertion of the suction hoses from the brush head cover

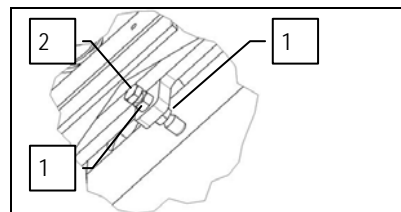


ATTENTION: these operations must be carried out using protective gloves to avoid any possible contact with the edges or tips of metal objects



28. ADJUSTING THE SQUEEGEE INCLINATION

During operation, the rear rubber must operate bent slightly backwards (by about 5 mm) uniformly over its whole length. If it is necessary to increase the curvature of the rubber in the central section, you must tilt the squeegee unit backwards, by loosening the locknut (1) and turning the screw (2) anticlockwise. To increase the bending of the rubber at the sides of the squeegee, loosen the locknut (1) and rotate the screw (2) clockwise. When fully adjusted, fix the locknut.



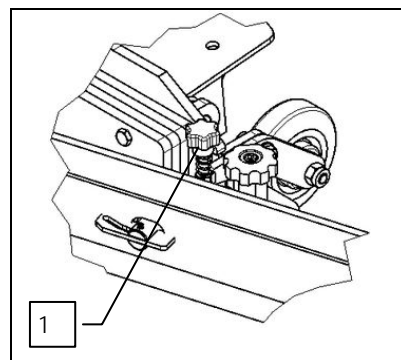
29. ADJUSTING THE SQUEEGEE HEIGHT

The height of the squeegee must be adjusted on the basis of the state of wear and tear of the rubber. To do this, turn the knob (1) anticlockwise to raise the squeegee, and clockwise to lower it.

Remarks: the right and left wheels must be adjusted to the same level, so the squeegee can work parallel to the floor.



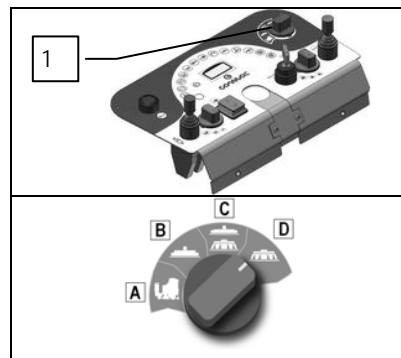
ATTENTION: these operations must be carried out using protective gloves to avoid any possible contact with the edges or tips of metal objects



30. ASSEMBLING THE BRUSH

Proceed as follows to assemble the brush:

1. Lift the brush head unit by operating the knob (1), the selected work programme must be "Transport" (position A)
2. Turn the main switch key anticlockwise to the "0" position
3. Engage the parking brake located on the left side of the machine
4. Remove the key from the instrument panel



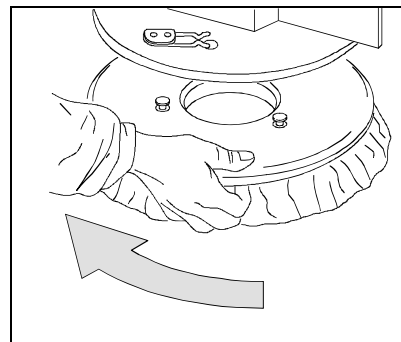


MACHINE PREPARATION

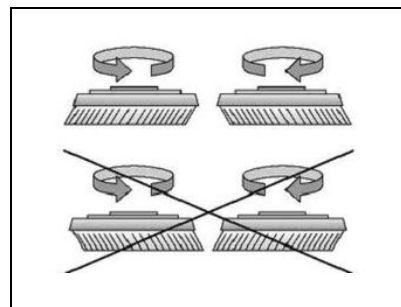


WARNING: during this operation, verify that there are no people or objects near the brush.

5. With the base up, insert the brushes in the plate housing beneath the base, turning them until the three pins enter the niches in the plate itself; turn until the pin is pushed towards the coupling spring and is locked into place. The photo shows the rotation direction to hook up the right-hand brush; for the left-hand one, rotate in the opposite direction.



You are advised to invert the right and left-hand brushes every day. If the brushes are not new however, and have deformed bristles, it is better to reassemble them in the same position (the right-hand one on the right, and the left-hand one on the left), to prevent the different inclination of the bristles producing an overload on the brush motor as well as excessive vibrations.



ATTENTION: during this operation, check there are no people or objects near the brush.

ATTENTION: Make sure the brushes are correctly connected. If this is not the case, the machine could move in an irregular, sudden manner.



ATTENTION: you are advised to always wear protective gloves, to avoid the risk of serious injury to your hands

31. DETERGENT PUMP PRIMING (VERSIONS WITH CDS)

Before starting work the detergent pump must be primed, to do so proceed as follows:

1. Check that the main switch is in the "Off – 0" position
2. Check that the battery connector is disconnected from the machine connector
3. Check the parking brake is correctly engaged
4. Make sure the recovery tank is empty, otherwise empty it completely
5. Check that the quick release coupling (1) under the detergent tank is properly fitted



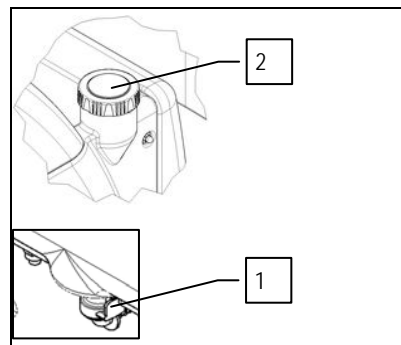
MACHINE PREPARATION

6. Unscrew the cap of the detergent canister (2) and fill it with the desired product

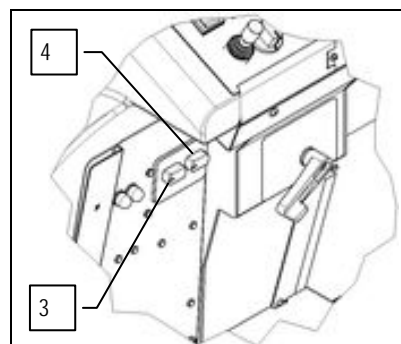


WARNING: always use low foam detergent. To avoid the production of foam, before starting to clean, put a minimum quantity of antifoam liquid into the recovery tank. Do not use pure acids.

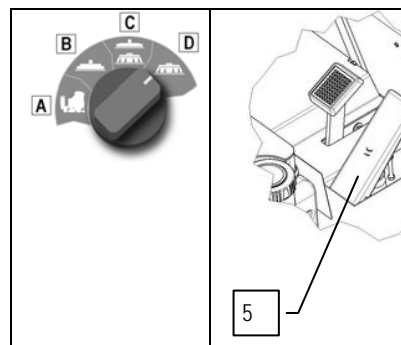
7. Refit the cap of the detergent tank
8. Check there is clean water in the solution tank



9. Check that the tap lever is fully opened, the lever is positioned at the rear of the machine.
10. Check that the by-pass tap is in the "dosing system" position
11. Turn the water flow rate adjustment knob (3) to the maximum position
12. Turn the detergent percentage adjustment knob (4) to the maximum position
13. Insert the battery connector into the machine connector.
14. Place the main switch in position "ON - I"
15. Disengage the parking brake



16. Make sure that the work programme is set to "Work" (position C).
17. Press the accelerator pedal (5) gently to activate the brush head and the dosing system
18. Wait a few moments, keeping the accelerator pedal gently depressed (normally 20 to 40 seconds) to allow engagement of the system
19. Proceed with the desired adjustment for normal cleaning

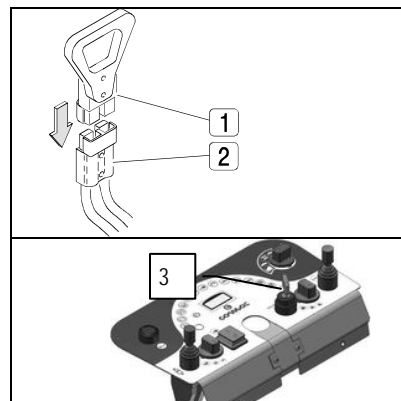




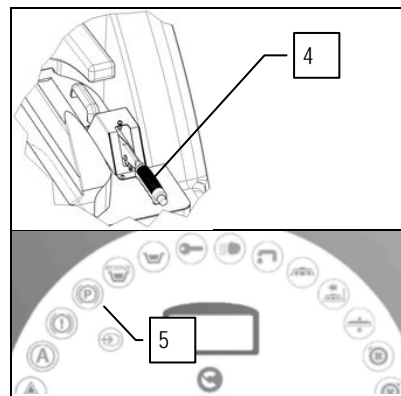
WORK

32. MACHINE PREPARATION

1. Make sure the recovery tank is empty, otherwise empty it completely
2. Check that the main switch (3) of the machine is set to "0"
3. Connect the battery connector (2) to the electric system connector (1)
4. Sit on the driver's seat



5. Check the parking brake is released (4), the warning light (5) on the instrument panel will go out.
6. Turn the key of the main switch a quarter of a turn clockwise (to position 1). Immediately, on the instrument panel, the display will turn on indicating the charge level of the batteries.



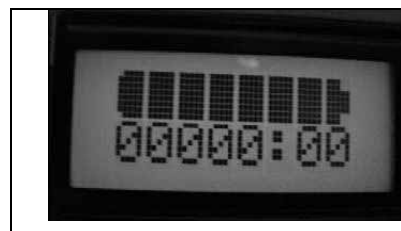
7. With switch-on, three consecutive screens are displayed on the monitor. The first screen shows (on the top line) what type of hour-counter has been set; in this case it is a total hour-counter (to display a different type - for instance partial - contact the qualified, COMAC-trained personnel). The bottom line shows the "service" setting (in this case there is no setting).



8. The second screen displays what battery technology has been set for machine operation; in this case it is lead batteries (to set another type of battery - for instance gel - contact the qualified, COMAC-trained personnel).



9. The third and last screen (known as "work") displays the battery charge status and the total functioning time. When the batteries supplied are fully charged, the upper line contains 8 light indicators that represent a battery. As the batteries gradually run down, the indicators go out and, with the batteries completely run down, only the battery outline flashes. The bottom line indicates the hours and minutes of functioning. The flashing ":" symbol indicates that the hour-counter is counting the machine functioning time.

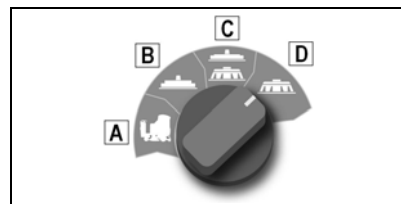




WORK

10. Choose the desired operating program with the I-Drive device:

- A. Transfer: movement of the machine without working
- B. Drying: use the squeegee only
- C. Washing / Drying: use both the brushes and the squeegee
- D. Washing only: use brushes only



11. Choose the forward operating speed by operating the knob (6) on the instrument panel

This machine can operate at three different speeds: via the knob (6) located on the instrument panel you have three different settings:

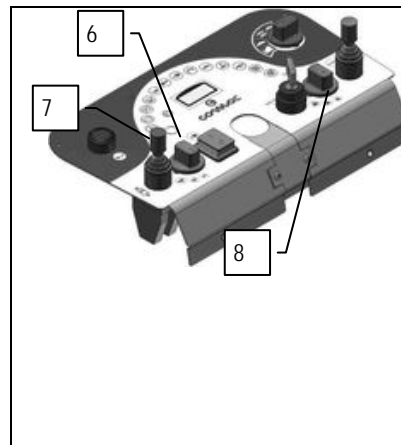
Step01: the maximum speed is 3.9 km/h

Step02: the maximum speed is 5.7 km/h

Step03: the maximum speed is 8 km/h



ATTENTION! The reverse speed is lower than the forward speed to comply with current health and safety standards.



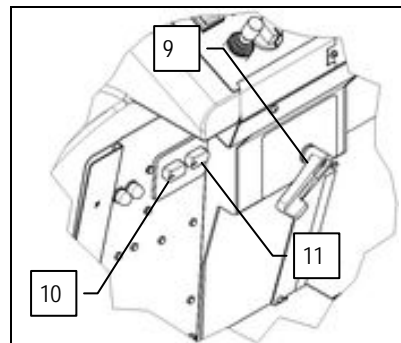
12. Choose the direction of movement by operating the knob (7) on the instrument panel

13. Choose the pressure exerted on the brushes by operating the knob (8) on the instrument panel

14. If the machine does not have the CDS device, move the tap lever (9) anticlockwise and adjust the amount of solution required.

15. If the machine is equipped with the CDS dosing system, the tap lever (10) must be turned fully anticlockwise, allowing maximum flow of water. This lever should not be used to make adjustments. To obtain the correct dose to the brushes, use only the knobs for adjusting the amount of water solution (10) and detergent (11). See paragraph "DETERGENT ADJUSTMENT WITH CDS SYSTEM".

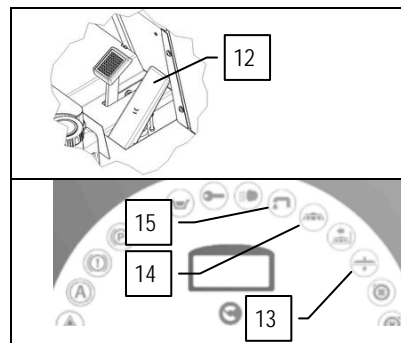
To avoid any tampering with the set regulation, you can remove the two switches and cover the two holes with the plastic caps supplied with the machine.



16. When you depress the accelerator pedal (12), the machine starts moving, the squeegee is automatically lowered, the warning light (13) indicating that the squeegee is in motion will come on automatically and the suction motors will start operating. At the same time the brush head is also automatically lowered and the warning light (14) indicating that the brush head motor is in operation will come on automatically. This will happen only if the I-Drive selector is set to work program 3.

17. As soon as the brush head is in the work position, the solenoid valve will begin operating and the warning light (15) indicating that the valve is operating will automatically come on.

During the first meters, check there is sufficient solution and that the squeegee dries perfectly. The machine will start working in good working order up to run out of detergent solution or until the battery is discharged.

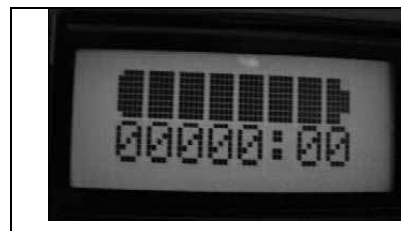




WORK

As the batteries run out, the battery charge indicators on the display will go blank; when the batteries are fully discharged the brush motor automatically turns off, it is therefore necessary to recharge them as soon as possible.

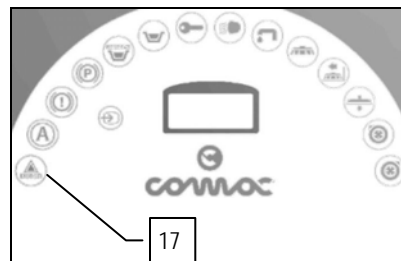
A residual charge remains available to complete the drying process and to move the machine to the charging point; to do this, choose the "Transfer" programme.



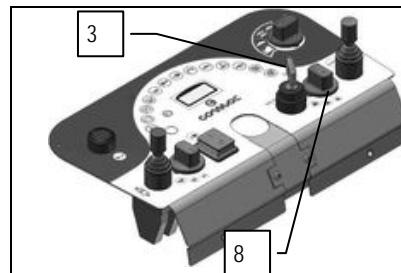
When the level of solution (for versions without CDS) or water (for versions with CDS) is about to run out, the red warning light (16) on the instrument panel will come on; when the solution or water is completely used up, take the machine to the place designated for emptying the recovery tank. On completion of the emptying operation, refill the solution tank.



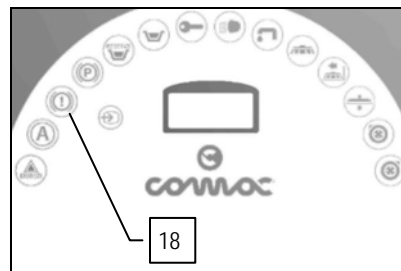
When the brush motor overload limit is exceeded, the red warning light (17) on the instrument panel begins to flash. After a few seconds the motor stops and the indicator light of the brush switch goes off.



To start up the motor again, turn the main switch key (3) off and on again. If the motor stops again, check the reason of the overload in order to prevent damage to the motor. Check to see if the knob (8) to increase the pressure on the brushes has been operated and, if so, turn it anticlockwise as far as it will go.

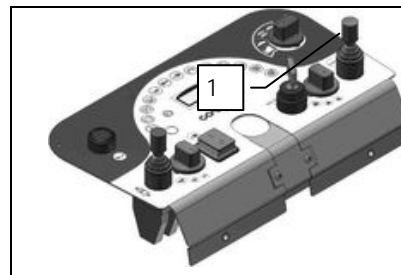


When the warning light (18) on the instrument panel lights up during machine operation, it means that the brake oil level is low (down to reserve); top up as soon as possible.



33. MOVEMENT OF THE BRUSH HEAD UNIT

This machine is able to move the brush head unit towards the right-hand side of the machine; simply move the knob (1) on the instrument panel to the right, to move the brush head back move the knob (1) to the left.

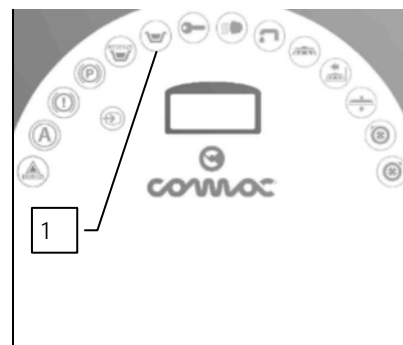




WORK

34. OVERFLOW DEVICE

The machine is equipped with an electromechanical device which indicates that the level reached in the recovery tank is dangerous for proper functioning of the suction motors; when it is activated the suction motors are switched off and the green warning light on the button (1) goes out. In this case, raise the squeegee unit and take the machine to the area used for emptying the recovery tank. Then empty the recovery tank using the special drain hose.



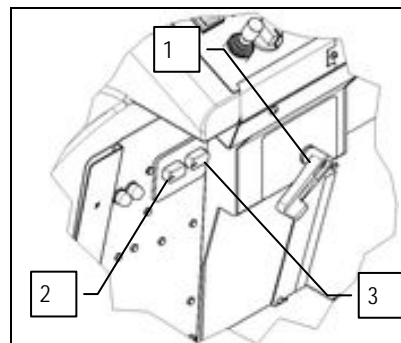


AT THE END OF WORK

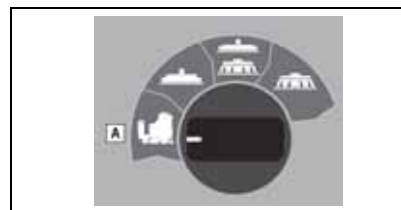
35. AT THE END OF WORK

At the end of work, and before carrying out any type of maintenance, perform the following operations:

1. Close the tap (1) for machine versions without the CDS system or turn the knobs (2-3) to OFF for machine versions with the CDS system



2. Turn the I-DRIVE selector to the "Transfer" position. Both the base and the squeegee rise and after a few seconds the suction motor will turn off.

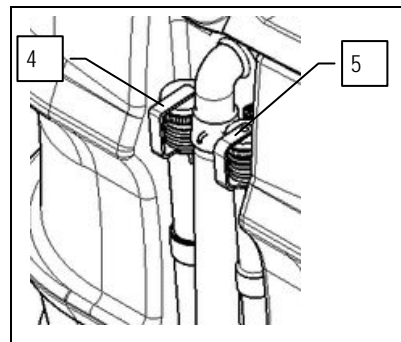


3. bring the machine to the place provided for draining the water
4. Turn the machine off by turning the key a quarter turn anticlockwise (to the "0" position) and remove it from the instrument panel
5. Engage the parking brake
6. Raise the seat support plate and disconnect the electrical system connector from the battery connector



ATTENTION: Before performing any maintenance, remove the keys from the panel and disconnect the battery connector of the machine.

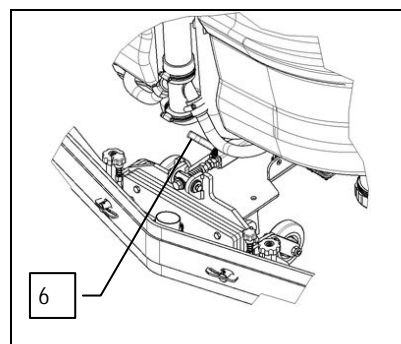
7. Disconnect the recovery tank drain hose (4) from its housing, unscrew the drain cap and empty the recovery tank
8. Disconnect the solution tank drain hose (5) from its housing, unscrew the drain cap and empty the solution tank



9. Press the release lever (6) to allow rotation of the squeegee support
10. Turn the squeegee unit clockwise
11. Clean the squeegee unit and the rubbers thoroughly with a jet of water
12. After cleaning the squeegee and rubbers, replace the squeegee by turning it anticlockwise, returning it to its original position, making sure that the lever (6) is returned to its normal position



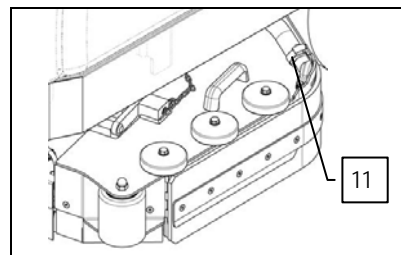
WARNING: this operation must be carried out by using gloves in order to protect against contact with dangerous solutions



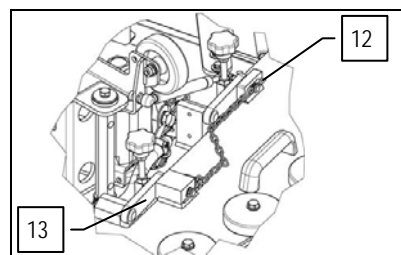


AT THE END OF WORK

13. Remove the suction hose (11) from the sleeve on the right-hand cover of the brush head unit
14. Remove the right-hand cover of the brush head unit by extracting the split pins (12)
15. Clean the brush head cover and the rubbers thoroughly with a jet of water



16. After cleaning the brush head cover and rubbers, replace the cover on the brush head unit, first inserting the front pin (13) in the front slot on the casing, then the rear pin in the rear slot, then insert the split pins (12) previously removed.
17. Finally insert the suction hose (11) in its sleeve



WARNING: this operation must be carried out by using gloves in order to protect against contact with dangerous solutions



ATTENTION: Repeat the operations from number 14 to number 18 for the left-hand side cover

18. Raise the seat support plate and connect the electrical system connector to the battery connector
19. Sit on the driver's seat
20. Insert the key in the ignition switch and turn it a quarter turn clockwise (to position "1")
21. Disengage the parking brake
22. Park the machine in a closed place, in an area where it cannot cause damage to people or other property, but also be protected from an accidental fall of objects.
23. Engage the parking brake
24. Turn the ignition key a quarter turn anticlockwise (position "0") and remove the key

25. Raise the seat support plate and disconnect the electrical system connector from the battery connector



ATTENTION: do not leave the machine unattended without first removing the start-up switch key and applying the parking brake. In addition, do not park the machine in open places or on sloping floors

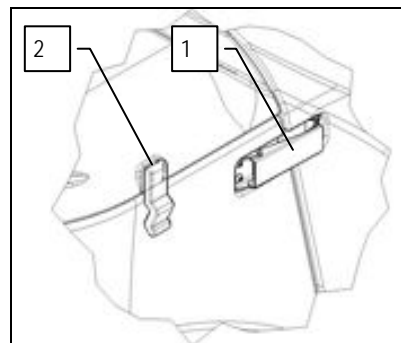


DAILY MAINTENANCE

PERFORM ALL MAINTENANCE OPERATIONS IN SEQUENCE

36. CLEANING THE SUCTION MOTOR FILTER

1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure that the main switch is in the "0" position
3. Check the parking brake is engaged
4. Check the recovery tank is empty (if necessary, empty it).
5. Release the recovery tank stop hinges (1) and rotate as far as possible
6. Release the suction hood stop hinges (2) and rotate as far as possible
7. Remove the suction filter protection (3) by rotating it clockwise
8. Remove the suction filter (4) from its seat
9. Use a jet of water to clean the walls and base of the filter



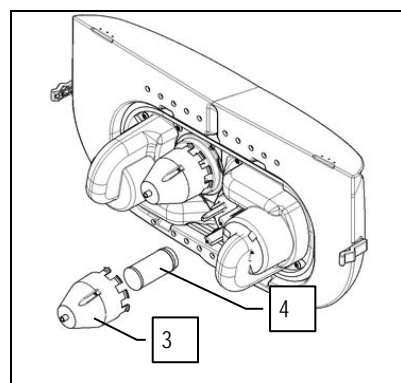
10. Perform steps 6 to 9 for the second filter of the second suction motor
11. Refit all the parts



ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions



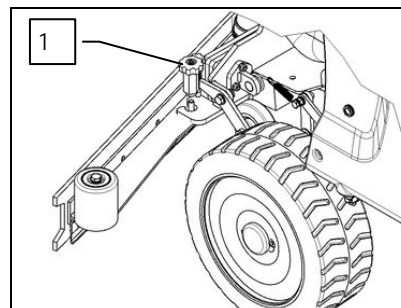
ATTENTION: Before performing any maintenance, remove the keys from the panel and disconnect the battery connector of the machine.



37. CLEANING THE SQUEEGEE

Careful cleaning of the whole suction group ensures better drying and cleaning of the floor as well as greater duration of the suction motor. Proceed as follows for cleaning:

1. Ensure that the electrical system connector is disconnected from the battery connector
 2. Make sure the main switch is in the "0" position
 3. Check the parking brake is engaged
 4. Undo the mounting clamp and remove the suction hose from the squeegee sleeve
 5. Disconnect the squeegee by loosening the knobs (1)
-
6. Clean the squeegee unit and the rubbers thoroughly with a jet of water, verify that there are no dirt residues in the vacuum chamber of the squeegee



WARNING: this operation must be carried out by using gloves in order to protect against contact with dangerous solutions

If the front squeegee rubber is worn, suction will be poor and the machine will not dry the floor properly; in this case replace it (see section REPLACEMENT OF FRONT SQUEEGEE RUBBER).

If the rear squeegee rubber is worn, suction will be poor and the machine will not dry the floor properly; in this case replace it (see section REPLACEMENT OF REAR SQUEEGEE RUBBER).



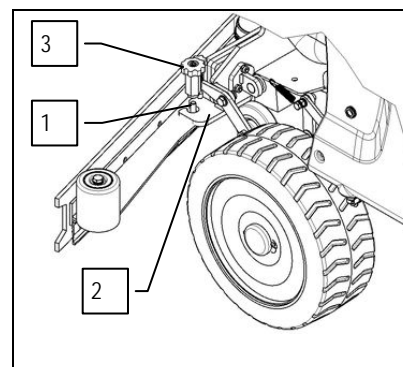
DAILY MAINTENANCE

After cleaning, replace the squeegee on its support:

1. Insert the squeegee right-hand pin (1) into the right-hand slot of the squeegee support (2), secure it by means of the handwheel (3).
2. Insert the squeegee left-hand pin into the left-hand slot of the squeegee support, secure it by means of the handwheel.
3. Finally, insert the squeegee hose in its sleeve and secure it using the clamp.



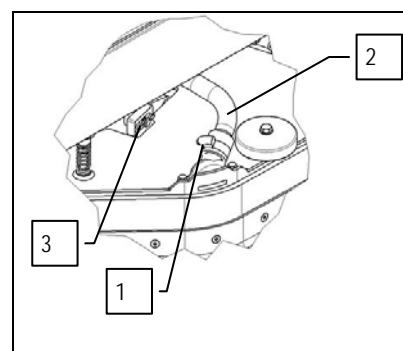
ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions



38. CLEANING THE BRUSH HEAD COVER

Careful cleaning of the whole suction unit inside the brush head cover ensures better cleaning and drying of the floor as well as a longer suction motor life. Proceed as follows for cleaning:

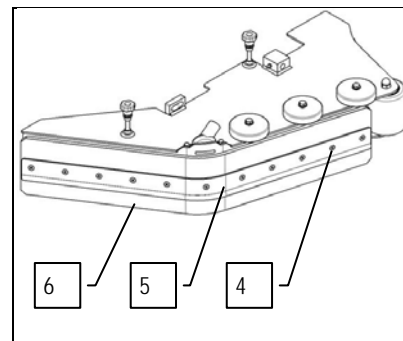
1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure the main switch key is set to "0"
3. Ensure the parking brake is engaged
4. Undo the mounting clamp (1) and remove the suction hose (2) from the brush head cover sleeve
5. Remove the cover from the brush head unit by extracting the split pins (3)
6. Clean the brush head cover and the rubbers thoroughly with a jet of water



Check the state of wear of the rear rubber. If the edge of the rubber is ruined, the rear rubber can be turned on all four corners. If the rubbers are completely worn, replace them.

To remove the outer rubber:

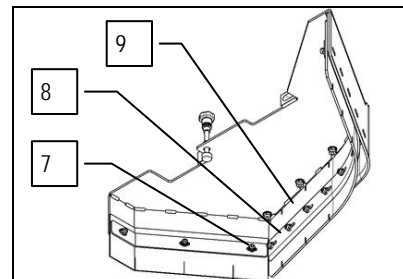
1. Undo the rubber-pressing blade securing nuts (7)
2. Remove the rubber-pressing blade (8) and then the rubber (9)
3. Undo the rubber-pressing blade securing screws (4)
4. Remove the rubber-pressing blade (5) and then the rubber (6) to turn it over or replace it
5. To replace the rubber, proceed in reverse order



Check the state of wear of the central rubber. If the edge of the rubber is badly damaged, the central rubber can be turned on all four edges. If the rubbers are completely worn, replace them.

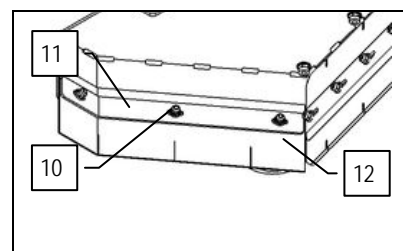
To remove the inner rubber:

1. Undo the rubber-pressing blade securing nuts (7)
2. Remove the rubber-pressing blade (8) and then the rubber (9) to turn it over or replace it
3. To replace the rubber, proceed in reverse order



Check the state of wear of the front rubber. If the edge of the rubber is badly damaged, the front rubber can be turned on two sides. If the rubbers are completely worn, replace them. To remove the rubber:

1. Undo the rubber-pressing blade securing nuts (10)
2. Remove the rubber-pressing blade (11) and then the rubber (12) to turn it over or replace it
3. To replace the rubber, proceed in reverse order

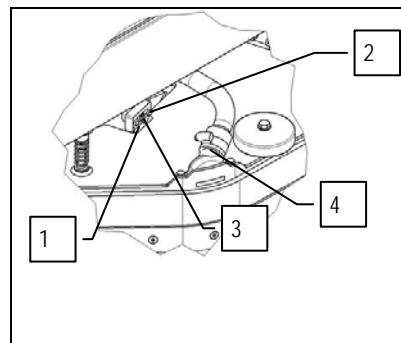




DAILY MAINTENANCE

After cleaning, replace the squeegee on its support:

1. Insert the rear pin (1) of the cover in the rear slot of the support (2) in the brush head body, secure it by means of the split pin (3) previously removed.
2. Insert the front pin of the cover in the front slot of the support in the brush head body, secure it by means of the split pin previously removed.
3. Finally, insert the squeegee hose in its sleeve and secure it by means of the clamp (4).



ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions



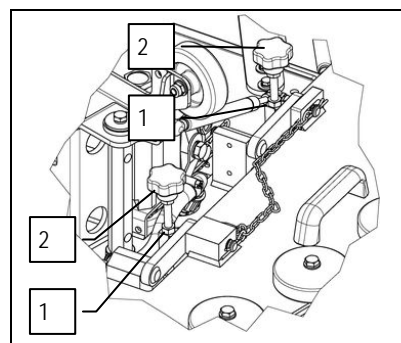
ATTENTION: These operations must be performed for both the right-hand side cover and the left-hand side cover

In operation, the rear rubber and central rubber must operate slightly bent outwards by about 5 mm evenly over their entire length.

If it is necessary to increase the curvature of the rubbers, you must tilt the brush head cover by loosening the nut (1) and turning the handwheel (2) clockwise to raise the rubbers from the ground.



ATTENTION: Before performing any maintenance, remove the keys from the panel and disconnect the battery connector of the machine.



39. CLEANING THE SOLUTION TANK FILTER

Careful cleaning of the detergent/water solution filter ensures a better working capacity. Proceed as follows for cleaning:

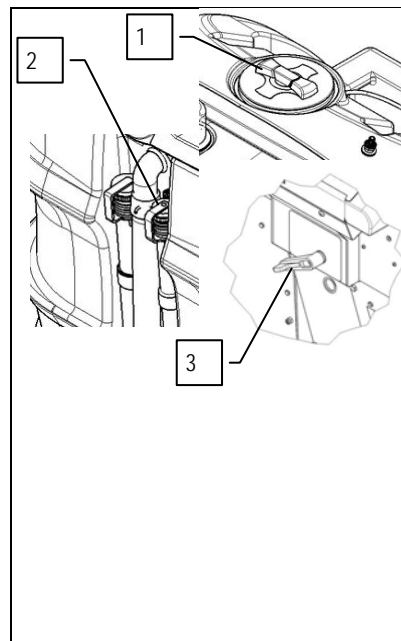
1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure the main switch key is set to "0"
3. Check the parking brake is engaged
4. Open the filler cap (1)
5. Disconnect the clean water drain hose (2) from its housing at the rear of the machine, unscrew the cap and empty the tank.
6. Close the water tap (3)
7. Unscrew the filter at the front of the machine.
8. Remove the internal filter cartridge and rinse everything thoroughly with running water.
9. Reassemble all the elements.



ATTENTION: Before performing any maintenance, remove the keys from the panel and disconnect the battery connector of the machine.



ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions





DAILY MAINTENANCE

40. DISC BRUSH DISASSEMBLY

To remove the brushes proceed as follows:

1. Connect the electrical system connector to the battery connector
2. Turn the key switch to the "1" position
3. Lift the brush head unit by operating the knob (1), if it is not already raised
4. Turn the key switch to the "0" position and remove the key from the instrument panel
5. Engage the parking brake (2)
6. Disconnect the electrical connector from the battery connector
7. Rotate the brush anticlockwise until it comes out of the brush-holder plate seat, as shown in the figure.

The photo shows the direction of rotation for releasing the right brush. Rotate in the opposite direction for the left brush.

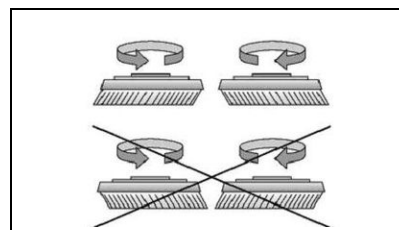


WARNING: Before performing any maintenance, remove the keys from the panel and disconnect the battery connector of the machine.



WARNING: This operation must be carried out using gloves to protect against contact with dangerous solutions.

You are advised to invert the right and left-hand brushes every day. If the brushes are not new however, and have deformed bristles, it is better to reassemble them in the same position (the right-hand one on the right, and the left-hand one on the left), to prevent the different inclination of the bristles producing an overload on the brush motor as well as excessive vibrations.





WEEKLY MAINTENANCE

41. CLEANING THE SUCTION HOSE

Whenever suction seems to be unsatisfactory, check that the suction tube is not obstructed. If necessary clean with a jet of water as follows:

1. Connect the electrical system connector to the battery connector
2. Turn the key switch to the "1" position
3. Turn the I-DRIVE selector to the "Transfer" position. Both the base and the squeegee rise and after a few seconds the suction motor will turn off.
4. Turn the key switch to the "0" position and remove the key from the instrument panel
5. Engage the parking brake
6. Disconnect the electrical connector from the battery connector

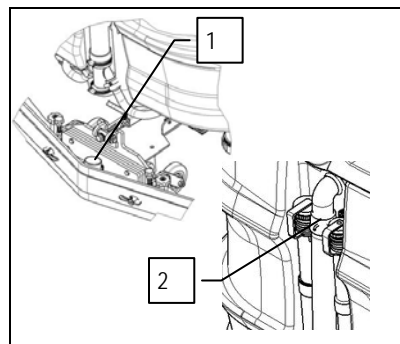


WARNING: Before performing any maintenance, remove the keys from the panel and disconnect the battery connector of the machine.

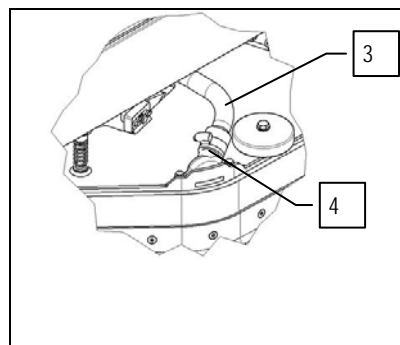


WARNING: This operation must be carried out using gloves to protect against contact with dangerous solutions.

7. Disconnect the suction hose from the squeegee nozzle (1)
8. Disconnect the suction hose from the holder (2) at the rear of the recovery tank



9. Disconnect the suction hose (3) from the nozzle (4) in the right-hand brush head cover
10. Disconnect the suction hose from the nozzle (4) in the left-hand brush head cover
11. Clean the hose with a jet of fresh water entering from the end where it is inserted into the holder at the rear of the recovery tank
12. Refit all the parts



42. CLEANING THE RECOVERY TANK

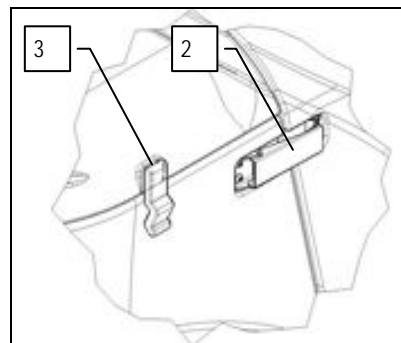
Proceed as follows for cleaning:

1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure that the main switch is in the "0" position
3. Check the parking brake is engaged
4. Check the recovery tank is empty (if necessary, empty it).



WEEKLY MAINTENANCE

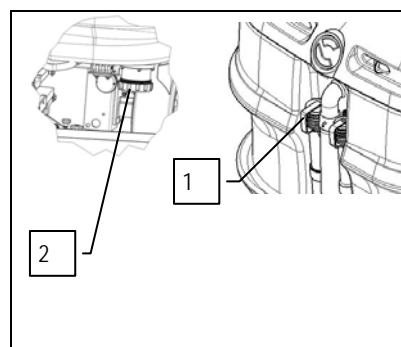
5. Check that the cap on the recovery tank drain hose (1) is closed
6. Unscrew the recovery tank drain hose cap (2) at the rear of the machine
7. Release the recovery tank stop hinges (3), located at the side of the tank
8. Rotate the recovery tank as far as it will go



9. Release the suction cover stop hinges (4), located at the side of the cover
10. Rotate the suction cover as far as it will go
11. Clean and rinse the recovery tank
12. Refit all the parts



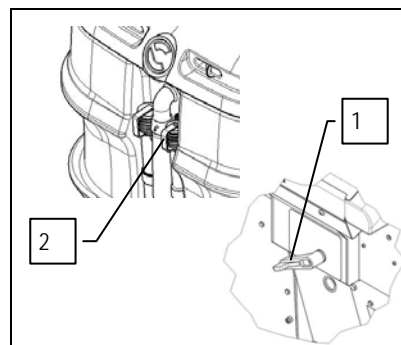
ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions



43. CLEANING THE SOLUTION TANK

Proceed as follows for cleaning:

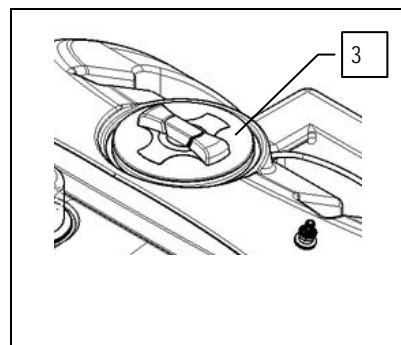
1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure that the main switch is in the "0" position
3. Check the parking brake is engaged
4. Close the water tap (1)
5. Disconnect the solution tank drain hose (2) located at the rear of the machine
6. Unscrew the solution tank drain hose cap



7. Unscrew the solution tank filling plug (3), located behind the operator's seat
8. rinse the inside of the tank with a jet of water
9. Refit all the parts.



ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions



44. CLEANING THE DETERGENT TANK (VERSIONS WITH CDS)

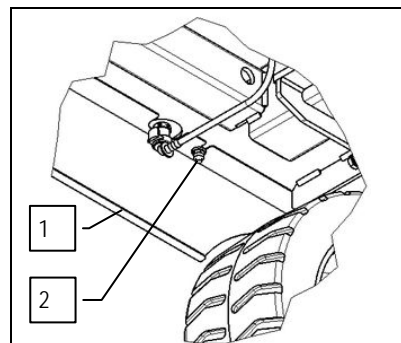
Proceed as follows for cleaning:

1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure that the main switch is in the "0" position
3. Check the parking brake is engaged

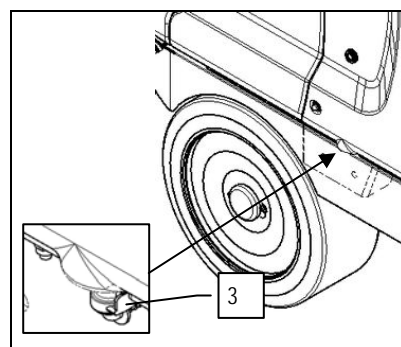


WEEKLY MAINTENANCE

4. Remove the right-hand cover (1) by unscrewing the nuts (2)



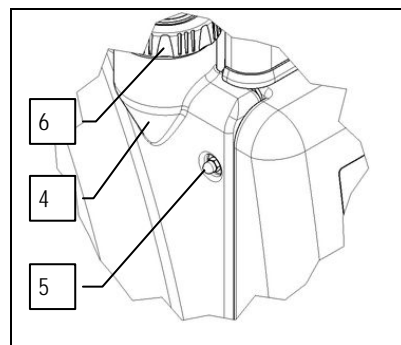
5. Disconnect the quick release coupling (3) located behind the side cover, to prevent damage to the coupling itself



6. Remove the detergent tank (4) by unscrewing the nuts (5)
7. Unscrew the detergent filler cap (6)
8. Rinse the inside of the tank with a jet of water
9. Refit all the parts.



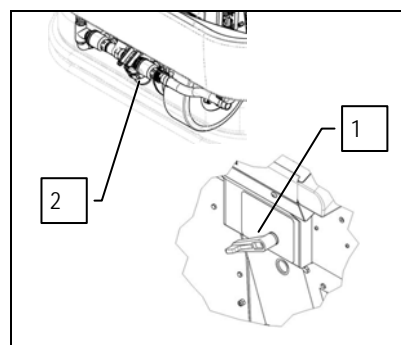
ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions



45. CLEANING THE SOLUTION TANK FILTER

Proceed as follows for cleaning:

1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure that the main switch is in the "0" position
3. Check the parking brake is engaged
4. Ensure the solution tank is empty, otherwise empty it
5. Close the water tap (1)
6. Unscrew the detergent solution filter (2) located at the front of the machine
7. Carefully clean the inside of the filter and the filter cartridge



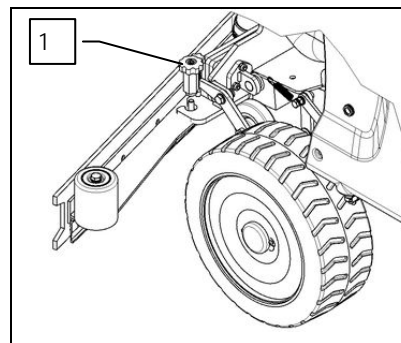


EXTRAORDINARY MAINTENANCE

46. REPLACING THE FRONT SQUEEGEE RUBBER

Suction will be poor and the machine will not dry perfectly if the front squeegee rubber is worn. Proceed as follows to replace:

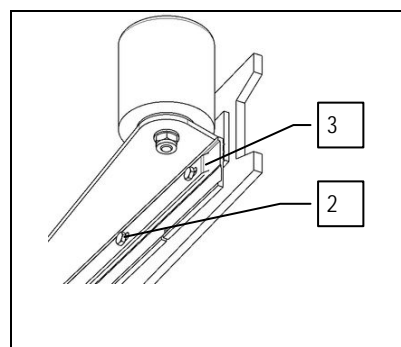
1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure that the main switch is in the "0" position
3. Check the parking brake is engaged
4. Disconnect the squeegee by loosening the knobs (1)



5. Undo the rubber-pressing blade securing screws (2)
6. Remove the rubber-pressing blade (3), then the rubber, for replacement
7. To replace the rubber, proceed in reverse order



ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions

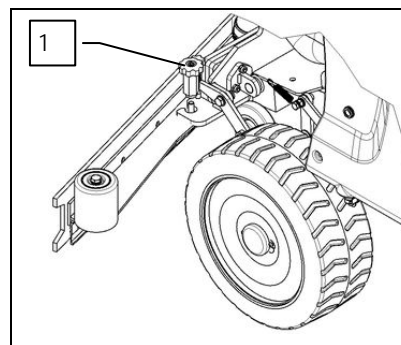


47. REPLACING THE REAR SQUEEGEE RUBBER

If the squeegee rear rubber is worn and does not dry well, it is possible to change the drying edge using one of the 4 edges of the rubber.

This can be done with the squeegee removed, proceeding as follows:

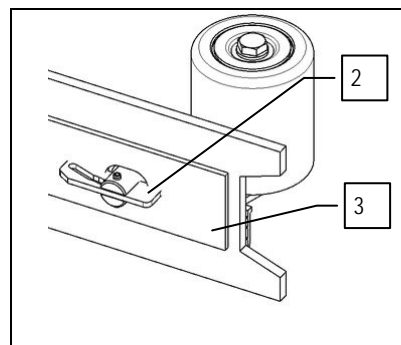
1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure that the main switch is in the "0" position
3. Check the parking brake is engaged
4. Disconnect the squeegee by loosening the knobs (1)



5. Rotate the fixing plates (2)
6. Remove the rubber-pressing blade (3) and then the rubber, to turn it over or replace it
7. To replace the rubber, proceed in reverse order
8. Adjust the height of the squeegee depending on the rubber (see "ADJUSTING THE HEIGHT OF THE SQUEEGEE SUPPORT")



ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions

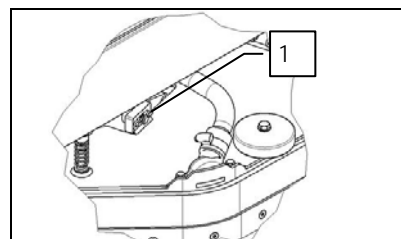


48. REPLACING THE CENTRAL RUBBER OF THE BRUSH HEAD COVER SPLASH GUARD

If the splash guard central rubber in the brush head cover is worn and does not dry well, it is possible to change the drying edge using one of the 4 edges of the rubber.

This operation can be done with the brush head cover removed, proceeding as follows:

1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure that the main switch is in the "0" position
3. Check the parking brake is engaged



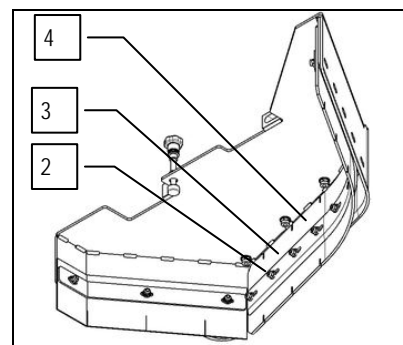


EXTRAORDINARY MAINTENANCE

4. Disconnect the brush head cover by removing the split pins (1)
5. Remove the brush head cover from its housing
6. Undo the rubber-pressing blade securing nuts (2)
7. Remove the rubber-pressing blade (3)
8. Rotate or remove the central rubber (4) for replacement
9. To replace the rubber, proceed in reverse order



ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions

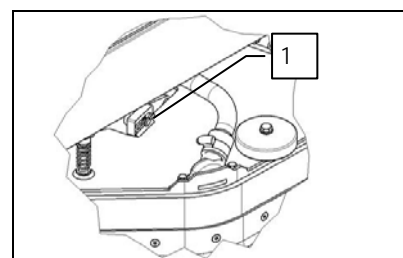


49. REPLACING THE OUTER RUBBER OF THE BRUSH HEAD COVER SPLASH GUARD

If the splash guard side rubber in the brush head cover is worn and does not dry well, it is possible to change the drying edge using one of the 4 edges of the rubber.

This operation can be done with the brush head cover removed, proceeding as follows:

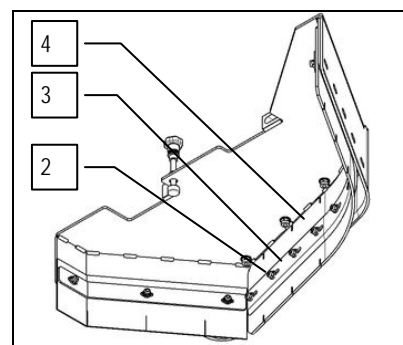
1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure that the main switch is in the "0" position
3. Check the parking brake is engaged



4. Disconnect the brush head cover by removing the split pins (1)
5. Remove the brush head cover from its housing
6. Undo the rubber-pressing blade securing nuts (2)
7. Remove the rubber-pressing blade (3)
8. Remove the central rubber (4)



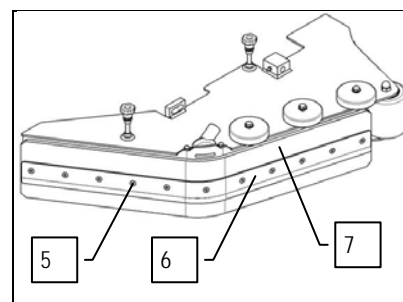
ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions



9. Undo the rubber-pressing blade securing screws (5)
10. Remove the rubber-pressing blade (6)
11. Rotate or remove the side rubber (7) for replacement
12. To replace the rubber, proceed in reverse order



ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions

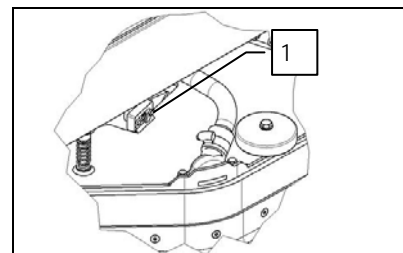


50. REPLACING THE FRONT RUBBER OF THE BRUSH HEAD COVER SPLASH GUARD

If the splash guard front rubber in the brush head cover is worn and does not dry well, it is possible to change the drying edge using one of the 4 edges of the rubber.

This operation can be done with the brush head cover removed, proceeding as follows:

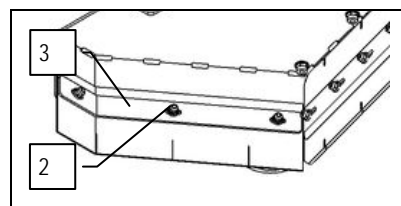
1. Ensure that the electrical system connector is disconnected from the battery connector
2. Ensure that the main switch is in the "0" position
3. Check the parking brake is engaged





EXTRAORDINARY MAINTENANCE

4. Disconnect the brush head cover by removing the split pins (1)
5. Remove the brush head cover from its housing
6. Undo the rubber-pressing blade securing nuts (2)
7. Remove the rubber-pressing blade (3), then rotate or remove the rubber for replacement
8. To replace the rubber, proceed in reverse order



Adjust the height of the brush head cover according to the splash guard rubbers (see "ADJUSTMENT OF BRUSH HEAD COVER HEIGHT")



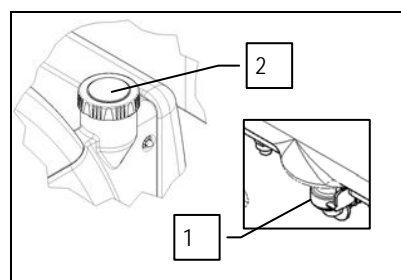
ATTENTION: These operations must be carried out using gloves to protect against contact with dangerous solutions

51. WASHING THE DOSING SYSTEM (VERSIONS WITH CDS)

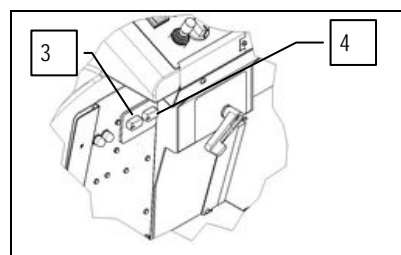
The dosing system should be cleaned when the machine is not used for a long period (more than 48 hours); to do so, proceed as follows:

1. Check that the main switch is in the "Off – 0" position
2. Check that the battery connector is disconnected from the machine connector
3. Check the parking brake is correctly engaged
4. Make sure the recovery tank is empty, otherwise empty it completely

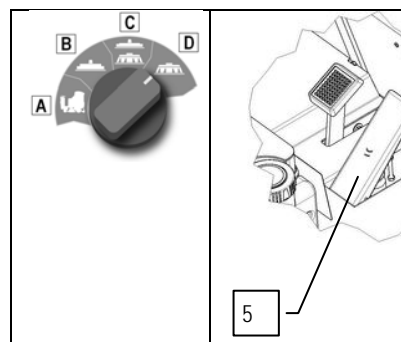
5. Unscrew the cap of the detergent canister (1) and fill it with clean water
6. Refit the cap of the detergent tank
7. Check there is clean water in the solution tank



8. Check that the tap lever is fully opened, the lever is positioned at the rear of the machine.
9. Check that the by-pass tap is in the "dosing system" position
10. Turn the water flow rate adjustment knob (3) to the maximum position
11. Turn the detergent percentage adjustment knob (4) to the maximum position
12. Insert the battery connector into the machine connector.
13. Place the main switch in position "ON – I"
14. Disengage the parking brake



15. Make sure that the work programme is set to "Work" (position C).
16. Press the accelerator pedal (5) gently to activate the brush head and the dosing system
17. Wait a few minutes keeping the dead man's levers pressed (normally 2 to 4 minutes) to allow the cleaning of the dosing system
18. Completely empty the solution tank and the detergent canister
19. Park the machine in a safe manner



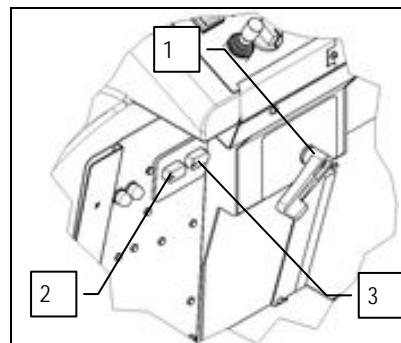
WARNING: The machine will deliver solution during this operation



TROUBLESHOOTING

52. INSUFFICIENT WATER ON THE BRUSHES

1. Check there is water in the solution tank
2. Check that the water/detergent solution release adjustment lever (1) is open
3. Check that the water/detergent selectors (2-3) are open (for CDS versions only)
4. Clean the solution filter located at the front of the machine.



53. THE SQUEEGEE DOES NOT DRY PERFECTLY

1. Check the squeegee is clean.
2. Check the regulation of the squeegee (see "MACHINE PREPARATION").
3. Clean the entire suction unit (see "WEEKLY MAINTENANCE").
4. Replace the rubbers, if worn.

54. THE BRUSH HEAD COVER DOES NOT DRY PERFECTLY

1. Check that the suction nozzle in the brush head cover is not obstructed
2. Check that the settings for the brush head cover are correct
3. Clean the entire suction unit (see "WEEKLY MAINTENANCE").
4. Replace the rubbers, if worn.

55. THE MACHINE DOES NOT CLEAN WELL

1. Check the state of wear and tear of the brushes and, if necessary, replace them. The brushes should be changed when the bristles are about 15 mm long. To replace them, see "REPLACING THE BRUSHES", or "DISASSEMBLING THE BRUSHES" and "ASSEMBLING THE BRUSHES". Working with over-worn brushes may cause damage to the floor.
2. Use a different kind of brush to the one fitted as standard. For cleaning floors where the dirt is particularly resistant, we recommend the use of special brushes supplied upon request and according to needs (see "CHOOSING AND USING THE BRUSHES").

56. EXCESSIVE FOAM PRODUCTION

Verify that a low foam detergent has been used. If necessary, add a small quantity of antifoam liquid to the recovery tank.

Remember that, when the floor is not very dirty, more foam is generated. In this case the detergent solution should be more diluted.

57. THE VACUUM CLEANER DOES NOT FUNCTION

1. Check whether the recovery tank is full and, if necessary, empty it.
2. Check the float switch on the suction cap (see also "CLEANING THE RECOVERY TANK" in the chapter "DAILY MAINTENANCE").

58. THE BRUSH MOTOR DOES NOT WORK

ATTENTION To avoid damaging the floor, the motor only starts up when the machine is moved forwards

1. Check that the base is lowered during start-up.
2. The operator must be properly seated in the driving position.
3. Check no thermal protection device has intervened.
4. Check the correct connection of the motor to the terminal under the footboards.



TROUBLESHOOTING

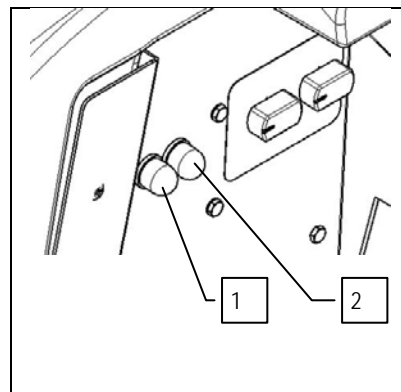
59. ELECTRIC FUSES AND THERMAL CUT-OUTS

The machine is fitted with the following electrical protection systems:

Power fuses arranged in the electrical box, to protect against short-circuiting
thermal circuit breakers arranged on the outside of the handlebars, to protect the following motors:

1. 25 A circuit breaker (1) for left-hand side suction motor
2. 25 A circuit breaker (1) for right-hand side suction motor

In the event of malfunctioning, check a thermal cut-out has not intervened. If the motor overheats, its thermal cut-out intervenes to block the electricity supply. Wait a few minutes until it has cooled down, then press the specific circuit breaker button to reactivate the power supply and motor operation. If the problem persists, contact the COMAC technical assistance centre.



60. THE MACHINE DOES NOT START

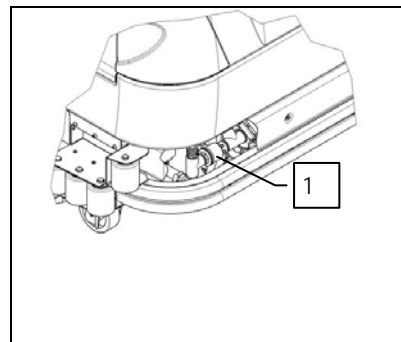
1. Check the connector is connected to the batteries
2. Check the key switch is ON/I.
3. Check that batteries are charged.

61. THE AUTOMATIC WATER/DETERGENT DOSING SYSTEM DOES NOT WORK

The automatic water/detergent dosing system has been designed with criteria of extreme sturdiness and reliability, but there is a special by-pass system that allows you to use the machine even if the system is out-of-use.

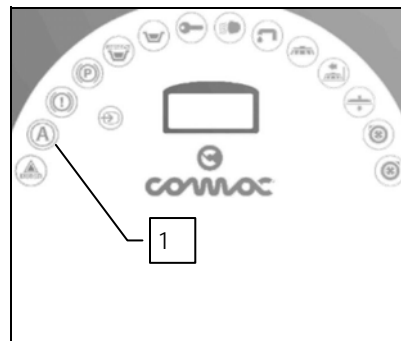
To by-pass the automatic water/detergent dosing system, you must rotate the tap lever (1) on the rear-centre of the base downwards; in this way you can go on working even with the system out-of-use. Remember, however, to put not only water in the solution tank, but the right quantities of both water and detergent. With the dosing system out-of-use, the water flow is regulated via the tap on the steering column.

Contact a COMAC authorised dealer to have the system repaired.



62. ALARMS

The machine is fitted with a flashing warning light (1) for diagnosing faults in the traction motor control system. Each sequence (number of consecutive flashes) indicates a particular type of fault. When flashing begins (with an accompanying working fault), you should contact the technical assistance centre, specifying the number of flashes.





DISPOSAL

To dispose of the machine, take it to a demolition centre or an authorised collection centre.

Before scrapping the machine it is necessary to remove and separate the following materials and send them to the appropriate collection centres in accordance with the environmental hygiene regulations currently in force:

- brushes
- filter
- electric and electronic parts*
- batteries
- plastic parts (tanks and handlebars)
- metal parts (levers and frame)

(*) In particular, to scrap the electric and electronic parts, contact your area distributor



CHOOSING AND USING THE BRUSHES

POLYPROPYLENE BRUSH (PPL)

Used on all types of floors. Good resistance to wear and tear, and hot water (no greater than 60°C). The Polypropylene brush is non-hygroscopic and therefore retains its characteristics even when working in wet conditions.

NYLON BRUSH

Used on all types of floors. Excellent resistance to wear and tear, and hot water (even over 60°C). The nylon is hygroscopic and so tends to lose its characteristics over time when working in wet conditions.

ABRASIVE BRUSH

The bristles of this type of brush are charged with highly aggressive abrasives. It is used to clean very dirty floors. To avoid floor damage, work only with the pressure strictly necessary.

THICKNESS OF THE BRISTLES

Thicker bristles are more rigid and are therefore used on smooth floors or floors with small joints.

On uneven floors or those with deep joints, it is advisable to use softer bristles which can enter the gaps more easily.

Remember that when the bristles are worn and therefore too short, they will become rigid and are no longer able to penetrate and clean deep down. In this case, like with overlarge bristles, the brush tends to jump.

PAD HOLDER

The pad holder is recommended for cleaning shiny surfaces.

There are two types of pad holder:

1. the traditional pad holder is fitted with a series of anchor points that allow the abrasive floor pad to be held and dragged while working
2. the CENTRE LOCK type pad holder not only has anchor points, but also a snap-type central locking system in plastic that allows the abrasive floor pad to be perfectly centred and held without any risk of it becoming detached. This type of holder is especially suitable for machines with several brushes, where the centring of the grinding wheels is difficult

TABLE FOR CHOOSING THE BRUSHES

Machine	No. Brush	Code	Type of bristles	Ø Bristl	Ø	Length	Notes
ULTRA120 B	2	405627	NYLON	0.9	610	-	BRUSH
		405629	PPL	0.9	610		BLACK BRUSH
		405630	PPL	0.6	610		WHITE BRUSH
		404627	PPL	0.3	610		BLUE BRUSH
		405628	ABRASIVE	-	610		BRUSH
		405519	-	-	585		PAD HOLDER
		410575	-	-	-		CENTER LOCK



EC DECLARATION OF CONFORMITY

The undersigned manufacturer:
COMAC S.p.A.
Via Maestri del Lavoro, 13
37059 Santa Maria di Zevio (VR)
declares under its sole responsibility that the product

Battery-powered FLOOR SCRUBBING MACHINE model ULTRA120 B

complies with the requirements of the following Directives:

- 2006/42/EC: Machinery Directive
- 2006/95/EC: Low Voltage Directive
- 2004/108/EC: Electromagnetic Compatibility Directive

They also comply with the following standards:

- EN 60335-1: Household and similar electrical appliances - Safety. Part 1: Generic standards
- EN 60335-2-72: Household and similar electrical appliances. Part 2: Generic standards for automatic machines for floor treatment for commercial and industrial use
- EN 12100-1: Machine safety - Fundamental concepts, fundamental principles of design - Part 1: Basic terminology and methodology
- EN 12100-2: Machine safety - Fundamental concepts, fundamental principles of design - Part 2: Technical principles.
- EN 55014-1: Electromagnetic compatibility - Regulations for household appliances, electrical devices and similar equipment. Part 1: Emission - Regulation for product family.
- EN 55014-2: Electromagnetic compatibility - Regulations for household appliances, electrical devices and similar equipment. Part 2: Immunity - Regulation for product family.
- EN 61000-3-2: Electromagnetic compatibility (EMC) - Part 3-2: Limits – Limits for emissions of harmonic current (Equipment with input current ≤ 16 A per phase).
- EN 61000-3-3: Electromagnetic compatibility (EMC) - Part 3-3: Limits – Restriction of voltage variations and flicker in low voltage power supply systems for devices with a rated current ≤ 16 A.
- EN 62233: Household and similar electrical appliances - Electromagnetic fields Methods for evaluation and measurement

The person authorised to compile the technical file:

Sig. Giancarlo Ruffo
Via Maestri del Lavoro, 13
37059 Santa Maria di Zevio (VR) - ITALY

Santa Maria di Zevio (VR), 13/04/2011

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Legal representative
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