



# Operations Manual



## Hurricane Scooter Ride-On

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### Automatic Scrubber

Code: 19353-C-AGM

Serial #: \_\_\_\_\_

Date of Purchase: \_\_\_\_\_

More info : [www.dustbane.ca](http://www.dustbane.ca)

07-2011



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## 2. General Information



**Read this manual carefully before carrying out any work on the machine.**

### 2.1. Scope of the manual

This manual has been written by the Manufacturer and is an integral part of the machine. It defines the purpose for which the machine has been designed and constructed and contains all the information required by operators.

In addition to this manual containing all user information, other publications are available providing specific information for maintenance personnel.

Constant respect for the instructions guarantees the safety of the operator and the machine, low running costs and high quality results and extends the working life of the machine. Failure to respect the instructions may lead to damage to the operator, machine, floor being washed and environment.

Parts of the text requiring special attention are highlighted in bold and preceded by the symbols illustrated and described here.



**Danger**

**Indicates the need for attention in order to avoid a series of consequences which could cause death or damage to the health of the operator.**



**Important**

**Indicates the need for attention in order to avoid a series of consequences which could cause damage to the machine or work environment or financial loss.**



**Information**

**Indicates particularly important instructions.**

In line with the company's policy of constant product development and updating, the Manufacturer reserves the right to make modifications without warning.

### 2.2. Identifying the machine

The serial plate provides the following information:

- model;
- serial number.

### 2.3. Documentation provided with the machine

- User manual;
- Parts List.

## 3. Technical Information

### 3.1. General description

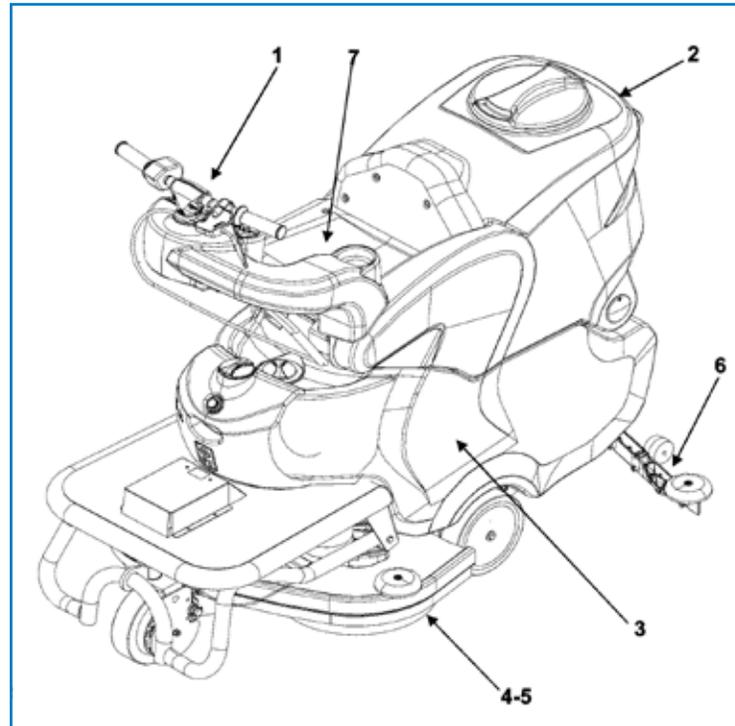
This machine is a automatic scrubber for sweeping, washing and drying flat, horizontal, smooth or moderately rough, even and obstacle free floors in civil and industrial premises.

The automatic scrubber spreads a solution of water and solution in the correct concentration on the floor and then scrubs it to remove the dirt. By carefully choosing the solution and brushes (or abrasive disks) from the wide range of accessories available, the machine can be adapted to a wide range of combinations of types of floor and dirt.

A suction system incorporated in the machine dries the floor after washing by means of the low pressure generated in the recovery tank by the suction motor. The squeegee connected to the recovery tank collects the dirty water.

The machine moves forward by means of a special electromechanical drive device.

### 3.2. Legend



The main parts of the machine are as follows:

- solution tank (ref. 3): contains and transports the mixture of clean water and cleaning product;
- the recovery tank (ref. 2): collects the dirty water picked up from the floor after washing;
- control panel (ref. 1);
- head assembly (ref. 4): the main element is the brushes (ref. 5) which distributes the solution on the floor and remove the dirt;
- squeegee assembly (ref. 6): wipes and dries the floor by collecting the water.

### 3.3. Danger zones

**A - Tank assembly:** when using certain solutions, danger of irritation for eyes, skin, mucous membranes and respiratory tract and of asphyxia. Danger represented by the dirt collected from the environment (germs and chemical substances). Danger of crushing between the two tanks when the recovery tank is replaced on top of the solution tank.

**B -Control panel:** danger of short circuit.

**C -Bottom of washing head:** danger due to brush rotation.

**D -Rear wheels:** danger of crushing between the wheel and chassis.

**E -Battery compartment:** danger of short circuit between the battery poles and presence of hydrogen during charging.

## 4. Safety Information

### 4.1. Safety regulations



**Read the “User manual” carefully before start-up and use, or before performing maintenance or any other work on the machine.**



**Rigorously respect all instructions in the Manual (in particular those relating to danger and important information) and on the safety plates fitted to the machine. The Manufacturer declines all liability for damage to people or things resulting from failure to observe the instructions.**

The appliance must be used exclusively by persons trained in its use and/or who have demonstrated their ability and have been expressly instructed to use the appliance.

- The machine must not be used by minors.
- The machine must not be used for purposes other than those for which it was expressly designed.
- Scrupulously respect all safety standards and conditions applicable to the type of building in which the machine is to be operated (e.g.: pharmaceutical companies, hospitals, chemicals, etc).
- Do not use the machine in places with inadequate lighting or explosive atmospheres, on public roads, in the presence of dirt hazardous to health (dust, gas, etc) and in unsuitable environments.
- The machine is designed for temperatures of between +4°C and +35°C when in use and between +0°C and +50°C when not in use.
- The machine is designed to work in a humidity of between 30% and 95%.
- Never use or pick up flammable liquids or explosives (e.g. petrol, fuel oil, etc), flammable gases, dry dusts, acids and solvents (e.g. paint solvents, acetone etc) even if diluted.
- Never pick up flaming or incandescent objects.
- Never use the machine on slopes or ramps of more than 2%. In the case of slight slopes, do not use the machine transversely, always manoeuvre with care and do not reverse.
- When transporting the machine on steeper ramps or slopes, take the utmost care to avoid tipping up and/or uncontrolled acceleration. Move the machine on ramps and/or steps only with the brush head and squeegee raised.
- Never park the machine on a slope.
- The machine must never be left unattended with the motors on. Before leaving it, turn the motors off and make sure it cannot move accidentally by putting the parking brake on and disconnecting it from the power supply.
- Always pay attention to other people, children in particular, present in the place where you are working.
- Never use the machine to transport people or things or to tow things. Do not tow the machine.
- Never rest objects of any weight on the machine for any reason.
- Never obstruct ventilation and heat dispersion slits.
- Never remove, modify or circumvent safety devices.
- Numerous unpleasant experiences have shown that a wide range of personal objects may cause serious accidents. Before beginning work, remove jewelry, watches, ties, etc.
- The operator must always use personal protection devices: protective apron or overalls, non-slip waterproof shoes, rubber gloves, protective goggles and ear protectors and mask to protect the respiratory tract.
- Keep the hands away from moving parts.
- Never use solutions other than those specified. Follow the instructions on the relative safety sheet. Solutions should be kept out of reach of children. In the event of contact with the eyes, wash immediately with abundant water. If swallowed, consult a doctor immediately.

- Make sure the power sockets used for the battery charger are connected to a suitable ground system and protected by differential thermal solenoid switches.
- Make sure the electrical characteristics of the machine (voltage, frequency, absorbed power) given on the rating plate are the same as those of the mains electricity supply.
- It is indispensable to respect the battery manufacturer's instructions and current legislation. The batteries should always be kept clean and dry to avoid surface leakage current. Protect the batteries from impurities such as metal dust.
- Never rest tools on the batteries as this could cause short circuit and explosion.
- When using battery acid, always follow the relative safety instructions scrupulously.
- Battery charger: check the power cable regularly for damage. If the power cable is damaged, the charger must not be used.
- In the presence of particularly strong magnetic fields, assess the possible effect on the control electronics.
- Never wash the machine with water jets.
- The fluids collected contain solution, disinfectant, water and organic and inorganic material. They must be disposed off in accordance with current legislation.
- In the case of malfunction and/or faulty operation, turn the machine off immediately (disconnecting it from the mains power supply or batteries) and do not tamper. Contact a service center authorized by the Manufacturer.
- All maintenance operations must be performed in an adequately lit place and only after disconnecting the machine from the power supply.
- All work on the electrical system and all maintenance and repair operations other than those explicitly described in this manual must be performed by specialised personnel expert in the sector only.
- Only original accessories and spare parts supplied by the Manufacturer may be used in order to guarantee safe problem-free operation of the machine. Never use parts removed from other machines or from other kits.



**Disposal Special waste. Do not dispose of with ordinary waste.**

- If you decide to stop using the machine, you are recommended to remove the batteries and dispose of them at an authorized collection center.
- You should also make sure that all parts of the appliance which could represent a hazard, particularly to children, are made safe.
- Properly clean solutions and recovery tank before disposal.

## 5. Handling And Installation

### 5.1. Lifting and transporting the packaged machine



**Important**

**During all lifting operations, make sure the packaged machine is firmly anchored to avoid it tipping up or being accidentally dropped.  
Always load/unload lorries in adequately lit areas.**

The machine, packaged on a wooden pallet by the Manufacturer, must be loaded using suitable equipment (see EC Directive 2006/42 and subsequent amendments and/or additions) onto the transporting vehicle. At destination, it must be unloaded using similar means.

The squeegees are packed in cardboard boxes without pallet. A fork lift truck must always be used to lift the packaged body of the machine. Handle with care to avoid knocking or overturning the machine.

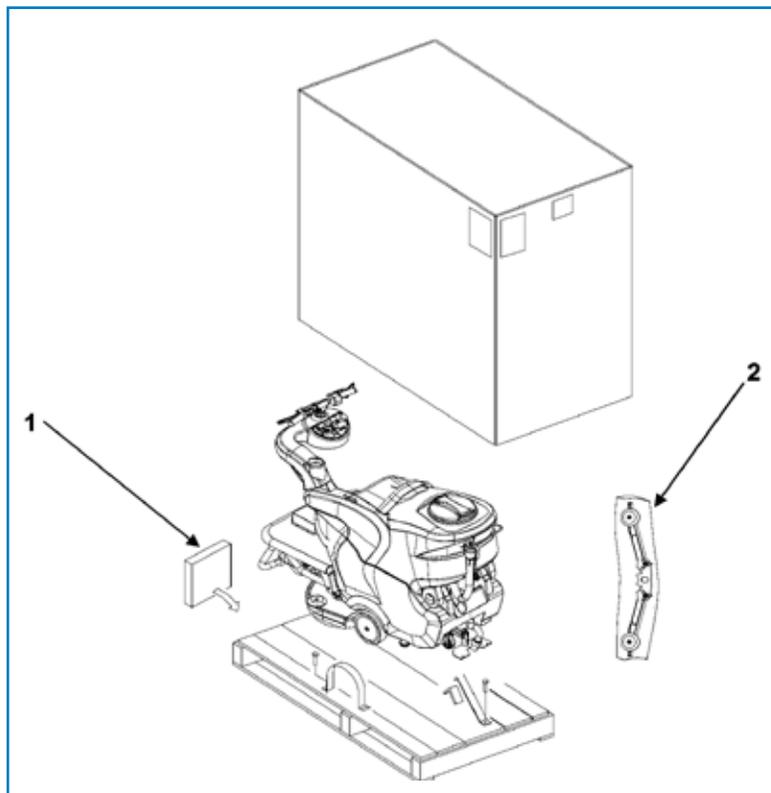
## 5.2. Checks on delivery

When the carrier delivers the machine, make sure the packaging and machine are both whole and undamaged. If the machine is damaged, make sure the carrier is aware of the damage and before accepting the goods, reserve the right (in writing) to request compensation for the damage.

## 5.3. Unpacking



**When unpacking the machine, the operator must be provided with the necessary personal protection devices (gloves, goggles, etc) to limit the risk of accident.**



Unpack the machine as follows:

1. cut and remove the plastic straps using scissors or nippers;
2. remove the cardboard;
3. remove the bags in the battery compartment (in the solution tank) and check the contents:
  - operation manual, parts list;
  - battery bridges with terminals
  - connector for battery charger;
4. depending on the model, remove the metal brackets or cut the plastic straps fixing the machine chassis to the pallet;
5. using a sloping ramp, push the machine backwards off the pallet;
6. unpack the brushes (ref. 1) and squeegee (ref. 2);

7. clean the outside of the machine in respect of safety regulations;
8. once the machine is clear of the packaging, the batteries can be installed (see relevant paragraph).

The packaging may be kept as it can be reused to protect the machine if it is moved to another site or to a repair workshop.

Otherwise it must be disposed off in compliance with current legislation.

## 5.4. Batteries

Two different types of battery may be installed on these machines:

- Deep cycle;
- GEL/AGM.

The technical characteristics must correspond to those indicated in the paragraph on the technical specification of the machine. The use of heavier batteries could seriously jeopardize maneuverability and lead to the brush motor overheating. Batteries with a lower capacity and weight will require recharging more frequently. They must be kept charged, dry and clean and the connections must be tight.



**Danger**

**Check that all switches on the control panel are in the “0” (off) position. Make sure you connect the terminals marked with a “+” to the positive poles of the battery. Do not check the battery charge by sparking. Meticulously follow the instructions given below as short circuiting the batteries could cause them to explode.**

- Make sure the two tanks are empty (if necessary, empty them. See the relevant paragraph).
- Lift the recovery tank and tilt it backwards by about 90°. This provides access to the battery compartment (in the solution tank) from above.
- Place the batteries in the compartment in the direction shown in the drawing printed inside the compartment on the solution tank.



**Important**

**Mount the batteries on the machine using lifting means suitable for their weight. The positive and negative poles have different diameters.**

- Referring to the wiring layout shown in the above diagram, connect the battery cable and bridge terminals to the battery poles. Arrange the cables as shown in the diagram, tighten the terminals on the poles and cover with Vaseline.
- Lower the recovery tank into the working position.
- When using the machine, follow the instructions below.

### 5.4.1. Batteries: removal



**Danger**

**When removing the batteries, the operator must be equipped with suitable personal protection devices (gloves, goggles, overalls, safety shoes, etc) to reduce the risk of accidents. Make sure the switches on the control panel are in the “0” position (off) and the machine is turned off. Keep away from naked flames, do not short circuit the battery poles, do not cause sparks and do not smoke.**

**Proceed as follows:**

- disconnect the battery wiring and bridge terminals from the battery poles;
- if necessary, remove the devices fixing the battery to the base of the machine;
- lift the batteries from the compartment using suitable lifting equipment.

## 5.5. Lifting and transporting the machine



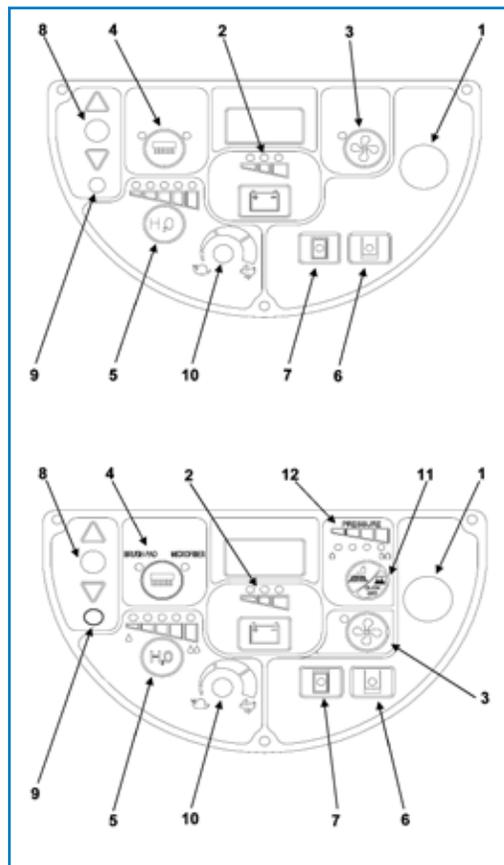
All phases must be performed in an adequately lit room and adopting the safety measures most appropriate to the situation.  
The operator must always use personal protection devices.

To load the machine onto a means of transport, proceed as follows:

1. empty the recovery tank and solution tank;
2. remove the squeegee and brushes (or drive disks);
3. remove the batteries;
4. place the machine on the pallet and fix it with plastic straps or metal brackets;
5. lift the pallet (with the machine) using a fork lift truck and load it onto the means of transport;
6. anchor the machine to the means of transport with cables connected to the pallet and machine itself.

## 6. Practical Guide For The Operator

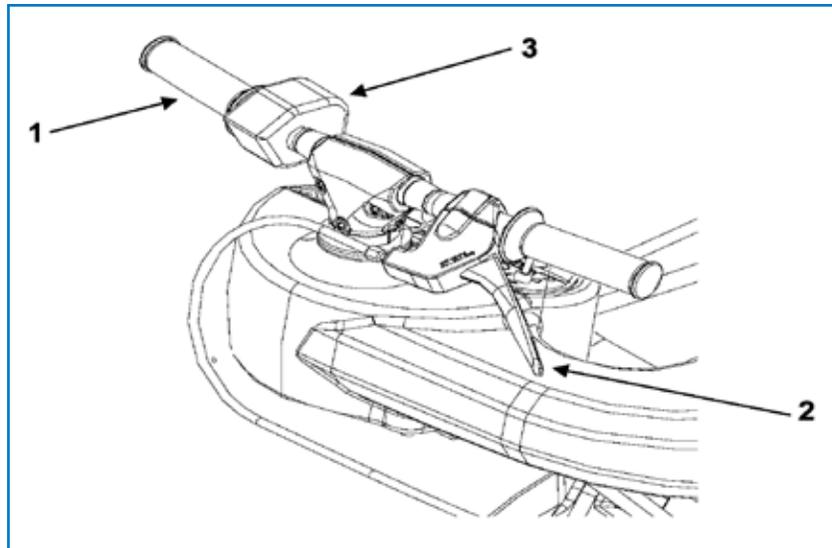
### 6.1. Controls - Description



The machine has the following controls and indicator lights:

- Battery charge light (ref. 2): consists of 3 LEDs (red, yellow and green) which indicate the level of battery charge. There may be:
  - a) green LED on: batteries from 100% to 50% charged;
  - b) yellow LED on: batteries from 50% to 18% charged;
  - c) red LED on: batteries almost flat;
  - d) red LED flashing: batteries completely flat; after a few seconds the brushes stop;

- Main Switch - emergency button with key (ref. 1): enables and disables electrical power to all machine functions. Acts as a safety device. To start up the machine, turn the key clockwise. To stop the machine press the button.
- Brush button with light (ref. 4): enables (LED on) and disables (LED off) brush operation and raising and lowering of the head. As well as enabling brush operation, pressing this button also performs the automatic brush attachment and release maneuver, see instructions below.
- Suction button with light (ref. 3): switches the suction motor responsible for drying the floor being washed on (LED on) or off (LED off). When the suction motor is turned on, the squeegee is automatically lowered. When it is turned off, the squeegee is automatically raised.
- Solution flow regulation button (ref. 5): pressing the button once enables solution flow, holding it down determines the quantity of flow. The LEDs come on to indicate the quantity of flow.
- Solution tank level indicator (ref. 6): the LED comes on when there is no longer sufficient water in the solution tank.
- Recovery tank level indicator (ref. 7): when the recovery tank is full the LED comes on and after a few seconds the suction motor shuts down.
- Display: displays active alarms and menus. During normal operation, it displays the hour counter (giving the actual number of hours the machine has been operating).
- Direction selector (ref. 8): move this selector to set movement of the machine to forwards or reverse
- Alarm indicator (ref. 9), depending on the frequency the LEDs come on, defines the electronic board error code. When operating without malfunction, the LED is on steadily.
- Accelerator (ref. 1): turning the accelerator moves the machine. If the brushes and suction motor are enabled (LEDs on), it also starts rotation of the brushes and turns the suction motor on. When the accelerator is released, the machine, brushes and suction motor stop.
- Speed control potentiometer (ref. 10): turning the potentiometer sets machine speed.



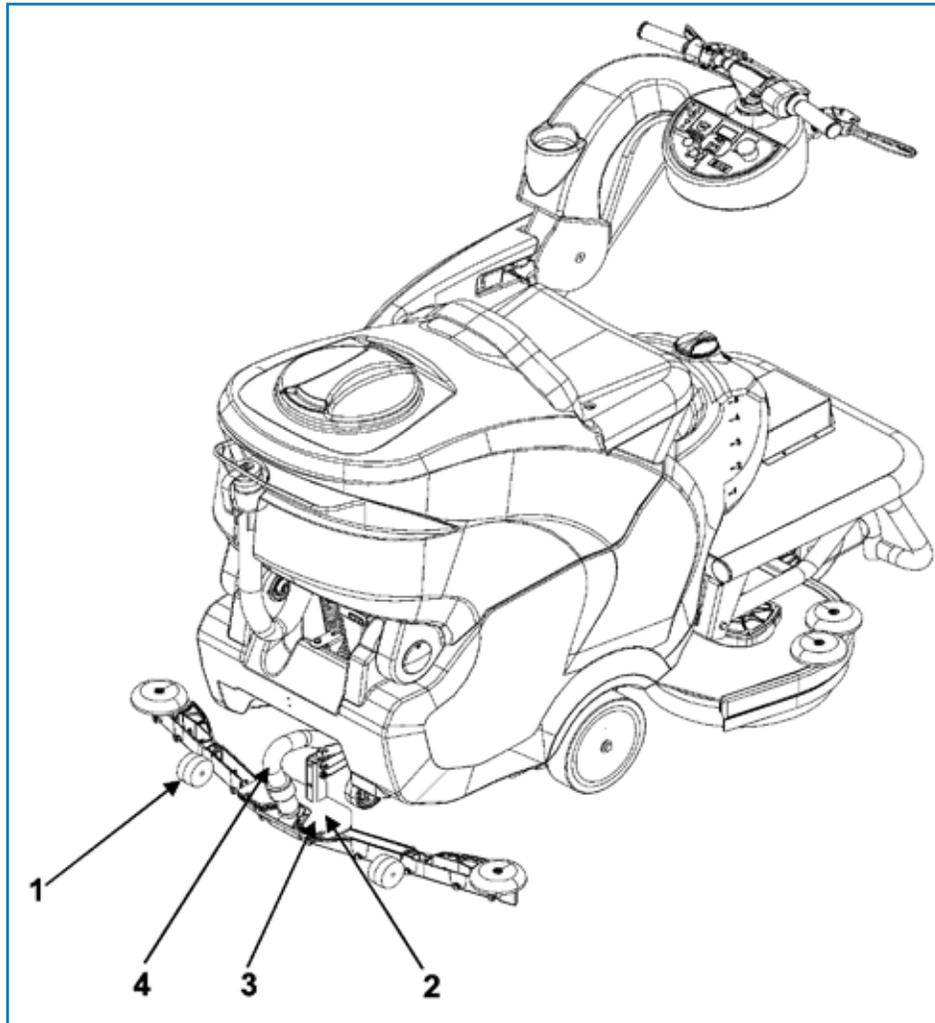
- Service/parking brake (ref. 2): operating the lever stops the machine. To put the parking brake on, pull the lever then block it.
- Horn (ref. 3): acoustic warning.



**The seat has a safety sensor which allows the machine to move only when the operator is seated.**

## 6.2. Mounting and adjusting the squeegee

The squeegee (ref. 6) is responsible for the first phase of drying.



To mount the squeegee on the machine, proceed as follows:

1. make sure the squeegee mount (ref. 2) is raised;
2. insert the suction hose sleeve (ref. 4) fully into the squeegee;
3. slacken the two knobs (ref. 3) at the center of the squeegee;
4. insert the two threaded pins into the slots on the support (ref. 2);
5. fix the squeegee by tightening the two knobs (ref. 3);
6. The squeegee blades scrape the film of water and solution from the floor and prepare the way for perfect drying. With time, the constant rubbing makes the edge of the blade in contact with the floor rounded and cracked, reducing the drying efficiency and requiring it to be replaced. The state of wear should be checked frequently;
7. For perfect drying, the squeegee must be adjusted in such a way that the edge of the rear blade bends during operation by about 45° with respect to the floor at every point;
8. Adjust the angle of the blade during operation by regulating the height of the two wheels positioned behind the squeegee (ref. 1).

### 6.3. Moving the machine when not in operation

To move the machine, proceed as follows:

- raise the squeegee by pressing the suction button (LED off);
- raise the head by pressing the brush button (LED off);
- use the selector to set the direction of movement;
- operate the accelerator;
- speed can be varied by the potentiometer knob.



**Do not leave the machine unattended or parked with the key inserted in the emergency button and the parking brake off.**

### 6.4. Mounting and changing the brush/drive disks



**Never work without the brushes and drive disks perfectly installed.**

**Automatic brush attachment:** lift the head by pressing the brush button (LED off). Place the disks under the head (ref. 1), making sure they rest against the stops to align them with the attachment device, then press the brush button (LED on). The machine performs the automatic attachment maneuver.

**Use of abrasive disks:** fit the abrasive disk on the drive disk and perform the operations described above.

**Automatic brush release:** stop brush rotation by pressing the brush button (ref. 4) (LED off). With the head raised, hold the brush button (ref. 4) down for at least 5 seconds. The machine performs the automatic release maneuver.



**Always dilute the solution according to the manufacturer's instructions. Do not use sodium hypochlorite (bleach) or other oxidants, particularly in strong concentrations. Do not use solvents or hydrocarbons. The temperature of the water and solution must not exceed the maximum indicated in the technical specification. They must be free of sand and/or other impurities.**

The machine has been designed for use with low-foam biodegradable solutions made specifically for automatic scrubber.

For a complete and up-to-date list of the solutions and chemicals available, contact the Manufacturer.

Use products suitable for the floor and dirt to be removed only.

Follow the safety regulations on use of solutions given in the section "Safety regulations".

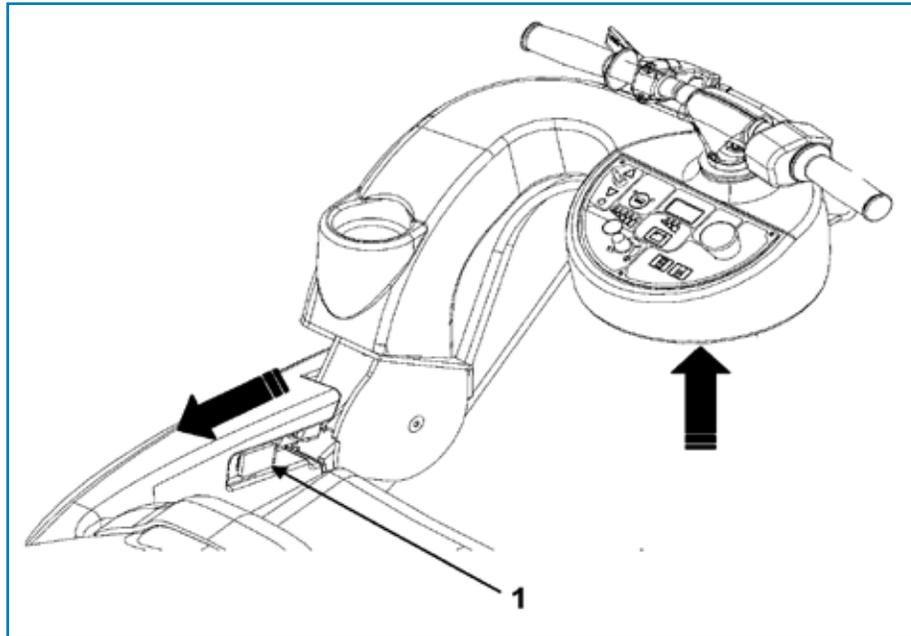
### 6.5. Preparing the machine for work



**Before starting work, wear overalls, ear protectors, non-slip waterproof shoes, mask to protect the respiratory tract, gloves and all other personal protection devices recommended by the supplier of the solution used or necessitated by the work environment.**

Before starting work, proceed as follows:

- check the battery charge (recharge if necessary);
- make sure the recovery tank is empty. If necessary, empty it;
- via the opening at the front, fill the solution tank with a suitable concentration of clean water and low-foam solution. Leave at least 5 cm between the surface of the liquid and the opening of the tank;
- make sure the squeegee is firmly attached and connected to the suction hose. Make sure the back blade is not worn;
- adjust the height of the control panel support by pressing the locking lever (ref; 1) and with the other hand raise the mount support. When the device has been released, raise or lower the support into the desired position.



**If you are using the machine for the first time, we recommend trying it on a large obstacle-free surface first to acquire the necessary familiarity.**  
**Always empty the recovery tank before filling the solution tank again.**

For effective cleaning and to extend the working life of the machine, follow a few simple rules:

- prepare the work area by removing all possible obstacles;
- begin working from the furthestmost point to avoid walking on the area you have just cleaned;
- choose the straightest possible working routes;
- divide large floors into parallel rectangular sections.
- if necessary, finish off by passing a mop or rag rapidly over parts inaccessible to the automatic scrubber.

## 6.6. Working

1. Start the machine by turning the key clockwise.
2. Press the suction button (LED on) to lower the squeegee and enable the suction motor.
3. Press the brush button (LED on) to lower the head.

4. Pressing the solution flow regulation button once enables solution flow, holding it down determines the quantity of flow (indicated by LED).
5. Operate the accelerator to move forwards or backwards.



**Empty the recovery tank each time you fill the solution tank. Periodically check that the solution is reaching the brushes/rollers and refill when it runs out. When there is no longer sufficient water in the solution tank, the level indicator lights up (ref. 6). Stop and fill the tank; while working, check the quality of washing and adjust the flow of solution reaching the brushes.**

6. when the recovery tank is full, the level indicator comes on and after a few seconds the suction motor shuts down. To restart the suction motor you must turn the suction switch off then on again.
7. if the red indicator light starts flashing, it means the batteries are almost flat. After a few seconds the brushes shut down to prevent excessive discharge of the batteries. Recharge.

At the end of work:

1. stop solution flow by pressing the button ;
2. stop the brushes by pressing the button (LED off);
3. release the accelerator;
4. stop the suction motor by pressing the button (LED off);
5. press the emergency button;
6. put the parking brake;
7. disconnect the batteries;
8. empty and clean the recovery tank.

## **6.7. Some useful tips to get the most from your automatic scrubber**

In the event of particularly stubborn dirt on the floor, washing and drying can be performed in two separate operations.

### **6.7.1. Prewashing with brushes or pads**

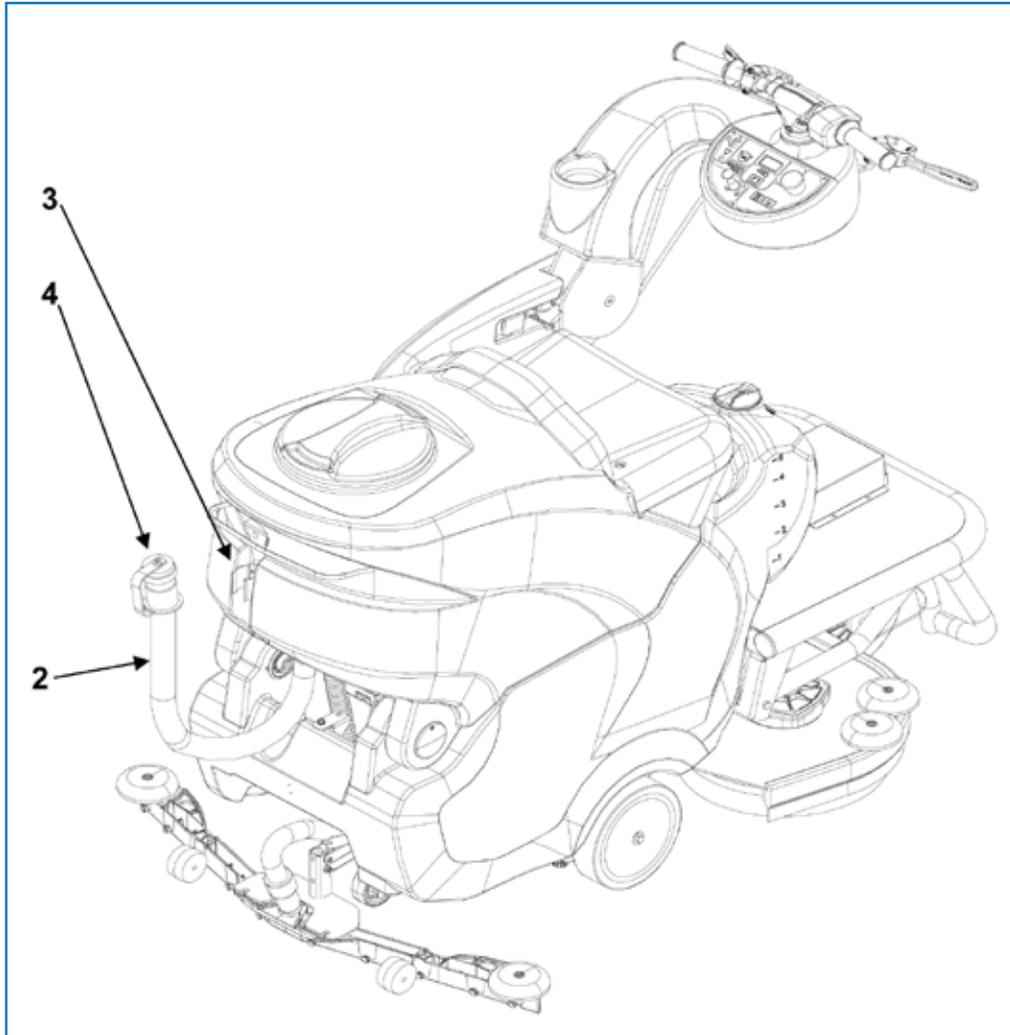
1. adjust the solution flow.
2. press the brush button.
3. stop the suction motor by pressing the button.
4. begin washing.

The flow of water must be adjusted in proportion to the desired advance speed. The slower the machine moves forwards, the less water is needed. Persist when washing particularly dirty points to give the solution time to perform its mechanical action detaching and suspending the dirt and the brushes time to exert an effective mechanical action.

### **6.7.2. Drying**

Turn the suction motor on by pressing the button then pass over the same area washed previously. The result is equivalent to in-depth washing and subsequent ordinary maintenance will take less time.

## 6.8. Draining the dirty water



**Use suitable personal protection devices.  
Drain the water with the machine disconnected from the power supply.**

The recovery tank drain hose is at the back left side of the machine.

To empty the drum:

1. move the machine near a drain;
2. detach the drain hose (ref. 2) from its seat by holding it near the fixing spring (ref. 3) and pulling horizontally;
3. keeping the hose end as high as possible, unscrew and remove the cap (ref. 4);
4. lower the hose end gradually, controlling the intensity of the flow of water by adjusting the height from the ground;
5. check the amount of dirt left in the recovery tank and if necessary wash it out. To facilitate cleaning and complete emptying of the drum, you are recommended to unfasten and lift it;
6. when the dirty water has been totally drained, lower the recovery tank (if previously lifted);
7. close the drain hose (ref. 4) by replacing the cap (ref. 2), check that it is tightly closed and replace the hose in its housing.



Important

**When washing the recovery tank, never remove the suction filter (ref. 2) from its housing and never direct the jet of water against the filter itself.**

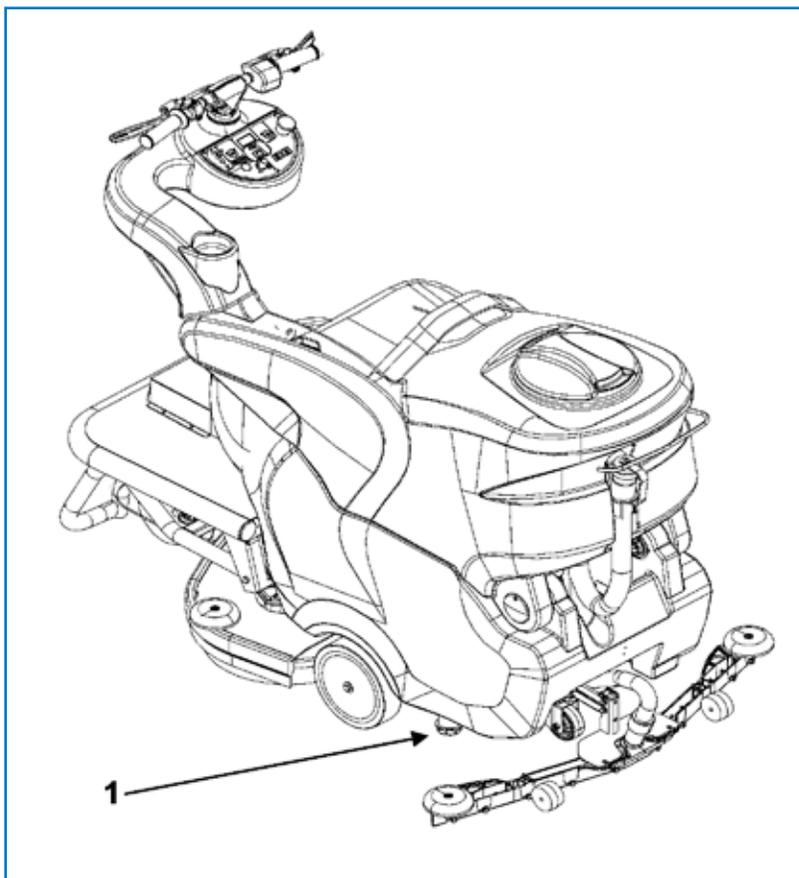
You are then ready to wash and dry again.

## 6.9. Draining the solution tank.



Danger

**Use suitable personal protection devices.  
Drain the water with the machine disconnected from the power supply.**



To empty the tank:

1. move the machine near a drain;
2. remove the cap (ref. 1);
3. when the solution tank is completely empty, replace the cap (ref. 1).



Information

**The water and solution solution can also be used to wash the recovery tank.**

## 7. Periods Of Inactivity

If the machine is not used for some time, remove the squeegee, brushes/microfibre disks and drive disks, wash them and put them away in a dry place (preferably in a bag or wrapped in plastic film) away from dust. Park the machine with the parking brake on.

Make sure the tanks are completely empty and perfectly clean.

Disconnect the machine from the power supply.

Completely recharge the batteries before storing them. During long periods of inactivity, you should charge the batteries regularly (at least once every two months) to keep them constantly at maximum charge.



Important

**If you do not charge the batteries regularly, they may be irrevocably damaged.**

## 8. Battery Maintenance And Charging



Danger

**Do not check the battery by sparking.**

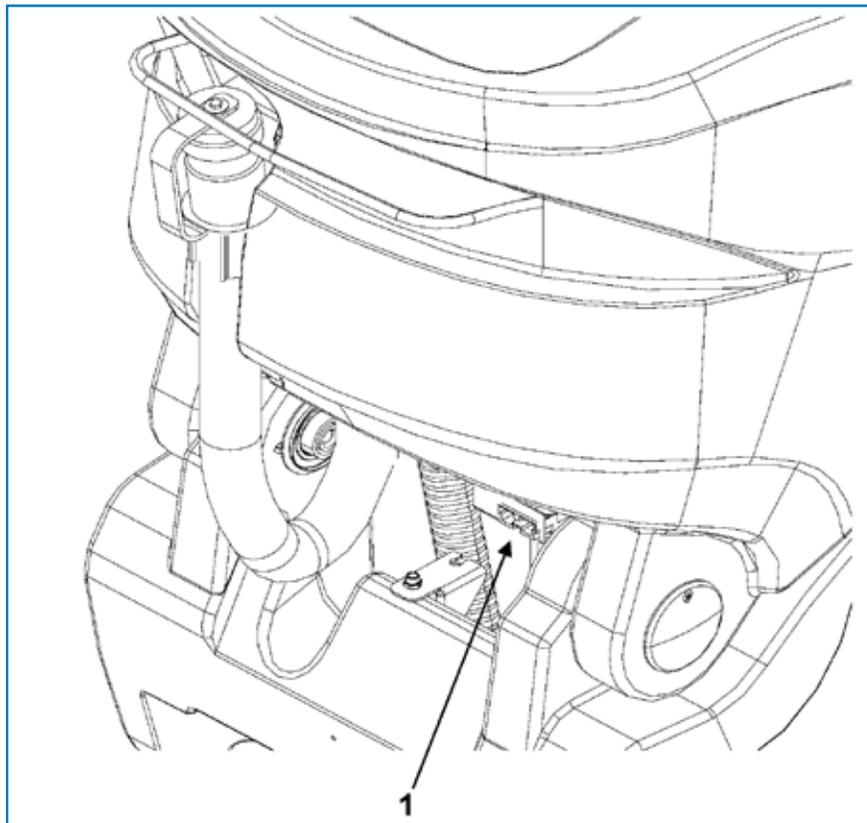
**The batteries give off flammable fumes. Put out all fires and hot embers before checking or topping up the batteries.**

**Perform the operations described above in a ventilated room.**

To avoid permanent damage to the batteries, do not run them down completely.

Remember that when the corresponding red LED flashes on the control panel, you must charge the batteries.

### 8.1. Recharging procedure



1. Connect the battery charger connector to the battery wiring connector (ref. 1).



**In the case of gel batteries, use a charger specific for gel batteries only.**

2. Charge the batteries as described in the battery charger manual.
3. At the end of charging, disconnect the connectors.

## 9. Maintenance Instructions



**Never perform any maintenance operations without first disconnecting the batteries. Maintenance on the electrical circuit and all other operations not explicitly described in this manual must be performed by specialized personnel only, in compliance with current safety legislation and as described in the maintenance manual.**

### 9.1. Maintenance - General rules

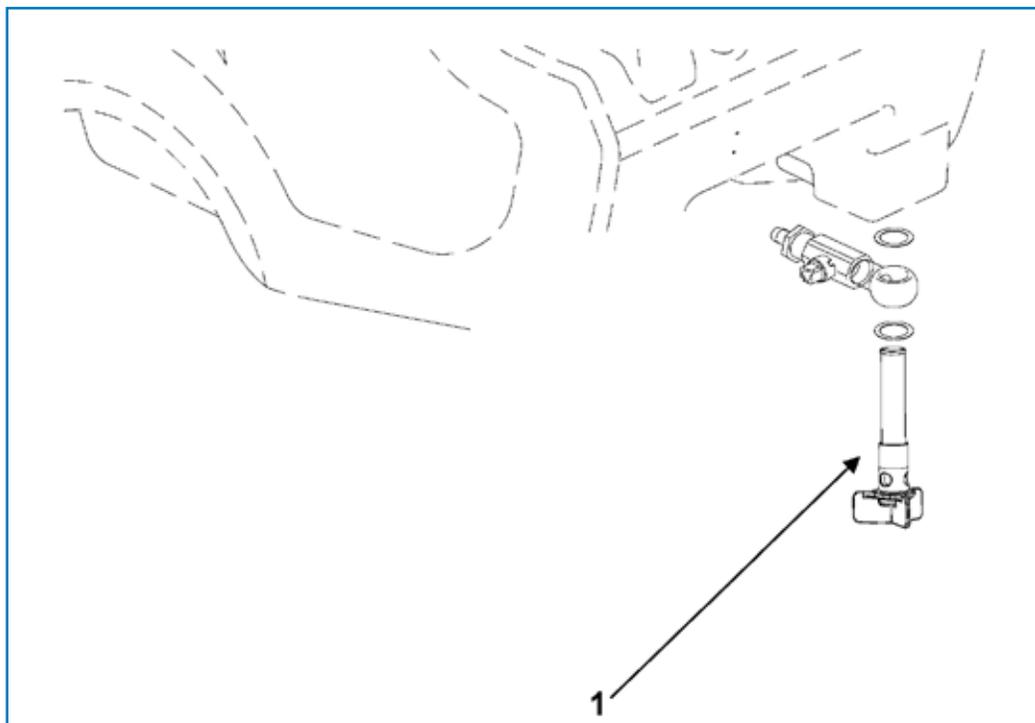
Performing regular maintenance according to the Manufacturer's instructions improves performance and extends the working life of the machine.

When cleaning the machine, respect the following:

- avoid the use of high pressure washers. Water could penetrate the electrical compartment or motors leading to damage or the risk of short circuit;
- do not use steam to avoid the heat warping plastic parts;
- do not use hydrocarbons or solvents as they could damage the cowling and rubber parts.

### 9.2. Routine maintenance

#### 9.2.1 Suction motor air filter and float switch: cleaning

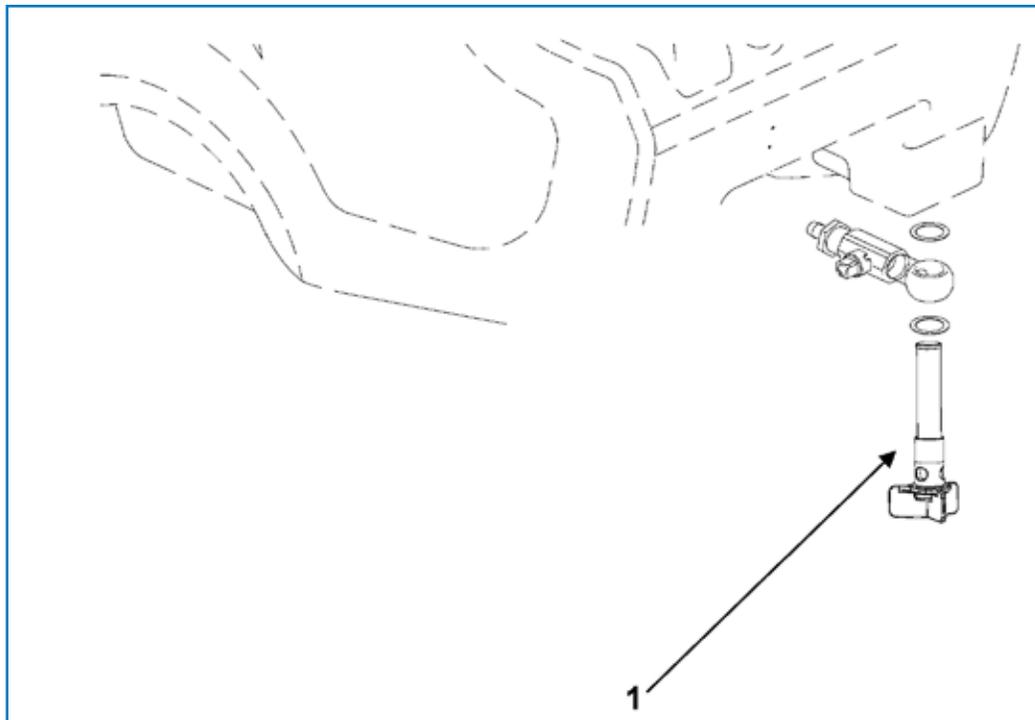


1. Unscrew and remove the tank cap (ref. 1) from the recovery tank;
2. make sure the recovery tank is empty;
3. clean the float switch at the back of the recovery tank, taking care not to direct the water jet directly against the float switch;
4. remove the suction motor air filter from the support inside the recovery tank at the top;
5. clean the filter with running water or the solution solution used on the machine;
6. dry the filter thoroughly before replacing it in the support. Make sure the filter is correctly located in its housing;
7. screw the cap back on the recovery tank.

### 9.3. Basket filter: cleaning

1. Remove the basket filter from the water fill hole at the front of the machine;
2. clean the filter with running water or the solution solution used on the machine;
3. replace the filter back in its housing, making sure it is correctly positioned.

### 9.4. Solution filter: cleaning

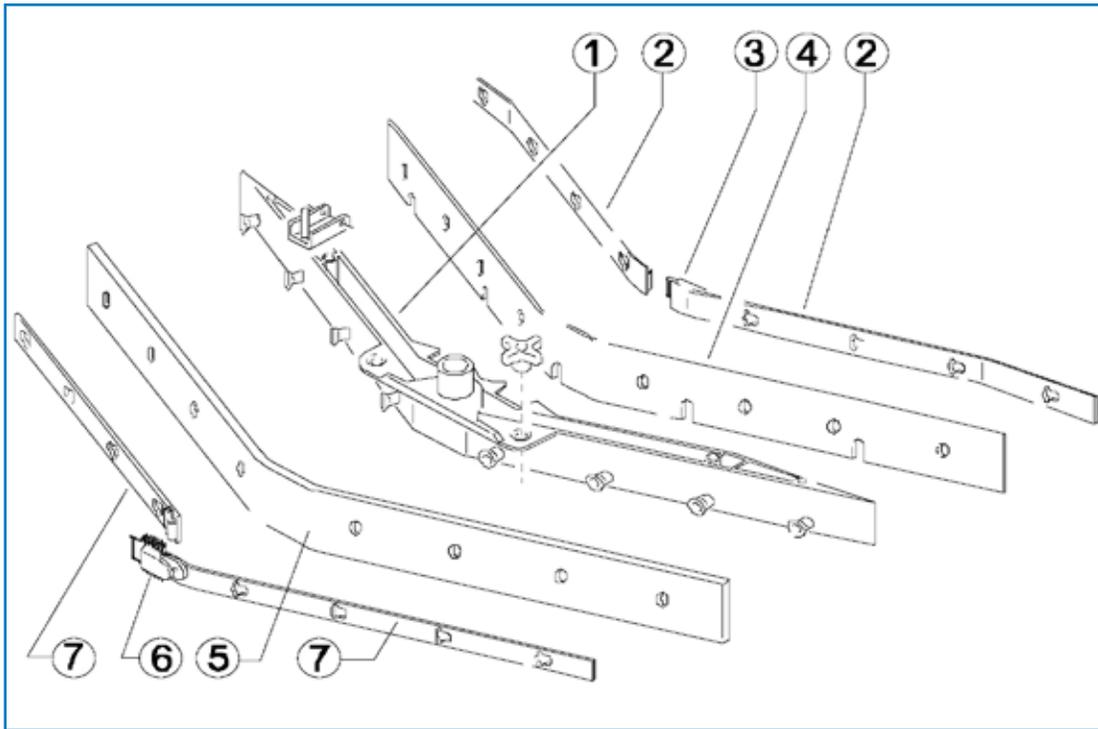


1. Unscrew the screw located below the bottom tank (ref. 1);
2. clean the filter with running water or the solution solution used on the machine;
3. replace the filter in its housing, making sure it is correctly positioned and retighten the screw.

#### 9.4.1 Squeegee blades: replacing

The squeegee blades collect the film of water and solution from the floor and prepare the way for perfect drying. With time, the constant rubbing leaves the edge of the blade in contact with the floor rounded and cracked, reducing the drying efficiency and requiring it to be replaced.

Turning or replacing the blades:



1. remove the squeegee from its mount by completely
2. unscrewing the two knobs
3. remove the suction hose sleeve from the squeegee;
4. release the catch (ref. 3 or 6);
5. remove the two blade retainers (ref. 2 or 7) by first pushing them towards the body of the squeegee (ref. 1) then extracting them;
6. remove the blade (ref. 4 or 5);
7. reuse the same blade by reversing the edge in contact with the floor until all four edges are worn out, or replace with a new blade, fitting it onto the screws on the body of the squeegee (ref. 1);
8. reposition the two blade retainers (ref. 2 or 7) by centering the widest part of the slots over the fixing screws on the squeegee body (ref. 1), then pushing the blade retainers inwards;
9. refasten the catch (ref. 3 or 6).

Replace the squeegee in its support.

#### 9.4.2 Fuses: replacement

The fuses protecting the brush and suction motors are located in the fuse holder (ref. 1) attached to the recovery tank above the machine battery compartment.

To replace the fuses:

1. make sure the recovery tank is empty and empty if necessary;
2. raise the recovery tank;
3. raise the fuse holder cover and remove the fuse by unscrewing the fixing screws;
4. fit a new fuse and close the fuse holder cover;
5. lower the recovery tank.

Fuse table: for the complete fuse table, see the spare parts catalogue.



## Never use a fuse with a higher amperage than specified.

If a fuse continues to blow, the fault in the wiring, boards (if present) or motors must be identified and repaired. Have the machine checked by qualified personnel.

### 9.5. Routine maintenance

#### 9.5.1. Daily operations

After each day's work, proceed as follows:

1. disconnect the machine from the power supply;
2. empty the recovery tank and clean if necessary;
3. clean the squeegee blades and check for wear. If necessary, replace.
4. check that the suction hole in the squeegee is not blocked. If necessary remove encrusted dirt;
5. recharge the batteries according to the procedure described.

#### 9.5.2. Weekly operations

- clean the recovery tank float switch and make sure it is working correctly;
- clean the suction air filter and make sure it is undamaged, if necessary, replace;
- clean the solution filter at the front opening of the solution tank (ref. 3) and
- check that it is not damaged (replace if necessary);
- clean the suction hose;
- clean the recovery tank and solution tank;
- check the level of battery electrolyte and top up with distilled water if necessary.

## 10. Troubleshooting

### 10.1. How to resolve possible problems

Possible problems affecting the whole machine.

PROBLEM	CAUSE	REMEDY
<b>The machine does not function</b>	Battery connector disconnected.	Connect the batteries to the machine.
	The batteries are flat.	Recharge the batteries.
<b>The brushes do not turn</b>	You have not pressed the brush switch.	Press the brush switch.
	The accelerator has not been operated.	Operate the accelerator.
	The brush motor thermal cutout has tripped; the motor has overheated.	Release the brush lever, turn the brush switch to the "0" position (off); leave the machine to cool down for at least 45'.
	The power supply or motor thermal cutout connectors are disconnected.	Reconnect the power supply or motor thermal cutout connectors.
	The brush motor fuse has blown.	Have someone check and eliminate the causes responsible for the blown fuse, then replace.
	The batteries are flat.	Recharge the batteries.
	The reduction unit is faulty.	Have the reduction unit replaced.
The motor is faulty.	Have the motor replaced.	

<b>The machine does not clean evenly</b>	The brush or disks are worn.	Replace
<b>No solution is delivered</b>	The solution tank is empty.	Fill it.
	The hose delivering the solution to the brush is blocked.	Unblock and open the circuit.
	The solenoid valve is faulty.	Replace the solenoid valve.
<b>The solution flow does not stop</b>	The solenoid valve is faulty.	Replace the solenoid valve.
<b>The suction motor does not start</b>	The suction motor button has not been pressed (off).	Press the suction button.
	There is no power to the suction motor or the motor is faulty	Check that the motor power connector is correctly connected to the main wiring; if it is correctly connected, have the motor replaced.
	The fuse has blown.	Replace the fuse.
<b>The squeegee does not clean or suction is ineffective</b>	The edge of the rubber blades in contact with the floor is worn.	Replace the rubber blade.
	The squeegee or hose is blocked or damaged.	Unblock and repair the damage.
	The float switch has tripped (recovery tank), is clogged by dirt or broken.	Empty the recovery tank or reset the float switch.
	The suction hose is blocked.	Unblock the hose.
	The suction hose is not connected to the squeegee or is damaged.	Connect or repair the hose.
	There is no power to the suction motor or the motor is faulty.	Check that the motor power connector is correctly connected to the main wiring and that the fuse is not blown; in the second case have the motor replaced.
<b>The machine does not move</b>	The suction motor does not operate.	Release the emergency button; make sure the motor is connected correctly to the main wiring; check the type of alarm present on the board (see chapter 10); replace the motor.
	The motor thermal cutout has tripped; the motor has overheated.	Stop the machine, turn it off and leave it to cool for at least 45'.
	The batteries are flat.	Recharge the batteries.
<b>The batteries do not provide the normal work time</b>	The battery poles and charging terminals are dirty and oxidized.	Clean and grease the poles and terminals, recharge the batteries.
	The electrolyte level is low.	Top up all the elements with distilled water as described in the instructions.
	The battery charger does not work or is unsuitable.	See battery charger instructions.
	There are considerable differences in density between the various elements of the battery.	Replace the damaged battery.
	You are using the machine with excessive pressure on the brushes.	Reduce pressure on the brush.

<p><b>The battery discharges too fast during use, recharging with an electronic battery charger is too fast and after recharging the battery supplies the right voltage (about 2.14V for each element without load), but when tested with a hydrometer is found not to be uniformly charged</b></p>	<p>The battery supplied filled with acid by the Manufacturer has been stored for too long before being recharged and used for the first time.</p>	<p>If recharging with a normal battery charger is not effective, you must use a double recharging cycle:  - charge slowly over a 10 hour period at a current of 1/10 the nominal capacity for 5 hours (e.g. for a 100Ah(5) battery the current must be set at 10A, using a manual battery charger);  - rest for one hour;  - charge with the normal battery charger.</p>
<p><b>At the end of charging with the electronic battery charger, the battery does not provide the correct voltage (about 2.14 V per element without load) and appears to be uniformly not charged when tested with a hydrometer</b></p>	<p>The battery has not been connected to the battery charger (for example, because the low voltage connector of the battery charger has been erroneously connected to the machine connector).</p>	<p>Connect the battery charger to the battery connector.</p>
	<p>The battery charger and power socket to which the battery is connected are not compatible.</p>	<p>Check that the power supply characteristics indicated on the battery charger rating plate comply with those of the mains power supply.</p>
	<p>The battery charger has not been installed correctly.</p>	<p>Taking the actual voltage available at the socket into account, make sure that the connections of the primary of the transformer inside the battery charger are correct (consult the battery charger manual).</p>
	<p>The battery charger is not working.</p>	<p>Make sure there is voltage to the battery charger, that the fuses are not blown and that the current reaches the battery; try charging with another rectifier. If the battery charger is not working, contact the technical service center and indicate the serial number of the battery charger.</p>
<p><b>At the end of charging with the electronic battery charger, the battery does not provide the correct voltage (about 2.14 V per element without load) and only one or a few elements are found to be discharged when tested with a hydrometer</b></p>	<p>One or more elements are damaged.</p>	<p>Replace the damaged elements if possible. For 6 or 12 V single block batteries, replace the entire battery.</p>
<p><b>The electrolyte in the battery is turbid</b></p>	<p>The battery has reached the end of the charging/ discharging cycles declared by the manufacturer.</p>	<p>Replace the battery.</p>
	<p>The battery has been recharged with too high a current.</p>	<p>Replace the battery.</p>
	<p>The battery has been charged beyond the limit suggested by the Manufacturer.</p>	<p>Replace the battery.</p>

## Alarms on the Display

1. **NAN** "drive lever" already pressed when the machine is turned on or after an Emergency
2. **SIC** Emergency button pressed
3. **POT** Speed potentiometer fault
4. **MOS** Board (mosfet) short circuit
5. **HOT** Motor thermal cutout tripped
6. **LIM** Board (mosfet) thermal limitation problem
7. **BLT** Drive block. Appears when the battery voltage is too low and the drive is blocked.
8. **AcS** Brush Control Fault Appears when there is a fault in the solenoid switch controlling the brushes.
9. **AcA** Suction control fault. Appears when there is a fault in the solenoid switch controlling suction.
10. **FuP** Fuse. Appears when the fuse is blown.

## Motor drive alarm board

If drive is interrupted, the error code should be identified by means of the status LED. In the absence of malfunctions, the status LED is steadily on while the machine is in operation. If a malfunction is detected, the status LED provides two types of information, a slow flash (2 Hz) or a rapid flash (4 Hz) to indicate the severity of the malfunction.

Malfunctions with a slow flash are cancelled automatically once the malfunction has been repaired and the machine functions normally again. Malfunctions with a rapid flash ("\*" in the table) are considered more serious. The machine must be turned of using the key switch to reset operation after repairing the malfunction.

The indication of severity remains active for 10 seconds, after which the status LED flashes constantly showing a two digit malfunction code until the repairs have been carried out.

For example, error code "1,4" is displayed as follows:

☼ ☼☼☼☼ Example alarm code 1,4

LED CODES		DESCRIPTION	
	1,1	☼ ☼	Overheating > 92°
	1,2	☼ ☼☼	Accelerator malfunction
	1,3	☼ ☼☼☼	Speed limiter potentiometer malfunction
	1,4	☼ ☼☼☼☼	Overvoltage malfunction
	1,5	☼ ☼☼☼☼☼	Undervoltage malfunction
	2,1	☼☼ ☼	Principal contactor actuator opening failure
	2,3	☼☼ ☼☼☼	Principal contactor actuator closing failure
	2,4	☼☼☼ ☼☼☼☼	Principal contactor actuator closing failure
*	3,1	☼☼☼☼ ☼	Accelerator potentiometer malfunction
	3,2	☼☼☼☼ ☼☼	Brake activation malfunction
	3,3	☼☼☼☼ ☼☼☼☼	Low battery voltage
	3,4	☼☼☼☼ ☼☼☼☼☼	Brake deactivation malfunction
	3,5	☼☼☼☼ ☼☼☼☼☼☼	HPD malfunction (incorrect regulation of accelerator potentiometer)
*	4,1	☼☼☼☼☼☼ ☼	Motor short circuit
*	4,2	☼☼☼☼☼☼ ☼☼	Incorrect motor voltage/short circuit in motor
*	4,3	☼☼☼☼☼☼ ☼☼☼☼	EEPROM malfunction
*	4,4	☼☼☼☼☼☼ ☼☼☼☼☼☼	Short circuit in motor/EEPROM error