

**diamond 100 AC
diamond 130**

06 2020

EN

Use and maintenance



Warning! Please read the instructions before use.

INTRODUCTORY COMMENT

Thank you for having chosen our machine. This floor cleaning machine is used for **commercial use** and is used for the industrial and civil cleaning to clean any type of floor. During its advance movement, the combined action of the brush and the detergent solution removes the dirt which is aspirated through the rear suction assembly, giving a perfectly dry surface.

The machine must be used only for such purpose. It gives the best performance if it is used correctly and maintained in perfect efficiency. We therefore ask you to read this instruction booklet carefully whenever difficulties arise in the course of the machine's use.

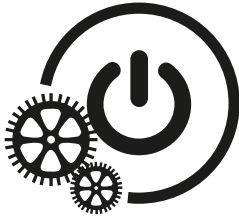
In case of need, we ask you to contact our service department for all advice and servicing as may prove necessary.

ATTENTION: This machine is for internal use only.

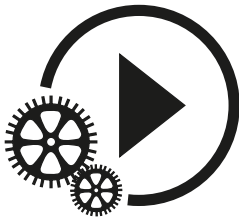
ATTENTION: This machine must only be stored indoors.

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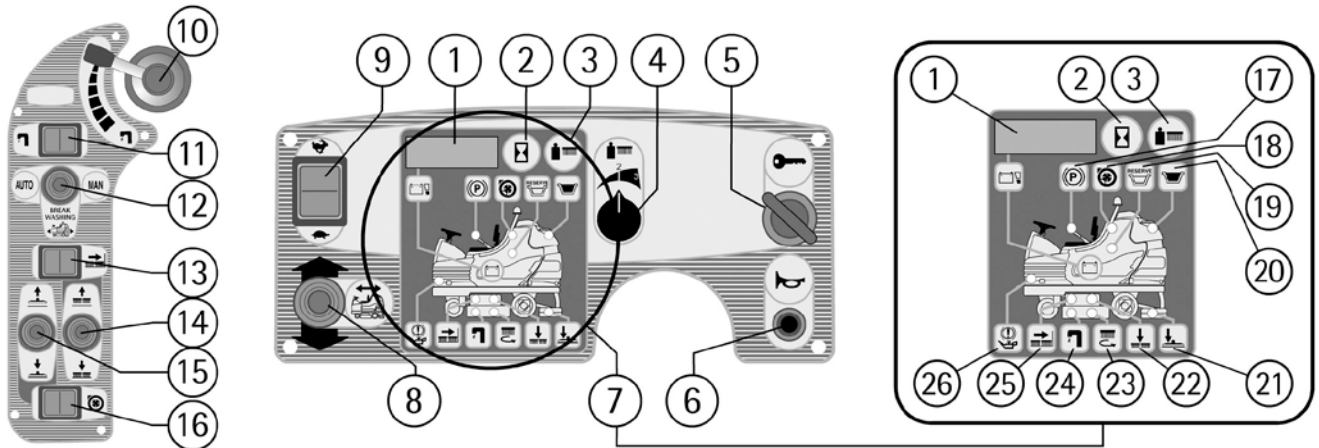


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LEGEND PANEL OF CONTROLS

1. DISPLAY VISUALIZATION
2. PUSH BUTTON VISUALIZATION HOUR METER (DISPLAY)
3. PUSH BUTTON VISUALIZATION BRUSHES PRESSURE SET (DISPLAY)
4. ADJUSTMENT KNOB BRUSHES PRESSURE
5. KEY SWITCH
6. PUSH BUTTON HORN
7. CONTROL PANEL FUNCTIONS
8. DRIVE SELECTOR FORWARDS/BACKWARDS
9. SELECTOR SPEED
10. SOLUTION VALVE LEVER
11. SWITCH WATER OPENING (SOLENOID VALVE)
12. SELECTOR MODE OF FUNCTIONING
13. BRUSHES UNLOCKING BUTTON (130 model)

14. SELECTOR UP/DOWN BRUSHES
15. SELECTOR UP/DOWN SQUEEGEE
16. SWITCH SUCTION MOTORS
17. SIGNAL LAMP PARKING BRAKE ON
18. SIGNAL LAMP SUCTION MOTORS ON
19. SIGNAL LAMP DETERGENT SOLUTION LOW
20. SIGNAL LAMP RECOVERY TANK FULL
21. SIGNAL LAMP SQUEEGEE DOWN
22. SIGNAL LAMP BRUSHES DOWN
23. SIGNAL LAMP BRUSHES ROTATION
24. SIGNAL LAMP WATER OPEN (SOLENOID VALVE)
25. SIGNAL LAMP RESTORATION LIQUID LEVEL BRAKES




LEGEND MACHINE


1. RECOVERY TANK
2. SOLUTION TANK
3. SEAT
4. DRIVE WHEEL
5. SCREW CAP FOR INLET DETERGENT SOLUTION
6. BLINKING LIGHT
7. ROLLBAR
8. INSPECTION CAP RECOVERY TANK
9. SQUEEGEE HOSE
10. PLUG EXHAUST HOSE RECOVERY TANK
11. EXHAUST HOSE RECOVERY TANK


12. SQUEEGEE ASSEMBLY
13. PANEL CONTROLS
14. LEVER BLOCK/RELEASE PARKING BRAKE
15. COVER ELECTRICAL LAYOUT
16. BUMPER
17. PEDAL ACCELERATOR
18. TRACTION MOTOR WHEEL
19. STEP FOR THE OPERATOR
20. OUTER FILTER DETERGENT SOLUTION
21. BOTTOM PLATE
22. BRUSHES BASE GROUP
23. REAR WHEELS



MACHINE SYMBOLOGY


 Symbol denoting the switch for the water opening and the signal lamp that the water is open.

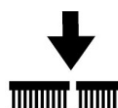
 Symbol denoting the functioning of the solution valve adjusting the flow of the detergent solution.


MAX 50°C
 Indication of the maximum temperature of the detergent solution. It is placed near the charging hole of the solution tank.

MAN
Symbol denoting the selection of the operation mode in manual.


AUTO
Symbol denoting the selection of the operation mode in automatic.


BREAK WASHING
 Symbol denoting the selection of the mode at the end of the washing and transfer.


 Symbol denoting the activation and the signal lamp brushes down.

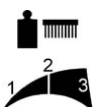
 Symbol denoting the activation of the brushes up.


 Automatic brushes unlocking symbol (130 model)


 Symbol denoting the signal lamp of the brushes rotation.


 Symbol denoting the push button to visualize the hour meter on the display.


 Symbol denoting the push button to visualize on the display the brushes pressure set.

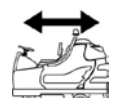
 Symbol denoting the functioning of the adjustment knob of the brushes pressure.


 Symbol denoting the activation and the signal lamp squeegee down.


 Symbol denoting the activation of the squeegee up.


 Symbol denoting the switch and the signal lamp of the suction motor.


 Symbol denoting the charge level of the batteries.


 Symbol denoting the selection of the forward/backward movement.


 Symbol denoting the push button and the signal lamps for the selection of the operation speed.


 Symbol denoting the signal lamp of the parking brake switched on.

 Symbol denoting the key switch.


 Symbol denoting the push button of the horn.


RESERVE
 Symbol denoting the signal lamp of low detergent solution.


 Symbol denoting the signal lamp of overflow of the recovery tank.


 Symbol denoting the signal lamp of restoration level liquid brakes.


HANDBOOK SYMBOLOGY


 Symbol denoting the open book. Indicates that the operator has to read the manual before the use of the machine.


 Symbol denoting the open book. For the good functioning of the battery recharger, read the manual of the constructor.


 Warning symbol. Read carefully the sections marked with this symbol, for the security of both the operator and the machine.


 Icon indicating the part of the manual related to the unboxing, preparation and start of the machine.


 Warning symbol. Risk of acid leakage from the batteries.


 Obligation symbol, disconnect the installation from the batteries acting upon the connector before any operation on the machine.


 Obligation symbol requiring the wear of protection glasses.

 Icon indicating the part of the manual related to the machine use.

 Obligation symbol requiring the wear of protection gloves.

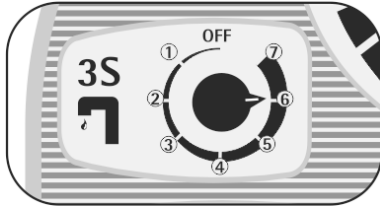
 Symbol preceding an information about the correct use of the machine.

 Symbol indicating operations to be carried out only by qualified personnel.

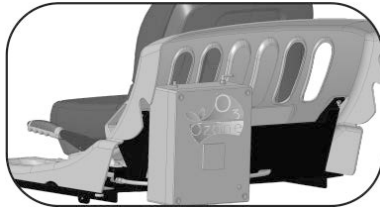
 Icon indicating the part of the manual related to the maintenance of the machine.

OPTIONAL EQUIPMENTS

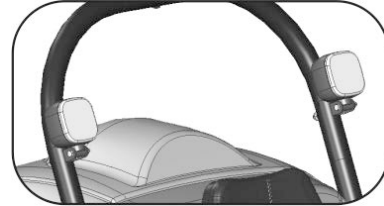
3S "Solution Saving System"



Ozone system O3



Adjustable lights



Safety seat belts



GENERAL RULES OF SAFETY

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

- Read the labels carefully on the machine. Do not cover them for any reason and replace them immediately if damaged.
- **ATTENTION:** The machine must be used exclusively by authorized staff that have been instructed on its correct and proper use.
- **ATTENTION:** Do not use the machine on areas having a higher gradient than the one stated on the number plate.
- **ATTENTION:** The machine is not to be used by persons, children included, with reduced physical, sensorial or mental capabilities, or with lack of experience or knowledge, unless they could benefit, through the intermediation of a responsible person for their safety, by a supervision or instructions concerning to its use.
- During the operation of the machine, pay attention to other people and especially to the children.
- Children shall not play with the machine.
- Children cannot carry out cleaning and maintenance of the machine.

TRANSFER

- **WARNING:** Do not use the machine in areas where it is likely that the operator is hit by falling objects since the appliance is not provided with a falling object protective structure (FOPS).
- Do not strike shelveings or scaffoldings where there is danger of falling objects.
- Leaving the machine in parking position, take off the key and act upon the parking brake.
- Do not use the machine as a means of transport.
- Adapt the working speed to the adhesion conditions: particularly, slow down before narrow curves have to be faced.

STORAGE AND DISPOSAL

- Storage temperature: between 0°C and +55°C (32°F and 131°F).
- Perfect operating temperature: between 0°C and +40°C (32°F and 104°F).
- The humidity should not exceed 95%.
- Provide for the scrapping of the material of normal wear (brushes, squeegee blades etc.) following strictly the respective rules.
- When your machine has to stop activity, provide for the appropriate waste disposal of its materials, especially oils, batteries and electronic components, and considering that the machine itself has been, where possible, constructed using recyclable materials.

CORRECT USE

- Do not use the machine on surfaces covered with inflammable liquids or dusts (for example hydrocarbons, ashes or soot).
- In case of fire, use a powder-based fire-extinguisher. Do not use water.
- Do not use the machine in explosive atmosphere.
- The machine has to carry out simultaneously the operations of washing and drying. Different operations must be carried out in restricted areas prohibited to non-authorized personnel and the operator has to wear suitable shoes.
- Signal the areas of moist floors with suitable signs.
- Do not mix different detergents, avoiding harmful odours.
- Avoid brushes operation when the machine is standing still in order to prevent floor damages.

MAINTENANCE

- If the machine does not work properly, check by conducting simple maintenance procedures. Otherwise, as for technical advice from an authorized assistance centre.
- For any cleaning and/or maintenance operation remove the battery connector.
- Where parts are required, ask for ORIGINAL spare parts from the distributor and/or from an authorized dealer.
- Use only ORIGINAL brushes.
- Do not take off the protections which require the use of tools for their removal.
- Do not wash the machine with direct water jets or with high water pressure nor with corrosive material.
- Every 200 working hours have a machine check by an authorized service department.
- Before using the machine, check that all panels and coverings are in their position as indicated in this use and maintenance catalogue.
- Restore all electrical connections after any maintenance operation.

TRANSPORTING THE MACHINE

WARNING: Before transporting the machine on an open truck or trailer, make sure that:

- All tanks are empty.
- Recovery tank cover is latched securely.
- The machine is tied down securely.
- The machine's electromagnetic brake is engaged (not manually overridden).

GENERAL RULES OF THE BATTERIES



- At any intervention on the batteries, use suitable acid-proof gloves and glasses.
- Do not smoke near the batteries and do not approach them with free flames.
- Check that a fire-extinguisher is available on site.
- Be very careful in case of leakages or liquid outlets because corrosive.
- Do not place any metallic tools onto the batteries. Risk of short circuit!
- It is compulsory to hand over exhaust batteries, classified as dangerous waste, to an authorized institution according to the current laws.

TECHNICAL DESCRIPTION		diamond 100AC	diamond 130
Cleaning width	mm	1000	1300
	in	40	51
Squeegee width	mm	1175	1550
	in	46	61
Working capacity, up to	m ² /h	7000	9100
	sqft/h	75347	97951
Brushes diameter	mm	2x510	4 x 355
	in	2x20	4 x 14
Brushes rpm	rpm	162	220
Pressure on the brushes	kg	160	160
	lbs.	353	353
Brushes motor	W	2000	1920
	A	56	53
Suction motor	W	2x570	2x570
	A	2x16	2x16
Suction vacuum	mbar	190	190
	water lift	76	76
Traction motor	W	1200	1400
	A	33	39
Type of drive		Autom.	Autom.
Movement speed (max)	km/h	7	7
	mph	4.35	4.35
Maximum gradient	%	10	10
Solution tank	l	235	235
	gal	62	62
Recovery tank	l	250	250
	gal	66	66
Machine length	mm	2025	2025
	in	80	80
Machine height without roll-bar	mm	1330	1330
	in	53	53
Height with rollbar, without blinking light	mm	1685	1685
	in	66	66
Height with rollbar and blinking light	mm	1850	1850
	in	73	73
Machine width (without squeegee)	mm	1040	1400
	in	41	55
Weight of the machine (empty and without batteries)	kg	600	600
	lbs.	1323	1323
Gross weight of the machine (in conformity with EN 60335-2-72 art. 5.z102)	kg	1510	1530
	lbs.	3329	3373
Battery voltage	V	36	36
Capacity of the batteries	Ah ₅	500	500
Weight of the batteries	kg	600	600
	lbs.	1323	1323
Battery van (LxPxH)	mm	665x640x530	665x640x530
	in	26x25x21	26x25x21
Acoustic pressure level (in conformity with EN 60704-1) Lpa	dB (A)	<70	<70
Class		III	III
Protection level	IP	X3	X3
Packed machine weight	kg	650	650
	lbs.	1433	1433
Package dimensions (LxDxH)	cm	213 x 115 x 165	213 x 115 x 165
	in	84 x 45 x 65	84 x 45 x 65

BEFORE USE

HANDLING OF THE PACKED MACHINE

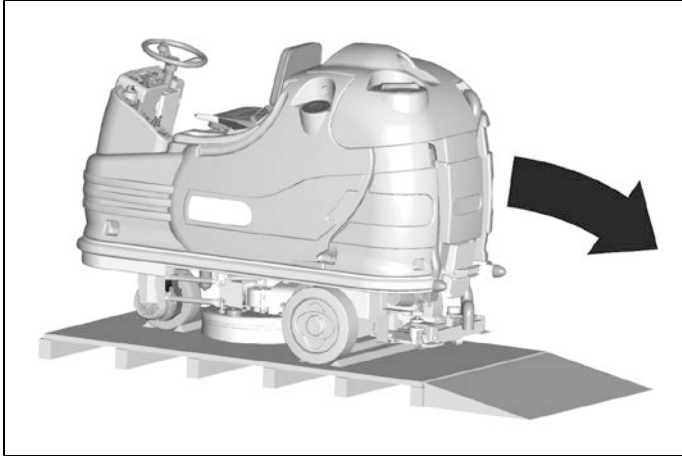
The machine is supplied with suitable packing foreseen for fork lift truck handling. For the package dimensions please look at the "TECHNICAL DESCRIPTION" table.



Do not place any packings on top.

UNPACKING THE MACHINE

1. Remove the external packing.
2. Move the machine backwards, as indicated in the figure, avoiding heavy contacts to mechanical parts.



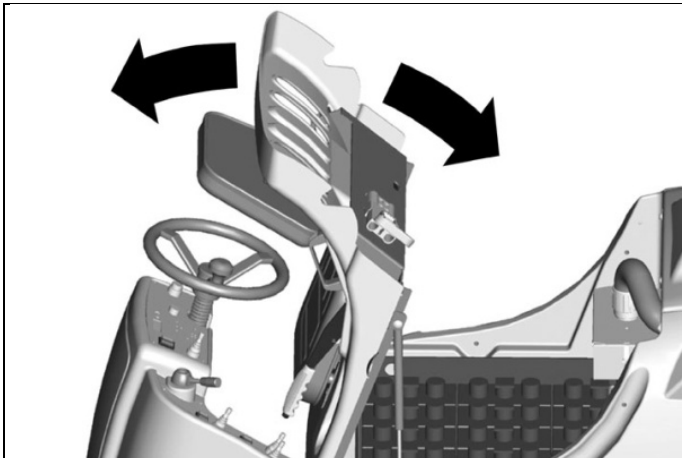
3. Keep the pallet for eventual transport.



The portable slope is not included in the packaging.

ACCESS TO THE BATTERY COMPARTMENT

1. Bring the machine on a levelled surface.
2. Rotate the seat platform forward up to the blocking of the support.
3. Having finished any intervention, to close the battery compartment, after having released the support, reposition the seat platform.



BATTERY INSTALLATION AND SETTING OF THE BATTERY TYPE

The machine is equipped either with batteries in serial connection or elements of DIN-type assembled together and connected in series for a total of 36 Volt, placed in its appropriate compartment under the seat platform and must be handled using suitable lifting equipment (due to weight, considering the type of batteries chosen, and coupling system). The batteries must be in accordance with CEI 21-5 Norms.



The machine and its battery check card foresee the use of traditional lead batteries. CHECK THE SETTING OF THE CHECK CARD (see under paragraph "BATTERIES CHARGE LEVEL INDICATOR"). In case of GEL batteries installation, it is necessary to set the check card. Please contact the authorized technical assistance.

Strictly follow manufacturer/distributor indications for the maintenance and recharge of the batteries. All installation and maintenance operations must be executed by specialized staff, using suitable protection accessories.

For batteries installation it is necessary to reach the battery compartment as indicated under paragraph "ACCESS TO THE BATTERY COMPARTMENT".

1. Place the batteries in its compartment.
2. Connect the terminals, respecting the polarities, avoiding contact with other parts that could create short circuit.

ASSEMBLING OF THE ROLLBAR

For packing reasons, the support of the blinking light is supplied disassembled.

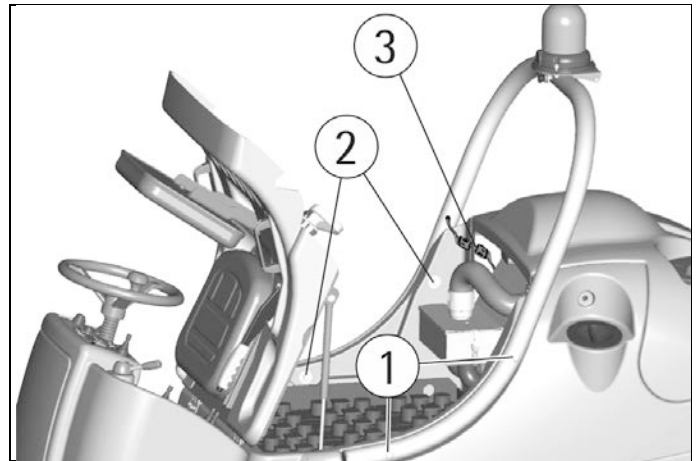
Proceed as follows:

Take off the four fixing screws (1) from the rollbar.

Place the rollbar into their seats (2) on the tank.

Fasten the screws passing them in the same order in their holes foreseen on the support.

Complete the assembly connecting the connectors (3) to supply the blinking light.



BATTERY CHARGER

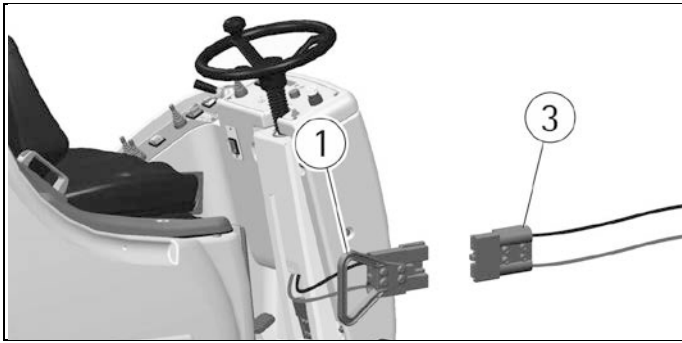


Make sure that the battery recharger is suitable for the installed batteries both for their capacities and type (lead/acid or GEL and equivalent).

In the plastic bag containing the use and maintenance you will find the coupling connector for the recharger. It must be assembled onto the cables of your recharger, following the instructions given by the manufacturer.

CHARGING THE BATTERIES

1. Plug the connector (3) of the battery recharger into the battery connector.
2. Proceed for the recharging.



Never charge a GEL battery with a non suitable recharger. Strictly follow the instructions supplied by the batteries and recharger manufacturer.

In order not to cause permanent damages to the batteries, it is necessary to avoid their complete discharge, providing for the recharging within a few minutes after that the batteries discharge signal starts blinking.

NOTE: Never leave the batteries completely discharged even if the machine is not used. In case of traditional batteries, please check the electrolyte level every 20 recharging cycles and eventually top them up with distilled water. Never leave the batteries discharged for more than two weeks.

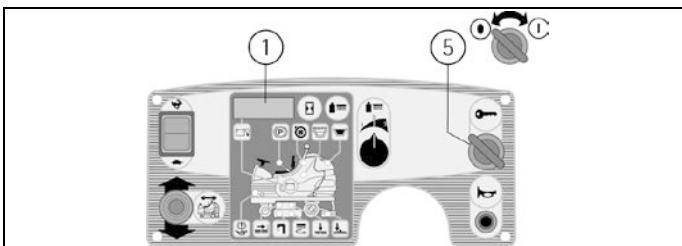
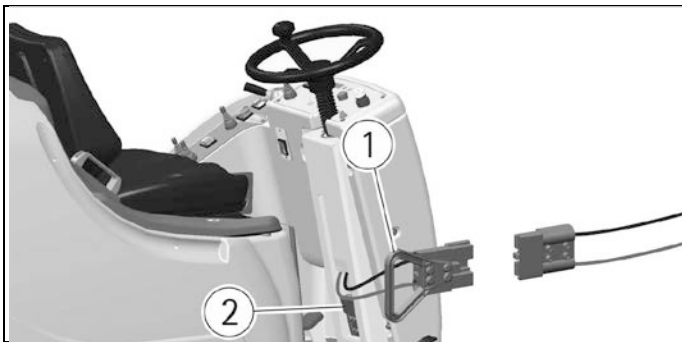


Danger of gas exhalations and emission of corrosive liquids. Fire danger: do not approach with free flames.

CONNECTING THE BATT. CONNECTORS AND SWITCHING ON OF THE MACHINE

Once that the battery recharging has been completed:

1. Disconnect the connector of the battery recharger from the battery connector (1).
2. Connect then the battery connector (1) to the machine connector (2).
3. To start any function of the machine, it is necessary to rotate clockwise the key switch (5). Rotating it counterclockwise any function will be switched off.

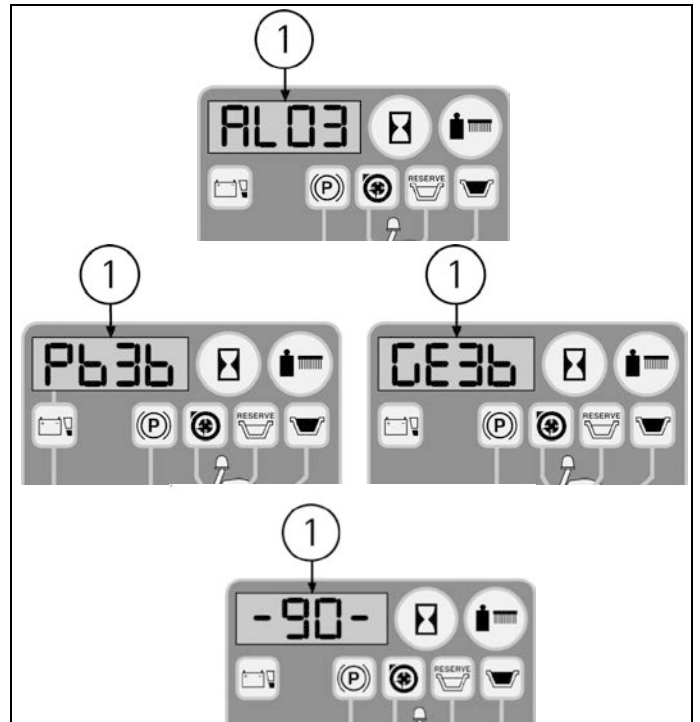


BATTERY CHARGE LEVEL

When the machine is switched on, on the display (1) appear in order the following information:

1. the version (for example A003) of software installed on the machine.
2. the setting of the battery check card which can be:
3. GE 36: check card set for GEL batteries.
or
4. Pb 36: check card set for lead batteries.

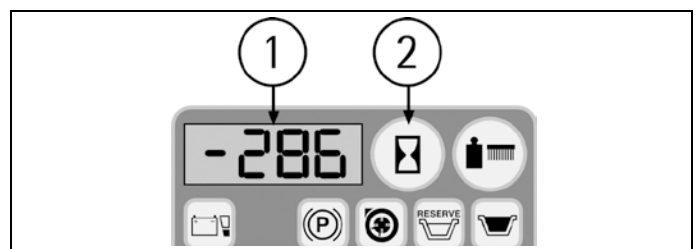
5. The batteries charge level indicator is digital and remains fixed on the display. The battery charge level starts from 100, which indicates the 100% of the total charge and decreases from 10 to 10. When the charge level reaches 20%, the display starts blinking, so you are about the end of working.



After a few seconds of the indication 10% and after this, the blinking of the four lines, all the functions stop automatically. With the remaining charge it is anyhow possible to finish the drying operation before proceeding to the recharge.

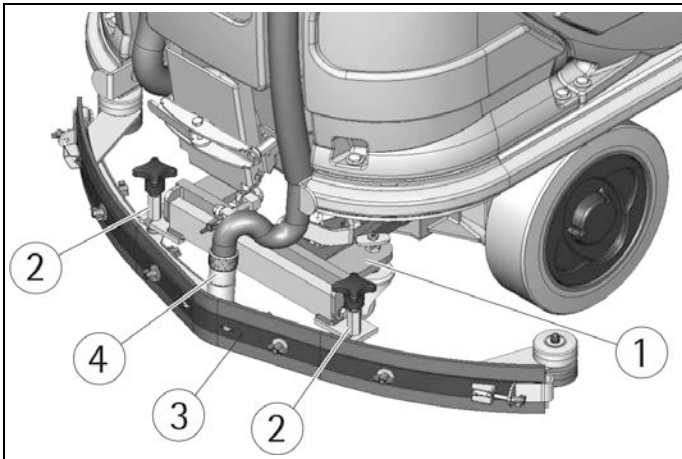
HOURLMETER

The machine is equipped with an hour meter located on the same display (1) of the battery charge level indicator. Pressing the button (2), the first data indicates the working hours and after a few seconds the working minutes are shown.



SQUEEGEE ASSEMBLY

1. Insert the two stud bolts (2) situated on the upper part of the squeegee (3) inside the slots present on the support (1).
2. To block the squeegee, tighten the stud bolts (2).
3. Insert the squeegee hose (4) into its coupling, respecting its position as indicated in the figure.



ADJUSTING THE SQUEEGEE

In order to have a perfect drying result through the squeegee, the rear rubber must have the lower bending uniformly adjusted in all its length. For the adjustment, it is necessary to put oneself in working condition and therefore the suction motor has to be switched on and the brushes have to function together with the detergent solution.

The lower part of the rubber is too much bent

Take off the pressure rotating the wing nut (5) counterclockwise.

The lower part of the rubber is not much bent

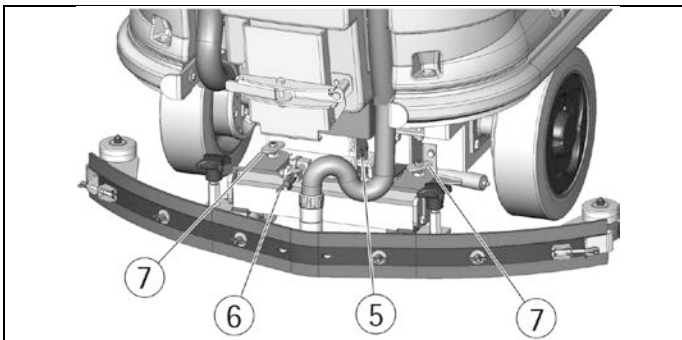
Increase the pressure rotating the wing nut (5) clockwise. Check that the wheels which adjust the height do not rest on the floor, in this case adjust them as indicated in paragraph "Height adjustment".

The bending is not uniform

Adjust the squeegee inclination rotating counterclockwise the wing nut (6) to increase the bending in the central part, or clockwise to increase the bending on the extremities.

Height adjustment

Once that the pressure and inclination of the squeegee have been adjusted, it is necessary to fix this optimum condition making touch slightly the wheels onto the floor. Rotate clockwise the registers (7) to lower the wheels or counterclockwise to raise them. Both wheels must be adjusted in the same measure. To act upon the register (7) loosen at the same time the two milled ring nuts, adjust the height acting on the upper one and then fix the adjustment screwing and blocking the lower one.



Every type of floor requires a specific adjustment. For example, concrete floors (where the friction results to be high) need little pressure, while smooth floors (ceramics) need higher pressure. If the cleaning operations are made always on the same type of floor, the adjustment can change only in function of the rubber wear.

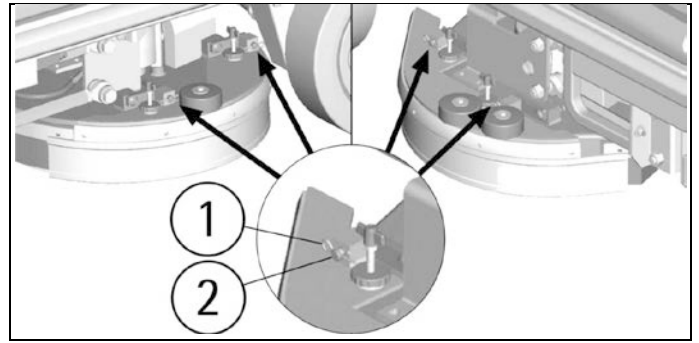
ASSEMBLING THE SPLASHGUARDS

The two splash guards are already preassembled on the two metal covers. To assemble the covers, it is necessary to proceed as follows:

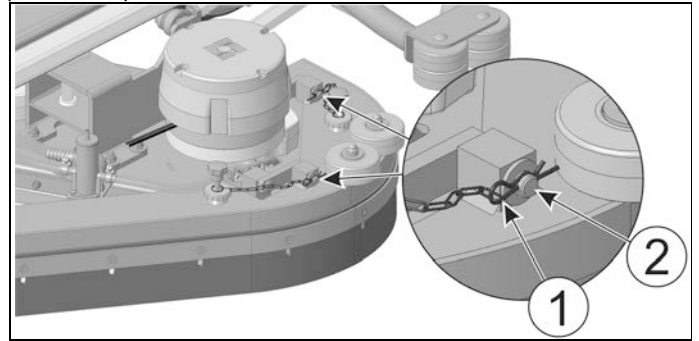
1. Take off the clips (1) present on the pins (2) fixed to the brushes base.
2. Assemble the cover onto the brushes base.
3. Reposition the clips (1) to block.

For the disassembly it is necessary to proceed inversely with above-mentioned operation

(version 100)



(Version 130)



BRUSHES ASSEMBLY

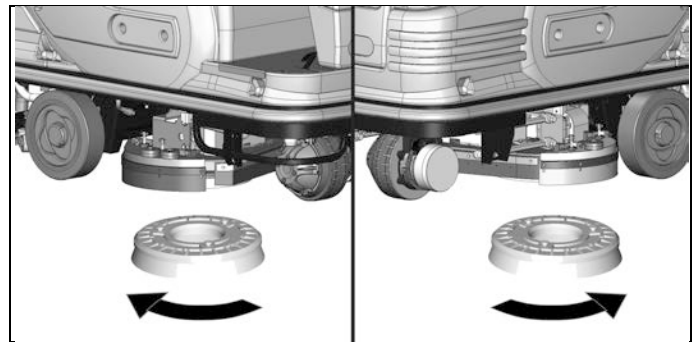


To assemble the brushes, it is necessary that the brushes base is in the lifted position. If it is not lifted, proceed as follows:

Without the operator seated, turning the key switch clockwise, the display comes on and after 3 seconds all working groups come off automatically and are lifted from the floor.

With the brushes base group in lifted position, insert the brushes into their plate seat underneath the brushes base turning them until the three metal buttons are properly seated in their slots; rotate energetically the brushes to push the button towards the coupling spring until they get blocked.

The figure shows the rotating sense for brushes coupling.



For a longer life of the brushes we suggest to invert daily their position. Whenever brushes result to be deformed we suggest to reassemble them in the same position, in order to avoid that the different inclination of the bristles causes excessive motor overload or troublesome vibrations.



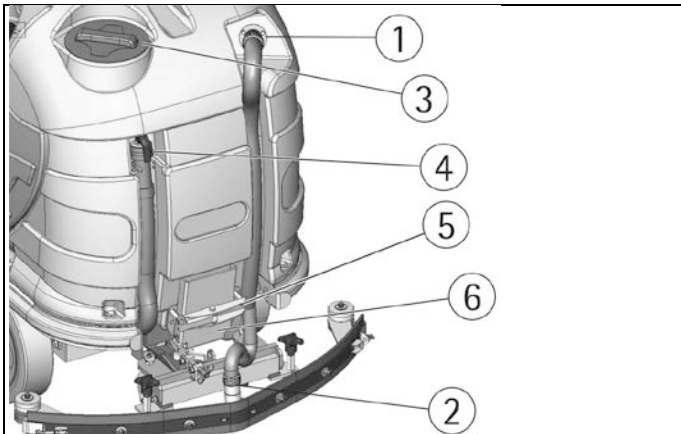
FLOOR CLEANING

RECOVERY TANK

Verify that the squeegee hose couplings (1/2) are correctly inserted into their seats and that the exhaust hose plug (4) placed in the rear part of the machine is well closed.

Check that the inspection cap (3) placed on the upper part of the tank is well closed.

Finally, verify the correct tightening of the closing lever (5) of the cleaning door (6) placed in the lower part of the tank.

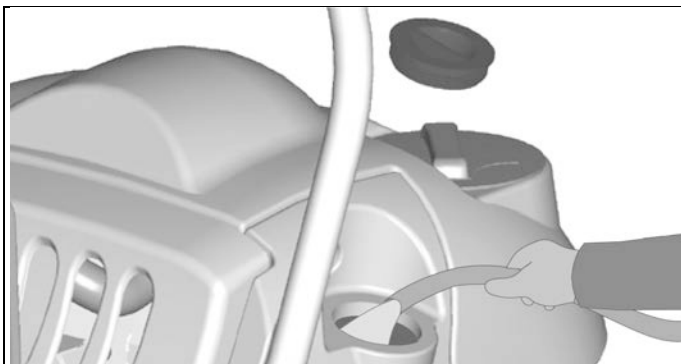


DETERGENT SOLUTION TANK

The capacity of the detergent solution tank is indicated in the technical data.

Open the screw plug placed in the left part of the machine and fill the detergent solution tank with clean water at a maximum temperature of 50°C (122°F). Add the liquid detergent in the percentage and conditions foreseen by the manufacturer. To avoid excessive foam presence, which could cause problems to the suction motors, use the minimum percentage of detergent. Screw down the plug to close the solution tank.

The switching on of the signal lamp of low detergent (19) indicates that the detergent solution is nearly exhausted.



Use always low foam detergent.

Protect yourself from accidental contact or splashes with the protection devices provided by the detergent manufacturer.

To avoid foam presence, before starting working operation, introduce into the recovery tank a minimum quantity of anti-foam product.

Never use pure acid.

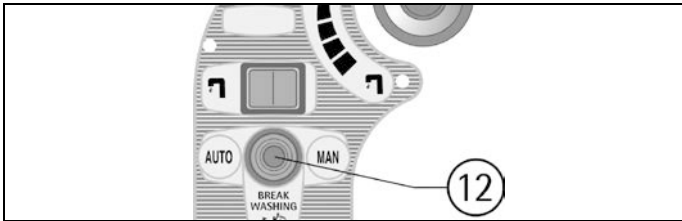
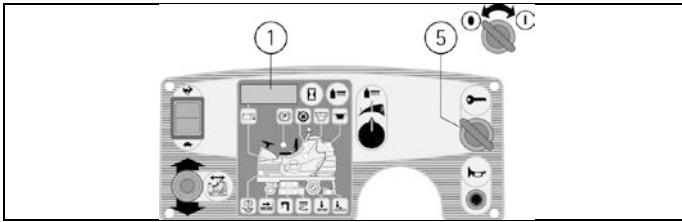


STARTING OF THE MACHINE

A safety device avoids the machine's movement if the operator is not seated correctly on the guiding place.

To switch on the machine:

1. Sit on the guiding place.
2. Turn the key switch (5) clockwise to switch on the machine.
3. Check the charge level of the batteries on the display (1).
4. With the selector (12) in central position (BREAK WASHING) the transfer operations of the machine are carried out (see under paragraph "FORWARD AND BACKWARD MOVEMENT").
5. Moving the selector (12) onto the left, the automatic (AUTO) functioning is chosen. Moving it instead onto the right, the functioning of the machine becomes manual (MAN):
 - a. If the selector (12) is in position (AUTO) the machine activates and deactivates all the working functions in an automatic mode (see under paragraph "WORKING IN AUTOMATIC MODE").
 - b. If the selector (12) is in position (MAN) every function of the machine has to be activated or deactivated manually (see under paragraph "WORKING IN MANUAL MODE").



FORWARD AND BACKWARD MOVEMENT

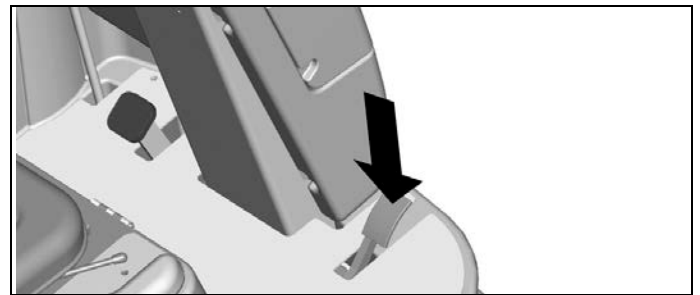
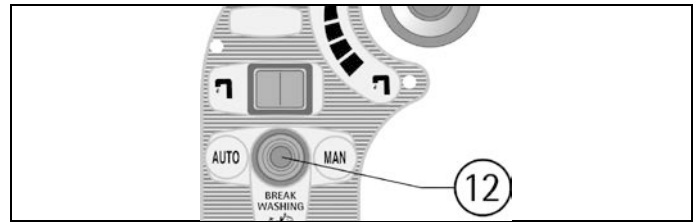
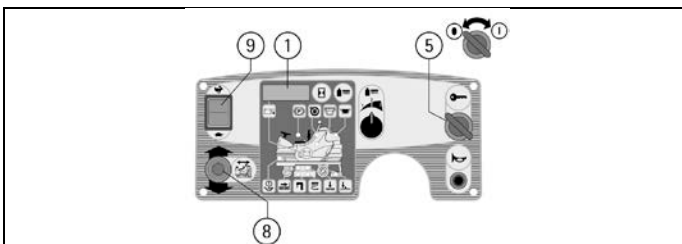
It is recommendable to carry out always the mere transfer of the machine in mode (BREAK WASHING).

To proceed to activate the movement of the machine:

1. Sit on the guiding place.
2. Turn the key switch (5) clockwise to switch on the machine.
3. Check the charge level of the batteries (1).
4. Release the parking brake. If the brake was inserted, the signal lamp (17) would be switched on (see under paragraph "EMERGENCY-PARKING BRAKE").
5. Bring the selector (12) in central position (BREAK WASHING) to carry out the mere transfer of the machine. In fact, in this mode the washing functions of the machine are not working and only the traction system functions.
6. Select the driving sense with the selector (8).
7. Press onto the accelerator pedal placed on the right side to start the machine.
8. Adjust the driving speed in forward choosing the slow one (at the maximum you can reach 4,5km/h - 2,8mph) or, pressing the same selector (9) upwards, the faster one (at the maximum you can reach 7 km/h - 4,35mph) can be obtained.
9. In backward movement, when the machine is moving, an intermittent warning device is activated.

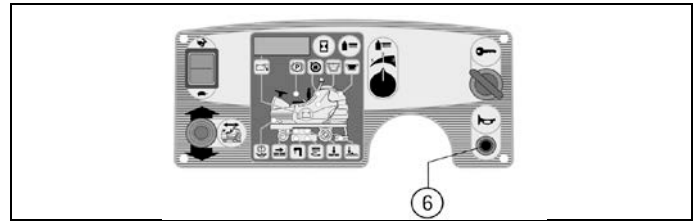
The machine is equipped with an automatic system that reduces the speed when the drive direction is changed. The speed reduction is as higher as sharper is the curve.

The speed returns again normally as soon as the machine gets out from the curve and it runs along straight paths.



HORN

The machine is equipped with a horn which is activated pressing the push button (6).



WORKING BRAKE

The machine is equipped with a hydraulic braking system that acts on the rear wheels.

To brake it is sufficient to press the pedal placed at the left side of the steering column releasing instead the accelerator pedal.

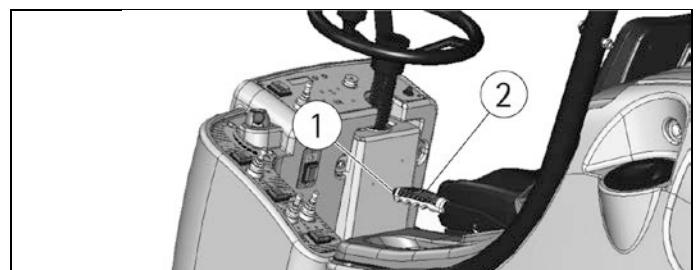


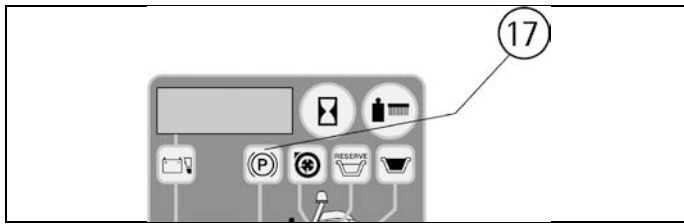
EMERGENCY-PARKING BRAKE

In case of an emergency pull the lever of the emergency and parking brake (1) placed on the left side of the seat.

On the instrument board the signal lamp (17) comes on which signals that the parking brake is inserted.

To release the parking brake press the button (2) placed at the final part of the brake lever (1) and simultaneously lower it to the end.





AUTOMATIC SQUEEGEE LIFTING WHEN GOING BACKWARDS

Selecting the backwards movement, the squeegee is brought automatically to the upper position. It will then lower again in the following forward movement. This happens both in automatic as in manual mode in order to protect the integrity of the squeegee.

WORKING IN AUTOMATIC MODE

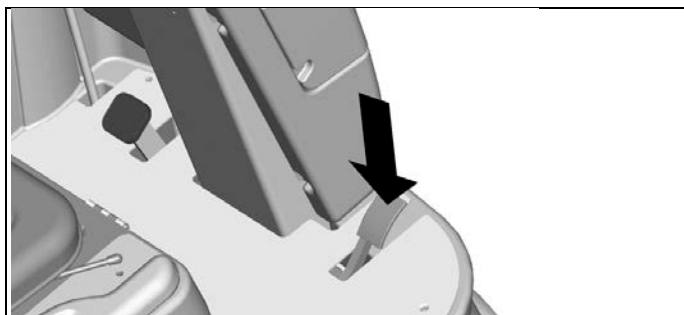
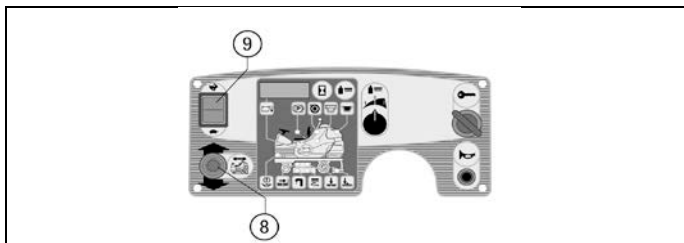
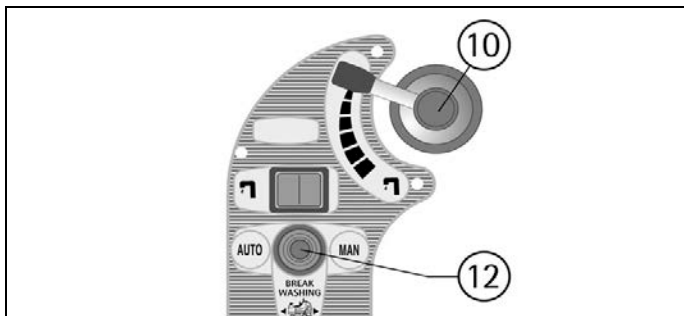
The automatic operation is useful to simplify the operator's work.

1. Activate the machine (see under paragraph "STARTING OF THE MACHINE") putting the selector (12) into the left position to choose the automatic function (AUTO).
2. Check that the lever (10) is in the position of optimum flow, depending on the type of floor and the type of dirt (see under the paragraph "FLOW ADJUSTMENT OF THE DETERGENT SOLUTION").
3. Selecting the sense of drive in forward with the selector (8), pressing the accelerator pedal and adjusting the speed of the forward movement with the selector (9), the machine starts to proceed and in automatic mode all the working functions are activated. In fact, automatically both the brushes base as the squeegee go down, the brushes begin to turn, the solenoid valve opens to permit the detergent solution to flow down onto the brushes and the suction system is activated to recover the dirty water from the floor.

Selecting the backward movement with the selector (8) the squeegee lifts automatically and will then return to lower itself during the next forward movement.

If the accelerator pedal is released for more than 3 seconds, automatically all the functions are switched off and both the brushes base as the squeegee are lifted.

Pressing again the pedal, the machine starts to move again and in automatic mode all the working functions are reactivated.



WORKING IN MANUAL MODE

The manual mode is useful when, in special cases, it is necessary to carry out separately only the washing with the brushes or only the drying of the floor.

Activate the machine (see under paragraph "STARTING OF THE MACHINE") positioning the selector (12) to the right to choose the manual mode (MAN).

TO CARRY OUT THE WASHING WITH ONLY THE BRUSHES:

1. Activate the selector (14) of up/down of the brushes base to lower the brushes. Once that it is lowered, the brushes begin to turn. The signal lamp (22) indicates that the brushes base is in the working position, while the signal lamp (23) signals that the brushes are turning.
2. Press the switch (11) to open the solenoid valve and permit the detergent solution to lower onto the brushes. The signal lamp (24) will come on to indicate that the solenoid valve is open.
3. Check that the lever (10) is in the position of optimum flow, depending on the type of floor and the type of dirt (see under the paragraph "FLOW ADJUSTMENT OF THE DETERGENT SOLUTION").

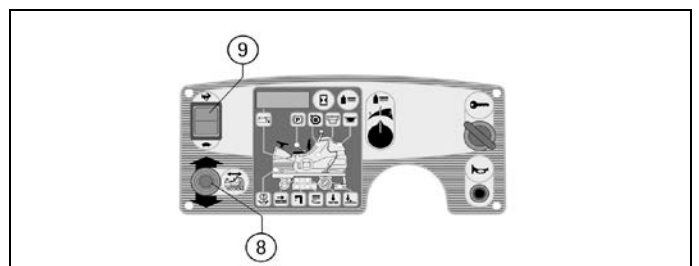
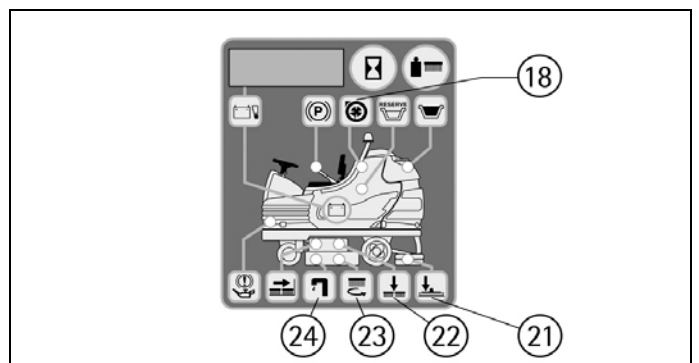
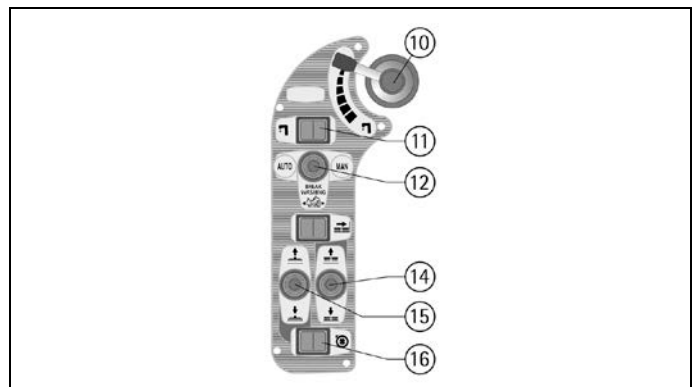
TO CARRY OUT THE FUNCTION OF ONLY DRYING:

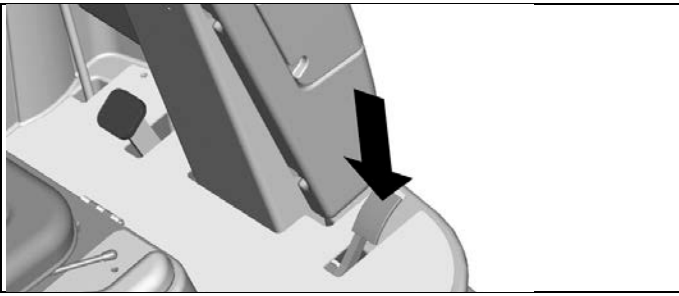
1. Activate the selector (15) of up/down squeegee to lower the squeegee. The signal lamp (21) indicates that the squeegee is in the working position.
2. Press the switch (16) of the suction motors to start the suction system. The signal lamp (18) indicates that the machine is drying.

Selecting the sense of drive in forward with the selector (8), pressing the accelerator pedal and adjusting the speed of the forward movement with the selector (9), the machine starts to proceed and in automatic mode all the working functions previously set are activated.



In manual mode every function of the machine has to be activated or deactivated manually.





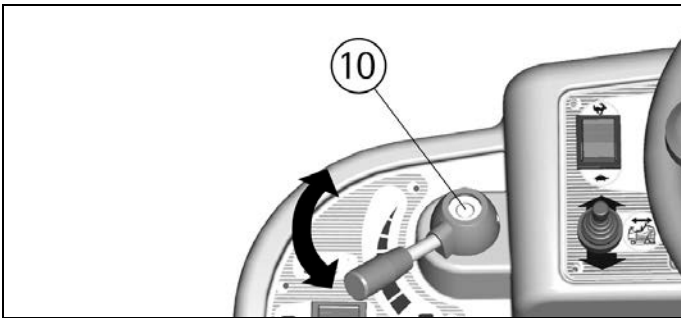
WORKING ADJUSTMENTS

Both in automatic as in manual mode, during the first metres check:

1. that the adjustment of the detergent solution flow is sufficient to wet the floor uniformly avoiding the leakage of detergent from the splash guards (see under paragraph "FLOW ADJUSTMENT OF THE DETERGENT SOLUTION").
2. that the squeegee adjustment guarantees a perfect drying result (see under paragraph "ADJUSTMENT OF THE SQUEEGEE").
3. that the brushes pressure permits an efficient washing action in function of the dirt and the speed (see under paragraph "ADJUSTMENT OF THE BRUSHES PRESSURE").

FLOW ADJUSTMENT OF THE DETERGENT SOLUTION

To adjust the detergent solution quantity that flows down onto the brushes it is necessary to act upon the solution valve knob (10) placed on the upper part of the side instrument board, rotating counterclockwise to increase it and clockwise to reduce it up to closure of the flow.



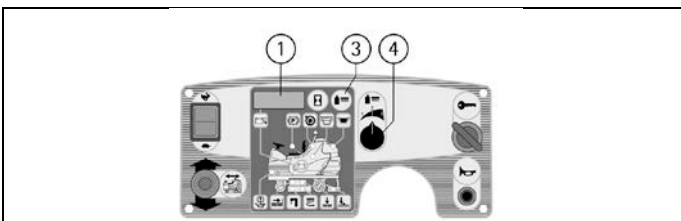
BRUSHES PRESSURE ADJUSTMENT

Using the knob (4) it is possible to adjust the brushes pressure on the floor on three preset levels. On the display (1) the pressure previously set can be seen, by pressing the button (3).

The adjustment is made this way on both manual and automatic mode.



To avoid overloading the brushes motors it is better to decrease the brushes pressure when switching from smooth to rough floors (i.e. concrete floors).



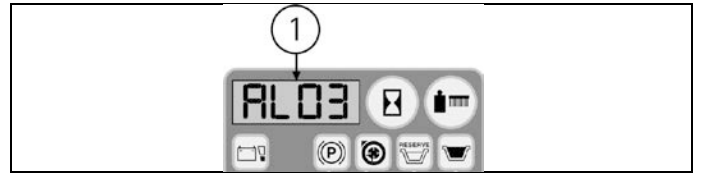
ELECTRIC PROTECTION

The machine is equipped with an electronic system of amperometric protection for the principal working functions. This control device disconnects the function of the interested component that shows the problem and indicates on the display (1) the corresponding alarm, for example "AL01", "AL03".

The last two figures indicate the code number of the alarm.

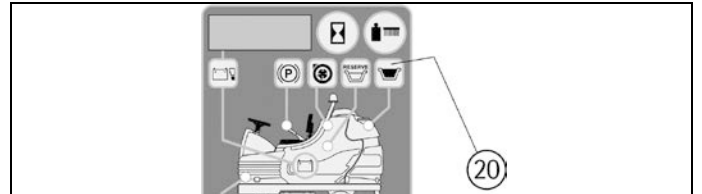


To restore the functioning of the component, turn off and on again the machine acting upon the key switch. If the alarm persists, please contact the authorized technical assistance.



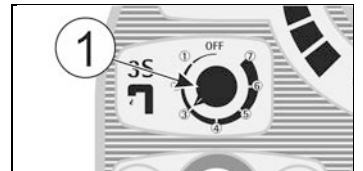
OVERFLOW DEVICE

In order to avoid serious damages to the suction motors, the machine is equipped with a float that intervenes when the recovery tank is full, closing the suction, the switching on of the signal lamp (20) for the signaling of the full recovery tank and consequently to the drying stop. When this happens, it is necessary to empty the recovery tank (see under paragraph "RECOVERY TANK EMPTYING AND CLEANING").



SELECTING AND WORKING ON 3S "SOLUTION SAVING SYSTEM" MODE

To work with the 3S "Solution Saving System" select a water carriage using the knob (1).



On manual mode the detergent solution flow is constant and related to the water carriage selected using the knob.

On automatic mode the carriage of the detergent solution flow changes accordingly to the speed, up to the maxim set, in order to have a constant water carriage per square meter.

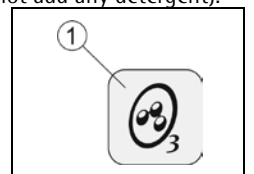
If the machine is steady then the speed will be zero and no water will come out.

SELECTING AND WORKING WITH OZONE (OPTIONAL)

The machine can produce water with an ozone level high enough to disinfect the surfaces cleaned.

In order to operate the ozone system, the best way, proceed as follows:

1. Make sure that the inside of the solution tank is clean, eventually rinse it making at least a couple of fillings and depletions.
2. Fill the solution tank with tap water (do not add any detergent).
3. Turn on the ozone generator by pressing the proper switch identified by the appropriate symbol (1) located on the side control panel and set the different controls for the work of the machine.
4. Start working.



Ozone is a very penetrating gas and it can be irritating.

The ozonated water is strongly oxidizing, therefore in order to protect from oxidization (rust) the metal parts of the machine, it is better to rinse with water all the lower parts of the machine at least once a week.

At the end of the work, it is not necessary to empty the solution tank.

STOP OF THE MACHINE AFTER CLEANING OPERATION

IN AUTOMATIC OR MANUAL WORKING MODE:

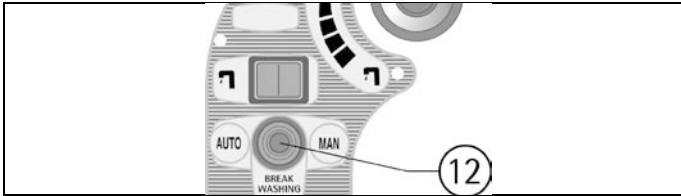
1. At the end of the washing cycle put the selector (12) into the central position (BREAK WASHING). In this way automatically the brushes lift, the solenoid valve shuts down and it is possible to finish the drying operation.
2. When the accelerator pedal is released for more than 3 seconds, the squeegee raises itself and the suction switches off automatically.
3. After three seconds, the accelerator can be pressed again, if a machine's transfer has to be made (the transfer can be carried out also if the pedal is never lifted, in this case the squeegee gets lifted and the suction stop automatically after 15 seconds).
4. Turn the switch key counterclockwise to switch off the machine.
5. Insert the parking brake (see under paragraph "EMERGENCY-PARKING BRAKE").



The mode (BREAK WASHING) is specific for the transfer at the end of the cleaning operation.

Starting again the cleaning operation:

- A. by positioning to the left the selector (12) into position (AUTO) one can start again to work in an automatic mode.
- B. by positioning to the right the selector (12) into position (MAN) the machine re-establishes the functions pre-set manually.



DAILY MAINTENANCE

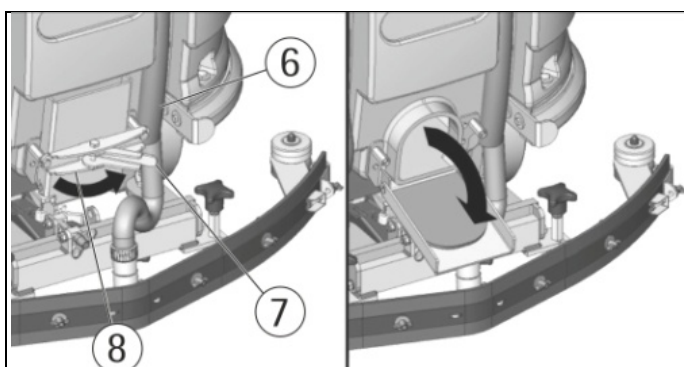
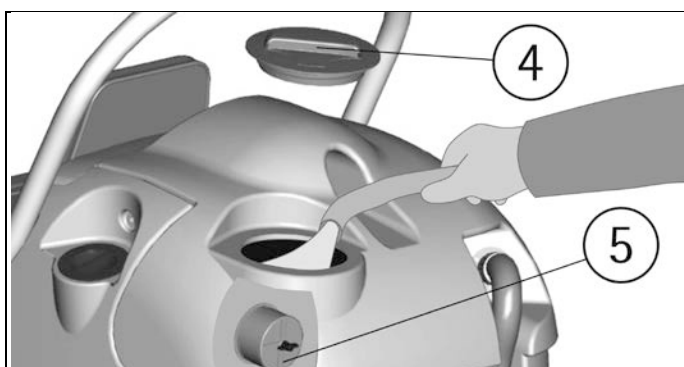
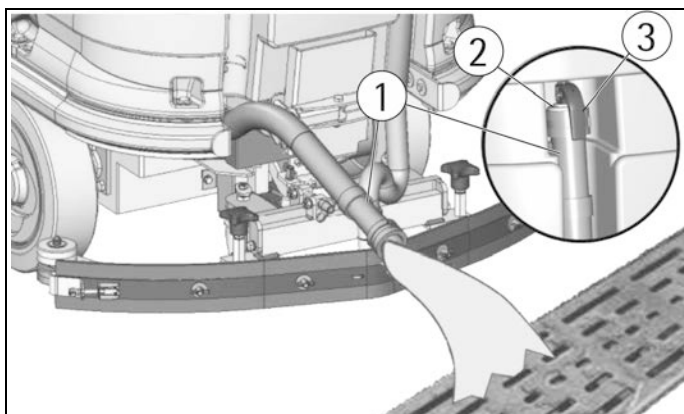
RECOVERY TANK EMPTYING AND CLEANING



1. Hold the exhaust hose (1) placed in the rear part of the machine after having taken it off from its fixing support.
2. Take off the plug (2) from the exhaust hose acting upon its lever (3) and empty the recovery tank into appropriate containers, in compliance with the respective rules what the liquid disposal concerns.
3. Unscrew and take off the upper inspection cap (4).
4. Rinse the inside of the tank with a water jet through the inspection hole paying attention to clean also the protection of the float switch placed right under the hole.
5. In case there should be solid waste or encrustation on the bottom of the tank, it is possible to use the lower cleaning door (6). To open it, it is necessary to act upon the lever (7) to release the closing bracket (8).
6. Reassemble all parts.



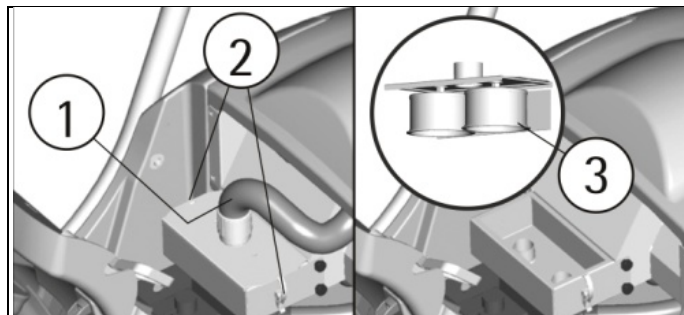
Do not open the lower cleaning door if the recovery tank contains water, check through the upper inspection cap that it is empty.



SUCTION FILTER CLEANING



1. Rotate the seat platform forward up to the blocking of the support.
2. Take off the upper hose (1).
3. Unhook the lever closings (2).
4. Take off the plate with the filters (3) and wash it with care.
5. Reassemble all parts.



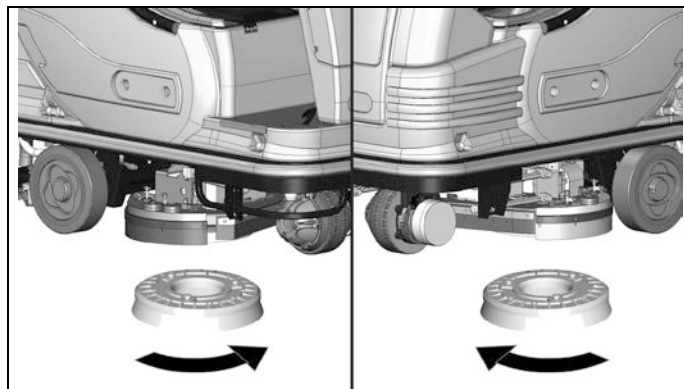
BRUSHES CLEANING

Disassemble the brushes and clean them with a water jet (for the brushes disassembly see under paragraph "BRUSHES DISASSEMBLY").

DISASSEMBLING THE BRUSHES



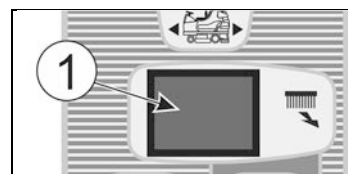
To disassemble the brushes, it is necessary that the brushes base is in the lifted position. If it is not lifted, proceed as follows: Without the operator seated, turning the key switch clockwise, the display comes on and after 3 seconds all working groups come off automatically and are lifted from the floor. Switch off the machine turning the key counterclockwise. Rotate the brushes energetically in order to release the button from the coupling spring until it becomes free and wash them with a water jet. The figure shows the rotating sense for brushes release.



AUTOMATIC BRUSHES UNLOCKING (VERSION 130)



With the brushes base in up position and the speed lever in its middle position, press the brush base button (1) for a few seconds.

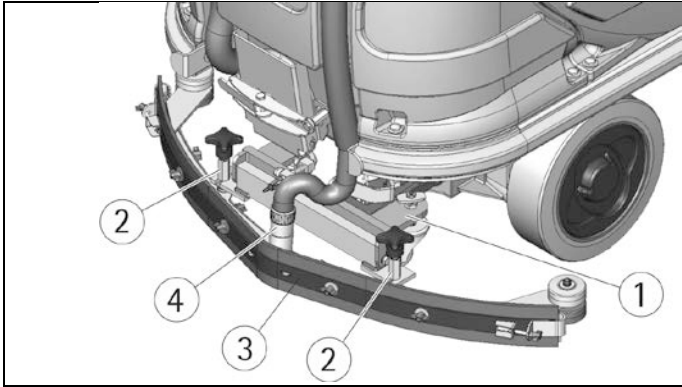


SQUEEGEE CLEANING



Keeping the squeegee clean guarantees always the best drying result. For its cleaning it is necessary to:

1. Take off the squeegee hose (4) from the coupling.
2. Disassemble the squeegee (3) from its support (1) loosening the stud bolts (2) and making them slide inside the slots up to release them.
3. Clean with care the internal part of the squeegee inlet eliminating eventual dirt residuals.
4. Clean with care the squeegee rubbers.
5. Reassemble all parts.



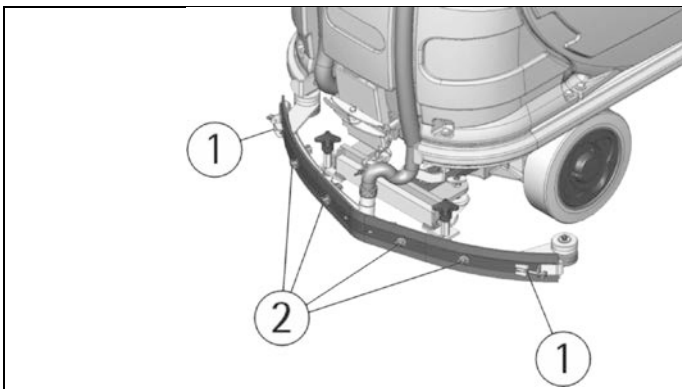
WEEKLY MAINTENANCE

REAR SQUEEGEE RUBBER CHECK



Check the squeegee rubber wear and eventually turn or replace it. For the replacement it is necessary to:

1. Take off the squeegee (see under paragraph "SQUEEGEE CLEANING").
2. Unhook the couplers (1), unscrew the wing nuts (2) that block the rubber blade and take off the rubber.
3. Turn the rubber to a new side or replace it.
4. To reassemble the squeegee, repeat inversely above-mentioned operations, inserting the rubber on the guides and blocking it with the rubber holder blade.

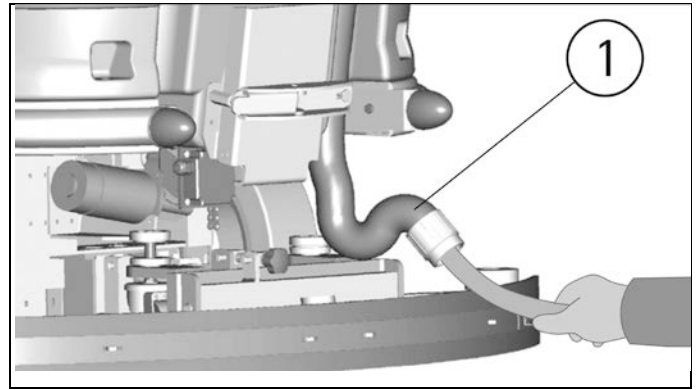


SQUEEGEE HOSE CLEANING



Weekly or in case of insufficient suction, it is necessary to check that the squeegee hose is not obstructed. Eventually, to clean it, proceed as follows:

1. Take off the hose (1) from the squeegee coupling.
2. Wash the inside of the hose with a water jet.
3. To reassemble the hose, repeat inversely the above-mentioned operations.



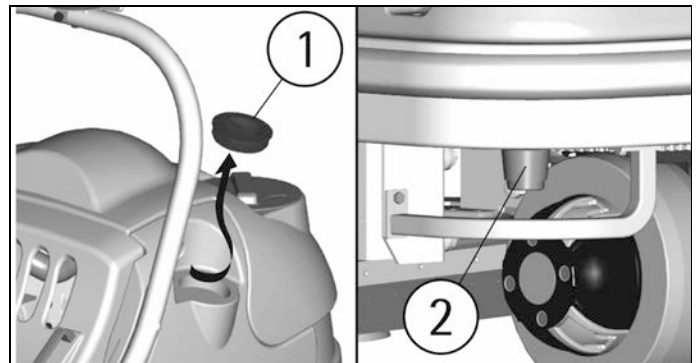
CLEANING OF THE SOLUTION TANK AND OF THE OUTER FILTER



Bring the machine to an appropriate place for the detergent solution draining.

1. Unscrew the solution tank cap (1).
2. Unscrew the cap of the exhaust filter (2) and take off the filter. Be careful not to lose the gasket of the cap.
3. Open the solution valve adjustment (see under paragraph "FLOW ADJUSTMENT OF THE DETERGENT SOLUTION"), so that the detergent solution flows down into appropriate containers.
4. Rinse with a water jet the solution tank and the components of the filter.
5. Reassemble all parts.

NOTE: in case of need it is possible to wash only the components of the outer solution filter as above-mentioned by closing the solution valve adjustment (see under paragraph "FLOW ADJUSTMENT OF THE DETERGENT SOLUTION"), so that the detergent solution remains in the solution tank.



TWO-MONTHLY MAINTENANCE

FRONT SQUEEGEE RUBBER CHECK

Check the wear of the squeegee rubber and eventually replace it. For the replacement it is necessary to:

1. Take off the squeegee (see under paragraph "SQUEEGEE CLEANING").
2. Unscrew the wing nuts in the front part of the squeegee.
3. Take off the rubber holder blade.
4. Replace the front rubber.
5. Reassemble all parts.

SIX-MONTHLY MAINTENANCE

SPLASH GUARD RUBBER CHECK

With the brushes assembled, the splash guards must slightly touch the floor. If they are worn, they have to be replaced.

Disassemble first the two metal covers (see under paragraph "SPLASH GUARD ASSEMBLY") and then act upon the screws to disassembly the blades and the rubbers to be replaced.

TROUBLESHOOTING GUIDE

NOTE: The machine is equipped with a control system of the main functions with indication on the display of a probable malfunction with codified alarms: AL01, AL02 up to AL19. Instead, a problem on the drive functioning foresees a check of the quantity of blinkings to be read on the led placed on the chopper card.



If with the key switch positioned clockwise to switch on the machine the display and other functions are not activated, it is necessary to check the batteries' connection to the machine (see under paragraph "CONNECTION BATTERIES' CONNECTION AND SWITCHING ON OF THE MACHINE"). If the problem persists, please contact the authorized technical assistance.

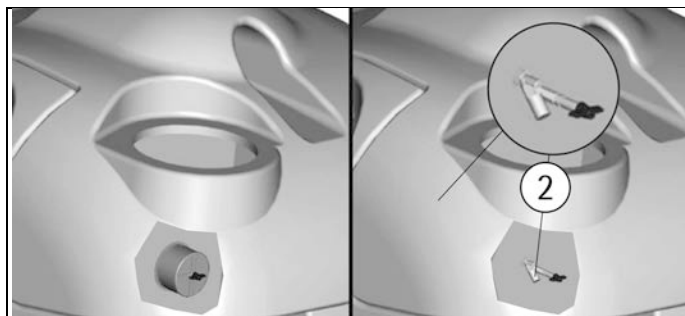
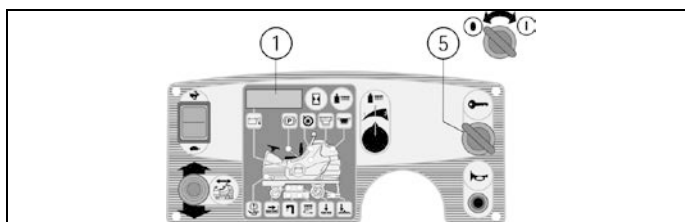
THE SUCTION MOTOR DOES NOT WORK

1. Verify that the key switch (5) is positioned clockwise to switch on the machine. In presence of alarm signals it is necessary to switch off and on again the machine to restore the functionality.
2. Check the charge level of the batteries on the display (1).
3. Verify of having activated correctly the function of drying (see under paragraph "STARTING OF THE MACHINE").

If, both in mode (MAN) as (AUTO), the signal lamp (18) is on but the suction system does not work, it is necessary to check the connection of the suction motor plugs situated in the compartment behind the seat.

4. Check that the recovery tank is not full.
5. Check that the float switch (2) in the recovery tank is assembled correctly.

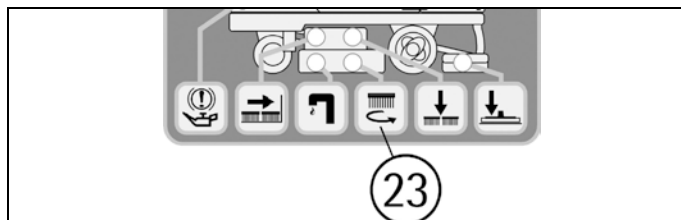
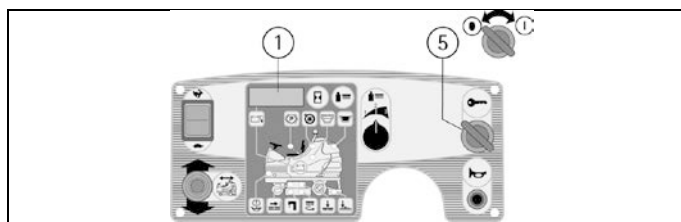
If the problem persists, please contact the authorized technical assistance.



THE BRUSHES MOTOR DOES NOT WORK

1. Verify that the key switch (5) is positioned clockwise to switch on the machine. In presence of alarm signals it is necessary to switch off and on again the machine to restore the functionality.
2. Check the charge level of the batteries on the display (1).
3. Verify of having activated correctly the function of washing with the brushes (see under paragraph "STARTING OF THE MACHINE").
4. If, both in mode (MAN) as (AUTO), the signal lamp (23) is on but the brushes do not turn, please contact the authorized technical assistance.

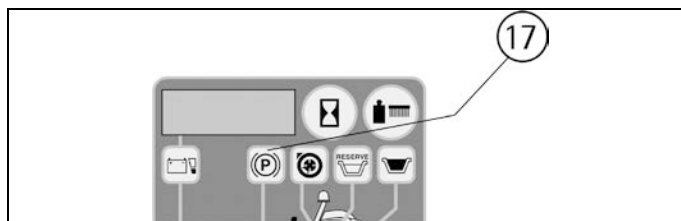
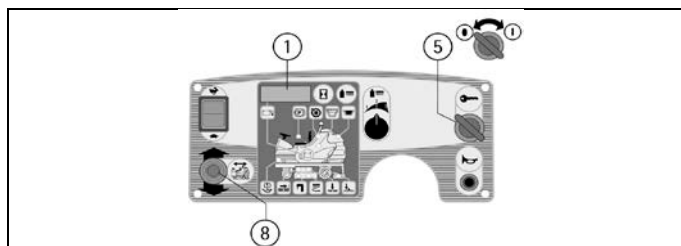
If the problem persists, please contact the authorized technical assistance.



THE TRACTION MOTOR DOES NOT WORK

1. Sit on the guiding place.
2. Verify that the key switch (5) is positioned clockwise to switch on the machine. In presence of alarm signals it is necessary to switch off and on again the machine to restore the functionality.
3. Check the charge level of the batteries on the display (1).
4. Check through the signal lamp (17) that the parking brake is not inserted and eventually release it (see under paragraph "EMERGENCY-PARKING BRAKE").
5. Check that the selector (8) is in the movement position.
6. Press the accelerator pedal placed on the right side to start the machine.

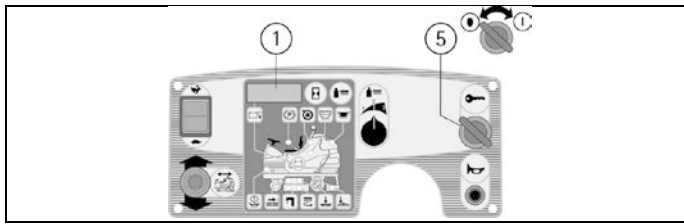
If the problem persists, please contact the authorized technical assistance.



WATER DOES NOT COME DOWN ONTO THE BRUSHES OR IS INSUFFICIENT

1. Verify that the key switch (5) is positioned clockwise to switch on the machine.
2. Check the charge level of the batteries on the display (1).
3. Verify of having activated correctly the function of washing with the brushes (see under paragraph "STARTING OF THE MACHINE").
4. Check that the solution valve is open (see under paragraph "FLOW ADJUSTMENT OF THE DETERGENT SOLUTION").
5. If, both in mode (MAN) as (AUTO), the signal lamp (24) is on but the detergent solution does not come down onto the brushes, it is necessary to:
 - A. check the level of the liquid in the tank.
 - B. check that the solution filter is clean (see under paragraph "CLEANING OF THE SOLUTION TANK AND OF THE OUTER FILTER").

If the problem persists, please contact the authorized technical assistance.



THE MACHINE DOES NOT CLEAN PROPERLY

1. The brushes do not have the suitable bristle dimension: contact the authorized technical assistance.
 2. The brushes have got worn bristles. Check the brushes wear condition and eventually replace them (the brushes have to be replaced when the bristles have reached a height of about 15mm).
 3. To replace the brushes, see instructions under paragraph "BRUSHES DISASSEMBLY" and "BRUSHES ASSEMBLY".
 4. The detergent solution is insufficient: open more the solution valve (see under paragraph "FLOW ADJUSTMENT OF THE DETERGENT SOLUTION").
 5. Check that the liquid detergent is in the recommended percentage.
 6. Increase the brushes base pressure (see under paragraph "ADJUSTMENT OF THE BRUSHES PRESSURE").
- Contact the authorized technical assistance for advice.

THE SQUEEGEE DOES NOT DRY PERFECTLY

1. Check that the suction function is on and that the recovery tank is not full.
 2. Check that the squeegee rubbers are clean (see under paragraph "SQUEEGEE CLEANING").
 3. Check the adjustment of the height and the inclination of the squeegee (see under paragraph "ADJUSTMENT OF THE SQUEEGEE").
 4. Check that the suction and the squeegee hoses are correctly inserted in their proper seats on the recovery tank.
 5. Clean the suction filter (see under paragraph "SUCTION FILTER CLEANING").
 6. Clean the squeegee hose (see under paragraph "SQUEEGEE HOSE CLEANING").
 7. Replace the rubbers if worn out.
- Contact the authorized technical assistance for advice.

EXCESSIVE FOAM PRODUCTION

Check that low foam detergent has been used. Eventually add small quantities of anti foam liquid into the recovery tank. Please be aware that a bigger quantity of foam is produced when the floor is not very dirty. In this case please dilute detergent solution.

PROGRAMMED MAINTENANCE

ORDINARY PERIODICAL MAINTENANCE CHART

WORK	DAILY	PERIODICAL
CLEANING OF THE RECOVERY TANK	•	
CLEANING THE SUCTION FILTER	•	
CLEANING THE SOLUTION FILTER		•
CLEANING THE BRUSHES	•	
DISASSEMBLING AND CLEANING OF THE BRUSHES	•	
CLEANING THE SQUEEGEE	•	
SQUEEGEE FRONT RUBBER CHECK		•
SQUEEGEE REAR RUBBER CHECK		•
SPLASHGUARDS CHECK		•
SQUEEGEE ADJUSTMENT CHECK		•
CLEANING THE SQUEEGEE HOSE		•
CLEANING THE SOLUTION TANK		•
BATTERIES ELECTROLITE CHECK		•

SEr1 WARNING

The machine is provided with a system that warns when it is time for the programmed maintenance. Such signal is shown on the display as SEr1. If this signal is shown please call an authorized assistance center to do the maintenance.

