

USE AND MAINTENANCE MANUAL

 **FIMAP**[®]



MR60 B
MR65 B - MR75 B - MR85 B
MR100 B

ED. 01-2013

EN

ORIGINAL
INSTRUCTIONS
Doc. 10025019
Ver. AD



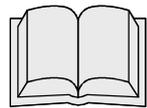
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Symbols used in the manual



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



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



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



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



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



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



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



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On consignment of the machine

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

Introductory comment

MR is a scrubbing machine that is able to clean a wide variety of types of flooring and types of dirt by using the mechanical action of two disc or cylindrical brushes, depending on the model, and the chemical action of a water-detergent solution. As it advances, it also collects the dirt removed and the detergent solution not absorbed by the floor.

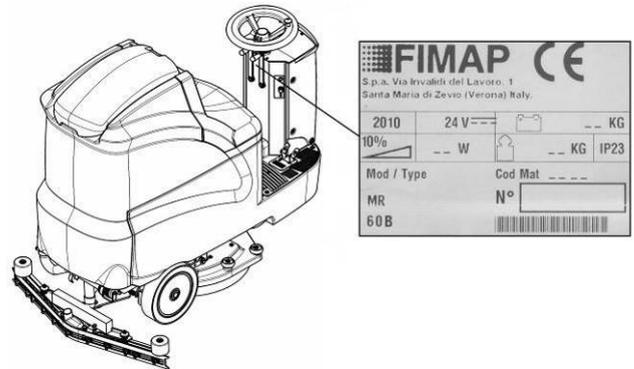
The machine must be used only for this purpose. Even the best machines will only work well if used correctly and kept in good working order. We therefore suggest you to read this instruction booklet carefully and re-read it whenever difficulties arise while using the machine. If necessary, remember that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

Intended use

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

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

Serial number plate

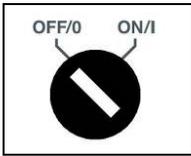




TECHNICAL DESCRIPTION	UM	MR60 B	MR65 B	MR75 B	MR85 B	MR100 B
Working width	mm	610	650	750	850	1010
Squeegee width	mm	780	970	970	1085	1085
Working capacity, up to	m ² /h	3660	3900	4500	5100	6000
Disk brush	No. / Ø mm	1 / 610	2 / 340	2 / 390	2 / 430	2 / 510
Brush rotations	rpm.	170	170	170	170	120
Brush motor	V/W	24 / 450	24 / 450	24 / 450	24 / 450	24 / 600
Pressure on the brushes	kg	30	30 – 60	30 – 60	30 – 60	30
Traction motor	V/W	24 / 400	24 / 400	24 / 400	24 / 400	24 / 400
Traction wheel	Ø mm	220	220	220	220	220
Forward speed	km/h	0,6	0,6	0,6	0,6	0,6
Maximum gradient with full load	%	10	10	10	10	10
Suction motor	V/W	24 / 310	24 / 310	24 / 310	24 / 310	24 / 310
Suction vacuum	mbar	160	160	160	160	160
Rear elastic wheels	Ø mm	300x70	300x70	300x70	300x70	300x70
Solution tank	l	110	110	110	110	110
Recovery tank	l	125	125	125	125	125
Detergent tank (CDS version only)	l	-	5	5	5	5
Steering diameter	mm	1910	1910	1910	1910	1910
Machine length	mm	1495	1495	1495	1495	1495
Machine height	mm	1320	1320	1320	1320	1320
Machine width (without squeegee)	mm	680	680	680	680	1035
Battery compartment (l x L x h)	mm	384x520x340				
Rated battery voltage	V	24	24	24	24	24
Battery weight (max)	kg	136	136	136	136	136
Machine weight (empty and without batteries)	kg	210	213	213	213	230
Machine weight in running order (machine + batteries + water + operator)	kg	530	535	535	535	555
Sound pressure level (ISO 11201)	dB (A)	-	-	-	-	-
Hand vibration level (ISO 5349)	m/s ²	-	-	-	-	-
Body vibration level (ISO 2631)	m/s ²	-	-	-	-	-



SYMBOLS USED ON THE MACHINE



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



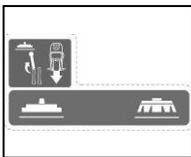
Parking brake symbol
Used on the instrument panel to indicate the red warning light showing parking brake on



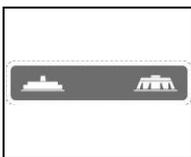
Symbol denoting pressure applied to the brushes
Used to indicate the green warning light that shows that the brush pressure increase has been engaged



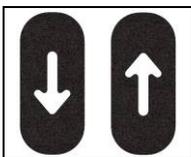
Parking brake and brush pressure symbol
Used on the instrument panel to indicate the yellow warning light showing that the parking brake and pressure increase on the brushes have been engaged



Brush head / squeegee motion symbol (idle position)
Used to indicate the movement levers of the brush head and squeegee



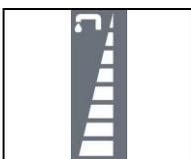
Brush head / squeegee motion symbol (working position)
Used to indicate the movement levers of the brush head and squeegee



Pedal labels that indicate the forward and reverse direction of the machine
Used to indicate the direction of the machine



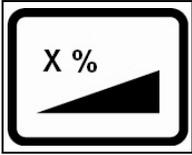
Symbol denoting acoustic alarm
Used to indicate the acoustic alarm button



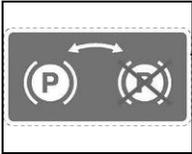
Water quantity adjustment symbol
Used on the steering column to indicate the knob for adjusting the quantity of water distributed on the brushes



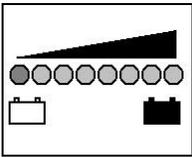
SYMBOLS USED ON THE MACHINE



Indicates the maximum gradient



Parking brake symbol
Used on the machine to indicate the parking brake control lever



Symbol denoting battery electric charging



GENERAL SAFETY REGULATIONS

The regulations below must be carefully followed in order to avoid harm to the operator and damage to the machine.

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

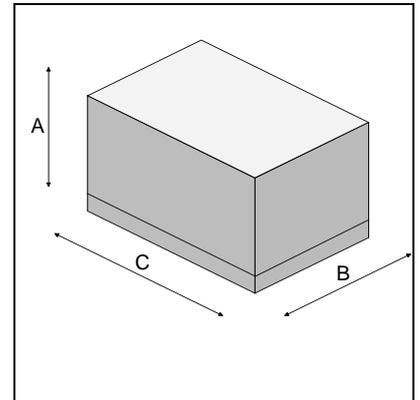


MACHINE PREPARATION

1. HANDLING OF THE PACKED MACHINE

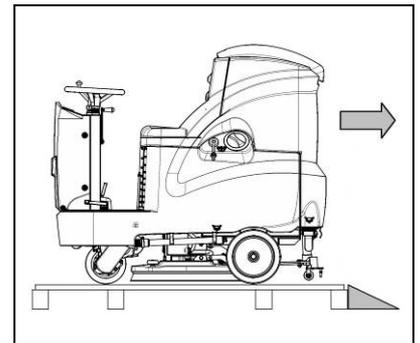
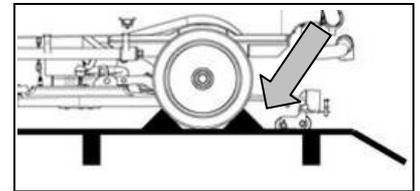
The machine is contained in specific packaging with a pallet for the handling with fork trucks. The packages cannot be placed on top of each other. The total mass of the machine with packaging is 240 kg (without batteries). The dimensions of the packaging is as follows:

MR
A: 1610mm
B: 730mm
C: 1600mm



2. HOW TO UNPACK THE MACHINE

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



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

3. HOW TO MOVE THE MACHINE

1. Make sure the recovery tank and the solution tank are empty
2. Check that the base and squeegee are lifted off the ground
3. Place it on a pallet using a chute
4. Check that the key switch is on OFF and remove the key
5. Engage the parking brake
6. Secure the machine to the pallet using wooden wedges

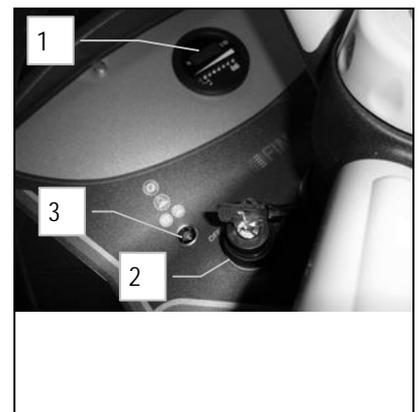
4. INSTRUMENT PANEL COMPONENTS

The instrument panel components are identified as follows:

- 1) Battery level / hour-counter display
- 2) Main key switch
- 3) Indicator light that can light up with:
 - Red: Parking brake engaged
 - Green: increase of pressure on the brush head unit engaged
 - Yellow: parking brake and increased pressure on the brush head unit engaged



WARNING: If you try to leave with the parking brake engaged and the pedal for increasing pressure on the brush head engaged, the machine will not move and a yellow indicator light on the instrument panel will come on, disengage both to move off.



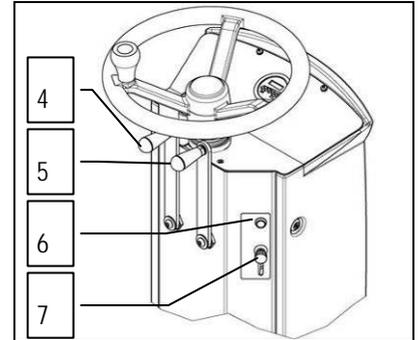


MACHINE PREPARATION

5. STEERING COLUMN COMPONENTS

The steering column components are identified as follows:

- 4) Squeegee body lifting lever
- 5) Brush head body lifting lever
- 6) Horn button
- 7) Detergent solution adjustment lever



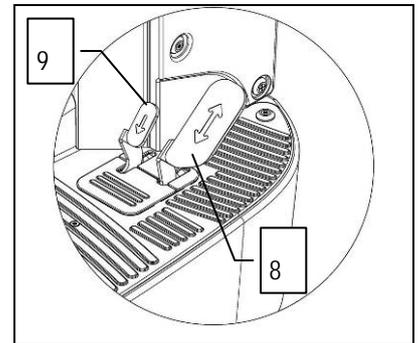
6. FOOTBOARD FRONT-RIGHT COMPONENTS

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

- 8) Accelerator pedal, forward
- 9) Accelerator pedal, reverse



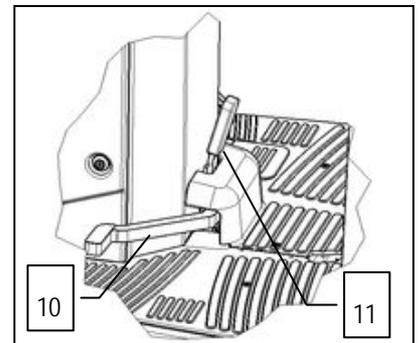
WARNING: Only by simultaneously pressing the pedals is the reverse made



7. FOOTBOARD FRONT-LEFT COMPONENTS

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

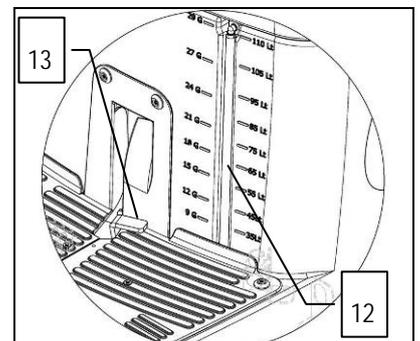
- 10) Brake pedal
- 11) Parking brake lever



8. FOOTBOARD REAR COMPONENTS

The components at the rear of the footboard are identified as follows:

- 12) Detergent solution level tube
- 13) Base extra pressure pedal (see paragraph BASE EXTRA-PRESSURE)



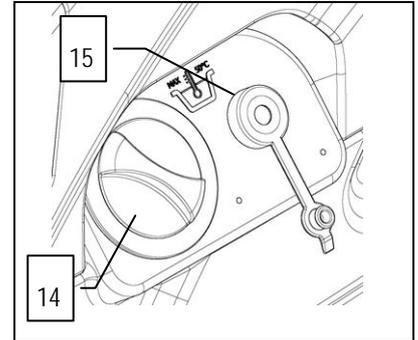


MACHINE PREPARATION

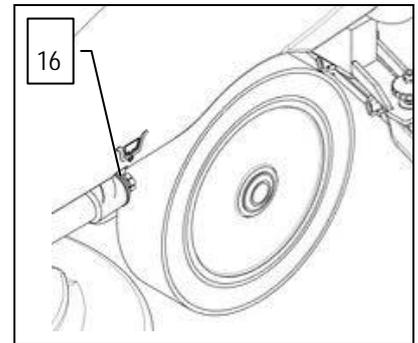
9. MACHINE'S SIDE COMPONENTS

The side components of the machine are identified as follows:

- 14) Water-detergent filler cap
- 15) Water filler cap



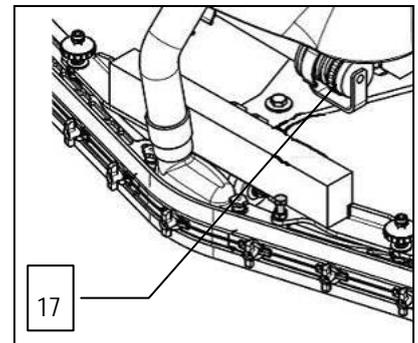
- 16) Water-detergent drainage cap



10. MACHINE'S REAR COMPONENTS

The rear components of the machine are identified as follows:

- 17) Recovery tank discharge cap



11. TYPE OF BATTERY

To power the machine it is necessary to use:

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

OTHER TYPES MUST NOT BE USED.

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

The battery compartment can house four 6V or two 12V batteries

For a good operating performance, we suggest the use of four 6V/210 Ah C5 batteries

12. BATTERY MAINTENANCE AND DISPOSAL

For maintenance and recharging, comply with the instructions provided by the battery manufacturer.

Particular attention must be paid when choosing the battery charger, if not supplied, since there are different kinds according to the type and capacity of the battery.

When the battery reaches the end of its working life, it must be disconnected by expert, trained personnel, then lifted (using the grips and suitable lifting devices) to remove it from the battery compartment. DEAD BATTERIES ARE CLASSIFIED AS DANGEROUS WASTE AND MUST BE DELIVERED TO THE AUTHORISED BODIES FOR CORRECT DISPOSAL.



MACHINE PREPARATION



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



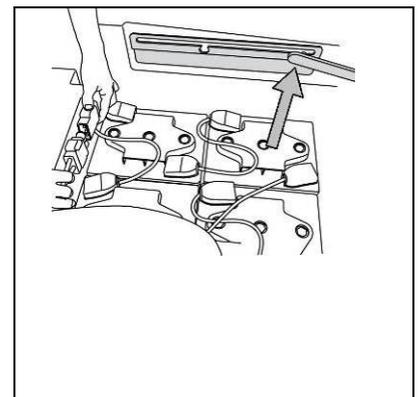
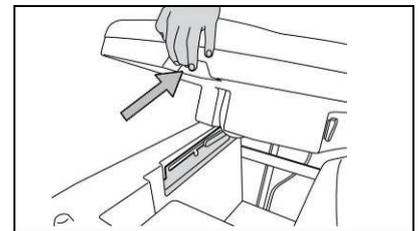
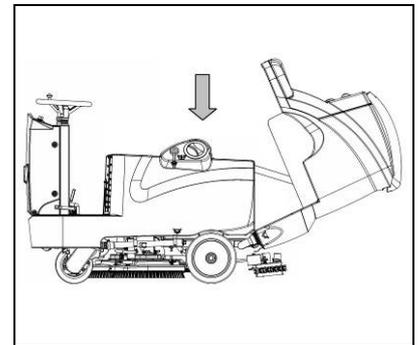
WARNING: You are advised to only lift and move the batteries with lifting and transportation means suitable for the specific weight and size

13. FITTING THE BATTERIES INTO THE MACHINE

The batteries must be housed in the special compartment beneath the recovery tank. They should be handled using lifting equipment that is suitable in terms of both weight and hook-up system. They must also satisfy the requirements of Standard CEI 21-5. The dimensions of the battery compartment are: 384 x 520 x H340 mm.



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



To insert the batteries you must:

1. Lock the machine engaging the brake lever
2. Make sure that the key switch is in the "OFF" position
3. Make sure the recovery tank is empty, otherwise empty it completely
4. Grip the handle under the seat to open the recovery tank
5. Lift the recovery tank until it hooks to the end of the safety clamp
6. house the batteries in the compartment, positioning the poles "+" and "-" opposite each other



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



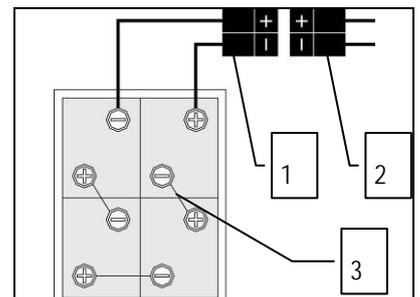
ATTENTION: you are advised to always wear protective gloves, to avoid the risk of serious injury to your hands.



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

14. BATTERY CONNECTION AND BATTERY CONNECTORS

1. connect the batteries in series - using the jumper cables supplied (3) - to the poles "+" and "-"
2. Connect the battery connector cable (1) to the terminal poles "+" and "-" to obtain a voltage of 24V on the clamps
3. Connect the battery connector (1) to the machine connector (2).





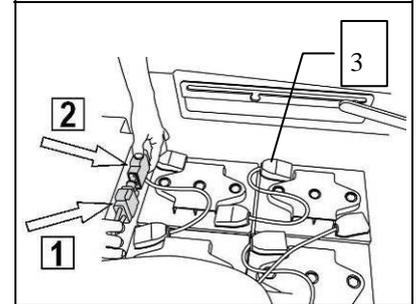
MACHINE PREPARATION



WARNING: you are advised to have the electric connections made by a qualified, FIMAP trained technician



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

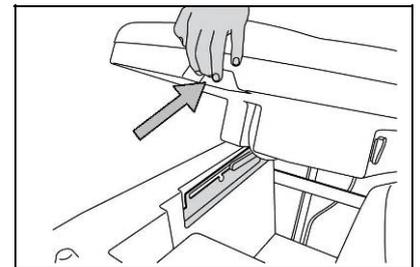
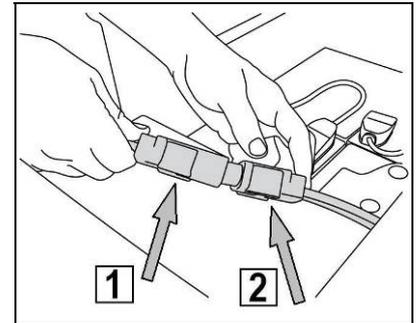


15. BATTERY CHARGER CONNECTION (VERSIONS WITHOUT BC)

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



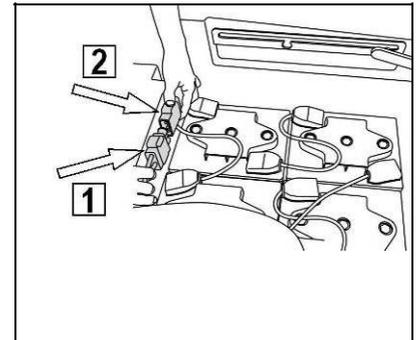
ATTENTION: never leave the batteries completely discharged, even if the machine is not being used. Check the battery charger is suitable for the batteries installed, in terms of both capacity and type.



To connect the batteries you must:

1. Make sure the recovery tank is empty, otherwise empty it completely
2. Move the machine near to the battery charger
3. Engage the parking brake
4. Put the key switch to the "OFF" position
5. Grip the handle under the seat to open the recovery tank
6. Lift the recovery tank until it hooks to the end of the safety clamp

7. Disconnect the electrical connector from the battery connector (1) from the machine connector (2)
8. Connect the battery charger cable connector
9. Close the recovery tank until the prop is hooked in the first point of the safety stop



The coupling connector of the battery charger is consigned inside the bag containing this instruction booklet, and must be assembled on the cables of the battery charger as indicated in the instructions.



ATTENTION: this process must be carried out by qualified personnel. An incorrect connection of the connector may cause problems with machine functioning.

10. Connect the recently wired cable to the external battery charger



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



ATTENTION: Keep the recovery tank open for the duration of the battery recharging cycle to allow gas fumes to escape

11. After recharging the batteries completely, the battery connector (1) must be connected to the machine connector (2)



MACHINE PREPARATION



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



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

16. BATTERY CHARGER CONNECTION (VERSIONS WITH CB)

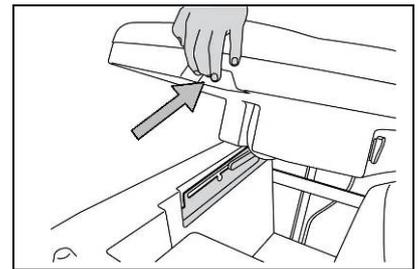
In order not to cause permanent damage to the batteries it is essential to avoid their complete discharge: arrange the recharge within a few minutes of the switching on of the flashing "discharged batteries" signal.



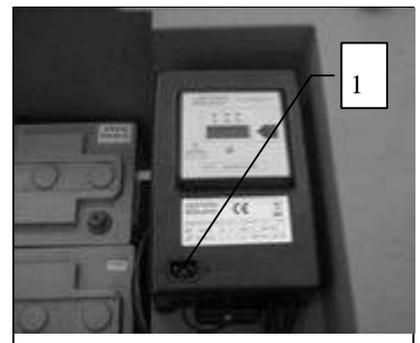
ATTENTION: never leave the batteries completely discharged, even if the machine is not being used. Check the battery charger is suitable for the batteries installed, in terms of both capacity and type.

To connect the batteries you must:

1. Make sure the recovery tank is empty, otherwise empty it completely
2. Move the machine near to the battery charger
3. Engage the parking brake
4. Put the key switch to the "OFF" position
5. Grip the handle under the seat to open the recovery tank
6. Lift the recovery tank until it hooks to the end of the safety clamp



7. Connect the battery charger cable to the socket (1) on the charger itself
8. Close the recovery tank until the prop is hooked in the first point of the safety stop
9. Plug the battery charger cable into the mains socket.



The charger power cable is delivered inside the bag containing this instruction booklet.



ATTENTION: this process must be carried out by qualified personnel. An incorrect connection of the connector may cause problems with machine functioning.



WARNING: Carefully read the use and maintenance manual of the charger that is delivered inside the bag containing this instruction booklet.



WARNING: Before inserting the charger power cable into the socket, verify that there is no condensate or other forms of liquids.



MACHINE PREPARATION



ATTENTION: the machine is equipped with an automatic system that disconnects the power supply from the electrical system while the batteries are being recharged

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

ATTENTION: never leave the batteries completely discharged, even if the machine is not being used.

ATTENTION: for the daily recharging of the batteries, you must fully respect the indications provided by the manufacturer or retailer. All installation and maintenance operations must be carried out by specialised personnel.

ATTENTION: Always make sure the green LED of the battery charger is on before using the machine again



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



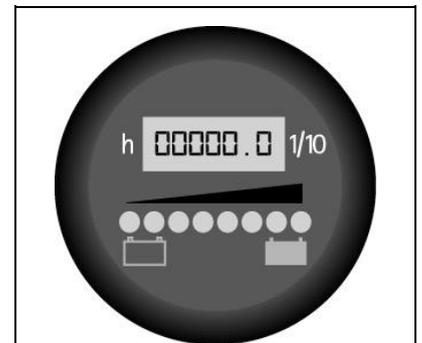
ATTENTION: danger of fire: do not go near with free flames

17. BATTERY CHARGE LEVEL INDICATOR

The battery indicator uses LEDs and has 8 positions (7 yellow - charged batteries, and 1 red - run down batteries).



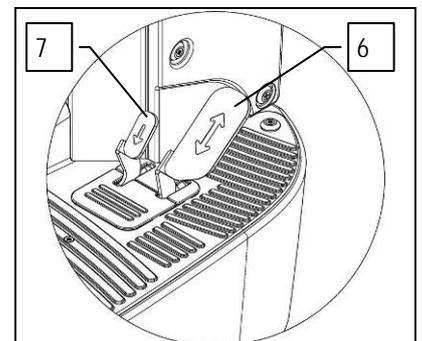
WARNING: A few seconds after the red indicator light comes on, the brush motor switches off automatically. With the remaining charge it is still possible, however, to complete the drying process before recharging



18. WORKING FORWARD SPEED

This machine is equipped with electronic traction control.

To move the machine, after having turned the key in the ON position, push the drive pedal (6) adjusting the speed by pressing and releasing the pedal. The machine will then start moving.



19. REVERSE FUNCTION

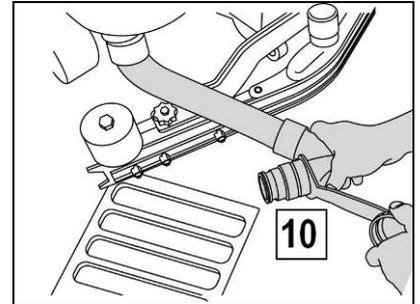
To make a reversing manoeuvre, press both pedals (6 and 7) the machine will then start moving backwards. During reverse motion, the machine emits an acoustic signal.



MACHINE PREPARATION

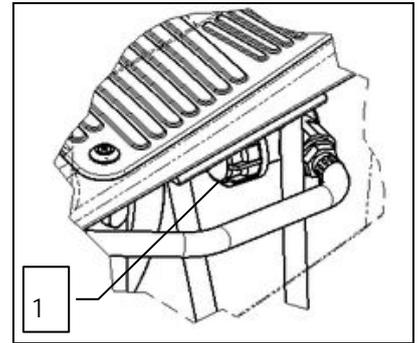
20. RECOVERY TANK

Make sure the recovery tank is empty, otherwise empty it completely.
Check the cap of the drainage tube (10) (on the rear of the machine) is correctly closed.



21. SOLUTION TANK

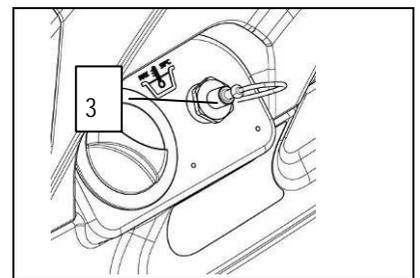
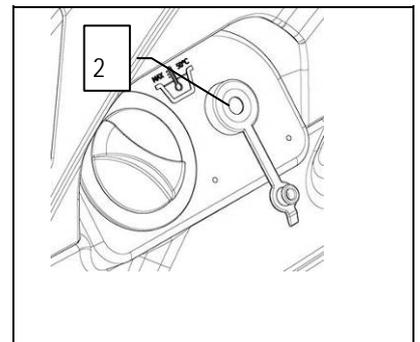
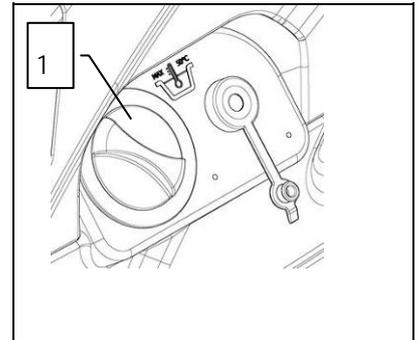
The recovery tank must be completely empty each time the solution tank is filled.
Remove the front inlet cap and check the solution filter is correctly fitted.
Check that the solution filter cap (1), under the solution tank in the front right of the machine, is properly closed.



22. FILLING THE SOLUTION TANK

The solution tank can be filled in three different ways:

1. Unscrew the filler cap (1) and fill using a hose.
2. Using the rubber cap (2), this supports the water hose on its own, be sure to unscrew the cap to allow the proper vent of air.
3. Using on request (optional) a tank clean water refilling system via a quick coupling (3), FFF with float to control the overflow.

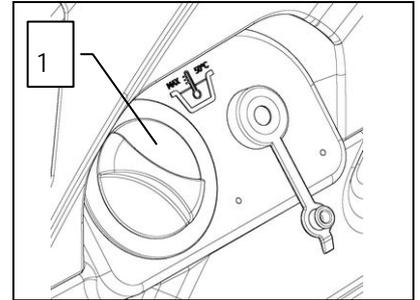




MACHINE PREPARATION

23. DETERGENT SOLUTION

Remove the filler cap (1) and check the solution filter is correctly assembled.
Check that the filter cap, under the solution tank in the front right of the machine, is properly closed.
Fill it with clean water at a temperature not exceeding 50°C. The amount inside the tank can be seen by means of the level pipe on the front left of the seat. The solution tank has a maximum capacity of about 110 litres. Add the liquid detergent to the tank in the concentration and manner indicated on the detergent manufacturer's label. The formation of excess foam could damage the suction motor, so use only the minimum amount of detergent that is necessary.



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



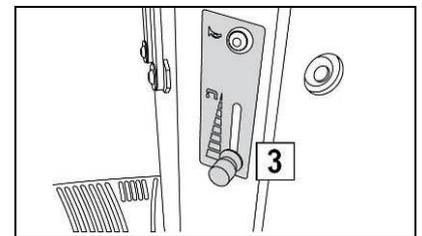
ATTENTION: Protective gloves should always be worn before handling detergents or acidic or alkaline solutions to avoid serious injury to hands.



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

24. REGULATING THE DETERGENT

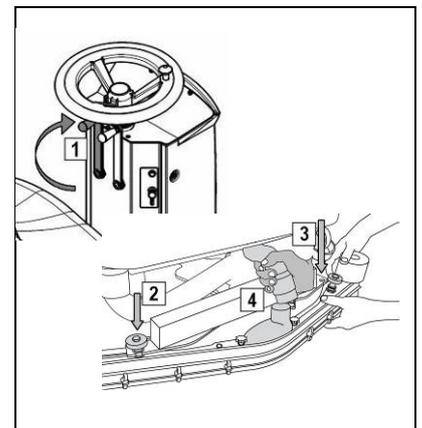
Firstly, fully open the outflow of the tap, by means of the lever (3) on the steering column. During the first few meters, check that the amount of solution to wet the floor is sufficient, but not too much that it exits the splash-guard, the adjustment of the detergent application is made by means of lever (3) (shifting it downwards increases the flow, shifting it upwards decreases it). Bear in mind that the correct amount of solution is always depends on the nature of the floor, the degree of dirt and the forward speed.



25. ASSEMBLING THE SQUEEGEE

For packaging reasons, the squeegee is supplied disassembled from the machine, and must be assembled as shown in the figure.

Raise the squeegee connection by means of the left lever (1) turning it clockwise into the vertical position. Make sure the parking brake is engaged and that the main switch is OFF. First thread left pin (2) of the squeegee into the left slot on the arm and then right pin (3) into the right slot, being careful to keep the spring and the washer above the arm's flat bar. This can be simplified by first loosening the handwheel on the pin. Then re-tighten the handwheel to block the squeegee in place. Insert the squeegee tube in the appropriate sleeve (4).



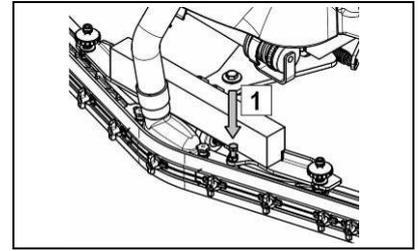


MACHINE PREPARATION

26. SQUEEGEE INCLINATION

During working operation, the rear rubber is slightly tilted backwards (by about 5mm) in a uniform way for its whole length.

If it is necessary to increase the bend of the rubber in the central part, you must tilt the squeegee backwards, rotating the adjuster screw (1) clockwise.

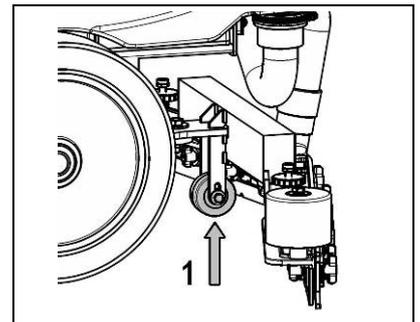


27. ADJUSTING THE SQUEEGEE SUPPORT HEIGHT

The height of the squeegee must be adjusted on the basis of the state of wear and tear of the rubber. Carry out the following operations for adjustment:

1. unscrew the locking nut
2. raise or lower the wheels (1) by sliding them on the slot of the support
3. block it by tightening the locking nut once the required height is reached.

NB: to facilitate the operation, completely lower the squeegee and put a spacer of a few millimetres (2 to 4 mm depending on the type of rubber) under the wheel.

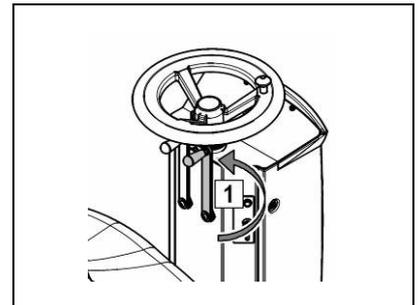


28. BRUSH ASSEMBLY (MR60 B VERSIONS)

1. Make sure the parking brake is engaged and that the main switch is OFF
2. Raise the brush head by turning the righthand lever (1) for the counter-clockwise movement of the brush head.



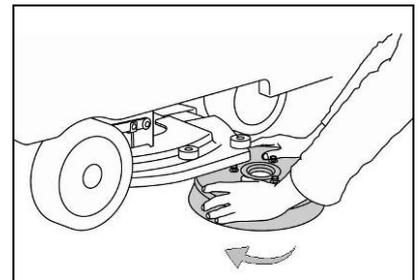
WARNING: during this operation, verify that there are no people or objects near the brush.



3. With the brush head in a high position put the brushes in the housing of the plate under the brush head, turning them until the three buttons go into the niches of the plate itself; turn the brush clockwise until the pin is pushed towards the coupling spring and is locked into place.

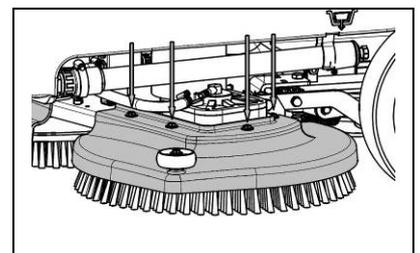


WARNING: You are advised to always wear protective gloves, to avoid the risk of serious injury to your hands.



29. WASHING BRUSH HEAD CASING ASSEMBLY (MR 65-75-85-100 B VERSIONS)

Make sure the parking brake is engaged and that the main switch is OFF. Raise the brush head by turning the righthand lever for the counter-clockwise movement of the brush head. The casing of the washing base that for reasons of packaging are supplied disassembled from the machine, must be mounted as shown.





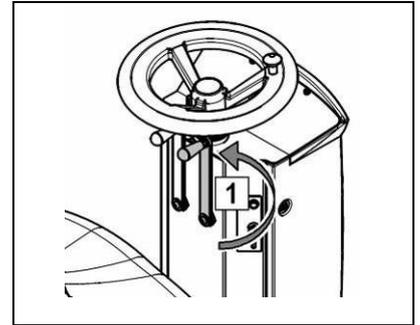
MACHINE PREPARATION

30. DISC BRUSH ASSEMBLY (MR 65-75-85-100 B VERSIONS)

1. Make sure the parking brake is engaged and that the main switch is OFF
2. Raise the brush head by turning the righthand lever (1) for the counter-clockwise movement of the brush head.



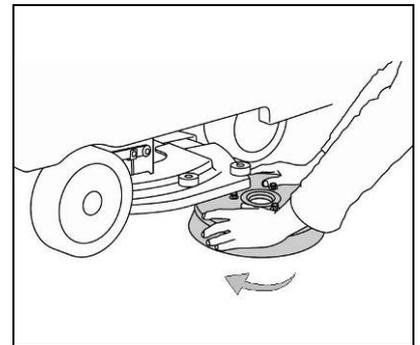
WARNING: During this operation, check there are no people or objects near the brush.



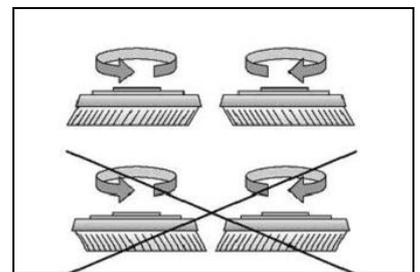
3. With the base up, insert the brushes in the plate housing beneath the base, turning them until the three pins enter the niches in the plate itself; turn until the pin is pushed towards the coupling spring and is locked into place. The photo shows the rotation direction to hook up the right-hand brush;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



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



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

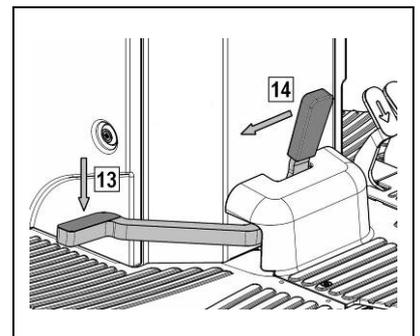


31. SERVICE BRAKE AND PARKING BRAKE

The machine has an electronic braking system. To brake, in normal conditions, just remove your foot from the accelerator pedal. If this service brake is working badly, or if necessary, activate the brake pedal (13) pushing it downwards. To engage the parking brake, press the brake pedal (13) and lock it by pulling the lever (14) to the left. The red indicator light on the instrument panel will switch on.



WARNING: If you try to leave with the parking brake on, the machine will not move; always disengage the parking brake before starting to work or moving



32. BLINKING LIGHT (OPTIONAL)

The machine can be equipped with a blinking light that turns on automatically when the key in the main switch is turned on.

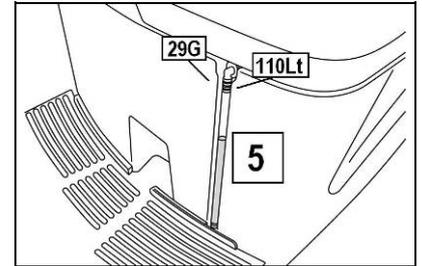




MACHINE PREPARATION

33. EMPTY SOLUTION TANK DEVICE

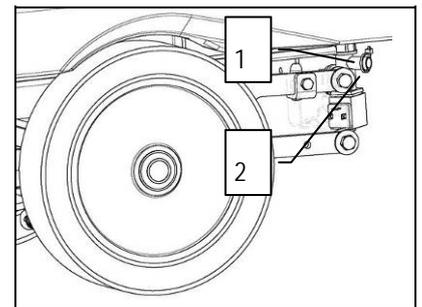
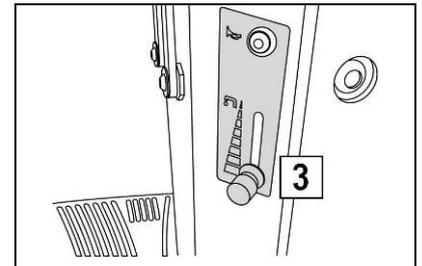
To check the quantity of water in the solution tank there is a special level indicator tube (5) next to the driver's seat.



34. WATER MANAGEMENT KIT (OPTIONAL)

If you want to increase the working capacity of the machine, you can replace the detergent solution choke bushing (optional) on the solenoid valve with the more suitable one included in the water management kit. To do this, proceed as follows:

1. Make sure the solution tank is empty, otherwise empty it completely
2. Check that the main switch of the machine is set to "OFF"
3. Disconnect the battery connector cable from the machine connector
4. Close the detergent solution tap (3)
5. Remove the screw tie (1) that fixes the solution distribution tube to the solenoid valve
6. Remove the solution distribution tube from the solenoid valve
7. If present, remove the solution choke bushing (2) and replace it with the more suitable one, or insert the more suitable choke bushing at the required working capacity (the choke bushings are included in the water management kit)
8. Reassemble all the elements



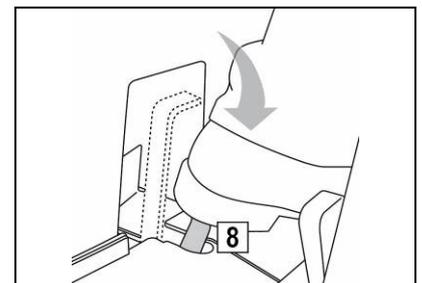
35. BASE EXTRA PRESSER (VERSIONS B)

The pressure on the brushes can be increased by pressing pedal (8) located under the seat. Simply release the pedal to return to the initial condition.

The pedal can also be locked in the maximum pressure position.

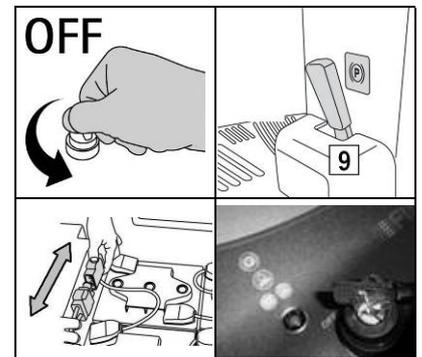
WARNING: The pedal must be released before lifting the base.

The pressure must be chosen according to the type of floor and the extent of the dirt. A pressure increase causes greater wear and tear of the brushes and higher energy consumption (for further information, read "CHOOSING AND USING THE BRUSHES")



If problems occur during work, turn the machine off, turn the key in the OFF position, engage the parking brake by moving the lever (9) to the left to stop the machine and disconnect the battery connector located under the operator. These commands block all moving machine parts. To resume work, once the problem has been resolved, reconnect the connector, start the machine, turning the key in the ON position, release the parking brake lever.

The machine will not start if the operator is not properly seated.



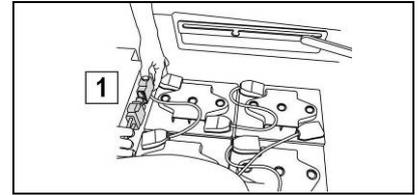
WARNING: As soon as the extra pressure on the brush head has been engaged, a green indicator light on the instrument panel will come on



WORK

36. PREPARING TO WORK

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



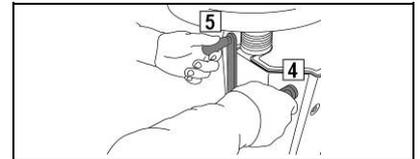
5. Check the parking brake is released (2).



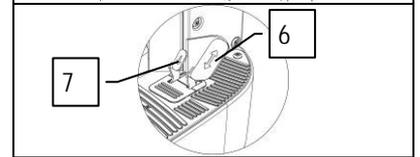
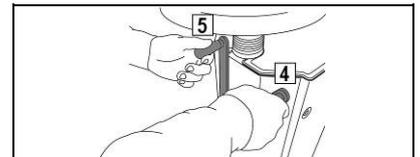
WARNING: If you try to leave with the parking brake on, the machine will not move; always disengage the parking brake before starting to work or moving



6. Turn the key of the main switch a quarter of a turn clockwise (to position ON). Immediately, on the instrument panel, the display will turn on indicating the charge level of the batteries.
7. Lower the base by turning the right lever (4) clockwise, then lower the squeegee turning the left lever (5) counterclockwise.

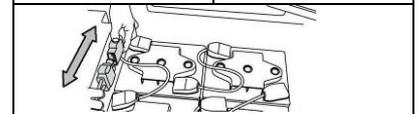
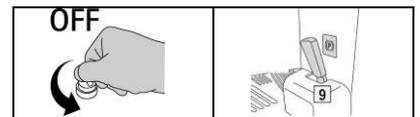


8. Pressing the accelerator pedal (6 - right pedal), the machine starts moving and the brushes will rotate
9. To perform a reverse manoeuvre, lift the squeegee by turning the left lever (5) clockwise, then press both pedals (6 and 7) and the machine will start moving backwards.



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

WARNING: If problems arise during operations, turn off the key, engage the parking brake by pushing the lever (9) to the left until the machine brakes and release the emergency lever placed below the operator. These commands block all moving machine parts. Having resolved the problem, to start working again, reconnect the connector, turn on the key and release the parking brake lever. The machine will not start if the operator is not properly seated.

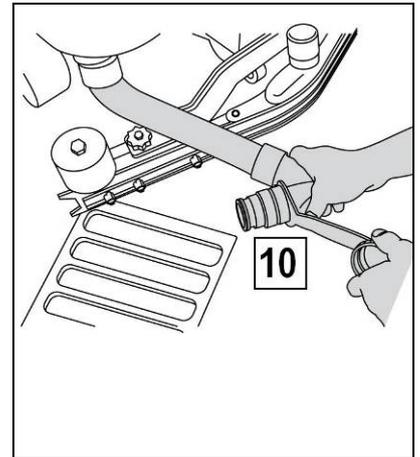


37. OVERFLOW DEVICE

The machine is not equipped with an overflow device, because the capacity of the recovery tank is greater than the capacity of the solution tank. In extraordinary cases, there is a mechanical device (float) on the lid that, when the recovery tank is full, shuts off the air to the suction motor intake TO protect it; the sound of the vacuum motor will then be deeper. If this happens, raise the squeegee by turning the left-hand lever clockwise. After about 15-25 seconds, switch off the suction motor by making a 1/4 turn of the key, anticlockwise. Make a 1/4 turn of the key clockwise, and take the machine to the designated water drainage area. Then proceed with emptying the recovery tank through a special drainage pipe (10). It is good practice when restoring the level of the solution tank, to empty the recovery tank through the special drainage pipe (10).



WARNING: during machine switch-on, do not keep the accelerator pedal pressed down

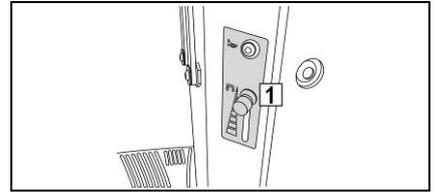




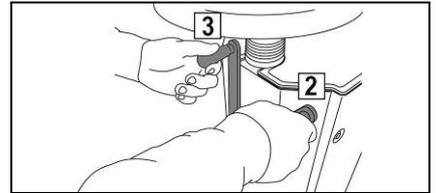
AT THE END OF THE WORK

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

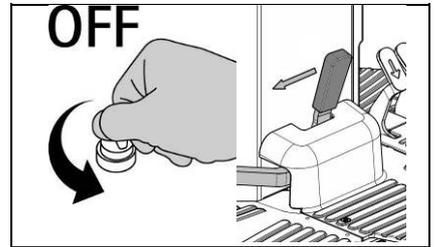
1. Close the tap (1).



2. Raise the brush head by turning the right-hand lever (2) anticlockwise. Then raise the squeegee by turning the left-hand lever (3) clockwise. After about 15-25 seconds, switch off the suction motor by making a 1/4 turn of the key, anticlockwise.



3. Make a 1/4 turn of the key clockwise, and take the machine to the designated water drainage area
4. Turn the machine off by turning the key one quarter turn anticlockwise and remove it from the panel.
5. Engage the parking brake

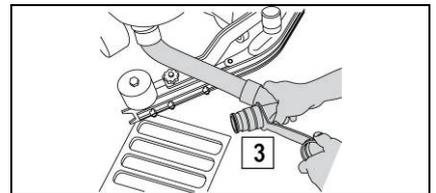


WARNING: Before performing any maintenance, remove the keys from the panel and disconnect the battery connector of the machine.

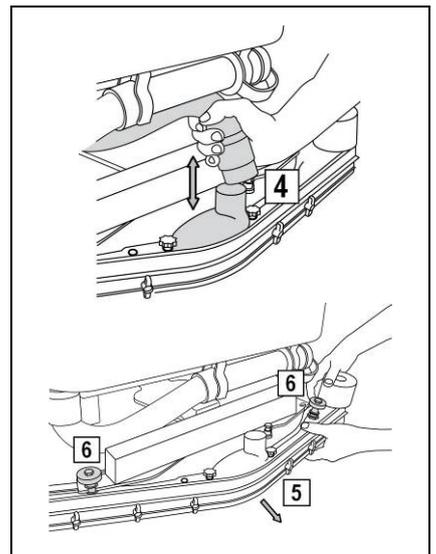
6. Disconnect the tube (3) from its seat, unscrew the drainage cap and empty the recovery tank.



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



7. Slide the suction tube (4) from the squeegee sleeve
8. Remove the squeegee (5) from the support arm by unscrewing the handwheel (6).
9. Clean well both the squeegee and the rubbers with a jet of water.
10. After cleaning the squeegee and rubbers, replace the squeegee on the initial support, firstly inserting the left pin of the squeegee in the left slot of the arm, then the right pin in the right slot, being careful to keep the spring and washer on the plate of the arm. This can be simplified by first loosening the handwheel on the pin. Then retighten the handwheel to block the squeegee in place.
11. Finally insert the squeegee tube in the special sleeve.
12. Lift the recovery tank and connect the battery connector
13. Sit on the driver's seat
14. Insert the key into the ignition switch and turn it a quarter turn clockwise (to position ON)
15. Disengage the parking brake
16. Park the machine in a closed place, in an area where it cannot cause damage to people or other property, but also be protected from an accidental fall of objects.
17. Engage the parking brake
18. Turn the ignition key a quarter turn counter-clockwise (OFF position) and remove the key



19. Lift the recovery tank and disconnect the battery connector



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



DAILY MAINTENANCE

PERFORM ALL MAINTENANCE OPERATIONS IN SEQUENCE

38. CLEANING THE RECOVERY TANK

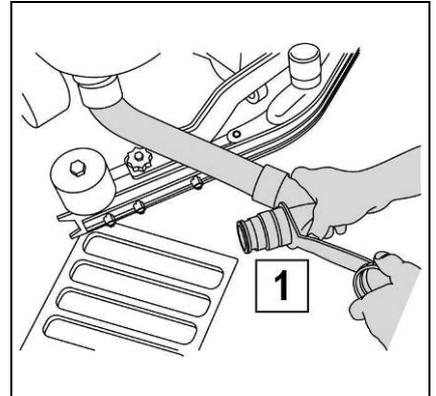
1. Disconnect the tube (1) from its seat, unscrew the drainage cap and empty the recovery tank.



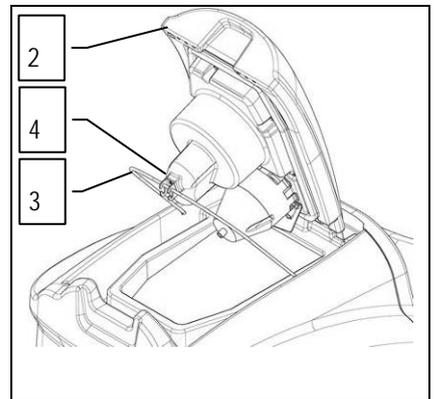
ATTENTION: Before performing any maintenance, remove the keys from the panel and disconnect the battery connector of the machine.



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

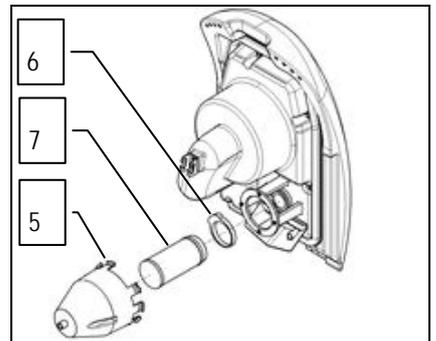


2. Raise the cap (2) until the hook (4) is secured to the prop (3) of the recovery tank.
3. Clean and rinse the recovery tank and the suction pipe (connecting pipe between the squeegee and the tank).
4. Reposition the cap on the drainage tube and lower the suction cap. To lock the prop (3) just slightly raise the cap, release the prop (3) and lower the cap up to close it.



39. CLEANING THE SUCTION MOTOR FILTER

1. Raise the suction cover (2) and block it with the stop (3)
2. Remove the suction filter protection (5) by rotating it clockwise
3. Release the retaining clips (6)
4. Remove the suction filter (7) from its seat
5. Use a jet of water to clean the walls and brush head of the filter
6. Reassemble all the elements



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



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



DAILY MAINTENANCE

40. CLEANING THE SQUEEGEE

The careful cleaning of the whole vacuum unit ensures better drying and cleaning of the floor as well as greater duration of the suction motor. Proceed as follows for cleaning:

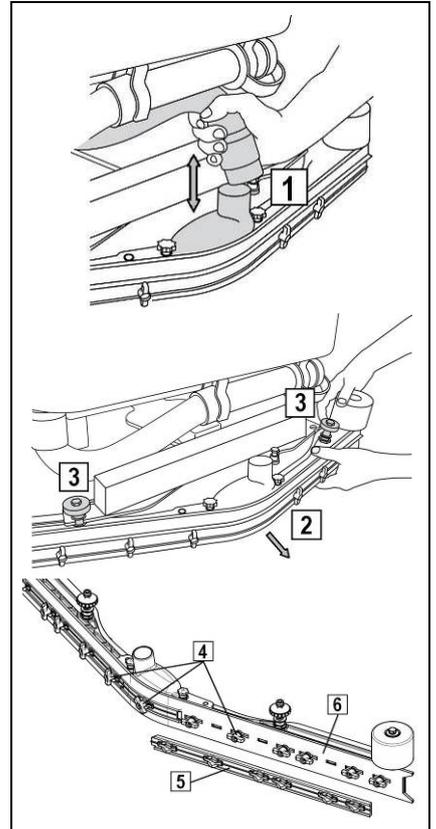
1. Slide the suction tube (1) from the squeegee sleeve.
2. Remove the squeegee (2) from the support arm by unscrewing the handwheel (3).
3. Check the wear of the rubbers. If the edge of the rubber is ruined, the rear rubber can be turned on all four corners. If the rubbers are completely worn proceed with the replacement. To remove the rubber, turn the wing nuts (4) in a horizontal position, remove the rubber-pressing blade (5) and then remove the rubber to turn it or replace it.
4. Proceed in reverse to replace the rubber.
5. After cleaning, replace the squeegee (2) on the initial support, firstly inserting the left pin of the squeegee in the left slot of the arm, then the right pin in the right slot, being careful to keep the spring and washer on the plate of the arm. This can be simplified by first loosening the handwheel (3) on the pin. Then retighten the handwheel (3) to block the squeegee in place.
6. Finally insert the squeegee tube in the special sleeve.



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



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



41. CLEANING THE SOLUTION TANK AND FILTER

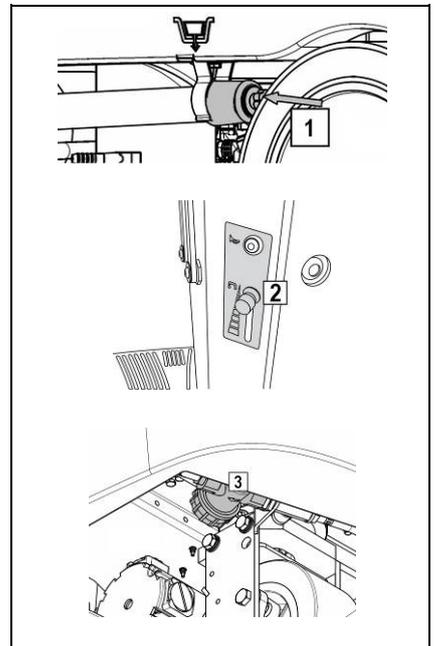
1. Disconnect the clean water drainage pipe (1) from its housing on the left side of the machine, unscrew the cap and empty the tank.
2. Remove the plug from the solution tank refill opening.
3. Rinse the inside of the tank with a jet of water.
4. Close the drainage pipe with the cap and put it in place.
5. Close the water tap (2).
6. Unscrew the filter (3) at the front of the machine.
7. Remove the internal filter cartridge and rinse everything thoroughly with running water.
8. Reassemble all the elements.



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



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





DAILY MAINTENANCE

42. DISC BRUSH DISASSEMBLY (MR60 B VERSIONS)

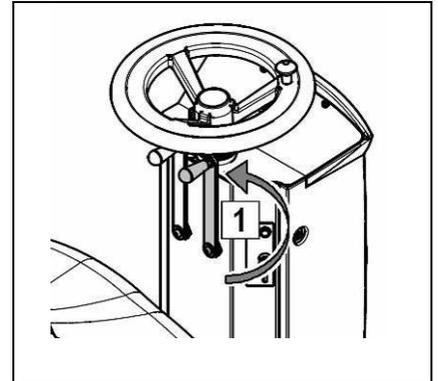
1. Lift the base by turning the right lever (1) to move the base counterclockwise.



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



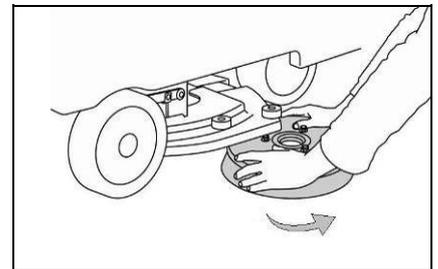
WARNING: During this operation, check there are no people or objects near the brush.



2. Rotate the brush counter-clockwise until it comes out of the brush-holder plate seat, as shown in the figure.



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



43. DISC BRUSH DISASSEMBLY (MR 65-75-85-100 B VERSIONS)

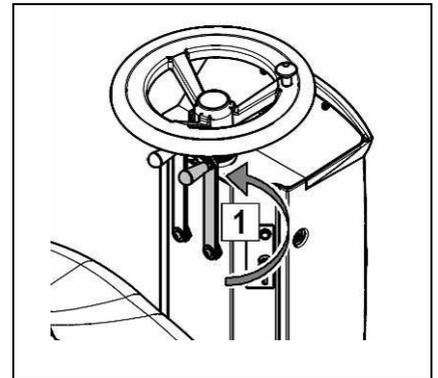
1. Lift the base by turning the right lever (1) to move the base counterclockwise.



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



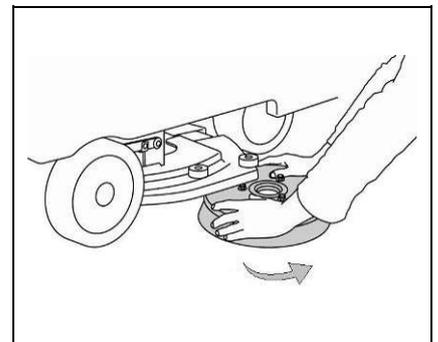
WARNING: During this operation, check there are no people or objects near the brush.



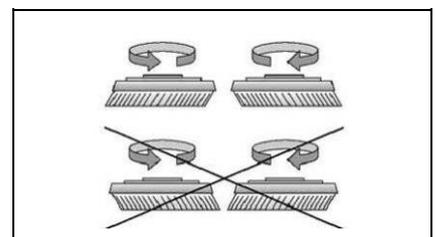
2. Rotate the brush counter-clockwise until it comes out of the brush-holder plate seat, as shown in the figure. The photo shows the direction of rotation for releasing the right brush. Rotate in the opposite direction for the left brush.



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



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





WEEKLY MAINTENANCE

44. CLEANING THE SUCTION TUBE

Whenever suction seems to be unsatisfactory, check that the suction tube (1) is not obstructed. If necessary clean with a jet of water as follows:

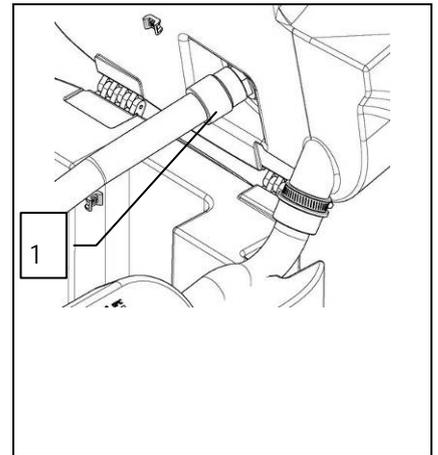
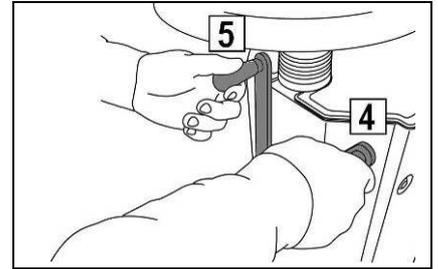
1. Make sure the recovery tank is empty, otherwise empty it
 2. Turn the key to the "OFF/0" position and remove it from the electrical board
 3. Raise the squeegee body from the ground by turning lever (5) clockwise
 4. Raise the brush head body from the ground by turning lever (4) counter-clockwise
-
5. Remove the tube from the squeegee suction nozzle
 6. Grip the handle under the seat to open the recovery tank
 7. Lift the recovery tank until it hooks to the end of the safety clamp
 8. Detach the aspiration tube from the seat on the recuperation tank (1)
 9. Clean it with a water jet introduced from the side where it is connected to the tank
 10. Reassemble all the elements



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



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



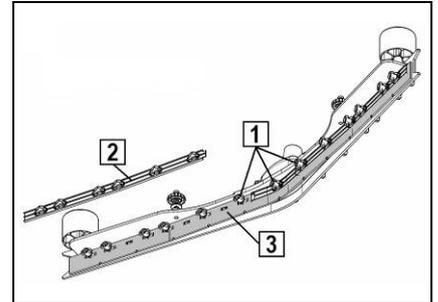


EXTRAORDINARY MAINTENANCE

45. REPLACING THE FRONT SQUEEGEE RUBBER

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

1. Turn the key to the "OFF/0" position and remove it from the electrical board.
2. Remove the squeegee from the support arm by unscrewing the handwheel.
3. Turn the wing nuts (1) in the horizontal position.
4. Remove the front rubber-pressing blades (2)
5. Remove the rubber (3) and replace it.
6. Proceed in reverse to replace the rubber.

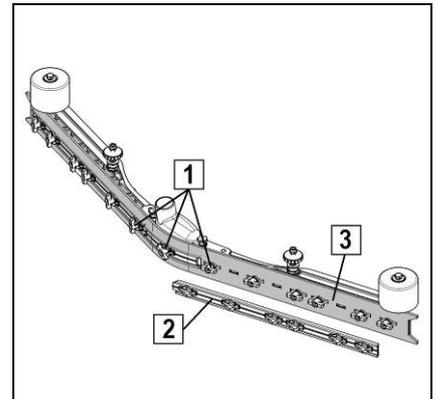


46. REPLACING THE REAR SQUEEGEE RUBBER

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

This operation can be done both with a squeegee fitted or removed as follows:

1. Turn the key to the "OFF/0" position and remove it from the electrical board.
2. Turn the wing nuts (1) in the horizontal position.
3. Remove the rear rubber-pressing blades (2)
4. Remove the rubber (3) and replace it.
5. Proceed in reverse to replace the rubber
6. adjust the height of the squeegee depending on the rubber (see "ADJUSTING THE HEIGHT OF THE SQUEEGEE SUPPORT")



47. REPLACEMENT OF THE BRUSH HEAD CASING

Periodically check the condition of the base casings that serve as protection to the rotation of the brushes. To replace proceed as follows:

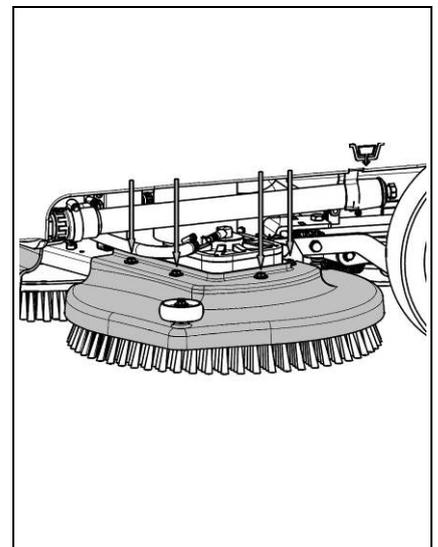
1. Make sure that the brush head body is lowered, otherwise lower it
2. Turn the key to the "OFF/0" position and remove it from the electrical board.
3. Ensure to remove the screws securing the casing
4. Dismantle the casings
5. Fit the new casings with the screws previously removed



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



WARNING: The housing can prevent damage to persons or property. Always check for wear.

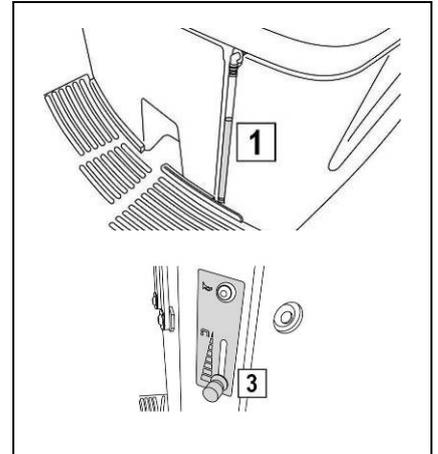




TROUBLESHOOTING

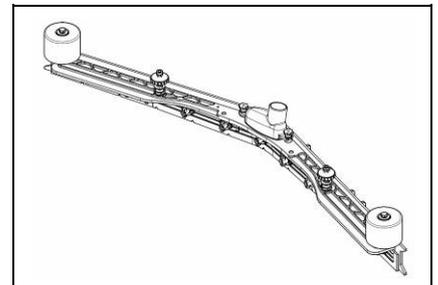
48. INSUFFICIENT WATER ON THE BRUSHES

1. Check there is water in the solution tank (1)
2. Check that the tap (3) is turned on
3. Clean the solution filter located at the front of the machine
4. Check that the choke bushing in versions with "KIT WATER MANAGEMENT" is not blocked



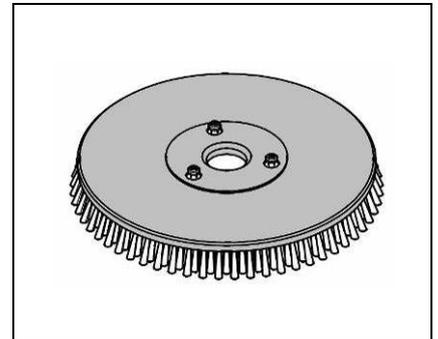
49. THE SQUEEGEE DOES NOT DRY PERFECTLY

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



50. THE MACHINE DOES NOT CLEAN WELL

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



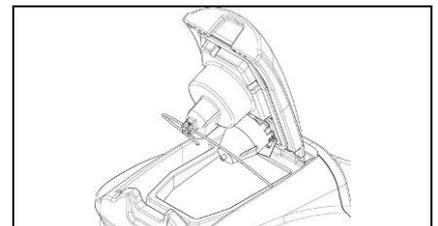
51. EXCESSIVE FOAM PRODUCTION

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

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

52. THE SUCTION MOTOR DOES NOT FUNCTION

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



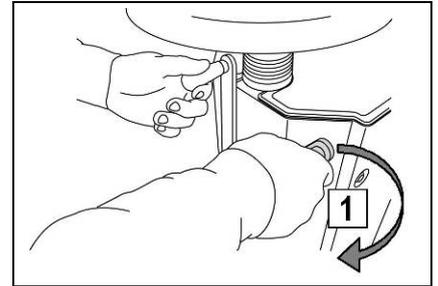


TROUBLESHOOTING

53. THE BRUSH MOTOR DOES NOT WORK

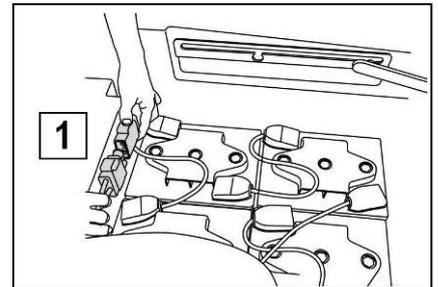
ATTENTION To avoid damaging the floor, the motor only starts up when the machine is moved forwards

1. Check that the base is lowered during the forward movement with the right lever (1) turned clockwise.
2. The operator must be properly seated in the driving position
3. Check no thermal protection device has intervened.
4. Check the correct connection of the motor to the terminal under the footboards.



54. THE MACHINE DOES NOT START

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



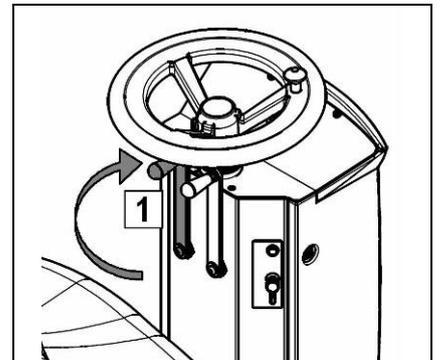
55. ELECTRIC FUSES AND THERMAL CUT-OUTS

In addition to general 80 A fuses, the machine is also fitted with self-restoring safety fuses located on the boards in the electric system that interrupt the power supply to the brush and vacuum motor when the machine exceeds the predetermined load. To restore the power supply to the motor, switch off the machine and wait for the fuses to cool down (about 40 seconds). If the switch disconnects the current again, contact the **FIMAP** technical assistance centre.

56. THE MACHINE DOES NOT REVERSE

WARNING To avoid damage to the squeegee, the reverse movement is disabled and only works when the squeegee is lifted

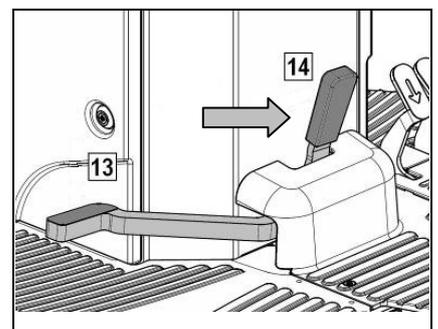
1. Check that the squeegee is lifted during the reverse movement with the left lever (1) turned clockwise.
2. The operator must be properly seated in the driving position
3. Check no thermal protection device has intervened.



57. THE MACHINE DOES NOT MOVE FORWARD

WARNING To prevent damage to the motorwheel, forward movement is disabled if the parking brake is on.

1. The operator must be properly seated in the driving position
2. Check no thermal cut-out device has been triggered
3. Move the locking lever to the right (14), the red parking brake indicator light on the instrument panel will go out.





DISPOSAL

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

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

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

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



CHOOSING AND USING THE BRUSHES

POLYPROPYLENE BRUSH (PPL)

Used on all types of floor, it has good resistance to wear and tear and hot water (no greater than 60°C). PPL is non-hygroscopic and therefore retains its characteristics even when working in wet conditions.

NYLON BRUSH

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

ABRASIVE BRUSH

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

THICKNESS OF THE BRISTLES

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

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

Remember that when the bristles are worn and therefore too short, they will become rigid and are no longer able to penetrate and clean deep down, also because, like with over-large bristles, the brush tends to jump.

PAD HOLDER

The pad holder is recommended for cleaning shiny surfaces.

There are two types of pad holder:

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

TABLE FOR CHOOSING THE BRUSHES

Machine	No. of brushes	Code	Type of bristles	Ø Bristles	Ø Brush	Length.	Notes
MR60	1	405630	PPL	0.6	610		CENTER LOCK
		405629	PPL	0.9	610		
		405627	NYLON	0.9	610		
		405628	TYNEX (ABRASIVE)		610		
		405519	PAD HOLDER		585		
MR65	2	422189	PPL	0.3	340		CENTER LOCK
		422971	PPL	0.6	340		
		422972	PPL	0.9	340		
		422981	TYNEX (ABRASIVE)		340		
		422973	PAD HOLDER		330		
MR75	2	427715	PPL	0.3	390		CENTER LOCK
		427716	PPL	0.6	390		
		427717	PPL	0.9	390		
		427719	TYNEX (ABRASIVE)		390		
		427718	PAD HOLDER		380		
MR85	2	430696	PPL	0.3	430		CENTER LOCK
		430697	PPL	0.6	430		
		430698	PPL	0.9	430		
		430699	TYNEX (ABRASIVE)		430		
		431122	PAD HOLDER		410		
MR100	2	436310	PPL	0.3	510		CENTRE LOCK
		436311	PPL	0.6	510		
		436312	PPL	0.9	510		
		436314	TYNEX (ABRASIVE)		510		
		436315	PAD HOLDER		500		



EC DECLARATION OF CONFORMITY

The undersigned manufacturer:
FIMAP S.p.A.
Via Invalidi del Lavoro, 1
37050 Santa Maria di Zevio (VR)
declares under its sole responsibility that the product

SCRUBBING MACHINES
models **MR60 B - MR65 B - MR75 B - MR85 B - MR100 B**

complies with the requirements of the following Directives:

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

They also comply with the following standards:

- EN 60335-1: Household and similar electrical appliances - Safety. Part 1: Generic standards.
- EN 60335-2-72: Household and similar electrical appliances. Part 2: Generic standards for automatic machines for floor treatment for commercial and industrial use.
- EN 60335-2-29: Household and similar electrical appliances. Part 2: Special standards for battery chargers.
- EN 12100-1: Machine safety - Fundamental concepts, fundamental principles of design - Part 1: Basic terminology and methodology.
- EN 12100-2: Machine safety - Fundamental concepts, fundamental principles of design - Part 2: Technical principles.
- EN 61000-6-2: Electromagnetic compatibility (EMC) - Part 6-2: Generic standards – Immunity for industrial environments.
- EN 61000-6-3: Electromagnetic compatibility (EMC) - Part 6-3: Generic standards — Standard emission for residential, commercial and light-industrial environments.
- EN 61000-3-2: Electromagnetic compatibility (EMC) - Part 3-2: Limits – Limits for harmonic current emissions (Equipment with input current ≤ 16 A per phase).
- EN 61000-3-3: Electromagnetic compatibility (EMC) - Part 3-3: Limits – Restriction of voltage variations and flicker in low voltage power supply systems for devices with a rated current ≤ 16 A.
- EN 55014-1: Electromagnetic compatibility - Regulations for household appliances, electrical devices and similar equipment. Part 1: Emission - Regulation for product family.
- EN 55014-2: Electromagnetic compatibility - Regulations for household appliances, electrical devices and similar equipment. Part 2: Immunity - Regulation for product family.
- EN 62233: Household and similar electrical appliances - Electromagnetic fields Methods for evaluation and measurement.

The person authorised to compile the technical file:

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

Santa Maria di Zevio (VR), 20/06/2012

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Giancarlo Ruffo

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