

USE AND MAINTENANCE MANUAL



C130 D

ED. 01-2007

EN

ORIGINAL
INSTRUCTIONS
Doc. 10006769
Ver. AA



The descriptions contained in this document are not binding.

The company therefore reserves the right to make any modifications at any time to elements, details, or accessory supply, as considered necessary for reasons of improvement or manufacturing/commercial requirements.

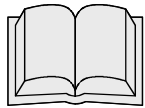
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The company reserves the right to make any technical and/or supply modifications. The images are for reference purposes only, and are not binding in terms of design and supply.

Symbols used in the manual



Open book symbol with an "i"
Indicates that this document is an 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, for the safety of the operator and the machine



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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.

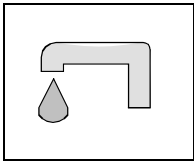
Introduction

This is a sweeping/scrubbing machine which, via the abrasive mechanical action of the four rotating brushes, the sweeping action of a cylindrical brush, and the chemical action of a water/detergent solution, can clean any type of flooring. 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 read this instruction booklet carefully and read it again whenever difficulties arise while using the machine. If necessary, remember that our customer assistance service (organised in collaboration with our dealers) is always available for advice or direct intervention.

TECHNICAL DESCRIPTION		C130D
Working width	mm	1300
Lateral movement of base	mm	100
Squeegee width	mm	1460
Work capacity	sq.m/h	7800
Cylindrical brush	Ø mm	300x1100
Cylindrical brush rotations	rpm	580
Cylindrical brush motor	V	36
Cylindrical brush motor	W	750
Counter-rotating brushes (4)	Ø mm	345
Brush rotations	rpm	220
Pressure on the brushes	kg	130÷180
Maximum specific pressure	rev/s /	66
Brush motor	V	36
Brush motor	W	1125
Brush motor	V	36
Brush motor	W	2000
Traction wheel	Ø mm	350x130
Forward speed	km/h	0÷6
Maximum gradient with full load		10%
Suction motor	V	36
Suction motor	W	1170
Suction vacuum	mbar	225
Rear elastic wheels	Ø mm	370x105
Solution tank	l	360
Recovery tank	l	380
Steering diameter	mm	3250
Machine length	mm	2250
Machine height	mm	1880
Machine width (without squeegee)	mm	1340
Batteries (start-up)	V/Ah	12/45
Type of motor		DIESEL
Machine weight (when empty)	kg	1100
Noise level (in compliance with IEC 704/1)	dB (A)	82
Body vibration level	m/s ²	0.85
Hand vibration level	m/s ²	1.15



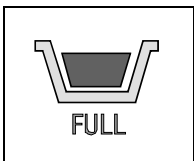
SYMBOLS USED ON THE MACHINE



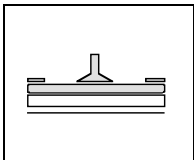
Symbol denoting solenoid valve open
Used to indicate the solenoid valve switch
The indicator light showing that the solenoid valve is open



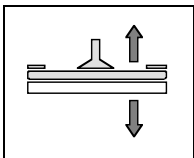
Symbol denoting empty solution tank



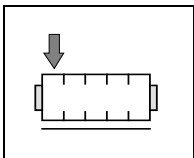
Symbol denoting full recovery tank



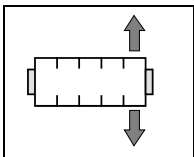
Symbol denoting squeegee fully down



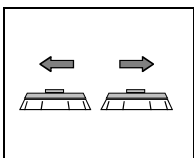
Symbol denoting squeegee rise/fall
The indicator light showing that the jack is working



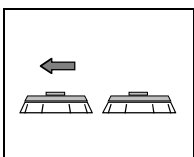
Symbol denoting cylindrical brush fully down



Symbol denoting rise/fall of cylindrical brush base
The indicator light showing that the jack is working



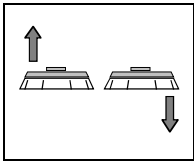
Symbol denoting sideways movement of brush base
The indicator light showing that the jack is working



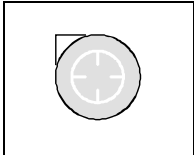
Symbol denoting end stop of base sideways movement
The green indicator light comes on when the brush base is fully to the left



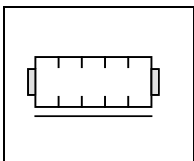
SYMBOLS USED ON THE MACHINE



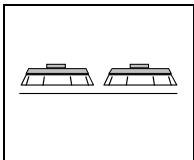
Symbol denoting brush base rise/fall
The indicator light showing that the jack is working



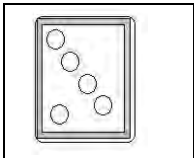
Symbol denoting suction motor
Used to indicate the suction motor switch



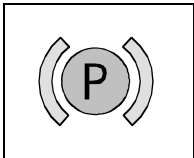
Cylindrical brush symbol
Used to indicate the cylindrical brush motor switch



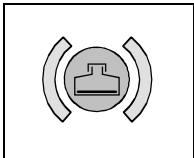
Symbol denoting brushes
Used to indicate the brush motor switch



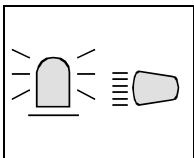
Symbol denoting the level of power supply voltage to the machine alternator



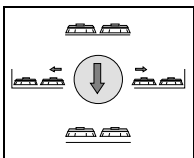
Symbol denoting brake
The indicator light showing the handbrake is on
Located above the emergency brake lever



Symbol denoting brake oil tank
The indicator light showing the absence of oil in the working brake system



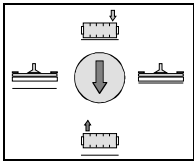
Symbol denoting the switches of the headlights and flashlight



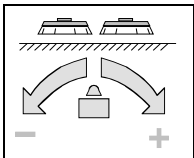
Symbol denoting brush lever
Used on the instrument panel, to indicate the lever of the brush base. Sideways movements of the lever correspond with sideways movements of the base. Longitudinal movements are accompanied by vertical movements of the base.



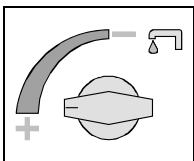
SYMBOLS USED ON THE MACHINE



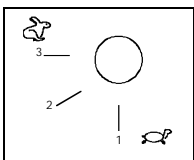
Symbol denoting the cylindrical brush lever, and the squeegee
Sideways movements of the lever are accompanied by vertical movements of the squeegee. Longitudinal movements of the lever are accompanied by vertical movements of the cylindrical brush base.



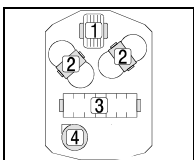
Symbol denoting pressure applied to the brushes



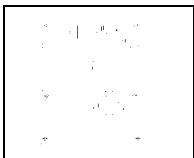
Symbol denoting tap regulation



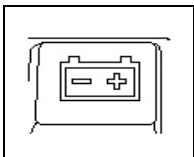
Symbol denoting forwards and backwards speed selector



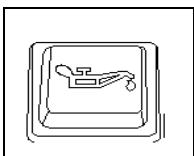
Symbol denoting motor control



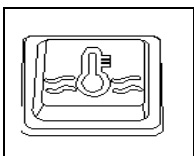
Symbol



Generator symbol



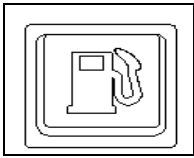
Oil pressure symbol



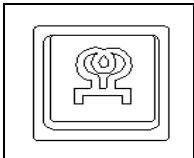
Symbol denoting the temperature of the cooling water



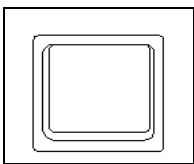
SYMBOLS USED ON THE MACHINE



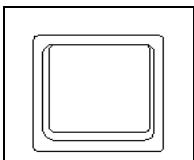
Symbol denoting light oil reserve



Symbol denoting glowplug pre-heating



Green indicator light showing that start-up battery is connected



Green indicator light (located beneath the steering wheel) showing the machine system is switched on



SYMBOLS USED ON THE MACHINE



Warning symbol

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



MACHINE PREPARATION

1. HANDLING 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 weight is 1100kg

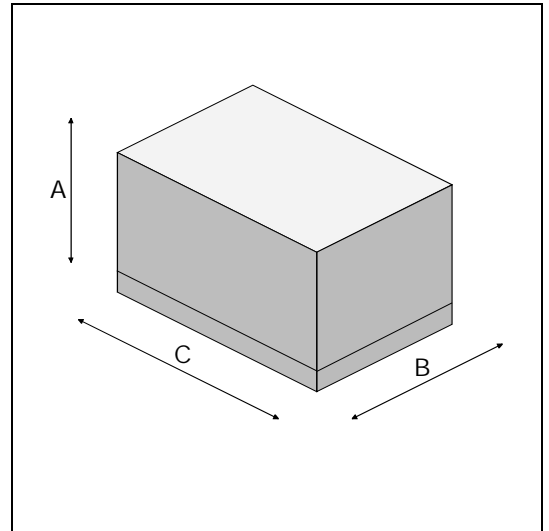
The overall dimensions of the package are:

C130D

A: 2050 mm

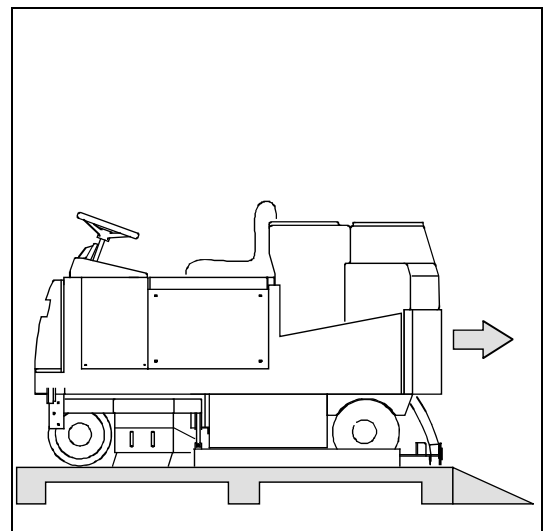
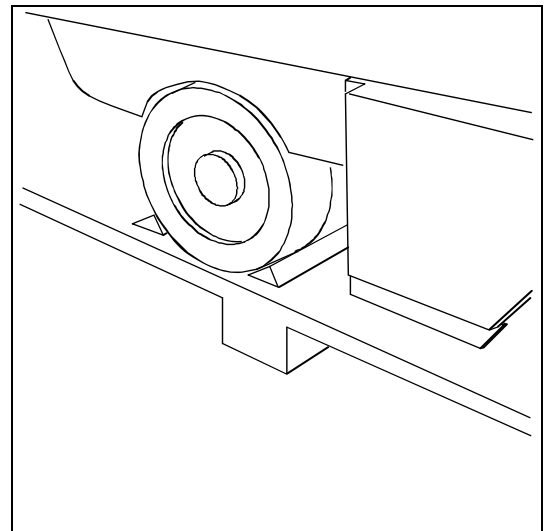
B: 1520 mm

C: 2380 mm



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 these wedges
4. Use a chute to get the machine down from the pallet, pushing it backwards.
5. Keep the pallet for any future transport needs.

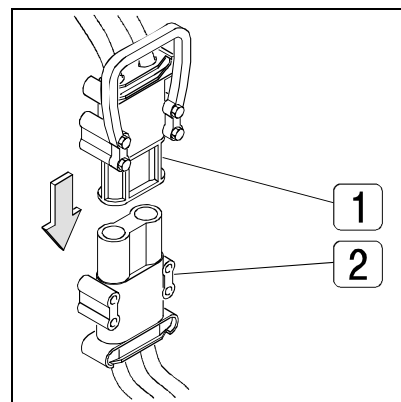




MACHINE PREPARATION

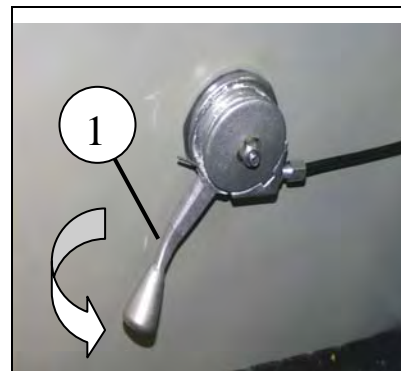
3. CONNECTING THE SYSTEM CONNECTOR

The connector (1) is located in the lower left section (in relation to the operator), and must be connected to the machine connector (2).



4. MOTOR START-UP (PRE-HEATING)

1. Check the accelerator lever is pressed fully down (1)
2. Turn the key of the main switch to position (2). The green indicator light showing key insertion (3) will light up, along with the red indicator lights relating to the oil (4) and battery (5)
3. The yellow indicator light (6) will come on if there is no diesel in the fuel tank.
4. Turn the key to position (7). The yellow indicator light showing glowplug pre-heating (8) will come on. Wait until the yellow indicator light goes off (after about 10 seconds), then turn the key again to start up the motor.



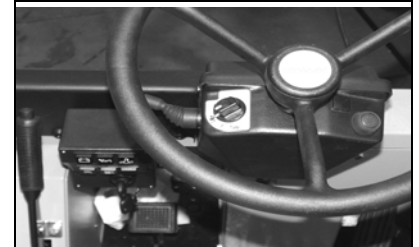
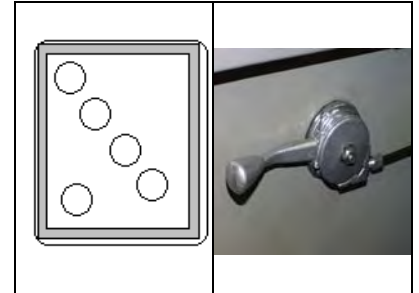


MACHINE PREPARATION

5. Keep the motor running at minimum speed, with the accelerator lever in position (1), for about 5 minutes to warm up the motor before beginning to work. Check that with the motor on, the green indicator light (3) and the red indicator light (9) are lit up.
6. Quickly raise the accelerator lever so that all the green voltage indicator lights (10) come on.
7. The green indicator light (12) near the steering wheel will come on when the motor has reached its optimum speed for correct machine operation.



ATTENTION: see the Yanmar motor instruction manual.



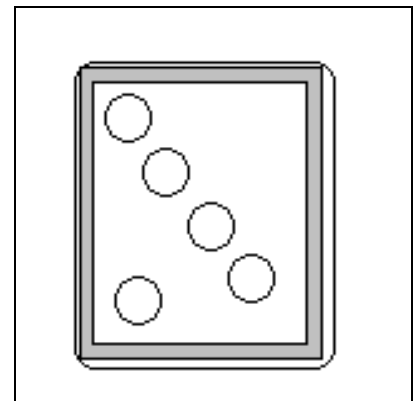
5. VOLTAGE LEVEL INDICATOR

This indicator operates by means of LEDs. The LEDs that appear on the display show the approximate system voltage level.

4 = 34V, **3** = 33V, **2** = 32V, **1** = 31V, **0** = insufficient voltage (the machine system is disabled)



WARNING: a few minutes after switch-on, you can accelerate until all the LEDs go off.



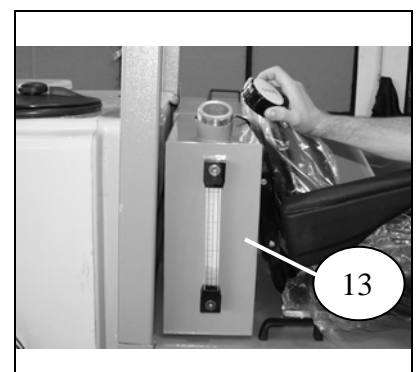
6. FUEL TANK

The fuel tank (13) is located behind the operator's seat.

Loosen the cap and pour in the most suitable diesel fuel for the motor.
Retighten the cap very well.



WARNING: use diesel fuel with a cetane number higher than 45.



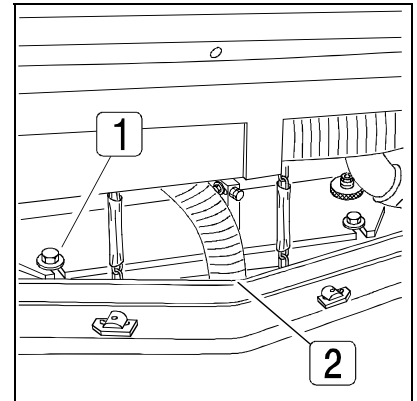


MACHINE PREPARATION

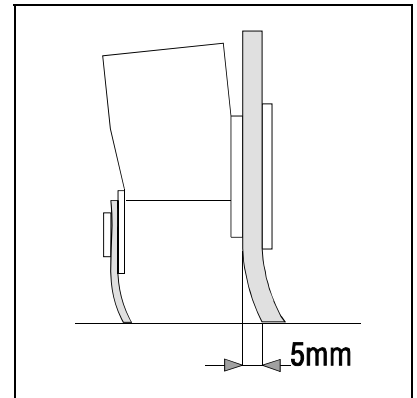
7. SQUEEGEE

For packaging reasons, the squeegee is supplied disassembled. It must be assembled as shown in the figure, inserting its screws (1) in the special housings on the squeegee support and fixing it with a CH17 spanner.

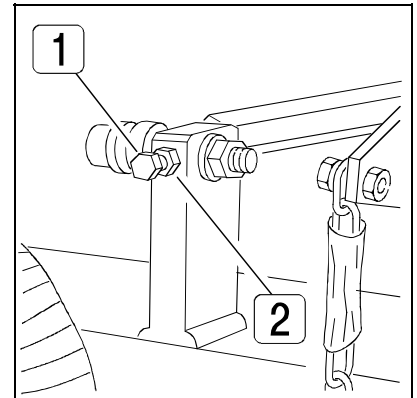
Insert the suction tube (2) in the sleeve and fix it with the special clamp.



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, loosening the locknut (2) and turning the screw (1) anticlockwise. To increase the bend of the rubber at the sides of the squeegee, loosen both the locknut (2) and the screw (1). When fully adjusted, fix the locknut. These operations can be carried out with the aid of a CH13 spanner.

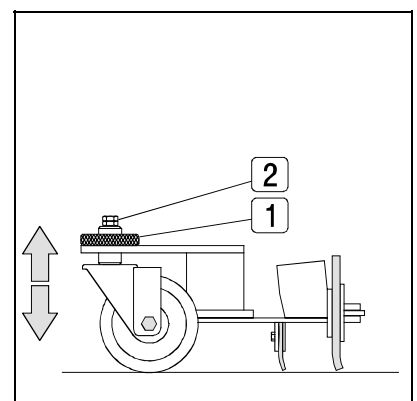


8. ADJUSTING THE SQUEEGEE SUPPORT HEIGHT

The height of the squeegee must be adjusted on the basis of the state of wear and tear of the rubber. Proceed as follows:

1. loosen the ring nut (1)
2. use a CH17 spanner to turn the pivoting wheel, via the nut (2), clockwise to lift the squeegee and anticlockwise to lower it
3. fix the ring nut (1)

NB: the left and right pivoting wheels must be adjusted to the same height





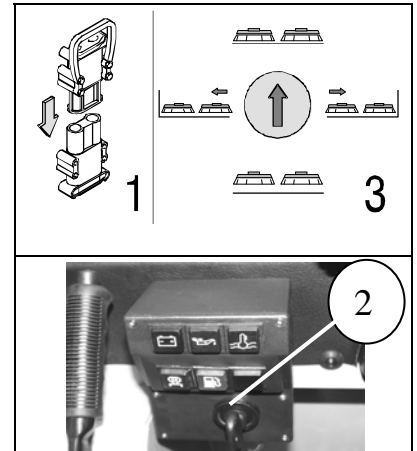
MACHINE PREPARATION

9. ASSEMBLING THE BRUSHES

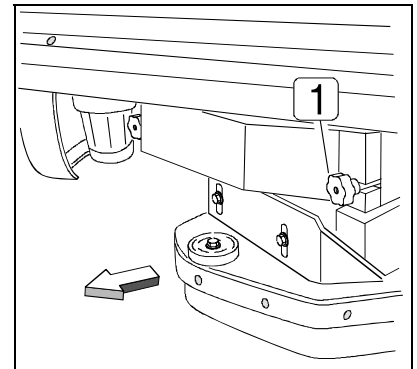
1. Connect the power supply connector
2. Start up the motor and accelerate after a few minutes
3. Use the lever to lower the base until it lightly touches the floor (do not lower it completely)
4. Decelerate and turn the key to the OFF position (2) until the motor switches off, then remove the key from the board



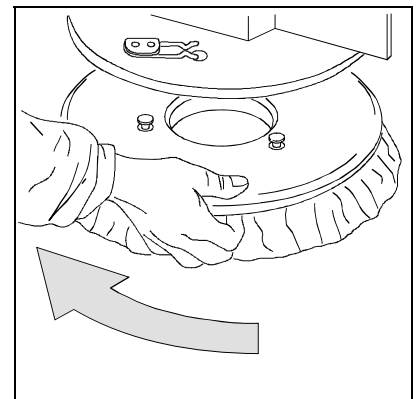
WARNING: carrying out the brush assembly operations with the power supply connected may cause injuries to the hands.



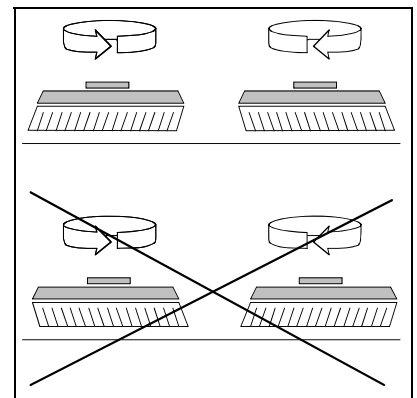
5. loosen the knobs (1) shown in the figure
6. Remove the bases by pulling on them
7. Raise the bases with the aid of a tool that is suitable for both the weight (60kg) and the type of hooks (see the special labels)



8. 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.
9. Reassemble the bases on the base support
10. Retighten the knobs



11. 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.





MACHINE PREPARATION

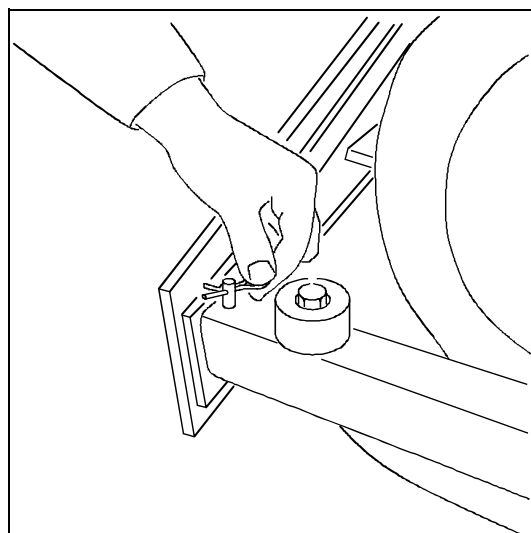
10. ASSEMBLING THE CYLINDRICAL BRUSH

This operation must be carried out by a technician from the Comac Technical Assistance Centre

11. ASSEMBLING THE SIDE BARS

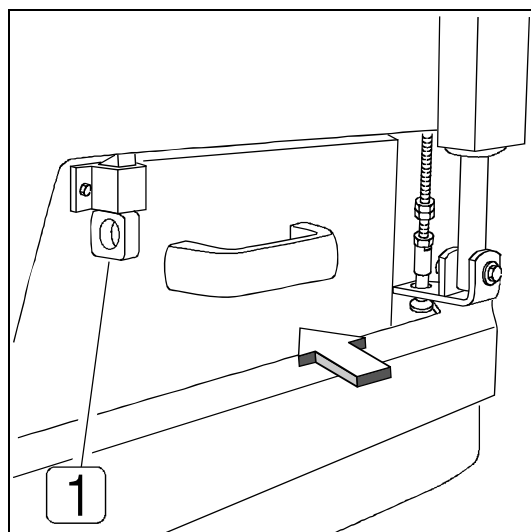
The side bars are already fixed at the front, but they still need to be positioned in the rear part. Proceed as follows:

1. Insert the rear part of the side bar in the squeegee pin
2. Position the seal clip
3. Repeat the same operations for both side bars



12. HOPPER

Check the hopper is closed and, if necessary, push it until the closing hook is locked in place (1)



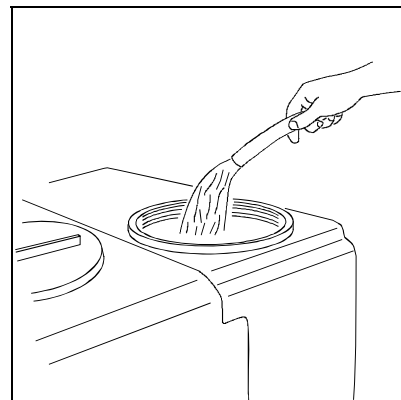


MACHINE PREPARATION

13. DETERGENT SOLUTION

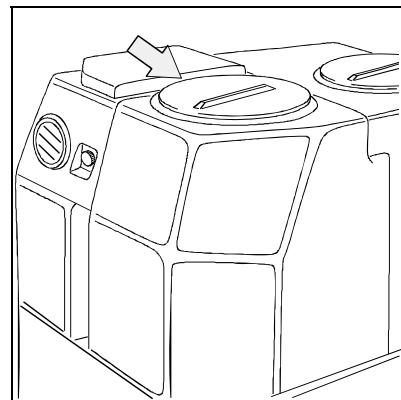
Fill the solution tank with clean water at a temperature no higher than 50°C and add liquid detergent in the proper concentration, following the manufacturer's instructions. The formation of excess foam could damage the suction motors, so only use the minimum amount of detergent needed.

NB: 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.**

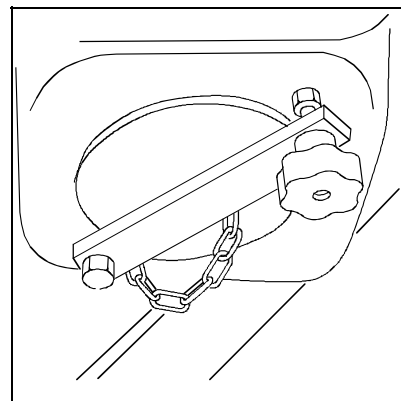


14. RECOVERY TANK

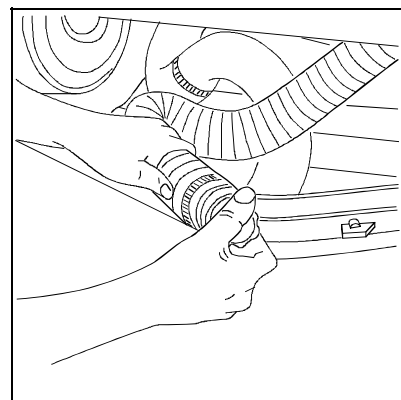
Check the inspection cap is tightened,



and that the tank drainage cap and drainage tube cap



are closed





GENERAL SAFETY REGULATIONS

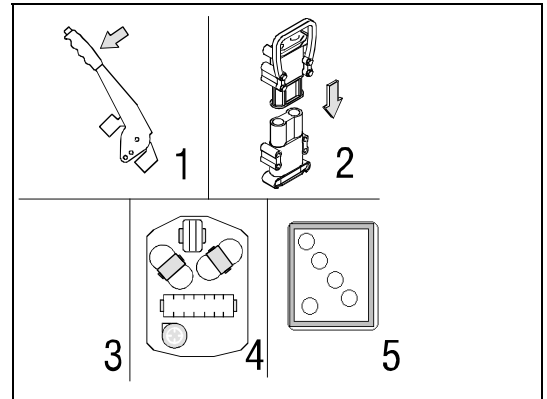
The regulations illustrated below must be carefully followed in order to avoid harm to the operator and damage to the machine.

- ☐ 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 used exclusively by authorised, trained personnel
- ☐ During the working of the machine, pay attention to other people and especially to children
- ☐ 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
- ☐ The optimum working temperature must be between 0°C and 40°C
- ☐ The degree of humidity must be 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 the machine in closed environments
- ☐ Do not use acid solutions that could damage the machine and/or harm people
- ☐ Avoid working with the brushes when the machine is standing still, so as not to damage the floor
- ☐ Do not vacuum inflammable liquids
- ☐ 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
- ☐ Adapt the speed to the adhesion conditions
- ☐ **WARNING!** Do not exceed the gradient limit as this could cause conditions of instability
- ☐ When the machine is in parking mode, remove the key and insert the parking brake
- ☐ The machine is designed to carry out the washing and drying operations simultaneously. Different operations should only be carried out in areas where the passage of unauthorised persons is prohibited. Signal the presence of damp floors with suitable signs
- ☐ If the machine does not work properly, check this is not caused by failure to carry out routine maintenance. Otherwise, request the intervention of the COMAC technical service
- ☐ If you need to replace any components, request the ORIGINAL spare parts from an Authorised dealer and/or Retailer.
- ☐ Use only the original COMAC brushes indicated in the paragraph "CHOOSING AND USING THE BRUSHES"
- ☐ In the event of danger, activate the emergency lever (connector placed on the left side of the operator) immediately
- ☐ Do not remove any protection devices which require the use of tools in order to be removed
- ☐ Do not wash the machine with direct water jets or with pressurised water, nor with corrosive substances
- ☐ After every 200 hours of operation, have the machine checked by a COMAC assistance centre
- ☐ The machine should not be abandoned, due to the presence of toxic-harmful materials (batteries, oil etc.) subject to regulations which provide for their scrapping in the appropriate centres
- ☐ To prevent the formation of scale 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 are positioned as shown in this Use and Maintenance Manual

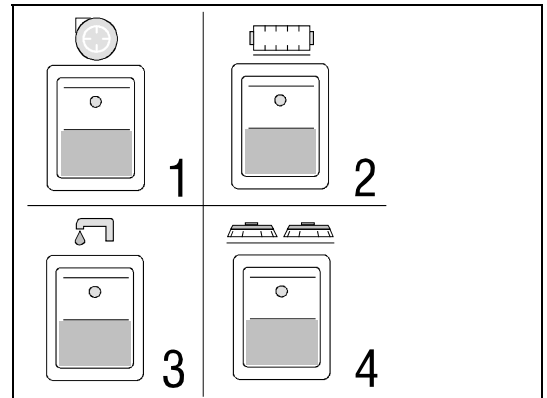


WORK

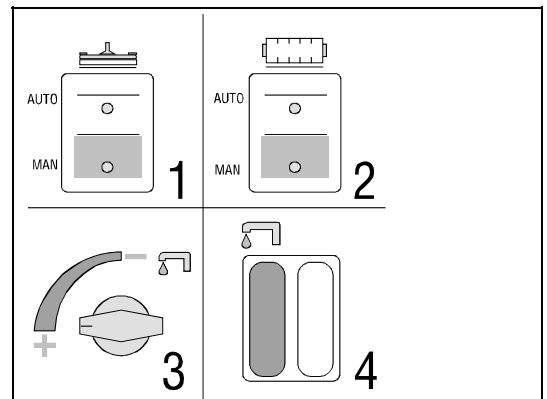
1. Carry out the operations to prepare the machine
2. Sit on the driver's seat
3. Check the parking brake is released (1)
4. Connect the electric system connector (2)
5. Switch on the motor (see "Start-up and acceleration")
6. After warming up the motor, accelerate until all the green voltage control LEDs light up on the instrument panel (5). If they flash, this means the motors are being checked
7. The LEDs of the motor control (4) will flash at the same time



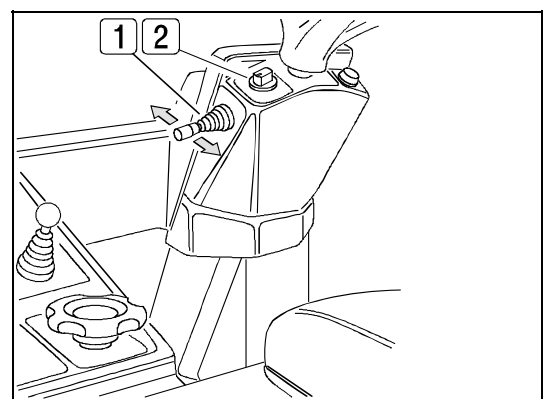
8. Press the suction motor switch (1)
9. Press the cylindrical brush motor switch (2)
10. Press the solenoid valve switch (3)
11. Press the brush motor switch (4)



12. Position the two-way switches (1 and 2) on automatic
13. Turn the lever (3) anticlockwise to turn on the tap. The water indicator light (4) only switches on during the advance phase



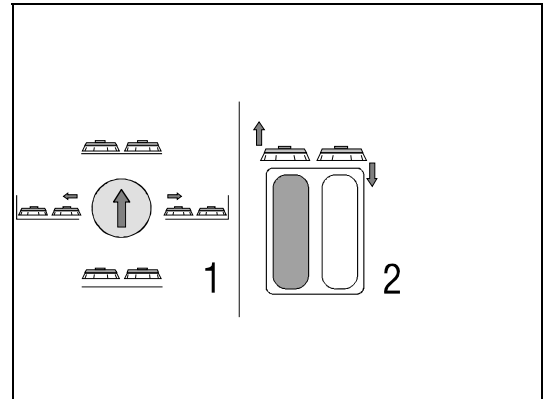
14. Check the parking brake is released (1)
15. Position the selector on (1) forwards
16. Select the advance speed by turning the knob (2)





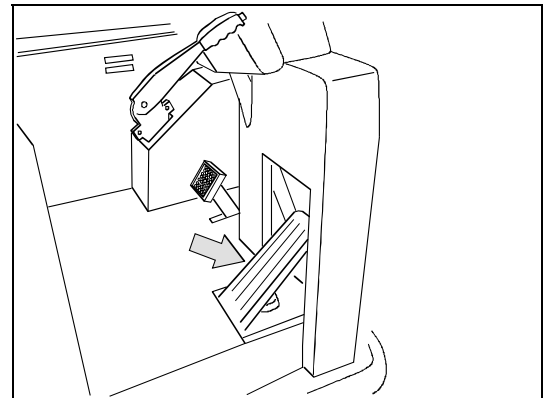
WORK

17. Push the brush lever (1) forwards, to lower the base. During the descent, the indicator lights of the jack and the brush motor will switch on. The brush base will be in its working position when the yellow indicator light (2) switches off.

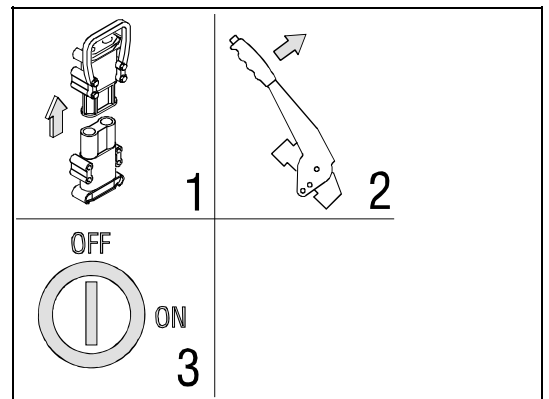


18. Press the accelerator pedal to start moving the machine, lower the squeegee and tunnel, and switch on the suction motors.

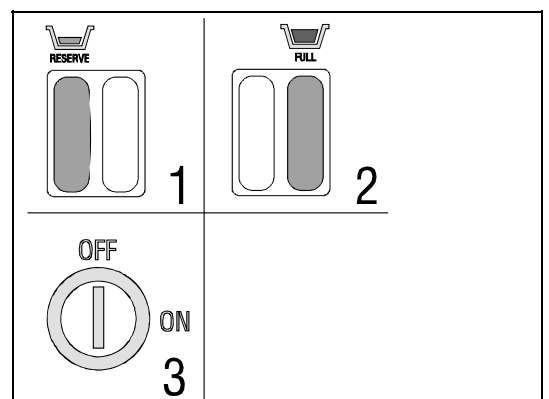
During the first metres of operation, check the brush pressure is suitable (see "BRUSH PRESSURE" below), the quantity of detergent solution is sufficient, and that the squeegee dries perfectly.
The machine will now start to work efficiently until the detergent solution runs out.



If any problems arise while you are working, quickly engage the emergency handle (1) to the left of the operator's position, pull the emergency brake (2), lower the accelerator, and switch off the motor by turning the key to the OFF position. These commands block all moving machine parts. To start the machine again (once the problem has been solved), reconnect the connector (1), switch on the motor (see "Start-up"), and lower the parking brake lever (2).



The machine will not start if the operator is not properly seated.
When the solution tank is empty, the indicator light (1) on the instrument panel switches on.
When the recovery tank is full, the indicator light (2) switches on and the suction motor switches off. To restart it (even if the tank has been emptied), you must disconnect the power supply then reconnect it by decelerating the motor then accelerating again after a few seconds.





WORK

CHECKING THE MOTORS

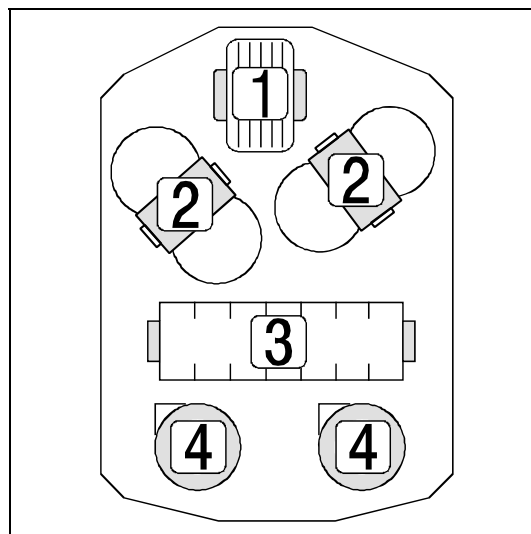
This machine has an ammetric motor control system. The symbol shown in the figure represents the machine as seen from above, and the flashing of each single LED indicates a specific problem:

LED 1 indicates the traction motor

LEDs 2 indicate the brush motors

LED 3 indicates the cylindrical brush motor

LED 4 indicates the suction motor



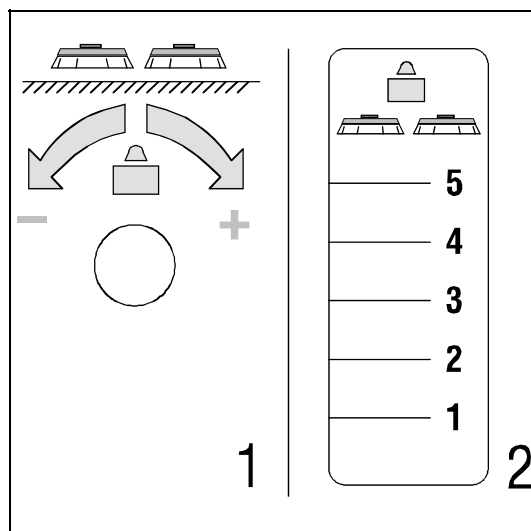
When a motor reaches its pre-established overload limits, the corresponding red indicator light starts to flash. After a few seconds the motor stops, and the relative switch indicator light goes off. To restart the motor, disconnect the power supply then reconnect it again by decelerating the motor then accelerating again after a few seconds. If the motor stops again, check the reason of the overload in order to prevent damage to the motor.

For the brush motors, it is usually sufficient to reduce the pressure on them (see "BRUSH PRESSURE" and "ADJUSTING THE HEIGHT OF THE CYLINDRICAL BRUSH"). For problems with the other motors, consult a technician from the Comac Technical Assistance Centre.

BRUSH PRESSURE

You can adjust the pressure on the brushes by means of the handwheel (1) located to the left of the operator's position. To increase the pressure, turn it clockwise. The pressure indicator (2) will move upwards as the pressure increases.

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



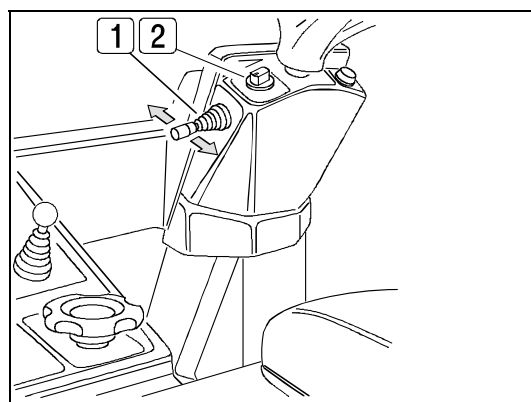


WORK

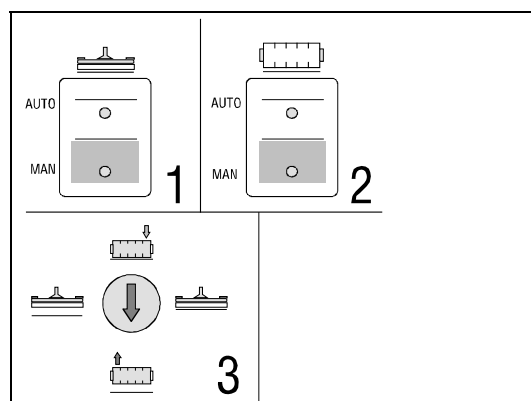
TRACTION

These machines are equipped with electronically commanded traction, with three speeds forwards and one backwards. To move the machine, move the lever (1) forwards (forward movement) or backwards (reverse movement). Press the drive pedal and the machine will start to move. The movement speed can be adjusted by rotating the selector (2).

ATTENTION: do not press the pedal before selecting forward or reverse movement



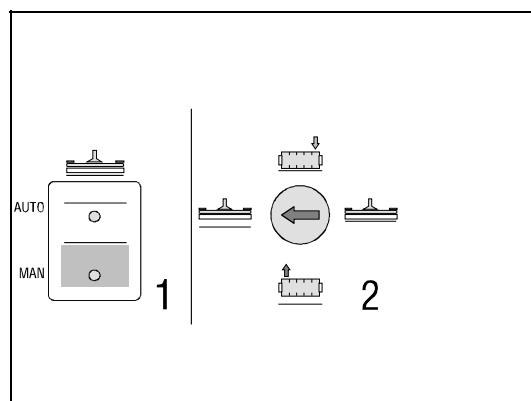
NOTES: during reverse movements, if the two-way manual/automatic switches (1 and 2) of the squeegee and tunnel are on manual, remember to raise the squeegee and tunnel via the lever (3). During transfer movements, put the two-way switches (1 and 2) on manual.



AUTOMATIC - MANUAL SQUEEGEE

Automatic: if the two-way switch is placed on automatic, the squeegee lowers and the suction motors start up when the machine moves forwards. In the same way, the squeegee rises and the suction motors stop when the machine moves backwards.

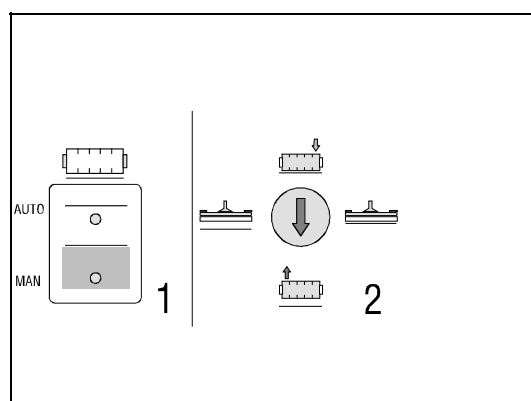
Manual: if the two-way switch is placed on manual, the squeegee has to be lifted and lowered manually by means of the lever (2). Suction motor operation is commanded in any case by the movement of the squeegee.



CYLINDRICAL BRUSH BASE (TUNNEL) - AUTOMATIC / MANUAL

Automatic: If the two-way switch is placed on automatic, the tunnel lowers and the cylindrical brush motor starts up when the machine moves forwards. In the same way, the tunnel rises and the suction motor stops when the machine moves backwards.

Manual: If the two-way switch is placed on manual, the tunnel has to be lifted and lowered manually by means of the lever (2). Motor operation is commanded in any case by the movement of the tunnel.

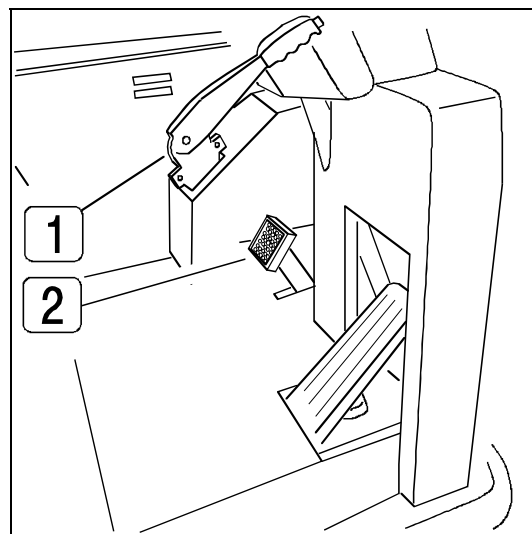




WORK

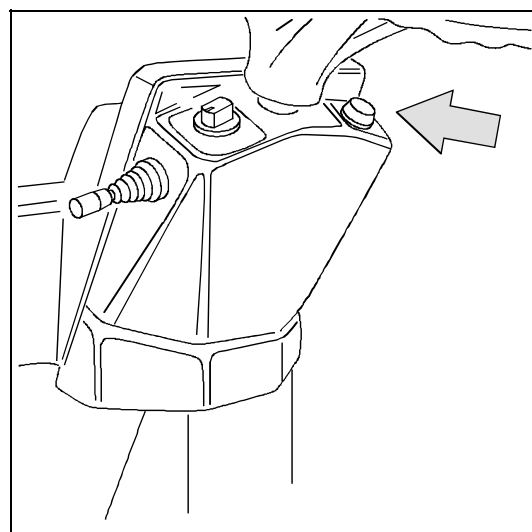
BRAKES

To brake, press the service brake pedal (2) with your left foot. If this brake is working badly, or if necessary (interruption, danger), activate the parking brake (1).



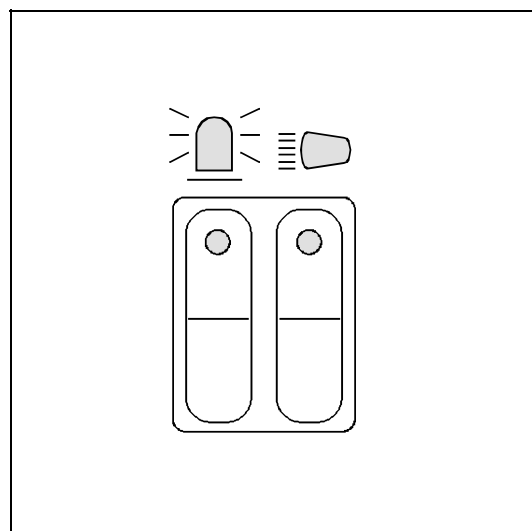
HORN

The machine is equipped with a horn switch. To operate it, press the button shown in the figure.



HEADLIGHTS AND FLASHLIGHT

The machine is fitted with a flashlight, one rear light and two front headlights. To turn them on, press the switches shown in the figure.

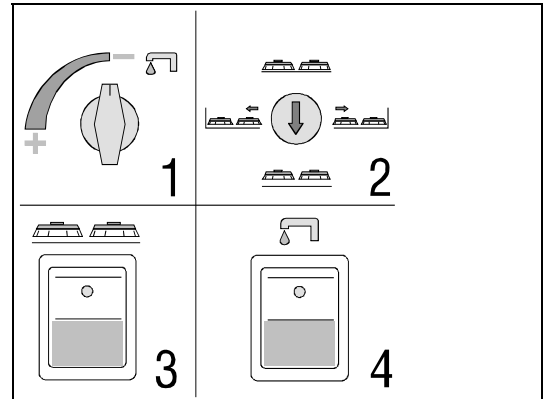




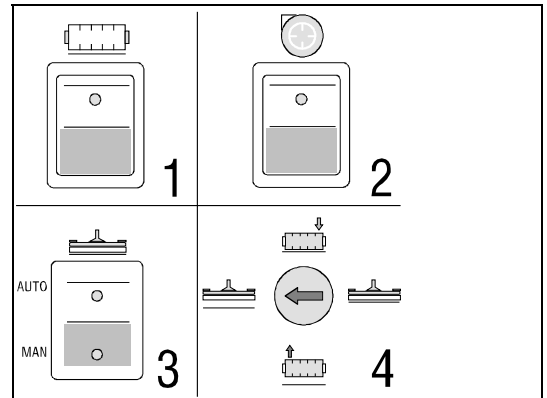
AT THE END OF THE WORK

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

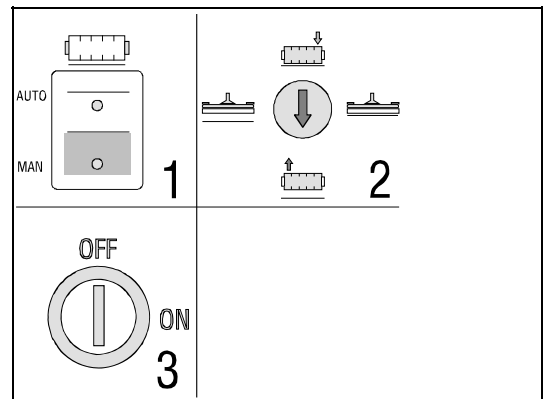
1. turn off the tap
2. Raise the brush base
3. switch off the brush motor switch
4. switch off the solenoid valve switch



5. Switch off the cylindrical brush motor switch
6. switch off the suction motor switch
7. position the squeegee switch on manual mode
8. raise the squeegee

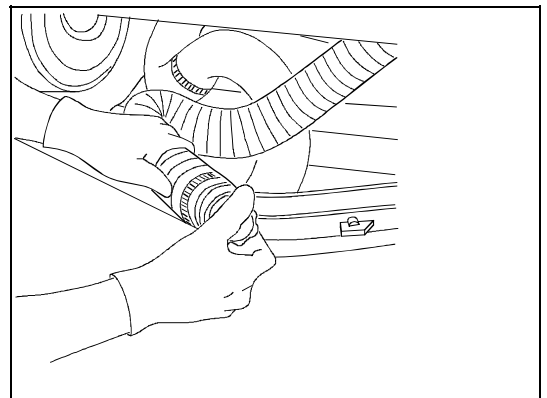


9. Position the tunnel two-way switch on manual
10. Raise the tunnel
11. bring the machine to the place provided for draining the water
12. Lower the motor acceleration lever until the green indicator lights go off (the red LED will automatically switch back on again)
13. Position the key of the main switch on OFF



14. Disconnect the pipe from its hook, unscrew the drainage cap, and empty the recovery tank

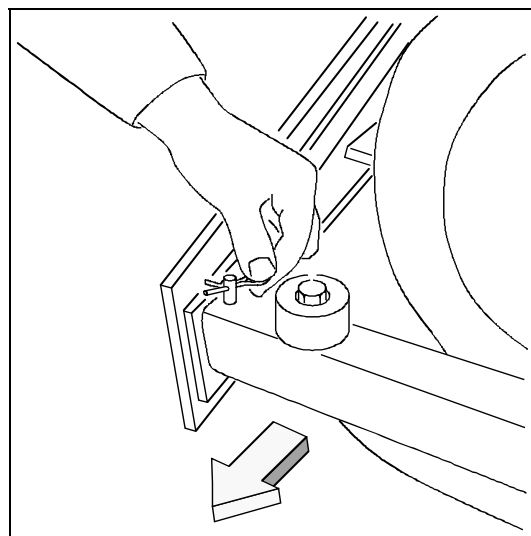
ATTENTION: This operation must be carried out using gloves to protect against contact with dangerous solutions



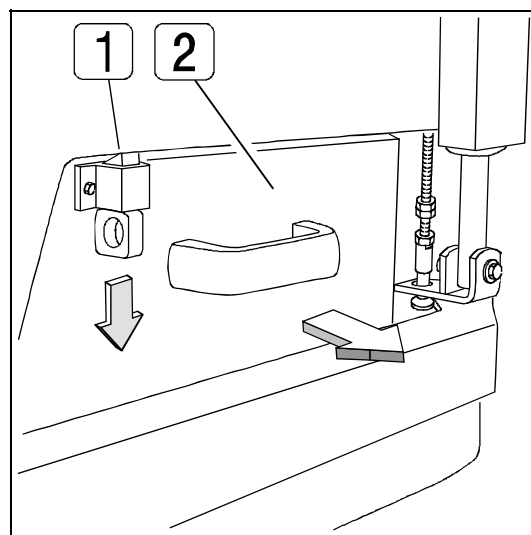


AT THE END OF THE WORK

15. Remove the clip from the right-hand side bar, and rotate it outwards



16. Release the pin (1) of the hopper
17. Take out the hopper (2) and clean it thoroughly (see "CLEANING THE HOPPER" below). This operation must be carried out using gloves to protect against contact with dangerous solutions



18. Raise the squeegee and clean it with a jet of water. The squeegee must be raised when the machine is not operating, to avoid deforming the rubber blades.
19. Disassemble the brushes and clean them with a jet of water (to disassemble the brushes, see "DISASSEMBLING THE BRUSHES" below).

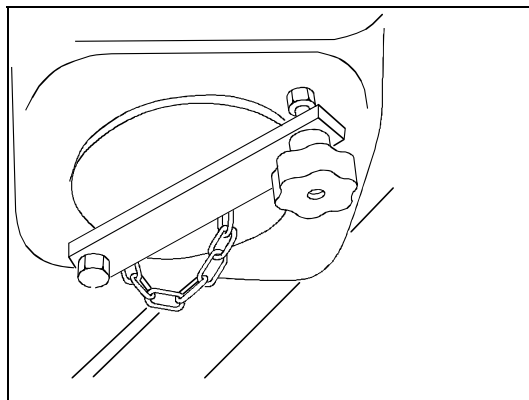
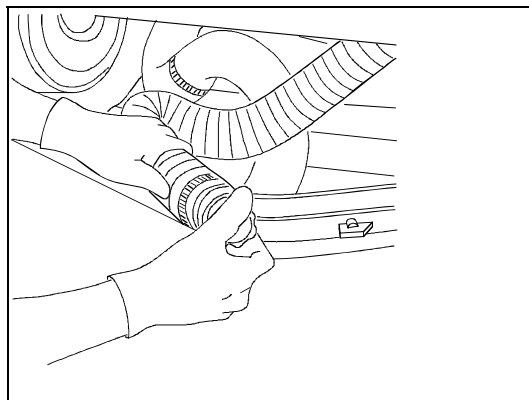


DAILY MAINTENANCE

CLEANING THE RECOVERY TANK

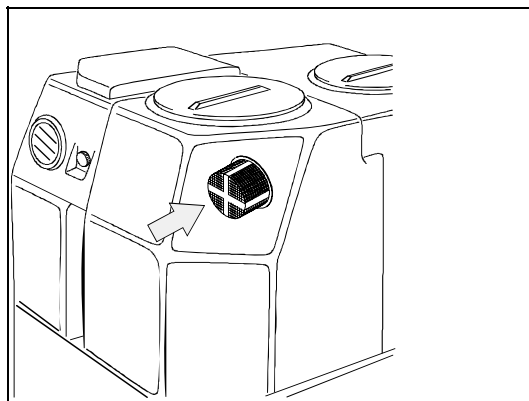
This operation must be carried out using gloves to protect against contact with dangerous solutions

1. Empty the tank by means of the flexible tube, turning the knob a couple of times to loosen it and then removing the cap
2. Open the side cap by loosening the knob and rotating the closure blade
3. Rinse the tank and clean the drainage cap
4. Check the correct position of the seal on the side cap
5. Reposition the side plug and the plug on the exhaust pipe



CLEANING THE RECOVERY TANK FILTER

1. Lift the lid of the recovery tank
2. Rinse the tank with a water jet
3. Take out the filter of the float switch installed in the tank
4. Wash it thoroughly then reposition it



CLEANING THE SQUEEGEE

Clean the squeegee with a jet of water. Check the state of wear and tear of the rubbers, turning or replacing them if necessary. The careful cleaning of the entire aspiration unit ensures a longer working life for the suction motors.

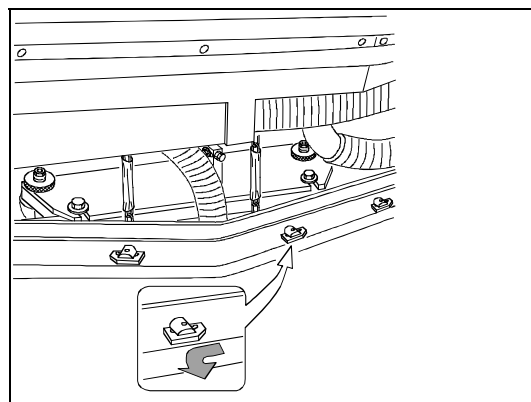


DAILY MAINTENANCE

REPLACING THE SQUEEGEE RUBBER

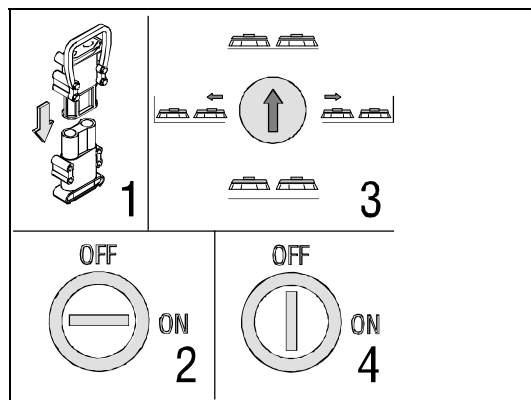
If the squeegee rubber is worn and does not dry well, it is possible to change the drying edge, proceeding as follows:

1. push and rotate the fixing plates
2. remove the rubber-pressing blade and the rubber itself
3. turn the rubber upside-down and, if necessary, replace it
4. adjust the squeegee height as indicated in "ADJUSTING THE SQUEEGEE SUPPORT HEIGHT" in the chapter "MACHINE PREPARATION"
5. reassemble everything, carrying out the above-mentioned operations in the reverse order

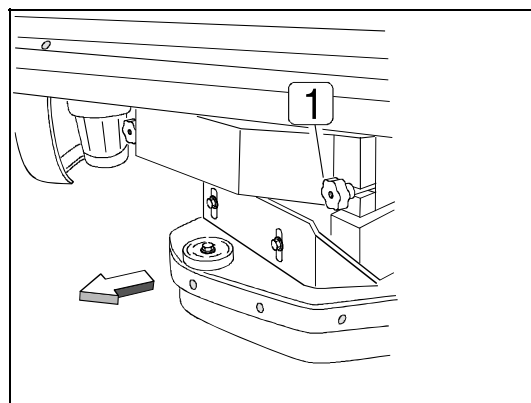


DISASSEMBLING THE BRUSHES

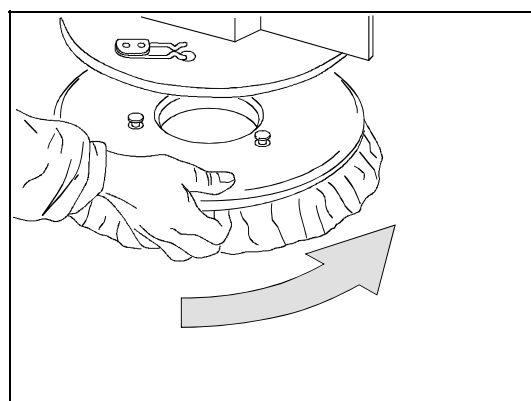
1. Connect the battery connector if it is not already connected
2. Switch on the motor (see "Motor start-up") by turning the key to the ON position
3. Use the lever to lower the base until it lightly touches the floor (do not lower it completely)
4. Turn the key to the OFF position and remove it from the panel (carrying out the brush disassembly operation with the power supply connected may cause injuries to the hands)



5. loosen the knobs (1) shown in the figure
6. Remove the bases by pulling on them
7. Raise the bases with the aid of a tool that is suitable for both the weight (60kg) and the type of hooks (see the special labels)



8. With the base up, rotate the brush 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.





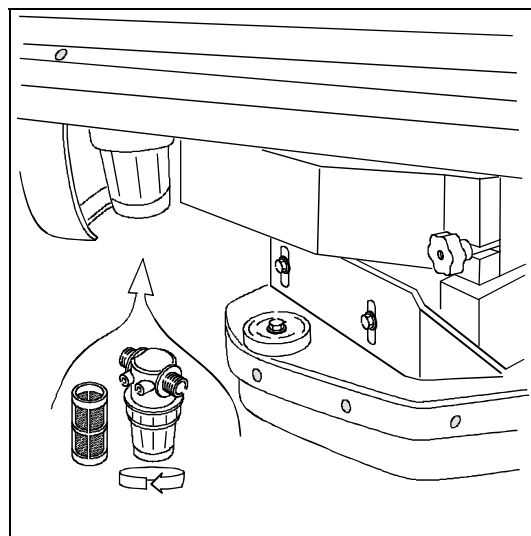
DAILY MAINTENANCE

CLEANING THE SOLUTION TANK AND FILTER

With the solution tank empty:

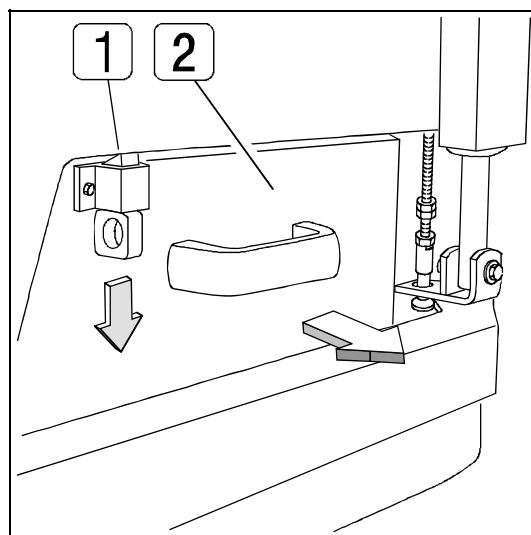
1. unscrew the filter and rinse the inside thoroughly
2. remove the cartridge and clean it
3. turn on the tap
4. Rinse the tank with a water jet
5. reassemble everything, repeating the above-mentioned operations in the reverse order

Notes: You can still clean the filter, even if the solution tank is full; just remember to turn off the tap

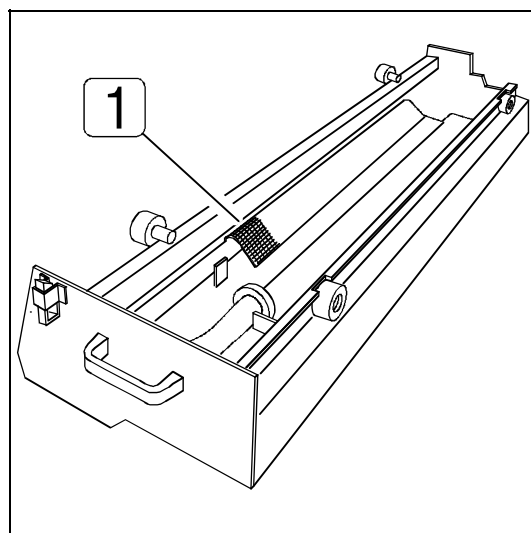


CLEANING THE HOPPER

1. Remove the clip from the right-hand side bar, and rotate it outwards
2. Release the pin of the hopper (1)
3. Remove the hopper (2) and clean it



4. Remove the filter (1) and clean it
5. reassemble everything, carrying out the above-mentioned operations in the reverse order



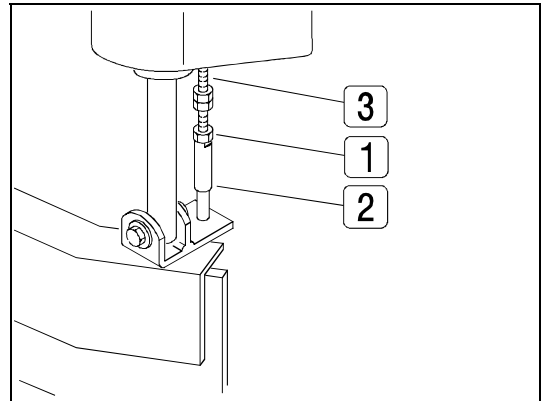


WEEKLY MAINTENANCE

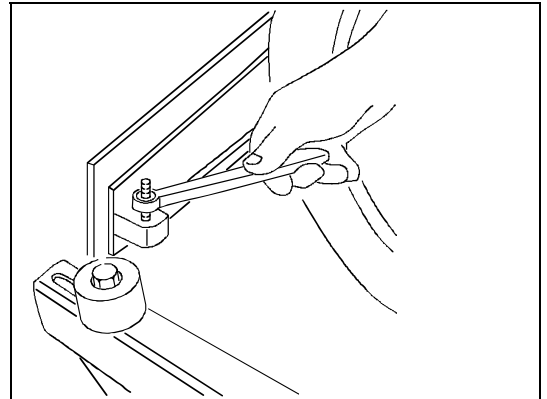
ADJUSTING THE SIDE BARS

It is necessary to adjust the height of the side bars at regular intervals. This operation must be carried out with the tunnel lowered.

1. Loosen the locknut (1)
2. Keep the adjuster (2) still
3. Tighten the threaded pin (3) to raise the side bar, or loosen it to lower the bar
4. When the adjustment has been completed, fix the locknut (1)



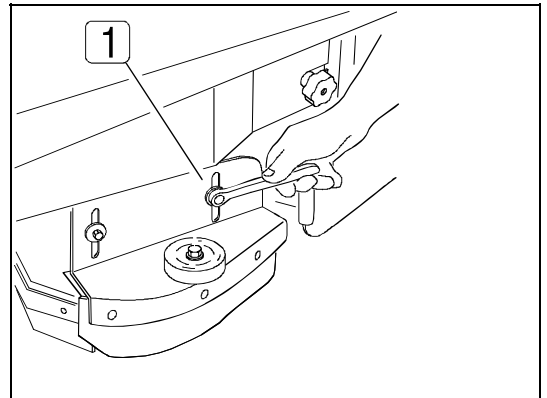
5. Remove the seal clip
6. Remove the side bar
7. Adjust the height of the supporting nut
8. put the side bar and the retaining clip back in position
9. Bear in mind that the side bar must be parallel to the floor
10. these adjustments must be made on both side bars



ADJUSTING THE BASE SPLASH GUARDS

It is occasionally necessary to adjust the height of the splash guards of the base. This operation must be carried out with the base lowered.

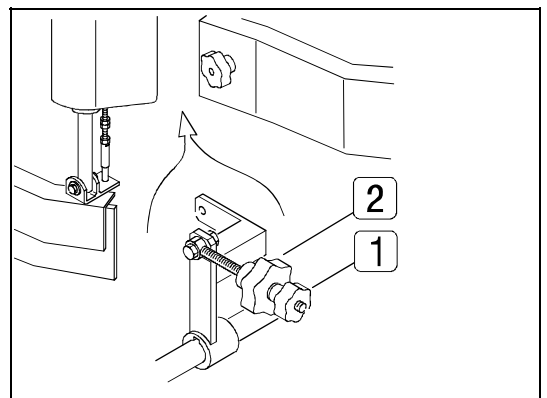
1. loosen the screws (1)
2. Adjust the height of the casing so that the rubber lightly touches the floor evenly
3. When the adjustment has been completed, fix the screws (1)



ADJUSTING THE HEIGHT OF THE CYLINDRICAL BRUSH

It is occasionally necessary to adjust the height of the cylindrical brush. This operation must be carried out with the tunnel lowered.

1. loosen the knob (1)
2. loosen the knob (2) further to lower the brush, or tighten it to raise the brush
3. When the adjustment has been completed, fix the knob (1)



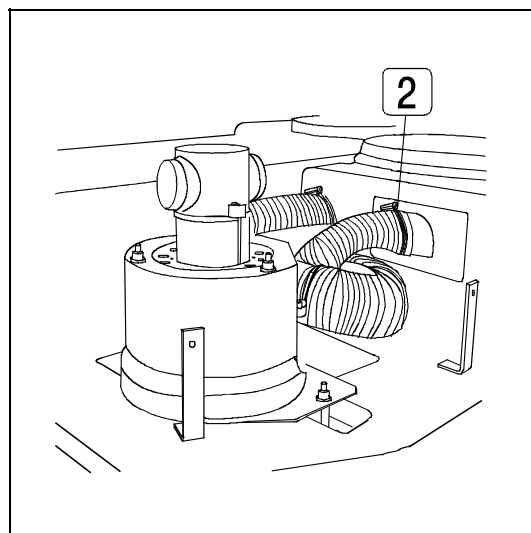
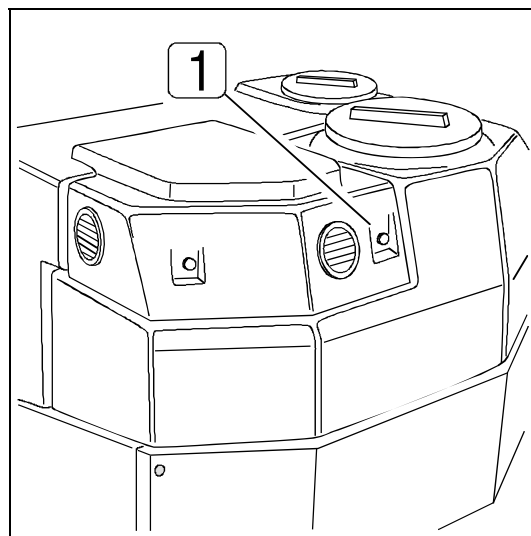


WEEKLY MAINTENANCE

CLEANING THE SUCTION TUBE

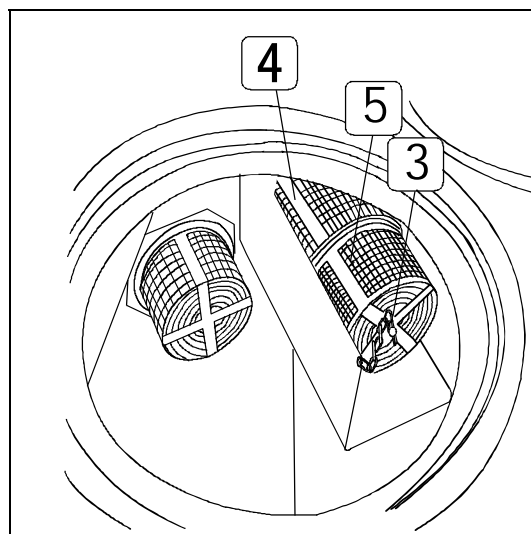
Whenever suction seems to be unsatisfactory, check that the suction tube is not obstructed. If necessary, clean it with a water jet introduced from the side where it is connected to the tank. Proceed as follows:

1. Loosen the knobs (1) of the vacuum cleaner guard
2. Loosen the tube-holder tie (2)
3. Clean it with a water jet inserted from the side where it enters the tank
4. reassemble everything, carrying out the above-mentioned operations in the reverse order



CLEANING THE SUCTION MOTOR FILTER

1. Loosen the recovery tank cap
2. Remove the filter retaining clip (3)
3. Take out the filters (4, 5) and clean them thoroughly with a jet of water
4. Replace the double filter (4)
5. Replace the single filter (5), making sure the flanges of the two filters are in contact
6. reassemble everything, carrying out the above-mentioned operations in the reverse order

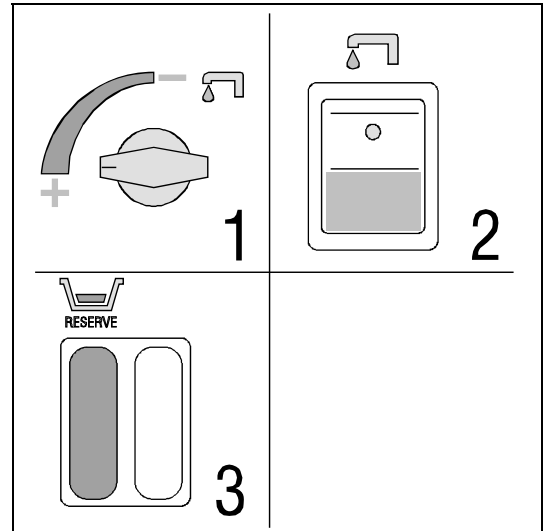




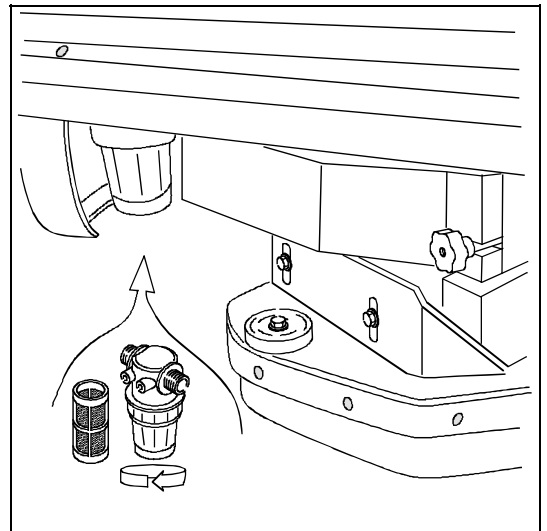
TROUBLESHOOTING

INSUFFICIENT WATER ON THE BRUSHES

1. Check the tap is turned on
2. Check the solenoid valve switch is on
3. Check there is water in the solution tank ("RESERVE" indicator light off)



4. Clean the solution filter



THE SQUEEGEE DOES NOT DRY PERFECTLY

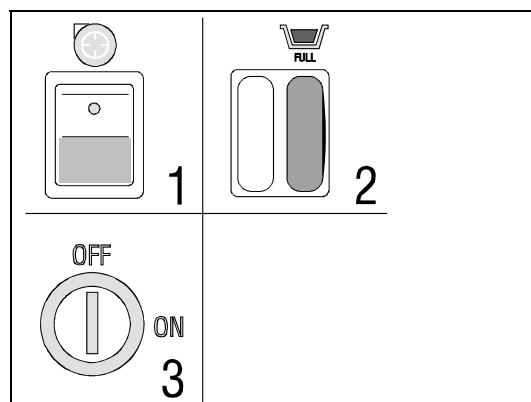
1. Check the squeegee is clean
2. Check the regulation of the squeegee (see "MACHINE PREPARATION")
3. Clean the entire suction unit (see "WEEKLY MAINTENANCE")
4. Replace the rubbers, if worn



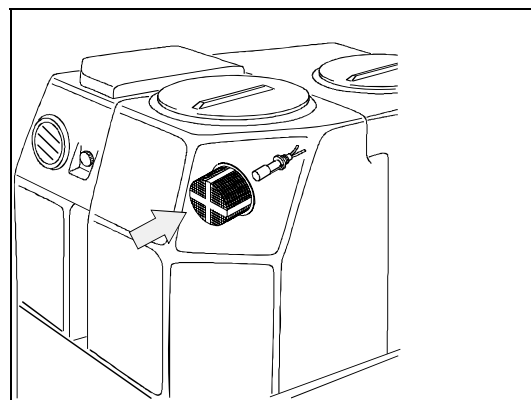
TROUBLESHOOTING

THE SUCTION MOTOR DOES NOT FUNCTION

1. Check the suction motor switch is on
2. Check whether the recovery tank is full ("FULL" indicator light switched on), and empty it if necessary

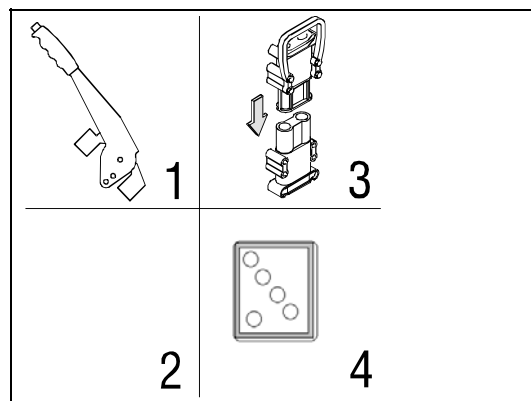


3. Check the float switch is working well (see also "CLEANING THE RECOVERY TANK FILTER" in the chapter "DAILY MAINTENANCE")
4. To restart the vacuum cleaner after the intervention of the float switch, lower the lever of the accelerator to bring the motor to its minimum speed, then raise the lever again so that the 4 green voltage control LEDs come on



THE MACHINE DOES NOT START

1. The operator must be properly seated in the driving position
2. Check the parking brake lever (1) is fully lowered
3. Check the connector (3) is connected
4. Check the green voltage control LEDs (4) are switched on
5. Check the traction diagnostics LED on the instrument panel (fig. "alarms 1") is switched off; if it is flashing, count the flashes



Example: ? flashes - pause - ? flashes - pause

2 flashes might indicate: the pedal has been pressed before switch-on, or the operator is not well seated

4 flashes might indicate: the movement pedal has been pressed before selecting the direction (repeat the operation)

7 flashes might indicate: the temperature of the traction control is too high - let it cool down for a few minutes, then try again

Continuous flashing: the battery is run down

If the problem persists, contact the Comac Technical Assistance Centre



TROUBLESHOOTING

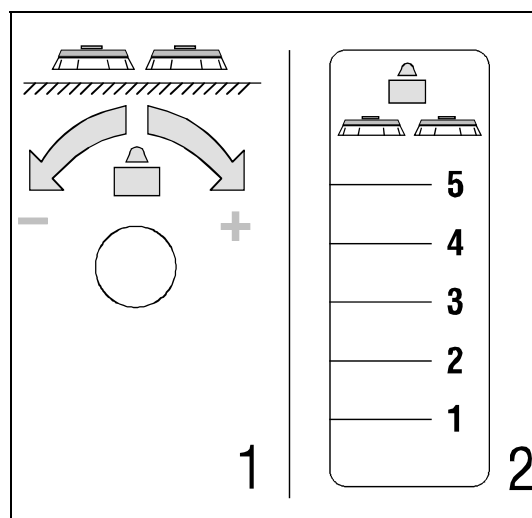
EXCESSIVE FOAM PRODUCTION

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.

THE MACHINE DOES NOT CLEAN WELL

1. Check the state of wear and tear of the brushes and, if necessary, replace them. The cylindrical brush should be changed when the bristles are about 25mm long. This replacement operation must be carried out by a technician of the Comac Technical Assistance Centre. The counter-rotating brushes should be changed when the bristles are about 15mm long. To do this, refer to "DISASSEMBLING THE BRUSHES", then "ASSEMBLING THE BRUSHES". Working with over-worn brushes may cause damage to the floor.
2. Check the brush pressure is sufficient and, if necessary, increase it (see "BRUSH PRESSURE" in the chapter "WORK")
3. 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").



DIESEL MOTOR

For the maintenance and operating checks on the diesel motor, refer to the relative manual



CHOOSING AND USING THE BRUSHES

POLYPROPYLENE BRUSH (PPL)

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

NYLON BRUSH

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

ABRASIVE BRUSH

The bristles of this type of brush are charged with highly aggressive abrasives. It is used to clean very dirty floors.

To avoid floor damage, work only with the pressure strictly necessary.

THICKNESS OF THE BRISTLES

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

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

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

PAD HOLDER

The pad holder is recommended for cleaning shiny surfaces.

There are two types of pad holder:

1. the traditional pad holder is fitted with a series of anchor points that allow the abrasive floor pad to be held and dragged while working
2. the 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 dragging device is recommended above all for machines with more than one brush, where the centring of the abrasive discs is difficult.

TABLE FOR CHOOSING THE BRUSHES

Machine	No. of brushes	Code	Type of bristles	Ø Bristles	Ø Brush	Length	Notes
C130D	4	66818010	PPL		345	1110	base. Pad locking
	4	66818020	Abrasive		345		
	1	66818030	PPL		300		
	4	66707010	PAD HOLDER		335		
	4	66718010	Center lock PAD		335		



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

MODEL C130 DIESEL SCRUBBING MACHINES

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 norms
- EN 60335-2-72: Household and similar electrical appliances. Part 2: Specific norms for automatic machines for floor treatment for commercial and industrial use
- EN 12100-1: Machine safety - Fundamental concepts, fundamental principles of design - Part 1: Basic terminology and methodology
- EN 12100-2: Machine safety - Fundamental concepts, fundamental principles of design - Part 2: Technical principles
- EN 55014-1: Electromagnetic compatibility - Regulations for household appliances, electrical devices and similar equipment. Part 1: Emission - Regulations for product family.
- EN 55014-2: Electromagnetic compatibility - Regulations for household appliances, electrical devices and similar equipment. Part 2: Immunity - Regulations for product family.
- 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 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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Santa Maria di Zevio (VR), 14/01/2011

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