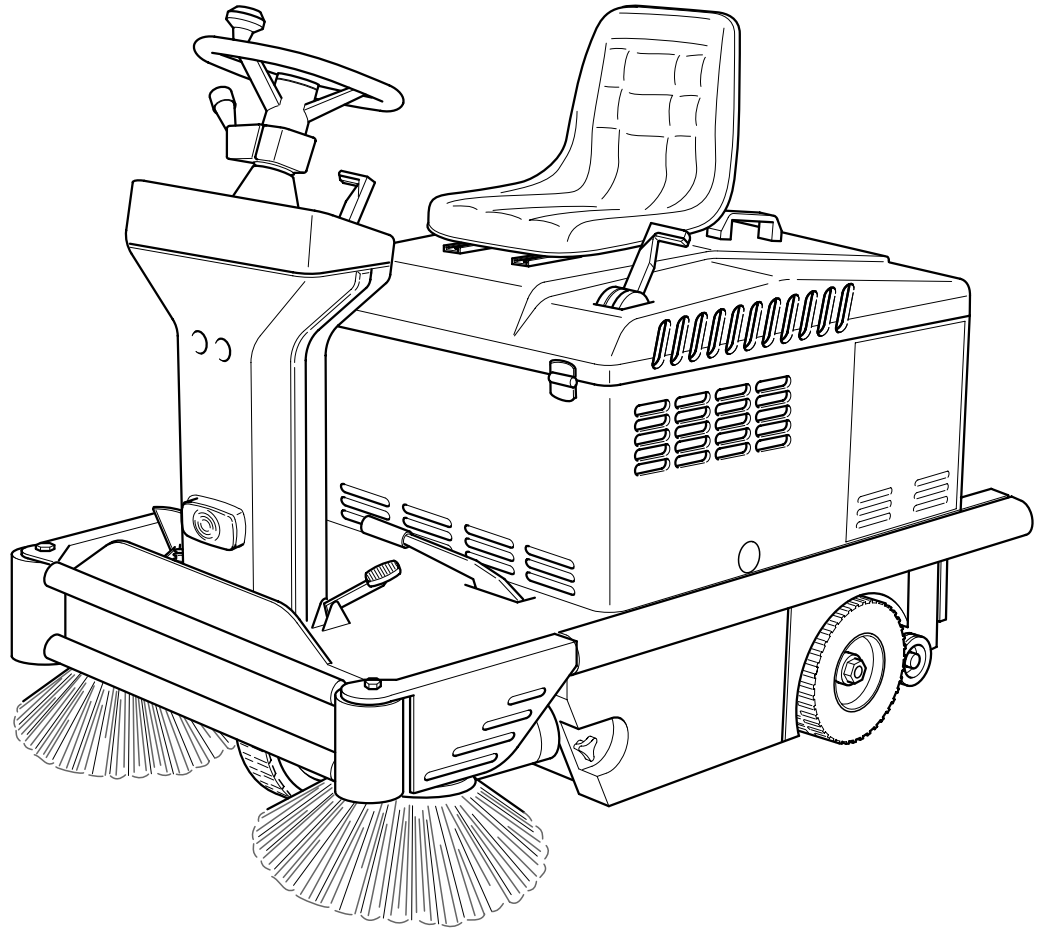


SWEeper

SR 1100 P/B

SR 5110 P/B



MANUAL FOR USE AND MAINTENANCE

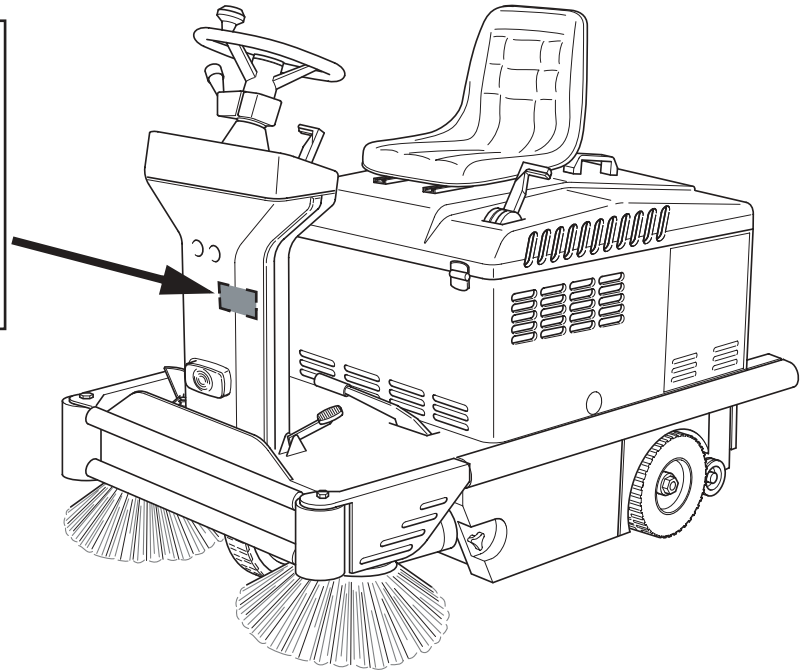
CONTENTS

Model:	Prod. No.:
Serial No.:	Max. axle rear:
Power:	Max. axle front:
Tot weight:	Noise level:
Tot weight: (w/o battery)	Voltage:
Type G&E Floor cleaning machine.	

TÜV GS
MADE IN ITALY

CE

Nilfisk Advance setting standards
 Nilfisk-Advance Italia
 Località Novella terza
 26862 Guardamiglio (Italia)



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INTRODUCTION/GENERAL INFORMATION

This manual will help you get the most from your Nilfisk SR1100/PB - SR5110/PB. Read it thoroughly before operating the machine. Specifications and details are subject to change without prior notice.

SPARE PARTS AND MAINTENANCE

Repairs, when required, should be performed by Nilfisk-Advance service personnel using Nilfisk-Advance original replacement parts and accessories. Any "left" or "right" indication are always defined with reference to the machine forward movement direction.

When calling Nilfisk-Advance for repair parts or service, please specify the Model and the Serial Number when discussing your machine.

CHANGES AND IMPROVEMENTS

Our company constantly improves its products and reserves the right to make changes and improvements at its discretion without being obliged to apply such benefits to the machine that were previously sold.

NAME PLATE

The Model and the Serial Number of your machine are shown on the Name plate located on the steering column. This information is needed when ordering repair parts for the machines. Use the space below to note the Model and the Serial Number of your machine for future reference.

MODEL _____

SERIAL NUMBER _____

GENERAL SAFETY RULES

Carefully follow the rules described below to avoid injury to the operator and damage to the machine.

Carefully read the labels on the machine, do not cover them for any reason and replace them immediately if they become worn or damaged.

- The machine storage temperature range should be between 32°F and 104°F
- The machine working temperature is from +32°F to +104°F
- Humidity range should be between 30% and 95%.
- Do not use the machine in an explosive atmosphere environment
- Do not use the machine as a transport vehicle.
- Do not allow the brushes to operate while the machine is stationary to avoid damaging the floor.
- In case of fire, use a powder extinguisher.
- Do not bump into shelves or scaffolding where there is a risk of falling objects.
- Adjust the operating speed to the floor conditions.
- Do not exceed the declared slope limit to avoid an unstable condition.
- When the machine is parked, remove the key and engage the parking brake.
- When machine-operating malfunction occur, make sure that they are not caused by a lack of routine maintenance. If not, request assistance from the service centre.
- If parts must be replaced, request ORIGINAL spare parts from a dealer or Authorised Retailer.
- Before any maintenance operations, disconnect the electric power supply from the batteries.
- Do not remove guards which require the use of tools to be disassembled.
- Do not wash the machine with pressurised water, or with corrosive substances.
- A service centre should inspect the machine every 200 hours of operation.
- The machine must be disposed of properly, because of the presence of toxic-harmful materials (battery acid, oil, etc.) which are subject to standards that require disposal in special centres.
- The machine will not generate damaging vibration.

SAFETY- ACCIDENT PREVENTION

No accident prevention program is effective without the complete co-operation of the person directly responsible for operating the machine. Most of the accidents that may occur in a company, on the job or during transfers are caused by not-observing fundamental safety rules. A careful and cautious user is the best guarantee against accidents and is more effective than any type of prevention program. While using the machine pay attention to your surroundings and people nearby, especially to children.

SAVE THESE INSTRUCTIONS!!

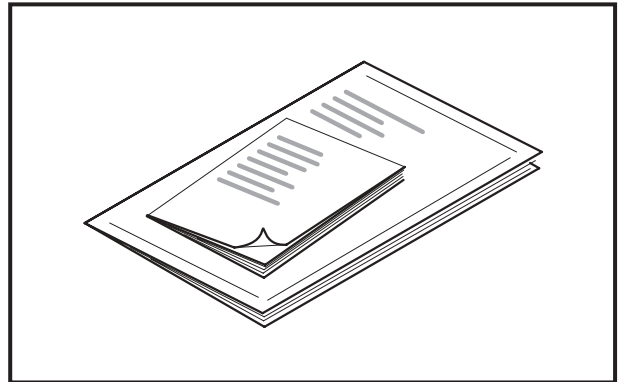
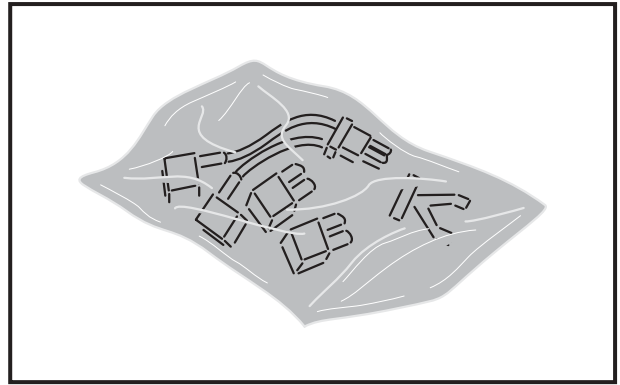
UNPACKING

When the machine is delivered, carefully check that the packing and the machine were not damaged. If damage is evident, keep the packing for future checks and contact the Service Centre immediately.

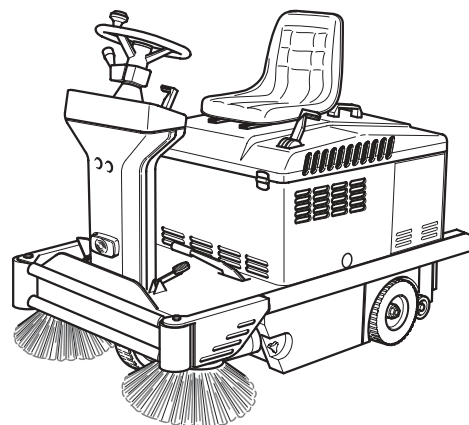
Please check that the following items are supplied with the machine:

- 1 - Envelope with cables for batteries and connector for battery-charger.

- 2 - Technical documents (Spare Parts Catalogue, Manual for Use and Maintenance and - for the petrol version only - Use and Maintenance Manual of the engine).

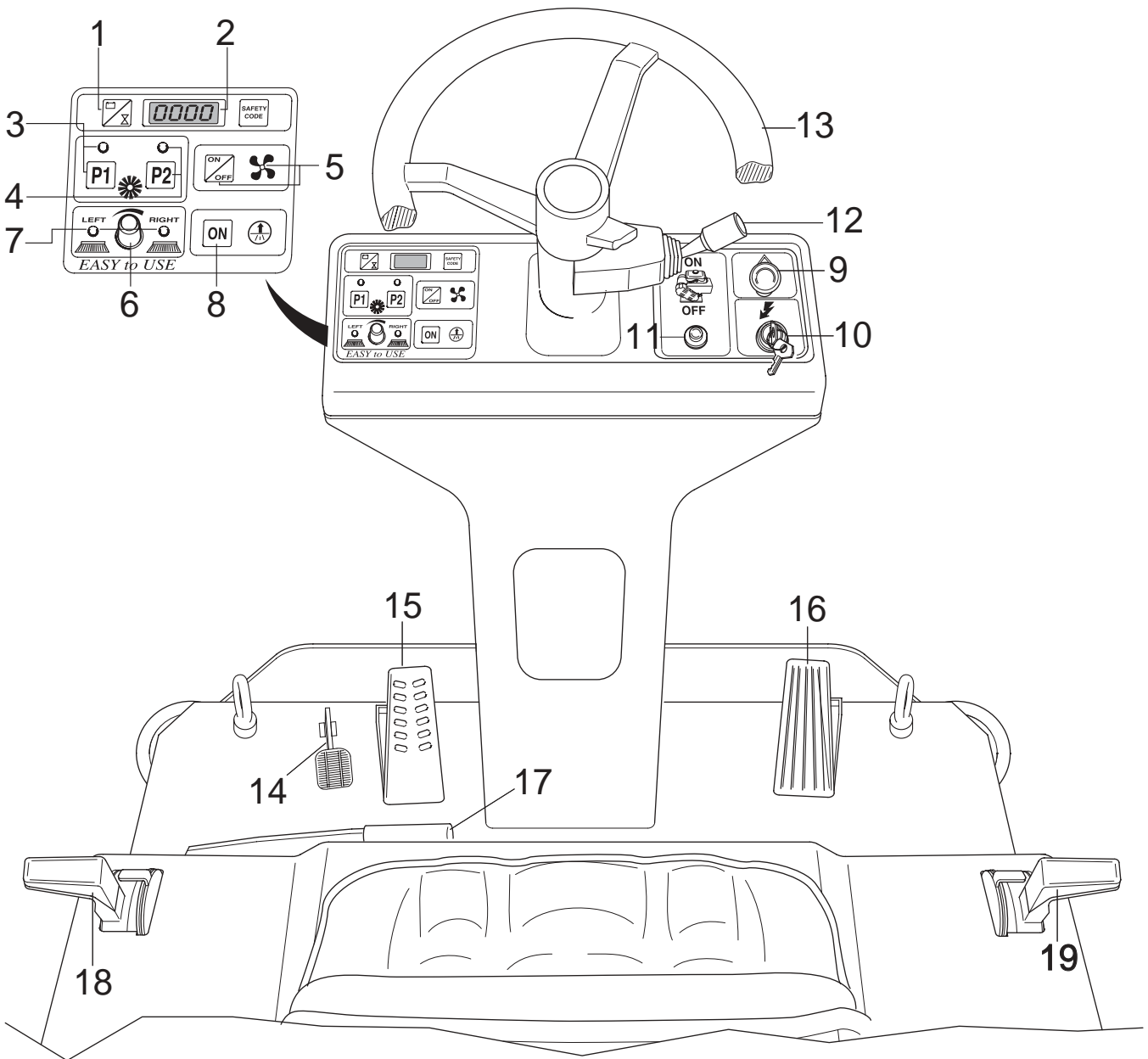


TECHNICAL DATA



VERSION	SR 1100B - SR 5110B	SR 1100P - SR 5110P
Voltage	24V	24V
Engine model	—	Vanguard OHV
Power at 3600 RPM	—	4 Hp - 2,97 kW
Displacement	—	126 cc - (7,69 cu.in)
Start	—	Electric
Drive electric motor	450W-120 RPM	400W-130 RPM
Main brush electrical motor	500W-1600 RPM	500W-1600 RPM
Suction electric motor	30W-3300 RPM	200W-3300 RPM
Side brush electric motor	90W-120 RPM	60W-120 RPM
Forward speed	max 7 km/h (4,8 m/h)	max 6,2 km/h (4,2 m/h)
Reverse speed	max 3,5 km/h (2,4 m/h)	max 3,6 km/h (2,4 m/h)
Max slope	20%	20%
Main brush	Ø 300 mm x 700 mm (11,8 x 27 in)	Ø 300 mm x 700 mm (11,8 x 27 in)
Side brush	Ø 430 mm (17 in)	Ø 430 mm (17 in)
Cleaning width with 1 side brush	900 mm (35 in)	900 mm (35 in)
Cleaning width with 2 side brushes	1100 mm (43 in)	1100 mm (43 in)
Front wheel (NR 1)	Ø 250 mm (9,8 in)	Ø 250 mm (9,8 in)
Rear drive wheels (NR 2)	Ø 250 mm (9,8 in)	Ø 250 mm (9,8 in)
Container capacity	70 lt (circa 6 gal)	70 lt (circa 6 gal)
Panel filter	5 micron - 4m ²	5 micron - 4m ²
Electric filter shaker	90W - 6000 RPM	90W - 6000 RPM
Machine length	1376 mm (54 in)	1376 mm (54 in)
Width	910 mm (36 in)	910 mm (36 in)
Height	1193 mm (47 in)	1193 mm (47 in)
Weight without batteries	240 kg	280 kg
Fuel tank capacity	—	3 lt (3,2 qt)
Engine oil tank capacity	—	0,6 lt (0,64 qt)

DESCRIPTION OF COMMANDS AND CONTROL PANEL



- 1 - Voltmeter/hourmeter push button
- 2 - Display
- 3 - Button for selection/indicator of working program P1
- 4 - Button for selection/indicator of working program P2
- 5 - ON/OFF button and indicator of suction motor
- 6 - Knob for the speed adjustment of the side brushes
- 7 - Indicator of the operation of left/right side brushes
- 8 - ON button of filter-shaker motor
- 9 - Emergency stop push button
- 10 - ON/OFF main key switch
- 11 - Start/Stop push button for petrol engine

- 12 - Selection of forward/reverse speed, light ON/OFF, horn
- 13 - Steering wheel
- 14 - Pedal for flap lifting
- 15 - Brake pedal
- 16 - Accelerator
- 17 - Parking brake lever
- 18 - Lever for left side brush command
- 19 - Lever for right side brush command

PRELIMINARY OPERATIONS (battery version)

The battery version needs a 24V battery assembly.

The machine can be equipped:

- 1 - The battery is supplied with the machine and it is set, complete with acid solution.
- 2 - The battery is supplied with the machine and it is set, but not complete with acid solution.
- 3 - The battery is not supplied.

The battery compartment is under the seat: lift the compartment lid, towards the steering wheel, and verify which one of the three possibilities is applied to your machine.

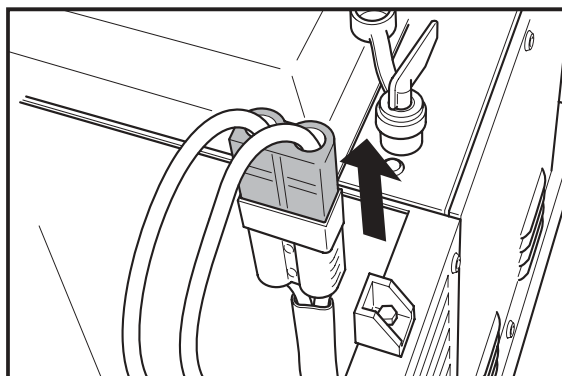
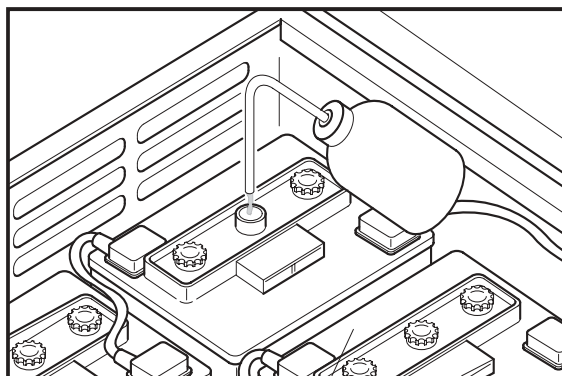
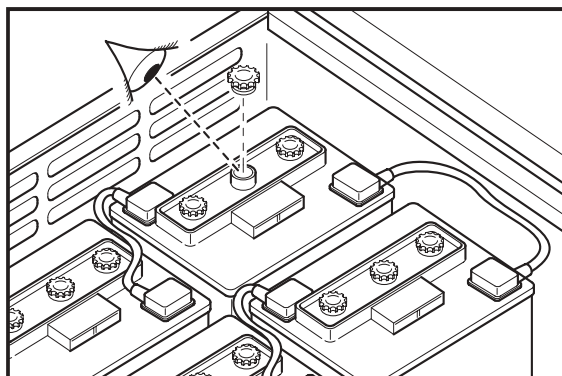
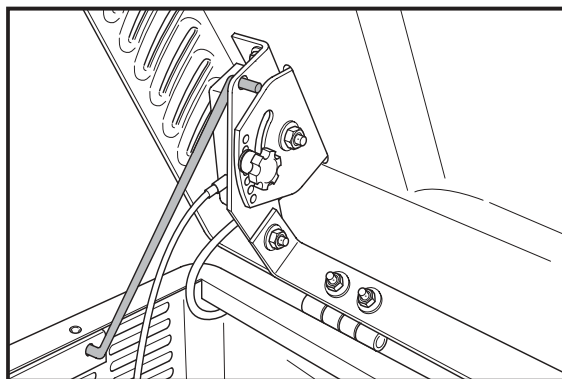
If the batteries are installed open one of the caps of every battery and check if they are filled with electrolyte.

1 - If the battery is filled:

- 1a. Check the electrolyte level in every cell and - if necessary- fill up with distilled water.
- 1b. Proceed with a battery recharge according to the MAINTENANCE paragraph and to the Battery User Manual.

Warning: before starting the recharge the battery connector must be disconnected from the machine.

After the recharge plug the battery connector to the machine.



- 2 - If the batteries are installed but not filled with acid solution they must be filled with a solution of sulphuric acid (density between 1,270 Kg and 1,290 Kg at 25°C temperature) according to the instructions specified below and in the Battery User Manual.

BATTERY FILLING UP WITH ACID SOLUTION

Warning: the battery acid is corrosive; if it comes in contact with the skin or eyes rinse thoroughly with water and consult a physician.
The batteries must be filled in a well ventilated area.



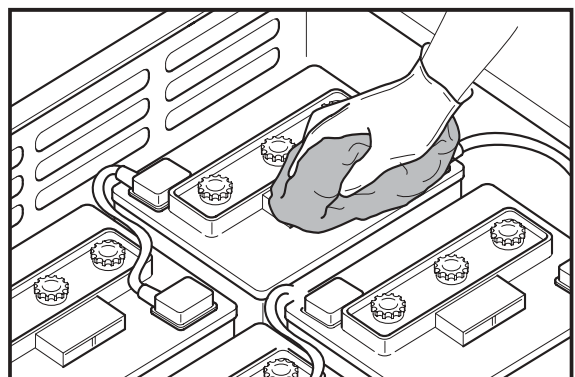
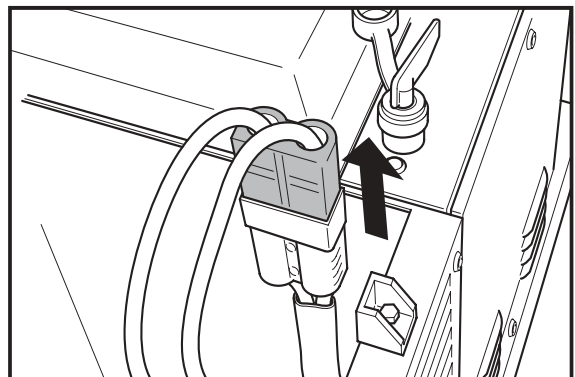
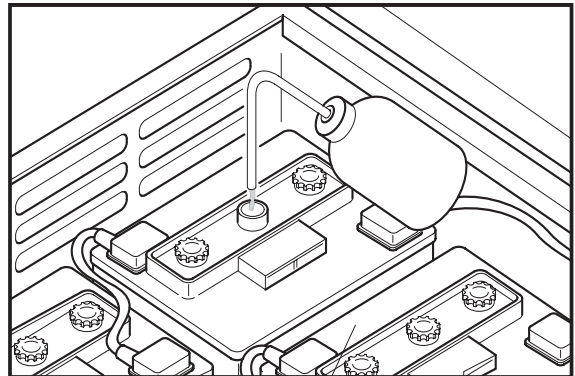
Fill every battery cell with acid; the right level is specified in the Battery User Manual.

After one hour fill up with acid, if necessary.

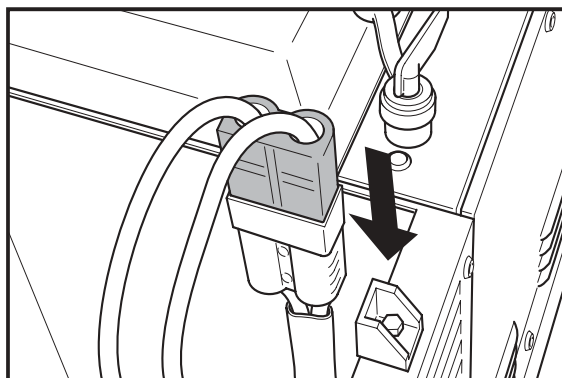
Let batteries rest for a further hour; then proceed with a recharge according to the instructions specified in the Battery User Manual and in the MAINTENANCE paragraph. During the recharge the battery caps must be open.

Warning: before starting the recharge the battery connector must be disconnected from the machine.

After the recharge close all the cell caps and clean the top of the battery from any acid remains.



Connect the battery connector to the machine.

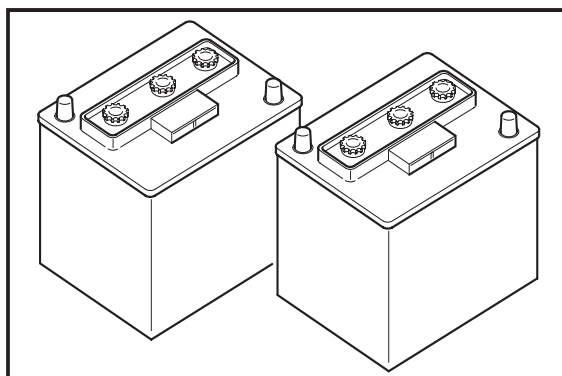


Remove the cover from the battery

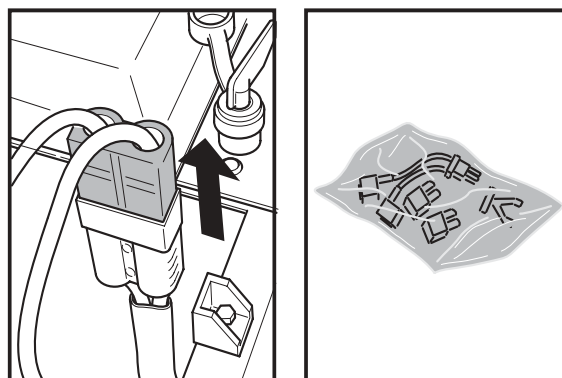
3 - If the machine is not equipped with batteries they must be procured and mounted.

It is recommended to get the assistance of qualified personnel to choose and set the batteries.

The electric cables supplied with the machine can be used for the connection of the four batteries.

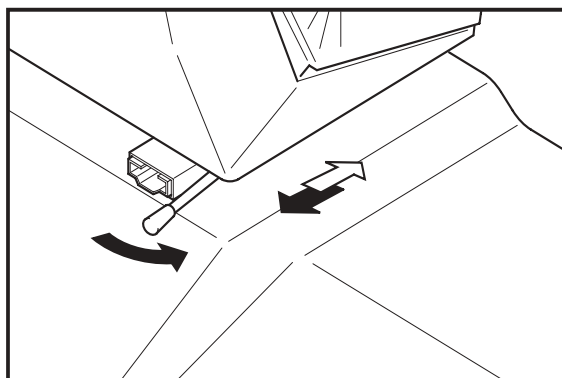


Warning: before starting the recharge the battery Connector must be disconnected from the machine.



After having set the batteries, climb onto the machine and adjust the seat to find the most comfortable position.

Now the machine is ready to be used.



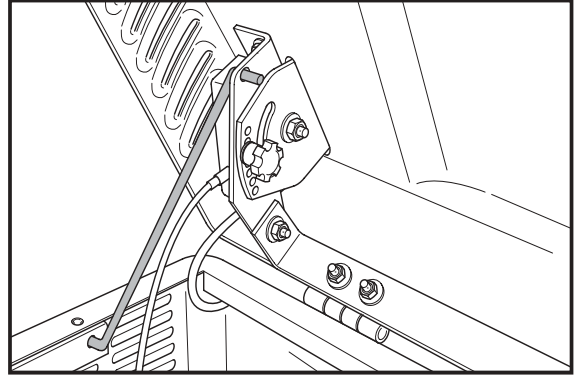
PRELIMINARY OPERATIONS (petrol engine version)

The petrol engine version needs two 12V batteries.

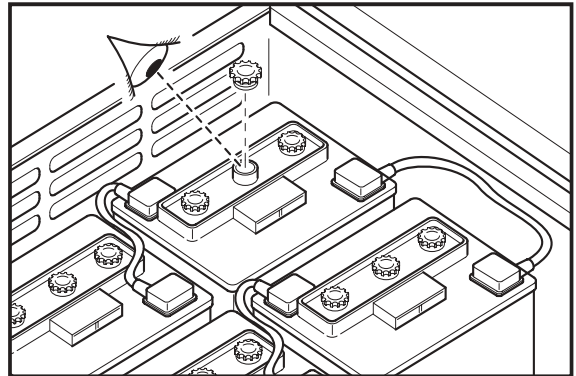
The machine can be equipped:

- 1 - The battery is supplied with the machine and it is set, complete with acid solution.
- 2 - The battery is supplied with the machine and it is set, but not complete with acid solution.
- 3 - The battery is not supplied.

The battery compartment is under the seat: lift the compartment lid, towards the steering wheel, and verify which one of the three possibilities is applied to your machine.

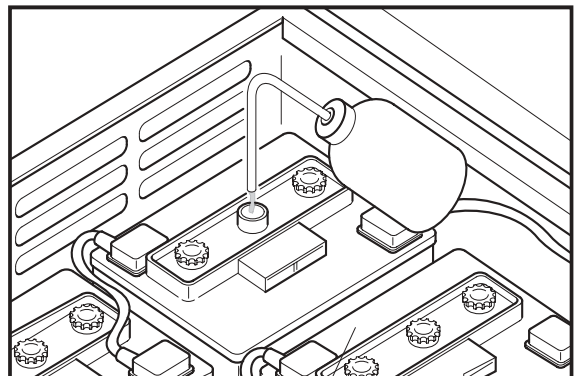


If the batteries are installed open one of the caps of every battery and check if they are filled with electrolyte.



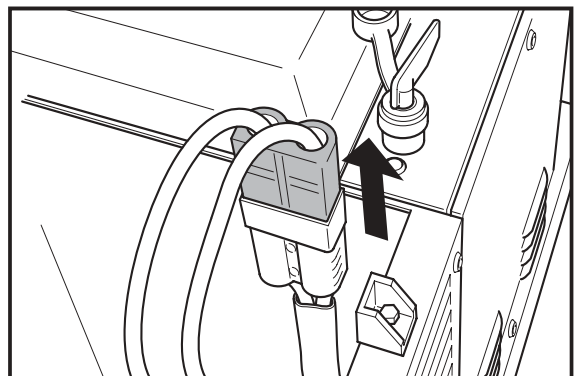
1 - If the battery is filled:

- 1a. Check the electrolyte level in every cell and - if necessary- fill up with distilled water.
- 1b. Proceed with a battery recharge according to the MAINTENANCE paragraph and to the Battery User Manual.



Warning: before starting the recharge the battery connector must be disconnected from the machine.

After the recharge plug the battery connector to the machine.



- 2 - If the batteries are installed but not filled with acid solution they must be filled with a solution of sulphuric acid (density between 1,270 Kg and 1,290 Kg at 25°C temperature) according to the instructions specified below and in the Battery User Manual.

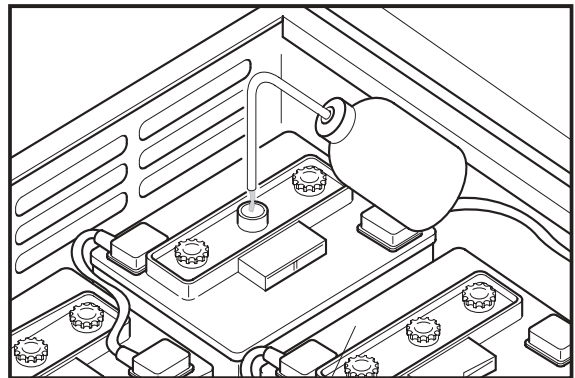
BATTERY FILLING UP WITH ACID SOLUTION

Warning: the battery acid is corrosive; if it comes in contact with the skin or eyes rinse thoroughly with water and consult a physician.
The batteries must be filled in a well ventilated area.



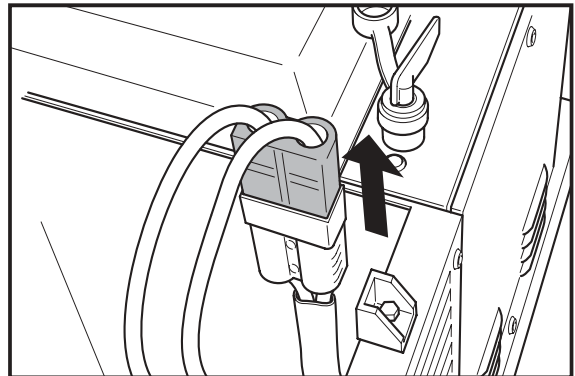
Fill every battery cell with acid; the right level is specified in the Battery User Manual.

After one hour fill up with acid, if necessary.

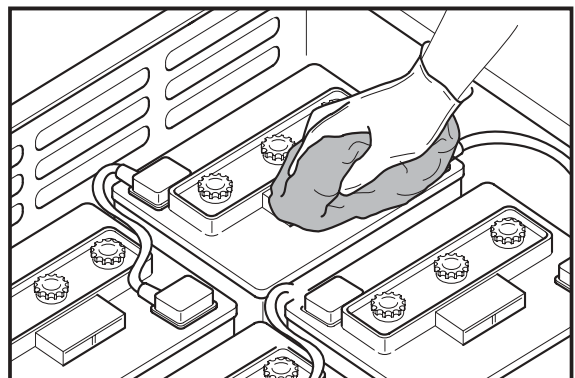


Let batteries rest for a further hour; then proceed with a recharge according to the instructions specified in the Battery User Manual and in the MAINTENANCE paragraph. During the recharge the battery caps must be open.

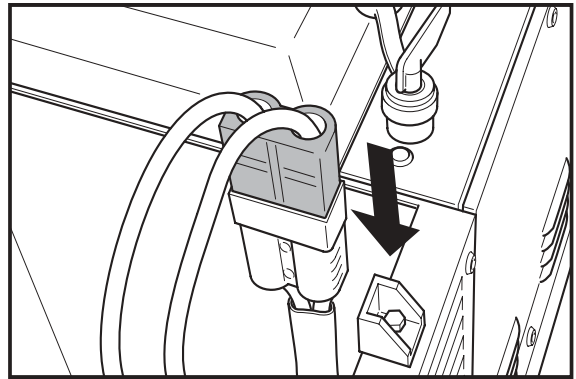
Warning: before starting the recharge the battery connector must be disconnected from the machine.



After the recharge close all the cell caps and clean the top of the battery from any acid remains.

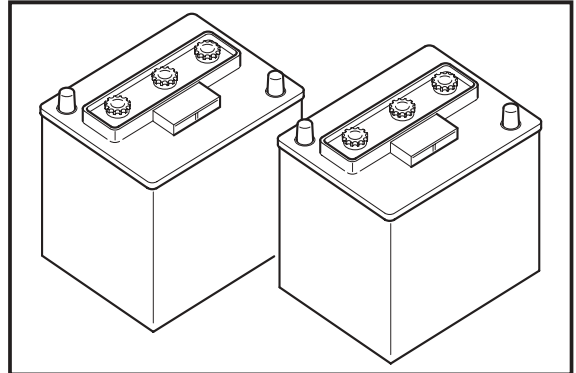


Connect the battery connector to the machine.



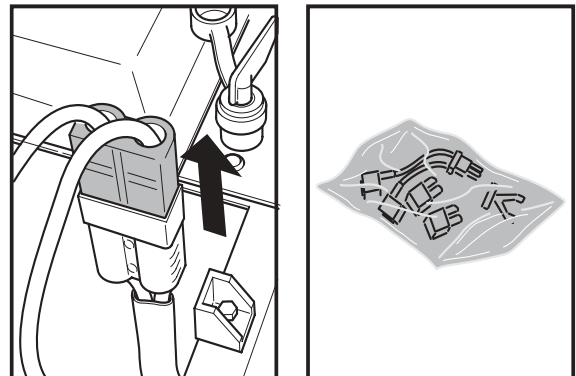
Remove the cover from the battery

3 - If the machine is not equipped with batteries they must be procured and mounted. It is recommended to get the assistance of qualified personnel to choose and set the batteries.



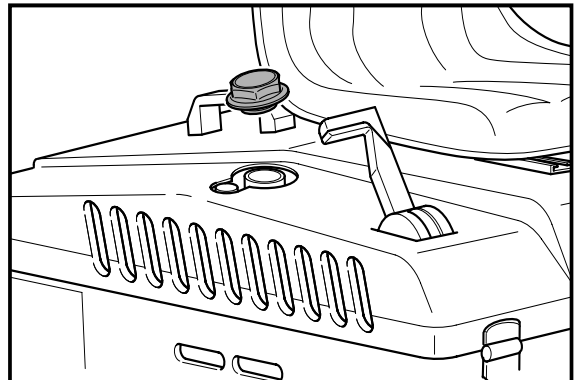
The electric cables supplied with the machine can be used for the connection of the four batteries.

Warning: before starting the recharge the battery Connector must be disconnected from the machine.



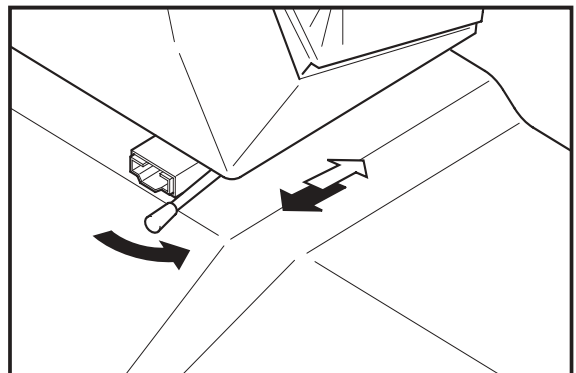
Fill the fuel tank with **UNLEADED PETROL** and close the engine compartment.

Check the engine oil level according to what specified in chapter "Maintenance"



After having set the batteries, climb onto the machine and adjust the seat to find the most comfortable position.

Now the machine is ready to be used.



MACHINE USE (battery version)

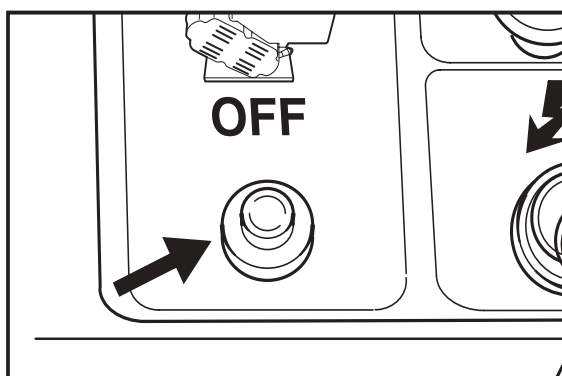
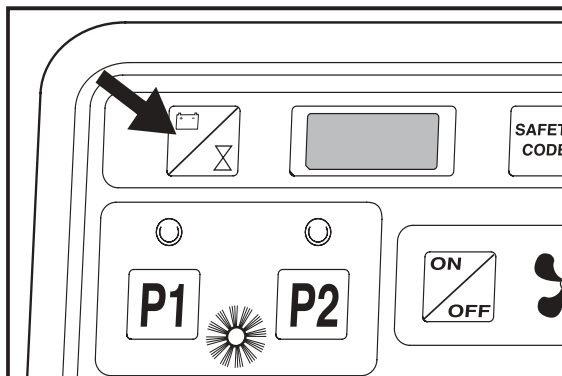
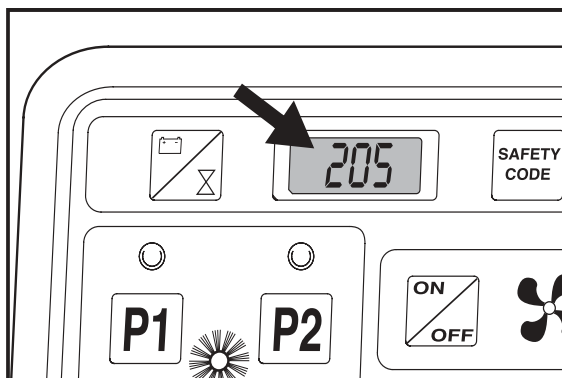
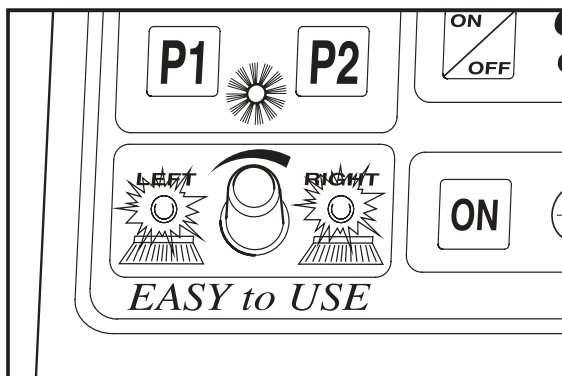
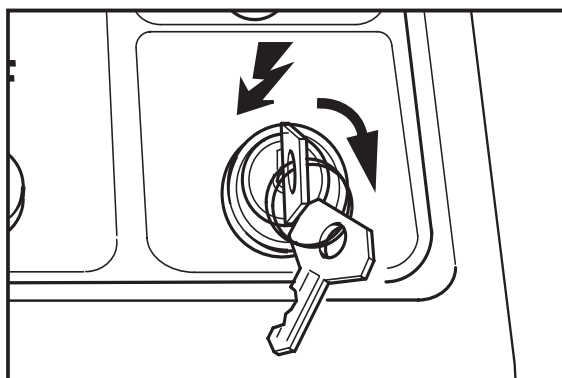
Insert the ignition key into the panel and turn it clockwise: the display will show all zeros and after about three seconds the battery voltage will appear.

Note: The temporary lighting of the two side brush indicators and the short sound from the reverse speed acoustic indicator are to be considered a normal behaviour.
Wait not less than three seconds before restarting the machine after switching Off.

Check the charge status of the batteries on the display. Six different data/functions can be shown on the display.

Note: The display has two functions: If the voltage supplied by the battery is too low (less than 20V) an automatic lock activates disabling all machine functions except for the traction (the display flashes).
It is necessary to recharge the battery as shown in the "Maintenance" chapter.

To access the hour meter function, press the key shown in the figure: the display shows the machine total working time in hours; if the key is pressed another time, the minutes will be displayed. If the key is pressed another time or after 10 seconds, the battery voltage will automatically reappear.

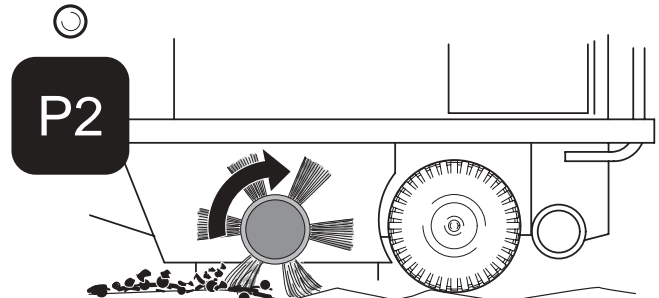
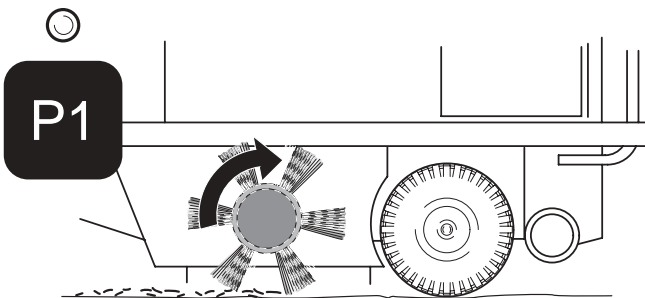
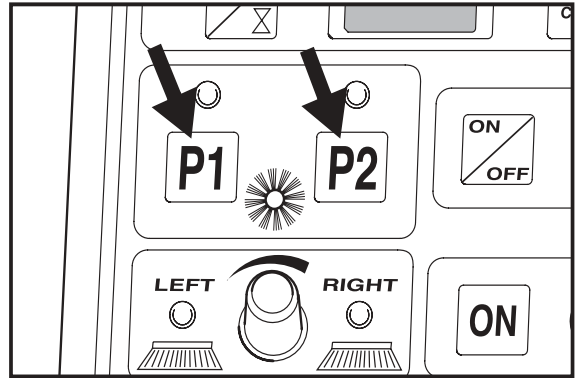


USE OF THE WORKING PROGRAMS

It is possible to choose one of the two working programs P1 and P2 by pressing the related key.

P1 is the "light cleaning program" (for internal environment, i.e. smooth floor, moquette, small debris etc.)

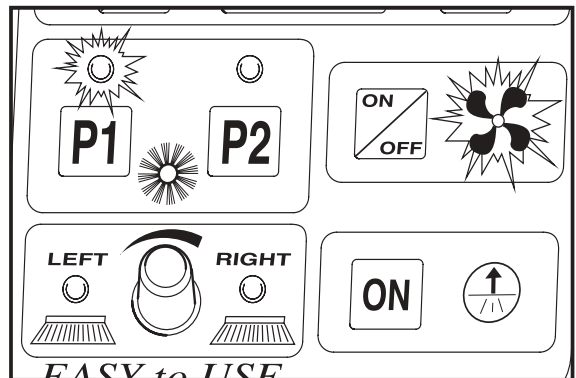
P2 is the "hard cleaning program" (for external environment, i.e. asphalt, uneven floor, big debris etc.).



After having pressed the preferred button the relevant light indicator will turn on, together with the suction motor indicator.

The temporary activation of the main brush and suction electric motors will also occur; (the relevant light indicators will flash).

Note: The working parameters of programs **P1** and **P2** are pre-set by the manufacturer of the machine: if you want to change the pre-set values call the customer service personnel of your supplier.

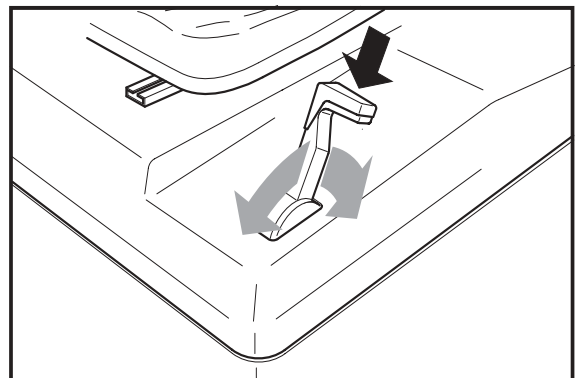


Lower the side brush/es by pressing the top of the relevant lever and moving it forward.

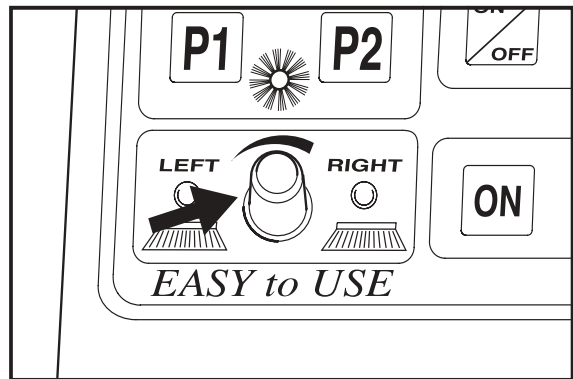
Note: On the control panel the corresponding light indicators will turn on.

To lift the side brush/es press the top of the levers and move them backwards.

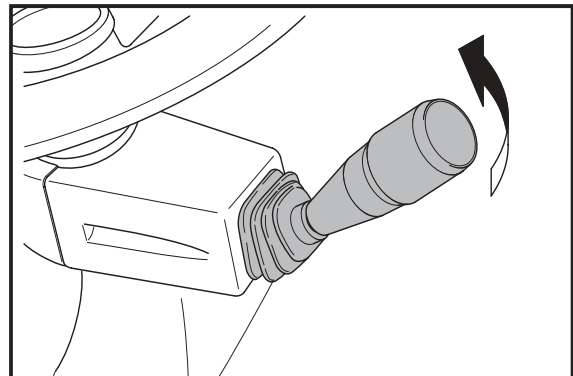
Note: The side brush/es, the main brush and the suction fan will start automatically when the accelerator pedal will be pressed (AUTO POWER-ON).



It is possible to adjust the side brush/es turning speed by means of the dedicated knob.

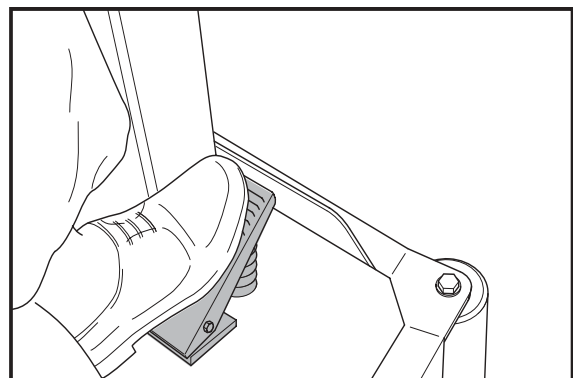


Select the forward speed by means of the command lever.

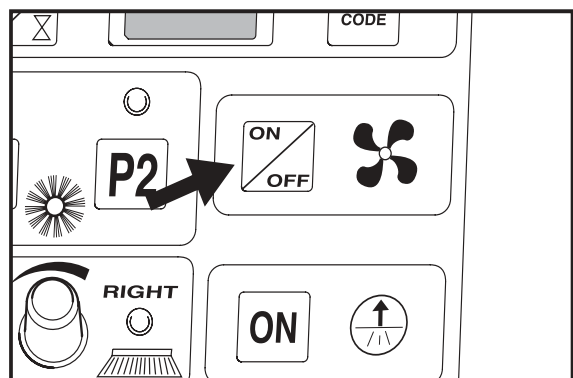


Press the accelerator pedal to start the job.

Note: By releasing the accelerator pedal (or setting the command lever to the neutral position) the automatic switch off of all functions will occur within 8 seconds (Auto Power Off); the light indicators of the selected working program and of the suction fan will start flashing. The automatic restart of all functions will automatically occur as soon as the accelerator pedal will be pushed again (Auto Power ON). In order to enable the selection of a different working program first disable the previously selected one.



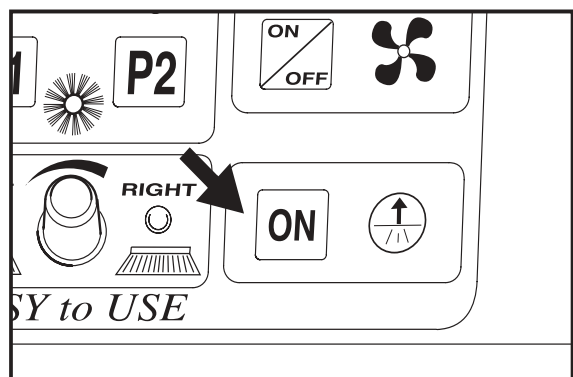
When it is necessary to sweep on a wet floor stop the suction fan pressing the relevant button, in order to prevent the damage of the paper panel filter.



In order to get an efficient cleaning function the panel filter must always be clean.

Press the filter-shaker button, even if the machine is working.

This operation must be repeated every 10 to 15 minutes, depending on the kind of rubbish to be swept; before emptying the dirt container and, in any case, at the end of the work.



During the filter-shaker operation, the suction fan continues to work (the automatic stop is not provided). To stop the suction fan during the filter-shaking, it is possible to operate in two ways:

1. Stop the fan by pressing the specific ON/OFF key.
2. Wait for the automatic switch off (after the accelerator pedal is released).

To restart the suction fan press the ON/OFF key or press the accelerator pedal.

Alternatively, to facilitate the operator, the automatic filter-shaker can operate every five minutes.

To collect light and bulky debris lift the front flap using the left pedal (do not press the pedal down for a long time, not to reduce the suction capability of the machine).

The machine gets an automatic braking function when the accelerator pedal is released; when necessary the service brake can also be used (see the figure).

When driving in reverse gear an intermittent acoustic signal will be heard and all the functions will remain active.

The figure shows the functions of the command lever:

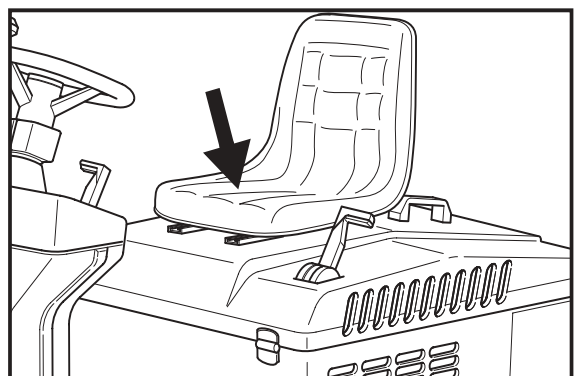
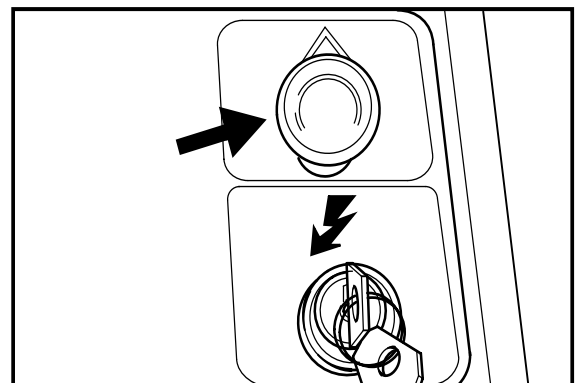
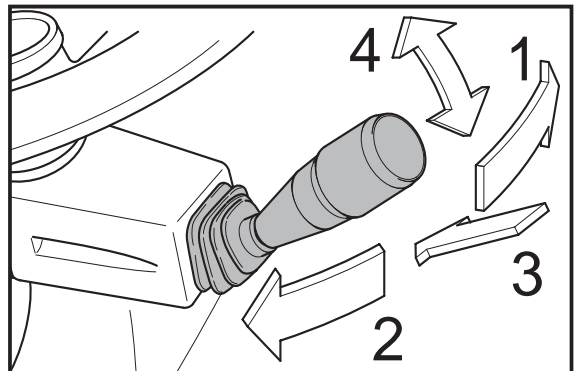
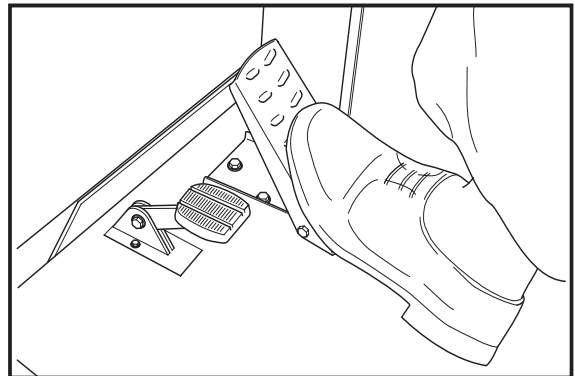
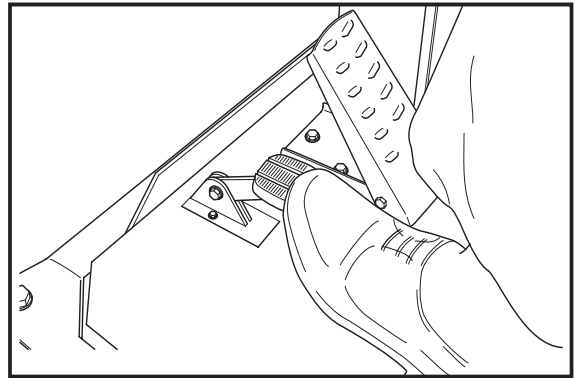
- 1 - Forward gear.
- 2 - Reverse gear.
- 3 - Horn.
- 4 - Front light ON/OFF.

The machine is equipped with an emergency stop button; by pressing this button (red light On) a sudden stop of the machine will occur and all functions will turn off, the petrol engine too.

To restart the machine turn the red button clockwise (according to the arrow shown on the button itself).

To restart the normal operation re-select one of the two working programs P1 or P2.

A safety device is located inside the operator seat: the drive function - either forward or reverse - is disabled as soon as the operator will stand up or leave the seat.

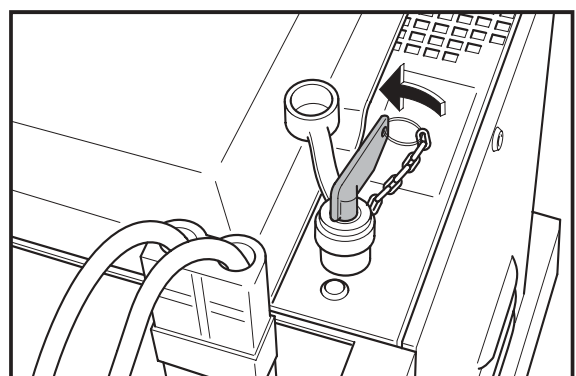
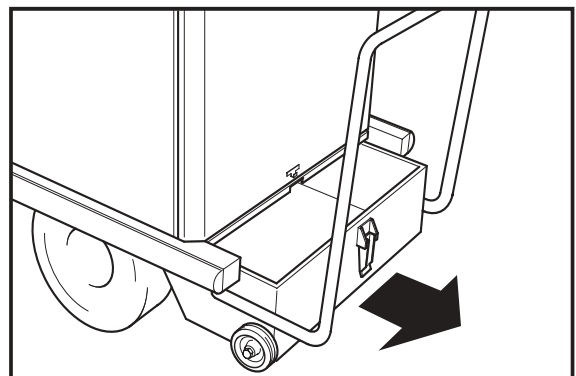
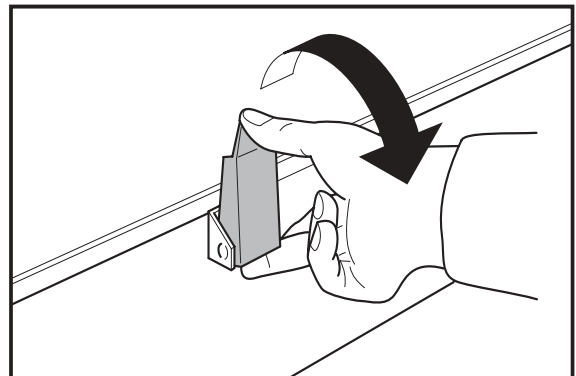
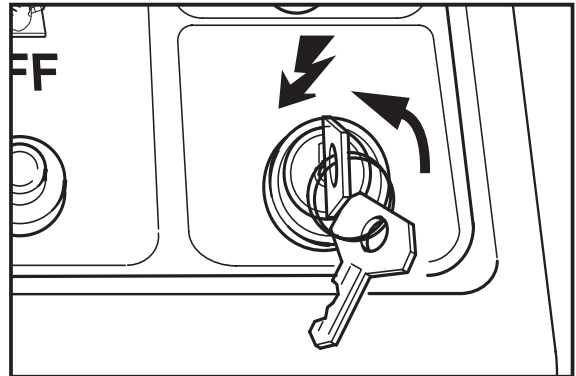
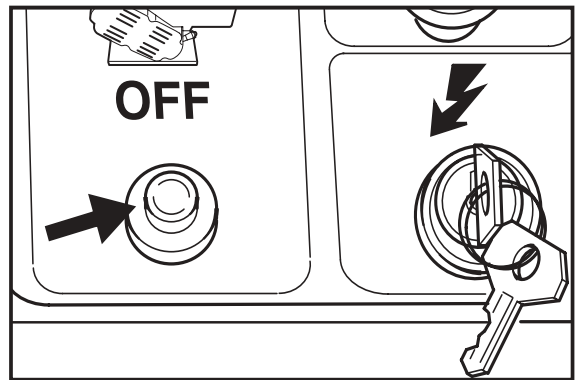


Deselect the used working program (P1 and P2) after each working period.

Before leaving the machine make sure that the side brushes are lifted, the parking brake engaged and the master key in the OFF position (counter clockwise).

At the end of the job or whenever it is necessary empty the rear dirt container.

In the event that the machine must be pushed when switched Off turn the proper red key counter-clockwise (see the figure), in order to disengage the electric drive motor and disable the self-breaking function. Turn and eventually remove the red key that can be seen after lifting the lid of the battery compartment.



MACHINE USE (petrol engine version)

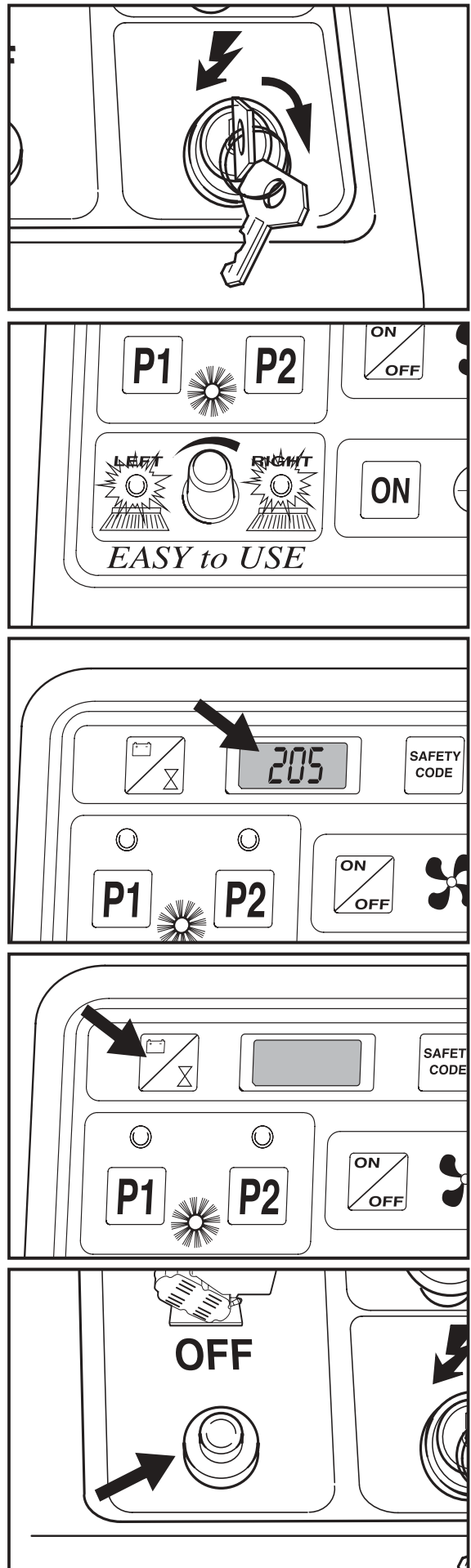
Insert the ignition key into the panel and turn it clockwise: the display will show all zeros and after about three seconds the battery voltage will appear.

Note: The temporary lighting of the two side brush indicators and the short sound from the reverse speed acoustic indicator are to be considered a normal behaviour.
Wait not less than three seconds before restarting the machine after switching Off.

Check the charge status of the batteries on the display. Six different data/functions can be shown on the display.

Note: The display has two functions: voltmeter and hour meter.
If the voltage supplied by the battery is too low (less than 20V) an automatic lock activates disabling all machine functions except for the traction (the display flashes). When this condition occurs there are two possibilities: it is necessary to recharge the battery as shown in the "Maintenance" chapter or to start the "ECO" function. To start the "ECO" function press the red button shown in the figure; to stop the engine press the button again

To access the hour meter function, press the key shown in the figure: the display shows the machine total working time in hours; if the key is pressed another time, the minutes will be displayed. If the key is pressed another time or after 10 seconds, the battery voltage will automatically reappear.

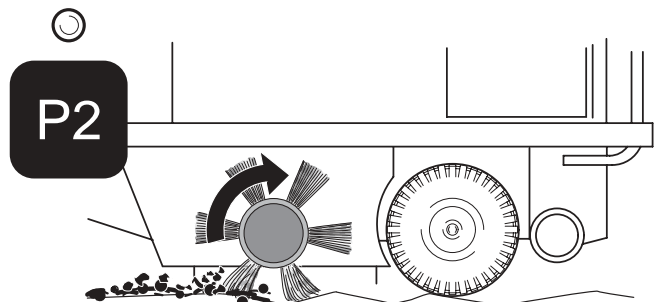
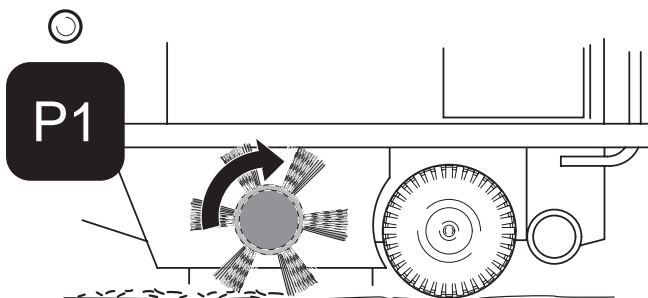
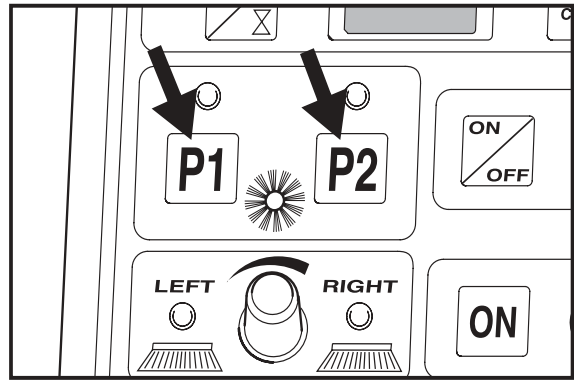


USE OF THE WORKING PROGRAMS

After starting the "ECO" function it is possible to choose one of the two working programs:

P1 is the "light cleaning program" (for internal environment, i.e. smooth floor, moquette, small debris etc.)

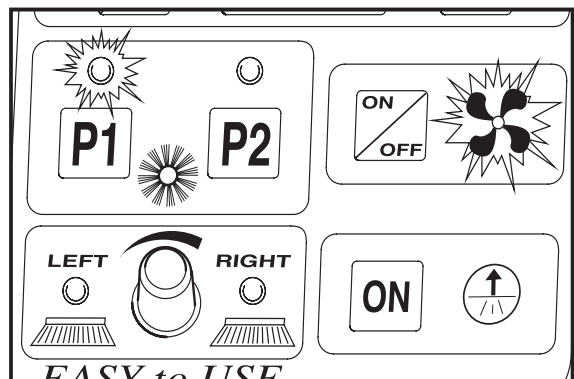
P2 is the "hard cleaning program" (for external environment, i.e. asphalt, uneven floor, big debris etc.)



After having pressed the preferred button the relevant light indicator will turn on, together with the suction motor indicator.

The temporary activation of the main brush and suction electric motors will also occur; (the relevant light indicators will flash).

Note: The working parameters of programs **P1** and **P2** are pre-set by the manufacturer of the machine: if you want to change the pre-set values call the customer service personnel of your supplier.

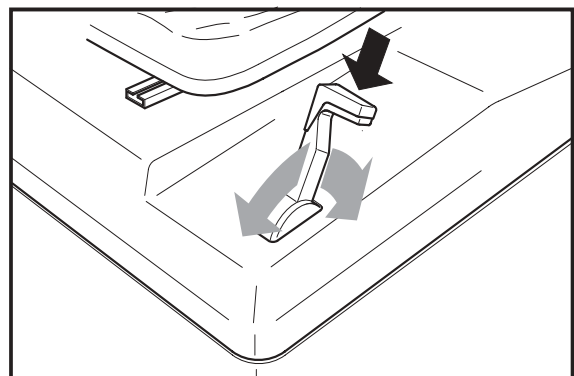


Lower the side brush/es by pressing the top of the relevant lever and moving it forward.

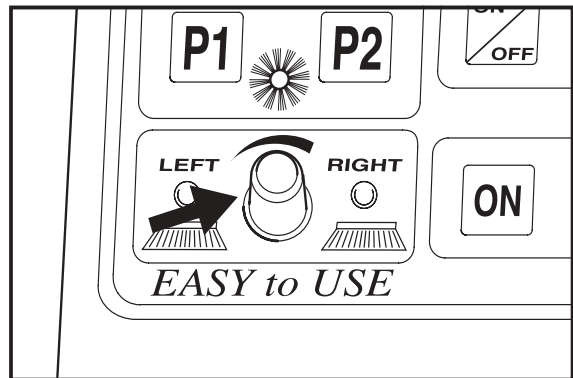
Note: On the control panel the corresponding light indicators will turn on.

To lift the side brush/es press the top of the levers and move them backwards.

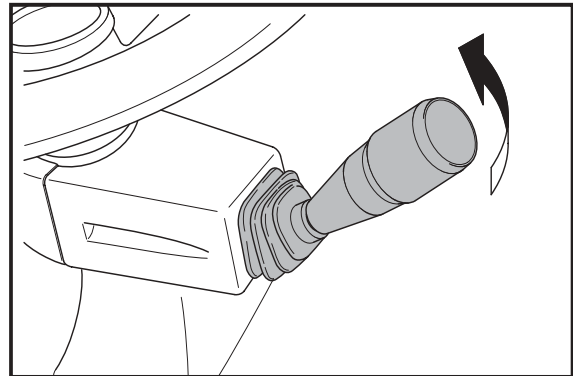
Note: The side brush/es, the main brush and the suction fan will start automatically when the accelerator pedal will be pressed (AUTO POWER-ON).



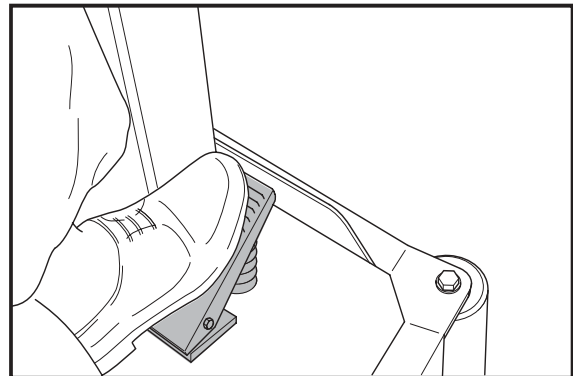
It is possible to adjust the side brush/es turning speed by means of the dedicated knob.



Select the forward speed by means of the command lever.



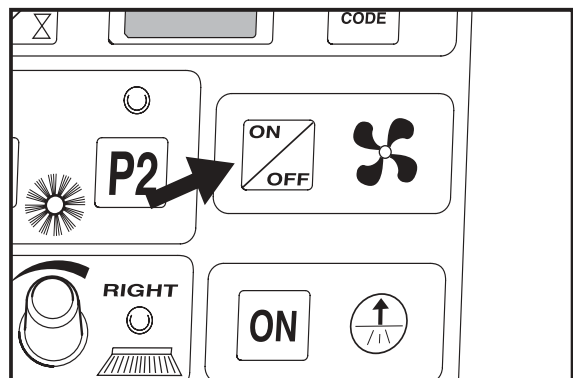
Press the accelerator pedal to start the job.



Note: When the accelerator is released or when the lever is in neutral position, the automatic switch off of all functions (Auto Power OFF) occurs within about 8 seconds, except for the "ECO" function: in this condition the warning lights related to the preselected program and to the suction motor begin to flash. To reactivate the functions, move the machine forward without deactivating the program already selected (Auto Power ON).

It is possible to select a new program only after deselecting the previous one.

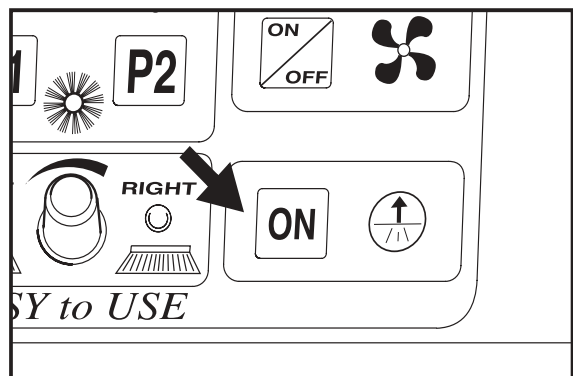
When it is necessary to sweep on a wet floor stop the suction fan pressing the relevant button, in order to prevent the damage of the paper panel filter.



In order to get an efficient cleaning function the panel filter must always be clean.

Press the filter-shaker button, even if the machine is working.

This operation must be repeated every 10 to 15 minutes, depending on the kind of rubbish to be swept; before emptying the dirt container and, in any case, at the end of the work.



To collect light and bulky debris lift the front flap using the left pedal (do not press the pedal down for a long time, not to reduce the suction capability of the machine).

The machine gets an automatic breaking function when the accelerator pedal is released; when necessary the service brake can also be used (see the figure).

When driving in reverse gear an intermittent acoustic signal will be heard and all the functions will remain active.

The figure shows the functions of the command lever:

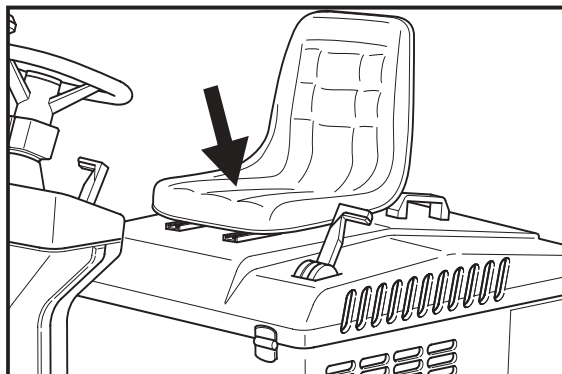
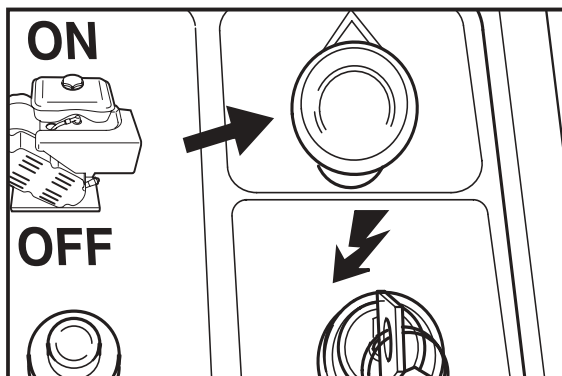
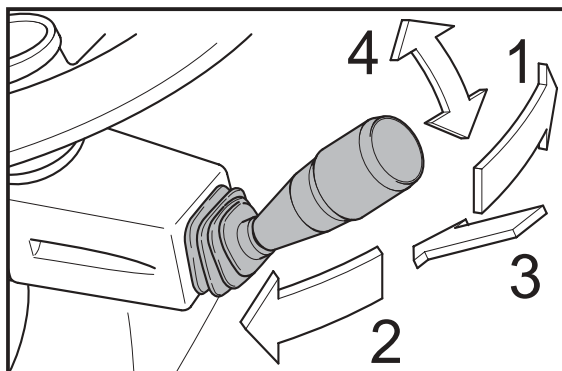
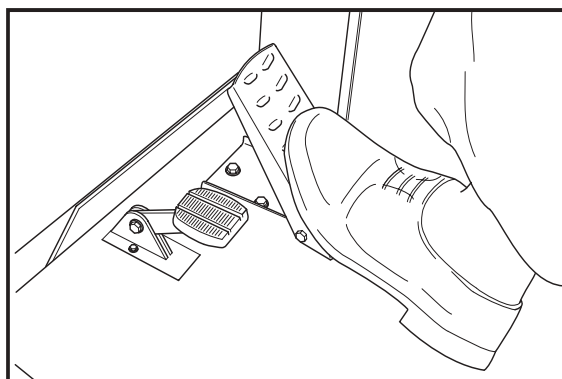
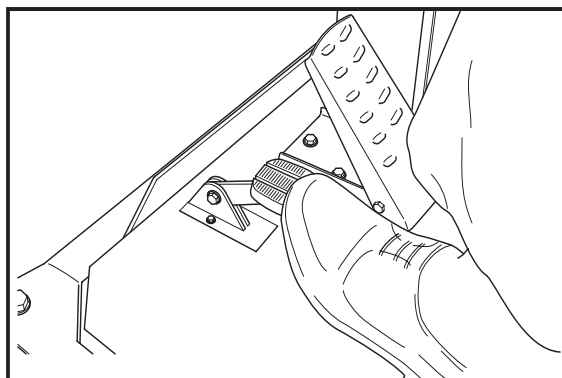
- 1 - Forward gear.
- 2 - Reverse gear.
- 3 - Horn.
- 4 - Front light ON/OFF.

The machine is equipped with an emergency stop button; by pressing this button (red light On) a sudden stop of the machine will occur and all functions will turn off, the petrol engine too.

To restart the machine turn the red button clockwise (according to the arrow shown on the button itself).

To start to work again, reselect one of the two working programs P1 or P2 and restart the machine.

A safety device is located inside the operator seat: the drive function - either forward or reverse - is disabled as soon as the operator will stand up or leave the seat.

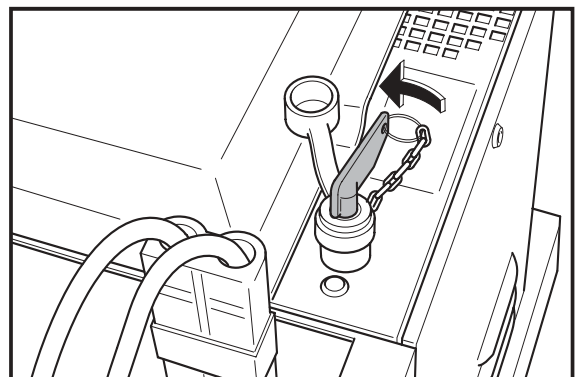
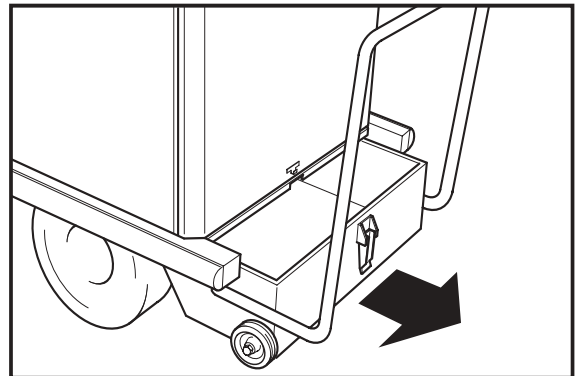
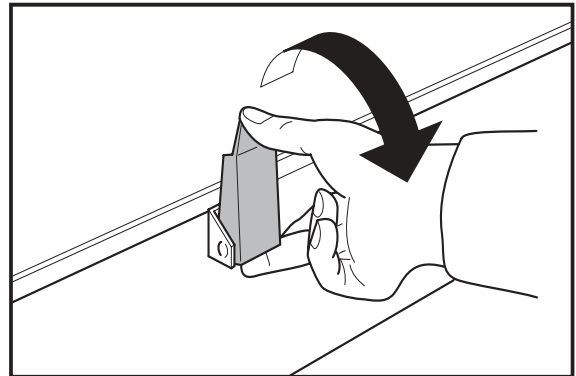
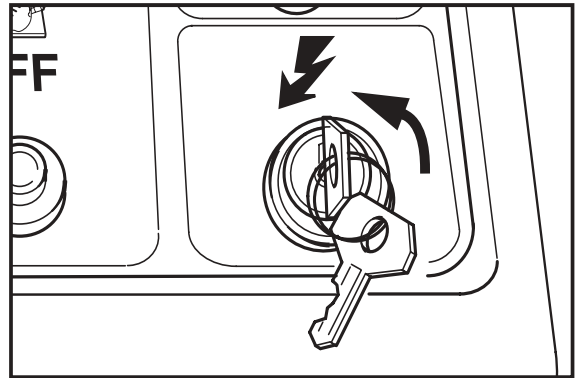
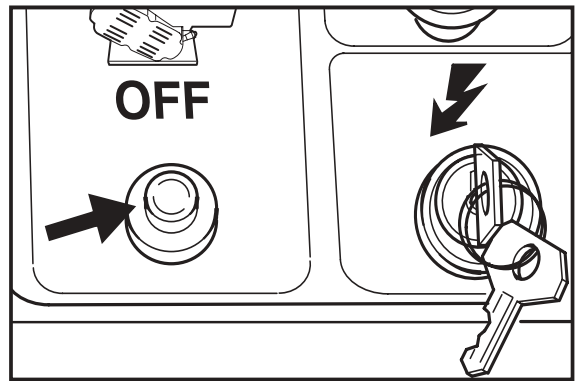


At the end of the job turn off the selected working program (**P1** or **P2**) and switch the petrol engine off by pressing the button shown in the figure.

Before leaving the machine make sure that the side brushes are lifted, the parking brake engaged and the master key in the OFF position (counter clockwise).

At the end of the job or whenever it is necessary empty the rear dirt container.

In the event that the machine must be pushed when switched Off turn the proper red key counter-clockwise (see the figure), in order to disengage the electric drive motor and disable the self-breaking function. Turn and eventually remove the red key that can be seen after lifting the lid of the battery compartment.



FURTHER PERFORMANCES OF THE MACHINE WITH PETROL ENGINE

The machine equipped with the petrol engine is able to work with full performance even if the petrol engine is turned Off; this could occur just because the machine run out of the fuel or when it is necessary to work in a closed environment.

In this case the available working time will depend on the capacity (amper.hours) of the batteries installed on the machine; on the intensity of the selected working program; on the charge status of the batteries.

On this machine, in order to guarantee the reliability of the batteries, two safety features are envisaged:

- 1 - Protection against the deep discharge of the battery: when the battery voltage drops down to about 20 Volt the automatic stop of all function will occur - except the traction function. When it is in this condition, it is necessary to proceed with the recharge of the battery or to start the petrol engine.
- 2 - Protection against the excessive recharge. If the battery voltage will be over 29 Volt the automatic stop of the petrol engine will occur.; in any case the machine will still be able to operate only with batteries. The petrol engine can be restarted when the battery voltage will be low enough (at about 24 Volt).

SIDE BRUSHES ADJUSTMENT AND REPLACEMENT

Warning: the following operations must be done with the machine in Off condition and master key out, on a flat floor.

When the side brush is worn its height must be adjusted.

Loosen the knob. Turn the adjusting disk and move its position of one hole.

And tighten the knob.

To check the adjustment of the brush start it and verify that the contact with the floor is as shown in the figure. If necessary repeat the adjustment sequence.

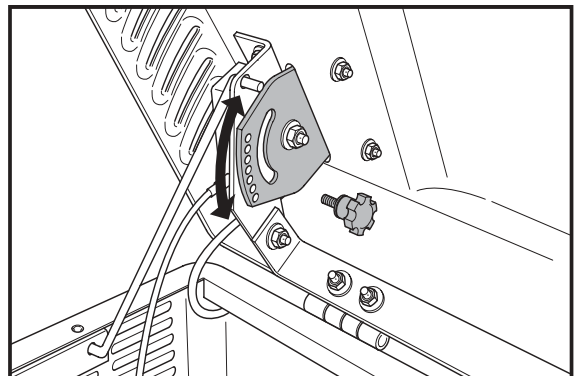
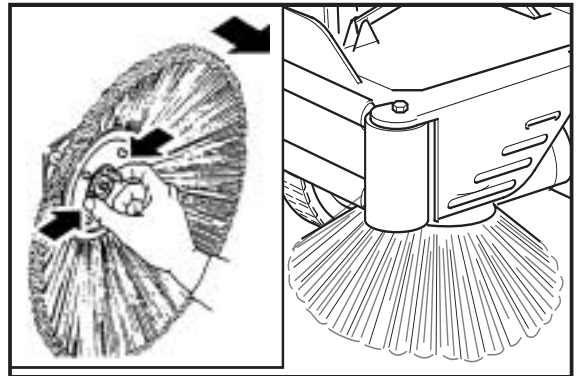
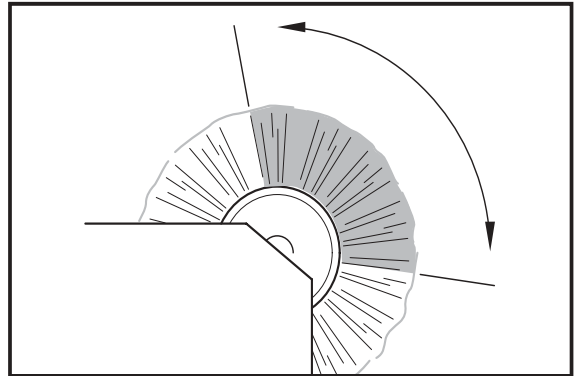
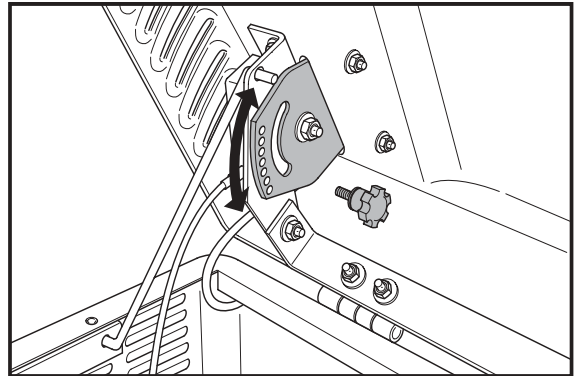
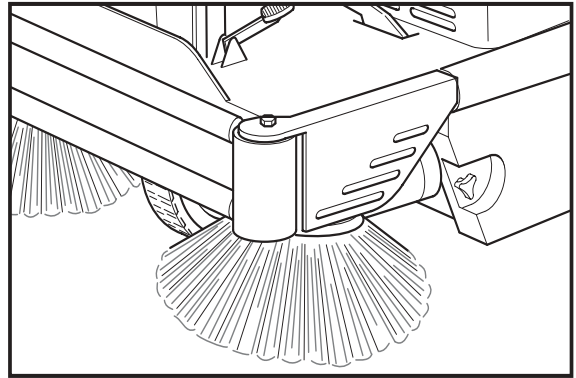
When the brushes are seriously worn, they must be replaced. Remove the screw securing the brush to the engine shaft (take care not to loosen the screw and the reference key).

Remove the metal hub from the worn brush and install it on the new brush.

Apply grease on the shaft.

Reinstall the new brush in the reverse order of removal.

Note: When the brush is replaced set the adjusting devices to their original position (corresponding to brush new, with no wear).



MAIN BRUSH REPLACEMENT

Warning: the following operations must be done with the machine in Off condition and master key out.

This machine is equipped with an automatic control of the main brush pressure; this also means that the position of the main brush is automatically adjusted (no need of manual adjustment).

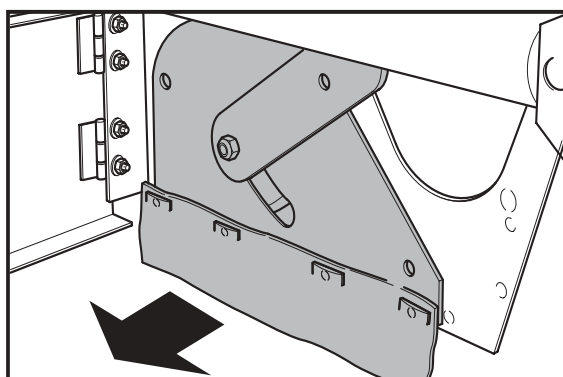
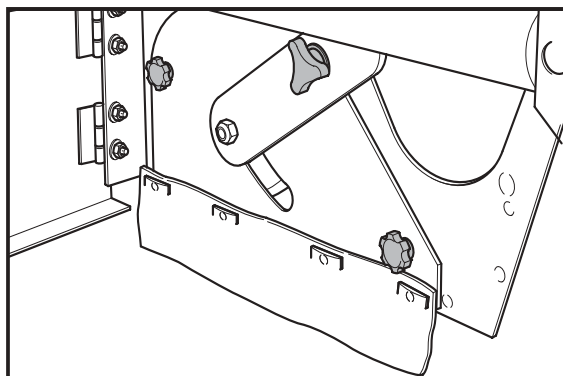
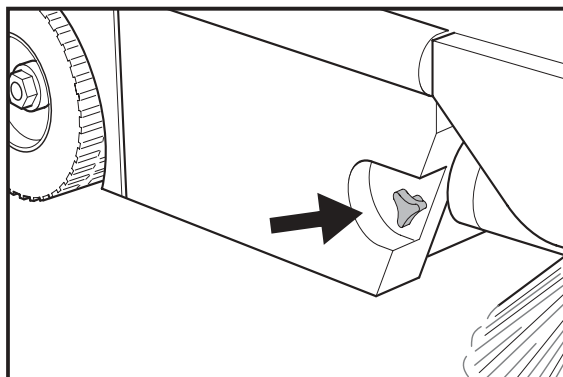
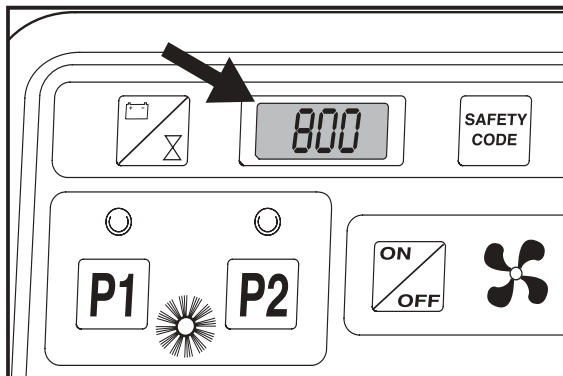
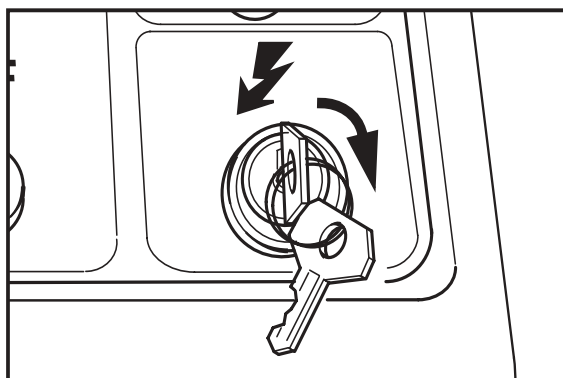
The complete wear out of the main brush - and therefore the need to replace it - is notified with code 800 on the display.

Please meet the following procedure for the main brush replacement.

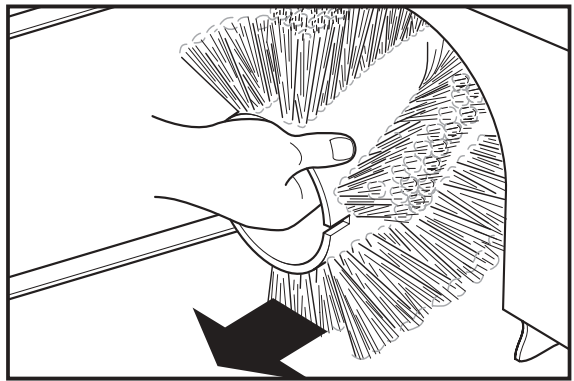
Open the side door on the right side of the machine, unscrewing the knob shown in the figure.

Remove the three knobs used to fix the lid of the main brush compartment.

Remove the lid.



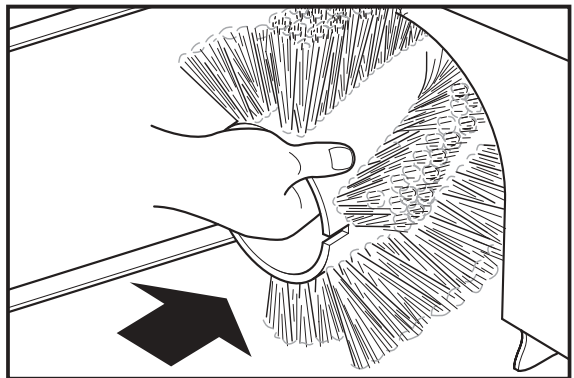
Remove the worn out brush.



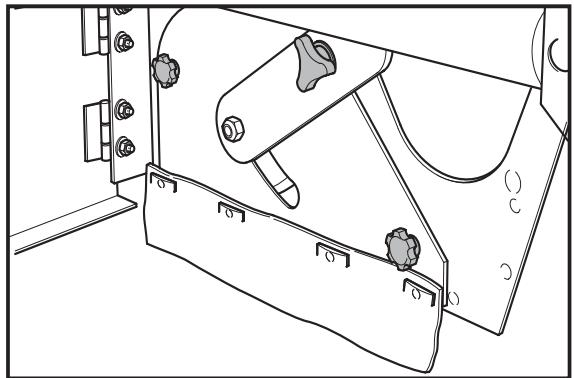
With a screwdriver, remove the plastic adapter from the worn brush.

Secure the plastic adapter to the new brush being careful to the proper bristles orientation (see in figure).

Reinstall the brush by checking the proper coupling between the plastic adapter and the hub on the opposite side of the compartment.



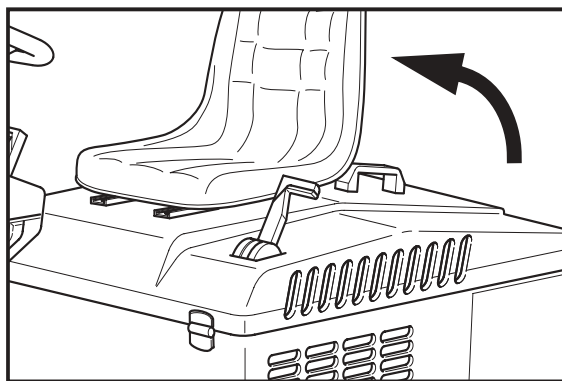
Reinstall the brush compartment cover and the knobs that were previously removed.



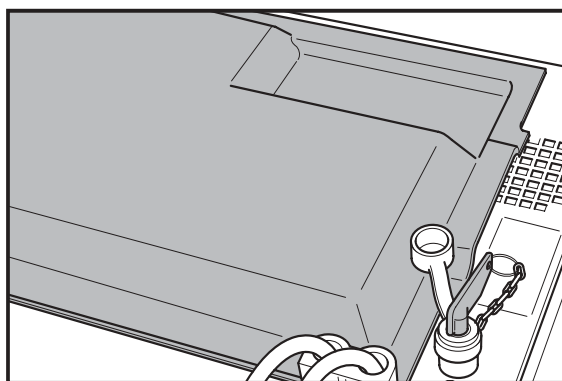
FILTER CLEANING AND REPLACEMENT

The panel filter requires a regular cleaning.

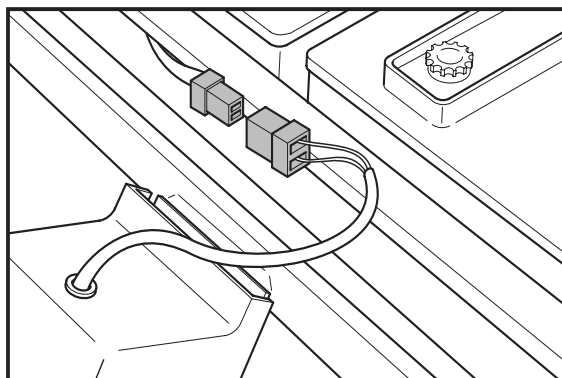
Lift the lid.



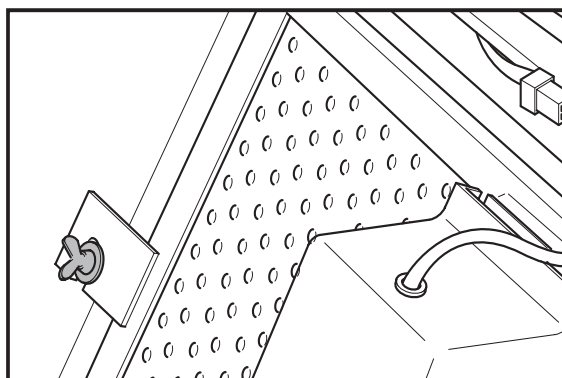
Remove the lid of the filter compartment.



Disconnect the filter-shaker motor harness (the machine must be turned off and the key taken out).

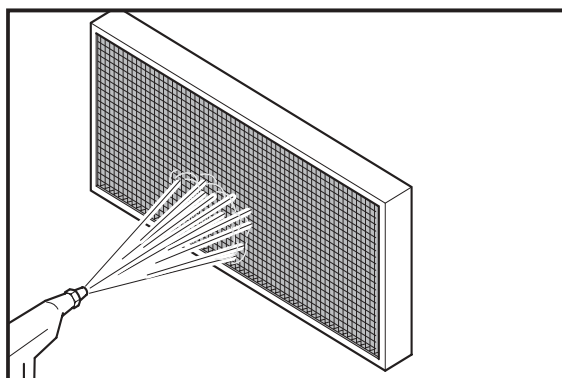


Loosen the two screws with butterfly head on the two sides of the metal frame fixing the panel filter; it is not necessary to remove the screws completely.



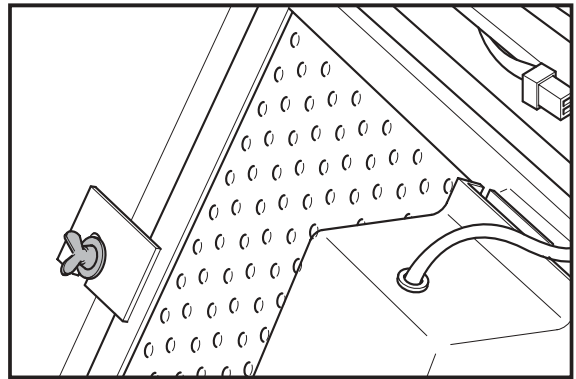
Remove the metal frame and take the panel filter out.

Clean the filter shaking, blowing it with compressed air - pressure not higher than 6 bar - from the side where the metal protection net is mounted, to avoid damaging to the paper.



After cleaning, fit the filter and the relevant fixing frame.

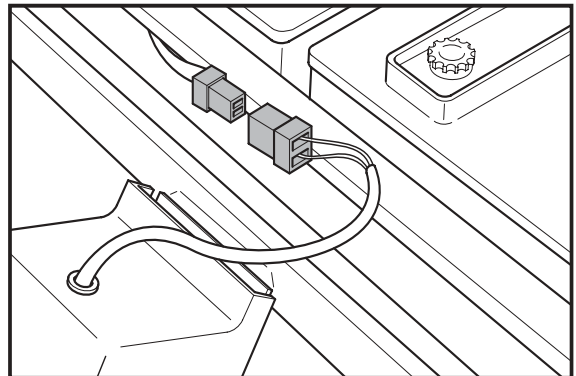
Tighten the two screws with butterfly head and reconnect the filter shaker electric cable.



If the filter is damaged or can not be properly cleaned replace it with a new one.

Ask to your supplier for the new spare parts list.

Polyester panel filters are also available.



MAINTENANCE

BATTERIES: CONTROL AND RECHARGE

Make a frequent check of the electrolyte level inside every battery cell. The battery compartment is under the operator seat; lift the lid and open the caps of all the battery cells: when necessary fill up the cells with distilled water.

The proper electrolyte level is specified in the Manual for use and maintenance of the battery.

Warning: On the version with petrol engine the battery level check must be done every week.

After filling close all the cell caps and clean the top of the battery from any acid remains.

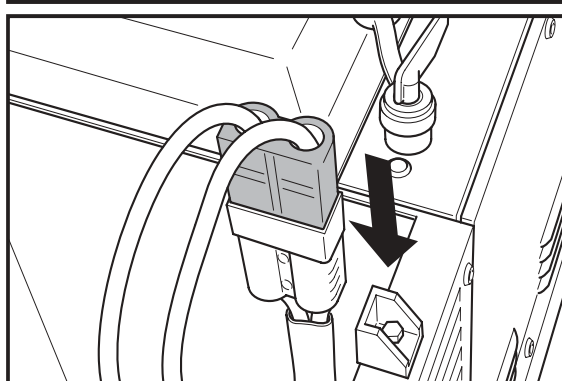
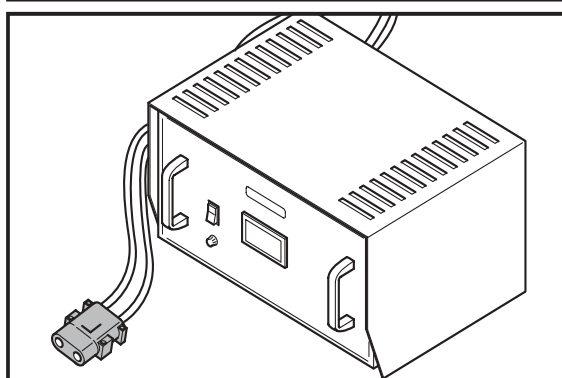
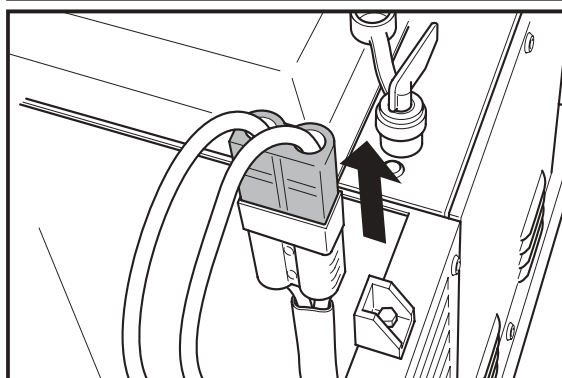
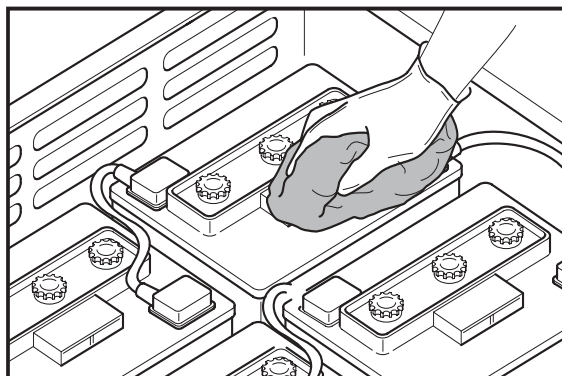
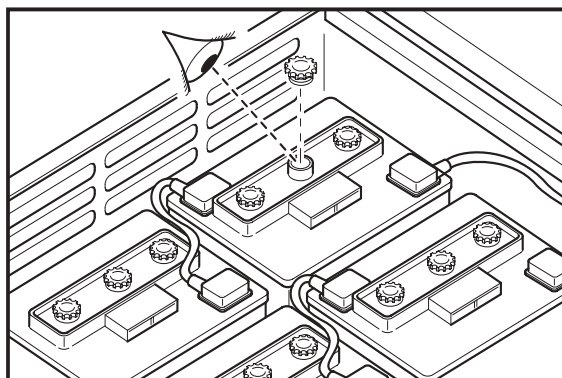
Warning: the battery acid is corrosive; if it comes in contact with the skin or eyes rinse thoroughly with water and consult a physician.

When necessary proceed with a recharge of the battery according to the following instructions:

- switch the machine Off and remove the master key;
- lift the lid;
- disconnect the battery connector;
- the recharge must be done in a well ventilated area;
- open all the cell caps;
- connect the battery connector to the battery charger connector;
- connect the battery charger cable to the mains (please check that the voltage and frequency of the mains correspond to the data of the charger).

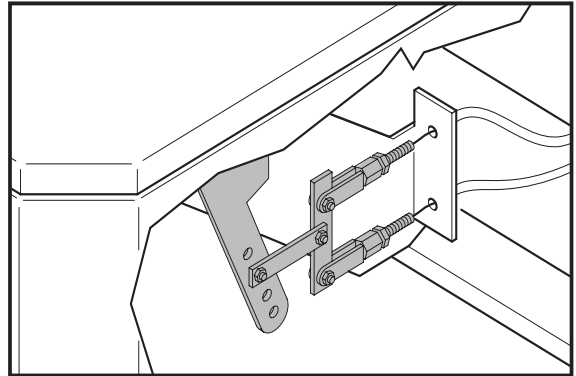
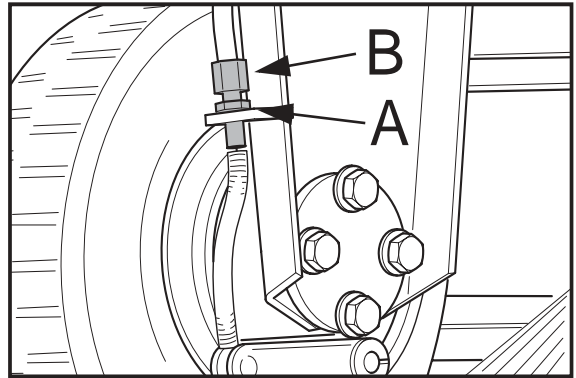
At the end of the recharge disconnect the battery from the charger and fit the battery connector to the machine. Close all the cell caps and clean the top of the battery from any acid remains.

Note: in any case refer to the instructions specified in the Battery Use Manual.



BRAKES ADJUSTMENT

When the pedal brake or the parking brake reach a low efficiency operation some adjustments can be done on the front wheel (models SR 1100 e SR 5110) by loosening the locking nut **A**, turning the adjuster **B** and tightening the locking nut **A**.



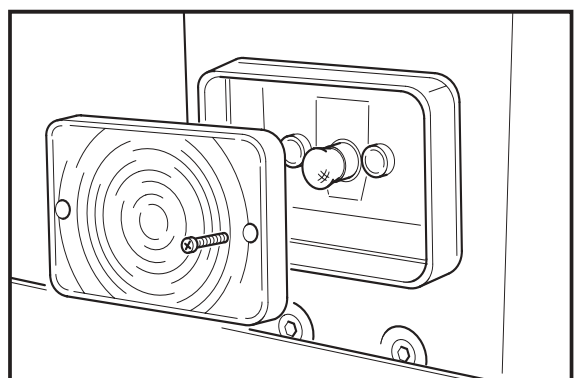
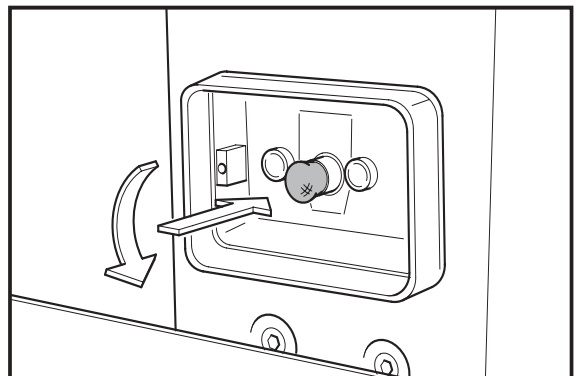
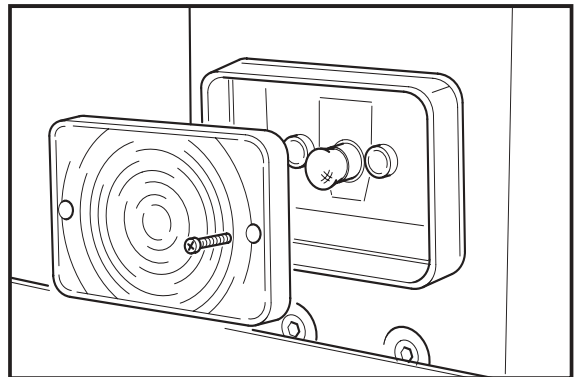
FRONT LAMP REPLACEMENT

In order to replace the front lamp:

- remove the transparent cover.

- push the lamp and turn it counter-clockwise to remove it.
- replace the lamp paying attention to the volt and watt ratings.

- fit the transparent cover.



MAINTENANCE OF THE PETROL ENGINE

It is necessary to read the engine Use and Maintenance Manual carefully and to follow some practical advices:

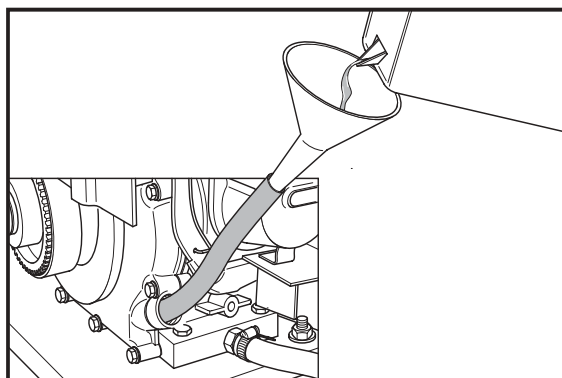
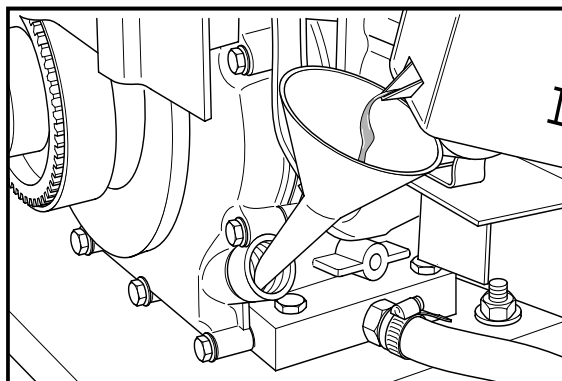
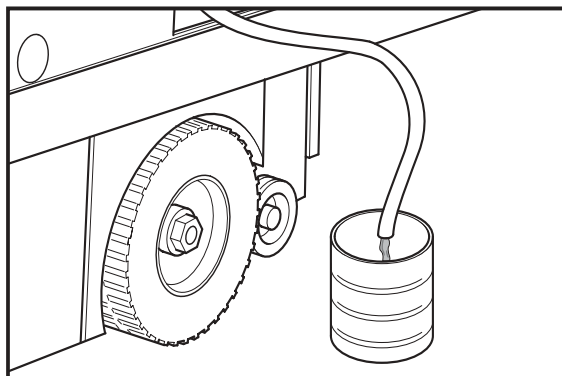
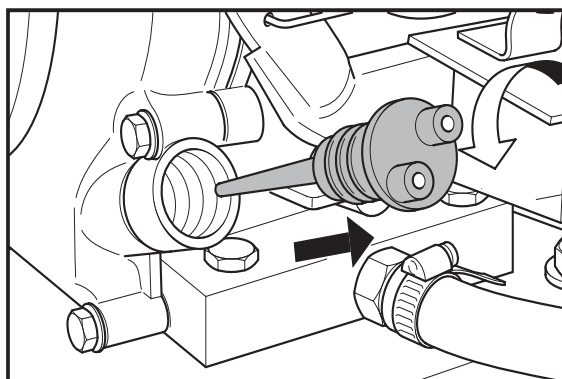
Check the engine oil level at each working session; for possible fill up read the oil type specified on the engine Manual.

Note: replace the engine oil the first time after 50 working hours or within 2 months. Afterwards, after 100 hours or within 8 months.

There is also an automatic device that prevents the machine start-up if the oil level is insufficient.

NO WARNING LIGHT IS PROVIDED FOR THIS SAFETY FUNCTION.

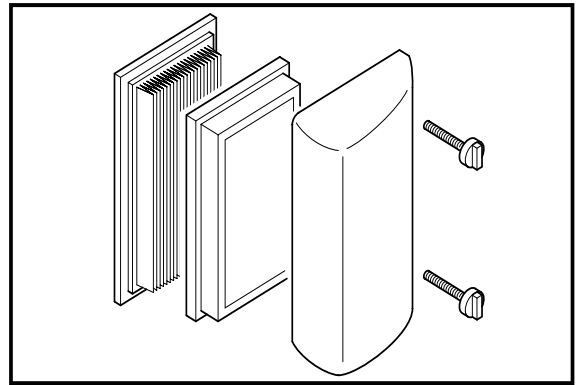
The following procedure shows the engine oil replacement.



Make a periodic check of the engine air filter.

Clean or replace the air filter according to the engine Use and Maintenance Manual or when it is necessary.

Remove the front panel to reach the air filter.



SUMMARY OF MAINTENANCE CONTROLS (battery version)

Warning: the following interventions must be done with machine in Off condition and master key out.

All the periodic maintenance operations must be performed by skilled personnel or by an authorized service centre.

Note: The battery life will depend on a good periodic maintenance (check of the level of the electrolyte and of battery voltage). Besides it must be taken into account that an unused battery is submitted to a self-discharge phenomenon. In the event that the machine is not used for a long time (e.g. 3 or 4 weeks) it is necessary TO RECHARGE THE BATTERY; in fact the battery voltage MUST NEVER drop down below 20 Volt.

CONTROL	UPON DELIVERY	EVERY 30 HOURS	EVERY 50 HOURS	EVERY 100 HOURS	EVERY 400 HOURS
Battery liquid level and voltage check	●	● OR EVERY TWO WEEKS			
Check the carbon brushes of all electrical motors and replace them if worn					●
Belt tension	●			●	
Brake adjustment	●			●	
Filter shaker			●		
Nut and screw tightness				●	
Wear of main brush and side brushes			●		
Panel filter cleaning			●		
Sealing of gaskets of filter compartment and of flaps	●		●		
Clean the steering chain using diesel fuel or solvent				●	

SUMMARY OF MAINTENANCE CONTROLS (petrol version)

Warning: the following interventions must be done with machine in Off condition and master key out. All the periodic maintenance operations must be performed by skilled personnel or by an authorized service centre.

Every maintenance intervention on the petrol engine must be performed in agreement with the engine User Manual.

Note: The battery life will depend on a good periodic maintenance (check of the level of the electrolyte and of battery voltage). Besides it must be taken into account that an unused battery is submitted to a self-discharge phenomenon. In the event that the machine is not used for a long time (e.g. 3 or 4 weeks) it is necessary TO RECHARGE THE BATTERY; infact the battery voltage MUST NEVER drop down below 20 Volt.

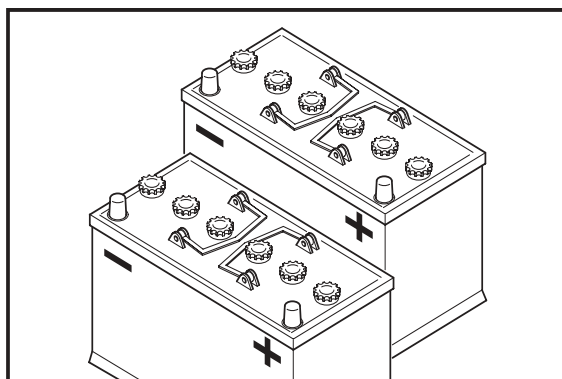
CONTROL	UPON DELIVERY	TWO TIMES PER WEEK	ONE TIME PER WEEK	EVERY 20 HOURS	EVERY 50 HOURS	EVERY 100 HOURS	EVERY 400 HOURS
Battery liquid level and voltage check	●		●				
Engine air filter cleaning				●			
Panel filter cleaning					●		
Engine oil level check	1 st TIME	●					
Engine oil replacement				● (+) 1 st TIME		● (++)	
Check the carbon brushes of all electrical motors and replace them if worn							●
Belt tension						●	
Brake adjustment	●					●	
Filter shaker					●		
Nut and screw tightness						●	
Wear of main brush and side brushes					●		
Sealing of gaskets of filter compartment and of flaps	●				●		
Clean the chain using diesel fuel or solvent.						●	

(+) 20 hours or not more than 1 month.

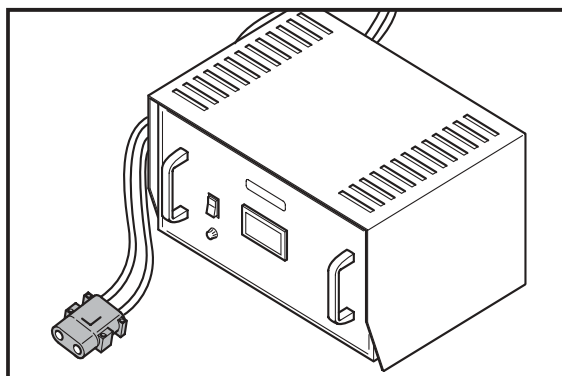
(++) 100 hours or not more than 8 months.

OPTIONAL ITEMS

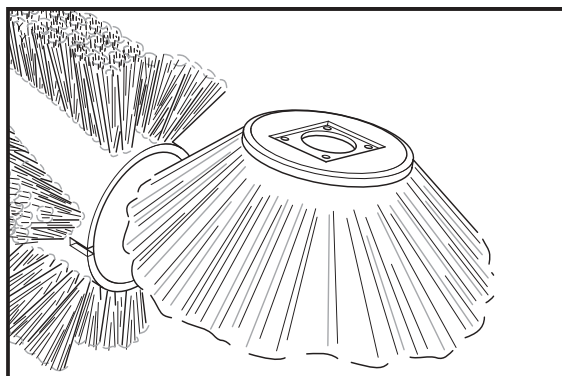
High capacity batteries both for the petrol version and for the battery version.



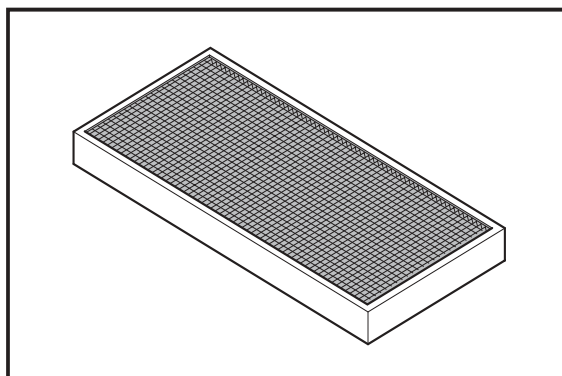
Battery charger.



Different types of main brushes and side brushes.



Polyester panel filter (it can be washed)

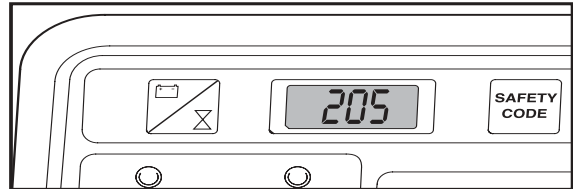
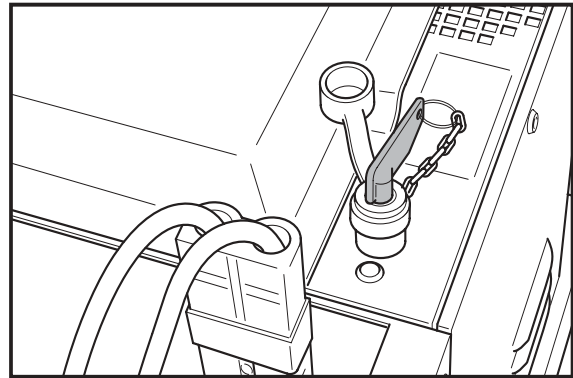


For further information about optional devices, please contact the machine supplier.

SAFETY FUNCTIONS AND TROUBLESHOOTING

The machine is equipped with many safety devices and functions which have been described in the USE paragraphs (both for petrol and electrical versions). For instance the automatic stop of all functions to avoid the deep discharge of the battery has been mentioned; and also the availability of a special red key for the disengagement of the self-breaking function has been notified: this is to be operated when the machine must be pushed in Off condition.

Besides the intervention of other safety functions is notified by means of dedicated safety codes appearing on the display. These safety codes are described in the following table.



MACHINE BEHAVIOUR	MACHINE BEHAVIOUR	DESCRIPTION OF THE MALFUNCTION	POSSIBLE INTERVENTION
301	Stop of all functions and traction	Overtemperature of the drive motor	<ul style="list-style-type: none"> - If the machine run on a long ramp it could be normal: let the machine cooling 20 minutes - Check the efficiency of the front and rear brakes - Check the rotation of the rear drive wheels
302	The machine does not start or, in the event it was working, will stop	Possible problem with traction control electronic circuit	<ul style="list-style-type: none"> - Check carbon brushes of traction motor - Check connection cables of traction motor - If the above is OK replace the power electronic board
305	The machine functions will stop	High temperature on the electronic control circuits (95°C)	<ul style="list-style-type: none"> - If the ambient temperature is high let the machine cool down 20 minutes. If the problem will remain call the technical service to check the electrical motors
306	Stop of all functions and traction	High temperature on the electronic control circuits (105°C)	<ul style="list-style-type: none"> - Make the same checks as per code 305
307	The machine does not start	Wrong start sequence	<ul style="list-style-type: none"> - Release the accelerator pedal before turning the key On
308	The machine does not start	Damage of the cable of potentiometer for traction control	<ul style="list-style-type: none"> - Check the connections of the potentiometer of the accelerator pedal or the condition of the potentiometer
333	The machine does not start	<ul style="list-style-type: none"> - Off status of the red key for the disabling of the self braking function (see the picture on the top page) - Possible trouble of motor cables short circuit or open circuit) 	<ul style="list-style-type: none"> - Insert the red key and turn it clockwise - Check the motor cables
800	Display flashing	Main brush worn	Replace the main brush

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