



# OWNERS MANUAL ST60BT



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2003	24 V 	 60 kg	
	850 W	 150 kg	IP23
Mod. / Type <b>Mb</b>		N° <b>03 6001 0518</b>	

## On delivery of the machine

When the machine is delivered to the customer, an immediate check must be performed to ensure all the material mentioned in the shipping documents have been received and also to check that the machine has not suffered any damage during transportation. If damage has occurred, get the shipping agent to verify immediately the amount and nature of the damage suffered and at the same time inform our claim department. It is only by prompt action of this type that compensation for damage may be successfully claimed.

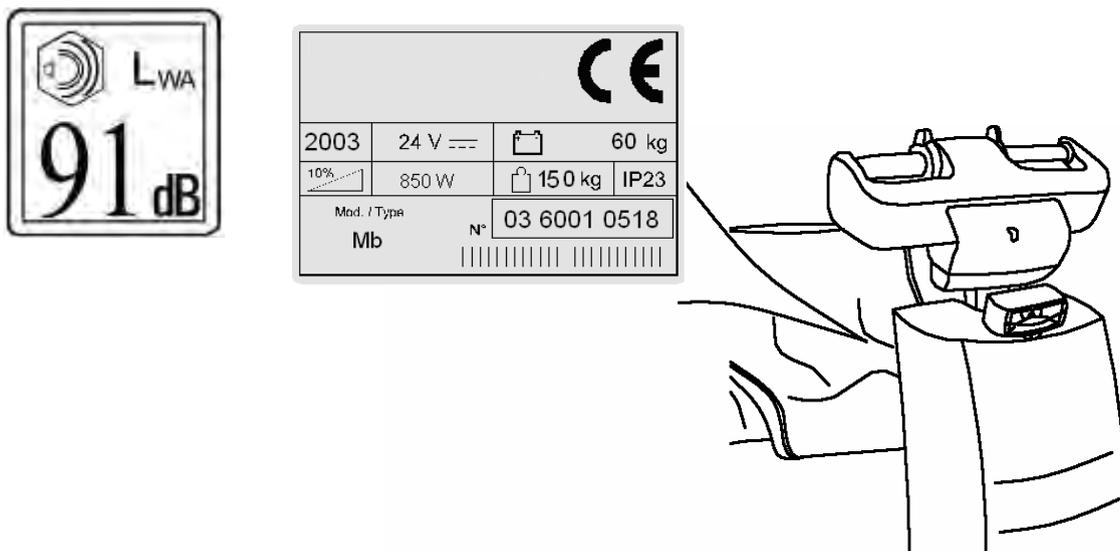
## Introduction

Any machine can only work efficiently when it is used correctly and it is maintained in full, efficient working order. We therefore encourage you to read this instruction manual thoroughly and to always refer to it first if any difficulties arise while using the machine. In addition we would inform you that our customer service department (in co-operation with our agents / distributors) is always at your complete disposal to answer any queries.

## Data for identification

For Technical service or when requesting spare parts, always state the model, the version and the serial number. These can be found on the serial plate.

Figure 1

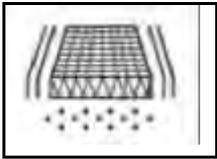


## TECHNICAL DATA

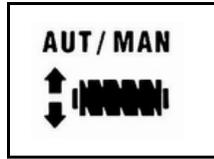
DUSTER M is a ride-on sweeping machine. The 'B' model is an electrically operated machine powered by traction batteries, used for cleaning internal or external hard floor surfaces eg tile, concrete or asphalt. This machine is designed to be operated on dry surfaces, however if it is used on wet surfaces the suction must be kept closed. The machine is characterized by a self-levelling main brush for wide-area sweeping, a side brush for corner, edge and perimeter cleaning and a vacuum suction system with filter to prevent dust being exhausted. A large hopper is provided for collection of the swept material which is manually emptied using the mechanical dumping system.

<b>TECHNICAL DATA</b>	<b>U/M</b>	<b>Mb</b>
Working width excluding side brush	mm	600
Working capacity	m <sup>2</sup> /h	2700
Max gradient	%	10 %
Dimensions of the central broom (Width x Dia.)	mm	600x265
Dirt hopper volume	l	50
Electric traction motor	V/W	24/250
Electric brush motor	V/W	24/600
Filter surface area	m <sup>2</sup>	3,2
Type of drive		Autom. traction
Forward speed	km/h	0-4,5
Machine length	mm	1250
Machine height	mm	1200
Machine width	mm	750
Traction battery set	V/Ah	24/140
Battery weight	kg	70
Machine weight (without batteries)	kg	150
Noise level (IEC 704/1)	dB (A)	72
Hand vibration level	m/sec.2	1,86
Body vibration level	m/sec.2	0,23

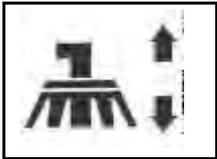
## SYMBOLS



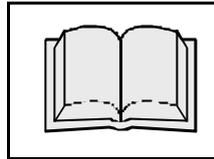
Filter shaker



Central broom rotation  
(automatic/manual traction)



Side brush



Open book symbol.  
Points out to read manual before  
using the machine.



Central broom



Warning symbol  
Read with care all instructions with  
this symbol to ensure operator and  
machine safety.



ON/OFF ( battery machine)



Suction



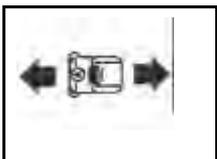
Batteries charge



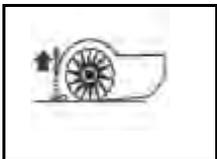
Parking brake



Service brake



Forward or reverse running



Flap lifting pedal

## PREPARATION OF THE MACHINE

### UNPACKING THE MACHINE

Figure 2

The machine is delivered packed on a pallet. To move it use a fork truck or a pulley block with sling.

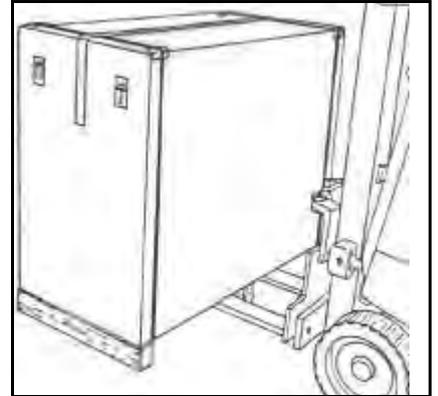


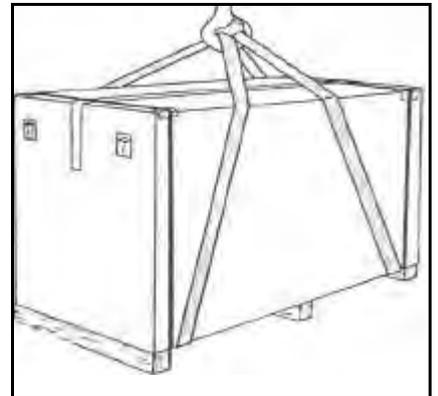
Figure 3

To remove the package proceed as follows:

1. Remove the fixing tapes
2. Remove the metal staples at package base.
3. Take off the carton.

Package size : 135x93x130.

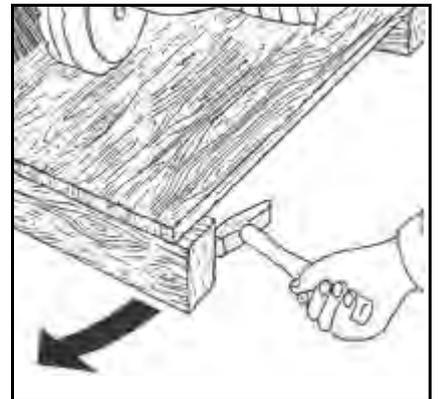
Weight of packed machine without batteries: 170 kg



### SLIDING THE MACHINE DOWN OFF THE PALLET

Figure 4

1. Use a hammer to remove the front crosspiece of the pallet to create a ramp.

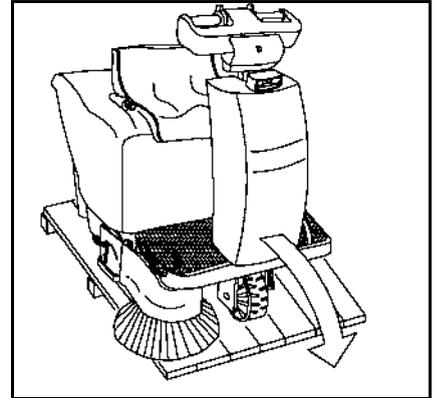


## PREPARATION OF THE MACHINE

### SLIDING THE MACHINE DOWN OFF THE PALLET

Figure 5

1. Close the bonnet and pull the machine forward such that it slides to the ground along the board.



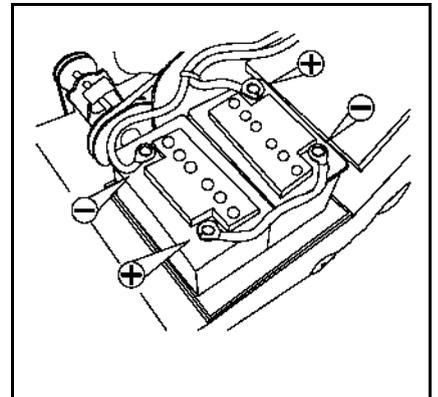
### BATTERIES ASSEMBLY AND CONNECTION (battery machine only)

Figure 6

For the best mix of economy and usage we suggest fitting 2 x 12V / 140Ah batteries. Before assembly, ensure the batteries are charged.

Assembly instructions:

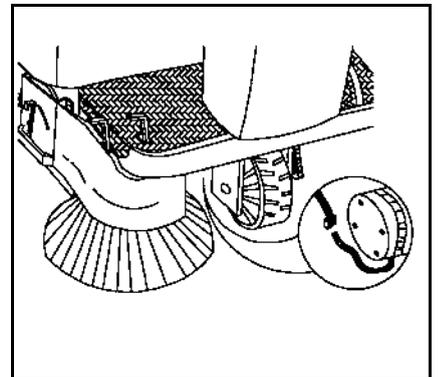
1. Remove the 'on/off' key from the lock.
2. Open the bonnet of the machine.
3. Using a suitable lifting method, position the batteries correctly in the compartment observing the polarity as in the attached picture.
4. Connect the bridge cables and the positive and the negative connections as in the attached picture.



### TRACTION MOTOR CONNECTION (battery machine only)

Figure 7

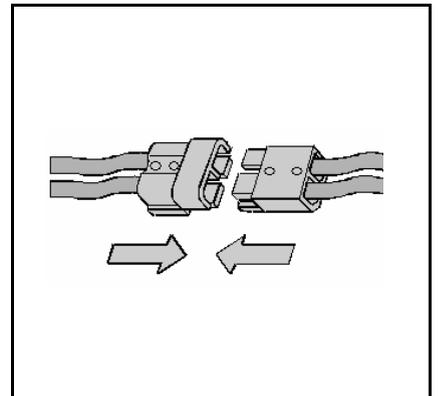
1. Take the key out of the instrument board
2. Connect the traction motor cable marked with the card.
3. Insert the key again



### BATTERY CHARGER CONNECTION

Figure 8

Open the front bonnet. Inside there is a female connector (see the picture) into which the male connector, (fixed to the battery charger cables), must be inserted. The male coupling connector is delivered in the bag containing this instruction catalogue and must be assembled on the charger cable. Pay attention to the polarities.



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## PREPARATION OF THE MACHINE

### BATTERIES RECHARGING

In order to avoid damage to the batteries, it is necessary to avoid their complete discharge. At the signal "0" flashing on the display of the charge indicator, the main broom stops, whilst vacuum and traction continue to work. There is therefore enough capacity left in the batteries to reach the recharge point.

**ATTENTION:** Never leave the batteries completely discharged, even if the machine is not used. During the recharge check the level of the electrolyte and top up with distilled water.

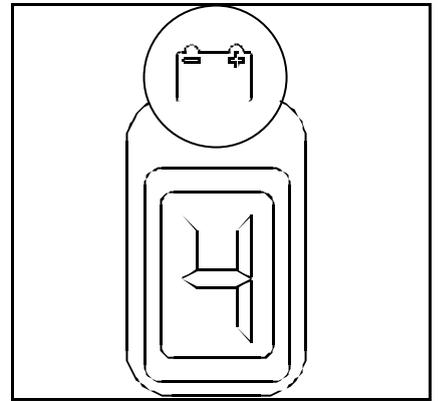
### BATTERY CHARGE LEVEL INDICATOR

Figure 9

The battery charge level indicator is digital with 4 fixed positions and a blinking one. The numbers which appear on the display show the approximate charge level.

4= maximum charge, 3= charge  $\frac{3}{4}$ , 2= charge  $\frac{2}{4}$ , 1= charge  $\frac{1}{4}$   
0= (blinking) discharged batteries

**ATTENTION:** A few seconds after the meter reads "0" it will start blinking, the brush motor will then automatically switch off.



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## GENERAL SAFETY REGULATIONS

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

- Read the labels carefully on the machine. Do not cover them for any reason and replace them immediately if damaged
- The machine must only be used by authorised staff who have been instructed in its use.
- During the operation of the machine, pay attention to other people around you, especially children.
- Do not place any liquid containers on to the machine.
- The storage temperature has to be between - 25°C and + 55° C.
- The perfect operating temperature should be between 0°C and 40°C.
- The humidity should be between 30 and 95 %.
- Do not use the machine in explosive atmospheres.
- Do not use the machine as a means of transport.
- Do not use acid solutions which could damage the machine and/or people.
- In order to prevent floor damage, do not leave brushes running when machine is standing still.
- Do not vacuum inflammable and/or explosive liquids or substances.
- In case of fire, use a powder extinguisher. Do not use water.
- Do not strike shelving or scaffoldings, where there is danger of falling objects.
- Adapt the speed of operation to the floor conditions to avoid skidding.
- Do not exceed the declared hill climbing capacity, otherwise the machine could become unstable.
- When the machine is in parking position, remove the key and apply the parking brake.
- If the machine does not work properly, check by conducting simple maintenance procedures. Otherwise, it is better to ask for NACE technical service.
- Where parts are required, ask for ORIGINAL spare parts from your agent and/or from an authorized NACE dealer.
- Prior to any maintenance operation remove the power supply from the machine.
- Do not remove any parts which require the use of tools to be removed except for maintenance.
- Do not wash the machine with direct water jets or with high water pressure nor with corrosive material.
- After every 200 working hours have a machine checked by a NACE service department.
- The machine should not be abandoned, because of the presence of toxic-harmful materials (batteries, oil etc.). This disposal must be subject to the rules which provide for its scrapping in appropriate centres.
- When scrapping the batteries refer to their proper 'Use and Maintenance' book.

## OPERATING THE MACHINE

### WORKING POSITION

Figure 10

The user operates while sitting, having manual lever and pedal controls on the instruments control board.



Figure 11

- a. Battery control indicator
- b. Central broom switch device
- c. Key start

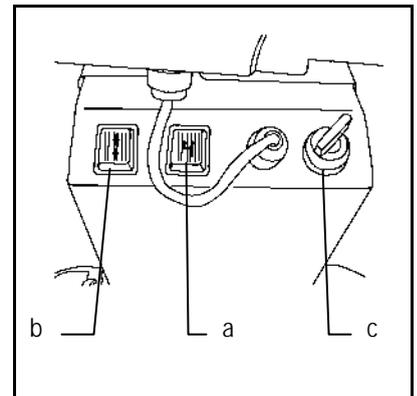
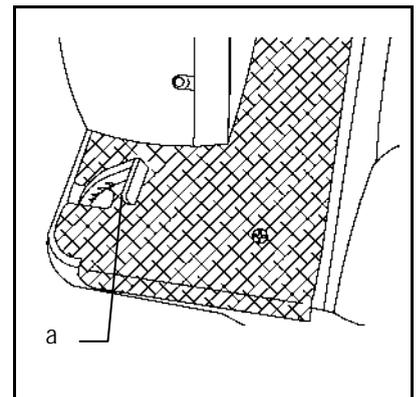


Figure 12

- a. Brake pedal.



## OPERATING THE MACHINE

Figure 13

- a. Side brush pedal
- b. Flap pedal
- c. Suction closing /filter shaker starting lever.

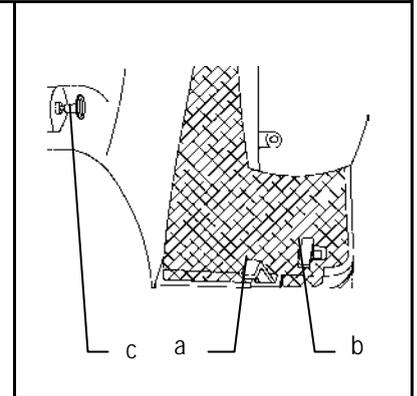
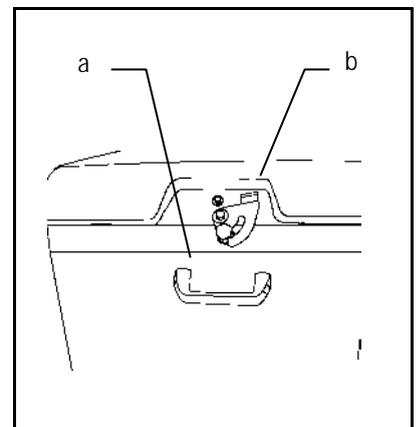


Figure 14

- a. Hopper handle
- b. Hopper opening lever



### STARTING

1. Make sure that the brushes are switched off, therefore the levers must be lifted (in a lifted position).
2. Turn the key on ON position.

OFF/O-ON/1

## USAGE

Figure 15

1. Make sure that the parking brake is released.

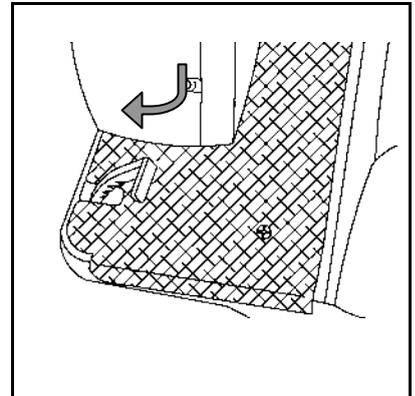


Figure 16

1. Make sure that the suction is opened

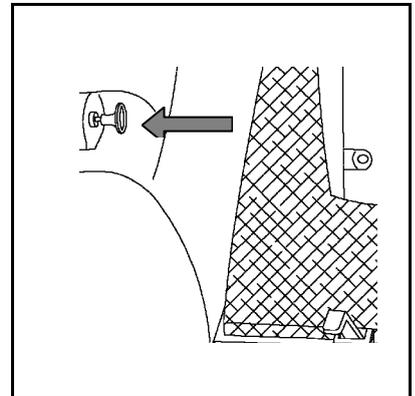


Figure 17

1. Use the side brush only to clean borders since it is not provided with suction.
2. Using your foot, lower the external lever and the brush locates automatically.
3. To stop the side brush only, push the lever outwards and the brush automatically retracts..

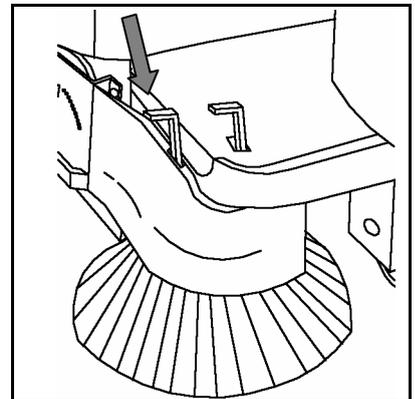
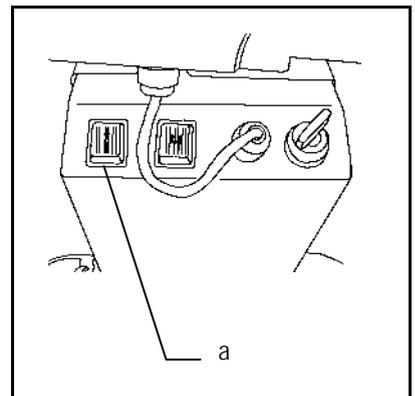


Figure 18

1. The central broom can work either with continuous or automatic working connected directly to the machine traction with the button (a) on the instrument board

**NOTE:** The use of the automatic system increases the batteries charge.



## USAGE

### BATTERY MACHINE

Figure 19

1. Select the direction of driving with the button (a) on the instrument board.
2. Adjust the machine speed according to the conditions and volume of dust and debris to collect.
3. When moving the machine the brushes must be raised.

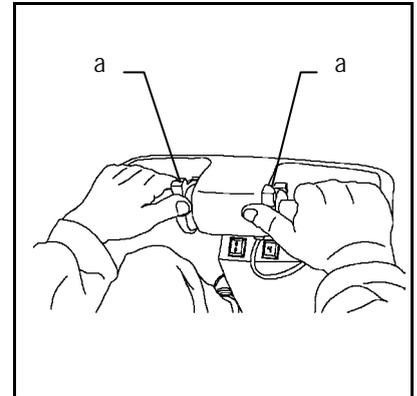


Figure 20

For the best suction performance clean the filter every 10 minutes and always before emptying the hopper proceed as follows :

1. Close the suction by pulling on knob "a"; after pulling completely the filter shaker starts automatically.

**NOTE:** avoid prolonged working of the filter shaker motor

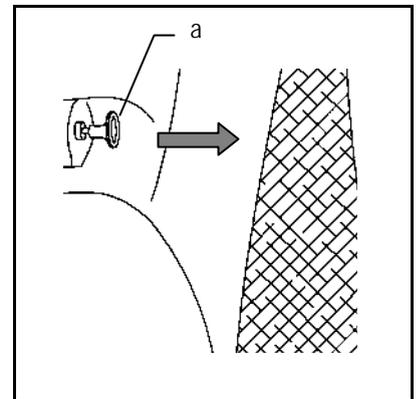


Figure 21

**NOTE:** Interrupt, or close suction whenever approaching wet surfaces to prevent any damage to the filter.

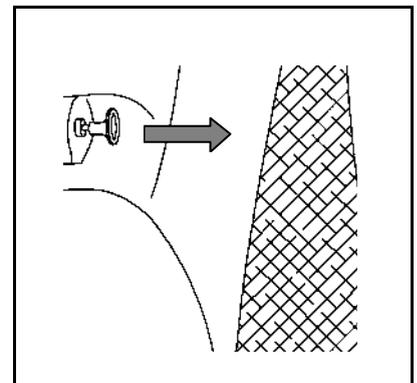
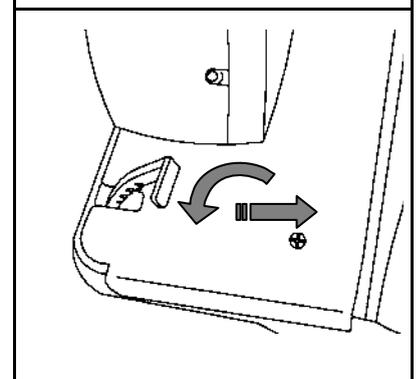


Figure 22

1. To slow down or stop, apply the brake by pushing the pedal.
2. When not in use, always apply the parking brake for parking especially on any inclines.

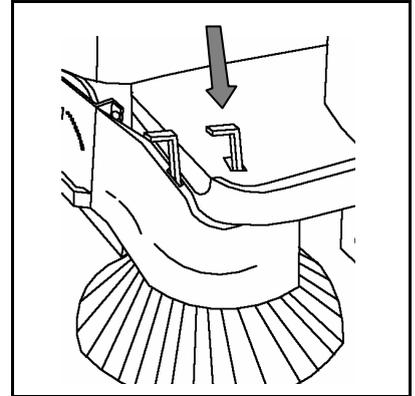
3. To insert it push the pedal and fasten it by pulling it
- NOTE:** It can be also used as an emergency brake.



## USAGE

Figure 23

Push the flap lifting pedal when there is bulky debris to collect in order to allow its entry and collection into the central broom. Do not keep the pedal pressed.

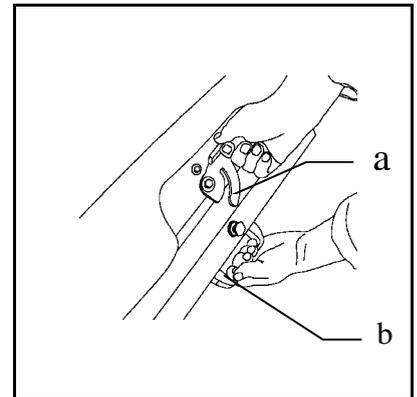


Periodically check the level of debris in the hopper and eventually empty it. Keep in mind that the weight of the collected waste is proportionate to the specific weight of the swept material. In case of heavy material such as sand, piece of soil, gravel, etc. we suggest you do not fill up the hopper more than about 70% otherwise emptying could prove difficult.

### DUMPING HOPPER

Figure 24

1. Rotate lever "a". counter clockwise and pull the hopper from the machine
2. Transport it to a dump area by using the handle "b" on the hopper itself.
3. For a better dust tight seal it may be necessary to clean the hopper basket with a low-pressure air line. In case of damage or wear replace it immediately.
4. To assemble the hopper again, push it fully into place and fasten it with lever 'a'.



### AT THE END OF USE

1. Stop the machine.
2. Apply the parking brake
3. Activate the filter shaker.
4. Dump the debris hopper
5. Switch off the machine by turning the key to the **OFF** position

## MAINTENANCE PROCEDURES



**ATTENTION** : Before any adjustment and/or maintenance procedure always switch off the machine.



**ATTENTION:** disconnect the battery before starting any cleaning or maintenance procedure on the machine.

### CLEANING THE FILTER



**ATTENTION:** use gloves for protection when performing the steps listed below.

Once a week clean thoroughly the filter as follow :

Figure 25

1. Switch off the machine.
2. Remove the debris hopper.
3. Disconnect the connector of the filter shaker "a"
4. Slightly loosen (not completely) the lower knobs "b"
5. Rotate by 180° the upper locking levers "c", take out the filter support frame using the same levers.

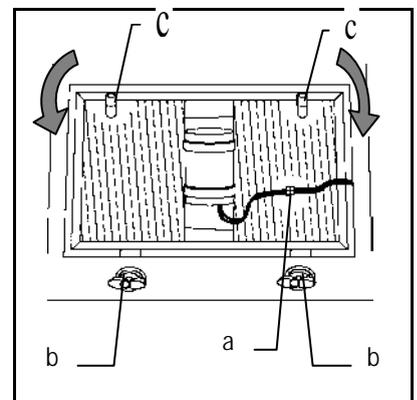
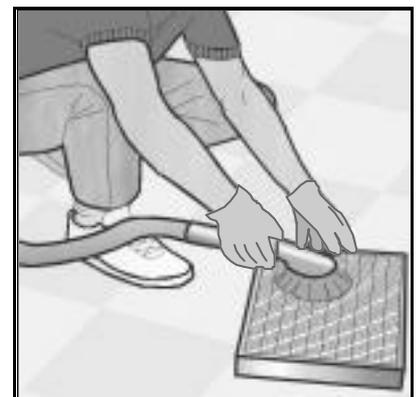


Figure 26

1. Carefully clean the filter using a vacuum cleaner or (if a vacuum is not available) gently shake the filter manually.
2. Reassemble all parts following the above operations in reverse.



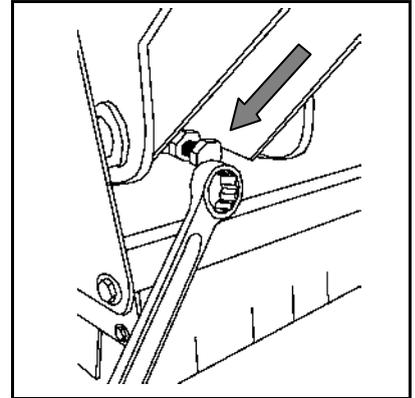
## MAINTENANCE PROCEDURES

### ADJUSTMENT OF SIDE BRUSH

Figure 27

The regulation of the brush pressure on the floor can be made by adjusting the screw behind the brush arm itself:

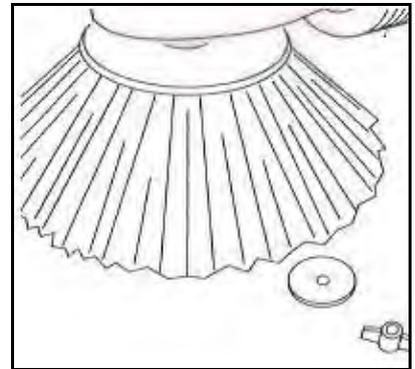
1. Loosen the lock nut.
2. Rotate the register screw counter clockwise until the bristles rest on the floor by about 2 cm.



### SIDE BRUSH REPLACEMENT

Figure 28

1. Unscrew the brush fixing knob. Remove the brush paying attention not to lose the washer and the knob .
2. Grease the shaft
3. Insert the new brush by putting the key into its place. Reassemble the washer and the knob.



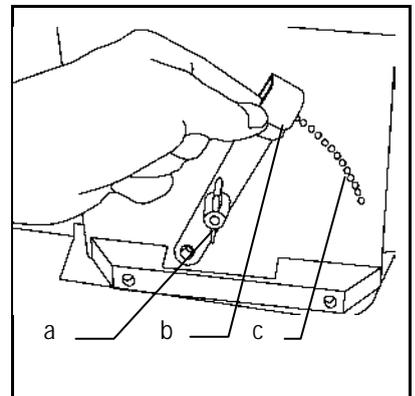
### ADJUSTMENT OF CENTRAL BROOM

Figure 29

To adjust loosen the knob "a" and position the lever "b" in the following eyelets "c".

Make the same adjustment on the opposite side.

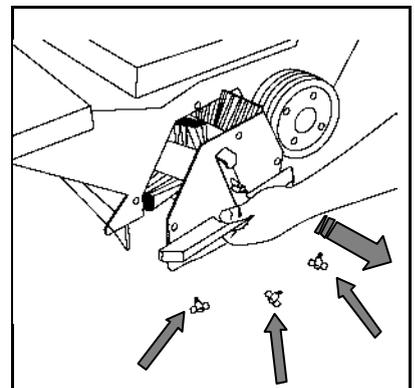
During adjustment follow the broom alignment.



### CENTRAL BROOM REPLACEMENT

Figure 30

1. Unscrew and remove all the knobs shown in the picture, and take out the brush support group.
2. Remove the worn broom and insert the new broom. ATTENTION: keep the same sense of direction of the bristles.
3. Reassemble the support group and the knobs in reverse order.



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## TROUBLE SHOOTING GUIDE

### **THE CENTRAL BROOM DOES NOT CLEAN**

1. The broom is worn or improperly positioned: adjust its position or, if necessary have it replaced at your nearest NACE service center.
2. The waste bin is full: empty it.

### **THE MACHINE CREATES AIRBORNE DUST IN USE**

1. The flaps that ensure good suctions are torn. Replace them.
2. The front flap is broken and the machine throws heavy dirty and waste forward: replace the front flap.
3. The filter is clogged: thoroughly clean the filter.

### **HIGH NOISE OR ABNORMAL NOISE FROM THE CENTRAL BROOM**

1. Material is wound around the broom: remove.

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## SCRAPPING OF THE MACHINE

The machine is composed of: iron materials, plastics, rubber. The battery-operated version of the machine is also equipped with a battery which may have to be replaced several times during the working life of the machine. We advise you use authorised waste collection and disposal agencies to ensure ecological waste disposal when replacing the battery or dismantling the machine.

For batteries replacement, please read batteries' use and maintenance book, either for their maintenance or their scrapping.