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## Receiving the machine

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Immediately check, when receiving the machine, that all the materials indicated on delivery documents have been received and also that the machine has not been damaged in transit. If it has been damaged, this damage must be immediately reported to the shipper and also to our customer service department. Only acting promptly in this manner will make it possible to receive missing material and to be compensated for damage.

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## Foreword

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This is a single-brush machine that uses the mechanical action of a disk-shaped pad to polish a wide range of floors and types of dirt, vacuuming the dust that is created as it moves forward into a disposable filter-bag.

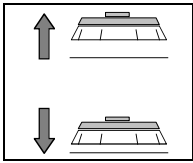
**The machine must only be used for this function.** Even the best machines will only operate efficiently and work with profit if they are used properly and kept in perfect operating order. Read this instruction booklet carefully and consult it every time problems arise with machine operation. Remember that, if necessary, our service organization, in collaboration with our dealers, is always available for helpful hints or direct intervention.



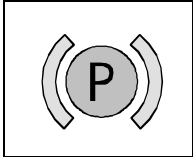
TECHNICAL DESCRIPTION	M/U	CM 50 hs
Working width	mm	510
Work capacity, up to	m <sup>2</sup> /h	1785
Disk brush (No. 1)	∅ mm	510
Brush revolutions	RPM	1400
Brush motor	W	1500
Pressure on the brush	kg	15
Traction motor	W	150
Front traction wheel	∅ mm	175x50
Forward speed	km/h	0÷3.5
Maximum slope when fully loaded	%	10
Bin capacity	l	4
Machine length	mm	1400
Machine height	mm	960
Machine width	mm	570
Battery compartment	mm	560x640xH480
Rated battery voltage	V	24
Battery capacity (C5)	Ah	320
Battery weight	kg	204
Machine weight (empty and without batteries)	kg	134



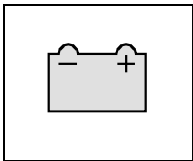
## SYMBOLS USED ON THE MACHINE



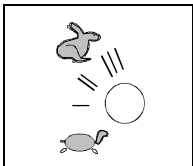
Pad base lift-lower symbol  
Used to indicate the base lift-lower switch



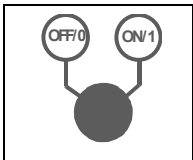
Brake symbol  
Used to indicate the signal lamp of the engaged hand brake  
Used above the emergency brake lever



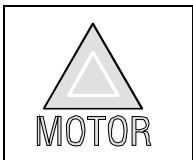
Battery charge level symbol



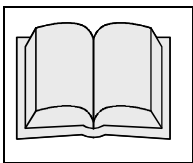
Forward/reverse speed selector symbol



Main switch symbol (key-operated switch)



Pad motor current consumption monitoring symbol (red signal lamp)  
The signal lamp turns on when the brush motor is under strain



Open book symbol  
Tells the worker to read the manual before operating the machine



## SYMBOLS USED IN THE MANUAL

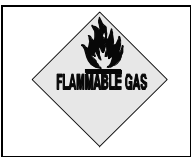


Warning symbol

Read sections preceded by this symbol with care: they concern the safety of the operator and the machine



Indicates danger of gas fumes and leakage of corrosive liquids



Indicates danger of fire

Do not approach with open flames



## PREPARING THE MACHINE

### 1. MOVING THE PACKAGED MACHINE

The machine is contained in specific packing with a platform so that it can be moved by a fork-lift. More than two packings cannot be stacked.

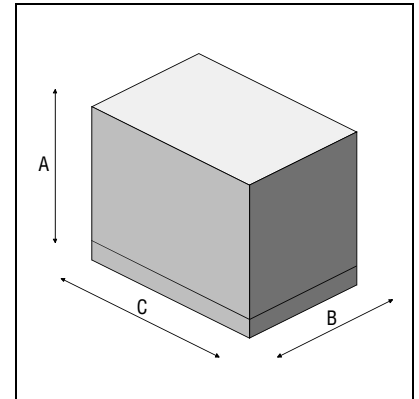
Total weight is 180 kg (without batteries)

Packing dimensions are:

**A:** 1230 mm

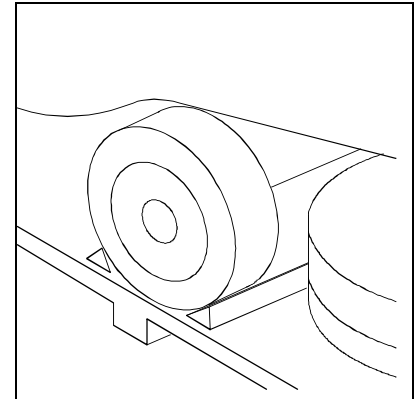
**B:** 740 mm

**C:** 1490 mm

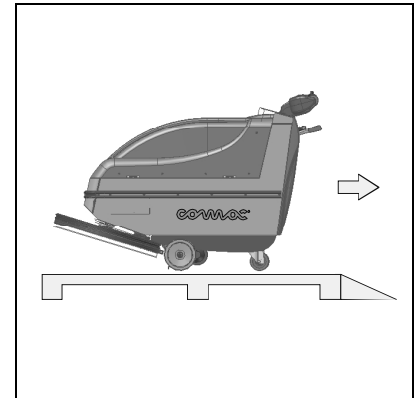


### 2. HOW TO UNPACK THE MACHINE

1. Remove the outer packing.
2. The machine is fastened to its platform by wedges that clamp its wheels.
3. Remove the wedges.



4. Use a ramp to lower the machine off the platform, pushing it in reverse. Avoid violent blows to the base.
5. Keep the platform since it may be necessary to transport the machine again.



### 3. CONNECTING THE TRACTION MOTOR CABLE (machines with traction)



**WARNING!** This procedure must be done by a **COMAC** Service Center technician.



## PREPARING THE MACHINE

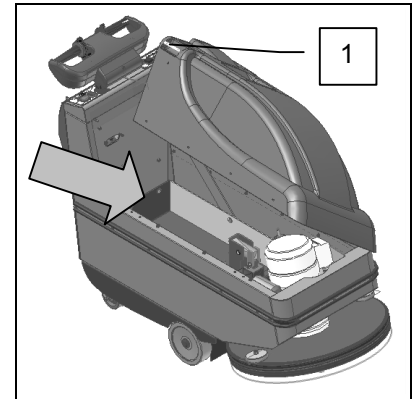
### 4. PUTTING THE BATTERIES IN THE MACHINE

The batteries must be housed in the battery compartment below the seat panel and must also comply with the requirements given in CEI 21-5 standards.

Battery compartment dimensions are: 540x640 H480 mm.

When inserting the batteries:

1. Use handle (1) to lift the hood and insert the safety strut
2. Position the batteries in the battery compartment



### 5. TYPE OF BATTERY

The machine must be powered using:

- flat or tubular plate lead-acid traction batteries with free electrolyte;
- gel-technology gas recombination hermetically sealed traction batteries.

**NO OTHER TYPES CAN BE USED.**

Each battery is composed of DIN cells connected in series and supplying 6V voltage across the terminals.

Maximum weight and dimensions are:

width 178 mm, length 295 mm, height 424 mm; weight 51kg

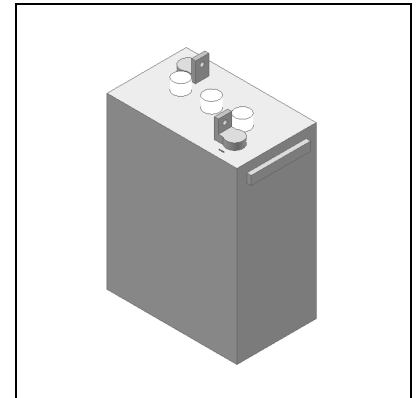
These must be handled using transport and hoisting equipment suitable for their size and weight.

Lift using the handles on the top.

They must be housed in the battery compartment with connection terminals directed towards the rear of the machine.

They must be connected in series together in order to have a 24V voltage across terminals.

Electrical connections must be made by trained and specialized personnel from the COMAC Service Center.



### 6. BATTERY MAINTENANCE

Comply with the battery manufacturer's instructions for battery maintenance and recharging.

Pay special attention when selecting the battery charger: it differs according to battery type and capacity.



## PREPARING THE MACHINE

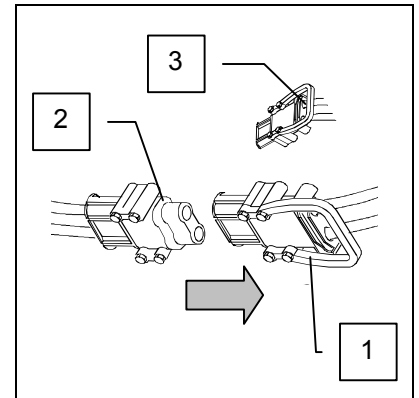
### 7. DISPOSAL METHODS

When the battery is run down it must be disconnected by trained and specialized personnel and then lifted using the handles on it and suitable hoisting equipment to remove it from the battery compartment.

**RUN-DOWN BATTERIES ARE CLASSIFIED AS HAZARDOUS WASTE AND MUST BE GIVEN TO A LEGALLY AUTHORIZED DISPOSAL AGENCY.**

### 8. CONNECTING THE BATTERY CHARGER

The connector is located low down compared to the driver's seat. Left part (1), connected to the batteries, must be detached from machine connector (2) and hooked up to the battery charger connector for charging. Hook-up connector (3) is delivered inside the bag that contains this instruction booklet. It must be first connected to battery charger cables according to instructions (refer to the battery charger manual).



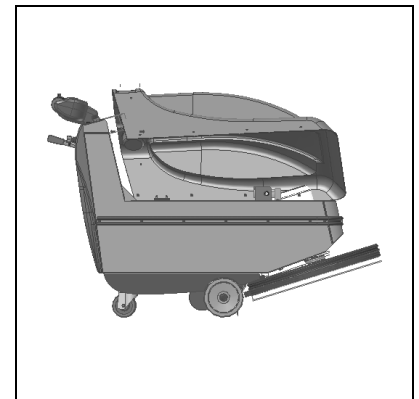
**WARNING!** This procedure must be done by qualified personnel. A mistaken or imperfect cable connection to the connector can cause severe damage to persons or property

### 9. BATTERY RECHARGING

Prevent permanent damage to the batteries by making sure they are never totally discharged. Recharge them just a few minutes after the flashing battery discharged signal starts to flash.



**NOTE:** Never leave the batteries totally discharged even if the machine is not being used. Keep the hood raised as illustrated when recharging. Make sure the battery charger is suitable for the type and capacity of the batteries that are installed.



**Danger of gas fumes and leakage of corrosive liquids.**



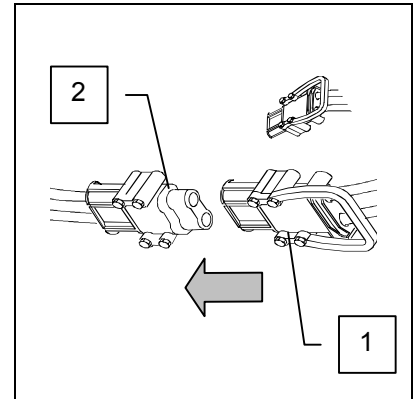
**Danger of fire.  
Do not approach with open flames**



## PREPARING THE MACHINE

### 10. CONNECTING THE BATTERY CONNECTOR

Battery connector (1) must be connected to machine connector (2)

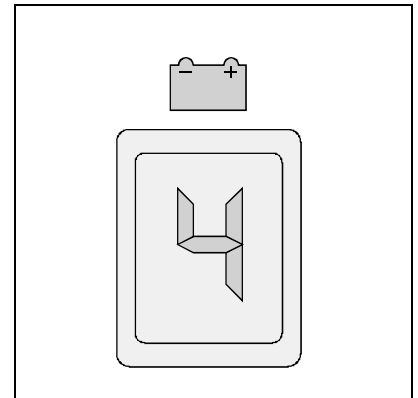


### 11. BATTERY CHARGE LEVEL GAUGE

The battery charge level gauge is a digital unit with 4 fixed and one flashing position.

The numbers on the display give an approximate idea of the state of charge:

**4** = maximum charge, **3** = 3/4 charge, **2** = 2/4 charge, **1** = 1/4 charge, **0**= batteries discharged (flashing)



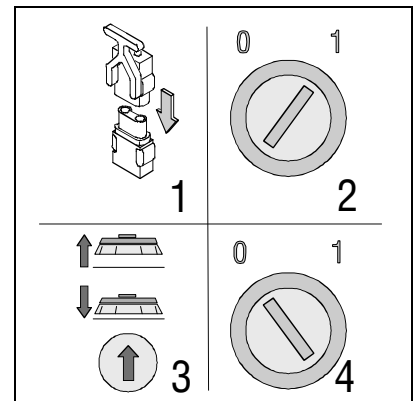
**WARNING!** The brush motor automatically turns off a few seconds after the flashing "0" appears. The remaining charge can be used to move the machine to the recharging point.

### 12. INSTALLING THE PAD

1. Connect the battery connector
2. Turn the key to "1"
3. Operate the lever to lift the base
4. Turn the key to "0" and pull it out from the dashboard



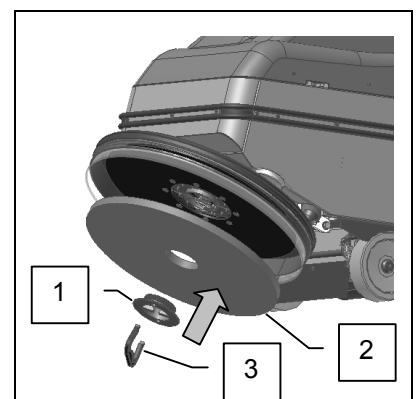
**WARNING!** Make sure no persons or objects are in the vicinity of the base when doing this.



5. Keep the base in its raised position. Unscrew (rotating counterclockwise) ring (1). Install pad (2) on the disk drive plate. Use one hand to support the pad and the other to tighten the fastening ring (rotating it clockwise), using handle (3) provided with the machine.



**WARNING!** Wear suitable safety gloves before installing the pad.







## GENERAL SAFETY REGULATIONS

Follow these regulations carefully to avoid harm to the operator and damage to the machine.

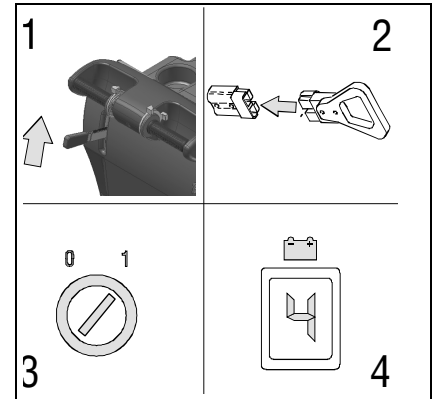
- Read the labels on the machine carefully. Never cover them for any reason and immediately replace them if they are damaged
- The machine must be used exclusively by authorized and trained personnel
- When operating the machine be careful of other persons and of children in particular
- Never mix different types of detergents: this could generate noxious gases
- Never set containers of liquid on the machine
- Machine storage temperature must be between  $-25^{\circ}\text{C}$  and  $+55^{\circ}\text{C}$
- Operating conditions: room temperature between  $0^{\circ}\text{C}$  and  $40^{\circ}\text{C}$  with relative humidity between 30 and 95%.
- Never use the machine in an explosive environment
- Never use the machine to transport goods
- Never use acid solutions which could damage the machine and/or persons
- Avoid running the brushes with the machine stopped: this could damage the floor
- Never suck flammable liquids
- Never use the appliance to collect dangerous powders.
- Use a powder fire extinguisher in case of fire. Do not use water
- Do not hit against shelving or scaffolding when there is a danger of falling objects
- Suit operating speed to traction conditions
- Do not use the appliance on surfaces with a slope higher than the one indicated on the name-plate.
- Whenever you park the machine remove the key and apply the parking brake
- Whenever the machine has operating troubles make sure these are not due to insufficient ordinary maintenance. If this is not the case then enquire with your nearest **COMAC** service center
- When replacing machine parts always ask for ORIGINAL spare parts from your Authorized **COMAC** dealer and/or Retailer
- Use only original **COMAC** polishing pads
- Immediately engage the emergency lever in case of danger (connector placed below the machine operator)
- Always cut off the electric power supply to the machine whenever maintenance is performed
- Restore all electrical connections after terminating any maintenance procedures
- Never remove guards that require tools for removal
- Never wash the machine with direct or pressurized jets of water or with corrosive substances
- Have your nearest **COMAC** service center check the machine every 200 operating hours
- Before you use the machine make sure that all doors and covers are positioned as shown in this operating and maintenance manual
- Dispose of consumables in accordance with currently applicable laws and codes
- When, after years of precious work, your **COMAC** machine is ready to be retired all of its component materials must be properly disposed of: they contain oils, batteries and electronic components. Remember that the machine itself was built using totally recyclable materials



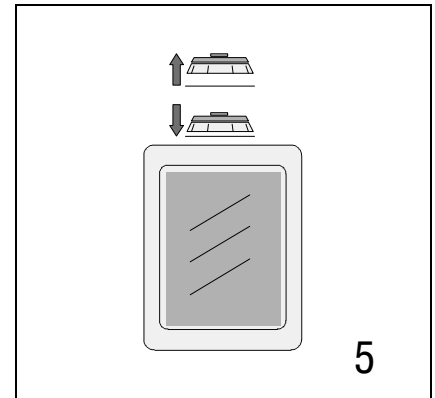
## OPERATION

### PREPARING TO WORK

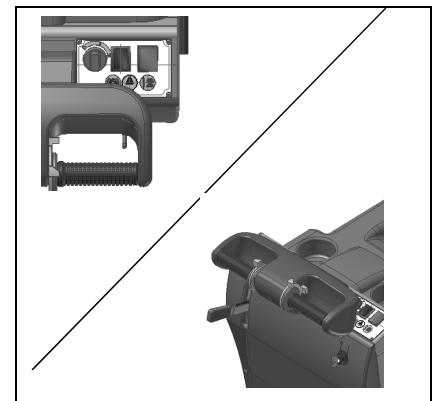
1. Prepare the machine for operation
2. Check that the parking brake is released (1)
3. Connect the battery connector (2)
4. Turn main switch key (3) clockwise to "1". Display (4) on the dashboard will immediately turn on and indicate the level of the battery charge and the hour counter.



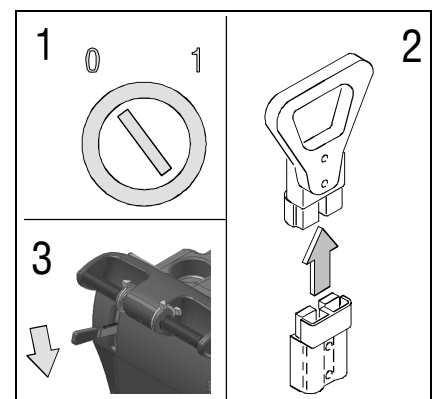
6. Press base-pad lift-lower switch (5) down to lower the base. The brush will only start to rotate when you actuate the control lever on the handlebar.



7. Select forward speed turning knob (7). The selector has three positions, indicated by symbols: turtle = slow speed, middle position = normal speed, rabbit = fast speed
8. The machine starts to move forward by actuating man-present lever (8) on the handlebar. The base will start to lower and when it is all the way down the polishing pad will start to rotate (release the lever on the handlebar and the base will lift a few centimeters and the pad will stop)
9. Check work quality during the first few meters of work.



**Whenever problems arise during operation turn off key (1), quickly detach emergency lever (2) placed below the operator and set the emergency brake by pushing lever (3) down.** These procedures will block all machine movements. To start working again, after you have solved the problem, reconnect connector (2), turn key (1) and release parking brake lever (3).

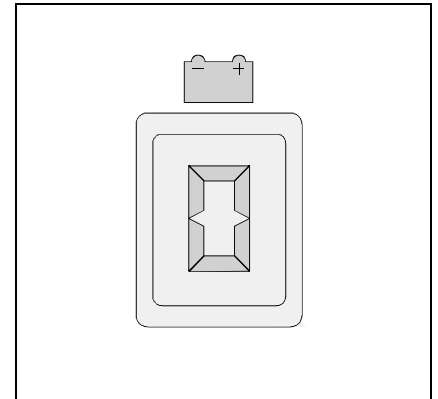




## OPERATION

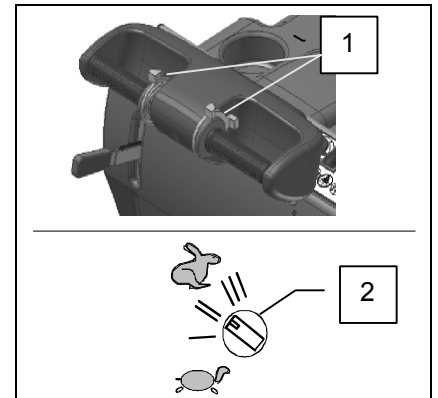
A “flashing zero” appears on the display when the battery charge level is getting too low. The pad motor automatically turns off. Batteries must be recharged as soon as possible.

A residual charge remains so as to move the machine to the recharging point.



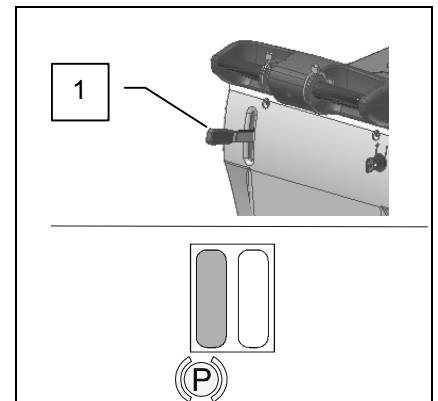
### TRACTION

This machine has an electronically controlled traction with three forward and three reverse speeds. To move the machine first turn the key and then move man-present lever (1) on the handlebar forward (to move forward) or backward (to move in reverse). Push it forward and the machine will move. Rotate selector to adjust forward movement speed. An audio signal will sound when the machine is moving in reverse.



### BRAKES

The machine has an electronic braking system. To brake, in normal conditions, just release the man-present lever. If the service brake does not operate properly or in case of need (parking, danger, etc.) actuate the mechanical brake by pushing the lever down (1) (red signal lamp ON).

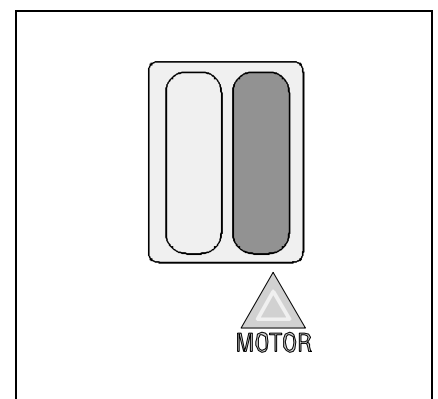


### POLISHING PAD MOTOR



**WARNING!** The pad motor starts only when the machine is moving forward in order to prevent damage to the floors.

The pad motor is electronically controlled. The red signal lamp on the dashboard starts to flash when preset overload limits are reached. After a few seconds the motor will stop and the pad switch signal lamp will turn off. To start the motor up again you must turn the main switch key off and on. If the motor stops again you must find the cause of the overload to prevent damage to the motor.

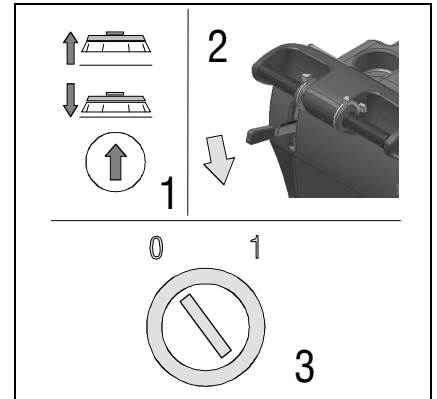




## AFTER WORK IS TERMINATED

At the end of the work, before performing any type of maintenance proceed as follows

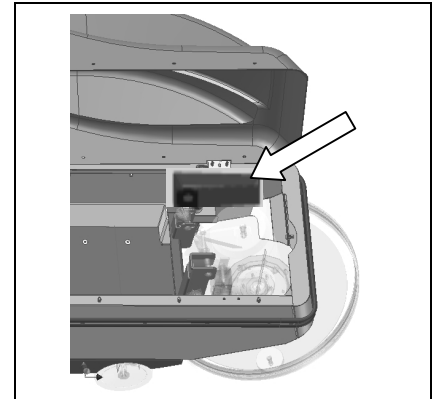
1. Actuate switch (2) to lift the base
2. Park the machine and actuate the parking brake
3. Turn the key to position "0" to turn the machine off



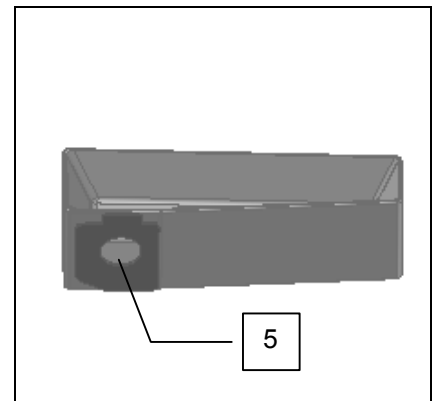
5. Lift the hood and install the safety strut



**WARNING!** Always wear gloves when doing this to protect yourself from contact with hazardous solutions.



6. Replace disposable filter (7)
7. Remove the safety strut and lower the hood





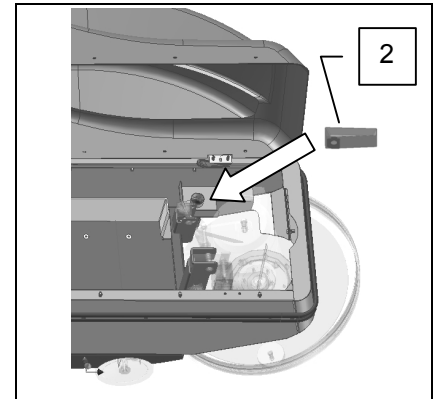
## DAILY MAINTENANCE

### REPLACING THE DUST COLLECTION FILTER

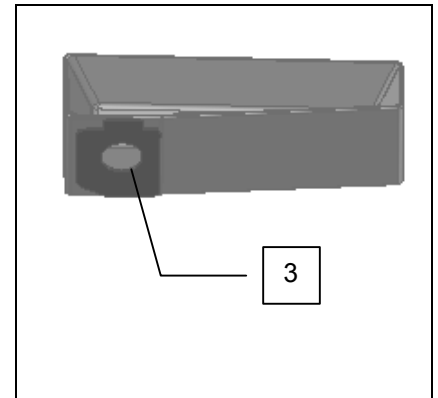
1. Lift the hood and install the safety strut



**WARNING!** Use gloves when doing this to protect yourself against contact with dangerous liquids.



2. Lift the filter up and out
3. Install a new filter (3) in the filter seat
4. Remove the safety strut and lower the hood

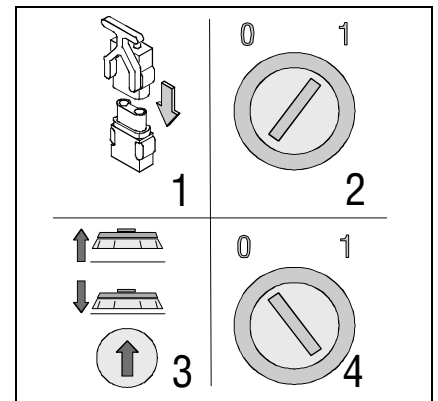


### REMOVING THE PAD

1. Connect the battery connector if it is not connected
2. Turn the key to position "1"
3. Use the control switch to lift the base (if it isn't already lifted)
4. Turn the key to "0" and pull it out from the dashboard (hand injuries may be caused if the pad is removed with power on)



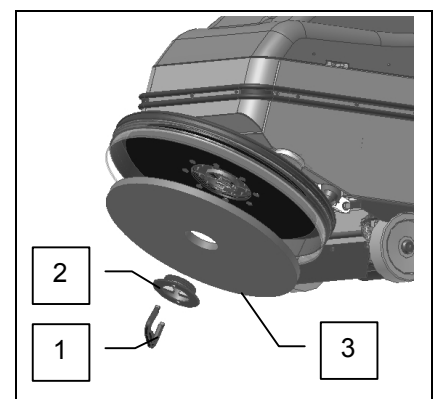
**WARNING!** Make sure there are no objects or persons in the vicinity of the base when doing this.



5. Keep the base in its raised position. Unscrew (rotating counterclockwise) fastening screw (2) using handle (1) provided with the drive disk. Replace pad (3). Use one hand to support the pad and the other to tighten ring (2) (rotating it clockwise) using handle (3).



**WARNING!** Wear gloves when doing this to protect yourself against possible contact with dangerous materials and liquids.



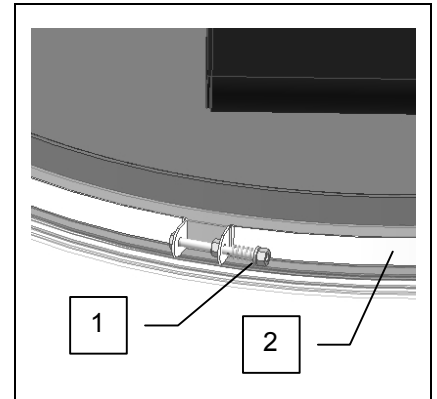


## EXTRAORDINARY MAINTENANCE

### REPLACING THE BASE SPLASHGUARDS

Periodically check the state of wear of the base splashguards. To replace them proceed as follows:

1. Lift the base
2. Install the pad
3. Lower the base until it touches the floor
4. Turn the key to "0" and pull it out from the dashboard
5. Loosen nut (1) and pull out the splashguard blade (2)
6. Remove the splashguard rubber and replace it
7. Reinstall everything by performing these procedures in reverse order. Make sure the rubber touches the floor.

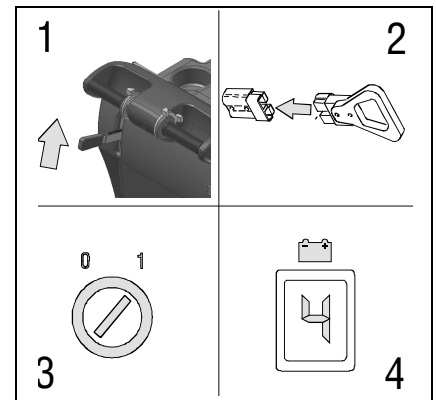




## SOLUTION FOR THE MOST FREQUENT TROUBLES

### MACHINE DOES NOT START

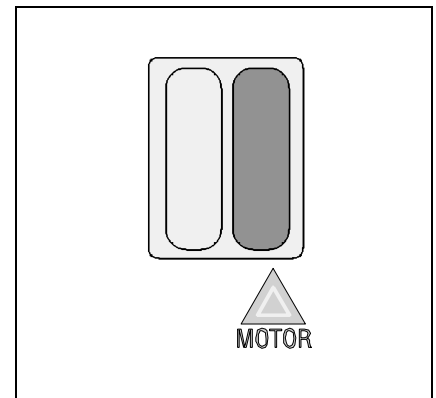
1. Check that parking brake pedal (1) is released
2. Check that connector (2) is connected to the batteries
3. Check that key-operated switch (3) is on
4. Check signal device (4) to make sure the batteries are charged
5. Check that no thermal cutout has tripped (see ELECTRICAL FUSES AND THERMAL CUTOUTS)



### PAD MOTOR DOES NOT OPERATE

**WARNING!** The pad motor only starts when the machine is moving forward in order to prevent damage to the floors

1. Check that the base is lowered down
2. Check the signal device to make sure the batteries are charged
3. Check that no thermal cutout has tripped.



### IMPOSSIBLE TO LIFT OR LOWER THE BASE

Check that the thermal cutout has not tripped (see ELECTRICAL FUSES AND THERMAL CUTOUTS)

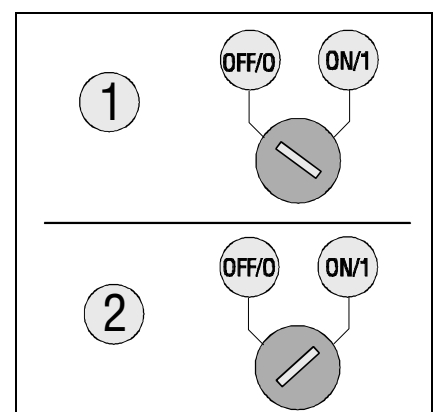
### ELECTRICAL FUSES AND THERMAL CUTOUTS

The machine is equipped with the following electrical protection systems:

- Power fuses placed on the machine left side to protect against short-circuits. Whenever a fuse blows check for the causes of the malfunction carefully and eliminate them before replacing the fuse.
- Low-current resettable fuses to protect:
  - General services
  - Traction control system

When a resettable fuse trips first turn the key to OFF (1), wait a few seconds and then turn the key to ON (2).

Turn to your authorized COMAC Service Center if the problem persists.





## SELECTING AND USING POLISHING PADS

### POLISHING PAD

Machine	No. of Pads	Pad diameter	
CM 50hs	1	508	