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CS 60 II

Ed. 09/2006

Codice 410856



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On delivery of the machine

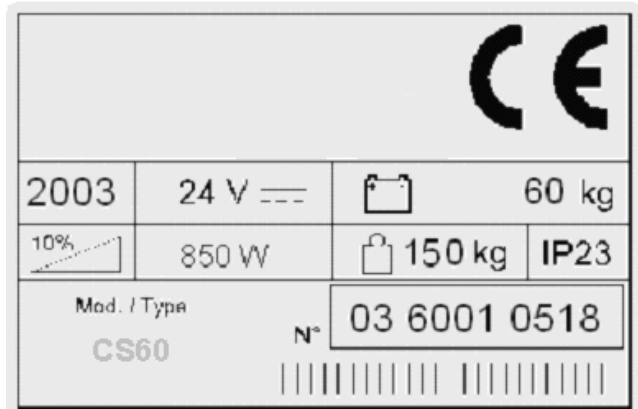
When the machine is delivered to the customer, an immediate check must be performed to ensure all the material mentioned in the shipping documents have been received and also to check that the machine has not suffered any damage during transportation. If damage has occurred, get the shipping agent to 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.



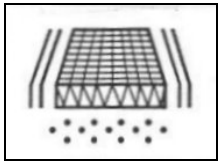
TECHNICAL DATA

CS60 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.

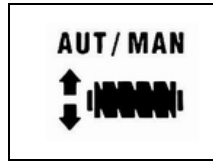
TECHNICAL DATA	U/M	CS 60 II
Working width excluding side brush	mm	600
Working capacity	m ² /h	2700
Max gradient	%	10%
Dimensions of the central broom	mm	600x265
Dirt hopper volume	l	50
Electric traction motor power	V/W	24/250
Electric brush motor power	V/W	24/600
Filter surface area	m ²	3,2
Type of drive		aut.
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/s ²	1,86
Body vibration level	m/s ²	0,23



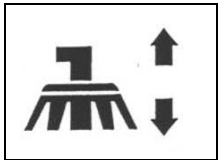
SYMBOLS



Filter shaker



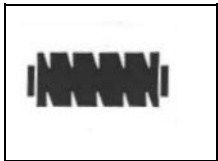
Central broom rotation
(automatic/manual traction)



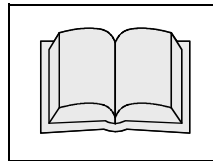
Side brush



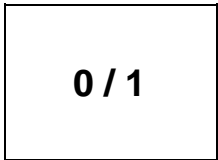
Horn



Central broom



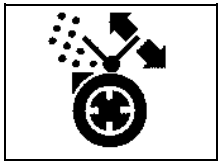
Open book symbol.
Points out to read manual before
using the machine.



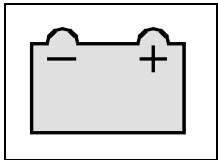
ON/OFF (battery machine)



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



Suction



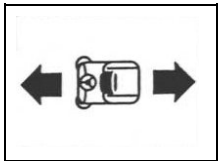
Batteries charge



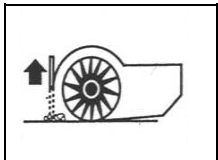
Parking brake



Service brake



Forward or reverse running



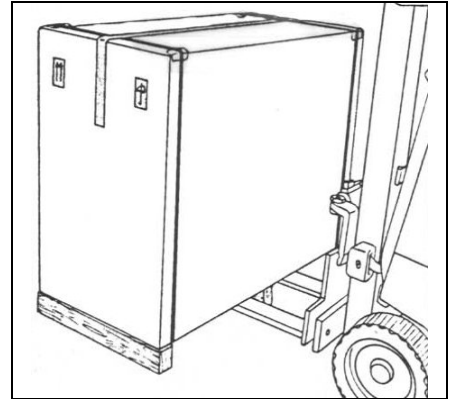
Flap lifting pedal



PREPARATION OF THE MACHINE

1. UNPACKING THE MACHINE

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



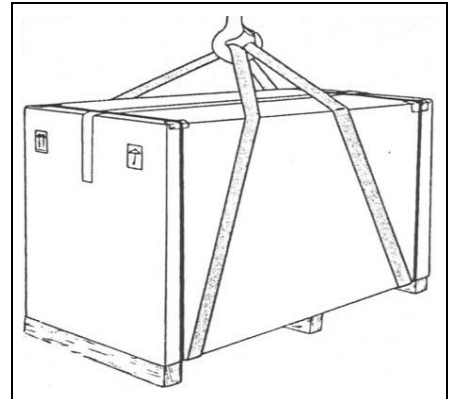
2. REMOVING THE PACKAGE

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.

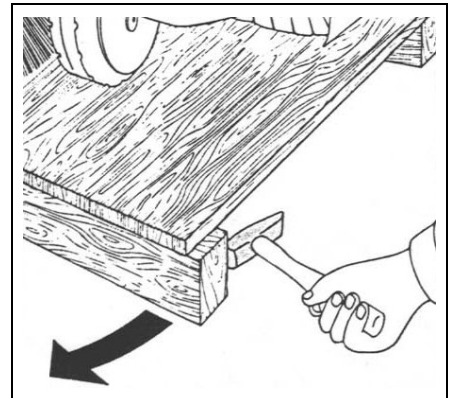
Package size in cm: 135x93x130.

Weight of packed machine without batteries: 170 kg

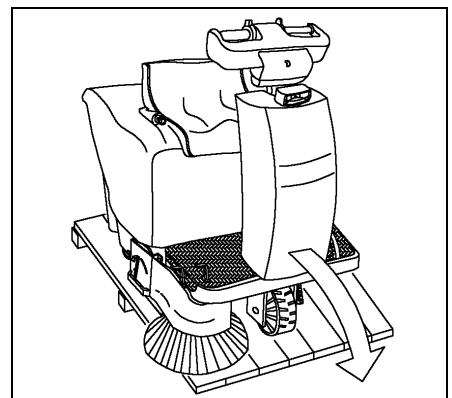


3. SLIDING THE MACHINE DOWN OFF THE PALLET

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



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





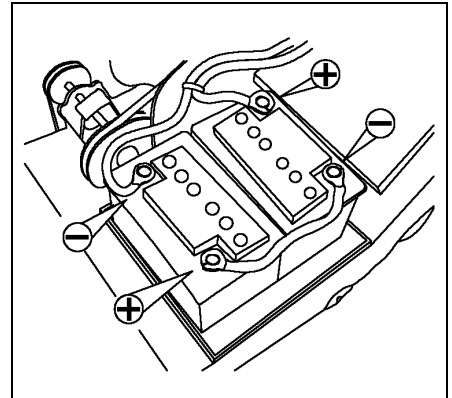
PREPARATION OF THE MACHINE

4. BATTERIES ASSEMBLY AND CONNECTION (battery machine only)

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

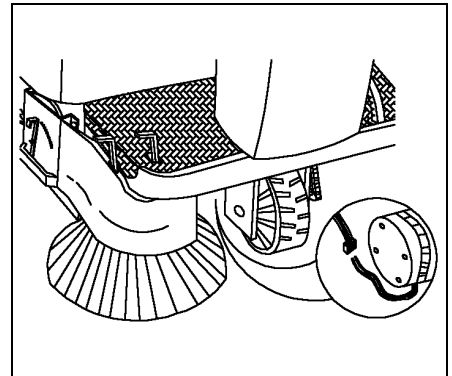
Assembly instructions:

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.



5. TRACTION MOTOR CONNECTION (battery machine only)

1. Take the key out of the instrument board.
2. Connect the traction motor cable, identified by the carton tag.
3. Insert the key again.

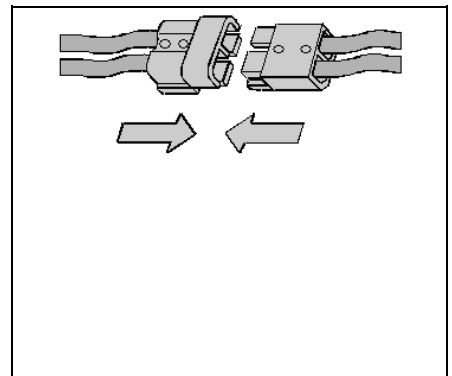


6. BATTERY CHARGER CONNECTION

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 instrument catalogue and must be assembled on the charger cable. Pay attention to the polarities.



ATTENTION! This operation must be done by qualified staff. A wrong or imperfect cables connection to the connector could cause heavy damages to people or things.



7. BATTERIES RECHARGING

In order to avoid damage to the batteries, it is necessary to avoid their complete discharge.

After having connected the batteries to the machine with the battery charger, proceed with the charge until it is completed. Usually the battery charger gives the necessary charge until its automatically stopping. We advise to use a 24V – 15A battery charger.



ATTENTION: with reference to the batteries space features, please see what there's in the last page.

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.



PREPARATION OF THE MACHINE

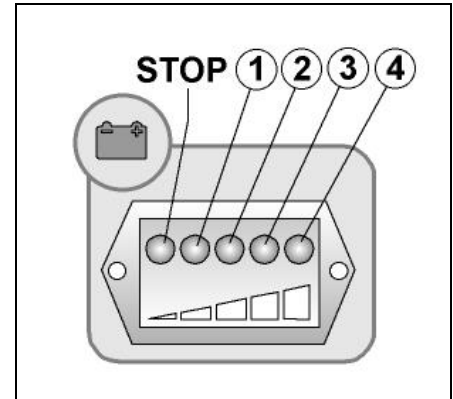
8. BATTERY CHARGE LEVEL INDICATOR

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



ATTENTION: a few seconds after the meter reads “0” it will start blinking, the brush motor will then automatically switch off, having only the capacity to reach the charge point.



ATTENTION! For the daily batteries recharge is necessary to follow with care the instructions given by the maker of by the reseller. All the installation and maintenance operations must be done by specialized people.



ATTENTION! Danger of gas exhalation and corrosive liquid leakage.



ATTENTION! Fire ranger: don't go near with blazes.



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 authorized 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 the machine.
- The storage temperature should be between -25°C and $+55^{\circ}\text{C}$.
- The perfect operative temperature must 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.
- 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 technical service COMAC S.p.A..
- Where parts are required, ask for ORIGINAL spare parts from your agent and/or from an authorized COMAC 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.
- 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 COMAC S.p.A. 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

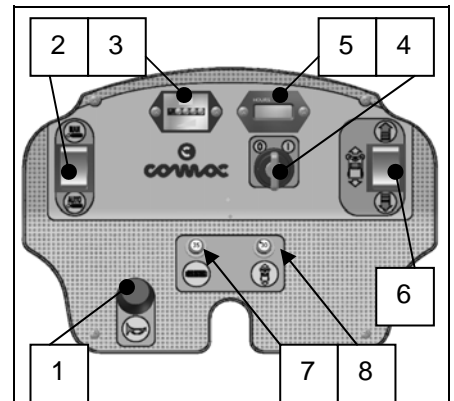
WORKING POSITION

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



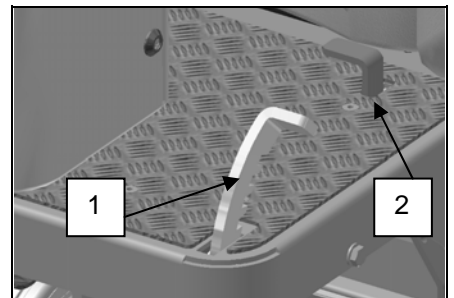
INSTRUMENT BOARD CONTROL POSITION

1. Horn
2. Central broom switch device (MAN/AUTO)
3. Battery control indicator
4. Key start
5. Hour meter
6. Gear way switch
7. Thermal protection (brush motor breaker)
8. Thermal protection (traction motor breaker)



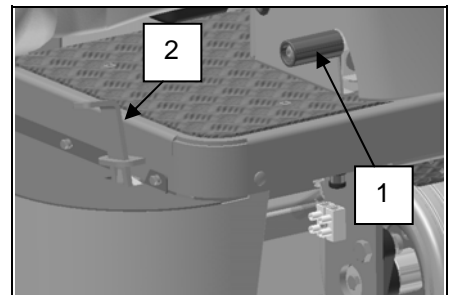
LEVER BRAKE AND FLAP POSITION

1. Parking and service brake lever
2. Flap control lever



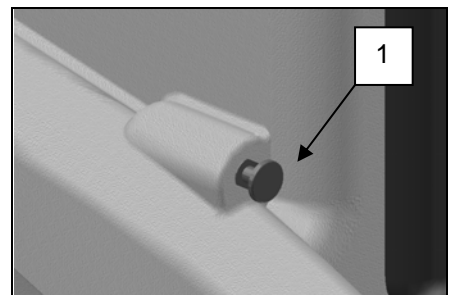
ACCELERATOR PEDAL AND SIDE BRUSH CONTROL LEVER POSITION

1. Accelerator pedal
2. Side brush control lever



SUCTION KNOB AND FILTER SHAKER POSITION

1. Suction knob



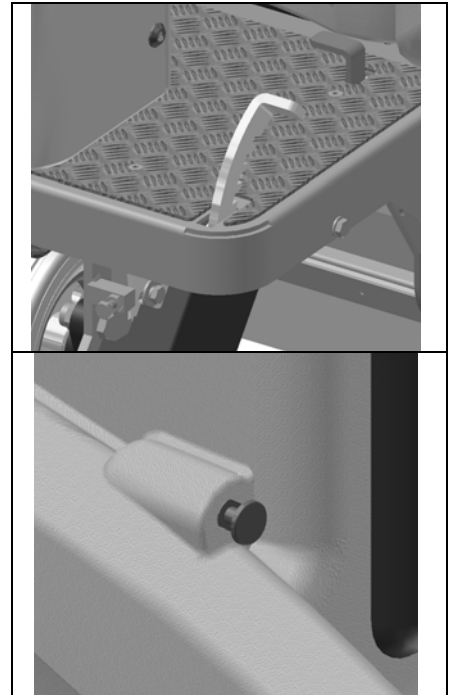


WORK

WARNING

Before to operate every type of work:

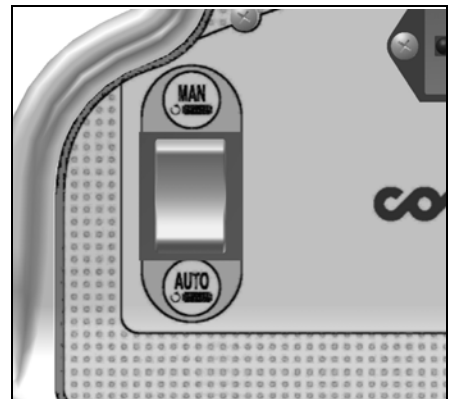
1. Make sure that the parking brake is released
2. Make sure that the suction opening knob is all inserted



OPERATION CENTRAL BRUSH SWITCH

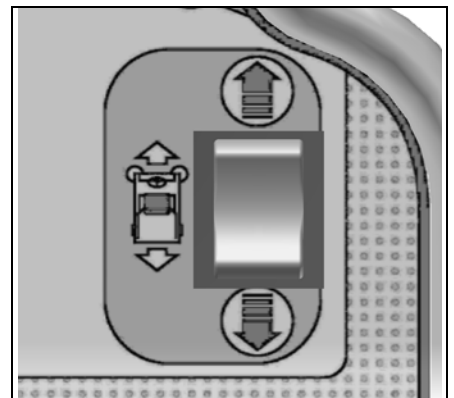
1. Push the brush motor switch in AUTO position. In this position the central brush starts to turn when the accelerator pedal is pressed. The stopping is automatically when the machine is stopped. In the position MAN instead the brush starts to turn when the key is turned in position I (ON) with the danger to ruin the floor because of a prolonged rubbing of the brush.

ATTENTION: The usage of the automatic system increase the batteries autonomy.



MACHINE DIRECTION SWITCH

Choose the gear direction of the machine operating the direction switch. The indicators show the side where the machine will moves.

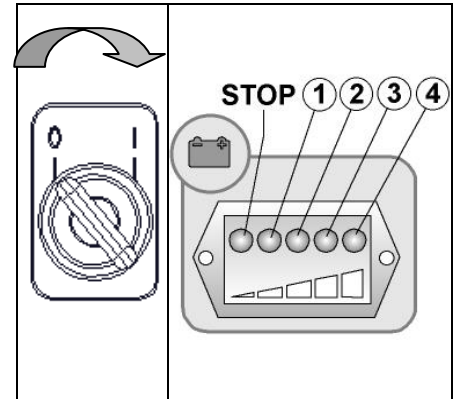




WORK

MACHINE STARTING SWITCH

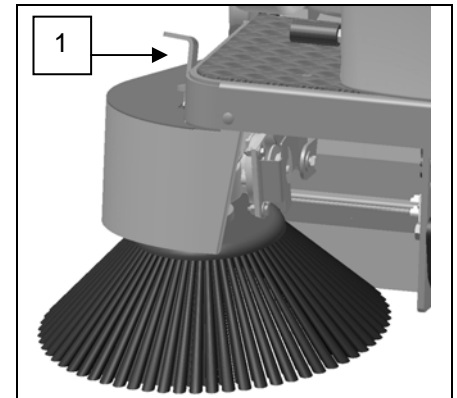
1. Turn the key in position **1** (clockwise direction).
2. Check that the batteries electric charge is enough to do the foreseen work.
4 = maximum charge, **3** = charge 3/4, **2** = charge 2/4, **1** = charge 1/4, **0** = discharged batteries (blinking)
To avoid permanent damages to batteries, it's essential to avoid the complete batteries discharge. When the meter reads "0" blinking on the display, the machine automatically switches off, having only the capacity to reach the charge point.



STARTING SIDE BRUSH

1. To operate the side brush, lower the external lever (1) until it arrives to the bottom plate base. The lever hooks automatically.
2. To stop the side brush rotation is enough to push the lever through the external. The lever lifts automatically and the brush will stop.

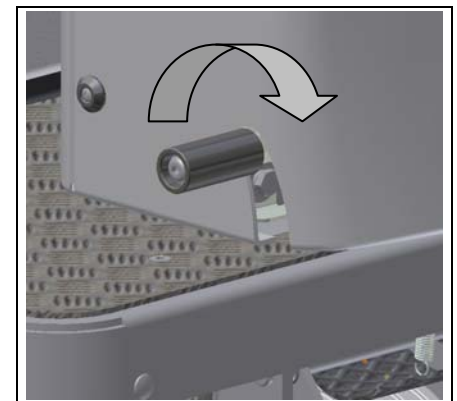
ATTENTION: Use the side brush only on the floor perimetric edge, because the collection is without the suction.



STARTING MACHINE

1. Push the accelerator pedal to move and regulate the machine speed according to the dust and waste quantity that are on the floor.
2. We advise to not use the brushes if a transfer gear is operated.

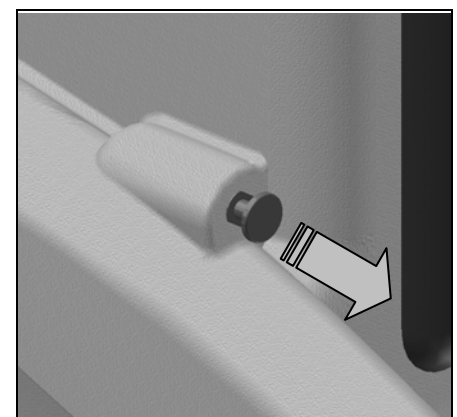
ATTENTION: the machine has a microswitch of presence operator on board that is under the seat. This microswitch doesn't allow to go on with the machine if the operator is not sit correctly.



SUCTION OPENING

The machine works in normal conditions with the closed knob because the dirty is not assembled by the brush and sucked up in the hopper. Operating on the knob you operate on the dirty suction. Pulling lightly, the dirty air flow in the hopper will stop. Pulling again few seconds the knob the filter shaker motor, that frees the dirty caught by the filter, is activated. To obtain efficient suction, clean the filter every about 10 minutes and always before every discharge of the hopper.

ATTENTION: Avoid the prolonged operating of the filter shaker motor. Close the suction when you work on wet or humid floor to avoid to ruin the filter.

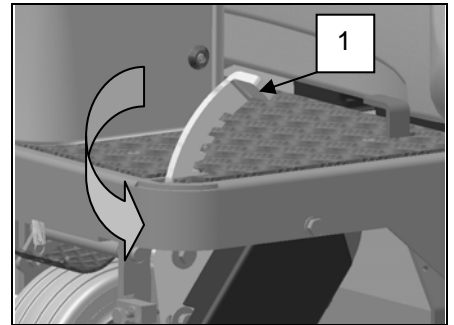




WORK

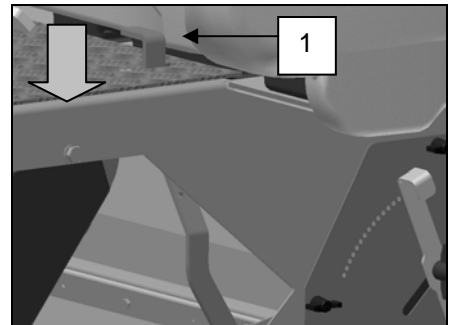
BRAKE OR EMERGENCY BRAKE USAGE

Operating on the lever (1) you operate to brake or stop the machine speed. To stop completely the gear press and push back the pedal until it stops. To unblock the lever push forward and lift the foot. Block the brake lever in case of parking or parking on sloping surface.



FLAP USAGE

Operating on the lever (1) you operate to open the flap. Push the pedal when there is bulky debris in order to allow its entry and collection into the central broom. Do not keep the pedal pressed.

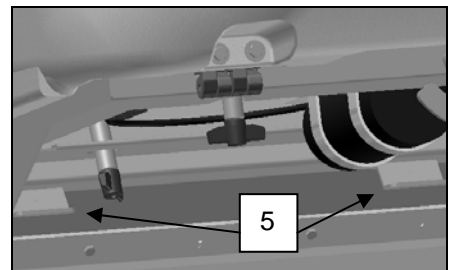
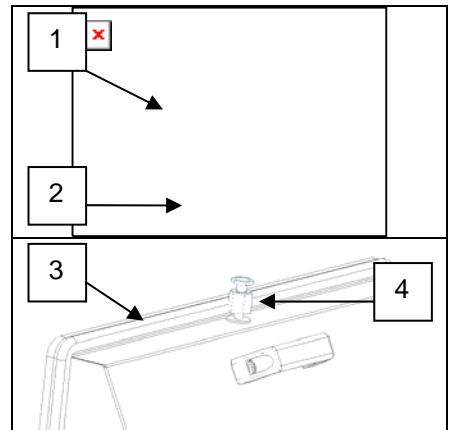


HOPPER EMPTYING

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.

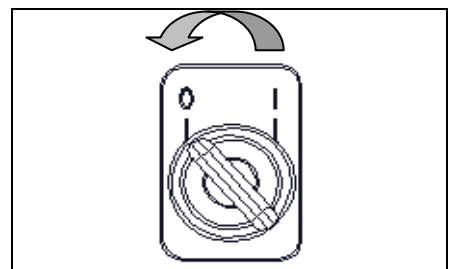
To dump the hopper from the machine proceed as follows:

1. Dump the hopper from the machine rotating clockwise the lever (1) until to free the hinge pin (4)
2. Transport it to a dump area by using the handle (2) and dump it.
3. Check that the gasket of the hopper (3) is clean so that it guarantees a good tightness.
3. To assemble again the hopper insert the edge into the two supports (5).
4. Lift the hopper until it is perfectly on the gasket (3) on the bodywork of the machine.
5. Rotate clockwise the lever (1) until to hook to the hinge pin (4) of the hopper.



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

WARNING



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.

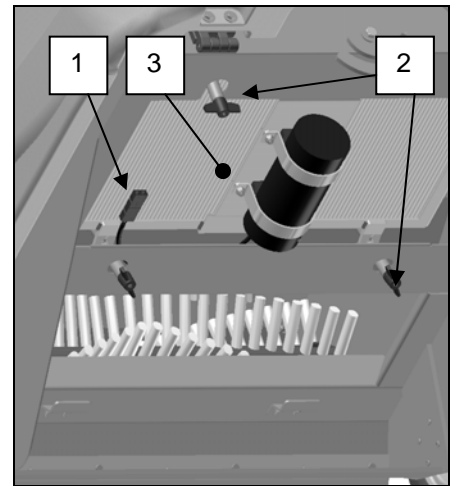
CLEANING THE FILTER

Once a week proceed with the cleaning of the filter operating as follows:

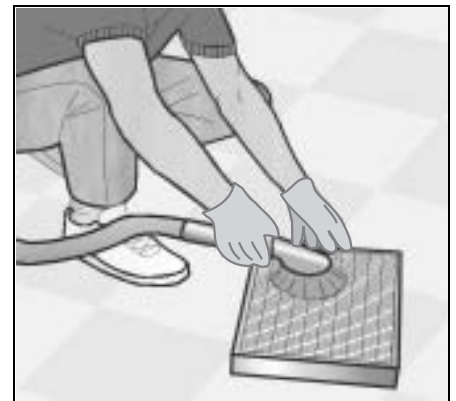
1. Switch off the machine
2. Remove the debris hopper
3. Disconnect the connector of the filter shaker (1)
4. Slightly loosen the 4 knobs (2)
5. Pull out the filter from its place (3)



ATTENTION: This operations must be done using gloves for hand protection from the contact with dangerous elements.



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



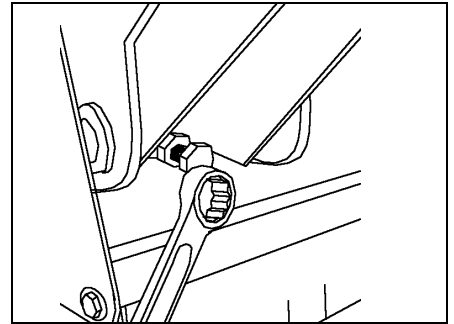


MAINTENANCE PROCEDURES

ADJUSTMENT OF SIDE BRUSH

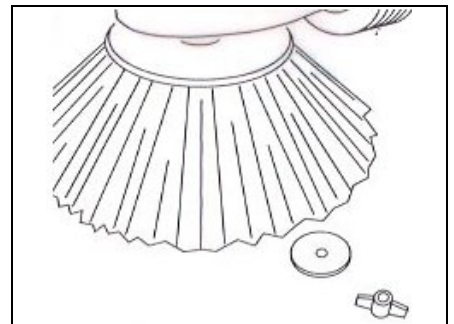
The regulation of the brush pressure on the floor can be made by adjusting the screw behind the brush arm itself:

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



SIDE BRUSH REPLACEMENT

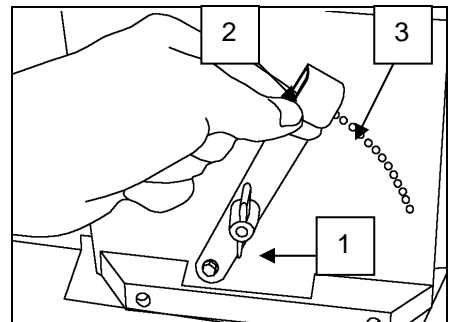
1. Unscrew the brush fixing knob. Remove the brush paying attention not to lose the washer and the knob.
2. Grease the shaft.
3. Insert the new brush by putting the key into its place. Reassemble the washer and the knob.



ADJUSTMENT OF CENTRAL BROOM

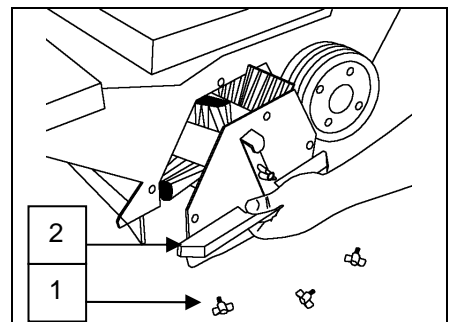
To adjust loosen the knob (1) and position the lever (2) in the following eyelets (3).

Make the same adjustment on the opposite side.
During adjustment follow the broom alignment.



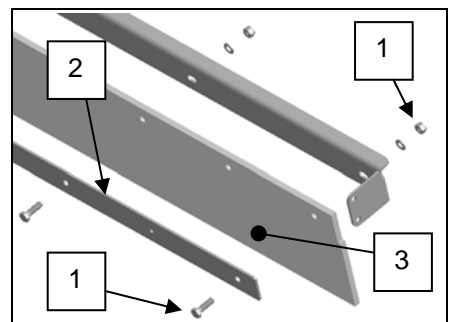
CENTRAL BROOM REPLACEMENT

1. Unscrew and remove all the knobs (1) shown in the picture, and take out the brush support group (2).
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.



FLAP RUBBER REPLACEMENT

1. Unscrew the fixing bolts (1) and slip off the blade (2).
2. Extract the worn rubber (3) and replace it with a new one.
3. Reassemble the blade and the fixing bolts.





TROUBLE SHOOTING GUIDE

THE CENTRAL BROOM DOES NOT CLEAN

1. If the broom is worn or improperly positioned, adjust its position or if necessary have it replaced at your nearest COMAC S.p.A. service centre.
2. If the waste bin is full empty it.

THE MACHINE CREATES AIRBORNE DUST IN USE

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

HIGH NOISE OR ABNORMAL NOISE FROM THE CENTRAL BROOM

If along the broom threads and other waste wrap themselves up, remove them.

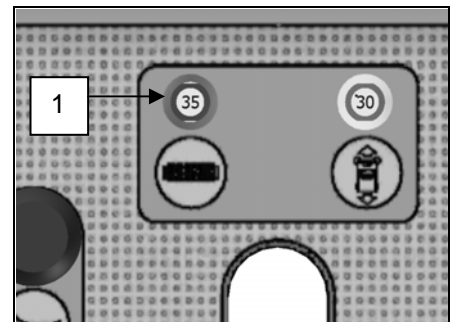
THE BRUSH MOTOR DOES NOT WORK

The brush motor can stop in case of excessive work load. To avoid that it breaks, the machine has a thermal protection that automatically disconnect the electric supply.

To make the motor go again push the bottom (1).



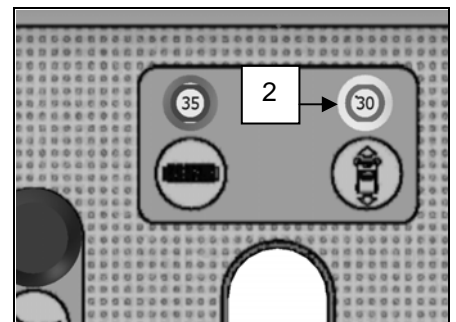
ATTENTION: If the breaker continues to disconnect the motor supply, it could create a motor overheating. Wait for few seconds before to go again.



THE TRACTION MOTOR DOES NOT WORK

The traction motor can stop in case of excessive work load. To avoid that it breaks, the machine has a thermal protection that automatically disconnect the electric supply.

To make the motor go again push the bottom (2).





BRUSH CHOICE AND USAGE

POLYPROPYLENE BRUSH (PPL)

It is used on any type of floors and it has a good resistance to wearing and to hot water (not over 60 degrees). PPL is not hygroscopic and so it keeps its features, also working on wet surfaces.

ABRASIVE BRUSH

The bristles are charged with very aggressive abrasives. It is used to clean very dirty floors. To avoid damages to the floor we suggest to work with the light necessary pressure.

STEEL BRUSH

The bristles are in steel threads. It is used to scale floor that are resistant to abrasion or with large groove.

BRISTLES THICKNESS

The bristles with bigger thickness are the most rigid to use on smooth and with small interstices floor.

On an irregular or with marks or deep interstices floors we suggest smoother bristles which easier penetrate in depth.

Keep in mind that when the bristles of the brush are consumed and too short, they became rigid and they are not able to clean in depth, also because (as for the bristles too big) the brush tends to skip.

TABLE TO CHOOSE THE BRUSHES

Machine	N° Br.	Code	Bristles type	ØBristles	Ø Br.	Note
CS60 II	1	411703	PPL	0.6	265	
	1	411704	PPL + STEEL	0.7 + 0.5	265	
	1	411705	TAMPICO BASSINA	-	265	
	1	414308	TAMP. BAS. + COPPER	-	265	