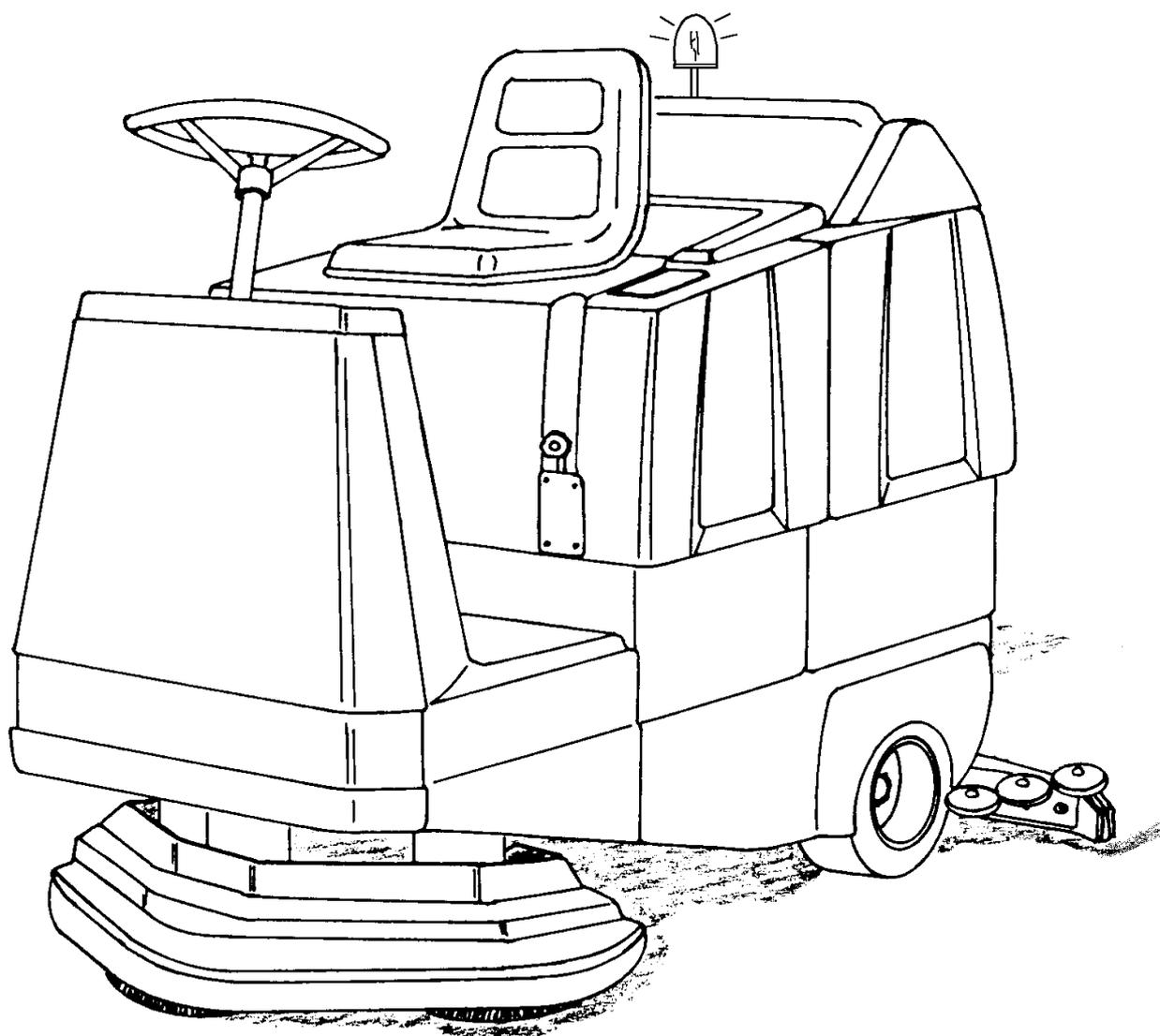


# Ing. O. Fiorentini

## Operator manual

### I34UE



# ENGLISH

ING. O. FIORENTINI S.p.A.  
INDUSTRIAL CLEANING MACHINES

## DIMENSIONAL CHARACTERISTICS

- length.....	1840mm
- width (brush cover ; squeegee) .....	870mm ; 1250mm
- height.....	1370mm
- brushes n°.....	2
- brush size (diameter) .....	425mm
- work width.....	840mm
- squeegee width.....	1200mm
- solution tank in polyethylene.....	210 liters
- recovery tank in polyethylene.....	215 liters
- front wheel (diameter).....	300mm
- rear wheel (diameter).....	300mm
- traction.....	electric
- weight without operator in operation conditions.....	750kg
- weight without battery.....	360kg
- battery compartment size.....(B x L x H)...	610 x 300 x 765mm

## ELECTRIC CHARACTERISTICS

- energy source.....	bat tery
- voltage.....	36Volt
- brush ratiomotor..... permanent magnet...2 x 750Watt	16,5Ampere 2400rpm
- traction ratiomotor..... permanent magnet...2 x 500Watt	16,5Ampere 2400rpm
- vacuum motor.....2 x 500Watt	13Ampere 16000rpm

## FUNCTIONAL CHARACTERISTICS

- drive.....	inboard
- steering wheel revolutions.....	1.5
- min. turning radius.....	1450mm
- brush lift control.....	electric
- squeegee lift control .....	electric
- emergency brake.....	mechanical by lever
- parking brake.....	mechanical by lever

## PERFORMANCE

- forward running speed.....	0-:6km/h
- reverse running speed.....	0-:6km/h
- max. slope.....	10%
- max. slope for reversal U.....	5% at 20km/h
- hour scrubbing sq. mt/hr.....	5000m q/h

## ECOLOGIC CHARACTERISTICS

- noise at driver's ear.....	80decibel
- vibrations on operator site.....	lower at 2,5m/sq

## THIS MACHINE CAN BE CORRECTLY USED AS FOLLOWS:

scrubber with operator on-board to be used on a flat surface or on ramps with slopes lower than 13%, to clean floors with any covering, moquette excluded. If the machine is provided with a sweeping unit, it can sweep small debris contemporary with the scrubbing.

### THIS MACHINE CANNOT BE USED FOR ANY OTHER PURPOSES, IN PARTICULAR:

it cannot be used as a tractor, neither on ramps with slopes higher than 13%, nor to transport people.

## HANDLING OF PACKED MACHINE

The machine is supplied packed on pallet, closed in a box made of plywood or paper board. The weight and sizes are shown in the NORMAL CHARACTERISTICS. The bary-center position is indicated by a black arrow on the box. The forks of the lift truck or of the transpallet should be placed so that the black arrow indicated on the packing is about in the centre of the forks. The package should be handled with extreme caution, thus avoiding impacts or lifting it to remarkable heights without any reasons. It is forbidden to stack the packages one another.

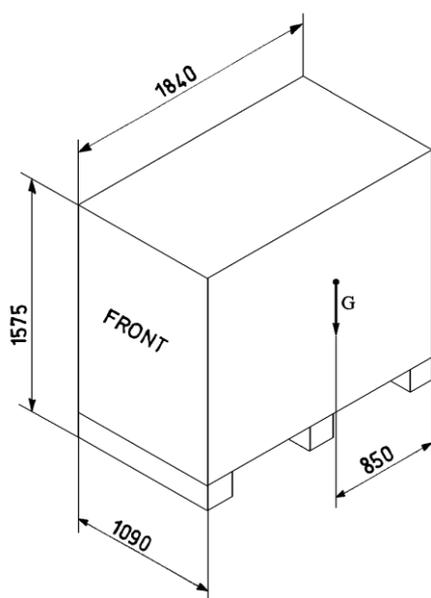


fig. 1

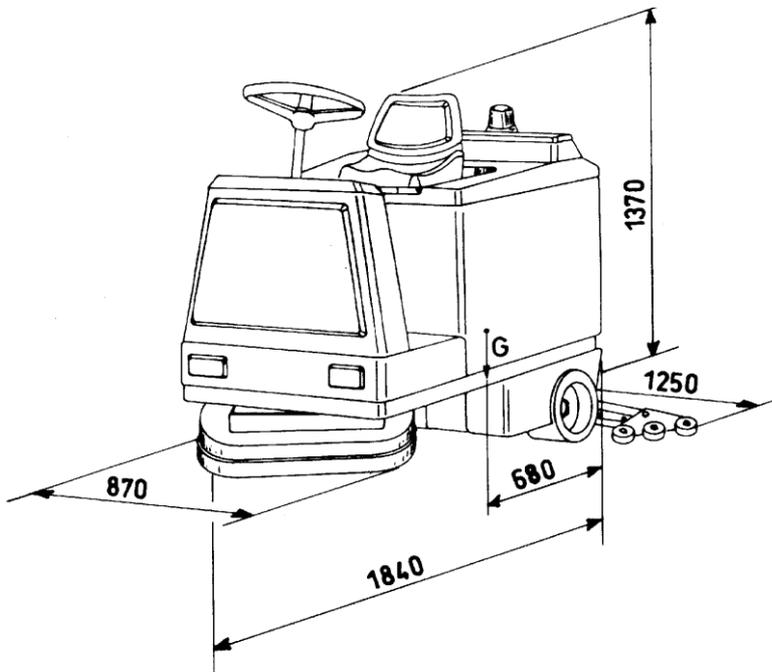
## UNPACKING THE MACHINE

The unpacking of the machine should be performed with caution and accuracy. First of all, cut the straps with proper cutting nippers, thus paying attention to the spring-back. Then, remove the clips on the paper board base which bind the paper board to the pallet by using a screwdriver or a proper tool, and lift the paper board up. In case of package made of plywood, remove the clips on the sides and on the base of each panel as well. Now remove the other clips fastening the machine by cutting them in the same way of the external ones. At this point, the machine should be brought at ground level by means of a metallic or wooden ramp.

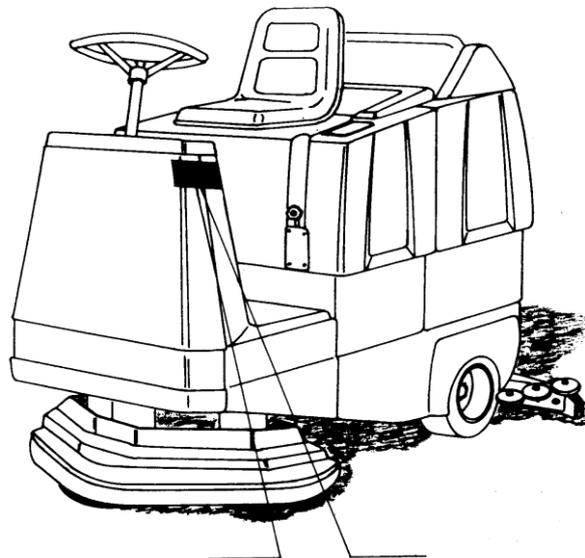
## HANDLING OF UNPACKED MACHINE

Check the unpacked machine and mount the batteries, if not yet installed. If the machine must be handled for a short transport after being used, detach the battery cables and remove brushes and squeegee; for a longer transport, it is recommended to pack the machine again in its original box. The machine can be thrust-moved for short distances.

fig. 2



## TECHNICAL DATA LABEL



Ing. O. Fiorentini S.r.l.  
50030 Piancaldoli (Fi)

MADE  
IN ITALY



Mod. I 34U	S.N.	1997
V 36	Hz	
kg 750	A	W 3500

## GENERAL INSTRUCTIONS

Before using the machine, instruct all operators to read the chapter "SAFETY STANDARDS".

### MANUFACTURER RESPONSABILITIES

The manufacturer FIORENTINI is not responsible for any inconvenients, failures, accidents, etc. due to the non-acquaitance (or non-fulfilment) of the prescriptions contained in this manual. The same applies to change's execution, modifications, and/or to the installation of accessory not preliminarily authorized.

In particular, the firm FIORENTINI is not responsible for any damages caused by:

- natural calamity
- erroneous operations
- no maintenance

Furthermore, the MANUFACTURER is not responsible for any interventions not performed by authorized personnel.

### SPARE PARTS

Use only ORIGINAL SPARE PARTS, checked and authorized by the manufacturer. Do not replace the components after they become worn by the use; replacing a component in due time allows for a better machine operation and a saving as well, because greater damages will be avoided.

### INTERVENTION REQUESTS

Possible intervention requests should be made after an accurate analysis of the inconvenients and their causes. In any case, when calling the technician, report what follows:

- Model of the machine
- Series number
- The detail of the detected faults
- The checks executed
- The performed adjustments and their results
- Any other information considered useful for this purpose
- Address the requests to the authorized customer service

### WARNING

The manufacturer can make any changes to the machine, for constructive or commercial reasons, without being obliged to change the instruction manual at the right time according to these modifications.

### GENERAL SAFETY STANDARDS

The machine described in this manual has been built according to the 98/37/CE rule regarding the machines and to its subsequent modifications.

The person responsible for the machine must adhere to CEE rules and to the local standards as well, regarding the working environment for operators' safety and health purposes. Before starting the machine, always perform the preliminary checks. The safety standards which involve any dangers, cited in the text of the manual, can be recognised by the symbol:



Beyond the standard listed hereunder, the person responsible for the machine must comply with the rules provided by the law in force regarding personnel's safety and health in the working stations. Furthermore, the person responsible for the machine must instruct the operators on what follows:

- Safety and accident prevention standards
- Specific standards regarding the machines
- Position on the machine of the emergency pushbuttons or of similar mechanisms, for a prompt operation. The fixed or movable protections (carters) should always remain in their

position, correctly fixed with perfect integrity during all procedures regarding the normal operation. If, for any reasons, the carters are removed (protections switched off or short-circuited), their efficiency should be restored before restarting the machine. Use the machine only under technically unexceptionable conditions and in compliance with its destination, by observing the safety and prevention standards according to the prescriptions contained in the instruction and maintenance handbook. Remove (or let remove) immediately any failures which could compromise the safety. The machine is exclusively designated to be used as a scrubber; any other different use, i.e traction, does not comply with its destination. The manufacturer/supplier takes no responsibility for any consequent damage. The risk is completely to be charged to the user. The use according to the destination includes also the compliance with the use and maintenance instructions and with the inspection and maintenance conditions as well.

### **CAUTION: DANGER**

It is absolutely forbidden to suck inflammable and/or toxic liquids and powders.

### **CAUTION: DANGER**

It is dangerous and absolutely forbidden to touch the lower part of the machine with the hands when some parts are moving. Should it be absolutely necessary, remove the key from the dashboard.

### **CAUTION**

Caution: on this machine with operator on-board, the rotating headlight should constantly operate and must be switched on when turning the key switch. The switch on the dashboard must be set to "0" position only in particular situations and, in any case, with stillstand machine.

### **INSTRUCTIONS FOR USE**

The machine can be used only by an authorized operator. To prevent the machine from being used by unauthorized personnel, it is necessary to block the operation by extracting the ignition key. When the machine is not working, it should be protected from any accidental movements by pressing the emergency pushbutton or detaching the plug from the battery. While the machine is working, pay attention to strangers and in particular to children. Always keep handy the instruction and maintenance handbook on the working place of the machine. Beyond the use and maintenance instructions, observe and prepare the binding general legislative rule regarding the accident prevention and environment protection as well. This can also concern the handling of harmful materials, the availability and mounting of customized protection equipments and the compliance with the rules of the road as well. In case of modifications detected on the machine, which can compromise its safety or its operation, stop the machine immediately and inform the responsible body or person. Do not make any changes or variations on the machine which can compromise its safety, without previous authorization by the supplier. Never perform any unsafe operations. Before starting the work, become familiar with the environment of the working place. The working environment includes, for instance, any possible obstacle present in the working and transition place, the knowledge of the ground capacity in a public traffic area, etc. Comply with the prescriptions contained in the instruction and maintenance handbook, as regards to on and off operations. Before switching the machine on and starting it, check that the operation does not endanger anyone. The transport of people and things is not allowed.

### **CAUTION**

Keep in mind the following standards; failure to adhere to these rules can endanger the life of the operator or of other people. Always keep a sufficient distance from the sidewalk edges and from large differences in height of the floor where the machine can fall; never adopt a work technique that can compromise the stability of the machine. Never pass through slopes in trasversal direction; when going through a downhill road, always adjust the speed to the environment conditions. Do not turn the machine at excessive speeds, particularly if the floor is not flat.

## **CAUTION: DANGER**

Never operate the machine when stopped for special operations (setting up, maintenance, etc.). Before starting the work, check for any possible visible defects on the safety devices, and the correct operation of the emergency stop pushbutton or of the equivalent mechanism. Never operate the machine when the control panel indicates defective tools, warning lights, etc.

### **MAKE SURE THAT:**

- No strangers are present near the machine
- No strange objects (appliances, cloths, etc.) are on the machine
- The machine does not emit strange noises after its starting; if so, stop it immediately and detect the cause.

All doors and protections are regularly closed.

Never let approach strangers near the machine. Use, maintenance and repair of the machine are allowed only to operators authorized by the person responsible of the machine, who knows the manual contents. These operators should be persons physically and intellectually fit for this work, not under alcohol or drug effects.

## **MAINTENANCE INSTRUCTIONS**

During the scrubbing operation, the maintenance of the machine and the replacement of parts, it is necessary to extract the ignition key.

Instructions for battery:

- when charging the battery, let the battery cover open
- do not use free flames and do not smoke near batteries
- caution: liquid is corrosive
- do not cause sparks near the batteries
- battery gases are explosive
- do not cause any shortcircuits
- do not invert polarities

### **GENERAL NOTE**

For any maintenance, revision or repair, engage qualified personnel or call an authorized workshop. Use only original fuses with the prescribed current intensity. In case of a power failure, disconnect the machine or the plant immediately. The electric installation should be periodically inspected and checked. Any possible failure, such as detached connections and burnt cables should be immediately removed.

## **CAUTION**

To clean the machine, use aggressive detergent solutions, acids, etc. only when necessary and with special care. Adhere to all instructions of the detergent manufacturer. Use protective clothes (overalls, gloves, protective glasses, etc., see CEE standards).

## **OPERATIONS ON THE ELECTRIC INSTALLATION**

The operations on the electric installation can be performed only by **QUALIFIED ELECTRICIANS**, instructed in the electric characteristics of the machine and in accident prevention rules.

## **CHECKS**

The machine must be inspected by a technician, who checks the safety conditions of the machine and any possible damages or defects visible from outside:

- before setting the machine at work
- after appropriate time intervals
- after any changes or repairs
- safety device control

## **SAFETY DEVICE CONTROL**

All six month, check the efficiency of the safety devices, the inspection should be performed by qualified personnel of FIORENTINI s.r.l. or authorized by it. To grant the efficiency of the safety devices, the machine should be overhauled by a technician of FIORENTINI every 5 months.

## ANNUAL CHECK

The responsible person should perform an annual check to determine if the machine complies with the technical safety standards. After this check, the responsible person should apply a test plate on the machine.

### INFORMATION FOR USING THE MACHINE IN EXPLOSIVE ATMOSPHERE

The machine has not been designed to work in environments in which explosive gas, powders or steams can be generated.

### INFORMATION CONCERNING THE ELIMINATION OF HARMFUL MATERIALS (SEE CEE STANDARDS) CAUTION: DANGER

To drain the liquids used for floor scrubbing, follow the local standards concerning the elimination and purification.

### INFORMATION CONCERNING THE MACHINE DEMOLITION (CEE STANDARDS)

In case of machine demolition, it is important to subdivide the different types of materials composing the machine and deliver the batteries to operators authorized to their elimination.

## GOODS TO BE RETURNED

In case of goods to be returned for warranty replacement, it is necessary to have a written acceptance from

FIORENTINI technical department before sending them.

All defective parts must be carefully packed in order to avoid further damages during transport.

Goods must be shipped ex-warehouse and followed by :

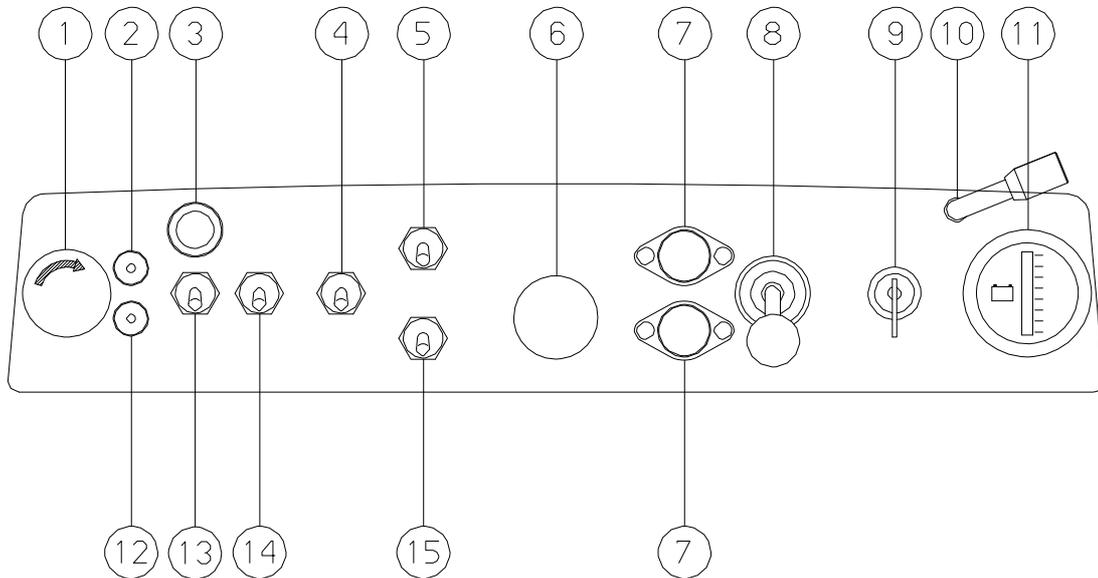
- **serial number of the equipment where they were installed on;**
- **item code of the defective part;**
- **detailed description of the defect and of the conditions where it happened.**

In case of defective electric or electronic goods, please return them separately from other materials, in order to help us in dividing dangerous wastegoods and recycle the (RAEE) as DER 2002/96/CEE LOW.



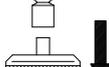
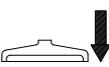
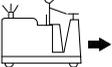
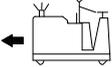
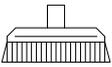
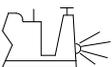
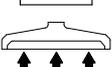
# OPERATING CONTROLS

## DASHBOARD CONTROLS

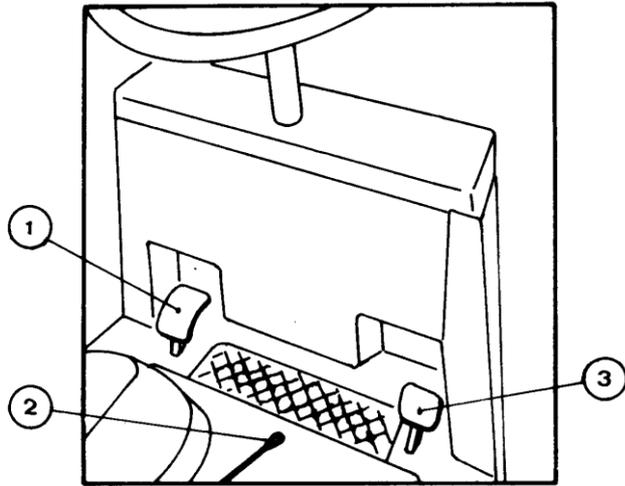


- 1) emergency stop switch
- 2) brush overload cutout
- 3) vacuum motor warning lamp
- 4) brush rotation locking switch
- 5) switch for rotating headlight
- 6) steering stem
- 7) fuse
- 8) selector switch for forward-reverse running
- 9) main key switch
- 10) solution flow adjusting lever
- 11) battery charge indicator
- 12) vacuum motor overload cutout
- 13) vacuum motor overload cutout
- 14) switch for brush up and brush down
- 15) headlamp switch

# SYMBOLS

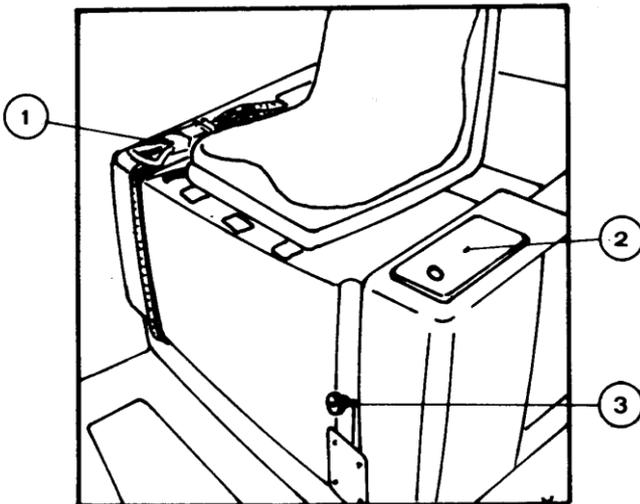
0	off		brush lowering
1	on (first function)		brush lowering and pressure increase
2	on (second function)		squeegee lowering
	increase by rotation		
	increase by translation		
	battery indicator		
	water valve		
	key switch		
	forward ranning		
	backward ranning		
	fuse or overload cutout		
	general stop		
	scrubbing brush		
	squeegee		
	headlight		
	rotating light		
	vacuum by squeegee		
	brush lifting		

**fig. 3**



- 1) brake pedal
- 2) seat adjusting lever
- 3) accelerator pedal

**fig. 4**



- 1) safety stop for battery charge plug
- 2) solution tank opening
- 3) hand brake retainer

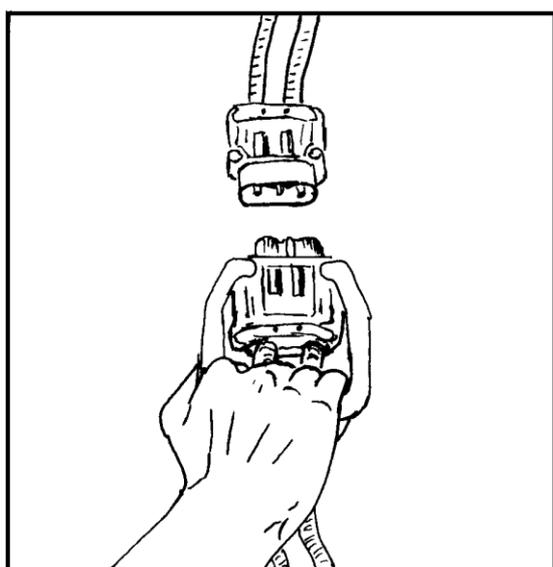
# USE OF THE MACHINE

## CAUTION

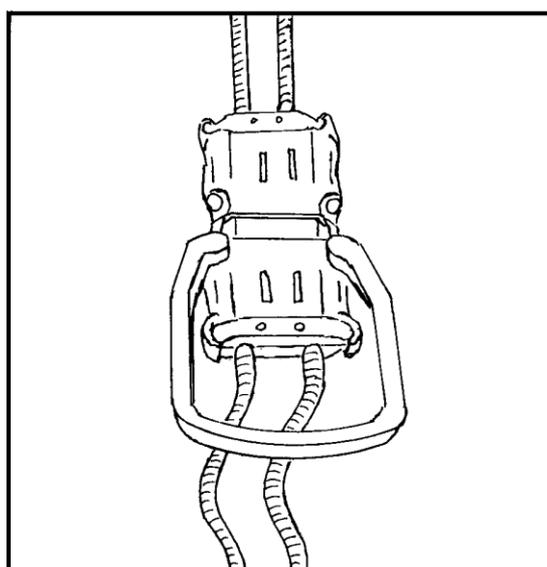
### SAFETY SYSTEM

**WARNING:** the machine is equipped with a safety system for “emergency stop”, constituted by a mushroom push-button (fig.). In emergency case, press down this button. Before learning how to use the machine, the operator should be familiar with the use of this safety system, to automatically use it in case of emergency. Never reset the safety system before having solved the failure, if necessary with the help of a specialized technician.

**fig. 5**



**fig. 6**



### BRAKE

The machine is provided with a parking and an emergency brake as well. The emergency brake is controlled by a pedal located on the left-hand side of the footboard (fig.). To engage the emergency brake, press down the pedal and insert the block by means of the lever (fig.) pressed downward. **CAUTION:** the brake should be checked and adjusted at least once every three months.

### PREPARING THE MACHINE FOR OPERATION

Upon delivery of the machine, remove the packing without damaging it. It can be re-used for any possible long displacements of the machine. Check immediately the machine state, and in case of damages due to the transport, contact the trucking company to file a freight damage claim. Before starting the machine, read carefully the contents of this manual, in particular the safety standards.

### INSTALLING THE BATTERIES

Install the batteries on the proper compartment. Inspect batteries carefully before installing, thus making sure that there are no cracks in the cases. Never add electrolyte if batteries have been in use for one week or longer. For positive connections of the batteries, the surfaces which get in contact with them should be clean. Apply a film of grease or vaseline to terminal clamps or connections. During transit, the batteries may have lost some of their charge. If so, give a freshening charge before operating the machine.

## **INSTALLING THE BATTERY CHARGER**

Install the battery charger in a ventilated and dry place, far from heat sources and corrosive environments. Make sure that the voltages are correct (see the data plate located on the battery charger). Protect the mains with a delayed switch or with a load fuse higher than the max. power consumption of the battery charger. Observe the polarity of the battery socket (black cables are identified by symbols + and -).

## **CHOOSING THE DETERGENT SOLUTION**

For a good cleaning of the floor, it is important to choose the proper detergent solution. If necessary, ask the supplier or a competent person for the proper solution. Keep in mind that a too strong chemical agent can compromise the long life of each machine. It is necessary to use a low-sudsing detergent solution, or an antifoaming additive, in order not to damage the vacuum motor. If it is impossible to get these products, use some vinegar to avoid foam, pouring 50cc of it in the recovery tank before scrubbing.

## **STARTING AND PREPARING THE MACHINE**

If the scrubber is connected to the battery charger (having finished the charge operation), detach the battery charger plug from the socket (located on the machine) coming from the battery (fig.). Then, connect the plug of the machine to this latter (fig.). Close the battery cover again. The machine should be operated by turning the master key switch (fig.). Then, proceed with the water loading described under the paragraph (par.). Perform the scrubbing once the work place has been reached.

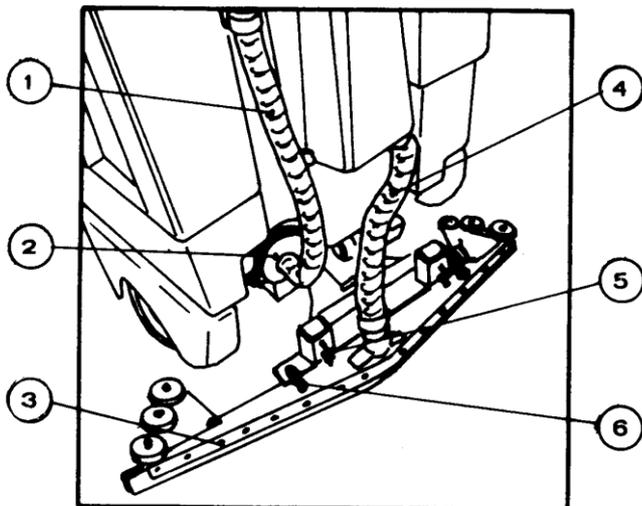
## **SCRUBBING**

The scrubbing operation is very delicate, as the operator's experience must be used to decide upon the brush type, the requirement of a possible double scrubbing operation, the right cleanser choice and the right machine adjustments: if only one of these factors is inadequate, the scrubbing operation can give very poor results. If the floor is very dirty or difficult to be cleaned, a double scrubbing operation is recommended. In this first phase, the squeegee must be lifted and the brushes must be in working position. Start the brushes and pass the machine over a surface of some tenth sq. mt. Let the detergent solution on the floor to dissolve the dirt, then pass the machine again. For this second machine passage, lower the brushes and bring the squeegee in contact with the floor. Look at the floor after this second passage and decide if the scrubbing operation was enough or if an additional operation is required. To perform the scrubbing procedure, turn the switch to pos. 2 (fig.) and keep it there till you hear the end-of-stroke croaking noise. The motor brushes will go automatically on and the brushes will be in contact with the floor, with the right pressure too. Now operate immediately the lever to apply the detergent water, and adjust it accordingly. Put the run selector (fig.) in its forward position and press the pedal (fig.) so that the machine moves forward and starts scrubbing. The water dosage must be adjusted to get the whole surface completely wet after the brush passage, but without any excess, that could generate splashes, stream or flows out of the squeegee. If no double scrubbing will be effected, lower the squeegee immediately after having put to forward the run selector. The squeegee is lowered through the switch set to pos. 1 (firm). The suction motors go automatically on during the squeegee lowering and go off when it is lifted back. At the end of the scrubbing and drying operation, close water through its lever (fig.), then set the switch (fig.) to pos. 1 till you hear the end-of-stroke noise, to lift the brushes. Finally, set the switch (fig.) to pos. 0 to lift the squeegee. Note that, during backwards motion, the squeegee is automatically lifted.

## **WATER FILLING AND DISCHARGE, TANK CLEANING**

Before every scrubbing operation, open the door (fig.) and fill the solution tank with the right quantity of water and cleanser. The tank is made of polyethylene, resistant to all acid and basic solutions and to all dissolvents found on the market. At the end of the scrubbing operation, discharge the dirty water from the recovery tank by means of the hose (fig.). The recovery tank is made of polyethylene too. Accurately clean the recovery tank at least once per week.

**fig. 7**



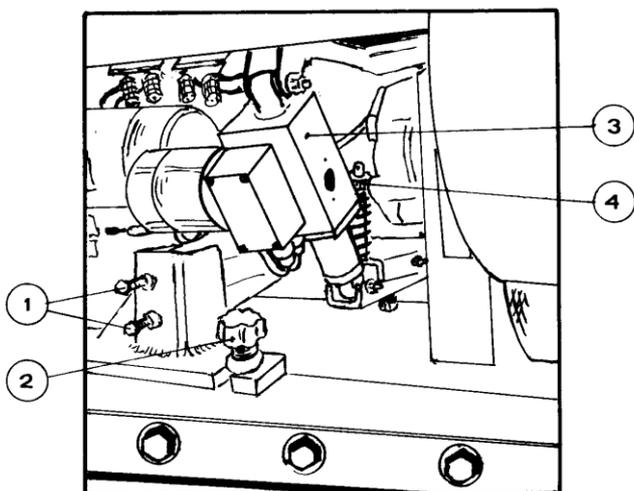
- 1) water drain pipe
- 2) squeegee blade replacement screws
- 4) squeegee solution pipe
- 5) squeegee adjusting screws
- 6) squeegee fastening screws

### SQUEEGEE ADJUSTMENT

The squeegee must be perfectly adjusted to get a perfect floor drying. ICM 38 is equipped with a V-shaped squeegee, as shown in (fig.). This type of squeegee performs very well in collecting water from the floor to the suction hose, but is particularly sensitive to the parallelism to the floor. Therefore, adjust first its angular position through the screws (fig.) so that its rubber blades get the same slanting on the floor along its entire width. If blades are more pressed at their ends than in their centers, unscrew the upper screws (fig.) and screw the lower ones (fig.), then tighten the lock nuts. If, on the contrary, blades are more pressed at their centers than in their ends, perform the opposite operation. After having reached the right angular position, adjust the pressure. Turn the ring nut (fig.) and tighten it to increase pressure to the floor, or loosen to decrease it. The right pressure is got when the edge of the rear blade touches the floor with a slanting of approx.  $60^{\circ}$ - $45^{\circ}$  referring to the floor. If the pressure is too high, the rear blade will touch the floor with its side surface, and not with its edge. If the pressure is too low, the edge doesn't work well and lets some water on the floor, particularly on an uneven floor. Of course the optimal adjustment is confirmed by very good results of the drying operation, and the operator's experience will contribute to enhance such good results. Note that often drying is negatively affected by a wrong suction operation. If the suction hose doesn't work well, drying will continue to be bad, even with all adjustments attempts. In this case:

- a) accurately clean the suction hoses, their inlets and filters and the squeegee itself
- b) check the vacuum motors operation
- c) confirm that all inspection openings of the tank are closed.

**fig. 8**

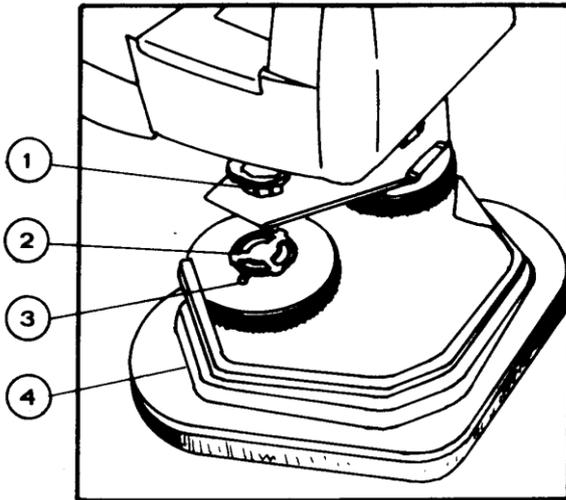


- 1) squeegee slanting adjusting screws
- 2) squeegee release knob
- 3) squeegee lifting jack
- 4) squeegee pressure adjustment ring nut

## BRUSHES REPLACEMENT

Before replacing the brushes, extract the key from the control dashboard, thus avoiding that any accidental ignition of some motors could cause damages. First of all remove the knobs (fig.) by unscrewing them, then extract the brush covering carter (fig.). Rotate each brush until its knob (fig.) can be reached, then extract it and remove the brush fallen on the ground. To insert the new brush, place the hexagon of the female joint (fig.) under the male joint located on the motor, then lift the brush vertically by rotating it until its automatic insertion has been reached. After placing the three brushes, insert the carter and screw the knobs again.

**fig. 9**



- 1) brush joint plug
- 2) brush joint intake
- 3) brush release joint
- 4) brush cover

# MAINTENANCE

## MAINTENANCE SCHEDULE

	EVERY DAY	EVERY WEEK	EVERY MONTH	EVERY SIX MONTH
Clean the recovery tank	X			
Clean the filter of the vacuum motors	X			
Check the filter of the clean water tank		X		
Check for the cleaning of the suction pipes and of the squeegee		X		
Check the brush state				
Check the state of the rubber squeegee blades		X		
Check the state of the scrubbing solution delivery valve			X	
Lubricate the fork articulated joint of the steering wheel			X	
Check the brush state of each motor				X

## BATTERIES

### CHECKING THE CHARGE STATE OF THE BATTERIES

As it is known that there is a direct relation between the specific gravity of the electrolyte and the charge state of the battery, the measure of the specific gravity of the electrolyte is assumed to be an efficient and correct control of the battery charge state. When the battery is charged and is under normal conditions, with the electrolyte located at the proper level, the electrolyte density will be about 1.260 (30°Bè) referred at 30°C. If density is between 1.26 (30° Bè) and 1.20 (24° Bè), the battery is partially discharged, but if density is lower than 1.14 (18° Bè), the battery is completely discharged.

### DENSITY MEASUREMENT

The density measurement of the electrolyte is the most important check on a battery. This measure should be performed with extreme caution by means of a densimeter. The syringe densimeter should be introduced, thus extracting an amount of electrolyte enough to bring the float on the surface. The float top should neither get in touch with the rubber pear nor be stuck with capillarity to the glass walls. Should a density measure be performed after having added some distilled water, wait until the density has become homogeneous in all liquid contained in the element.

### WATER TOPPING UP

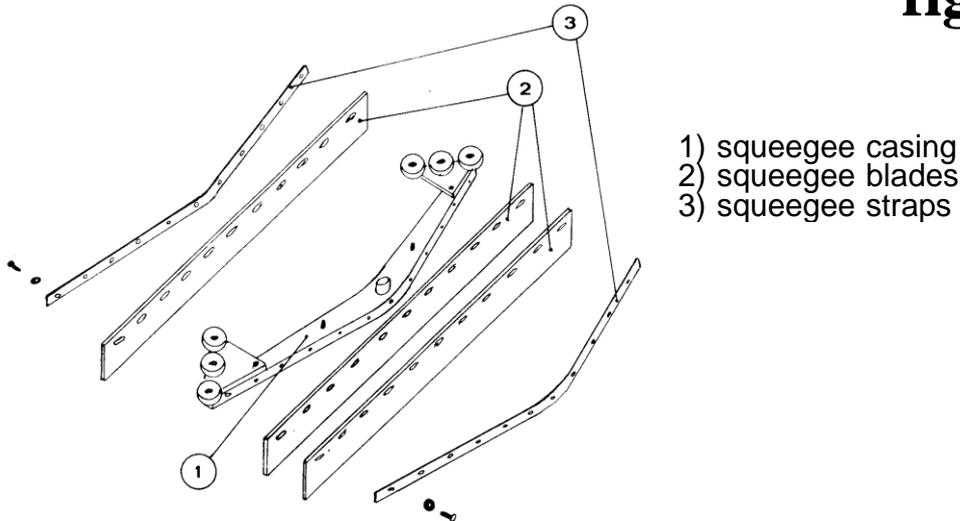
Add some distilled water in each battery cell, after charging the batteries, to bring the liquid to a level of 6 mm over the plates. The operation will initially take place after each charge, then the subsequent topplings up can be executed less frequently, according to the experience of the person responsible of it, but never let more than one week between one topping up and the next.



## SQUEEGEE BLADE REPLACEMENT

The squeegee blades should be replaced when the contact edge becomes worn; the perfection of the edge is essential for a perfect drying. To replace the blades, the squeegee should be demounted from the machine. To do that, lift the squeegee support in UP position, then remove the suction pipe from the squeegee, partially unscrew the screws. At this point, remove the squeegee from the machine and place it on a desk. Now, remove the screws (fig.6) both on the front part and on the rear part of the squeegee, the steel straps (fig.6), and the three worn rubber blades (fig.6) as well. Perform the inverse procedure and assemble the new blades, then adjust the squeegee.

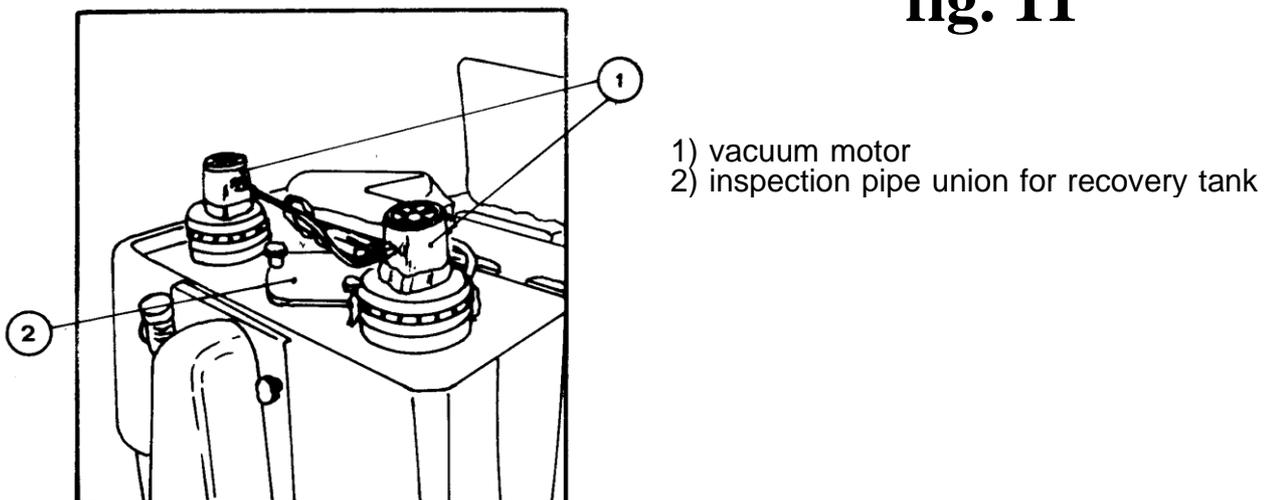
**fig. 10**



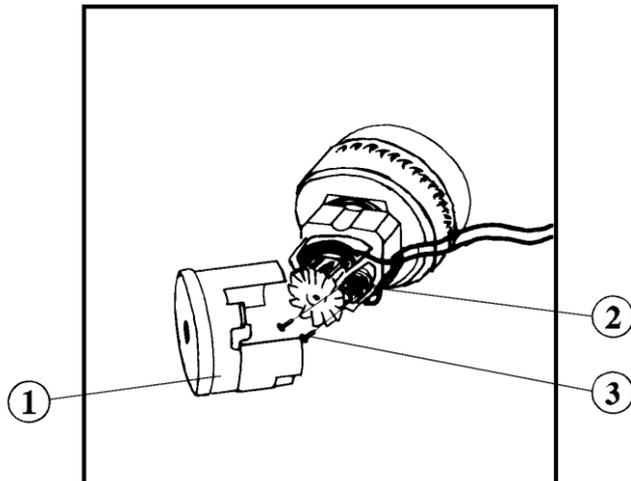
## VACUUM MOTOR MAINTENANCE

The vacuum motors must be checked and cleaned. The brushes should be checked all six months and replaced, if necessary. After removing the key from the dashboard, remove the motor cover located on the rear part of the machine. To release the motors, unhook the hooks and detach the plug. In this way, it is possible to extract the motors and release the sponge filter under the motors that can be extracted, cleaned and replaced. Check the suction fan from the hole located in the front part of the vacuum motor. By a visual check, the fan should appear undamaged and well-cleaned. To check the brushes, first of all remove the plastic cap (fig.7), then unscrew the screws (fig.7) and remove the two plastic supports of the brushes. Once checked and replaced (if necessary), the brushes can be easily re-mounted, by reassembling all elements until the initial situation has been reached.

**fig. 11**



**fig. 12**



- 1) terminal board guard
- 2) carbons brushes
- 3) carbons brsshes screws

**CAUTION**

Each maintenance and repair operation not described under the “ordinary maintenance” should be performed by qualified personnel authorized by FIORENTINI S.p.A. only.

## DIAGNOSTICS

When the control detects an abnormal situation it stops and gives an error. The type of error can be determined from the LED diagnostics. There are two types of error: serious and non-serious.

### Non-serious errors

Recognised by an LED flashing quickly.

Resolve the error situation by putting the start controls into neutral and bringing the potentiometer to minimum.

There are two types:

- At least one potentiometer is not at 0.
- Forward and reverse start controls are active simultaneously.

### Serious errors

Recognised by counting the number of consecutive flashes given by the LED.

Resolve the error situation by switching off the control with the key.

Flashing lights	Code	Error	Possible causes and solutions
1	1 f	Engine not stopped at start	Engine running when key is turned. If the error persists the power may be damaged.
2	08	Contact with the remote control switch	Check the operation of the contactor, the pad and the power wiring.
3	1d	Insufficient battery voltage	The power supply voltage has dropped below Vmin. (1.72 V/el.). Check the battery and its wiring
4	1e	Excessive battery voltage	The power supply voltage has risen above Vmax. (2.35 V/el.) or it has exceeded the maximum supported. Check battery wiring.
5	10	Block of remote control switch	The maximum power consumption on an output for the contactor is exceeded. Check coils and wiring.
6	1b	Pot. interrupted	Check the potentiometer and relative wiring (white/blue and red/black lines).
7	18	Temperature outside the allowed limits	Improve heat dissipation of the control.
8	23	Switch-off while moving	The control was switched off while the vehicle was moving. Always switch-off the control with the vehicle stationary.
9	27	Incorrect parameters set	Some calibration values are incorrect. Check programming
10	2d	Incorrect Checksum	The programming procedure was interrupted. Repeat it
12	22	Failed acquisition	Acquisition could not be completed. Check wiring and calibrations.
14	2b	Rotor over-current	Check the wiring strength of the left engine. Contact the after-sales assistance if the error persists
16	5b	Rotor 2 over-current	Check the wiring strength of the right engine. Contact the after-sales assistance if the error persists
19	28	Corrupted program memory	Contact the specialist technicians.
20	29	Corrupted parameter memory	Contact the specialist technicians.
21	2f	Device not registered	Contact the specialist technicians.
22	2e	External block	Block was given through the specific input.

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