READ THE USE AND MAINTENANCE MANUAL

PROGRAMMING CONSOLE

Console function

With the console you can:

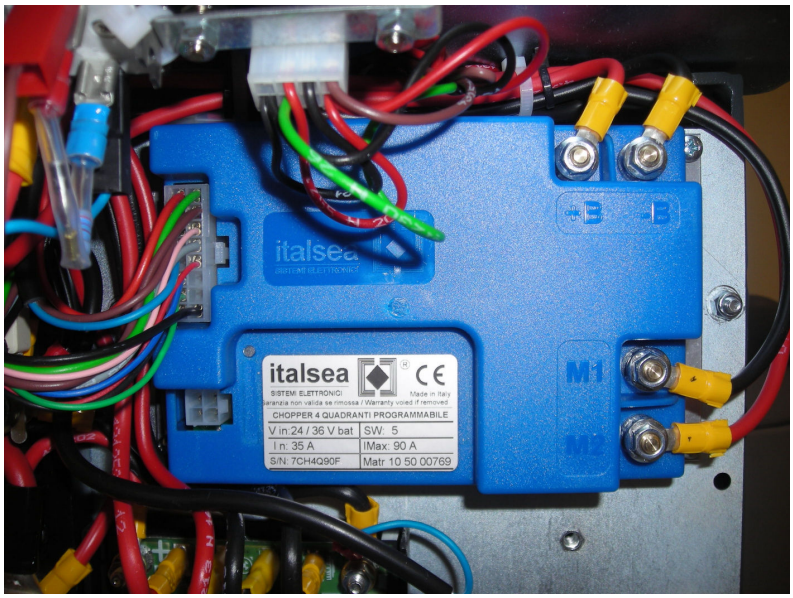
- set the chopper to customise drive motor behaviour
- test the electrical values and the electrical circuit status with regards drive
- read the type of alarm to easily and correctly find the failure.

Using the Console

The sequence that always has to be followed to turn the console on is:

1. **TURN THE general machine KEY OFF**;
2. connect the console in the appropriate connector (as shown in the figure), checking the position;
3. turn the key on and work with the console;
4. exit all the programmes (main switch-on header) and **TURN THE general machine KEY OFF**;
5. disconnect the console connector.

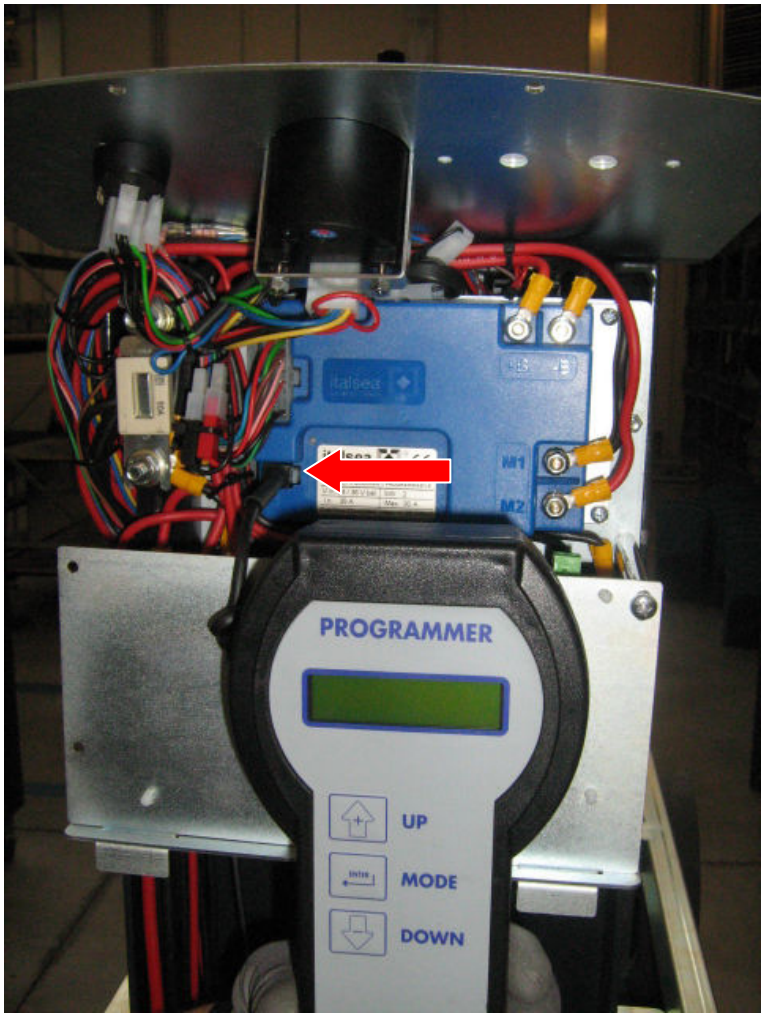
AN INCORRECT SEQUENCE OF OPERATIONS CAN EASILY COMPROMISE CHOPPER OR CONSOLE OPERATION



ALARM DIAGNOSIS TABLE

Display	Alarm	What to do
ALARM A1 FW Switch ON	Forward movement micro-switch on when starting	Place the speed reference at rest and open the forward movement micro-switch.
ALARM A2 BW Switch ON	Reverse movement micro-switch on when starting	Place the speed reference at rest and open the reverse movement micro-switch.
ALARM A3 Pot. FAULT	Potentiometer pulled	Check the Potentiometer cables.
ALARM A4 Ref OUT Neutral	Potentiometer not at rest upon switch-on	Place the potentiometer in the rest position, or if it isn't already, adjust the travel of the potentiometer.
ALARM A5 Overtemperature	Thermal cut-out	Wait a few minutes and check the absorption of the motor.
ALARM A6 POWER STAGE	Damaged power stage	Replace the drive.
ALARM A7 OVERCURRENT	Overcurrent	Check the motor cables: if the connections are correct and the alarm occurs again, replace the drive.
ALARM A8 POWER FUSE/RELAY	Damaged power fuse or internal relay	Check the fuse on the +Battery and the wiring: replace the drive if it persists (general relay damaged).
ALARM A9 UNDERVOLTAGE	Undervoltage	Check battery charge.
ALARM A10 OVERVOLTAGE	Overvoltage	Battery voltage over 45V: check the condition of the batteries
ALARM A11 Overload Current	Amperometric protection	Check the motor current and if necessary adjust the amperometric calibration
ALARM A12 DISABLE ON	Disable on	Check the condition of the disable input.
ALARM A13 KEY-OFF	Power off sequence detected	Check the wiring for the power key.
ALARM A14 EEPROM FAIL	E^2prom reading failed	Check the settings: if the alarm is repeated, replace the drive.

CHOPPER PROGRAMMING



Console code: ***431320***

To access the programming functions, press the "MODE" key.
The letters of the first parameter ("F0") will appear; press "UP" and "DOWN" to select the required parameter.
Press the "MODE" key to enter modification mode, then use the "UP" and "DOWN" keys to select the required value; after selecting, confirm the new value with the "MODE" key.

PARAMETERS:

PARAMETER	DESCRIPTION	DEFAULT	INNOVA
RESET TO DEFAULT	Parameters reset	DISABLE	**DISABLE**
ACCELERATION RAMP	Acceleration ramp	3	**3**
REVERSE RAMP	Dec. ramp on reverse	1.5	**1.5**
NEUTRAL RAMP	Dec. ramp on release	1	**1**
FORWARD SPEED	Max. forward speed	100	**100**
BACKWARD SPEED	Max. reverse speed	60	**60**
MINIMUM SPEED	Minimum speed	0	**0**
BATTERY VOLTAGE	Battery voltage	24	**24**
SPEED REFERENCE	Speed reference	single-ended	**single-ended**
REF. DEADBAND	Potentiometer deadband	0.2	**50mV**
BRAKE DELAY	Brake delay	2	**0.5**
MULTIMODE SPEED	Multimode motor speed	50	**50**
MULTIMODE CURRENT	Multimode current	25	**45**
BW SAFETY TIME	Anticrushing time	0	**0**
BW SAFETY SPEED	Anticrushing speed	0	**0**
LOW BATTERY	Low battery threshold	19	**19**
TIMEOUT RUN AWAIT	RxI compensation	0	**60**
RUN-AWAY	Anti Run-Away function	0	**14**
CURRENT LIMIT	Motor current limit	45	**90**
RATED CURRENT	Motor nominal current	15	**25**
OVERLOAD TIME	Motor overload time	60	**60**
5-J1 HW CONFIG	Input Config. Pin 5 – J1	N.C. switch	**N.O. switch**
6-J1 HW CONFIG	Input Config. Pin 6 – J1	N.O. switch	**N.C. switch**
11-J1 HW CONFIG	Input Config. Pin 11 – J1	N.O. switch	**N.O. switch**
ENABLE ALARM 1	Enable alarm A1	ENABLE	**ENABLE**
ENABLE ALARM 2	Enable alarm A2	ENABLE	**ENABLE**
ENABLE ALARM 3	Enable alarm A3	ENABLE	**ENABLE**
ENABLE ALARM 4	Enable alarm A4	ENABLE	**ENABLE**
ENABLE ALARM 12	Enable alarm A12	ENABLE	**DISABLE**
PASSWORD	Password	0	**0**

POTENTIOMETER CALIBRATION

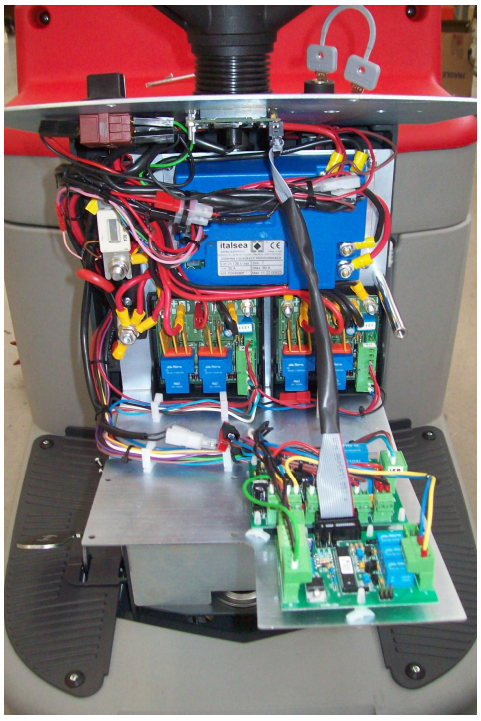
1) Make sure the machine is off.
2) Connect the console to the machine.
3) Start the machine.
4) Access the parameters menu with the “MODE” key.
5) Scroll down the parameters until you get to “Speed Reference”.

SPEED REFERENCE single-ended	Select “single-ended” and confirm with the “MODE” key.
CALIBRATION Stop pos = 0.6 V	Position the pedal in the idle position and confirm the position with the “MODE” key.
CALIBRATION Max pos = 2.7 V	Position the pedal to the maximum and confirm the position with the pedal pressed this position and pressing the "MODE" key.

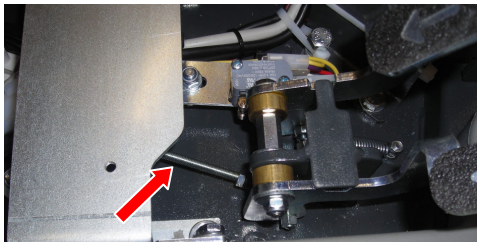
6) Turn the machine off.
7) Disconnect the console.
8) Start the machine again and perform a functional test.

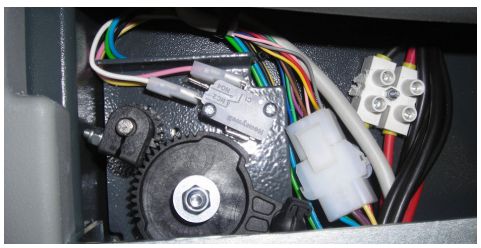
Electric System Testing

1. Disconnect the battery connector.
2. Check cleanliness and tightness of the battery connection cables.
3. Check the connection and tightness of the power cables: batteries, relays, fuses, motor, etc.
4. Check the condition and correct fitting of the fuse.
5. Check the functionality of the movement micro-switch located under the footrest.
6. Reconnect the battery connector.



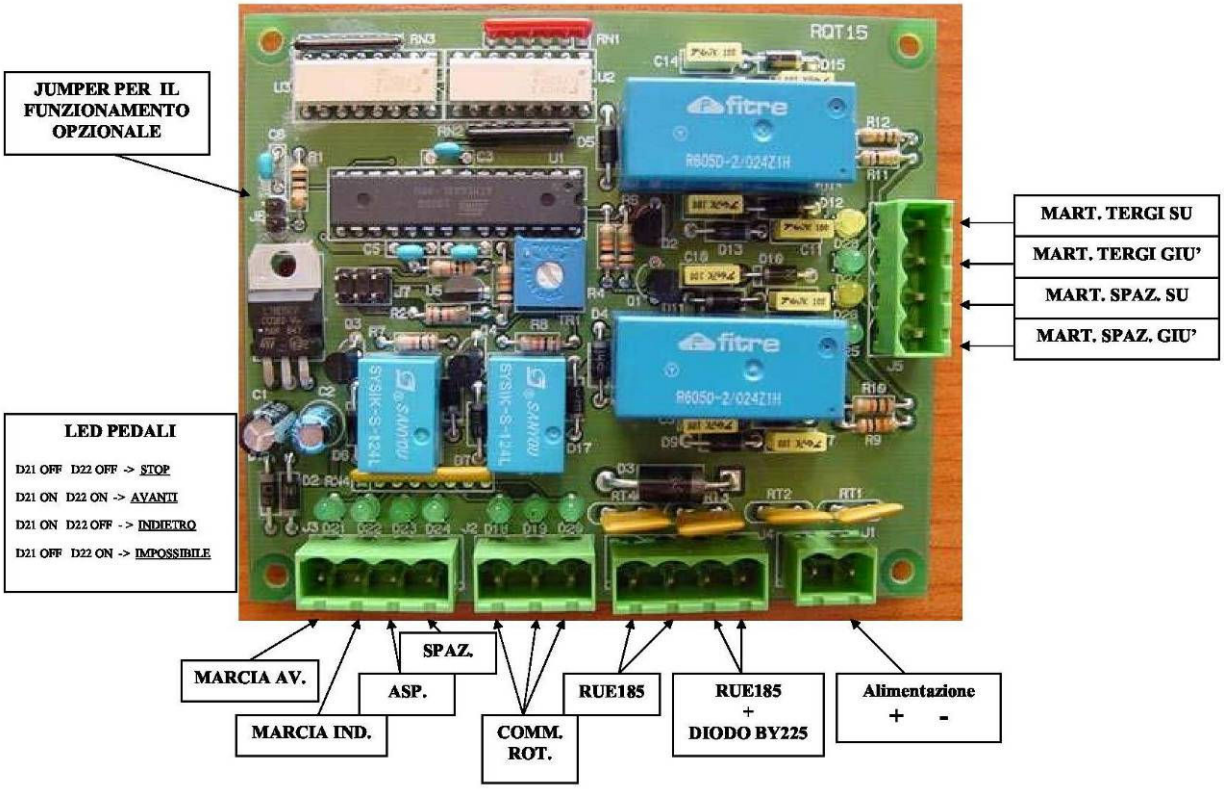
7. Check the functionality and conditions of the potentiometer and base consensus (water and brushes rotation) and running microswitches.
8. Check that the throttle lever is calibrated correctly, ensuring that even in the idle position the potentiometer is at zero. Otherwise act on the **threaded rod** until the desired setting is achieved.



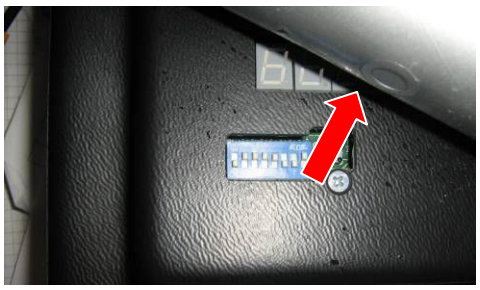


9. Check the functionality:
   - seat micro-switch;
   - hour meter;
   - horn and key contact;
   - Job selection knob
10. Check forward movement, backward movement, acceleration and braking, lifting and lowering of the brush base and the squeegee.

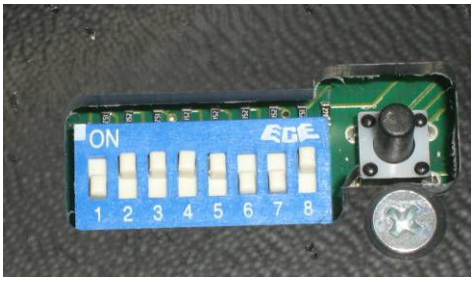
Check the actuators control card



Adjusting the battery charger

1. Check the set-up of the battery charger corresponds to the type of battery actually installed on the machine.	
2. To adjust the battery charger, proceed as follows: • lift the **label** on the front of the battery charger • set the dip switches inside, on the basis of the table below; • replace the label as it was before	

You can see the dip switches beneath the plastic cover as shown in the figure.



The dip switches should be set as follows:

DP1 – DP2: load curve selection

TROJAN GEL	**DP1**	**DP2**
	ON	ON
WET CELL	**DP1**	**DP2**
	ON	OFF
GENERIC GEL or AGM	**DP1**	**DP2**
	OFF	ON
EXIDE SONNENSCHEIN GEL	**DP1**	**DP2**
	OFF	OFF

Other NON MODIFIABLE dip switches

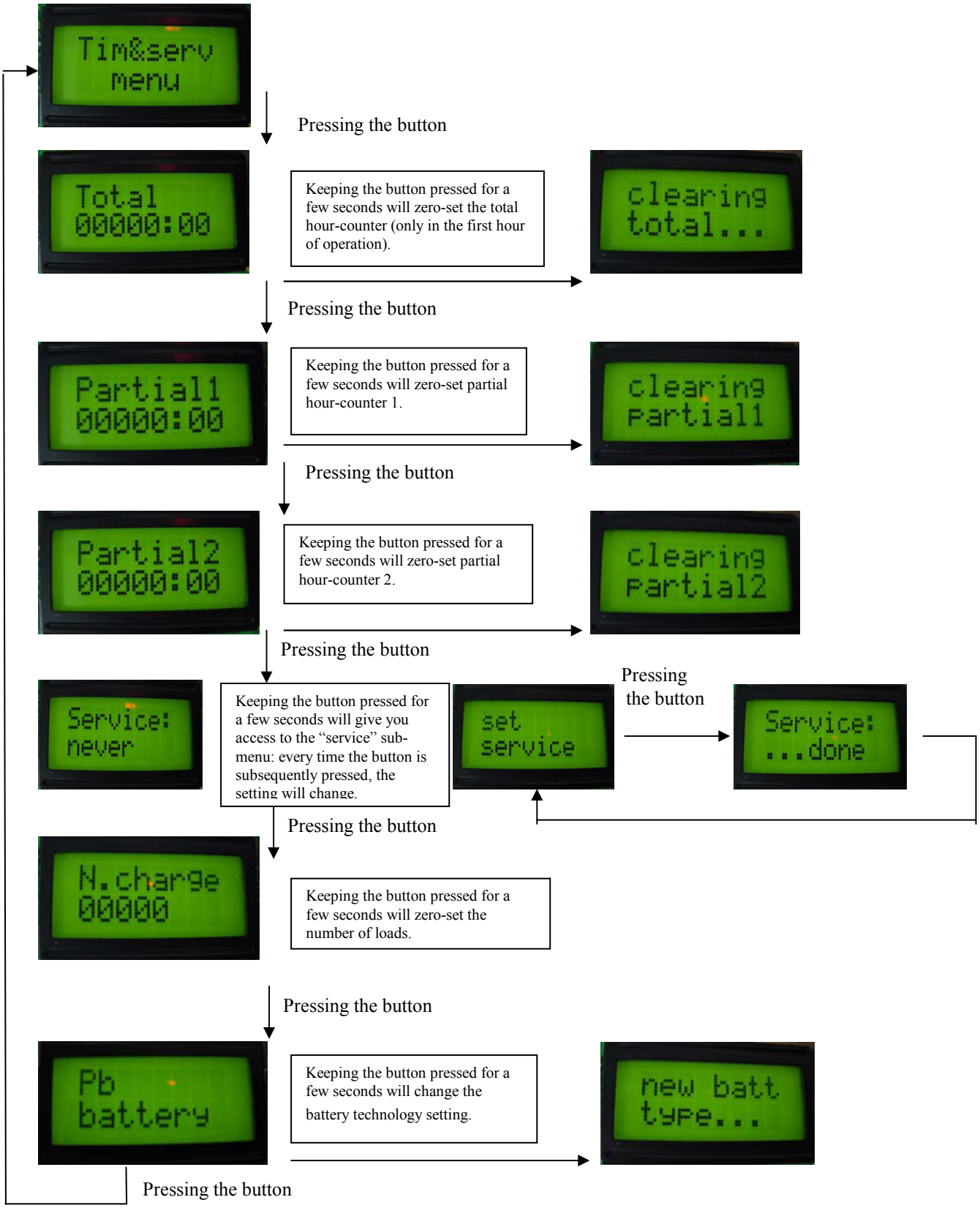
DP3	DP4	DP5	DP6	DP7	DP8
ON	ON	ON	OFF	OFF	ON

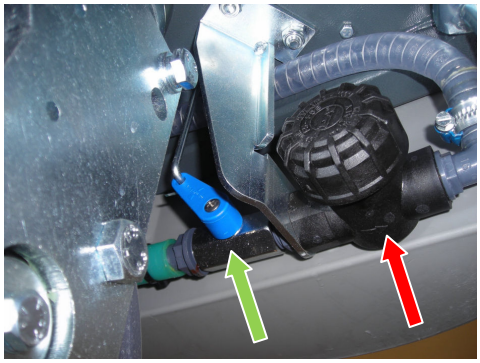
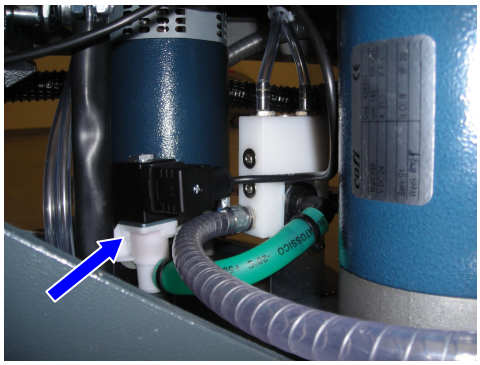
Carefully read the battery charger operating manual

Battery charger alarm signals:

ERROR MESSAGE	CAUSE	CORRECTIVE ACTION
E01	The maximum allowable battery voltage has been exceeded.	Check the installed battery is the correct one. Check the connections are clean and the power cables are in good condition.
E02	The maximum temperature detected by an external sensor has been exceeded.	Switch the battery charger off then on again, and replace it if the problem persists.
E03	The maximum duration of the battery recharging phase has been exceeded.	Check the battery is in good condition, replacing it if necessary.
SCt	The maximum duration of the recharging cycle has been exceeded.	Check the battery is in good condition, replacing it if necessary.
SCr	Internal short-circuit.	Replace the battery charger.
bat	Incorrect battery connection.	Check the battery connection and the correct position of the polarities.

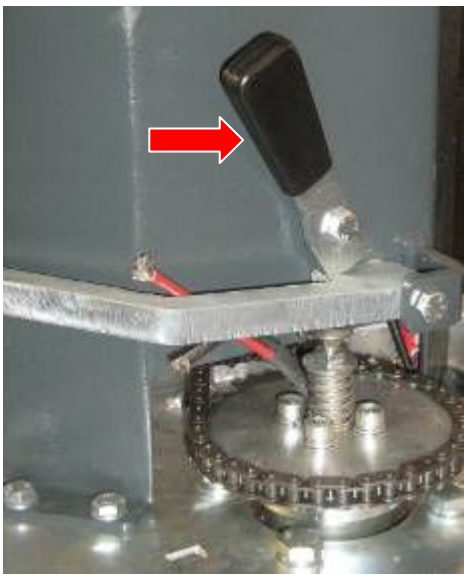
Check the functioning of the "service menu". Remember that to access it, you must keep the button pressed while starting up the machine (when you turn the key).



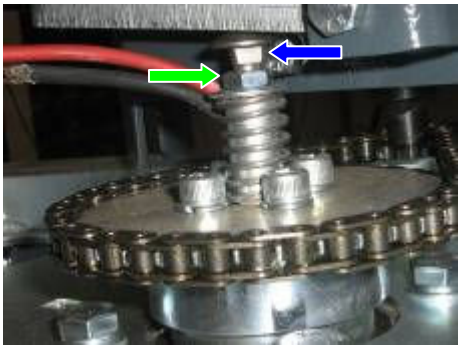
Testing the Water System	
3. Check the **solution filter** just underneath the tank cap is clean and functioning.	
4. Check the cleanliness and seal of the **solution filter** (in the front part of the machine under the frame).	
5. Completely fill the solution tank with water. 6. Check the seal of the pipes, **solenoid valve** (on the brush base) and the **water tap** regulator. 7. Check the solution pours onto the floor in a continuous manner when the tap is open.	

Brakes and traction adjustment

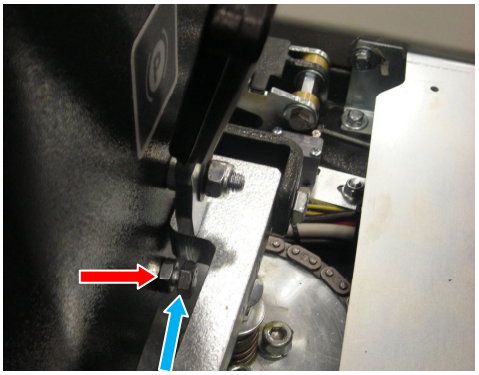
1. Move the **brake lever** into the parked position (turning it anticlockwise).

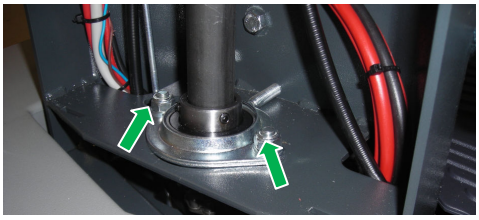


2. Loosen the **locking nut** and unscrew the **bolt** until the wheel is locked. Then tighten the **locking nut**.
3. After releasing the lever, check that the wheel moves freely.

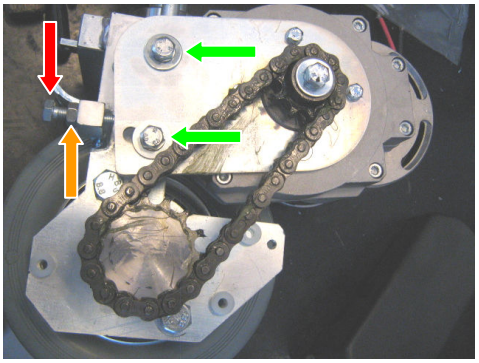


4. Check the tension of the steering wheel chain. If necessary, adjust as follows:
   - loosen the **locking nut** of the adjustment screw;
   - loosen the **two self-locking nuts** of the steering support flange;
   - turn the **screw** until the desired tension of the chain is obtained (the flange will slide along the slots);
   - tighten the two self-locking nuts;
   - tighten the check nut.

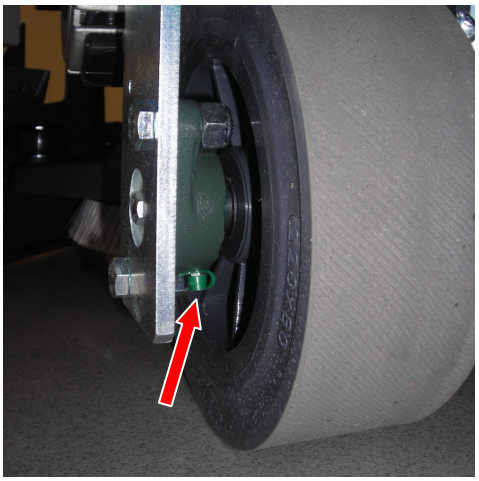




5. To adjust the chain tension of the drive wheel, proceed as follows:
   - remove the plastic guard;
   - loosen the **nuts** that secure the plate of the drive wheel;
   - loosen the **locking nut**;
   - tighten or loosen the **screw** to tighten or loosen the traction chain;
   - once the correct tension has been achieved, tighten the **locking nut** to block the adjustment;
   - then tighten the two **nuts** to block the plate and replace the plastic guard.

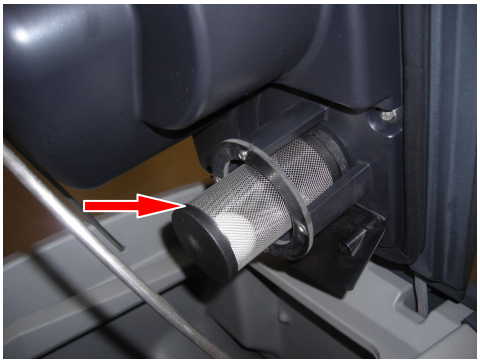


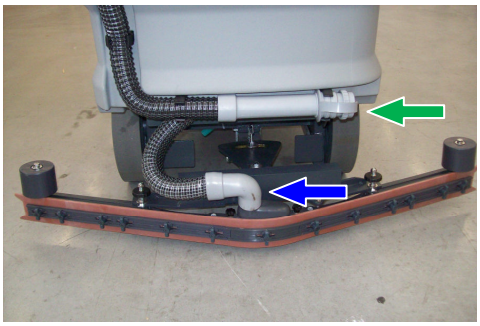
6. When necessary, grease the **bearing supports** of the drive wheel.



Suction Testing

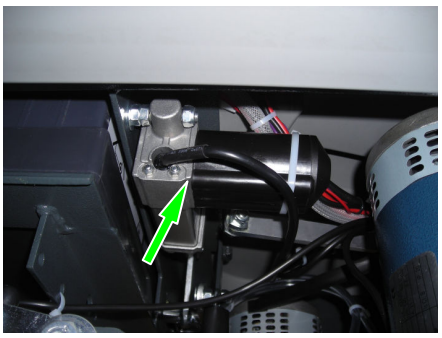
1. Check the **filter – float** is clean and functioning.
2. Check the air seal of the cap on the recovery tank.
3. Check the connections and seal of the suction tubes and the squeegee tube.
4. Check the seal of the **squeegee nozzle**.
5. Check the seal of the drain tube and **cap**.

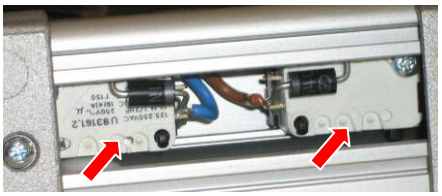




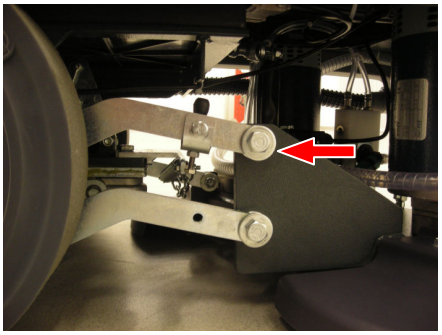
Adjustment of the brushing base

1. Check the right functionality of the **actuator** of lifting and lowering of the brush base.
2. If necessary adjust the microswitch of the actuator, acting as following:
   - using a screwdriver remove the plastic cover of the internal microswitches of the actuator;
   - unscrew the screws which fix the **micro** and position them so that they are at the extreme sides;
   - check that, in that position, with brush base up, the brushes can be easily removed and mounted, and when the brush base is down the lifting chain is not under tension;
   - tight the screws of the micro and close the cover.

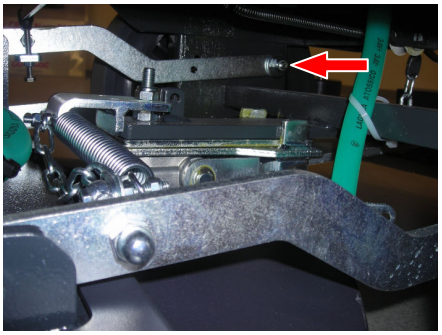




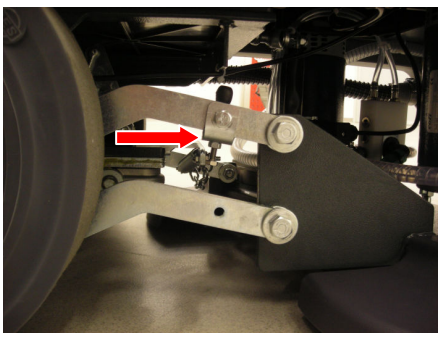
3. The base is pivoting transversely and must be adjusted longitudinally inclined in relation to the machine so that the brush has a distance of about 5 mm more from the floor at the front than the back.
4. To make this adjustment, proceed as follows:
   - loosen the **bolt** that fastens the third point to the base (right side of the machine);
   - Lower the base with brush onto the floor
   - tilt the base until it is in the correct position;
   - tighten the **bolt** securing the third point to the base.



5. The basement is pivoting crosswise so adjustment in that direction is not necessary.
6. Make sure that the **self-locking nuts** that secure the base arms to the frame are not fully tightened and allow the movement of the base.

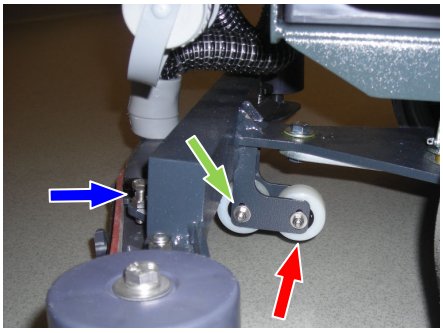


7. Adjust the **screw** on the right base lifting arm so that a when the base is raised it appears to be flat and parallel to the floor.

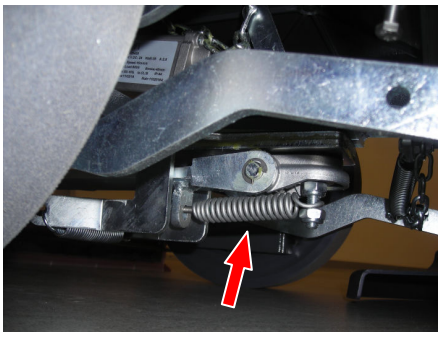


Squeegee adjustment

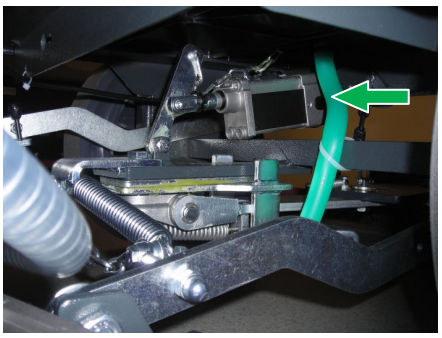
1. Adjust the squeegee as follows:
   - lower the squeegee to the floor so that the rubbers are perfectly vertical.
   - loosen the **bolt** that secures the **wheel** of the squeegee placing it at a height of 3 mm from the floor;
   - tighten the **bolt**.
2. Adjust the angle of the squeegee rubber by loosening the locking nut and screwing or unscrewing the adjustment **screw**. Verify that the rubber has a uniform slope throughout its length.

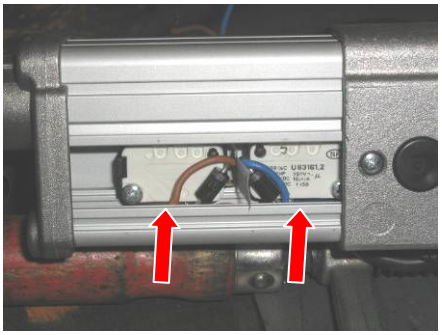


3. Adjust the pressure of the squeegee, depending on the floor, acting on the **spring** under the squeegee arm.

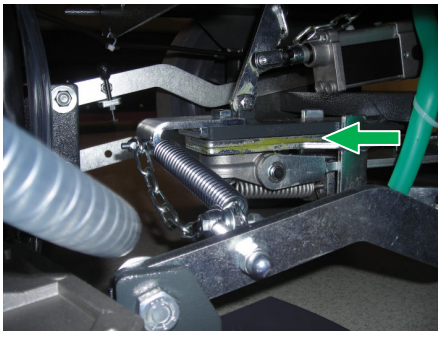


4. Check the right functionality of the **actuator** of lifting and lowering of the squeegee.
5. If necessary to adjust the micro of the actuators, act as following:
   - using a screwdriver remove the plastic cover of the internal microswitches of the actuator;
   - unscrew the screws which fix the **micro** and position them so that they are both at the right side;
   - check that in that position, when the squeegee is down on the floor, is completly free to move, and when it is up the central armi s at minimum 2 mm. from the support plate;
   - tight the screws of the micro and close the cover.



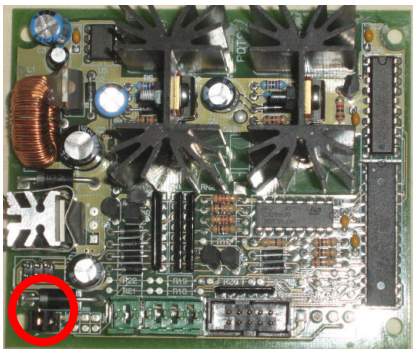


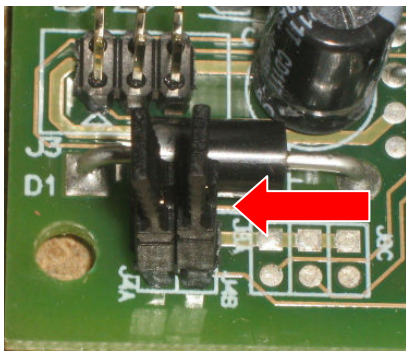
6. For proper maintenance, keep the **two plates** greased for the extra rotation of the squeegee.



Check the dosing system

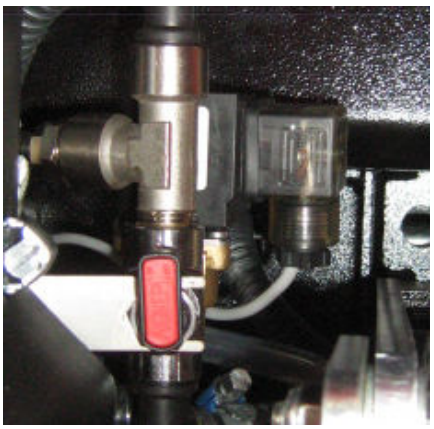
1. Check the cleaness of the contacts and of the side of the dosing system card.
2. Check the set up of the two **jumper J4A e J4B** of the dosing system card.
3. Check that the two Jumper are positioned on the pin to close both (as indicated on the picture).



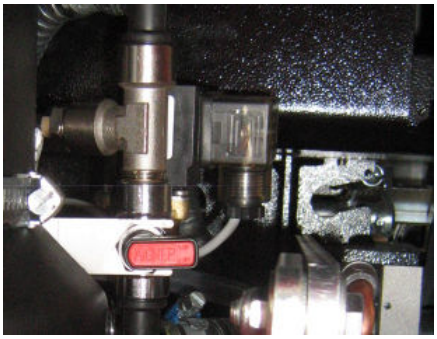


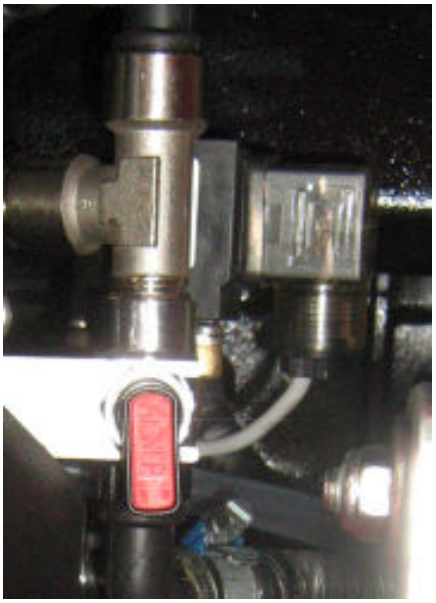
4. Check the detergent tubes and the detergent canister tubes are clean, in good condition, and functioning correctly.
5. Check the correct functionality of the bypass of the dosing system. The bypass system is activated by a **robinet** positioned on the brush base.

6. Check the dosing system is activated when the tap lever is in the position shown in the photo (<u>up</u>).



7. Check the solution emerges due to gravity only (i.e. the dosing system is not activated) when the tap lever is in the position shown in the photo (<u>central</u>).



8. Check no detergent solution ever emerges when the tap lever is in the position shown in the photo (down).	
9. Check the functionality and the connections of the water and detrgent pump. 10. Check that the solution hoses are clean and in good condition.	

Testing machine operation

- ☐ Check the function of the key switch and hour meter;
- ☐ Check the functioning of the job selector.
- ☐ Check the functioning of the accelerator.
- ☐ Check the functioning of the base.
- ☐ Check the functioning of the brush motor.
- ☐ Check the functioning of the solenoid valve.
- ☐ Check the functioning of the suction motor.
- ☐ Check the functioning of the parking brake.
- ☐ Check the condition of the batteries, clamps and cables.

Machine operating tests

- ☐ Fill the tanks with water and check for any leaks.
- ☐ Check the seal of the water system and check the water falls evenly onto the two brushes.
- ☐ Adjust the inclination and wheels of the squeegee, carrying out an operating test.
- ☐ Adjust the brush pressure and base inclination, carrying out an operating test.
- ☐ Check the efficiency of the parking brake.
- ☐ Check forward movement, backward movement, acceleration and braking.

Final Testing

Check all the functions: washing, drying, forward movement.