

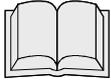
	<p>ADJUSTMENT AND INSPECTIONS</p>	<p><b>MMG</b></p>	<p>Doc. 10023983 Issued February 2011 Ver. AA Pag. 1 di 17</p>
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## VALIDITY

This documents is valid for all machine

## CHANGE FROM PREVIOUS DOCUMENT

Page Ref.	Argument	Description
11	Clean water installation testing	Pictures update
13	Vacuum adjustment	Pictures update
14	Deck adjustment	Update with sweeping version (MMG 70S)
16	Squeegee adjustment	Pictures update



## **READ THE USE AND MAINTENANCE MANUAL**

### **CONSOLE CONFIGURATIONS AND SETTINGS**

#### **Console Services**

The console allows you to:

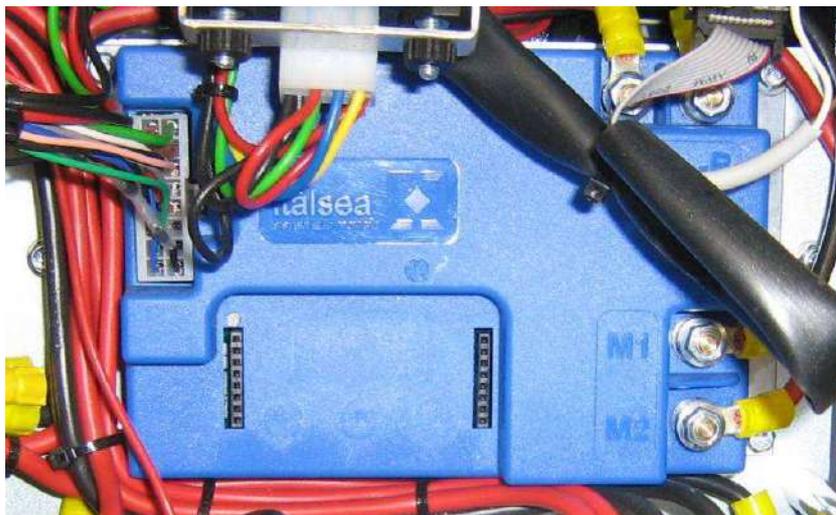
- Program the chopper card to ensure the correct behaviour of the machine;
- Test the electric components and circuit regarding the traction system.
- Read the alarms to identify the error code easily.

#### **Console use**

The correct sequence to connect the console is:

1. **TURN OFF** the machine by turning the main key.
2. Connect the console to the chopper card via the connector on the board.
3. Turn on the machine and operate with the console.
4. When finish **TURN OFF** the machine.
5. Disconnect the console from the machine.

**A BAD SEQUENCE IN CONNECTING AND UNCONNECTING THE CONSOLE CAN EASILY DAMAGE THE CARD OR THE CONSOLE.**



## ALARM TABLE

Message	Alarm	What to do
<b>ALARM A1 FW Switch ON</b>	Forward micro-switch on in turning on.	Put the potentiometer in idle position and verify that the forward micro-switch is open.
<b>ALARM A2 BW Switch ON</b>	Backward micro-switch on in turning on.	Let the pedal stay in idle position and open the backward micro-switch.
<b>ALARM A3 Pot. FAULT</b>	Potentiometer error	Check the potentiometer harness.
<b>ALARM A4 Ref OUT Neutral</b>	Potentiometer not correctly positioned	Put the potentiometer in the idle position or if it already is in the right position, make the potentiometer programming.
<b>ALARM A5 Over temperature</b>	Thermal protection	Wait for 5 minutes and then verify the traction motor absorption rate.
<b>ALARM A6 POWER STAGE</b>	Damaged power stage	Replace the chopper card.
<b>ALARM A7 OVERCURRENT</b>	Overcurrent	Check the motor cables: If connections are regular and repeat the alarm, replace the chopper card.
<b>ALARM A8 POWER FUSE/RELAY</b>	Power fuse or internal contactor damaged	Check the fuse on the + battery and wiring, replace the chopper card if it persists (General relay damaged).
<b>ALARM A9 UNDERVOLTAGE</b>	Undervoltage	Check the batteries for poor voltage.
<b>ALARM A10 OVERVOLTAGE</b>	Overvoltage	Battery voltage greater than 45V: check battery status
<b>ALARM A11 Overload Current</b>	Current protection	Check the motor current and possibly trim the electronic current control
<b>ALARM A12 DISABLE ON</b>	Disabling active	Check the status of the disabled.
<b>ALARM A13 KEY-OFF</b>	Turn off sequence active	Check the wiring on the ignition power key.
<b>ALARM A14 EEPROM FAIL</b>	E <sup>2</sup> prom data reading failed	Check the settings: if the alarm is repeated, replace the chopper card.

## CHOPPER CARD CONFIGURATION



Console Code: 431320

To enter the parameter list:

1. Press the "MODE" button.
2. The first parameter description will appear, pressing up or down it is possible to scroll the parameter list.
3. Once on the parameter you want to change, press the "MODE" button to enter into the parameter to modify the configuration (in modification condition the parameter description will blink).
4. Change the value using the "UP" and "DOWN" buttons. Once configured correctly confirm the changes by pressing the "MODE" button, this will confirm the changes.

## PARAMETERS:

PARAMETER	DEFAULT	MMG
RESET TO DEFAULT	<b>DISABLE</b>	<b>DISABLE</b>
ACCELERATION RAMP	3	<b>3</b>
REVERSE RAMP	1,5	<b>1,5</b>
NEUTRAL RAMP	1	<b>1</b>
FORWARD SPEED	100	<b>100</b>
BACKWARD SPEED	60	<b>60</b>
MINIMUM SPEED	0	<b>0</b>
BATTERY VOLTAGE	24	<b>24</b>
SPEED REFERENCE	single-ended	<b>single-ended</b>
REF. DEADBAND	0,2	<b>50mV</b>
BRAKE DELAY	2	<b>0,5</b>
MULTIMODE SPEED	50	<b>50</b>
MULTIMODE CURRENT	25	<b>45</b>
BW SAFETY TIME	0	<b>0</b>
BW SAFETY SPEED	0	<b>0</b>
LOW BATTERY	19	<b>19</b>
TIMEOUT RUN AWAIT	0	<b>60</b>
RUN-AWAY	0	<b>14</b>
CURRENT LIMIT	45	<b>90</b>
RATED CURRENT	15	<b>25</b>
OVERLOAD TIME	60	<b>60</b>
5-J1 HW CONFIG	N.C. switch	<b>N.O. switch</b>
6-J1 HW CONFIG	N.O. switch	<b>N.C. switch</b>
11-J1 HW CONFIG	N.O. switch	<b>N.O. switch</b>
ENABLE ALARM 1	ENABLE	<b>ENABLE</b>
ENABLE ALARM 2	ENABLE	<b>ENABLE</b>
ENABLE ALARM 3	ENABLE	<b>ENABLE</b>
ENABLE ALARM 4	ENABLE	<b>ENABLE</b>
ENABLE ALARM 12	ENABLE	<b>DISABLE</b>
PASSWORD	0	<b>0</b>

## POTENTIOMETER SETTINGS

(Resister Settings)

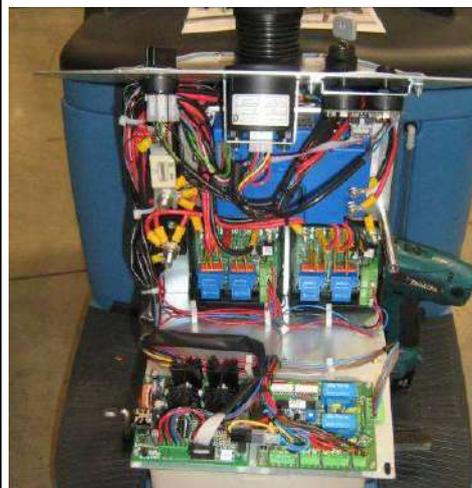
- 1) Ensure the machine is **TURNED OFF**.
- 2) Connect the console to the machine.
- 3) Turn on the machine.
- 4) Enter into the parameter list using the "MODE" button.
- 5) Scroll down the list until you reach the parameter "Speed reference appears"
- 6) Press the "MODE" to enter into parameter to change the settings as below.

<p><b>SPEED REFERENCE</b> <b>single-ended</b></p>	<p>Select the "single-ended" option and confirm with "MODE"</p>
<p><b>CALIBRATION</b> <b>Stop pos = 0.6 V</b></p>	<p>Put the pedal in the idle condition and confirm its value using the "MODE" button.</p>
<p><b>CALIBRATION</b> <b>Max pos = 2.7 V</b></p>	<p>Press completely the potentiometer and confirm the value using the "MODE" button.</p>

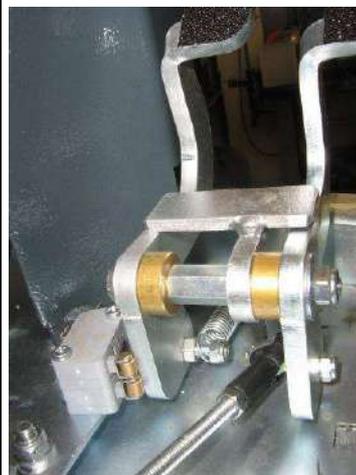
- 7) Turn off the Machine.
- 8) Disconnect the console.
- 9) Turn on the machine and perform a functional test to verify the adjustment.

**Electric installation tests**

1. Check the electric installation functionality: switches, contactors, motors, solenoid valve, power fuses and thermal switches.



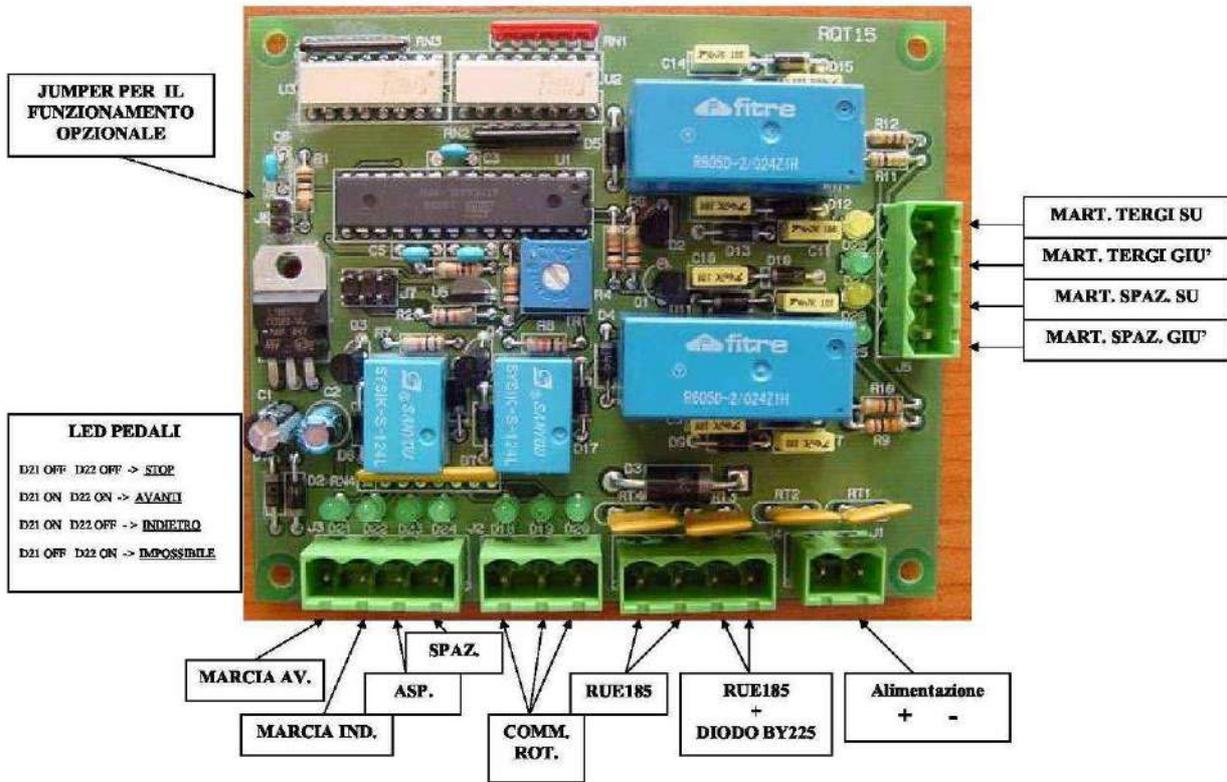
2. Check the functionality and the potentiometer conditions and the conditions of the direction micro-switches.
3. Check that when the micro-switch is pressed there is about 0,5 mm of micro-switch lever movement clearance.



4. Check the conditions and the connections of the power cables and battery charger (option).



**Actuators pcb control**



### Battery check card adjustment

1. Check that when turning on the machine the battery check card has the following starting sequence:
  - Turning on of the LED which correspond to the set-up (red LED = "0")
  - Turning on of all the LEDs (check of the lamps)
  - Turning on of the LEDs depending on the charge of the battery
2. Check the hour meter is functioning correctly.

To check the settings you simply need to turn on the machine and check which is the first LED that turns on. Counting the LEDs from the left side any LED correspond to a position and the LED which turn on correspond to the current set-up.

Check that if the machine is using wet cell batteries the adjustment is on position 1.



Check that if the machine is using GEL batteries the adjustment is on position 4.



**WARNING:** A wrong set-up of the battery control card will compromise the battery efficiency and damage them permantly.



### Battery charger adjustment

1. Verify that the battery charger set up is correct for the battery type used on the machine.



2. To adjust the battery charger act as follow:
  - Lift up the **sticker** on the front part of the battery charger.
  - Set up the dip switches under the sticker following the instructions of the table below.
  - Put the **sticker** in its original position.



Battery charger with serial number from 470878.

Under the plastic cover you can see the dip switches as the picture shows.

The dip switches has to be setted up as follow:

**DP1 – DP2:** Charge curve selection

<b>GEL TROJAN</b>	<b>DP1</b>	<b>DP2</b>
	ON	ON
<b>WET CELL</b>	<b>DP1</b>	<b>DP2</b>
	ON	OFF
<b>GENERIC GEL o AGM</b>	<b>DP1</b>	<b>DP2</b>
	OFF	ON
<b>GEL EXIDE SONNENSCHN</b>	<b>DP1</b>	<b>DP2</b>
	OFF	OFF



**Other switches UNCHANGEABLES**

<b>DP3</b>	<b>DP4</b>	<b>DP5</b>	<b>DP6</b>	<b>DP7</b>	<b>DP8</b>
ON	ON	ON	OFF	OFF	ON



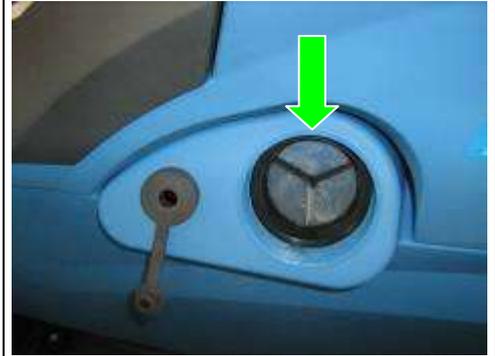
**Read carefully the battery charger use and maintenance manual**

Charger warning codes:

ERROR MESSAGE	CAUSE	WHAT TO DO
E01	Over voltage on the battery	Verify the battery installed on the machine, the installation of the power connections and the quality of the power cables.
E02	Over temp of an external probe.	Restart the battery charger if the problem is still there, replace the battery charger.
E03	Charging phase issue	Verify the battery conditions and, if necessary, replace it.
SCt	Charging cycle taking too long	Verify the battery conditions and, if necessary, replace it.
SCr	Internal short circuit	Replace the battery charger

**Clean water installation testing**

3. Check the cleanliness and functionality of the **solution filter** under the solution tank plug.



4. Check the cleanness and sealing of the **solution filter**.

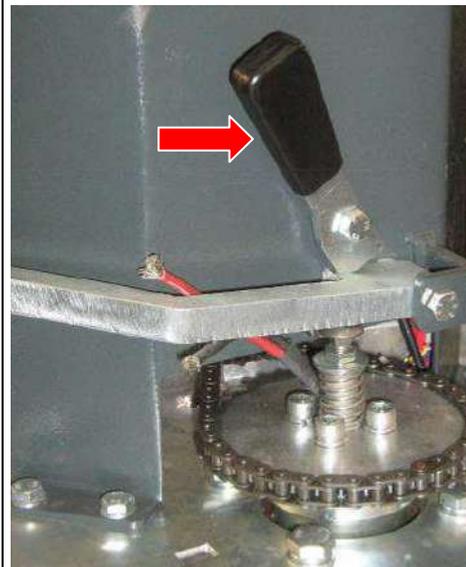


5. Fill up the solution tank.  
6. Check the hoses sealing, **solenoid valve** (on brush deck) and **water valve**.  
7. Check that when the water valve is open, the solution arrive continuously onto the floor.

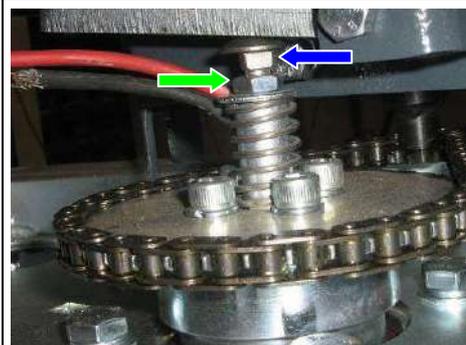


### Traction and brakes adjustment

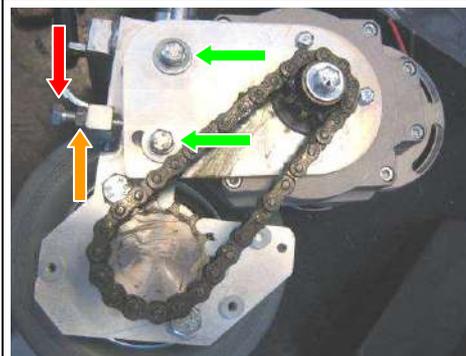
1. Move the brake lever to put it in parking position.



2. Loosen the **locking nut** and unscrew the **screw** until the traction wheel is secure. Once you have reached the right adjustment adjust the **locking nut**.
3. Check that when the lever is in standard position (brake off) the wheel is free to move.

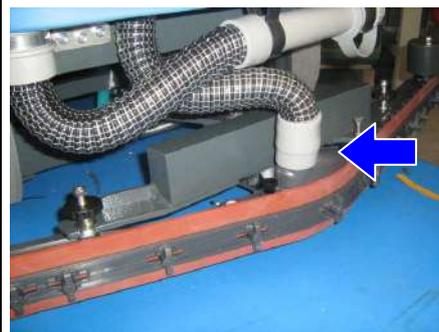


4. To proceed to the chain tensioning adjustment act as follow:
  - Remove the plastic cover;
  - Loose the **nuts** that fix the plate to the traction wheel.
  - Loose the **locking nut**;
  - Screw or unscrew the **screw** to tension or loose the chain;
  - Once reached the correct adjustment lock the **locking nut** to fix the adjustment.
  - Lock the locking **nut** to fix the plate and refit the plastic cover.



### Vacuum adjustment

1. Check the cleanliness and functionality of the **floating filter**.
2. Check the sealing between the **vacuum head** and the recovery tank.
3. Verify the connections and sealing of the vacuum hoses and squeegee hose.
4. Check the sealing of the **squeegee adapter gasket**.
5. Check the sealing of the drain hose and its plug.



### Deck adjustment

#### MMG 65/75/85

1. The brush deck is on a floating support. It is necessary to adjust its horizontal inclination only.
2. To proceed to the deck adjustment proceed as follow:
  - Loose the **screw and nut M8** that fix the brush deck to the third point of the arm.
  - Put the brush to let it have a distance from the floor 5mm higher in the front that in the rear of the machine.
  - Tighten screw and nut loosened to complete the adjustment.



3. Verify the correct functionality of the **actuator** that moves the brush deck.
4. If it is necessary adjust it as follow:
  - Remove the plastic cover of the actuator;
  - Move the **micro-switch that stops the lowering** at the end of the slot.
  - Move the **micro-switch of the lifting up** to the end of the slot as well (in opposite direction than before)
  - Tighten the **fixing screws** and put back the plastic cover.

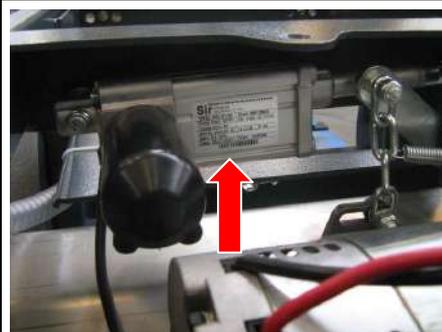


**MMG 70S**

1. The brush deck is fixed to the body. It is necessary to adjust its vertical inclination only.
2. To proceed to the deck adjustment proceed as follow:
  - Loose the **screw** that fix the brush deck to the body.
  - Adjust the brush deck, to move it vertically, so that it's horizontal to the floor.
3. Tighten **screw** loosened to complete the adjustment.



4. Verify the correct functionality of the **actuator** that moves the brush deck.
5. If it is necessary adjust it as follow:
  - Remove the plastic cover of the actuator;
  - Move the **micro-switch** that stops the lowering at the end of the slot.
  - Move the **micro-switch** of the lifting up to the end of the slot as well (in opposite direction than before)



Tighten the **fixing screws** and put back the plastic cover.

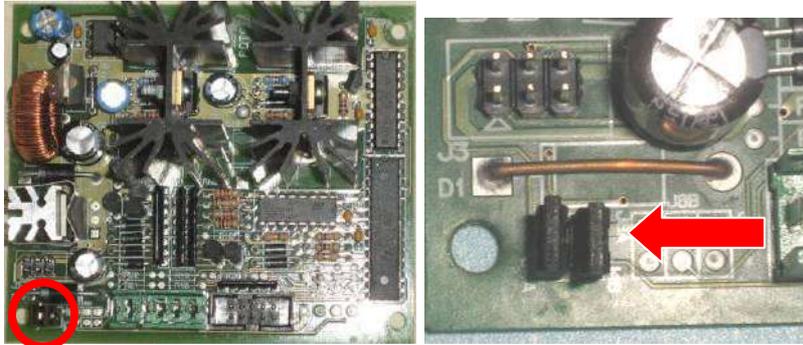


### Dosing system adjustment

Verify the contacts cleanness of the dosing pump card.

Verify the **J4A and J4B jumper** adjustment.

Verify that both jumpers are positioned on the two bridges.



Verify the cleanness and conditions of the detergent hoses and detergent tank.



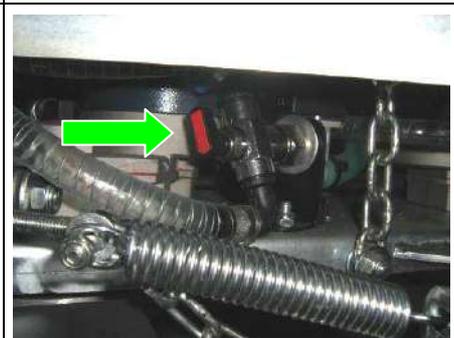
Check the correct functioning of the dosing system bypass valve.

The bypass system can be actuated by a **valve** installed on the brush deck.

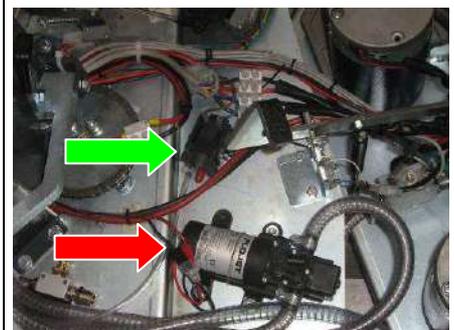
Up position is ON

Down position is OFF

Only use these to settings

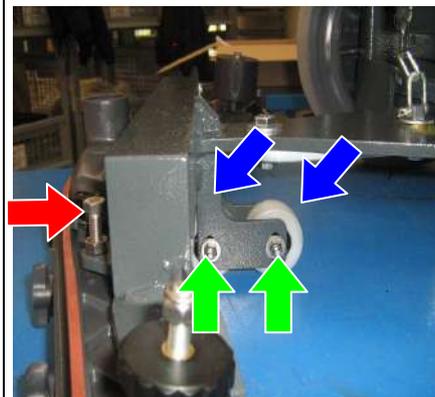
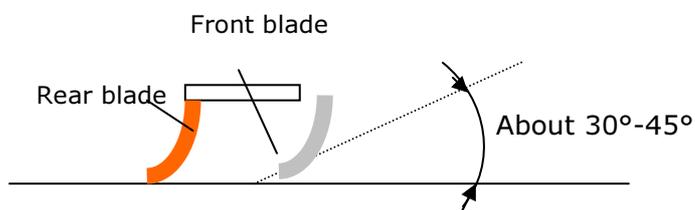


Check the functionality and the connection of the **water pump** and **chemical pump**. Verify all the hydraulic hoses conditions.

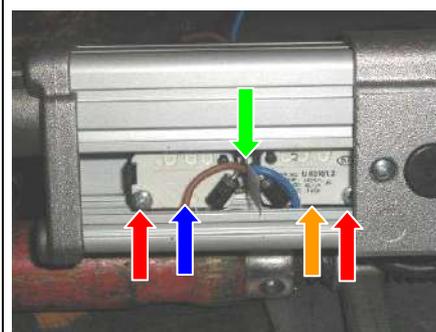


### Squeegee adjustment

1. Adjust the **adjuster** for the blade inclination when the vacuum motor is on. The blade has to have an even inclination on all its lengths.
2. Adjust the blade inclination as follow:
  - Loosen the **bolts** that fix the two wheels
  - Put the squeegee on the floor with the blade perfectly vertical.
  - Put a spacer between the floor and the **wheels** 3 mm high.
  - Tighten the **bolts** to fix the adjustment
3. Check that you have an even inclination of the blade for all its length. The inclination has to be between 30° and 45°.



1. Verify the correct movement of the squeegee.
2. To adjust the squeegee actuator movement act as follow:
  - Remove the **plastic cover** form the actuator.
  - Move the lowering **micro-switch** at the end of the slot.
  - Put between the two micro-switches some **insulating paper**.
  - Move the lifting micro-switch to touch the lowering **micro-switch**.
  - Tighten the **locking screws** to block the adjustment.



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#### **Functional check of the machine**

- Check the functionality of switches and warning lamps;
- Check the functionality of the accelerator lever;
- Check the functionality of the brush base;
- Check the functionality of the brush motor;
- Check the functionality of the solenoid valve;
- Check the functionality of the suction motor;
- Check the functionality of the brakes;
- Check the functionality of batteries and power cables;

#### **Functional test of the machine**

- Fill the tanks completely and verify the sealing;
- Verify the sealing of all the water plant and that the water is equal on both brushes;
- Adjust the inclination and the height of the squeegee rubbers doing a functional test;
- Adjust the inclination of the brush base and do a functional test;
- Check the efficiency of the parking brake;
- Verify the forward and backward movement, acceleration and braking;

#### **Final Check**

Check all the functions: washing, drying and movement