FIMAP®

SERVICE MANUAL

MXR

Version: **AC**
Date: **February 4, 2022**
Document Number: **10083759**

Contents

Part I

Product Introduction

Chapter 1

General Info

1.1 Service Manual Purpose

Good customer service requires in-depth training and well-structured training materials.
This service manual has been created to assist certified service technicians through instructions and reference guide. It is recommended to read it thoroughly before servicing your machine.

1.2 Revision History

AB
- Updated Vacuum Parameters Table (see section 3.6.8 at page 39)
- Vacuum Motor Absorption (see section 6.5.1 at page 59)

AC
- Improved Main card Contact legend (see section 3.3.1 at page 26)
- Battery charger settings updated (see section 3.5.2 at page 31)
- Added Revision History

1.2.1 Other reference Documents

DOCUMENT	DESCRIPTION	DOC. NO.	VERS.	TYPE
Spare Parts Catalogue	MXR	10035264	AD	RIC
Wiring diagram	MXR	10034924	AC	CIE
Use and Maintenance Manual	MXR	10035037	AD	UM

1.3 Configurations

Mxr is a battery-powered ride-on scrubber-dryer, able to clean a wide range of floors and dirt types, collecting during its forward motion the removed dirt and the detergent solution not absorbed by the floor. The machine can be powered by single monobloc batteries, to provide 24 V DC to the motors and to the controls.

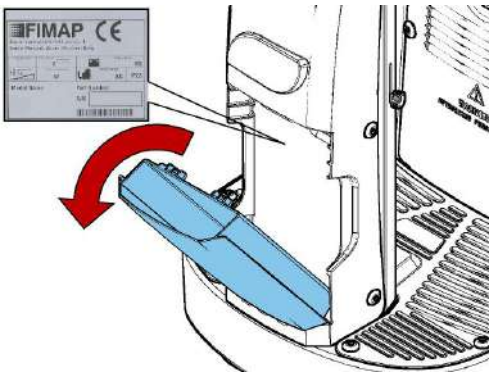
The Mxr with Disc Brush Deck is equipped with a disk brush.
The Mxr with Orbital Brush Deck is equipped with an oscillating central rectangular pad.

1.4 Products related to this Manual

105860 MXR
105861 MXR CB
107300 MXR CB FFM
109214 MXR CB STANDARD
110001 MXR ACTION

1.5 The Serial Number Plate

1 Part Number
2 Serial Number



The serial number plate is located on the back of the steering column, below the steering wheel.

1.6 Positioning Conventions

By convention, all the forward and backward reference, front and rear, right and left indicated in this manual, are meant as referring to the operator in the driving position with the hands on the handlebars.

1.7 General Safety Instructions

Always wear the appropriate personal protective equipment for each operation.

In order to avoid short-circuits when working in the vicinity of electrical components, do the following: avoid the use of non-insulated tools; do not place or allow metallic objects to fall upon the electrically powered components; remove any rings, watches and/or clothing with metallic parts that might come into contact with the electrically powered components.

Do not work underneath the raised machine without adequate fixed safety supports.

Restore and double check all electrical connections after any maintenance interventions.

When doing maintenance work, switch off the machine using the main switch. Remove the key from the instrument panel and disconnect the battery connector from the electrical system connector.

Avoid contact with moving parts. Do not wear loose clothing or jewellery and tie long hair back.

Block the wheels before lifting the machine.

Lift the machine with equipment that can sustain the weight to be lifted.

Empty both tanks before transport.

Bring both the squeegee and the brushes to a working position before securing the machine to the transport vehicle.

The ramp for placing the machine on the transport vehicle should have such a slope that the machine does not get damaged.

Check that the electro-brake is correctly inserted after loading the machine on the transport vehicle.

1.8 How to move the machine

The traction gearmotor is equipped with a built-in electrobrake which is activated when the key switch is deactivated or the lever is released. It is possible to manually exclude this brake, if necessary, reaching the right rear part of the machine and turning the Red lever upwards. Do this only if you need to push or pull the machine. Remember to reinsert the brake lever after moving the machine, by rotating it downwards. If the electric brake is not reactivated, an alarm will appear when the machine is turned on.

1.9 Technical Data

Technical Data

TECHNICAL DESCRIPTION	U/M	MXR Disc	MXR Orbital
Working capacity, up to	$\frac{m^2}{h}$ / $\frac{ft^2}{h}$	2632/32292	2632/32292
Steering Diameter	mm/in	1980/78	1980/78
Maximum Ramp Gradient at Full Load	%	8	8
Brush Motor *(Voltage - Nominal Power - Revolutions)*	V-W-rpm	24-500-140	24-600-2000
Vacuum Motor *(Voltage - Nominal Power)*	V-W	24-424	24-424
Traction Motor *(Voltage - Nominal Power)*	V-W	24-300	24-300
Solution Tank	L/gal	65/17.2	65/17.2
Recovery Tank	L/gal	75/19.8	75/19.8
Battery compartment dimensions *((length - width - height)*	mm in	362-354-290 14.25-14-11.4	362-354-290 14.25-14-11.4
Usage Temperature *(Min - Max)*	˚C ˚f	0 - 40 32-104	0 - 40 32-104
Sound pressure level *(ISO 11201)*	LpA dB (A)	63	63
Hand vibration level *(ISO 5349)*	$\frac{m}{s^2}$ $\frac{ft}{s^2}$	≤ 2.5 ≤ 8.2	≤ 2.5 ≤ 8.2
Body vibration level (ISO 2631)	$\frac{ft}{s^2}$ $\frac{m}{s^2}$	≤ 1.6 ≤ 0.5	≤ 1.6 ≤ 0.5

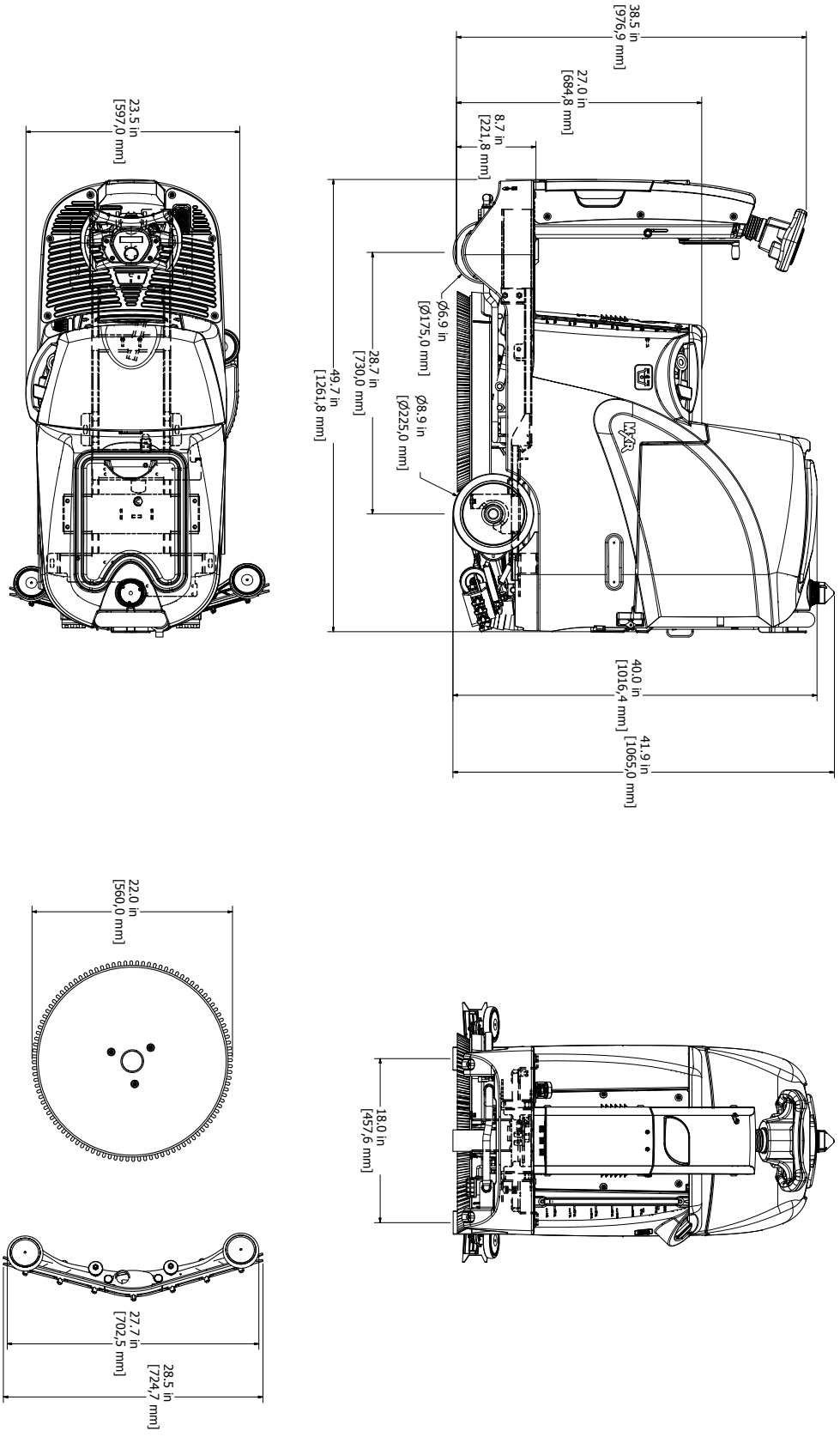
Weights and Pressures[1]

TECHNICAL DESCRIPTION	U/M	MXR Disc	MXR Orb
Machine Weight *(empty and without batteries)*	Kg lb	110.4 243.4	110.4 243.4
Machine Weight in work conditions *(machine + batteries + water + operator)*	Kg lb	332.4 734	332.4 734
Weight front wheel	Kg $\leq$ lb $\leq$	116 255	115 253
Front wheel pressure	$\frac{kg}{cm^2}$ $\leq$ PSI $\leq$	14.4 205	14.3 203
Weight rear right wheel	Kg $\leq$ lb $\leq$	120.8 266	120 264
Rear right wheel pressure	$\frac{kg}{cm^2}$ $\leq$ PSI $\leq$	11.75 167	11 156
Weight rear left wheel	Kg $\leq$ lb $\leq$	124 273	123 271
Rear left wheel pressure	$\frac{kg}{cm^2}$ $\leq$ PSI $\leq$	12.87 183	12 170

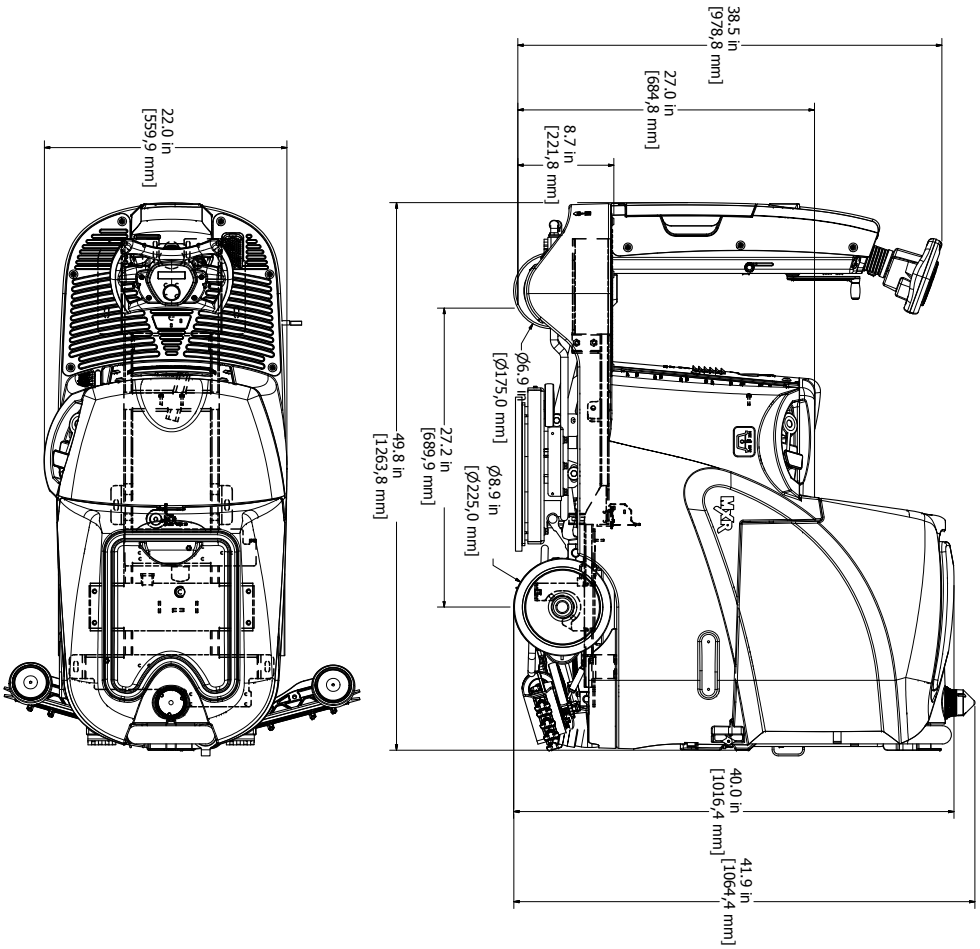
[1]Weight and Pressures depends on how much water there is in the tanks and on the type of battery the machine fits.

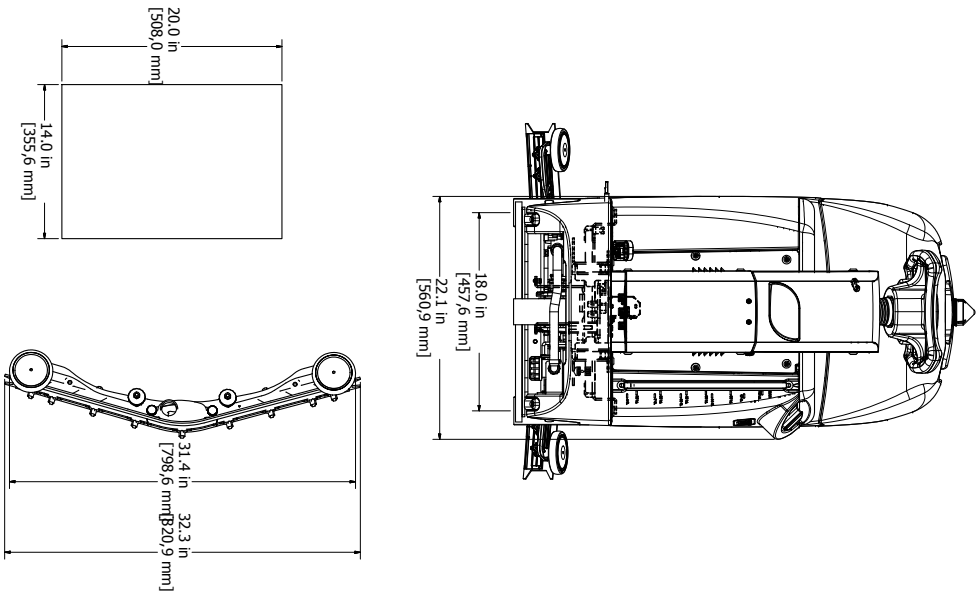
1.10 Machine Dimensions

1.10.1 Mxr Disc



1.10.2 Mxr BTO


38.5 in
[978,8 mm]
27.0 in
[684,8 mm]
8.7 in
[221,8 mm]
22.0 in
[559,9 mm]
Ø6.9 in
[Ø175,0 mm]
27.2 in
[689,9 mm]
Ø8.9 in
[Ø225,0 mm]
49.8 in
[1263,8 mm]
40.0 in
[1016,4 mm]
41.9 in
[1064,4 mm]


20.0 in
[508,0 mm]
14.0 in
[355,6 mm]
18.0 in
[457,6 mm]
22.1 in
[560,9 mm]
31.4 in
[798,6 mm]
32.3 in
[820,9 mm]

1.11 Diagnostic and necessary Service Tools

In addition to a full set of metric and standard tools, the following items are required in order to successfully and quickly perform troubleshooting and repair.

- Digital voltmeter
- DC Current Probe with Full Scale 40-200A
- Densimeter
- Hydraulic Lift
- Charger Serial Data Cable, PN **435226**

1.12 Fastener Torque Specifications

Nominal Diameter	Standard Screws	Stainless Steel Screws
M4	3.1 Nm - 27.4 lb/in	2.1 Nm - 18.6 lb/in
M5	6 Nm - 53.1 lb/in	4 Nm - 35.4 lb/in
M6	10.4 Nm - 92 lb/in	7 Nm - 62 lb/in
M8	24.6 Nm - 18.1 lb/ft	16.5 Nm - 12.2 lb/ft
M10	50.1 Nm - 37 lb/ft	33.5 Nm - 24.7 lb/ft
M12	84.8 Nm - 62.5 lb/ft	56.8 Nm - 42 lb/ft

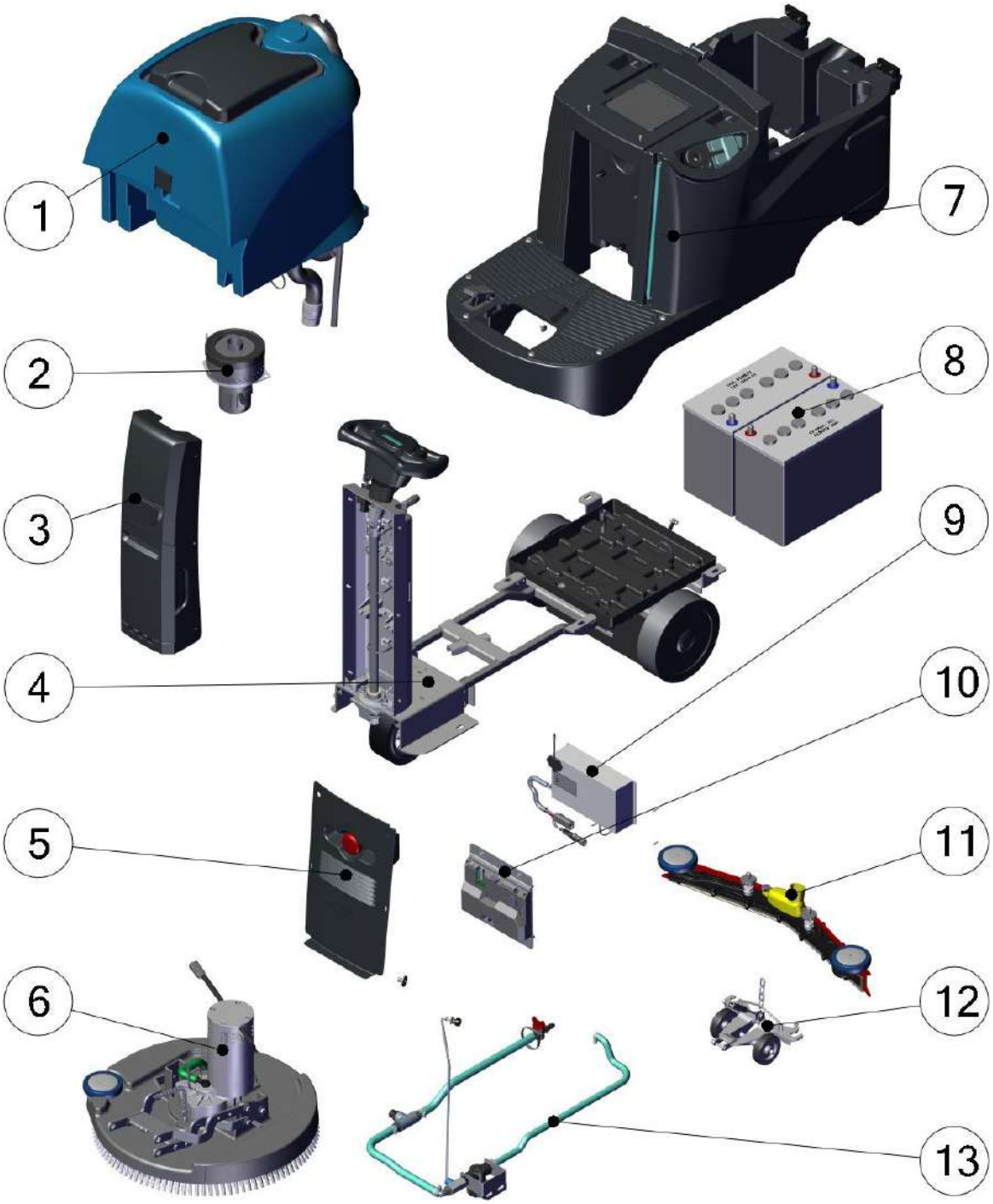
1.13 Scheduled Maintenance

Maintenance of	Daily	Weekly	Monthly	Yearly
Charge batteries	X			
Check/Clean Tanks & Hoses	X			
Check/Clean the Brushes/Pads	X			
Check/Clean the Squeegee	X			
Check/Clean Recovery Tank Float	X			
Empty/Clean Debris Catch Tray of Recovery Tank	X			
Check EACH Battery Cell(s) Water Level		X		
Check/Clean all the Splashguards		X		
Check/Clean Solution Filter		X		
Check/Clean Solution Tank and Water group		X		
Lubricate Machine			X	
*Check/Replace Carbon Brushes				X
**Check/Tightening Electrical Contacts				X

* The carbon brushes of the brush motor and traction motor must be checked every 500 hours or once a year.

** Perform the operation after each replacement of an electrical component or once a year.

1.14 Main Components



1	Recovery Tank	8	Batteries
2	Vacuum Motor	9	Battery Charger
3	Front Carter Group	10	Main Card
4	Traction and Frame Group	11	Squeegee
5	Electrical Harness Carter	12	Squeegee Control
6	Brush Deck	13	Water Group
7	Solution Tank		

1.15 PDI

1.15.1 Before delivering the machine, carry out all the operations described below:

- Install the batteries and perform a complete recharge cycle (check the setting of the machine and of the battery charger)
- Install the clean water filter
- Fill the Solution Tank completely with water; check for eventual leaks and the correct water supply on the brushes
- Check the Washing function (brushdeck movement, water supply and brush rotation)
- Check the washing function (movement of the base, water delivery and rotation of the brush or pad)
- Check the Drying function (movement of the squeegee, operation of the suction motor and the sealing of the recovery tank)
- Check the Traction (Forward, Backward)
- Proceed with on-site adjustments (brushdeck and Squeegee adjustment)
- Check the functioning of the Optional if present:
  - Battery Charger
  - Blinking Light
- Once the demo has been completed, immediately perform the daily maintenance (see the Use and Maintenance manual).

1.15.2 Demo Tips:

Squeegee

You need to have a complete squeegee with a length different from the original (wider or narrower) if available.
You need to have an alternative squeegee rubber kits in PARA and Polyurethane with different hardness (see section 9.1 at page 74).

Brushes

You need to have alternative brushes in PPL of different thickness (see section 9.1 at page 74).
You need to have a pad holder and various PAD at different hardness (see section 9.1 at page 74).
You need to have several rectangular PADs with different hardness (see section 9.1 at page 74).

Chemical

You Always need to have the detergent available.
You need to have the Anti-foaming liquid (in case the customer uses his chemical).

Part II

Anomalies Resolution Guide

Chapter 2

Trouble-shooting

2.1 Electrical system: what to do if...

The machine doesn't switch on			
1.	The emergency button is pressed	⇒	*Release the emergency button.*
2.	The key is in position 0	⇒	*Rotate the key in position I.*
3.	The key switch is not properly connected	⇒	*Restore the proper connections.*
4.	The key switch doesn't work	⇒	*Replace the key switch.*
5.	The batteries don't work properly	⇒	*Check the proper section* *(see section 2.1 at page 16)*.

The display shows an alarm message			
1.	The display shows an alarm message	⇒	*Check what alarm message is shown and solve the related issue by following the proper instructions* *(see section 3.4.1 at page 30)*.

The machine has a very limited working autonomy			
1.	The BDI (Battery Discharge Indicator) is not properly adjusted	⇒	*Verify the type of battery used on the machine and adjust properly the BDI* *(see section 3.6 at page 34)*.
2.	The batteries have been working for several cycles	⇒	*Replace the batteries.*

The batteries don't work properly			
1.	The batteries are not properly connected	⇒	*Connect the loop wires and the output cables correctly.*
2.	The batteries are discharged	⇒	*Perform a complete charge cycle.*
3.	Battery terminal are oxidized	⇒	*Disconnect the batteries, clean the batteries terminals and reconnect properly the batteries.*
4.	With the machine in working conditions one battery has a voltage lower (difference higher than 2 V) than the other ones	⇒	*Replace the battery with lower voltage.*
5.	The fuse on the loop wire is damaged	⇒	*Check for possible short circuits, If not present replace the loop wire.*
6.	The power wires are damaged	⇒	*Replace the damaged wires.*
7.	The battery charger is not properly adjusted	⇒	*Adjust the battery charger properly* *(see section 3.5.2 at page 31)**.*
8.	The battery charger doesn't work	⇒	*Check the proper section* *(see section 2.1 at page 16)**.*

The battery charger doesn't work			
1.	The battery charger is not connected to the power supply	⇒	*Connect the charger to a supplied electric socket.*
2.	The battery charger is not connected to the batteries	⇒	*Connect the charger to the batteries.*
3.	The battery charger has one or more lights (or LEDs) blinking continuously	⇒	*The battery charger is in error conditions, verify the alarm tables and solve the issue by following the related instructions* *(see section 3.5.2 at page 31)**.*
4.	The battery charger is properly connected but it doesn't switch on	⇒	*Replace the battery charger.*

2.2 Mechanical scrubbing system: what to do if...

The machine doesn't clean well			
1.	The machine is switched off	⇒	*Switch on the machine.*
2.	The machine doesn't switch on	⇒	*Refer to the proper section* (see section 2.1 at page 15).
3.	The machine is in "ECO" mode	⇒	*Set the machine in Standard mode by pushing again the "ECO" mode button.*
4.	The machine is not in working condition	⇒	*Switch on the machine.* *Lower the brush deck.* *Press the traction pedal.*
5.	The microswitch of the traction pedal doesn't work	⇒	*Replace the traction pedal* (see section 3.2 at page 24).
6.	The brush rotates in opposite way	⇒	*Check the motor connections.*
7.	The brush is not properly engaged	⇒	*Release and engage properly the brush.*
8.	The solution flow rate is not correct or not enough	⇒	*Refer to the proper section* (see section 2.5 at page 21).

The brush motor doesn't work properly			
1.	The brush motor is Off	⇒	*Activate the brush motor by lowering the lever.*
2.	The brush motor is not powered properly	⇒	*Check the power connections on the brush motor.*
3.	The display shows an alarm message	⇒	*Check what alarm message is shown and solve the related issue by following the proper instructions* (see section 3.4.1 at page 30).
4.	The brush deck lifting Lever microswitch doesn't work	⇒	*Replace the microswitch* (see section 3.2 at page 24).
5.	The carbon brushes are worn out	⇒	*Replace the carbon brushes.*
6.	The brush motor is supplied but it doesn't work	⇒	*Replace the motor* (see section 3.2 at page 24).

The Brushdeck doesn't move			
1.	The brush deck Lever doesn't move	⇒	*Check that there are no mechanical obstacles to the movement of the lever.*
2.	**(Disc)** The lever moves but the brush deck doesn't move	⇒	*Check that the lifting cable runs in its sheath and the chain is free to move. Check that the brush deck lifting arms are free to move.*
3.	**(Disc)** The brush deck is lowered but it doesn't touch the ground	⇒	*Check the settings of the lifting cable.*
4.	**(Orbital)** The lever moves but the brush deck doesn't move	⇒	*Check that the microswitch inside the steering column is activated by the lever.*
5.	**(Orbital)** The brush deck is lowered but it doesn't touch the ground	⇒	*Check that there are no mechanical obstacles to the movement of the actuator.*

2.3 Drying system: what to do if...

The machine doesn't dry well			
1.	The machine is switched off	⇒	*Switch on the machine.*
2.	The machine doesn't switch on	⇒	*Refer to the proper section* *(see section 2.1 at page 15).*
3.	The recovery tank is full	⇒	*Empty the recovery tank completely.*
4.	The vacuum motor doesn't work properly	⇒	*Refer to the proper section* *(see section 2.3 at page 19).*
5.	The machine is in "ECO" mode	⇒	*Set the machine in Standard mode by pushing again the "ECO" mode button.*
6.	The squeegee is lifted up from the floor	⇒	*Lower down the squeegee.*
7.	The squeegee rubber blades are worn out or broken	⇒	*Rotate or replace the squeegee rubber blades.*
8.	The squeegee is not properly adjusted	⇒	*Adjust the squeegee properly following the proper procedure* *(see section 6.6.1 at page 60).*
9.	The vacuum system - vacuum chamber & adapter - vacuum hose - filter & holder is dirty or stuck	⇒	*Clean the vacuum system.*
10.	The vacuum cover is not well positioned	⇒	*Position properly the vacuum cover.*
11.	The vacuum cover gasket doesn't adhere properly	⇒	*Replace the vacuum cover gasket.*

The vacuum motor doesn't work properly			
1.	The vacuum motor is Off	⇒	*Activate the vacuum motor by lowering the lever.*
2.	The vacuum motor is not powered properly	⇒	*Check the power connections on the vacuum motor.*
3.	The display shows an alarm message	⇒	*Check what alarm message is shown and solve the related issue by following the proper instructions* *(see section 3.4.1 at page 30).*
4.	The microswitch on the squeegee activation lever doesn't work	⇒	*Replace the microswitch.*
5.	The vacuum motor carbon brushes are worn out	⇒	*Replace the vacuum motor carbon brushes.*
6.	The vacuum motor is not working even if powered	⇒	*Replace the motor.*

The squeegee doesn't move			
1.	The squeegee Lever doesn't move	⇒	*Check that there are no mechanical obstacles to the movement of the lever.*
2.	The lever moves but the squeegee doesn't move	⇒	*Check that the lifting cable runs in its sheath and the chain and the rear lever is free to move.*
3.	The squeegee is lowered but it doesn't touch the ground	⇒	*Check the settings of the lifting cable.*

2.4 Frame and traction system: what to do if...

The traction motor doesn't work properly			
1.	The machine is switched off	⇒	*Switch on the machine.*
2.	The machine doesn't switch on	⇒	*Check the proper section* *(see section 2.1 at page 15).*
3.	The display shows an alarm message	⇒	*Check what alarm message is shown and solve the related issue by following the proper instructions* *(see section 3.4.1 at page 30).*
4.	The operator is not sitting on the seat	⇒	*The operator must sit on the seat.*
5.	The operator is sitting on the seat	⇒	*Check and/or replace the seat microswitch* *(see section 3.2 at page 24).*
6.	The pedal is not pressed	⇒	*Press the pedal depending on the required speed.*
7.	The pedal is pressed	⇒	*Check and / or replace the traction pedal* *(see section 3.2 at page 24).*
8.	The traction motor is not supplied	⇒	*Check the power connections of the motor.*
9.	The traction motor carbon brushes are worn out	⇒	*Replace the carbon brushes.*
10.	The traction motor is not working even if powered	⇒	*Replace the motor* *(see section 3.2 at page 24).*
11.	The electrobrake doesn't disengage	⇒	*Check the connections of the electrobrake.*

2.5 Solution delivery system: what to do if...

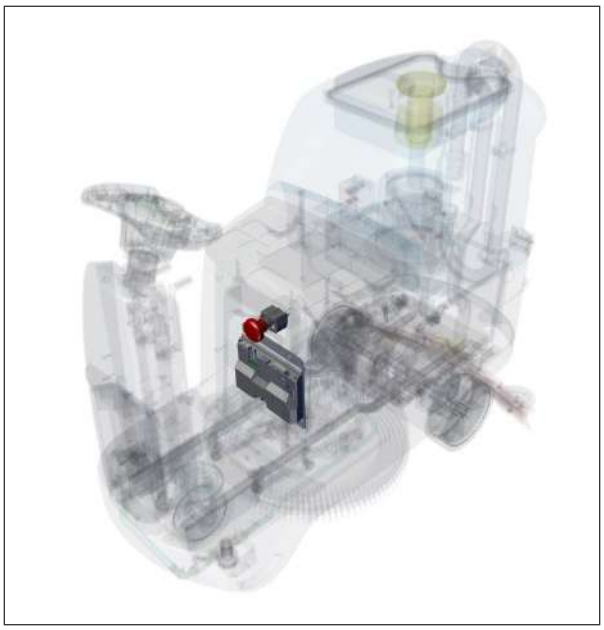
The delivered solution is not correct or not enough			
1.	The machine is switched off	⇒	*Switch on the machine.*
2.	The machine doesn't switch on	⇒	*Refer to the proper section* *(see section 2.1 at page 15).*
3.	The solution tank is empty	⇒	*Fill up the solution tank.*
4.	The proportional valve for the solution flow adjustment is completely closed	⇒	*Open the proportional valve to the desired position.*
5.	The hose that connects the solution tank to the filter is stuck	⇒	*Clean the hose.*
6.	The solution filter is stuck	⇒	*Clean the solution filter.*
7.	The brush deck is not in working conditions	⇒	*Lower the brush deck to the floor* *Press the traction pedal to start the washing.*
8.	The solenoid valve doesn't work	⇒	*Check the solenoid valve connections and, if necessary, replace it* *(see section 3.2 at page 24).*
9.	The display shows an alarm message	⇒	*Check what alarm message is shown and solve the related issue by following the proper instructions* *(see section 3.4.1 at page 30).*
10.	The detergent doesn't fit the type of dirt	⇒	*Replace the detergent with a proper one.*

Part III

Functional Groups

Chapter 3

Electrical System



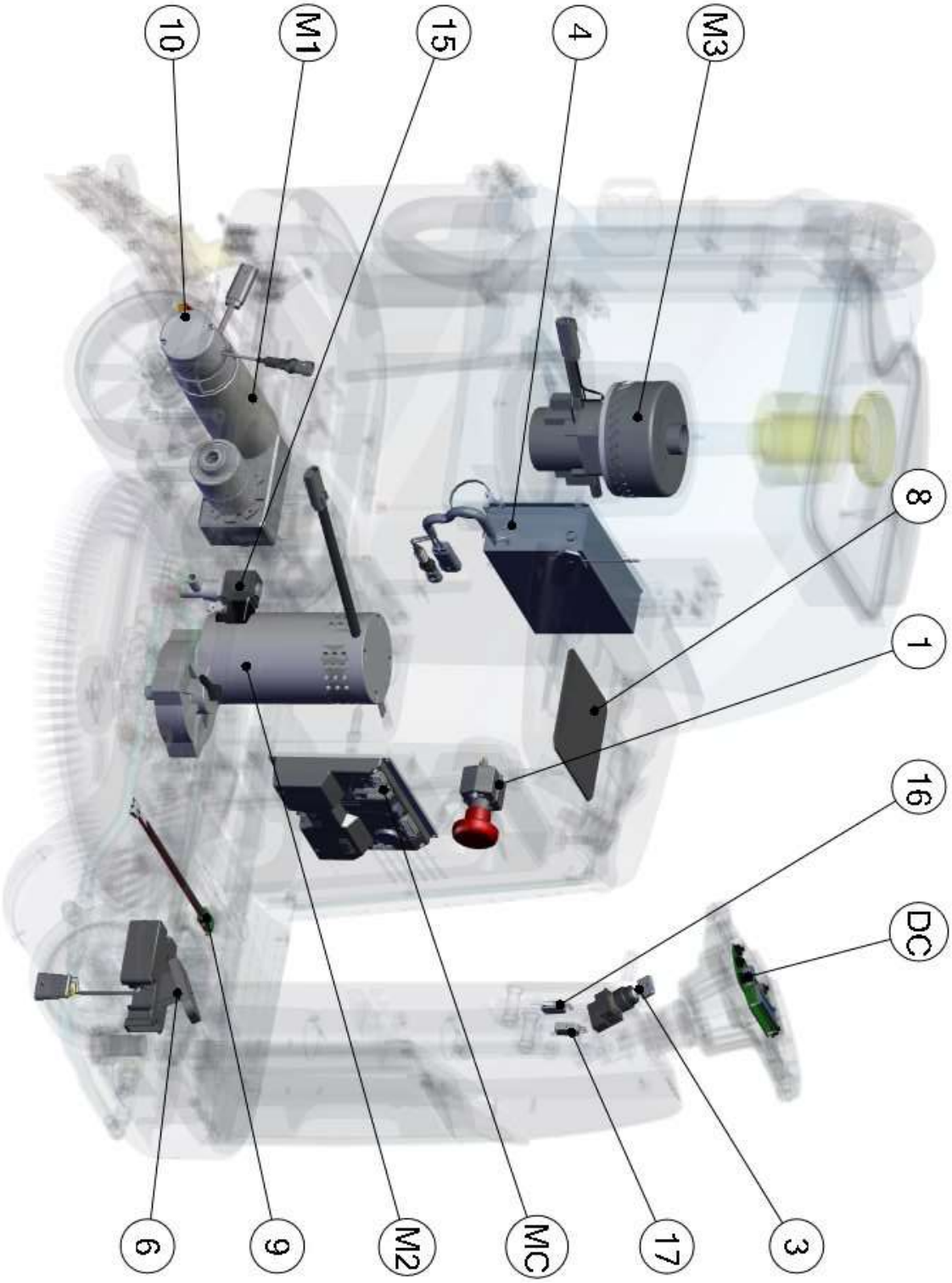
3.1 Description

A main card runs all the functions of the machine, traction, brush base, vacuum and water.

The main card receive as input, all the information from the control card, the safety micro and all the electronic devices of the machine.
These signals are translated from the main card to run correctly the scrubber dryer and to prevent any safety problem to the operator.

The dash board can be used also as a programmer, both to set the main operating parameters of the machine.

3.2 Location of Electrical components



3.3 List of Components

1 Emergency Button

3 Key Switch

4 Battery Charger

6 Traction Pedal

8 Seat Microswitch

9 curve reduction speed microswitch (Multimode)

10 Electrobrake

15 Solenoid Valve

16 Brush Motor Microswitch

17 Vacuum Motor Microswitch

M1 Traction Motor

M2 Brush Motor

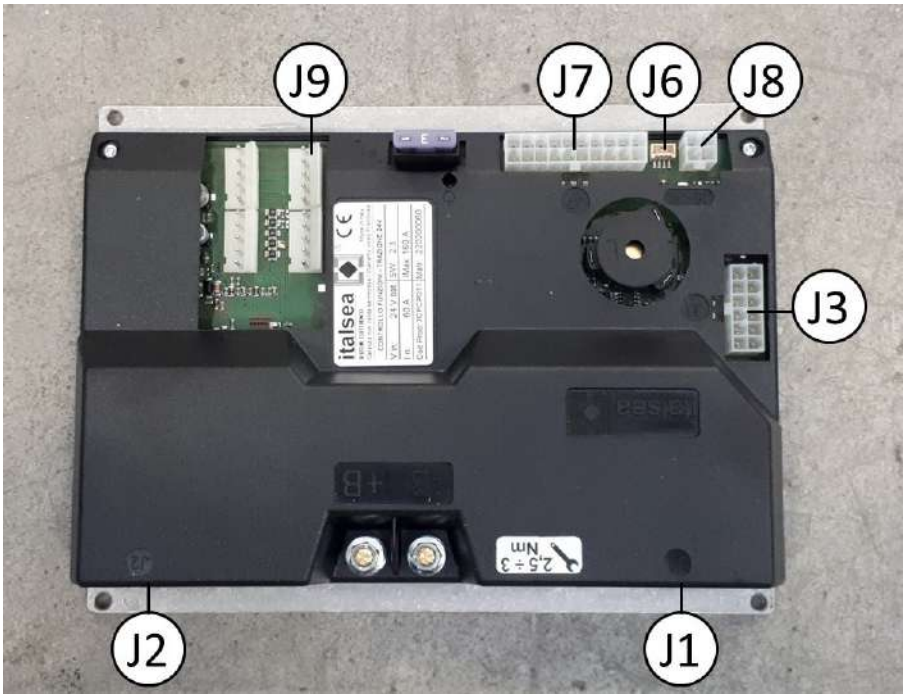
M3 Vacuum Motor

MC Main Card

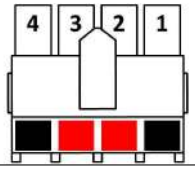
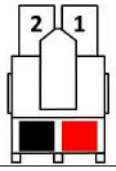
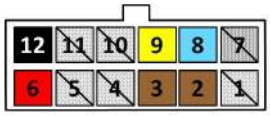
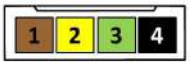
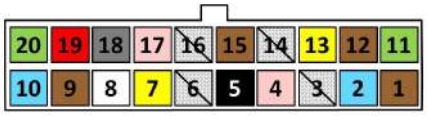
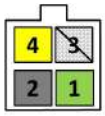
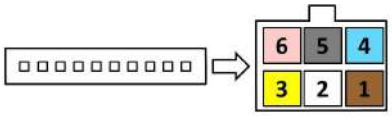
DC Display Card

3.3.1 Main Card

The Main Card (see section 3.2 at page 24) is the heart of the machine and, depending of the input information, decides how to use the devices of the machine during normal work. On the table here below, is possible to identify the input/output signals of the card.



Legenda Cavi Scheda

J1		J2	
J3		J6	
J7		J8	
J9 Slot			

J1

1	Brush Motor Negative	3	Black	Negative
2	Brush Motor Positive	4	Red	Positive
3	Vacuum Motor Positive	6	Red	Positive
4	Vacuum Motor Negative	5	Black	Negative

J2

1	Traction Motor Positive	8	Red	Positive
2	Traction Motor Negative	3	Black	Negative

J3

2	Electrobrake Positive	10	Brown	Positive
3	Solenoid Valve Positive	10	Brown	Positive
6	Blinking Light Positive	5	Red	Positive
8	Electrobrake Negative	10	Blue	Negative
9	Solenoid Valve Negative	14	Yellow	Negative
12	Blinking Light Negative	5	Black	Negative

J6

1	Display Communication	11	White	Receiving
2	Display Communication	11	Brown	Transmitting
3	Display Communication	11	Green	Negative
4	Display Communication	11	Yellow	Positive

J7

1	Key	12	Brown	Input
2	Battery Charger	14	Blue	Input
4	Traction Microswitch	12	Pink	Traction Pedal
5	Speed Reduction Microswitch		Black	Multimode Input
7	Vacuum Motor Microswitch		Yellow	Squeegee Lever
8	Brush/Vacuum Motor Microswitch	14	White	Positive
9	Battery Charger	14	Brown	Output (Positive)
10	Seat Microswitch	12	Blue	Output (Positive)
11	Traction Potentiometer Positive	21	Green	Output
12	Traction Potentiometer (Signal)	21	Brown	
13	Traction Potentiometer Negative	21	Yellow	Output
15	Seat Microswitch	14	Brown	Input
17	Brush Motor Microswitch	14	Pink	Brushdeck Lever
18	Traction Pedal Positive		Gray	Output
19	Speed Reduction Microswitch Positive		Red	Output
20	Key Positive	12	Green	Output

J8

1	FFM Communication	3	Green	Receiving
2	FFM Communication	3	Gray	Transmitting
4	FFM Communication	3	Yellow	Negative

J9 Slot

1	Brush Actuator Power Output (M4)	20	Brown	
2	Extra pressure / Pressure Lev.1	20	White	Input
3	Pressure Lev.3		Yellow	Input
4	Brush Actuator Power Output (M4)	20	Blue	
5	Pressure Lev.2		Gray	Input
6	Extra pressure	20	Pink	Output

3.3.2 Key switch

The key switch (see section 3.2 at page 24) provides the power supply to the whole machine.

3.3.3 Display Card

The Control Card is located inside of the steering wheel and transfers to the Main Card all the information and settings set through the control buttons. The Control Card is linked to the Main Card by a connecting cable (item J6).

3.3.4 Emergency button

The machine is equipped with an emergency button (see section 3.2 at page 24), aimed at the protection of the operator in case of sudden critical conditions. A press of the button switches off the power to the Main card and the machine stops immediately.

3.3.5 Traction Pedal

The traction pedal (see section 3.2 at page 24) have an internal microswitch that closes when the pedal is pressed and a potentiometer to adjust the intensity of the traction speed.

3.3.6 Electrobrake

The machine is equipped with electrobrake (see section 3.2 at page 24). The electro-brake is engageable through an appropriate control lever positioned on the electro-brake itself, close to the traction motor. looking at a global security condition, even if the machine is switched off and the electrobrake is disengaged, the electrobrake blocks however, in case of exceeding a certain speed (when pushing the machine or if the machine is on an inclined floor). If the machine is switched on, the drive is inhibited if the electrobrake is disengaged.

3.3.7 Batteries and battery charger

The machine is available with the optional battery charger. To get access to the battery charger and the battery compartment is enough to actuate the recovery tank release hook, positioned behind the seat. On the batteries there is a loop wire with 80 Ampere general protection fuse.

3.3.8 Microswitches

The machine is provided with a series of microswitches that send signals to the main card. In particular:

- **Brush Motor Microswitch**. With lowered brush deck lifting lever and closed micro the deck goes down to the floor and the brush motor starts running (as long as the gear pedal is pressed). The cleaning function is active.
- **Vacuum Motor Microswitch**. With lowered squeegee lifting lever and closed micro the squeegee goes down to the floor and the vacuum motor starts running. The cleaning function is active.
- **Curve speed reduction Microswitch**. It is positioned below the platform. After a predetermined angle of rotation of the steering, the microswitch opens and the curve speed reduction function is activated. The percentage of the speed reduction is an adjustable parameter.
- **Deadman Microswitch**. The micro switch is located below the seat. With the operator on board, the traction and the brush deck can be activated.

3.3.9 Batteries

The power supply is 24V with 2 batteries 12V each, in series. Below is the list of available batteries.

Number	Model	Type	Voltage [V]	Capacity [Ah]
2	12 TP 110	WET	12	110
2	12 MFP 105	GEL	12	105

The function board transforms the voltage value of the batteries into percentage. This value is then used for operation as a percentage of charge with respect to the maximum capacity. The conversion depends on the type of battery (settable by parameter). In the following table the percentage values according to the voltage value of the batteries where **Vb** is the voltage read on the battery

Display	Vb	Pb60	Gel60	Pure Lead	Pb80	Gel80
100 %	≥	24.3	24.3	24.5	24.3	24.3
90 %	≤	24.3	24.3	24.5	24.3	24.3
80 %	≤	24.1	24.0	24.3	24.0	24.0
70 %	≤	23.5	23.7	24.2	23.5	23.6
60 %	≤	23.0	23.4	24.1	22.9	23.2
50 %	≤	22.5	23.1	23.9	22.3	22.8
40 %	≤	22.1	22.8	23.8	21.7	22.4
30 %	≤	21.7	22.5	23.6	21.1	22.0
20 %	≤	21.2	22.2	23.4	20.5	21.6
10 %	≤	20.8	21.9	23.2	20.1	21.2
0 %	≤	20.4	21.6	23.0	19.8	20.9

Alert Threshold 1: when the 20% battery level is reached, the brushes function is disabled (central brush plus any lateral brush(es).

Alert Threshold 2: when the 10% battery level is reached, the machine moves to transfer mode, regardless of the selected operating mode.

3.4 Troubleshooting

3.4.1 Alarms of Overcurrent and Temperature

Id Alarm	Meaning	Solution
AL_1: Function Brushes Ammeter	Brush Amperometric Protection	Check consumption of the brush motor. Detected high current on brush motor.
AL_2: Function Vacuum Ammeter	Vacuum Amperometric Protection	Check consumption of the vacuum motor. Detected high current on vacuum motor.
AL_3: Function Powerstage fail	Damage of Power	Damage power of brush or vacuum: replace the main board.
AL_4: Function Overcurrent	Output overcurrent on brush or vacuum	Detect a shortcircuit on output brush motor or vacuum motor: Check connections and motors.
AL_5: Function Overtemperature	Thermal protection on brush/vacuum	Overtemperature of brush/vacuum motor: check consumption of motors.
AL_6: Function Act1:endswitch fail	Scrubdeck pressure switch open	When switch-on the machine, at least 1 out of the 3 microswitches is open: check the scrubdeck microswitches and its cables, and the scrubdeck position.
AL_7: Function Squeegee Actuator Anomaly	Anomaly on the reading of the brushdeck actuator	When switch-on the machine, 1 microswitch is open: check the scrubdeck microswitches and its cables, and the scrubdeck position.
AL_8: Function Actuator Stroke	End Position not reached	Check the connections of the actuator.
AL_9: Function Actuator Stroke	End Position not reached	Check the connections of the actuator.
AL_10: Function Battery not connected	Battery not connected	Check the correct connection of the battery cables and their connections on the electrical control Card.

Traction Alarms

Id Alarm	Meaning	Solution
AL_13: Traction Pedal Damage	Pedal Anomaly	Check the connections and the status of the pedal potentiometer.
AL_14: Traction Release Pedal	Pedal pressed before starting	Detected Pedal microswitch pressed before starting : release the Pedal.
AL_15: Traction Overtemperature	Thermal protection on traction	Overtemperature on traction : check consumption of traction motor.
AL_16: Traction Powerstage fail	Power of traction damage	Replace the main board.
AL_17: Traction Overcurrent	Traction Overcurrent	Detected a shortcircuit on the traction motor output: Check connections and traction motor.
AL_18: Traction Traction Ammeter	Traction Amperometric protection	Check how the traction function is used. Detected too high working current on traction motor.
AL_19: Traction Electrobrake	Electrobrake not inserted	Check the condition of the electrobrake and its related microswitch.

General Alarms

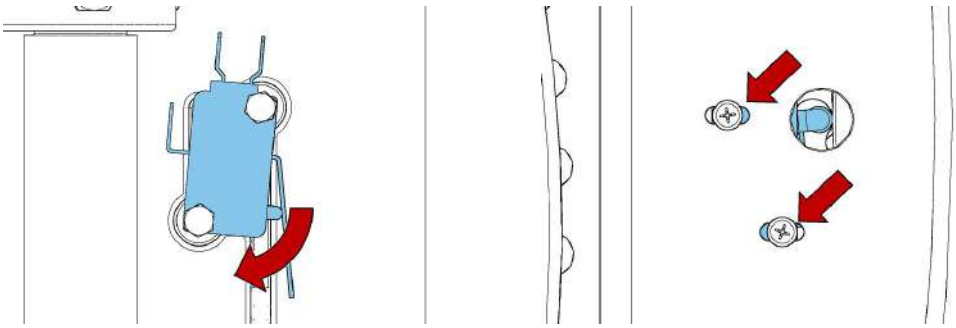
Id Alarm	Meaning	Solution
AL_20: General EEPROM FAIL	Error reading internal memory	Replace the main board.
AL_21: General KEY-OFF FAILURE	Error key sequence	Error on key signal: Check the key connection. Check, also, the batteries connections and main board
AL_22: General Main relay fail	Damage of general relay	Check the traction motor connections. If the connection are OK, the general relay on the main board is damaged: replace the main board.
AL_23: General Overvoltage	Overvoltage	Detected a overvoltage on the main board. Check the batteries connections.
AL_24: Traction Batt.connection	Battery not connected to the main board	Check battery functioning and connection to the main board.
AL_25: General Keyboard com.	No communication between control board and main board	Check the connections between control board and main board.

3.5 Adjustments

3.5.1 Microswitches

Check functionality and conditions of the brush motor microswitch, the vacuum motor microswitch and the curve speed reduction microswitch. Check that with microswitch pressed, remain **about 0.5 mm clearance** between the lever and the body of the device. Make sure the lever of the micro is working properly. Otherwise, proceed as follows:

- Loosen the fixing screws.
- Move the microswitches using the loop adjustment.
- Tighten the screws to lock the microswitches taking care not to over tighten in order not to ruin the devices.
- When the setting is finished, verify the correct functionality of the microswitches.



3.5.2 Battery Charger (CB)

The battery charger is positioned behind the operator's seat and is easily accessible by pressing the release button on the recovery tank. At the start of the charging cycle the GREEN LED blinks to indicate which charging algorithm is selected. Subsequently the LED blinks to indicate the battery status check.
A Proper Charging cycle follows the below phases order.

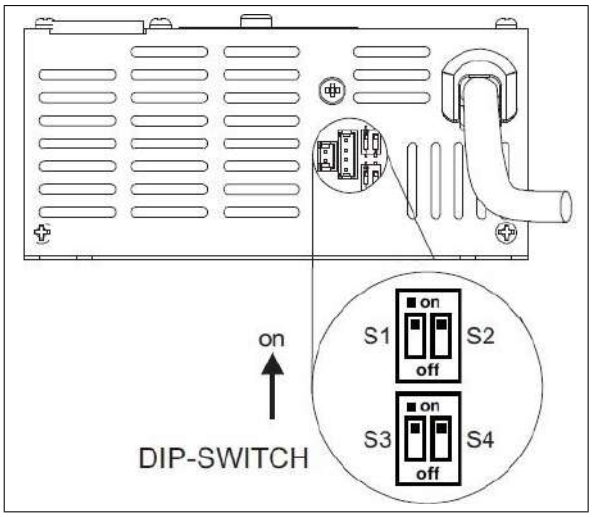
Recharge Cycles		
Phase	LED	Description
A	Green	Blinking, confirms the recharge Setting
B	Red	First charging phase
C	Yellow	Second charging phase
D	Green	Charged battery

Check if the charger is properly set according to the installed batteries.

Charging curve SetUp

To set up the charger, follow the instructions:

- Use a screwdriver to remove the small black plastic cap
- Set-up the internal dipswitches according to the following table



The dipswitches are divided in two couples.
The higher couple are dipswitches **DP1** & **DP2**.
the lower couple are dipswitches **DP3** & **DP4**.
The following table shows how to setup the dipswitches.

up to serial number 221017014

Set-up of Charging Curve							
DP1	DP2	DP3	DP4	Set Up	Standard	Yellow LED	Green LED Flashes
OFF	OFF	-	OFF	IUI0-Pb Flooded		OFF	1
ON	ON	-	OFF	IUoU-Gel Trojan		OFF	2
OFF	**ON**	**-**	**OFF**	**IUoU-AGM GEL**	*	**OFF**	**3**
ON	OFF	-	OFF	IUI0-Gel Sonnenschein		OFF	4
OFF	OFF	-	ON	IUIa-Pb Flooded		ON	1
ON	ON	-	ON	IUI0-AGM EV-Discover		ON	2
OFF	ON	-	ON	IUa-AGM Zenith		ON	3
ON	OFF	-	ON	IUIa-Gel Sonnenschein		ON	4

starting from serial number 221017015

Set-up of Charging Curve								
DP1	DP2	DP3	DP4	Set Up	Standard	Red LED	Yellow LED	Green LED Flashes
OFF	OFF	OFF	OFF	IUI0-Wet Generic		OFF	OFF	1
ON	ON	OFF	OFF	IUI0-Wet TJ		OFF	OFF	2
OFF	ON	OFF	OFF	IUoU-Gel TJ		OFF	OFF	3
ON	**OFF**	**OFF**	**OFF**	**IuIa-Gel ES**	*	**OFF**	**OFF**	**4**
OFF	OFF	OFF	ON	IUI0-Gel SO		OFF	ON	1
ON	ON	OFF	ON	IUI0-Gel Generic		OFF	ON	2
OFF	ON	OFF	ON	IUI0-AGM DI		OFF	ON	3
ON	OFF	OFF	ON	IUIa-AGM ES		OFF	ON	4
OFF	OFF	ON	OFF	IUoU-AGM Generic		ON	OFF	1
ON	ON	ON	OFF	IUa-Litio DI		ON	OFF	2
OFF	ON	ON	OFF	IUa-Litio ZH		ON	OFF	3
ON	OFF	ON	OFF	IUa-Litio Generic		ON	OFF	4
OFF	OFF	ON	ON	IUIa-Wet Generic		ON	ON	1
ON	ON	ON	ON	IUIa-Gel Generic		ON	ON	2
OFF	ON	ON	ON	IUa-AGM Generic		ON	ON	3
ON	OFF	ON	ON	Remote		-	-	-

Error Codes of Charger

The charger have an alarm system through successive flashes of the yellow LED.

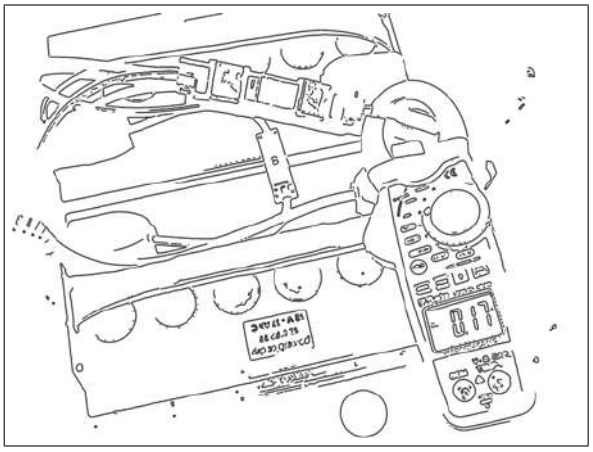
Error code	
Flash	Description
1	Battery not connected or reverse polarity or output short circuit. Verify the battery connection.
2	Alarm time-out: damaged battery or battery capacity is too high The alarm is reset disconnecting the main supply. If it persists consult your service.
3	Faulty battery charger The alarm is reset disconnecting the main supply. If it persists consult your service.
4	Overtemperature The alarm will be reset itself when the charger cools. Verify the ventilation.

Charger Cables Detail

1 Battery -
2 Battery +

1 COM Relay contact
2 N.C. Relay contact

3.5.3 ECO Function

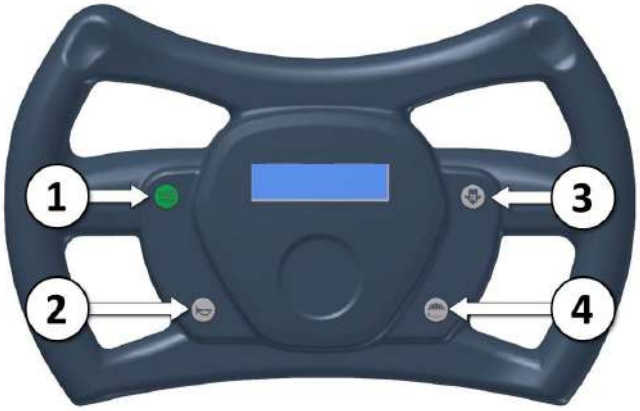


Once activated the ECO function (with the proper button), lower the brushdeck and let the brush motor and the vacuum motor work. With the ECO mode activated, check if the noise of the vacuum motor and the brush motor is reduced. Connect an Amperometric to the positive cable of the batteries and check if the current consumption in ECO mode is less than normal function (without ECO mode). **ATTENTION:** We don't give the amperometric reference values because they can change depending of the working conditions of the machine.

3.6 Programming

3.6.1 Dashboard Overview

The Dashboard allows free access to the basic settings and the parameter list protected by the password (60).



	Function of the buttons in Setting Mode
1	Not Used
2	ENTER (Confirm)
3	SCROLL UP/PLUS (Scroll up and Increase)
4	SCROLL DOWN/MINUS (Scroll down and Decrease)

How to access Operator Menu

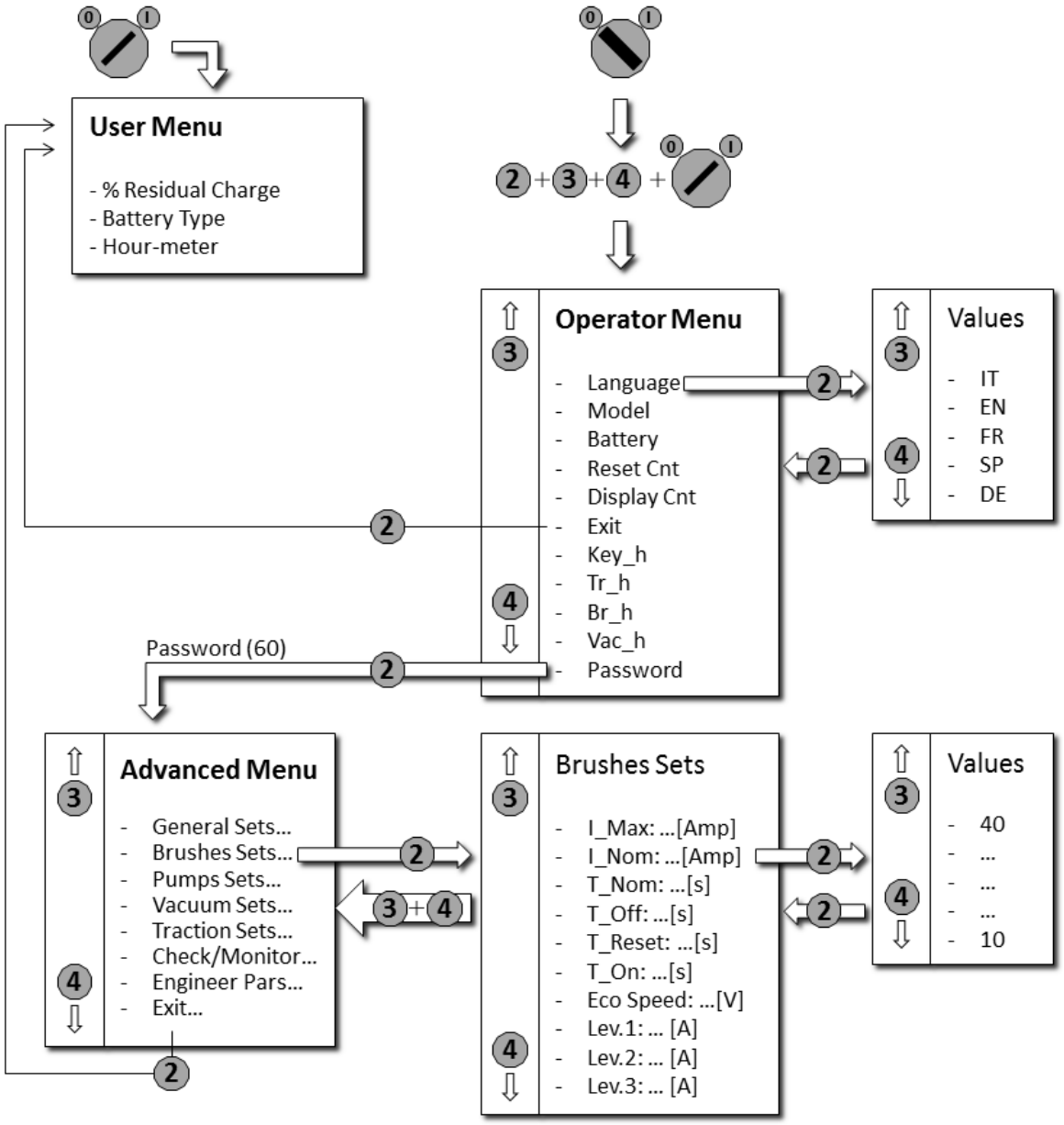
To enter to the *Operator Menu* go ahead as follow:

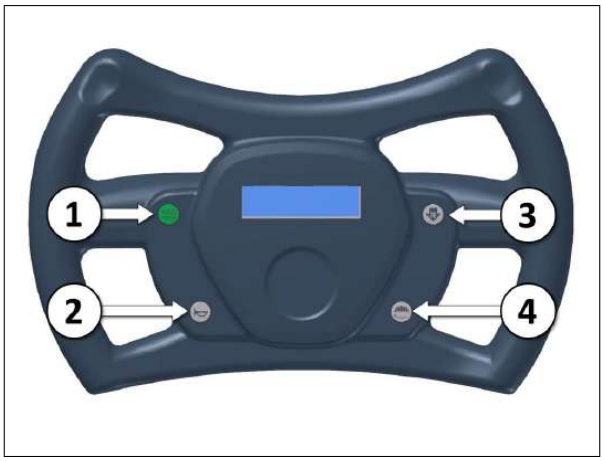
- With the machine off, press at the same time button 2, 3 and 4.
- Turn on the key, with the three buttons pressed.
- Waiting the upload of the Working Menu.
- Release the buttons.

To move inside of the Operator Menu, press button 3 and 4.
To modify a parameter or confirm a changed value within a specific section, press the button 2.
The modified setting remains automatically confirmed, whether you exit the menu (exit) or if the machine is switched off.

3.6.2 Menu table

The structure of the menus can be schematically summarized in the following image.
Turn on the machine and access the menus following the icons in the diagram





3.6.3 How to Change a Parameter (Operator Menu)

To change the value of a parameter proceed as follows:

- Run the menu with the button 3 or 4 and select the parameter to change.
- Select the parameter to be changed pressing the button 2
- Utilize the button 3 and 4, to shift all the available values to edit the parameter.
- To confirm the new value press the button 2.
- To save the change is necessary to return to the User Menu; to exit from Working Menu select the Exit parameter and confirm by pressing the button 2.

3.6.4 For example, to modify the language from GEL to WET

- Turn OFF the machine.
- With the machine off, press at the same time button 2, 3 and 4.
- Until the buttons are pressed, turn ON the key and wait the upload of the Working Menu.
- Use the buttons 3 and 4 to select the Language parameter.
- To modify the values of this parameter, press the button 2. To confirm the possibility to change parameters, the first line on the display will blink.
- Utilize the buttons 3 and 4 to shift all the values of this parameter and select the value WET.
- Confirm the new value by pressing the button 2.
- To save this modification, select the Exit parameter and confirm by pressing button 2.

3.6.5 How to access Advanced Menu

The *Advanced Menu* can be reached from the Operator Menu by accessing the Password parameter and setting the value **60**.

Change a Parameter (in the Advanced Menu)

To change the value of a parameter, proceed as follows:

- Scroll through the submenus with the buttons 3 and 4.
- Select the submenu that contains the parameters to be changed using the button 2.
- Scroll through the parameters with the buttons 3 and 4 to find the parameter to be edited.
- Select the parameter with the button 2.
- Use the buttons 3 and 4 to scroll through the list of available values of the parameter.
- Confirm the new value of the parameter using the button 2.
- To enable the changes, it is necessary to return to the User Menu; to exit the parameters and return to the Advanced Menu press simultaneously the buttons 3 and 4, then find the Exit parameter and confirm with button 2.

3.6.6 Check/Monitor Function

The Check / Monitor function allows to check the status of the microswitches (contact open or closed) and the motors absorption.

The microswitches status is displayed by entering the Check / Monitor function, and scrolling the entries up to J7: by activating the various switches, the card will display the status on the display, showing the number related with the involved microswitch. The list of numbers is included in the table (see section 3.6.8 at page 41).

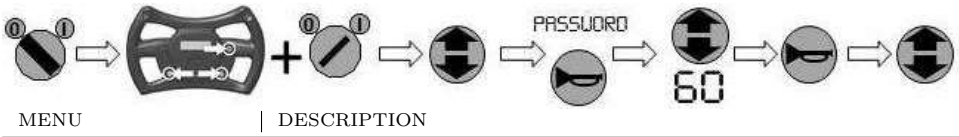
The motors absorption instead can be viewed while the machine is in working condition. To view the values, following the instruction:

- Access the Advanced Menu by entering the password and confirming with button 2.
- Press the button 3 or 4 to select the menu Check/Monitor sub-menu.
- Confirm access to the sub-menu by pressing 2.
- Press the button 3 or 4 to select the parameter you want to check during normal work.
- Press the button 2 to confirm.
- Once confirmed, the display will return to normal working mode, but in the second line it will be displayed the value of the selected parameter.
- By repeatedly pressing button 2 you can scroll through the single parameters.
- To exit form the Check/Monitor function, turn OFF and ON the machine.

3.6.7 Working Menu

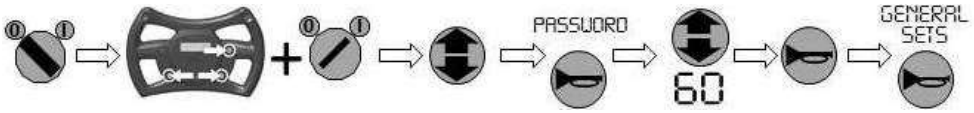
MENU	DEFAULT	CHOICES	DESCRIPTION
General Setup: Language: ##	IT	IT - EN - FR - SP - DE	Setup language
General Setup: Mod: ########	MXR	...	Setup type of machine
General Setup: Battery: ###	GEL	GEL - WET - AGM - GE1 - WE1	Setup kind of battery
General Setup: Reset Cnt: #	N		Reset partial hourmeter.
General Setup: Display Cnt: ###	TR	KEY - TR	Select the kind of hourmeter: **key** connect to the key - **tr.** connect to the traction motor
General Setup: Exit.....			Exit from the menu.
General Setup: Key_h: #### h:## m			Total hourmeter connect to the key.
General Setup: Tr_h: #### h:## m			Total hourmeter connect to the traction.
General Setup: Br_h: #### h:## m			Total hourmeter connect to the brush motor.
General Setup: Vac_h: #### h:## m			Total hourmeter connect to the vacuum motor.
General Setup: password: ###	60		This password is necessary to enter into the “Advanced menu”, manageable by expert technicians only.

3.6.8 Advanced Menu



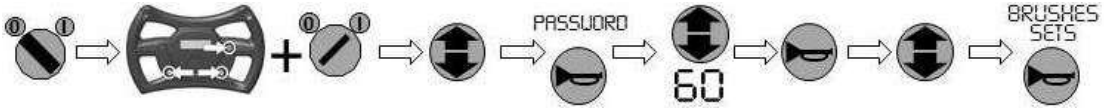
MENU	DESCRIPTION
Options menu: General sets.	Enter to the general parameters (language, battery...).
Options menu: Brushes sets.	Enter to the parameters for the brush base.
Options menu: Pumps sets.	Parameters not managed.
Options menu: Vacuum sets.	Enter to the parameters of vacuum motor.
Options menu: Traction sets.	Enter to the parameters of traction motor.
Options menu: Check/Monitor.	Enter to view the list of working parameters.
Options menu: Engineer pars.	Protected parameters (calibrations and factory settings)
Options menu: Exit.....	Exit and return to the main menu.

General Sets



MENU	DEFAULT	VALUES	DESCRIPTION
General Sets: Language: ##	IT	IT - EN - FR - SP - DE	Setup the language of the display.
General Sets: Mod: ###	Mxr	...	Setup of the machine model (Normal version or with dosing system).
General Sets: Battery: ###	GEL	...	Setup of the battery type. GEL - WET - AGM - GE1 - WE1
General Sets: Rst.Cnthr: #	N		Reset partial hourmeter (like on “working menu”).
General Sets: Rst.Cnthr Brsh:	N		Reset hourmeter of the brush motor.
General Sets: Rst.Cnthr Vac	N		Reset hourmeter of the vacuum motor.
General Sets: Rst.Cnthr Trct:	N		Reset hourmeter of the traction motor.

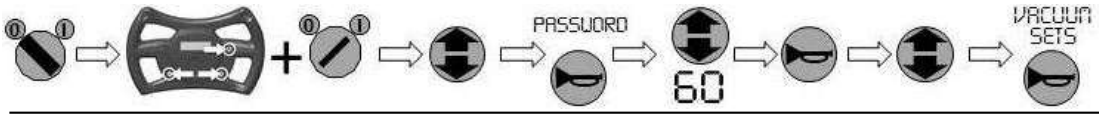
Brushes Sets



Parameter	Default	Min ÷ Max	Description
Brushes Sets: I_ Max: ## [Amp]	50	20 ÷ 80	Maximum current from the main card to the brush motor.
Brushes Sets: I_ Nom: ## [Amp]	22	10 ÷ 40	Rated current; with T_ Nom manages the amperometric protection (alarm + stop brush motor).
Brushes Sets: T_ Nom: ## [s]	30	1 ÷ 60	Rated timer; with I_ Nom manages the amperometric protection (alarm + stop brush motor).
Brushes Sets: T_ Off: #.# [s]	0.2	0.0 ÷ 10.0	Delay of switching off of the brush motor when the safety lever is released.
Brushes Sets: T_ Reset: ## [s]	10	0 ÷ 100	Timing of reset amperometric protection (overcurrent).
Brushes Sets: T_ On: #.# [s]	0.5	0.0 ÷ 5.0	Delay to switching on of the brush motor when the safety lever is pressed.
Brushes Sets: Eco Speed: ## [V]	17	15 ÷ 20	Value of Voltage reduction of brush motor, during ECO mode.

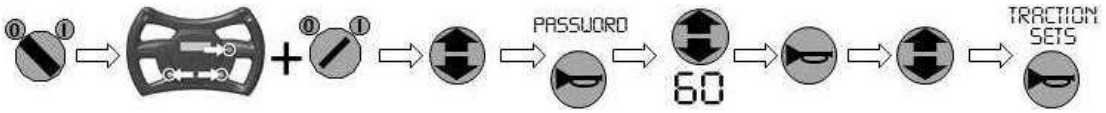
Pumps Sets - **Parameters not managed**

Vacuum Sets



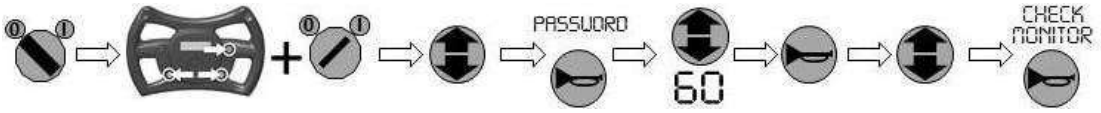
Parameter	Default	Min ÷ Max	Description
Vacuum Sets: I_ Max: ## [Amp]	40	10 ÷ 50	Maximum current from the main card to the vacuum motor.
Vacuum Sets: I_ Nom: ## [Amp] Till 215020607 From 215020608 on	 18 22	 5 ÷ 20 5 ÷ 25	Rated current; with T_ Nom manages the amperometric protection (alarm + stop vacuum motor).
Vacuum Sets: T_ Nom: ## [s]	30	1 ÷ 100	Rated timer; with I_ Nom manage the amperometric protection (alarm + stop vacuum motor).
Vacuum Sets: T_ Off: ## [s]	20	0 ÷ 30	Delay of switching OFF of the vacuum motor when the squeegee lever is lifted.
Vacuum Sets: T_ reset: ## [s]	60	0 ÷ 100	Timing of reset amperometric protection (overcurrent).
Vacuum Sets: Eco Speed: ## [V]	17	15 ÷ 20	Value of Voltage reduction of vacuum motor, during ECO mode

Traction Sets



Parameter	Default	Min ÷ Max	Description
Traction Sets: Acc_ Ramp: #.# [s]	3.0	0.5 ÷ 5.0	Acceleration ramp. The time necessary to arrive at the maximum speed.
Traction Sets: Dec_ Ramp: #.# [s]	0.7	0.5 ÷ 5.0	Deceleration ramp. The time necessary to stop the machine when the safety lever is released.
Traction Sets: Rev_ Ramp: #.# [s]	0.7	0.5 ÷ 5.0	The time necessary to invert the way.
Traction Sets: FW_ Speed: ### [%]	100	20 ÷ 100	Maximum speed in forward way (expressed in %).
Traction Sets: BW_ Speed: ### [%]	60	20 ÷ 100	Maximum speed in reverse way (expressed in % respect the maximum speed in forward way).
Traction Sets: Min_ Speed: ### [%]	0	0 ÷ 20	Minimum speed when the safety lever is pressed.
Traction Sets: Ref_ 0: #.# [V]	0.7	0.0 ÷ 15.0	Minimum voltage of the potentiometer when released.
Traction Sets: Ref_ FW: #.# [V]	0.9	0.5 ÷ 15.0	Maximum voltage of the potentiometer in forward speed when safety lever is pressed.
Traction Sets: Ref_ BW: ## [V]	0.9	0.5 ÷ 15.0	Maximum voltage of the potentiometer in backward speed when safety lever is pressed.
Traction Sets: Ref_ DB: 0.### [V]	0.200	0 ÷ 0.500	Potentiometer dead band
Traction Sets: Brake_ Del: ### [S]	1.5	0.0 ÷ 10	Engaging time of electronic brake when the machine is stopped.
Traction Sets: Mode1 V: ## [%]	50	10 ÷ 100	Voltage setting for the curve speed reduction microswitch.
Traction Sets: Mode1 I: ## [A]	25	0 ÷ 90	Current intensity setting for the curve speed reduction microswitch.
Traction Sets: Runaway: ### [Volt]	12	0 ÷ 20	Parameter not managed.
Traction Sets: optional3: ##	0	0	Parameter not managed.
Traction Sets: optional2: ##	0	0	Parameter not managed.
Traction Sets: optional1: ##	0	0	Parameter not managed.
Traction Sets: I_ Max: ## [Amp]	70	10 ÷ 70	Maximum output from the main card to the traction motor.
Traction Sets: I_ Nom: ## [Amp]	20	5 ÷ 30	Rated Current; with T_ Nom detect the amperometric protection threshold. (Alarm + stop traction motor).
Traction Sets: T_ Nom: ## [s]	10	1 ÷ 10	Rated Timer; with I_ Nom detect the amperometric protection threshold. (Alarm + stop traction motor).

Check / Monitor



Check / Monitor: I_ Tr: ### [Amp]	Show current of traction motor.
Check / Monitor: I_ Br: ## [Amp]	Show current of brush motor.
Check / Monitor: I_ Vac: ## [Amp]	Show current of vacuum motor.
Check / Monitor: V_ Tr: #### [V]	Show voltage of traction motor.
Check / Monitor: V_ Batt: #### [V]	Show battery voltage.
Check / Monitor: Vref: ### [V]	Show the voltage reference of the traction pedal.
Check / Monitor: Wtr_ Pump: ### [%]	Parameter not managed.
Check / Monitor: Det_ Pump: ### [%]	Parameter not managed.
Check / Monitor: BR Temp: ## [C]	Show temperature inside of main card, related to brush/vacuum.
Check / Monitor: TR Temp: ## [C]	Show temperature inside of main card, related to traction.
Check / Monitor: TR Ovrld: ### [%]	Show the percentage value of the amperometric protection of traction motor (when 100% the amperometric protection cuts the current).
Check / Monitor: J7:	Check of the microswitches functioning: 2 ⇒ Battery Charger (active if the charger is OFF or missing) 4 ⇒ Traction Pedal Microswitch 5 ⇒ Curve Reduction Speed Microswitch 7 ⇒ Squeegee Lever Microswitch 15 ⇒ Seat Microswitch 17 ⇒ Brush Deck Lever Microswitch

3.7 Maintenance and Checks

3.7.1 Electrical System

Controllo *(da eseguire ogni **150h**)*
Check the functions and the proper connections of the switches, microswitches, motors, solenoid valve, contactors, battery loop wire and battery cable. Check periodically, the wiring connections status. To get access to the electrical system, remove the carter sited near the emergency button.

3.7.2 Batteries

Controllo *(da eseguire ogni **150h**)*
Check the proper connection of the Loop wire with 80 Ampere general fuse.

3.7.3 Electrobrake

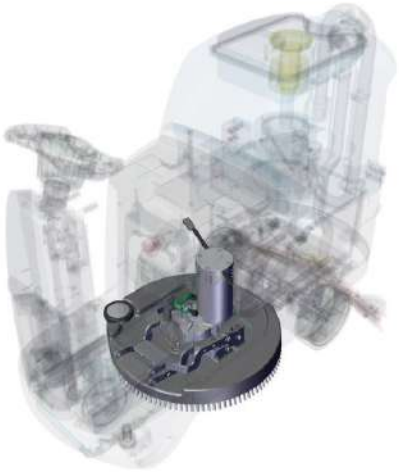
Controllo *(da eseguire ogni **150h**)*
Check the functionality of the electrobrake. With control lever rotated downward (electrobrake ON), and switched on machine, if the emergency button is pressed, the machine must stop immediately. With control lever rotates upward (electrobrake OFF), and switched on machine, the traction must be disabled.

Chapter 4

Washing Unit

4.1 Location on machine

The washing unit is located under the machine body in a central position.
The washing unit control is assembled above it



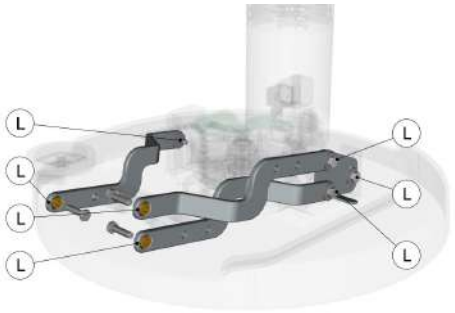
4.2 Main Components

1 Water Hose
2 Lifting Chain
3 Bump Wheel
4 Lifting Right Lower Arm
5 Compensating Spring
6 Brush Gearmotor
7 Adjustment Plate
8 Brush Deck Body
9 Lifting Upper Arm
10 Lifting Left Lower Arm
11 Brush Coupling Flange
12 Brush Coupling Spring
13 Brush

4.3 Lubrication Points

For lubrication use standard grease.

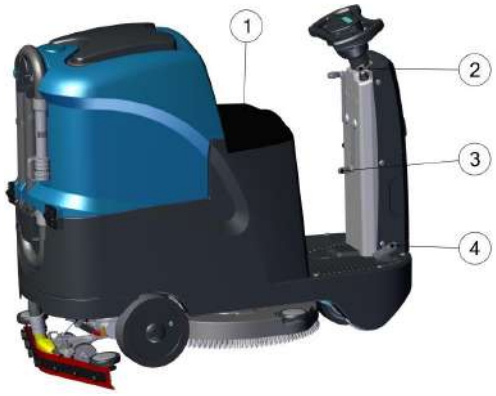
- Lifting Arms
- Bushings



4.4 Work requirements

The washing unit only works if the following conditions are met:

1. The batteries are not discharged.
2. The operator is seated on the machine so as to press the seat safety switch (1).
3. The machine is on (2).
4. The electrobrake is activated.
5. The control lever is lowered to release the micro (3).
6. The accelerator pedal is pressed(4).

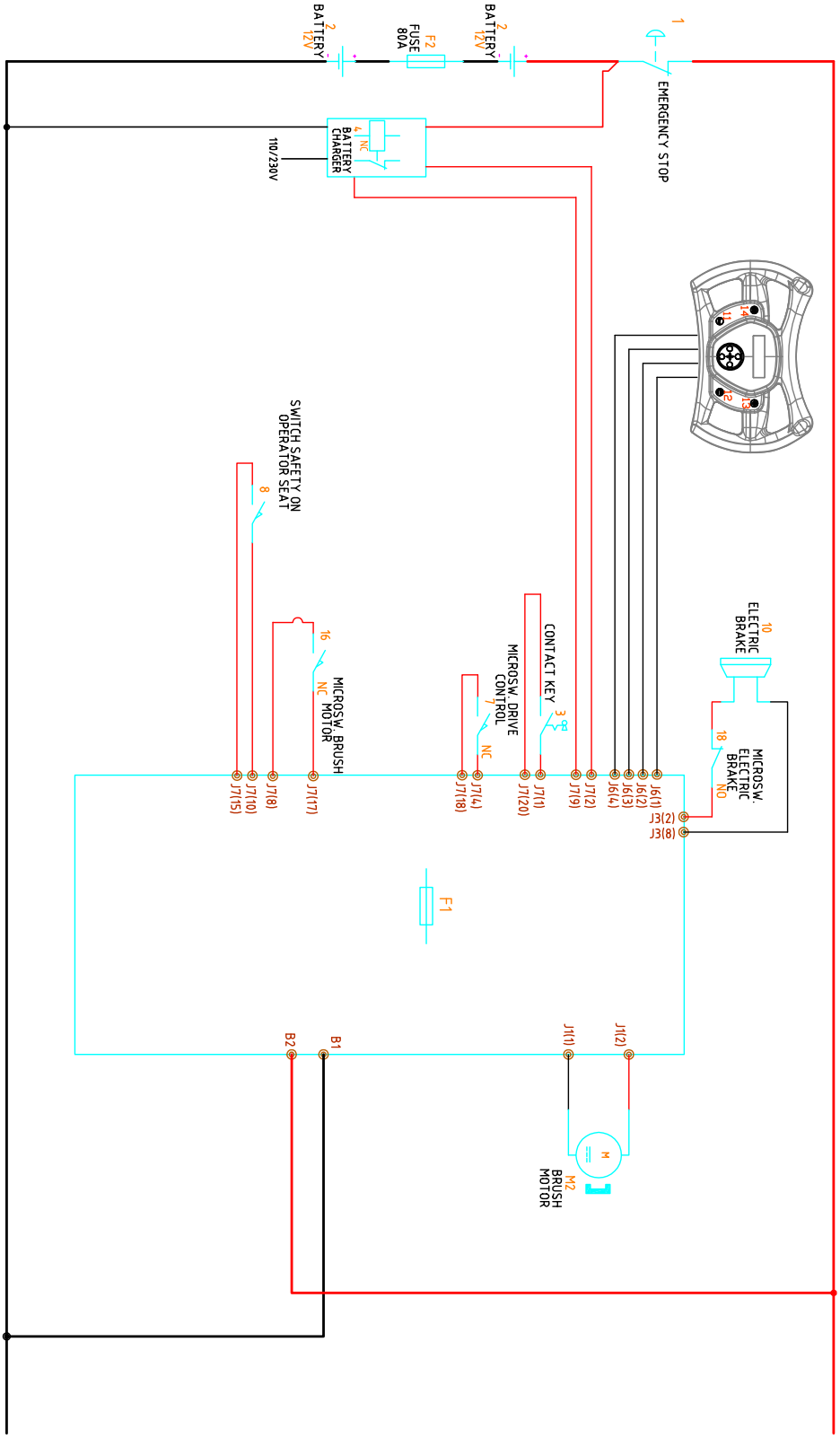


4.5 Operating mode

WASHING

Operator	Seat Microsw.	Action	Result
Sitting	Closed	Brushdeck Lever Lowered Forward pedal pressed	Brush Motor ON after 0,5 seconds (+24V to M2) Solenoid Valve ON (+24V to J3-3)
Sitting	Closed	Backward function enabled during work Squeegee Lifted	Brush Motor ON (+24V to M2) Solenoid Valve OFF
Sitting	Closed	Traction Pedal not pressed during work	Brush Motor OFF Solenoid Valve OFF
Sitting	Closed	Brushdeck Lever Lowered during work	Brush Motor OFF Solenoid Valve OFF

4.6 Related electrical circuit



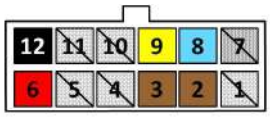
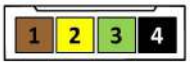
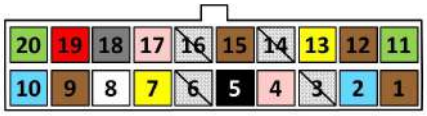
Functionality Check - Disc Brush Deck

Conventions:

- $+V_b$: Positive voltage of the battery.
- $-V_b$: Negative voltage of the battery.
- **The Brush Deck is in working condition**.

Input/output:

Satisfied condition	Pin	V at work	V at rest
Emergency button Not pressed	B+ ref to B-	$+V_b$	$+V_b$
Brush Motor Activated	J1(1) ref to J1(2)	$+V_b$	$-V_b$
Electrobrake Activated	J3(2) ref to J3(8)	$+V_b$	$-V_b$
Display Receiving	J6(1) ref to B-	$+V_b$	$-V_b$
Display Transmitting	J6(2) ref to B-	$+V_b$	$-V_b$
Display Negative	J6(3) ref to B-	$-V_b$	$-V_b$
Display Positive	J6(4) ref to B-	$+V_b$	$+V_b$
Key Contact Activated	J7(1) ref to J7(20)	$+V_b$	$-V_b$
Battery Charger Disabled	J7(2) ref to J7(3)	$-V_b$	$-V_b$
Traction pedal pressed	J7(4) ref to J7(18)	$+V_b$	$-V_b$
Brush gearmotor Microswitch	J7(8) ref to J7(17)	$+V_b$	$-V_b$
Operator Sit	J7(10) ref to J7(15)	$+V_b$	$-V_b$

J3		J6	
J7			

4.6.1 Relative electrical Components

Brush Motor

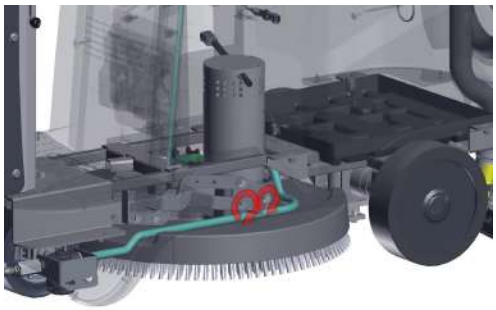
The brush gearmotor is DC type with permanent magnets, connected directly to the main card via a connector. With constant 24 V DC power supply (battery charged) the single brush motor with no load (M2) absorbs 2.6 Amps ± 0.1. With a constant supply of 21 V DC (low battery) the absorption is 2.4 Amps ± 0.1.

4.7 Adjustments

4.7.1 Brush Deck

The brush deck must be adjusted so that the brush acts parallel to the floor. This allows the brush to evenly lean to the ground and perform its function properly.

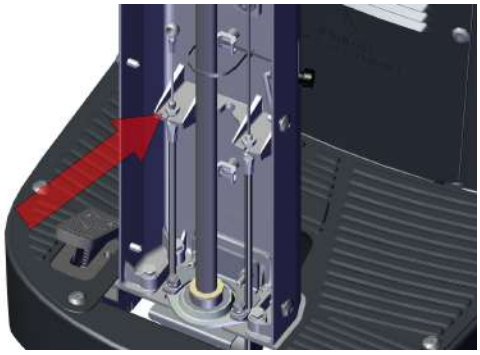
Requirements: Mounted brush, switched off machine.



Procedure:

- Hook the brush to the deck.
- Loosen the adjustment nuts.
- Lower the brush deck to the ground so that the brush lies uniformly and parallel to the floor.
- Tighten the adjustment nuts.

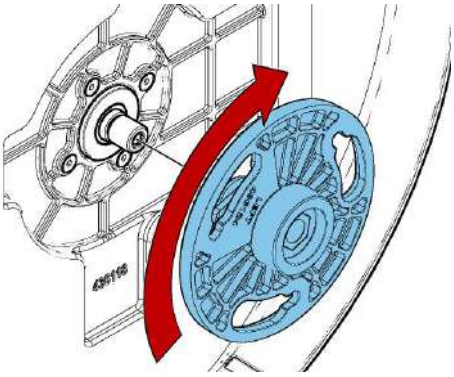
4.7.2 Brush deck lifting cable



Adjust the lifting cable using the appropriate register on the sheath so that when the base is in the raised position the brush has a chance to pass under the base in an easy manner. In any case, the lowest part of the deck, must have a height from the ground of at least 7 cm.

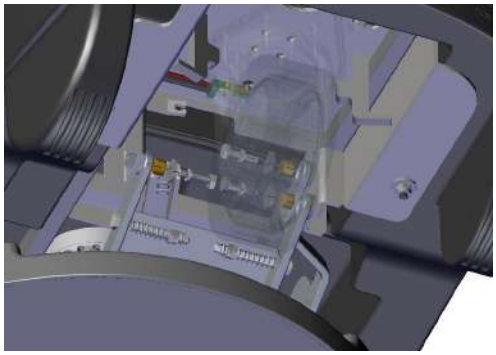
4.8 Disassembly

4.8.1 Brush Flange



- Put the machine in safe conditions.
- Disassemble the Brush Deck from the machine.
- Unscrew the Coupling Flange rotating it in the same direction as the brush in standard working conditions.
- Proceed at reverse to refit the part being careful to lubricate the thread in order to prevent blockings because of dirt or oxide.

4.8.2 Brush Deck



- Release the brush from the Brush Deck.
- Put the machine in safe conditions.
- Lower the brush deck to the floor.
- Remove the lift arms from the frame.
- Disconnect the electrical connector of the brush motor and the electric connector of the solenoid valve.

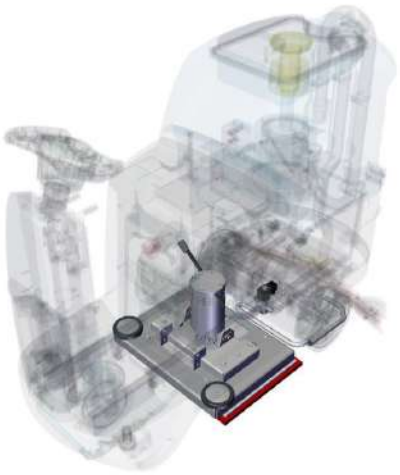
- Disconnect the solution supply hose from the solenoid valve.
- Disconnect the lift chain from the brush plate.
- Lift the front wheel in order to lift the front part of the machine of about 20cm.
- Pull off the brush deck sideways to the machine.

Chapter 5

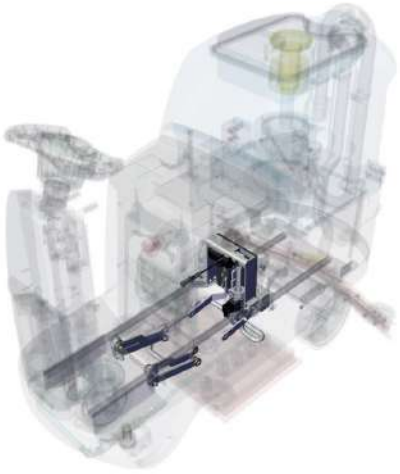
Orbital Unit

5.1 Location on machine

The orbital unit is located under the machine body in a central position.

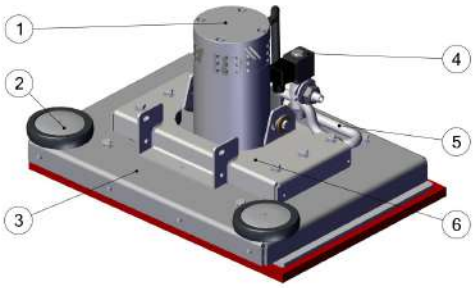


The orbital unit control is assembled above it

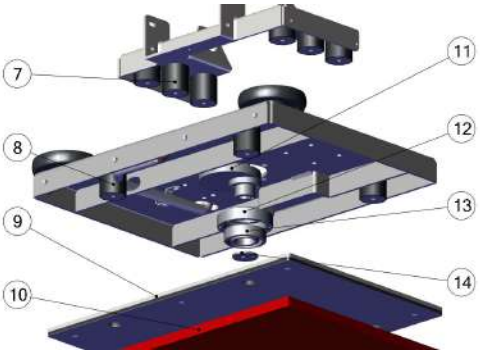


5.2 Main Components

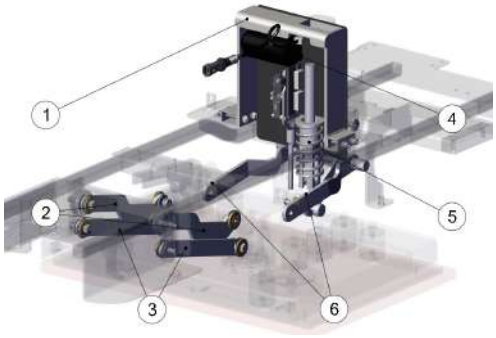
1 Brush Motor
2 Bumping Wheel
3 Brush Deck Body
4 Solenoid Valve
5 Water Hose
6 Brush Deck Fixing Body



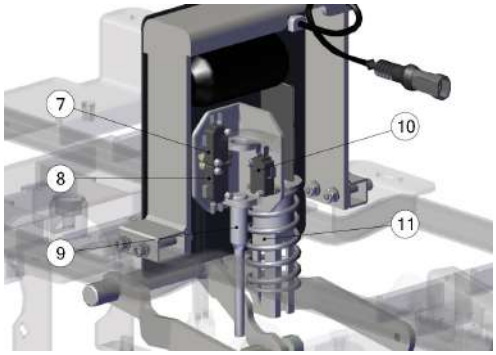
7 Upper Antivibration dampers
8 Lower Antivibration dampers
9 Pad Plate
10 Pad
11 Orbital Flange
12 Bearings Support
13 Bearing
14 Retaining Washer



1 Actuator Support
2 Upper Front Arms
3 Lower Front Arms
4 Actuator
5 Compensation Spring
6 Rear Arms

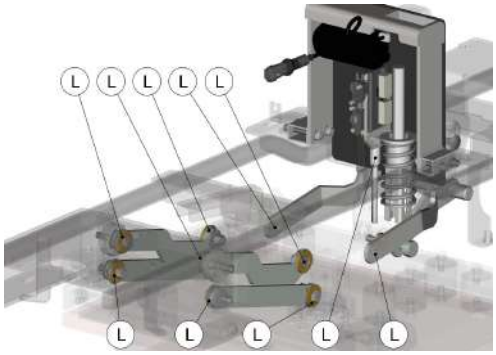


7 3° Pressure Microswitch
8 2° Pressure Microswitch
9 Microswitch Activation Rod
10 1° Pressure Microswitch
11 Brushdeck Pressure Rod



5.3 Lubrication Points

For lubrication use standard grease.

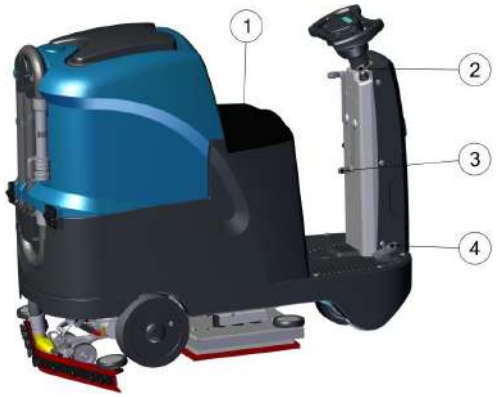


- Lifting Arms
- Bushings
- Microswitches Rod

5.4 Work requirements

The orbital unit only works if the following conditions are met:

1. The batteries are not discharged.
2. The operator is seated on the machine so as to press the seat safety switch (1).
3. The machine is on (2).
4. The electrobrake is activated.
5. The control lever is lowered to release the micro (3).
6. The accelerator pedal is pressed(4).

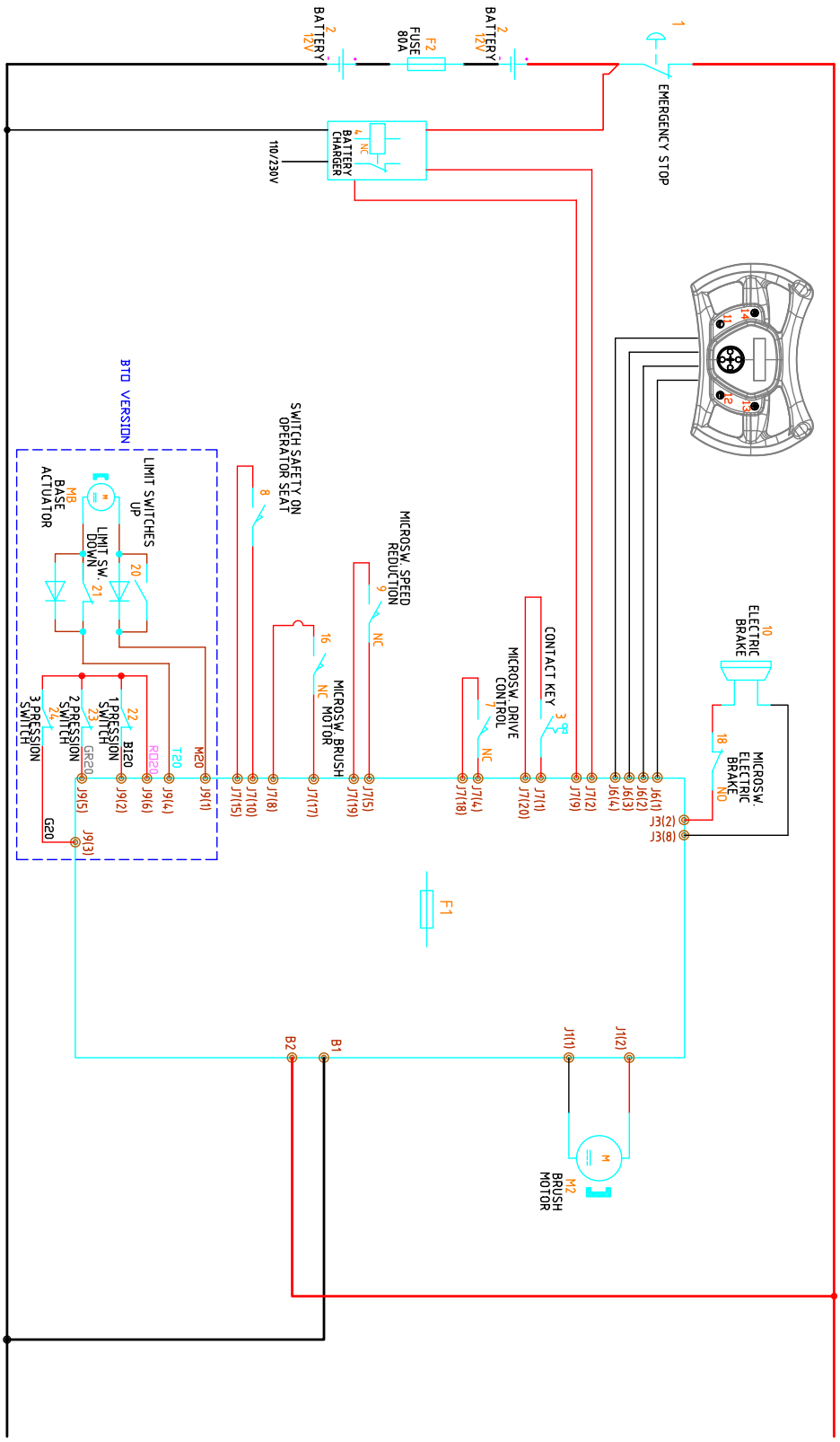


5.5 Operating mode

WASHING

Operator	Seat Microsw.	Action	Result
Sitting	Closed	Washing Enabled Forward pedal pressed	Brushdeck Actuator goes down (+24V to MB) Brush Motor ON after 0,5 seconds (+24V to M2) Solenoid Valve ON (+24V to J3-3)
Sitting	Closed	Backward function enabled during work Squeegee Lifted	Brushdeck Actuator goes down (+24V to MB) Brush Motor ON (+24V to M2) Solenoid Valve OFF
Sitting	Closed	Traction Pedal not pressed during work	Brushdeck Actuator goes down (+24V to MB) Brush Motor OFF Solenoid Valve OFF
Sitting	Closed	Washing disabled during work	Brushdeck Actuator rises (-24V to MB) Brush Motor OFF Solenoid Valve OFF

5.6 Related electrical circuit



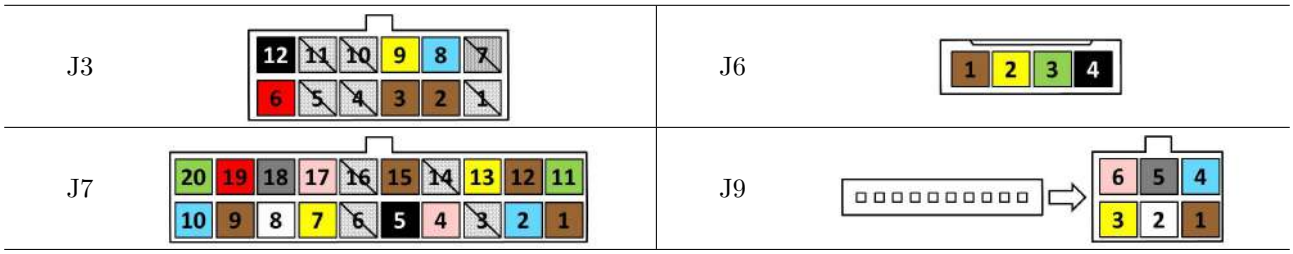
Functionality Check - Orbital Brush Deck

Conventions:

- $+V_b$: Positive voltage of the battery.
- $-V_b$: Negative voltage of the battery.
- **The Brush Deck is in working condition**.

Input/output:

Satisfied condition	Pin	V at work	V at rest
Emergency button Not pressed	B+ ref to B-	$+V_b$	$+V_b$
Brush Motor Activated	J1(1) ref to J1(2)	$+V_b$	$-V_b$
Electrobrake Activated	J3(2) ref to J3(8)	$+V_b$	$-V_b$
Display Receiving	J6(1) ref to B-	$+V_b$	$-V_b$
Display Transmitting	J6(2) ref to B-	$+V_b$	$-V_b$
Display Negative	J6(3) ref to B-	$-V_b$	$-V_b$
Display Positive	J6(4) ref to B-	$+V_b$	$+V_b$
Key Contact Activated	J7(1) ref to J7(20)	$+V_b$	$-V_b$
Battery Charger Disabled	J7(2) ref to J7(3)	$-V_b$	$-V_b$
Traction pedal pressed	J7(4) ref to J7(18)	$+V_b$	$-V_b$
Brush gearmotor Microswitch	J7(8) ref to J7(17)	$+V_b$	$-V_b$
Operator Sit	J7(10) ref to J7(15)	$+V_b$	$-V_b$
Brush Actuator	J9(1) ref to J9(4)	$+V_b$	$-V_b$
Lev.1 Pressure	J9(2) ref to J9(6)	$+V_b$	$-V_b$
Lev.2 Pressure	J9(5) ref to J9(6)	$+V_b$	$-V_b$
Lev.3 Pressure	J9(3) ref to J9(6)	$+V_b$	$-V_b$



5.6.1 Relative electrical Components

Orbital Motor

The brush gearmotor is DC type with permanent magnets, connected directly to the msin card via a connector. With constant 24 V DC power supply (battery charged) the single brush motor with no load (M2) absorbs 1.76 Amps ± 0.1. With a constant supply of 21 V DC (low battery) the absorption is 1.6 Amps ± 0.1.

Actuator

The brush deck lifting actuator, by means of the lever and the tie rod, lowers and pushes the brushes to the ground, according to the preset pressure.

Pressure Control Microswitches

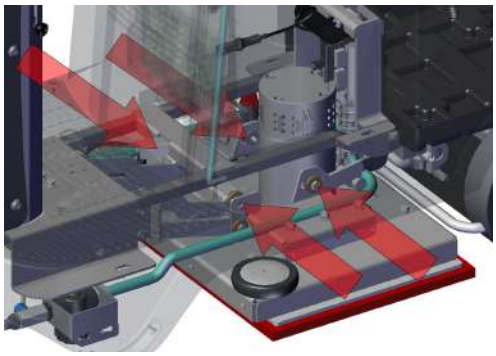
The pressure control microswitches are mounted on a bracket. When the operator changes the pressure from the steering wheel, the jack pushes the pin until the next microswitch is reached.

5.7 Adjustments

5.7.1 Orbital Brush Deck

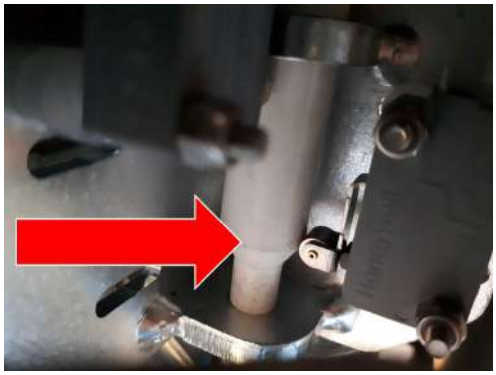
Procedure:

- Hook the Pad and lower the scrub deck.
- Loosen the brush deck fixing screws on the upper front and rear upper arms.
- Move the machine so that the Pad sits evenly and parallel to the floor.
- Tighten the screw to fix the flatness adjustment of the scrub deck.



5.7.2 Brush Deck Actuator (BTO)

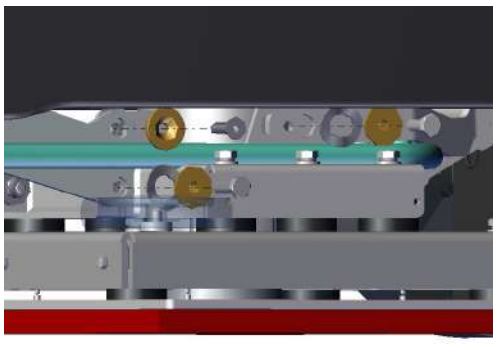
The scrub deck actuator does not need any particular adjustment, in case of need check that with the scrub deck on the ground the actuator rod has the beginning of the conical part flush with the microswitch. If necessary, adjust the rod by screwing it or unscrewing it and fix the setting with the locknut.



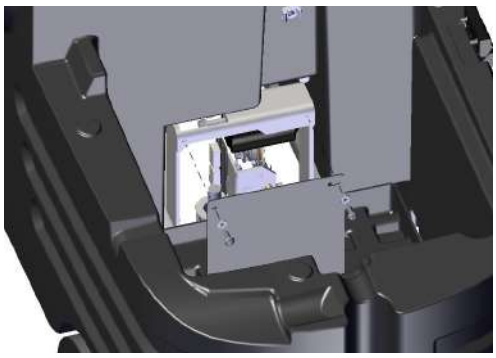
5.8 Disassembly

5.8.1 Orbital Brush Deck

Close the water, lower the brush deck and switch off the machine.
Remove the screws securing the lift arms to the deck. Disconnect the electrical connector of the brush motor, the solution supply hose from the brush motor and the solenoid valve.
Remove the seeger to free the deck from the actuator.
Lift the front wheel in order to lift the front part of the machine of about 8 in.
Pull off the brush deck sideways to the machine.



5.8.2 Cylindrical Brush Deck Actuator



Lift the recovery tank and remove the batteries.
Unscrew the screws that hold the rubber protection and remove it.

Remove the nut to release the actuator from its holder.
Remove the seeger to release the actuator from the brush deck and remove it.

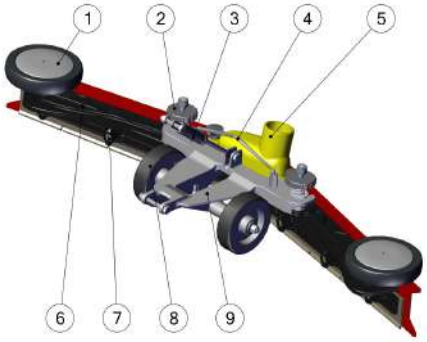
Chapter 6

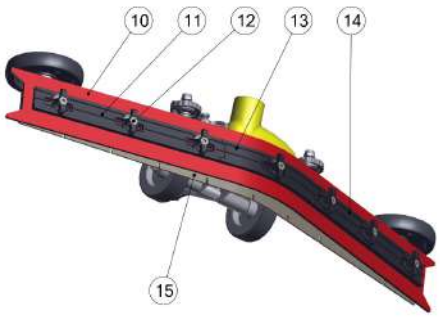
Vacuum Unit

6.1 Location on machine

The vacuum unit is located in central rear position.

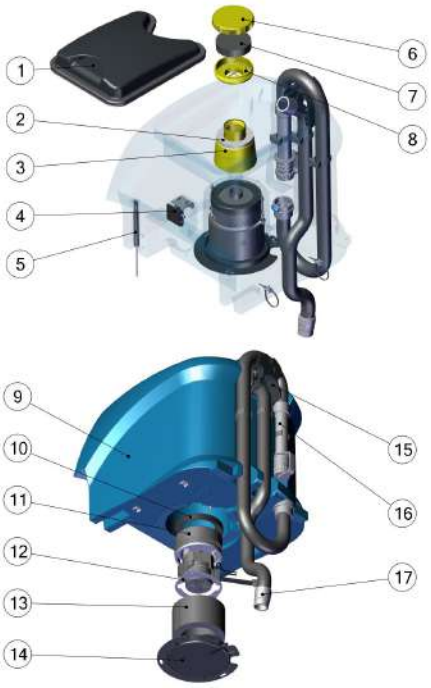
6.2 Main Components





1 Bumping wheel
2 Wheel height adjustment Knobs
3 Gas Spring
4 Lifting Arc
5 Vacuum Nozzle
6 Squeegee Body
7 Rubber holder Pin
8 Squeegee Support Wheel
9 Support Wheel
10 Squeegee Rear Wheel
11 Rubber Side Support
12 Rubber holder Pin
13 Rubber Central Support
14 Rubber Side Support
15 Squeegee Front Rubber

1 Vacuum Cap
2 Vacuum Gasket
3 Vacuum Floater
4 Recovery tank Release system
5 Support Gas Spring
6 Filter Cap
7 Vacuum Filter
8 Filter Support
9 Recovery Tank
10 Vacuum Motor Rubber Cap
11 Vacuum Motor
12 Vacuum Motor Plate
13 Vacuum Motor Deadening Foam
14 Vacuum Motor Carter
15 Drain Hose Support
16 Drain Hose
17 Vacuum Hose



6.3 Work requirements

The Vacuum unit only works if the following conditions are met:

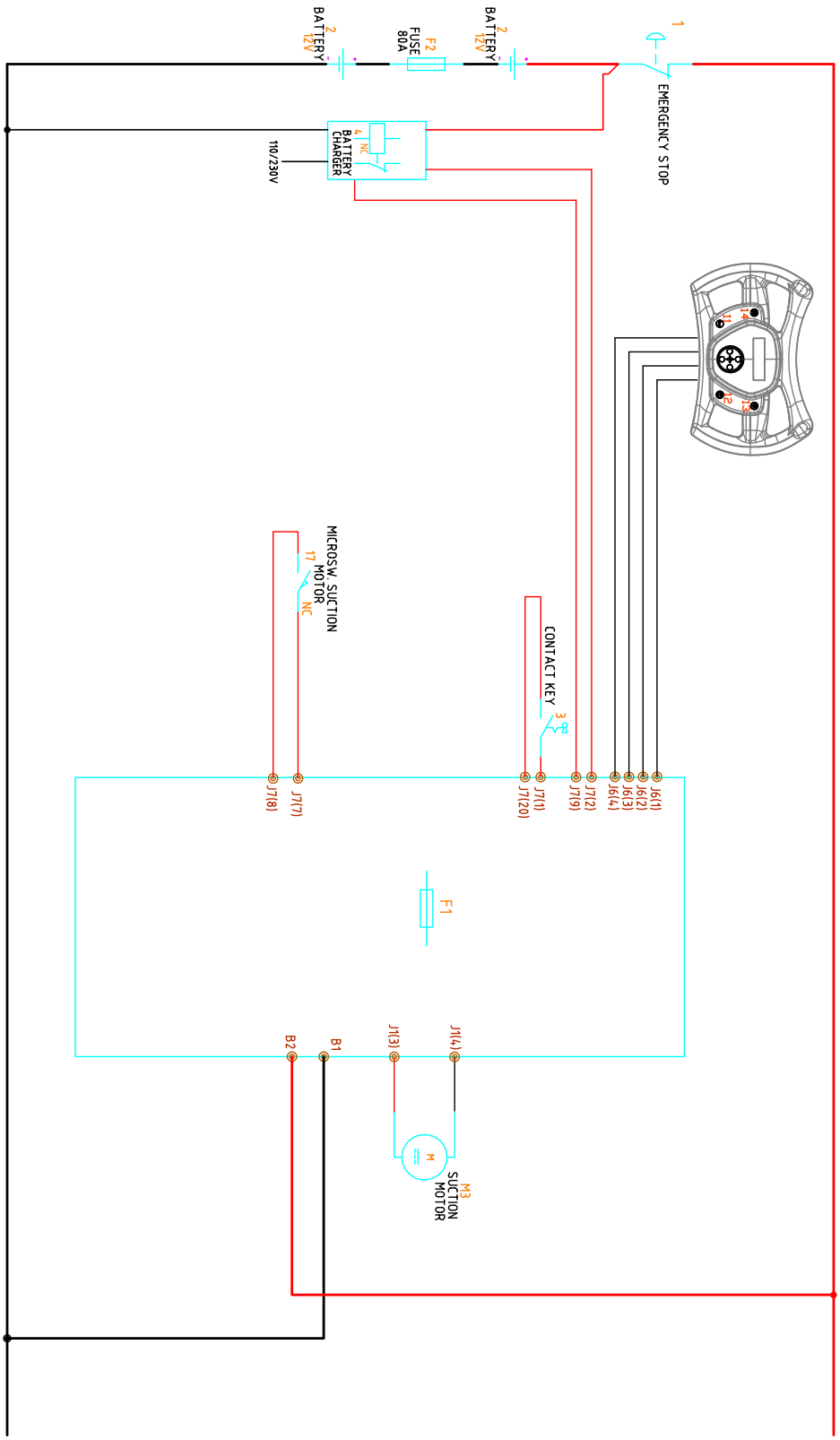
1. The batteries are not discharged.
2. The machine is on (1).
3. The control lever is lowered to release the micro (2).

6.4 Operating mode

VACUUM

Operator	**Seat Microsw.**	**Action**	**Result**
Standing	Open	Vacuum Enabled	Vacuum motor ON (+24V to M3)
Sitting	Closed	Vacuum Enabled Forward pedal pressed	Vacuum motor ON (+24V to M3)
Sitting	Closed	Backward function enabled during work	Traction Motor OFF, Backward Buzzer ON, Vacuum motor ON (+24V to M3)
Sitting	Closed	Traction Pedal not pressed during work	Vacuum motor ON(+24V to M3), Traction Motor OFF.
Sitting	Closed	Vacuum Disabled during work	Vacuum Motor OFF after 20 seconds at maximum level.

6.5 Related electrical circuit



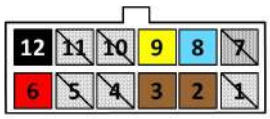
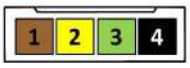
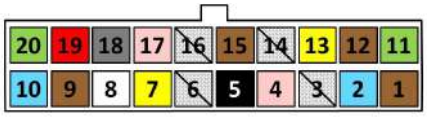
Functionality Check - Vacuum Unit

Conventions:

- $+V_b$: Positive voltage of the battery.
- $-V_b$: Negative voltage of the battery.
- **The Vacuum system is in working condition**.

Input/output:

Satisfied condition	Pin	V at work	V at rest
Emergency button Not pressed	B+ ref to B-	$+V_b$	$+V_b$
Vacuum Motor Activated	VAC(1) ref to VAC(2)	$+V_b$	$-V_b$
Electrobrake Activated	J3(2) ref to J3(8)	$+V_b$	$-V_b$
Display Receiving	J6(1) ref to B-	$+V_b$	$-V_b$
Display Transmitting	J6(2) ref to B-	$+V_b$	$-V_b$
Display Negative	J6(3) ref to B-	$-V_b$	$-V_b$
Display Positive	J6(4) ref to B-	$+V_b$	$+V_b$
Key Contact Activated	J7(1) ref to J7(20)	$+V_b$	$-V_b$
Battery Charger Disabled	J7(2) ref to J7(3)	$-V_b$	$-V_b$
Vacuum Motor Microswitch	J7(7) ref to J7(8)	$+V_b$	$-V_b$

J3		J6	
J7			

6.5.1 Relative electrical Components

Vacuum Motor

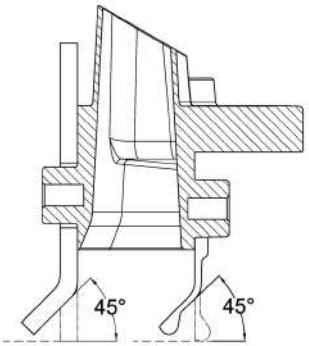
The vacuum motor produces a vacuum in the system upstream of it which causes a flow of air that runs through the entire drying system and allows the water to be sucked together with the air.
With constant 24 V DC power supply (battery charged) the single vacuum motor with no load (M4) absorbs 17,6 Amps ± 0.1. With a constant supply of 21 V DC (low battery) the absorption is 15,9 Amps ± 0.1.

Flashing light

The flashing light always active when the machine is on, has the function of facilitating its visibility.

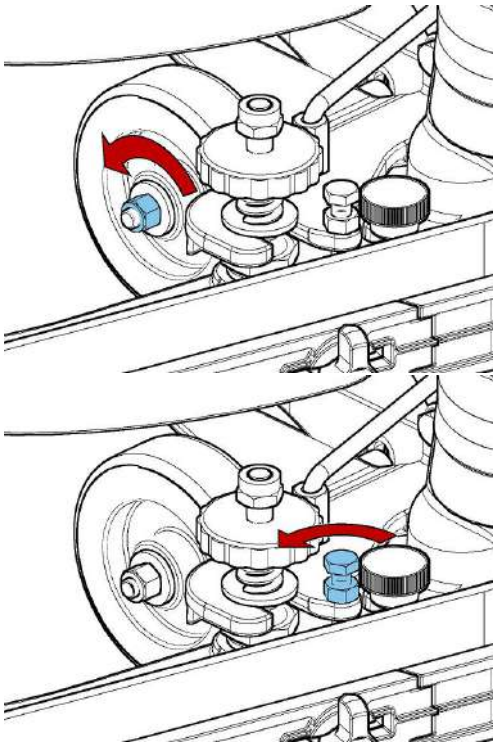
6.6 Adjustments

6.6.1 Squeegee



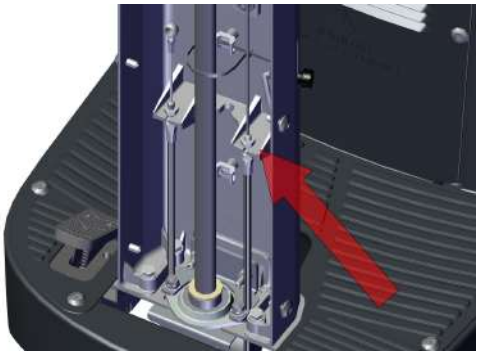
The Squeegee Support has to be adjusted with the Squeegee fitted on, lowered on the floor and vacuum system on. The goal of the adjustment is to let the squeegee blade be angled **45 degrees** to the floor for its whole length.
To obtain the correct adjustment act on the squeegee wheels adjusting knob to adjust the distance from the floor, and on the central adjusting knob to adjust the inclination of the squeegee.

Procedure:



Put the machine in safe conditions.
Loosen the nuts holding the wheels of the squeegee support.
Interpose between the squeegee wheels and the floor a thickness of **approximately** $\frac{1}{20}$ **inch**.
Lower the squeegee on the floor keeping the squeegee rubbers **perfectly vertical**.
Fix the wheels of the squeegee support by tightening the nuts loosened earlier and **remove the spacer**.
Turn on the machineand with lowered squeegee activate the traction pedal.
Turn the screw to adjust the inclination until the correct setting is obtained.
Rotate **clockwise** the register to increase the inclination **in the centre**.
Rotate **counterclockwise** the register to increase the inclination **in the lateral sides**.
Tighten the locknut when the adjustment is completed.

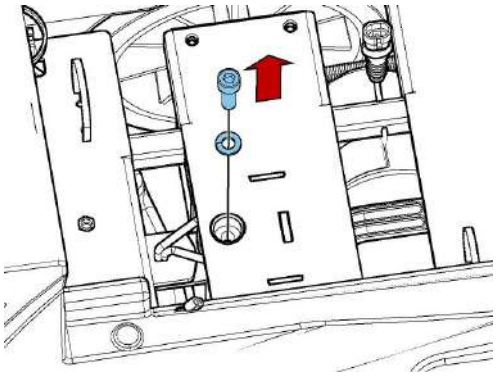
6.6.2 Squeegee Lifting Rope



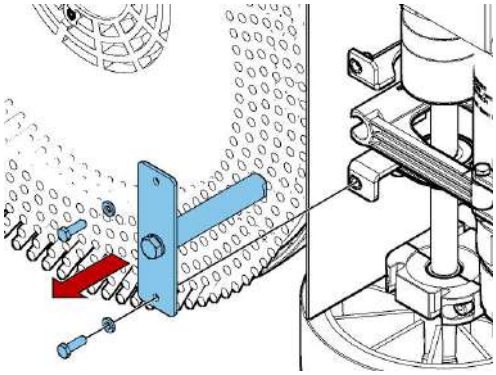
Adjust the squeegee lifting cable using the adjuster on the sheath so that when the squeegee is lowered to the floor, it can move laterally in all its possible excursion.

6.7 Disassembly

6.7.1 Squeegee Actuator

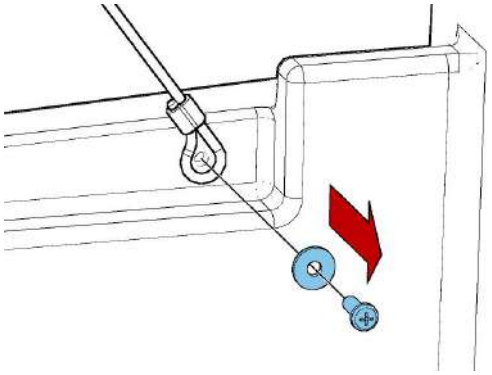


Disassemble the squeegee coupling and remove the battery support from the machine.
Loosen the upper fixing screw of the squeegee support hub fulcrum.
Lay the machine on the left side.

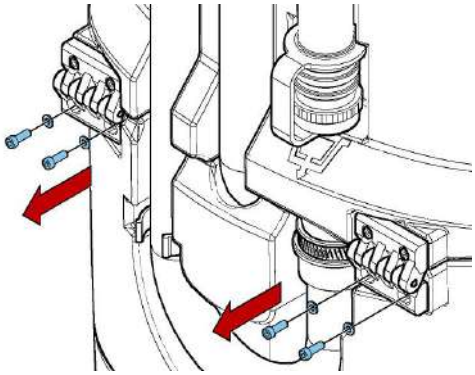


Remove the screws that secure the reinforcing plate of the squeegee support fulcrum and remove it. together with, it will be also removed the squeegee support fulcrum hub.
Remove the squeegee support fulcrum rotating it properly.

6.7.2 Serbatoio di Recupero



Make sure that the recovery tank is completely empty otherwise, drain it completely.
Remove the recovery tank lid and the vacuum hose.
Unplug the charger cable - vacuum motor - blinking light.



Cut the clamps that secure the cables to the solution tank.
Loosen the screw that fix the safety cord of the tank.
Unscrew the screws holding the opening hinges to the recovery tank.

Chapter 7

Frame and Traction Unit

7.1 Location on machine

The frame and traction unit is located under the machine body.

7.2 Main Components

1 Steering Wheel/Display
2 Steering Rod
3 Adjustment Screws
4 Front Wheel
5 Battery Compartment
6 Rear Wheels
7 Frame
8 Electrobrake
9 Traction Gearmotor
10 Key Switch
11 Brush deck Control Lever
12 Squeegee Control Lever
13 Curve Speed reduction Microswitch
14 Steering Chain

7.3 Work requirements

The traction unit only works if the following conditions are met:

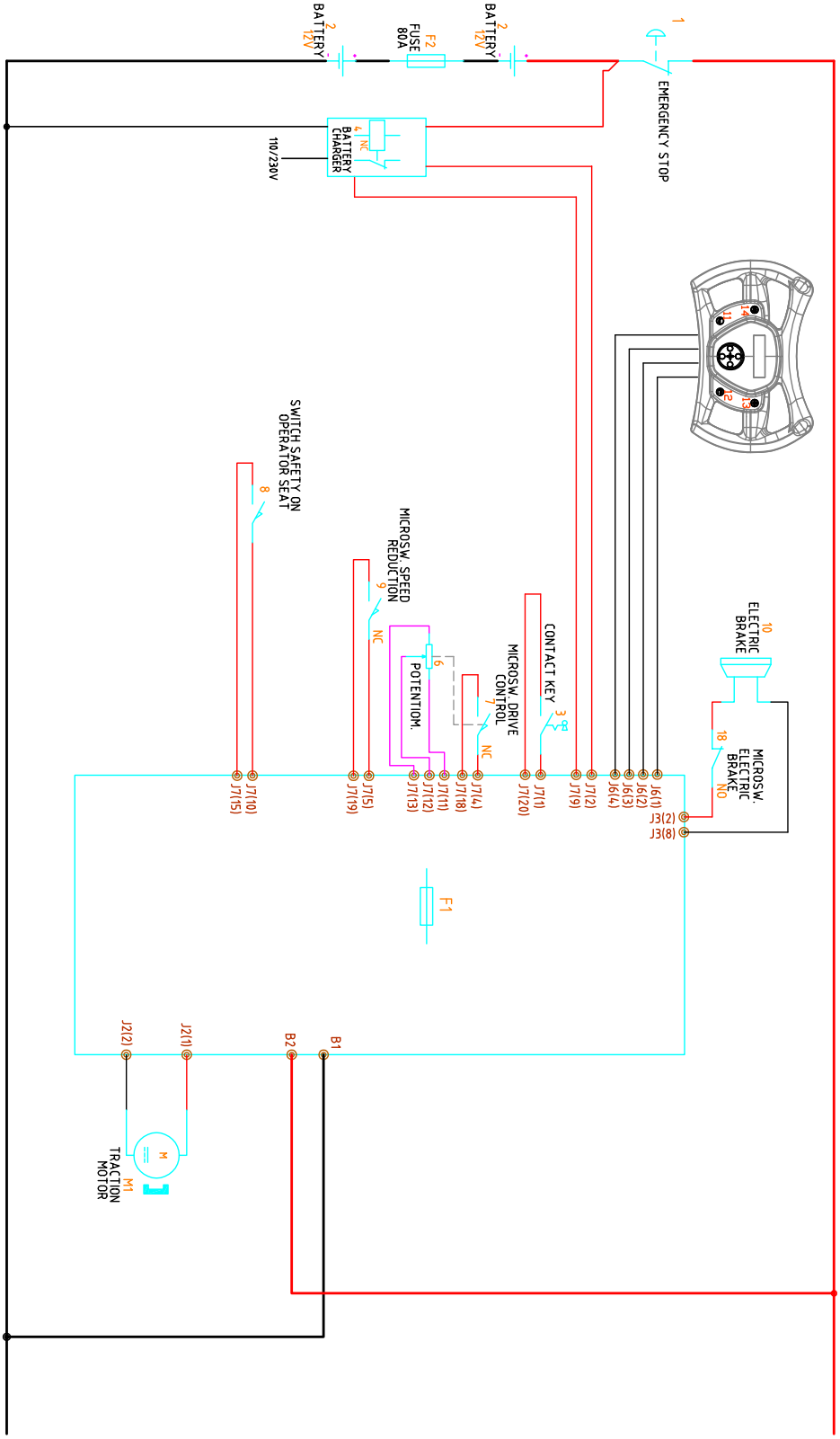
1. The batteries are not discharged.
2. The operator is seated on the machine so as to press the seat safety switch (1).
3. The machine is on (2).
4. The electrobrake is activated.
5. The accelerator pedal is pressed(3).

7.4 Operating mode

TRACTION

Operator	Seat Microsw.	Action	Result
Sitting	Closed	Forward pedal pressed	Traction motor ON (+24V to M1).
Sitting	Closed	Backward function enabled	Traction motor ON (+24V to M1).

7.5 Related electrical circuit



Functionality Check - Traction Unit

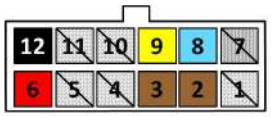
Conventions:

- $+V_b$: Positive voltage of the battery.
- $-V_b$: Negative voltage of the battery.
- **The Traction is in working condition**.

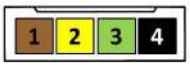
Input/output:

Satisfied condition	Pin	V at work	V at rest
Emergency button Not pressed	B+ ref to B-	$+V_b$	$+V_b$
Brush Motor Activated	J1(1) ref to J1(2)	$+V_b$	$-V_b$
Electrobrake Activated	J3(2) ref to J3(8)	$+V_b$	$-V_b$
Display Receiving	J6(1) ref to B-	$+V_b$	$-V_b$
Display Transmitting	J6(2) ref to B-	$+V_b$	$-V_b$
Display Negative	J6(3) ref to B-	$-V_b$	$-V_b$
Display Positive	J6(4) ref to B-	$+V_b$	$+V_b$
Key Contact Activated	J7(1) ref to J7(20)	$+V_b$	$-V_b$
Battery Charger Disabled	J7(2) ref to J7(3)	$-V_b$	$-V_b$
Traction pedal pressed	J7(4) ref to J7(18)	$+V_b$	$-V_b$
Potentiometer signal activated	J7(13) ref to J7(11)	$+V_b$	$-V_b$
Curve Speed reduction Microswitch	J7(5) ref to J7(19)	$-V_b$	$+V_b$
Operator Sit	J7(10) ref to J7(15)	$+V_b$	$-V_b$

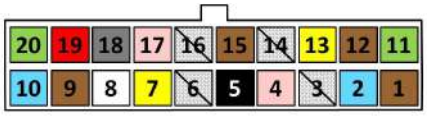
J3



J6



J7



7.5.1 Relative electrical Components

Traction Gearmotor

The traction of the machine is guaranteed by an electric motor installed in combination with a gear, which acts directly on the rear wheels of the machine, ensuring traction.
With constant 24 V DC power supply (battery charged) the traction gearmotor with no load (M1) absorbs 2.1 Amps ± 0.1. With constant 21 V DC power supply (low battery) the absorption is 2.0 Amps ± 0.1.

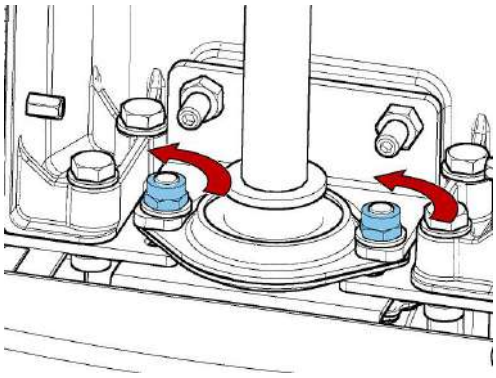
Batteries

The batteries must have a voltage of 24V. Two 12V monoblock elements can be installed (see section 3.3.9 at page 29).

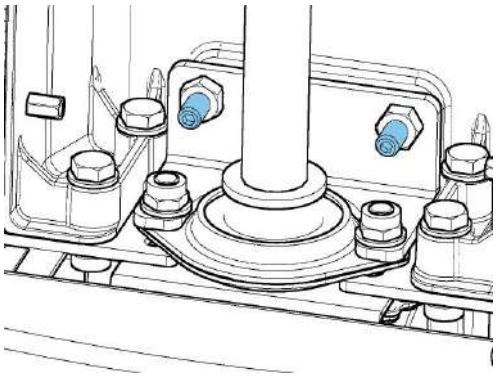
7.6 Adjustments

7.6.1 Steering Column/Chain

Remove the steering wheel cover.
Loosen the nuts securing the bottom support plate of the steering shaft.
Release the headless screws locking nuts, set the optimum tension of the chain by acting on the screws, lock the adjustment by tightening the locking nuts.



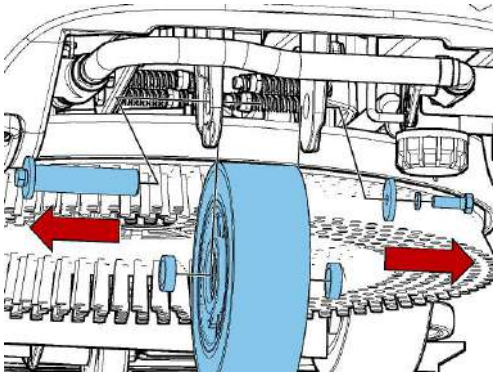
Once found the optimum tension tighten the fixing nuts to lock the bottom supporting plate of the steering shaft.



7.7 Disassembly

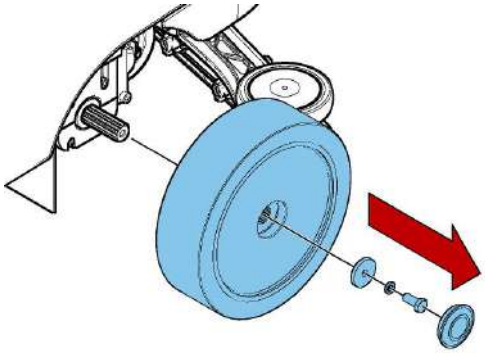
7.7.1 Front Wheel

Lift up the front wheel from the ground.
Unscrew the fixing screw of the wheel shaft to the support.
Remove the wheel securing shaft to the support.

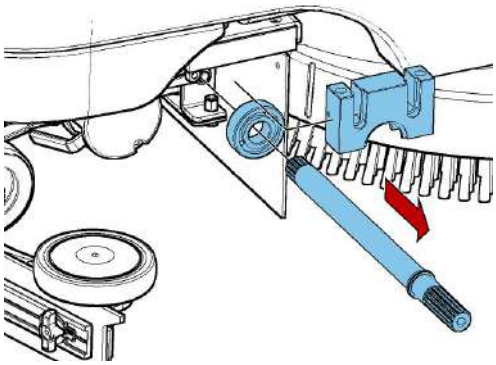


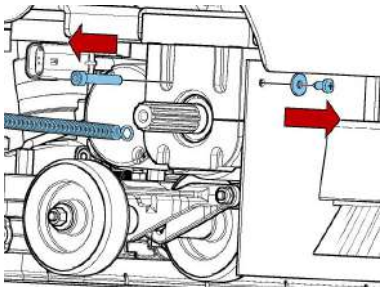
7.7.2 Traction Gearmotor

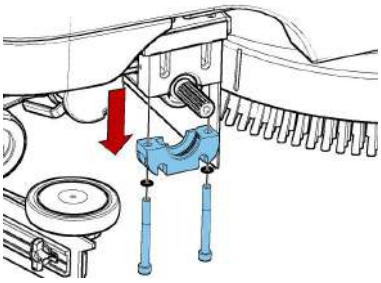
Remove the rear wheels and the drive shafts from the machine.
Disconnect the electrical connector of the Traction Gearmotor.
Remove the screws securing the Traction Gearmotor to the machine frame.

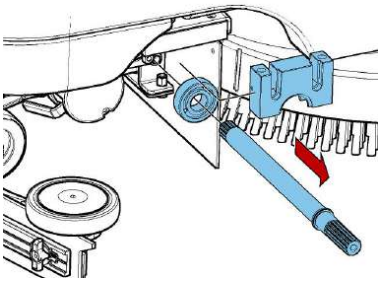


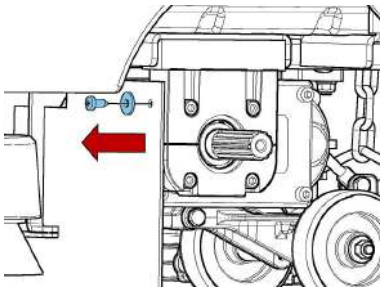
Remove the traction gearmotor.
Remove the brackets and bearing by unscrewing the fixing screws.

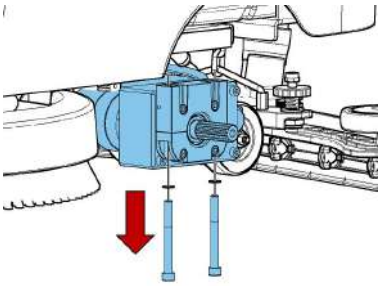


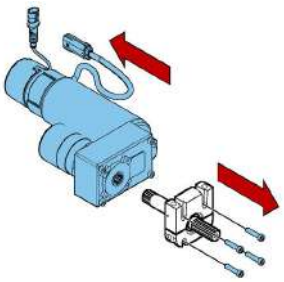










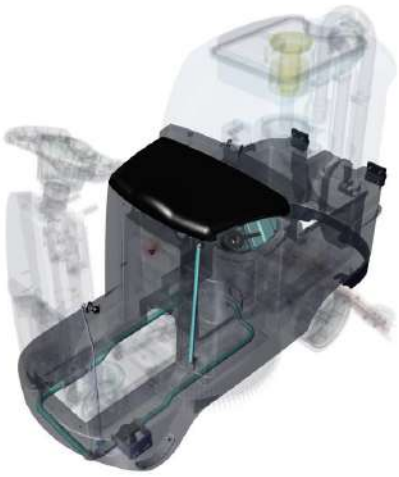


Chapter 8

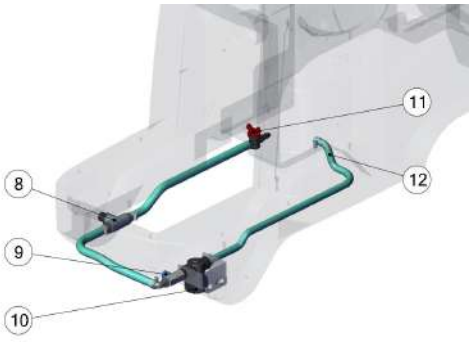
Water Unit

8.1 Location on machine

The Water unit is located under the machine body in central position.



8.2 Main Components

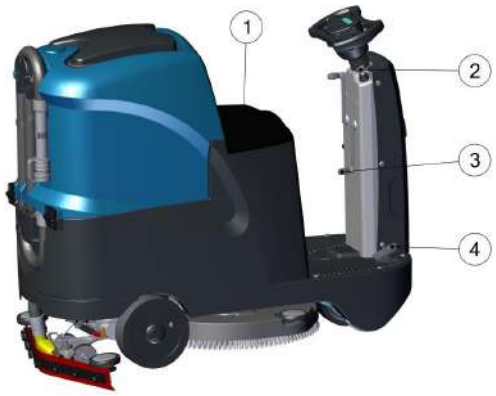


1 Seat
2 Solution Tank
3 Vater Valve Rod
4 Tank Hinges
5 Chemical Dosing Cap
6 Water filling Cap
7 Water Level Hose
8 Water Outlet Connection
9 Water Valve Knob
10 Water Filter
11 Clean Water drain Valve
12 Path end water Hose

8.3 Work requirements

The Water unit only works if the following conditions are met:

1. The batteries are not discharged.
2. The operator is seated on the machine so as to press the seat safety switch (1).
3. The machine is on (2).
4. The electrobrake is activated.
5. The control lever is lowered to release the micro (3).
6. The water valve is open.
7. The accelerator pedal is pressed(4).

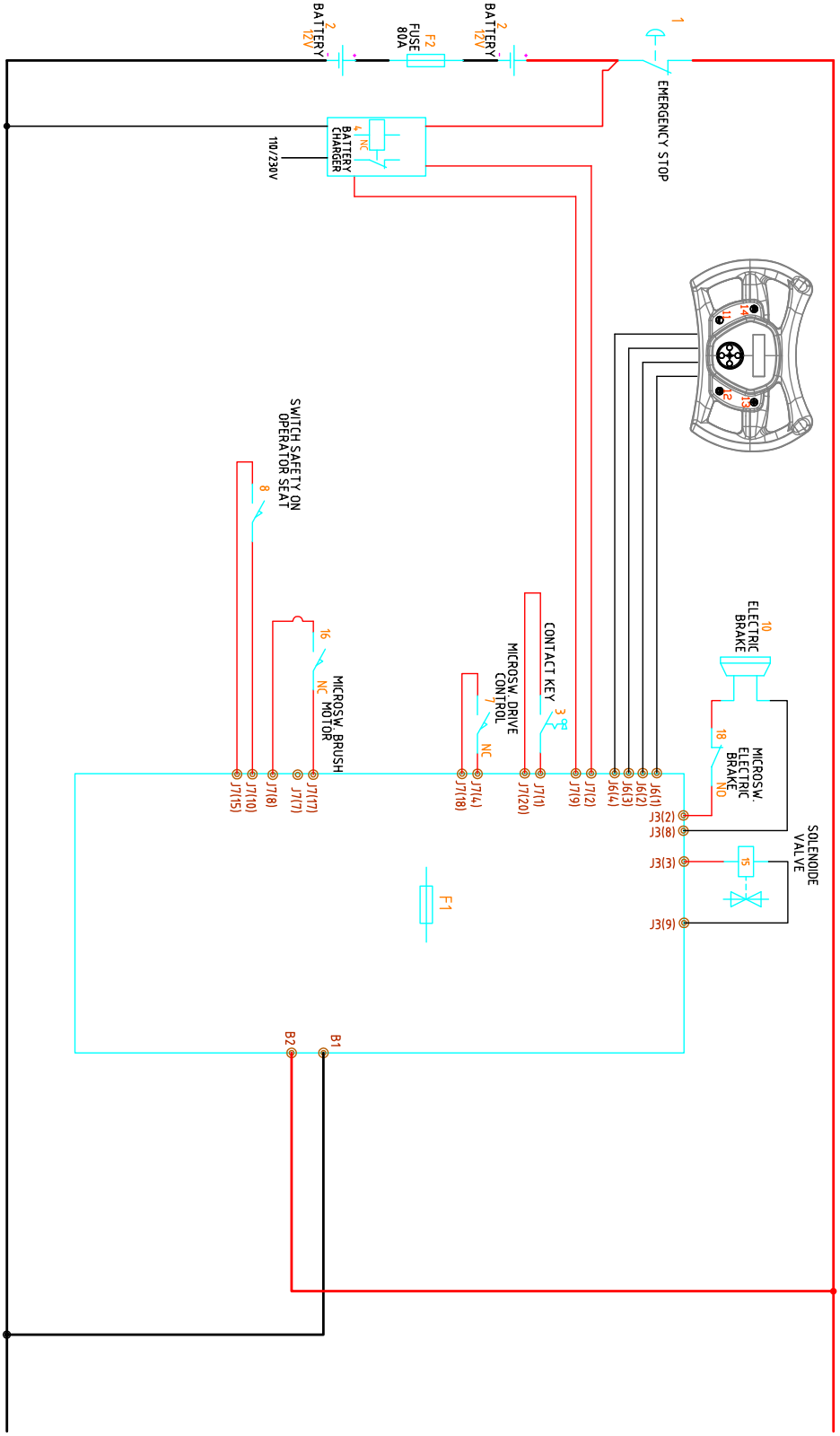


8.4 Operating mode

WASHING

Operator	Seat Microsw.	Action	Result
Sitting	Closed	Washing Enabled Forward pedal pressed	Solenoid Valve ON (+24V to J3-3 to J3-9)
Sitting	Closed	Backward function enabled during work	Solenoid Valve ON (+24V to J3-3 to J3-9)
Sitting	Closed	Traction Pedal not pressed during work	Solenoid Valve OFF
Sitting	Closed	Washing disabled during work	Solenoid Valve OFF

8.5 Related electrical circuit



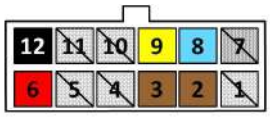
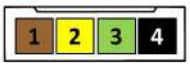
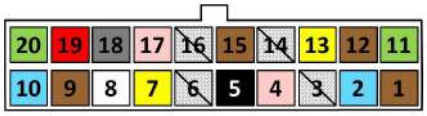
Functionality Check - Water Unit

Conventions:

- $+V_b$: Positive voltage of the battery.
- $-V_b$: Negative voltage of the battery.
- **The Water system is in working condition**.

Input/output:

Satisfied condition	Pin	V at work	V at rest
Emergency button Not pressed	B+ ref to B-	$+V_b$	$+V_b$
Electrobrake Activated	J3(2) ref to J3(8)	$+V_b$	$-V_b$
Solenoid Valve Activated	J3(3) ref to J3(9)	$+V_b$	$-V_b$
Display Receiving	J6(1) ref to B-	$+V_b$	$-V_b$
Display Transmitting	J6(2) ref to B-	$+V_b$	$-V_b$
Display Negative	J6(3) ref to B-	$-V_b$	$-V_b$
Display Positive	J6(4) ref to B-	$+V_b$	$+V_b$
Key Contact Activated	J7(1) ref to J7(20)	$+V_b$	$-V_b$
Battery Charger Disabled	J7(2) ref to J7(3)	$-V_b$	$-V_b$
Traction pedal pressed	J7(4) ref to J7(18)	$+V_b$	$-V_b$
Brush gearmotor Microswitch	J7(8) ref to J7(17)	$+V_b$	$-V_b$
Operator Sit	J7(10) ref to J7(15)	$+V_b$	$-V_b$

J3		J6	
J7			

8.5.1 Relative electrical Components

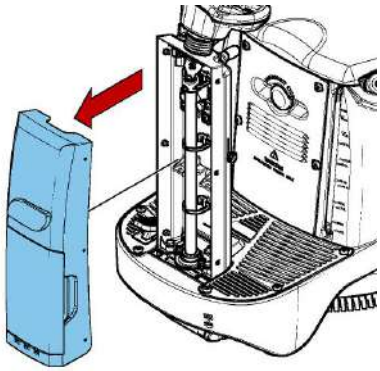
Solenoid Valve

The solenoid valve is located on the back of the brush deck body, which can be easily accessed from the left side.

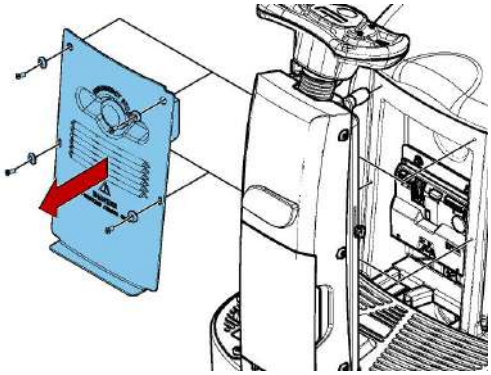
8.6 Smontaggio

8.6.1 Serbatoio Soluzione

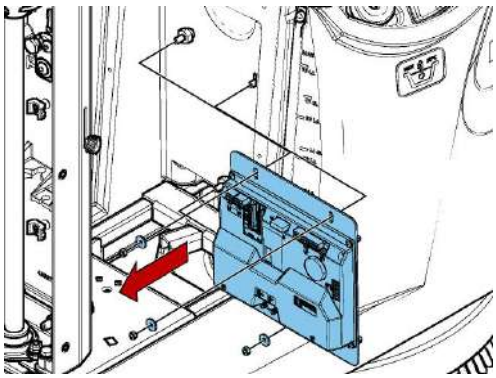
Remove the recovery tank.
Remove the battery tray.
Remove the steering column carter.
Remove the footrest.



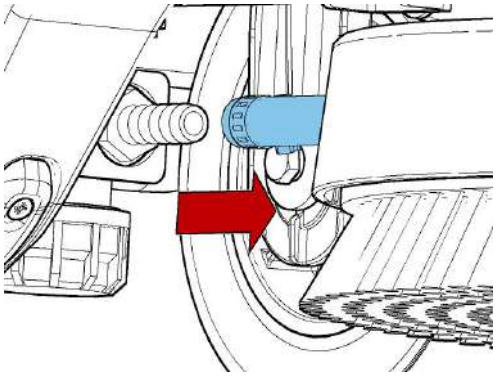
Remove the electrical installation carter.
Disconnect the wiring form the Main card and remove the support bracket of the card itself.
Remove the traction pedal assembly.
Remove the seat and the deadman microswitch.

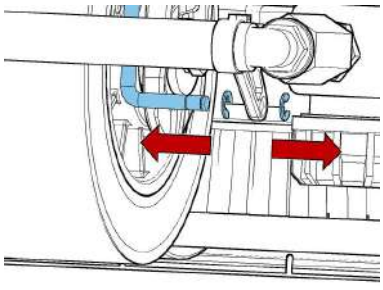


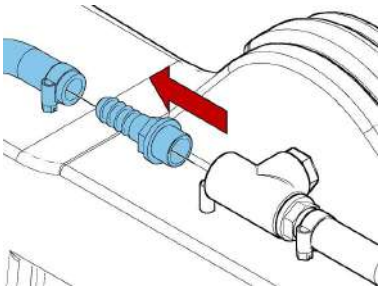
Disconnect the water hose from the solution filter.
Disconnect the control rod from the water valve.
Release the wiring from the plastic clamps.

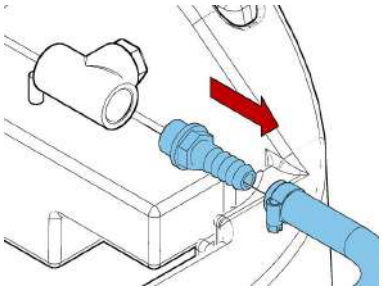


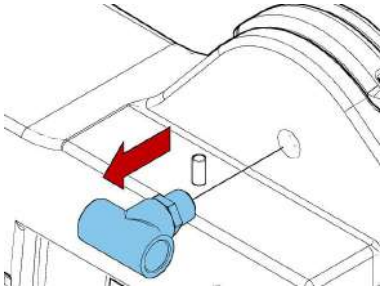
Remove the screws that secure the solution tank to the machine frame.
Remove the tank, pulling it out from the steering column, taking care not to damage the steering wheel.
Put the tank Upside down and remove the solution delivery system.

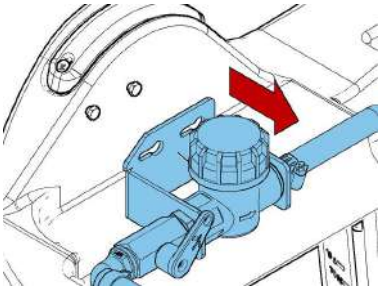


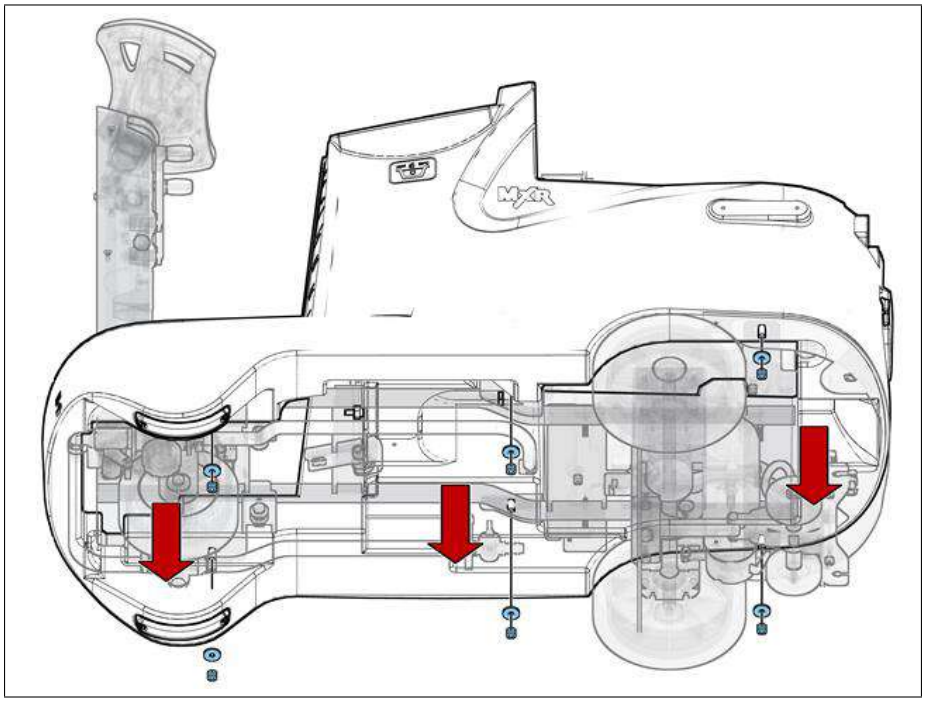












Chapter 9

Consumable & Recommended Spare Parts

9.1 Consumable Spare Parts

9.1.1 Disc Brush Deck

PN	**Description**	**Measures ϕ**	**Bristle**	**ϕ Bristle**	**Color**
436232	BRUSH PPL 0,3	560 mm 22 in	PPL	0,3 mm 0,012 in	Blue
436233	BRUSH PPL 0,6	560 mm 22 in	PPL	0,6 mm 0,023 in	White
436234	BRUSH PPL 0,9	560 mm 22 in	PPL	0,9 mm 0,035 in	Black
436235	BRUSH TYNEX	560 mm 22 in	ABRASIVE	0,9 mm 0,035 in	Gray
436236	PAD HOLDER	535 mm 21 in	-	-	-
Carbon Brushes					
Till Serial Number 216004992					
409412	BRUSH MOTOR CAR.BR.	-	-	-	-
Since Serial Number 216004993					
422462	BRUSH MOTOR CAR.BR.	-	-	-	-

9.1.2 Orbital Brush Deck

PN	Description	Measures	Colour
442662	BLACK PAD	508 x 355 mm 20 x 14 in	Black
442005	RED PAD	508 x 355 mm 20 x 14 in	Red
442661	GREEN PAD	508 x 355 mm 20 x 14 in	Green
443711	WHITE PAD	508 x 355 mm 20 x 14 in	White
443712	BROWN PAD	508 x 355 mm 20 x 14 in	Brown

9.1.3 Drying System

PN	Description	Measures	MxR	
			Disc	Orbital
	Squeegee 705 mm - 27,75 in			
219451	RUBBER KIT 33 SHORE	750 x 70 x 4 mm 30 x 2.8 x 0.15 in	√	
219452	RUBBER KIT 40 SHORE POLIURETANO	750 x 70 x 4 mm 30 x 2.8 x 0.15 in	√	
219453	RUBBER KIT LATEX	750 x 70 x 4 mm 30 x 2.8 x 0.15 in	√	
427251	SQUEEGEE SUPPORT WHEEL D=80 L=23	-	√	√
	Squeegee 800 mm - 31,5 in			
221391	RUBBER KIT 33 SHORE	850 x 70 x 4 mm 34 x 2.8 x 0.15 in		√
221392	RUBBER KIT 40 SHORE POLIURETANO	850 x 70 x 4 mm 34 x 2.8 x 0.15 in		√
221393	RUBBER KIT LATEX	850 x 70 x 4 mm 34 x 2.8 x 0.15 in		√
427251	SQUEEGEE SUPPORT WHEEL D=80 L=23	-	√	√
	Carbon Brushes			
424210	VACUUM MOTOR CARBON BRUSHES	-	√	√

9.1.4 Machine Frame and Traction System

PN	Description
436222	FRONT WHEEL D=7 d=1 S=3 WITH BEARINGS
426460	REAR WHEEL D=9 L=3
	Carbon Brushes
422462	TRACTION MOTOR CAR.BR.

9.2 Recommended Spare Parts

The following table refers to the Recommended Spare Parts, and reports the amount suggested by the number of purchased machines.

Machines		Parts
1	⇒	1
10	⇒	2
25	⇒	3
50	⇒	4

9.2.1 Electrical System

PN	Description
438767	MAIN BOARD 7CFCP001
436267	CONTROL BOARD
436268	SERIAL CABLE FOR CONTROL BOARD
223940	TRACTION PEDAL ASSEMBLY
210516	COMPLETE KEY SWITCH
409499	MICROSWITCH 3X22 L.C.FLAT
409503	SEAT MICROSWITCH
216691	COMPLETE SEALED MICROSWITCH
436144	EMERGENCY BUTTON
222386	BATTERY CHARGER KIT

9.2.2 Mechanical Rubbing System

		MxR	
PN	Description	Disc	Orbital
222452	GEAR MOTOR 24V 500W 140RPM H2O W/MOLEX	√	
436124	BRUSH FLANGE	√	
436120	DECK BUMPER WHEEL	√	√
227828	GEARMOT. 24V 680W 2000RPM H2O W/MOLEX		√
227767	BRUSHDECK ACTUATOR 24V		√
441992	DAMPERS D=40x40		√

9.2.3 Drying System

PN	Description
222453	VACUUM MOTOR 24V 420W H950 2ST
436198	VACUUM HOSE
436196	DRAIN HOSE W/CAP
430957	STRAIGHT ADAPTER FOR SQUEEGEE
436120	BUMPER WHEEL
436190	GAS SPRING 16-1 F=150 N
436195	FLOATER PROTECTION
436361	FILTER AU PPI 10

9.2.4 Machine Frame and Traction System

PN	Description
222454	TRACTION MOTOR 24V 300W 18A EL.BR.+MOLEX

9.2.5 Cleaning Solution Supply System

PN	Description
407887	COMPLETE SOLENOID 24V 1/2” ACL 3
212616	CLEAN WATER FILTER 1/2” F/F COMPL.
420950	GASKET OR

Fimap S.p.A.
Service Manual MxR

Fimap S.p.A. Via Invalidi del Lavoro, 1 - 37050 S.Maria di Zevio Verona - ITALY
Tel. +39 045 6060411 - Fax +39 045 6060417
Edizione: February 4, 2022