FIMAP®

SERVICE MANUAL

GMG

Version: **AB**
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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 Master function controller (see section 3.2.6 at page 28)
- Updated Master aux controller (see section 3.2.8 at page 36)
- Updated Slave aux controller (see section 3.2.9 at page 38)
- Updated CNA connector (see section 3.2.10 at page 41)
- Updated batteries pararaph (see section 3.2.11 at page 42)
- Updated Consumable and Recommended Spare Parts (see section 14.1 at page 149)
- Updated Parameters chapter (see section 3.5.6 at page 61)
- Updated Frame and Traction Unit chapter (see section 12.5.1 at page 140)
- Added Slave function controller (Combinata) (see section 3.2.7 at page 32)
- Added Combinata alarms (see section 3.3.7 at page 52)
- Added Cylindrical pre-sweeping group chapter (see section 8 at page 104)
- Added Side pre-sweeping group chapter (see section 9 at page 111)
- Added debris hopper chapter (see section 10 at page 118)
- Added Updates installation chapter (see section 3.6 at page 71)

1.3 Other reference manuals

DOCUMENT	DESCRIPTION	DOC. NUMBER	VERS.	TYPE
Spare Parts Catalogue	GMG B PRO	10116916	AB	RIC
Spare Parts Catalogue	GMG B PLUS	10119934	AA	RIC
Spare Parts Catalogue	GMG BS PRO	10119938	AA	RIC
Spare Parts Catalogue	GMG BS PLUS	10119951	AA	RIC
Electric Diagram	GMG	10112345	AA	CIE
Use and Maintenance Manual	GMG B/BS PLUS	10111413	AA	UM
Use and Maintenance Manual	GMG B PRO/PLUS	10114166	AA	UM

1.4 Configurations

GMG 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 or box with elements connected in series, to provide 36 V DC to the motors and to the controls.
GMG is available in 2 types and 3 cleaning versions

Pro - Version with membrane display.
PLUS - Advanced version with integrated touch screen display.

Disc Brushdeck - The disc scrubbing base of the disc version is equipped with two counter-rotating disc brushes with conveyance in the centre.

Cylindrical Brushdeck - The sweeping base of the BS version is equipped with two counter-rotating cylindrical brushes with conveyance in the centre, and a small debris collection drawer.

Combinata (Combined) - The base of the combined version consists of a pre-sweeping unit placed in front of the base.

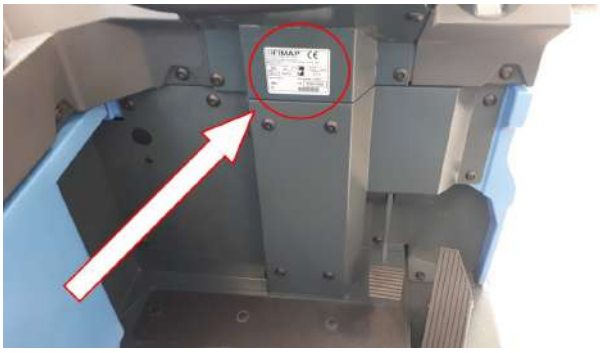
1.5 Products related to this Manual

110525	GMG B PLUS
110524	GMG B PRO
110643	GMG BS PLUS
110641	GMG BS PRO
110644	GMG COMBINATA PLUS
110642	GMG COMBINATA PRO

1.6 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.



1.7 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

1.8 Conventions

By convention, all forward and backward references, front and rear, right and left indicated in this manual, are intended to refer to the operator in the driving position with his hands on the control handlebar.

1.9 General Safety Instructions

Always wear the appropriate personal protective equipment at each intervention.

To avoid short-circuits when working in the vicinity of electrical components: avoid the use of non-insulated tools; do not place or allow metallic objects to fall upon the electrically powered components; remove 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 all electrical connections after any maintenance interventions.

When doing maintenance work, switch off the machine using the main switch. Remove the key from the block 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.

Drain both tanks before transport.

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

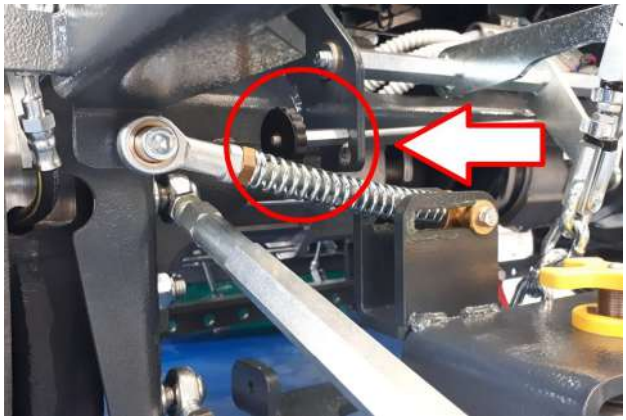
The ramp gradient must not be such as to cause damage to the machine as it moves up onto the vehicle.

Make sure the electro-brakes are correctly engaged after loading the machine onto the transport vehicle.

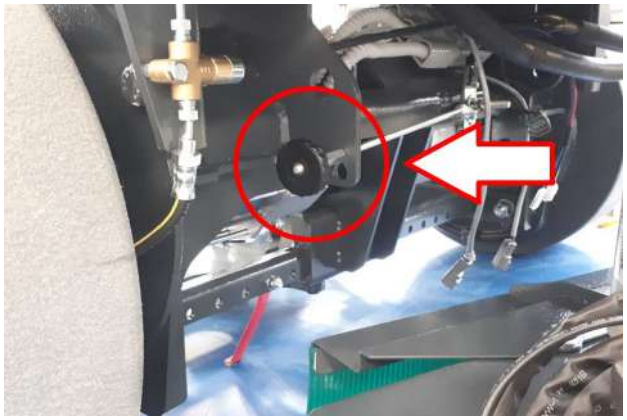
1.10 How to move the machine

Rear-wheel drive motors have a built-in electro-brake that activates when the key switch is turned off or the pedal is released. It is possible to manually exclude these brakes, reaching the right and left rear part of the machine and pulling the knob, moving it upwards.
The electro-brake is considered activated when the hexagonal column is free to move inside the hole on the bracket.
The electric brake is considered deactivated when the hexagonal column rests on the bracket.

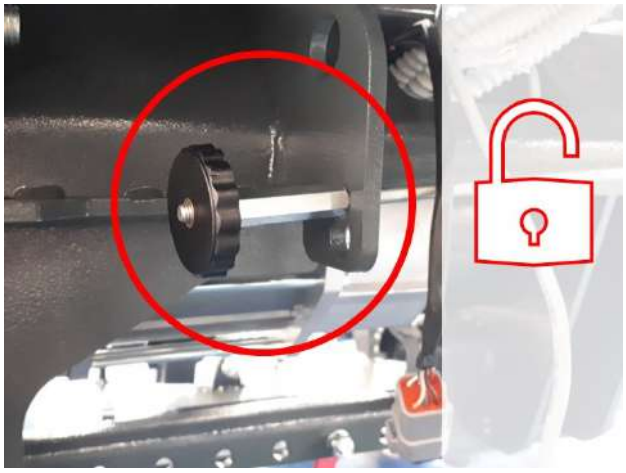
Do this only if you need to push or pull the machine. Remember to re-engage the brake lever after moving the machine, pulling the knob and moving it downwards. If the electro-brake is not reactivated, an alarm will appear when the machine is switched on.



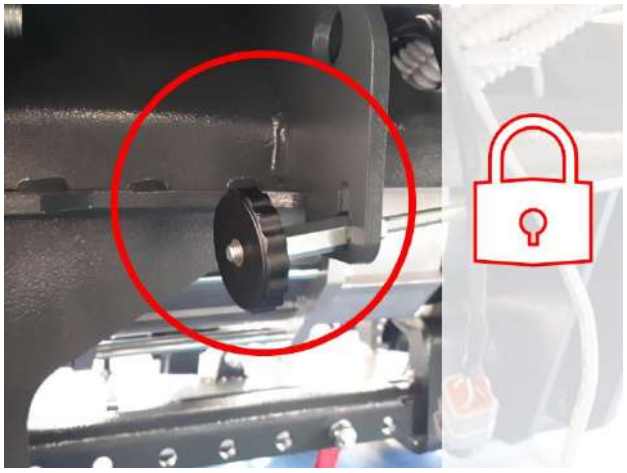
Right wheel electro-brake
On the left side of the machine, between the rear wheel and the squeegee



Left wheel electro-brake
On the right side of the machine, between the brushdeck and the rear wheel



Electric brake deactivated, the wheel is free



Electric brake activated, the wheel is locked

1.11 GMG Technical Data

TECHNICAL DESCRIPTION	U/M	Disc	Cylindrical	Combinata
Total Power	W	10,7	11,4	13,4
Working capacity, up to	$\frac{m^2}{h}/\frac{ft^2}{h}$	10800/116250	11700/125937	15300/164687
Cleaning path width	mm/in	1000/39.4	975/38.4	1000/39.4
Cleaning path width with Side Brush	mm/in	1200/47	975/38.4	1200/47
Working width	mm/in	1000/39.4	975/38.4	1000/39.4
Working width with Side Brush	mm/in	1200/47	1300/51	1700/67
Squeegee width	mm/in	1350/53	1350/53	1350/53
Disc Brushes *(Number - Ø External)*	Nr-Ømm/in	2-507/20	-	-
Cylindrical Brushes	Nr-Ømm-mm	-	2-230-975	-
(Number - Ø External - Lenght)	Nr-Øin-in	-	2-9-38	-
Pre-sweeping Brushes	Nr-Ømm-mm	-	-	2-240-840
(Number - Ø External - Lenght)	Nr-Øin-in	-	-	2-9.4-33
Central Brush Motor *(Voltage - Nominal Power - Revolutions)*	V-W-rpm	36-1100-315	36-1500-720	-
Max weight on Central Brushes	Kg/lb	250/551	250/551	-
Side Brush Motor *(Voltage - Nominal Power - Revolutions)*	V-W-rpm	36-200-140	36-200-75	-
Side Brush *(Number - Ø External Bristles)*	Nr-Ømm/in	1-356/14.0	2-550/21.6	-
Pre-sweeping brush Motor *(Voltage - Nominal Power - Revolutions)*	V-W-rpm	-	-	36-1000-600
Max weight on Pre-sweeping brushdeck	Kg/lb	-	-	250/551
Pre-sweeping side brush Motor *(Voltage - Nominal Power - Revolutions)*	V-W-rpm	-	-	36-300-105
Pre-sweeping Brush *(Number - Ø External Bristles)*	Nr-Ømm/in	-	-	2-550/21.6
Lateral displacement of Side Brush	mm/in	200/7.8	-	
Max weight on Side Brush	Kg/lb	30/66	-	

TECHNICAL DESCRIPTION	U/M	Disc	Cylindrical	Combinata
Traction Motorwheels	n-V-W	2-36-2500	2-36-2500	2-36-2500
Maximum Ramp Gradient (Transfer)[1]	%	25	25	25
Maximum Ramp Gradient (Work) *(GVW)*	%	20	20	20
Maximum forward speed (Transport) *(Default)*	Km/h / mph	10/6.2	10/6.2	10/6.2
Maximum forward speed (Work) *(GVW)*	Km/h / mph	9/5.6	9/5.6	9/5.6
Vacuum Motors *(Number - Voltage)*	n-V	2-36	2-36	2-36
(Stages - Nominal Power)	n-W	3-550	3-550	3-550
Vacuum Motor Depression	mbar	200	200	200
Debris Hopper Vacuum Motor	V-W	-	-	36-450
Solution Tank	L/gal	300/79.2	300/79.2	300/79.2
Recovery Tank	L/gal	350/92.5	350/92.5	350/92.5
Detergent Tank	L/gal	32/8.5	32/8.5	32/8.5
Minimum inversion corridor	mm/in	2500/98.5	2500/98.5	3135/123.4
Machine Length	mm/in	2310/91	2310/91	2965/117
Machine Width *(with squeegee)*	mm/in	1350/53	1350/53	1525/60
Machine Height	mm/in	1555/61.2	1555/61.2	1555/61.2
Machine Width *(with roof)*	mm/in	2090/82.3	2090/82.3	2090/82.3
Battery compartment dimensions *(length - width - height)*	mm in	→ →	430-930-800 16.9-36.6-31.5	← ←
Usage Temperature *(Min - Max)*	°C	→	10-40 / 50-104	←
Sound pressure level *(ISO 11201)*	LpA dB (A)	$\leq$ 67	$\leq$ 67	$\leq$ 71,5
Hand vibration level *(ISO 5349)*	$\frac{m}{s^2}$	$\leq$ 0,52	$\leq$ 0,52	$\leq$ 0,81
Body vibration level *(ISO 2631)*	$\frac{m}{s^2}$	$\leq$ 0,4	$\leq$ 0,4	$\leq$ 0,45

GMG Weights and Pressures[2]

TECHNICAL DESCRIPTION	U/M	Disc	Cylindrical	Combinata
Machine Weight *(empty and without batteries)*	kg/lb	986/2174	1008/2222	1475/3252
Machine Weight in transport *(machine + batteries)*	kg/lb	1795/3957	1820/4012	2250/4960
Machine Weight in work conditions (GVW) *(machine + batteries + water + operator)*	kg/lb	2215/4883	2205/4861	2745/6051
Front wheels specific pressure	$\frac{N}{mm^2}$ / PSI	0,38/55	0,38/55	0,93/134
Rear right wheel specific pressure	$\frac{N}{mm^2}$ / PSI	0,70/101	0,70/101	0,55/80
Rear left wheel specific pressure	$\frac{N}{mm^2}$ / PSI	0,68/98	0,68/98	0,62/90

[1] "Transfer" setting and empty Tanks

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

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/Tightening Electrical Contacts				X

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

1.14 PDI

1.14.1 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
- Fill the Detergent Tank completely with water (if available); check for eventual leaks and the correct chemical outlet
- Check the Washing function (brushdeck movement, water supply and brush rotation)
- 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 and Braking)
- Proceed with on-site adjustments (brushdeck and Squeegee adjustment)
- Check the functioning of the Optional if present:
  - Rear camera
  - Anti-collision sensors
  - Front lights
  - Service lights
  - Wand Kit
  - Gun Kit
- Once the demo has been completed, immediately perform the daily maintenance (see the Use and Maintenance manual).

1.14.2 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 14.1 at page 149).

Brushes

You need to have alternative brushes in PPL of different thickness (see section 14.1 at page 149).
You need to have a pad holder and various PAD at different hardness (see section 14.1 at page 149).

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* *(see section 3.2.1 at page 24)**.*
5.	The batteries don't work properly	⇒	*Check the proper section* *(see section 2.1 at page 16)**.*
6.	The machine is powered properly	⇒	*Check the battery charge level and if necessary perform a recharge cycle or replace it.*

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 3.5.4 at page 59)**.*
2.	The batteries have been working for several cycles	⇒	*Replace the batteries.*

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 3.3.1 at page 43)**.*

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, protecting the connections with grease.*
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 power wires are damaged	⇒	*Replace the damaged wires.*

2.2 Brushes 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 "Standard" mode	⇒	*Set the machine in Extrapressure mode.*
4.	The machine is not in working condition	⇒	*Switch on the machine.* *Set the Wash/Dry mode.* *Press the traction pedal.*
5.	The recovery tank is full	⇒	*Empty the recovery tank completely.*
6.	The brush rotates in opposite way	⇒	*Check the motor connections.*
7.	The traction pedal doesn't work	⇒	*Replace the traction pedal* (see section 3.2.1 at page 24).
8.	The brush is not properly engaged	⇒	*Release and engage properly the brush.*
9.	The brushdeck is not properly adjusted	⇒	*Check and proceed to a proper adjustment of the brushdeck by following the instructions* (see section 4.6.1 at page 79).
10.	The machine does not clean properly	⇒	*Verify / use the brushdeck extra pressure control.*
11.	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 with the Wash mode.*
2.	The brush motor is not powered properly	⇒	*Check the power connections on the brush motor* *(see section 4.4 at page 75)(see section 5.4 at page 83)(see section 6.4 at page 90)(see section 7.4 at page 97).*
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 3.3.1 at page 43).*
4.	The brush motor is not working even if powered	⇒	*Check the Float and Recovery Tank and if full drain it completely.* *If the problem persists replace the motor.*

The Brushdeck doesn't move			
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 3.3.1 at page 43).*
2.	The brush deck is lowered but it doesn't touch the ground	⇒	*Check the settings of the actuator* *(see section 4.6.2 at page 80)(see section 6.6.2 at page 94).*
3.	The brush deck does not lift properly	⇒	*Check the adjustments of the actuator* *(see section 4.6.2 at page 80)(see section 6.6.2 at page 94).*
4.	The brush deck does not move	⇒	*Verify the actuator connections to the main controller and the max pressure microswitch* *(see section 3.2.1 at page 24).*

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 machine is not in working condition	⇒	*Switch on the machine.* *Set the Wash/Dry mode.* *Press the traction pedal.*
4.	The recovery tank is full	⇒	*Empty the recovery tank completely.*
5.	The vacuum motor doesn't work properly	⇒	*Refer to the proper section* *(see section 2.3 at page 19).*
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 11.6.1 at page 131).*
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.	(PLUS) The vacuum motor is Off	⇒	*Activate the brush motor with the Drying mode.*
2.	The vacuum motor is not powered properly	⇒	*Check the power connections on the vacuum motor* *(see section 11.4 at page 128).*
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 3.3.1 at page 43).*
4.	The vacuum motor is not working even if powered	⇒	*Check the Float and Recovery Tank and if full drain it completely.* *If the problem persists replace the motor.*

The squeegee doesn't move			
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 3.3.1 at page 43).*
2.	The squeegee is lowered but it doesn't touch the ground	⇒	*Check the settings of the actuator.*
3.	The squeegee does not lift properly	⇒	*Check the adjustments of the actuator.*
4.	The squeegee does not move	⇒	*Verify the actuator connections to the main controller* *(see section 3.2.1 at page 24).*

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 3.3.1 at page 43).
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* (see section 3.2.1 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 3.2.1 at page 24).
8.	The traction motor is not supplied	⇒	*Check the power connections of the motor* (see section 12.3 at page 136).
9.	The traction motor is not working even if powered	⇒	*Replace the motor* (see section 3.2.1 at page 24).
10.	The electrobrake doesn't disengage	⇒	*Check the connections of the electrobrake.*

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

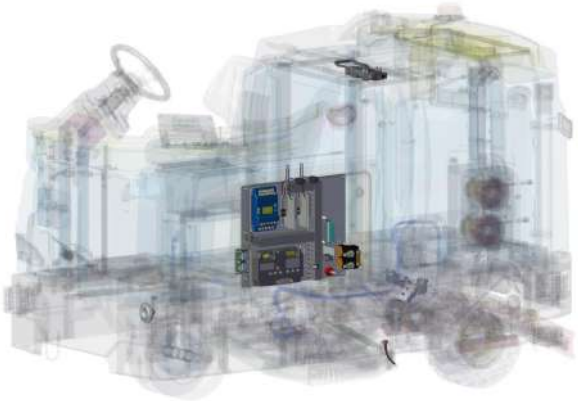
The delivered solution is not correct or not enough			
1.	The machine is switched off	⇒	*Switch on the machine.*
2.	The machine doesn't switch on	⇒	*Refer to the proper section* *(see section 2.1 at page 15).*
3.	The solution tank is empty	⇒	*Fill up the solution tank.*
4.	(FSS) The chemical tank is empty	⇒	*Fill up the chemical tank.*
5.	The flow control water valve is closed	⇒	*Fully open the water valve.*
6.	The display shows an alarm message	⇒	*Check what alarm message is shown and solve the related issue by following the proper instructions* *(see section 3.3.1 at page 43).*
7.	The water pump doesn't work	⇒	*Check the water pump connections and, if necessary, replace it* *(see section 3.2.1 at page 24).*
8.	(FSS) The water or the chemical pump doesn't work	⇒	*Check the pump connections and, if necessary, replace the non working one.*
9.	The solenoid valve doesn't work	⇒	*Check the solenoid valve connections and, if necessary, replace it* *(see section 3.2.1 at page 24).*
10.	The hose that connects the solution tank to the filter is stuck	⇒	*Clean the hose.*
11.	The solution filter is stuck	⇒	*Clean the solution filter.*
12.	The solution distributor is stuck	⇒	*Clean the distributor.*
13.	The detergent doesn't fit the type of dirt	⇒	*Replace the detergent with a proper one.*
14.	(FLR) The pump doesn't work	⇒	*Check the flojet pump connections and, if necessary, replace it.*
15.	(FLR) The solenoid valve doesn't work	⇒	*Check the solenoid valve connections and, if necessary, replace it* *(see section 3.2.1 at page 24).*
16.	(FLR) The recycle filter is stuck	⇒	*Clean the recycle filter.*

Part III

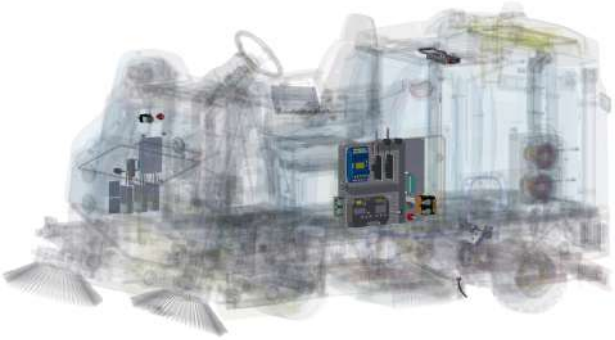
Functional Groups

Chapter 3

Electrical System



GMG B / GMG BS



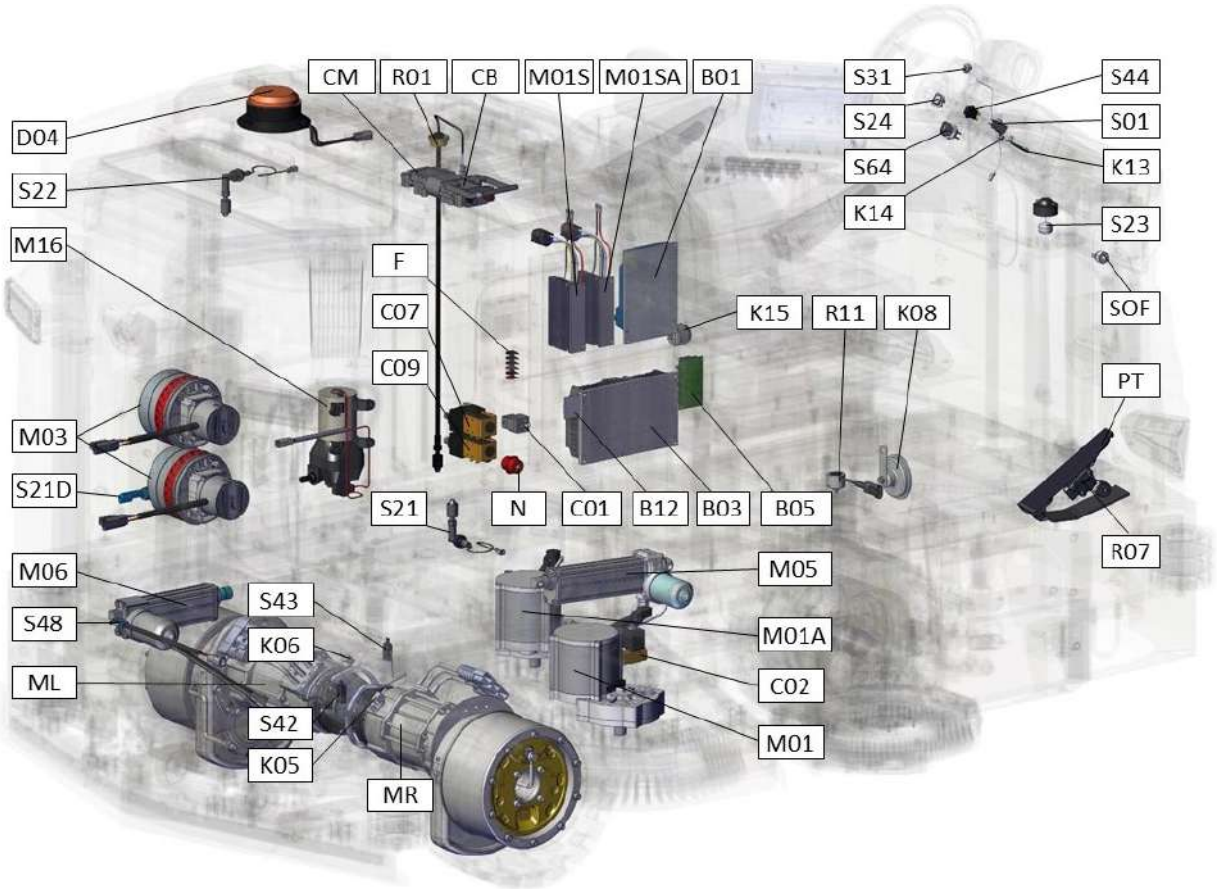
GMG Combinata

3.1 Description

GMG is an electronically modular machine.
The electronic boards communicate in order to operate the scrubber dryer correctly and guarantee the operator's safety conditions.

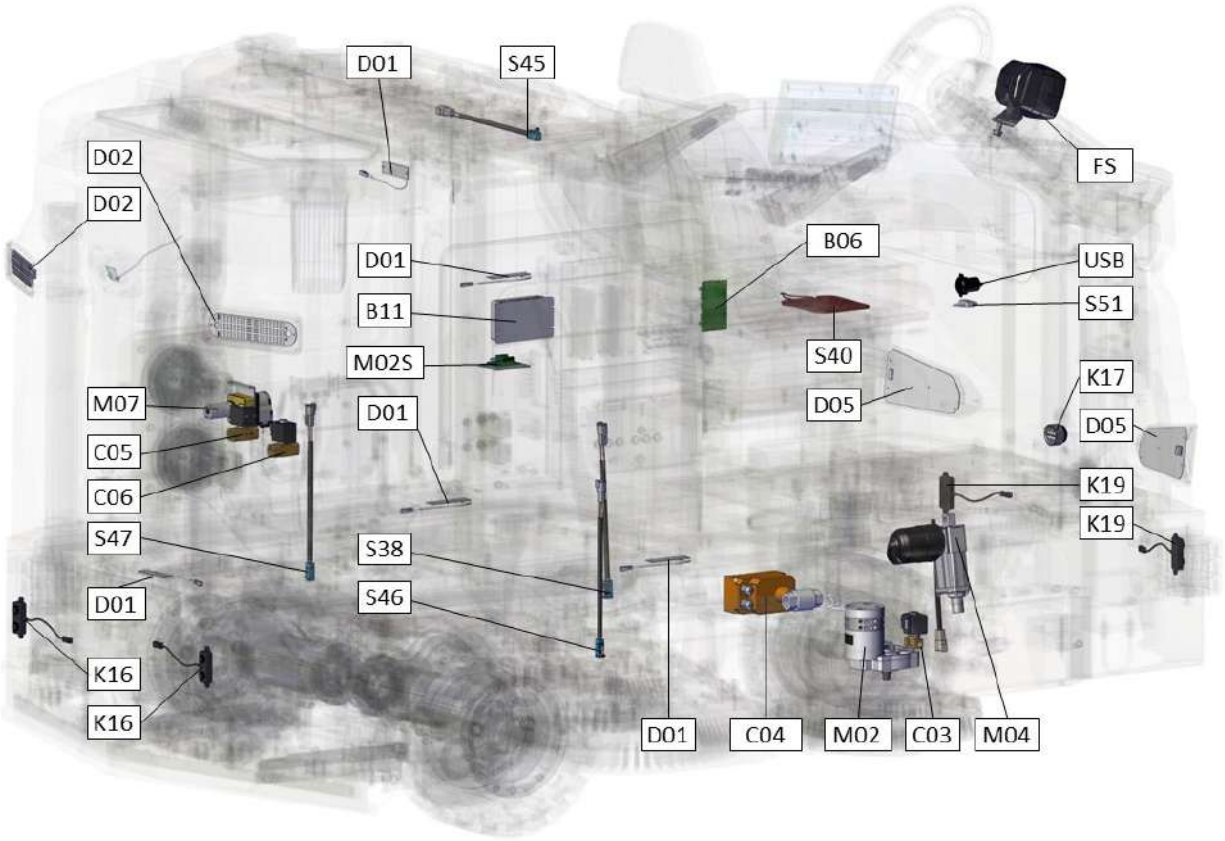
3.2 Location of Electrical Components

3.2.1 GMG Disc



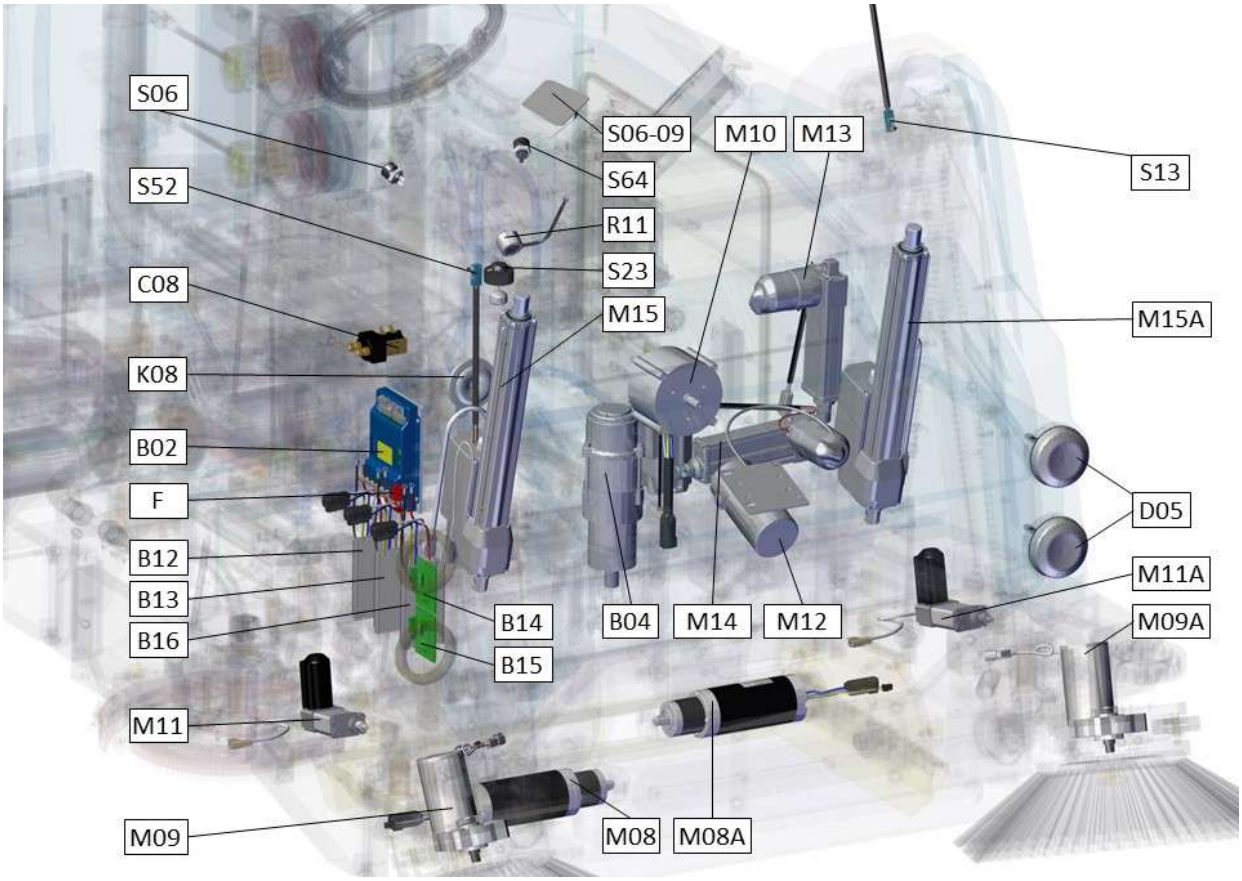
B01	Function controller	M06	Squeegee Actuator
B03	Traction controller (Chopper)	ML	Leftside Motorwheel
B05	Auxiliary Master controller	MR	Rightside Motorwheel
B12	Converter controller 36V/24V	N	Common Negative
C01	Horn Relay	M16	Water Pump
C02	Brushdeck Solenoid Valve	PT	Traction Pedal
C07	Function controller Contactor	R01	Reserve Solution Tank Float (PRO)
C09	Traction controller Contactor	R01	Level Solution Tank Float (PLUS)
CB	Batteries Connector	R07	Traction Potentiometer
CM	Machine Connector	R11	Steering Angle Sensor
D04	Blinking light	S01	Key Microswitch
F	Fuses	S21D	Reserve Detergent Tank Float
K05	Rightside Electrobrake	S21	Reserve Recovery Tank Float
K06	Leftside Electrobrake	S22	Full Recovery Tank Float
K08	Horn	S23	Brakes Oil Float
K13	RFID controller (FFM)	S24	Extrapressure Switch
K14	Badge Sensor (FFM)	S31	SOS Button
K15	Rear Sensor buzzer	S42	Rightside Electrobrake Microswitch
M01	Rightside Brush Motor (Front Cyl)	S43	Leftside Electrobrake Microswitch
M01A	Leftside Brush Motor (Rear Cyl)	S44	Backward Switch
M01S	Rightside Brush Motor controller	S48	Rear Service Light Microswitch
M01SA	Leftside Brush Motor controller	S64	Horh Button
M03	Vacuum Motors	SOF	Brakes Oil Sensor
M05	Brushdeck Actuator		

3.2.2 GMG Disc



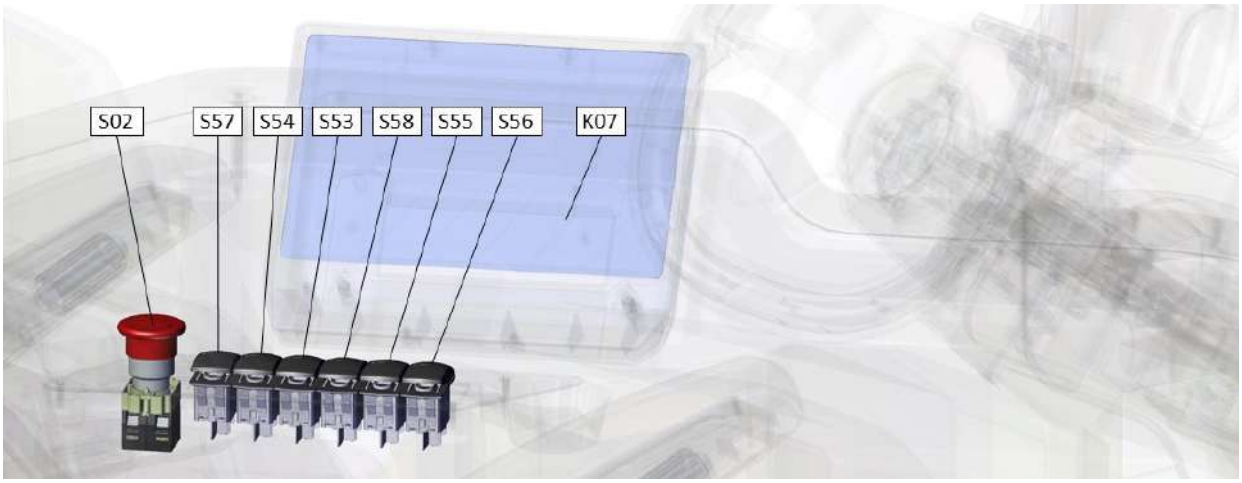
B06	Auxiliary Slave controller	K19	Front anti-collision Sensors
B11	FFM controller	M02	Side Brush Motor
C03	Side Brush Solenoid Valve	M02S	Side Brush Motor controller
C04	2 Ways Solenoid Valve	M04	Side Brush Actuator
C05	Recovery Tank Recycle Solenoid Valve	M07	Detergent Pump
C06	Recovery Tank Recycle Solenoid Valve	S38	Brushdeck Extrapressure Microswitch
D01	LED Service Light	S40	Seat Microswitch
D02	Rear Lights	S45	Battery Service Light Microswitch
D05	Front Lights	S46	Rightside Brush Service Light Microswitch
FA	Front Light	S47	Leftside Brush Service Light Microswitch
K16	Rear anti-collision Sensors	S51	Service Light Selector On/Off/Auto
K17	Front anti-collision Sensors Buzzer	USB	USB Plug

3.2.3 GMG Combinata



B02	Function controller - Slave	M11A	Leftside Brush actuator
B04	Power Steering	M12	Filter shaker
B12	Front Brush motor controller (M08)	M13	Hopper Rotation actuator
B13	Rear Brush motor controller (M08A)	M14	Cylindrical brushdesk actuator
B14	Rightside Brush motor controller (M09)	M15	Hopper lifting rightside actuator
B15	Leftside Brush motor controller (M09A)	M15A	Hopper lifting leftside actuator
B16	Vacuum fan motor controller (M10)	R11	Steering sensor (Power steering)
C08	Slave Function controller contactor	S06	Hopper lowering consent button
D05	Front Lights	S06-09	S06 Hopper lowering button
F	Fuses		S07 Hopper lifting button
K08	Horn		S08 Hopper Rotation button
M08	Front Cylindrical Brush motor		S09 Filter shaker button
M08A	Rear Cylindrical Brush motor	S13	Hopper Rotation consent microswitch
M09	Rightside Brush motor	S23	Oil level sensor
M09A	Leftside Brush motor	S52	Hopper lifting consent microswitch
M10	Hopper vacuum fan motor	S64	Horn Button
M11	Rightside Brush actuator		

3.2.4 GMG PRO Dashboard



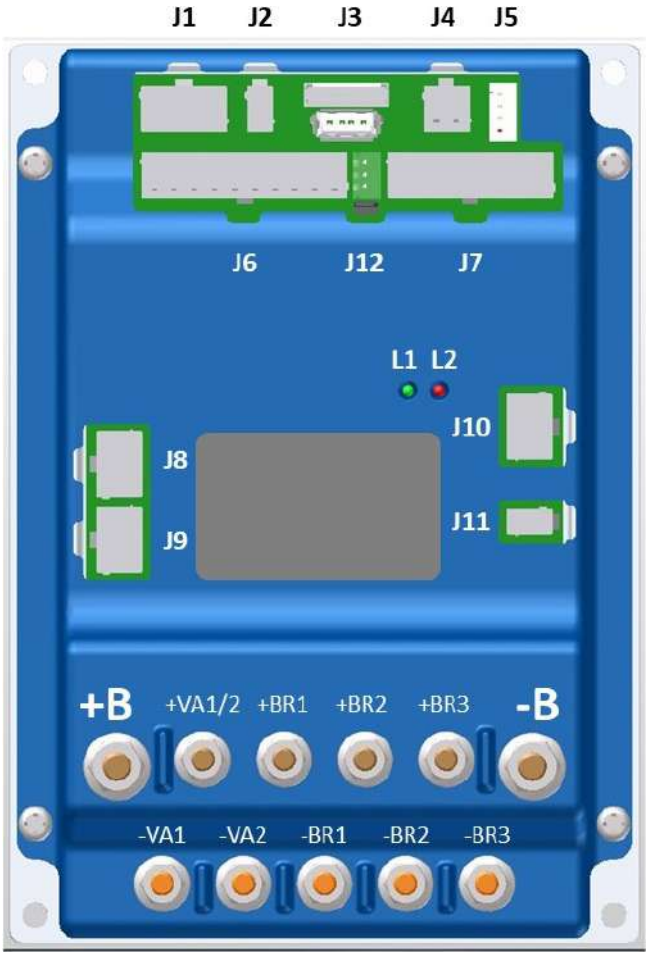
K07	PRO Membrane	S55	Gun Switch
S02	Emergency Button	S56	Wand Switch
S53	Side Brushes Switch	S57	Brush Uncoupling Switch
S54	Lights Switch	S58	Recycle Switch

3.2.5 GMG PLUS Dashboard

K09	PLUS version Display	S02	Emergency Button
K10	PLUS version Membrane	S57	Brush Uncoupling Switch

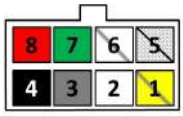
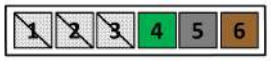
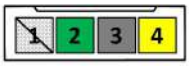
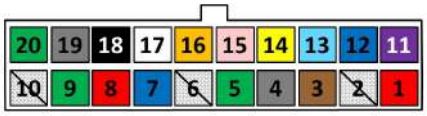
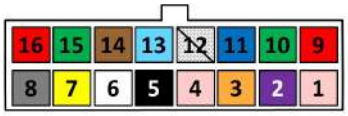
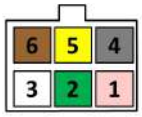
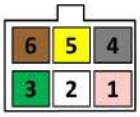
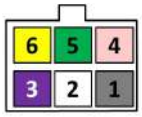
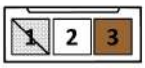
3.2.6 Master Function controller (M)

The Master functions controller manages the consent and measurement of traction, washing and drying currents. It manages the brush and squeegee jacks and, based on the information received from the field, adjusts the behavior of the machine in working conditions. The tables show the legend of the cables for each single connector and the legend of the contacts.



		Power Output
+	VA1/2	Vacuum Motors
-	VA1	Vacuum Motors
-	VA2	Vacuum Motors
+	BR1	Disc Leftside Brush Motor / Front cylindrical
-	BR1	Disc Leftside Brush Motor / Front cylindrical
+	BR2	Disc Rightside Brush Motor / Rear cylindrical
-	BR2	Disc Rightside Brush Motor / Rear cylindrical
+	BR3	Side Brush/es Motor
-	BR3	Side Brush/es Motor
+	B	Battery Positive
-	B	Battery Negative
	L1	Alarms Green LED
	L2	Alarms Red LED

Controller Cables Detail

J1M		J2M	
J3M		J5M	
J6M		J7M	
J8M		J9M	
J10M		J11M	
J12M			

J1M

1	Key Return	30	Yellow	Negative
2	Emergency Button Loop	30	White	Button Out
3	(PRO) Display	D	Gray	Micro NO
6	Emergency Button Loop	D	Black	Button In
7	(PRO) Display	D	Green	Micro NO

J2M

1	Contactor Negative	30	Black	Negative
2	Contactor Positive	30	Red	Positive

J3M

4	Empty Solution Tank Float Sensor	18	Green	Input
5	(PLUS) Empty Solution Tank Float Sensor	18	Gray	Input
6	Float Sensor Commone Positive	18	Brown	Positive

J5M

2	FFM (Tx)		Green	Reception
3	FFM (Rx)		Gray	Transmission
4	FFM		Yellow	Negative

J6M

1	Common Positive J6(3-4-5)	31	Red	Input
3	Empty Recovery Tank Float Sensor	31	Brown	Input
4	Full Recovery Tank Float Sensor	31	Gray	Input
5	Brakes Oil Float Sensor	31	Green	Input
7	Power Paddle Positive	32	Blue	Positive
8	Footrest Microswitch	32	Red	Positive
9	Auxiliary controller Communication	30	Green	Positive
11	Disc Common Positive J6(7)	34	Purple	Positive
12	Alarm Brush 1	31	Blue	Positive
13	Alarm Brush 2	31	L.Blue	Positive
14	Alarm Vacuum 1	31	Yellow	Positive
15	Alarm Vacuum 2	31	Pink	Positive
16	Brushdeck Enable	31	Orange	Positive
17	Side Brush/es Enable	31	White	Positive
18	Vacuum Enable	32	Black	Positive
19	Auxiliary controller Communication	30	Gray	Positive

J7M

1	Stop Lights	33	Pink	Reception
2	Backwards Lights	33	Purple	Transmission
3	Recovery Tank Recycle Solenoid Valve	33	Orange	Negative
4	Solution Tank Recycle Solenoid Valve	37	Pink	Negative
5	Side Brush Solenoid Valve	33	Black	Negative
6	Brushdeck Solenoid Valve	33	White	Negative
7	Chemical Pump	PD	Yellow	Negative
8	Work Lights	33	Gray	Negative
9	Common Positive (1-2)	33	Red	Positive
11	Common Positive (3-4)	33	Blue	Positive
13	(Disc) Side Brush Solenoid Valve	33	L.Blue	Positive
14	Brushdeck Solenoid Valve	33	Brown	Positive
15	Detergent Pump	PD	Green	Positive
16	Work Lights	34	Red	Transmission

J8M

1	Brushdeck Actuator Power Output	34	Pink	
2	Brushdeck UP Sensor Input	34	Green	Input
3	Extrapressure Sensor Input	34A	White	
4	Brushdeck Actuator Power Output	34	Gray	
5	Brushdeck DOWN Sensor Input	34	Yellow	
6	Common Micro	34	Brown	Input

J9M

1	Squeegee Actuator Power Output	35	Pink	
2	Squeegee UP Sensor Input	35	White	
3	Moving Actuator Input	35	Green	
4	Squeegee Actuator Power Output	35	Gray	
5	Squeegee DOWN Sensor Input	35	Yellow	
6	Common Micro	35	Brown	Negative

J10M

1	Side Brush Actuator Power Output	36	Gray	
2	(Disc) Brusdeck UP Sensor Input	36	White	Steering Column
3	(Cyl.) Sweeping Version autoconfiguration Loop	36	Purple	
4	Side Brush Actuator Power Output	36	Pink	
5	(Disc) Brushdeck DOWN Sensor Input	36	Green	Steering Column
6	(Disc) Common Micro (Cyl.) Common Micro Loop	36	Yellow	

J11M

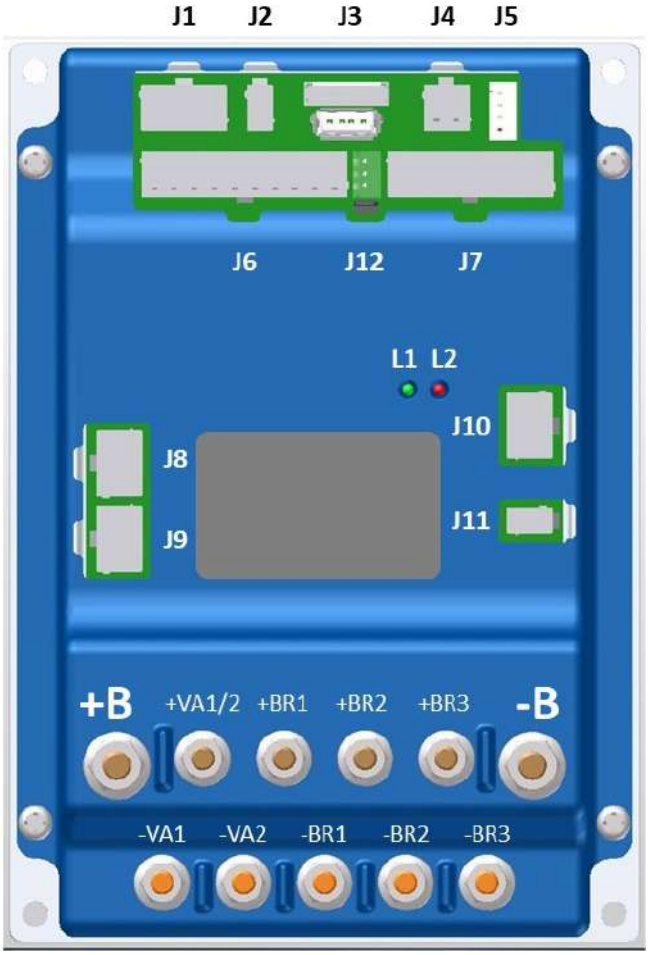
1	Water Pump	PA	Black	Negative
2	Water Pump	PA	Red	Micro NO

J12M

2	(PLUS) Communication DisplayPlus + Trac. contr.+ Presweep. contr. (PRO) Communication Trac. contr.+ Presweep. contr.		White	CAN L
3	(PLUS) Communication DisplayPlus + Trac. contr.+ Presweep. contr. (PRO) Communication Trac. contr.+ Presweep. contr.		Brown	CAN H

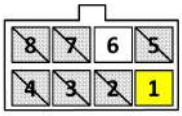
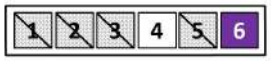
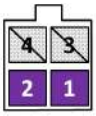
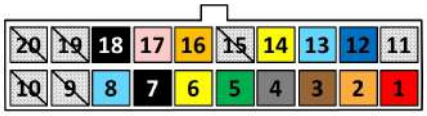
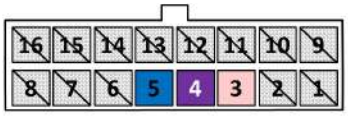
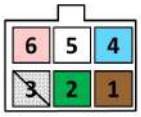
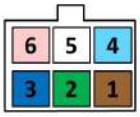
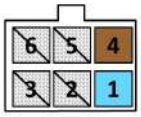
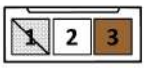
3.2.7 Slave Function Controller (S) (GMG Combinata)

On GMG Combinata, a second function board similar to the Master board is used for the pre-sweeping part. This function board called Slave, manages the consent and current measurement of the cylindrical and side brush motors, suction fan motor and filter shaker.
It also manages the actuators of the cylindrical and lateral brushes and the rotation actuator of the waste container, and on the basis of the information received from the field, it regulates the behavior of the machine in working conditions. The tables show the legend of the cables for each single connector and the legend of the contacts.



	Uscite di Potenza	
+	VA1	Debris Hopper Vacuum Motor
-	VA1	Debris Hopper Vacuum Motor
+	BR1	Front cylindrical Brush Motor
-	BR1	Front cylindrical Brush Motor
+	BR2	Rear cylindrical Brush Motor
-	BR2	Rear cylindrical Brush Motor
+	BR3	Sweeping side brush Motors
-	BR3	Sweeping side brush Motors
+	B	Battery Positive
-	B	Battery Negative
	L1	Alarms Green LED
	L2	Alarms Red LED

Controller Cables Detail

J1S		J2S	
J3S		J4S	
J6S		J7S	
J8S		J9S	
J10S		J11S	
J12S			

J1S

1	Key Return	30P	Yellow	Negative
2	Emergency Button Loop	30P	White	Button Out
6	Emergency Button Loop	30P	Black	Button In

J2S

1	Contactor Negative	31P	Black	Negative
2	Contactor Positive	31P	Red	Positive

J3S

4	Lift microswitch	32P	White	Input
4	Lift microswitch	34P	Purple	Positive

J4S

1	Pre-sweeping self-configuration loop	32P	Purple	Input
2	Pre-sweeping self-configuration loop	32P	Purple	Input

J6S

1	Sweeping Side Brush	31P	Red	Input
2	(PRO) Sweeping Side Brush Button	18P	Orange	Input
3	Debris Hopper rotation Button	31P	Brown	Input
4	Debris Hopper lifting Button	31P	Gray	Positive
5	Debris Hopper lifting Button	31P	Green	Negative
6	(PRO) Cylindrical Brushes Button	32P	Yellow	Positive
7	Filter shaker	34P	Black	Positivo
8	(PRO) Vacuum Stop Button	32P	L.Blue	Positive
12	Alarm Brush 1	31P	Blue	Positive
13	Alarm Brush 2	31P	L.Blue	Positive
14	Alarm Vacuum 1	31P	Yellow	Positive
16	Brushdeck Enable 1	31P	Orange	Positive
17	Side Brush Enable	31P	Pink	Positive
18	Vacuum Enable	32P	Black	Positive

J7S

3	(PRO) Side Brushes Button LED	40P	Pink	Negative
4	(PRO) Cylindrical Brushes Button LED	40P	Purple	Negative
5	(PRO) Vacuum LED	40P	White	Negative

J8S

1	Brushdeck Actuator Power Output	34P	Brown	
2	Brushdeck UP Sensor Input	34P	Green	Input
4	Brushdeck Actuator Power Output	34P	L.Blue	
5	Brushdeck DOWN Sensor Input	34P	White	
6	Common Micro	34P	Pink	Input

J9S

1	Rotation Actuator Power Output	35P	Pink	
2	Rotation closed Input	35P	Green	
3	Moving Actuator Input	35P	Blue	
4	Rotation Actuator Power Output	35P	L.Blue	
5	Rotation moving Sensor Input	35P	White	
6	Common Micro	35P	Pink	Negative

J10S

1	Side Brush Actuator Power Output	36P	L.Blue	
4	Side Brush Actuator Power Output	36P	Brown	

J11S

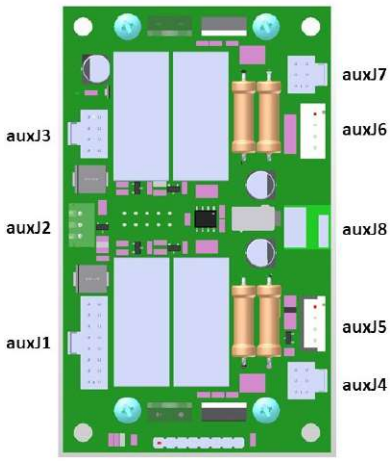
1	Filter shaker Motor	SC	Black	Negative
2	Filter shaker Motor	SC	Red	Positive

J12S

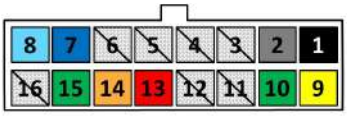
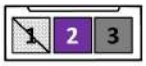
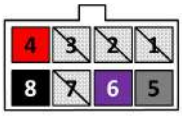
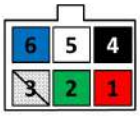
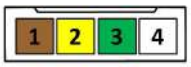
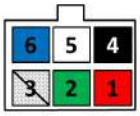
2	Master Function controller Communication		White	CAN L
3	Master Function controller Communication		Brown	CAN H

3.2.8 Auxiliary Master Controller (D)

The auxiliary master Controller manages the anti-collision sensors, the brush release, the switches and in the combined version, the Debris Hopper lifting actuators.



Controller Cables Detail

J1D		J2D	
J3D		J4D	
J5D-J6D		J7D	
J8D			

J1D

2	Function Controller Communication	30	Gray	OUT TX1
3	Common Positive			J1-4/5/6/7
7	Work lights Button	P	Blue	IN 7 / AN In / TTL Out
8	Side Brush Button		L.Blue	IN 9 (shared with ACT1 FC3)
9	Key Positive	30	Yellow	Positive
10	Function Controller Communication	30	Green	OUT RX1
11	(PLUS) Common Positive J1D			Positive
13	Drying Wand Switch		Red	IN 4 / AN In
14	Water gun Switch	PP	Orange	IN 6 / AN In
15	Brush Release switch	SG	Green	IN 8 / AN In

J2D

2	Slave auxiliary Controller Communication	E	Purple	JST XHP-3
3	Slave auxiliary Controller Communication	E	Gray	JST XHP-3

J3D

4	Backwars Buzzer	C	Red	Positive
5	(PRO) FSS/FLR Switch	D	Gray	OUT1 (1A nom, 3A max) / OPT IN 11
6	Buzzer Enabling	E	Purple	OUT2 (1A nom, 3A max) / OPT IN 12
4	Backwars Buzzer	C	Black	OUT4 (1A nom, 3A max) / OPT IN 14

J4D (Combinata)

1	Actuator Positive	SS	Red	Positive
2	Endswitch Rest	SS	Green	Positive
4	Actuator Negative	SS	Black	Negative
5	UP Endswitch	SS	White	Positive
6	Common Endswitch	SS	Blue	Positive

J5D

1	Out +5V (opt 12V)	AC	Brown	Positive
2	Anti-collision BW 1 TX	AC	Yellow	IN Enc CHA / TX2 Opt
3	Anti-collision BW 1 RX	AC	Green	IN Enc CHB / RX2 Opt
4	Negativo	AC	White	Negative

J6D

1	Out +5V (opt 12V)	AC1	Brown	Positive
2	Anti-collision BW 2 TX	AC1	Yellow	IN Enc CHA / TX3 Opt
3	Anti-collision BW 2 RX	AC1	Green	IN Enc CHB / RX3 Opt
4	Negativo	AC1	White	Negative

J7D (Combinata)

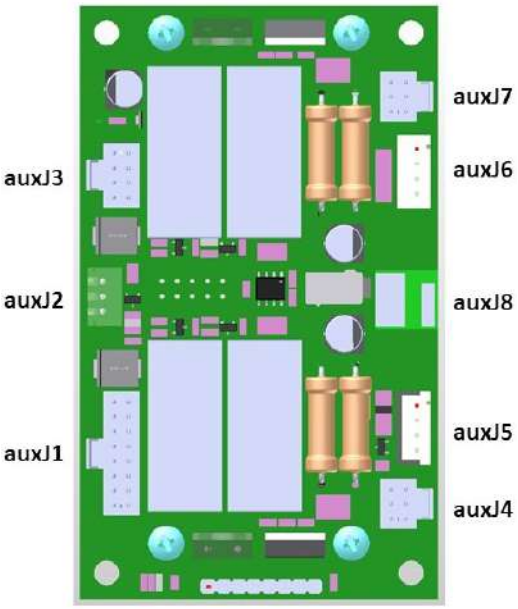
1	Actuator Positive	S	Red	Positive
2	Endswitch Rest	S	Green	Positive
4	Actuator Negative	S	Black	Negative
5	UP Endswitch	S	White	Positive
6	Common Endswitch	S	Blue	Positive

J8D

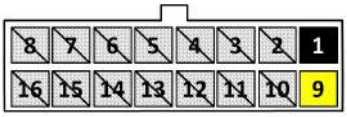
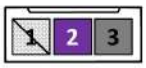
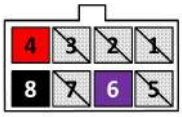
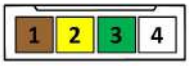
1	Controller Supply	48	Red	Positive
2	Controller Supply	47	Black	Negative

3.2.9 Auxiliary Slave Controller (DA)

If the machine is fitted with front anti-collision sensors, a second auxiliary board similar to the Master auxiliary board is also used.
This auxiliary controller, called Slave, manages the front anti-collision sensors and the relative buzzer.



Controller Cables Detail

J1DA		J2DA	
J3DA		J5DA-J6DA	

J1DA

1	Negative	47	Black	Negative
9	Key in	30	Yellow	Signal

J2DA

2	Master auxiliary Controller Communication	E	Purple	JST XHP-3
3	Master auxiliary Controller Communication	E	Gray	JST XHP-3

J3DA

4	Positive	C	Red	Positive
6	Buzzer Enabling	E	Purple	OUT2 (1A nom, 3A max) / OPT IN 12
8	Front Sensor Buzzer	C	Black	OUT4 (1A nom, 3A max) / OPT IN 14

J5DA

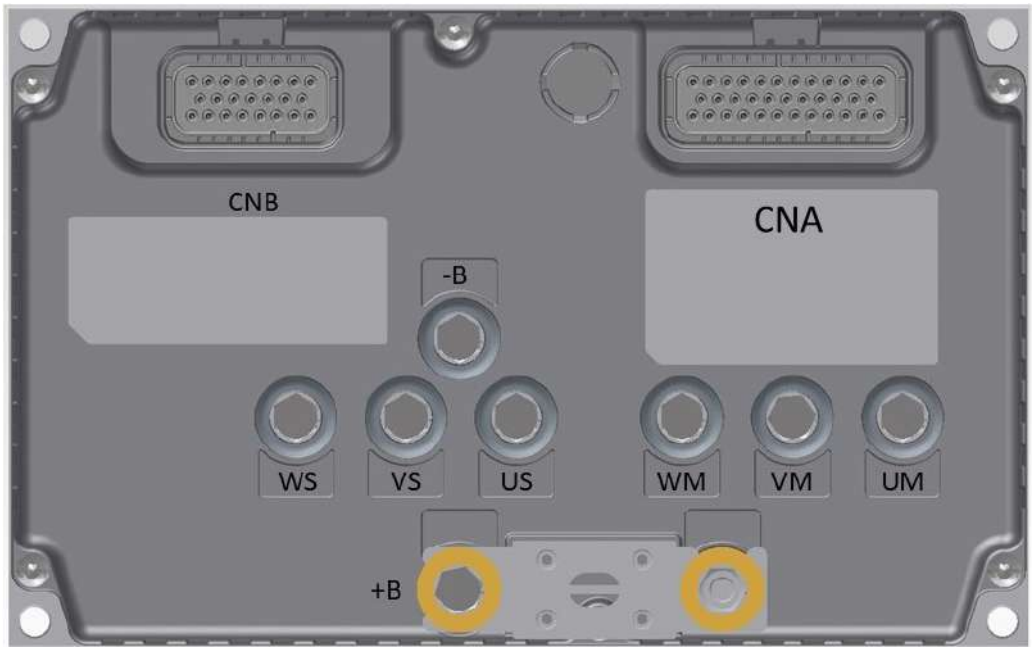
1	Out +5V (opt 12V)	AA	Brown	Positive
2	Anti-collision FW 1 TX	AA	Yellow	IN Enc CHA / TX2 Opt
3	Anti-collision FW 1 TX	AA	Green	IN Enc CHB / RX2 Opt
4	Negative	AA	White	Negative

J6DA

1	Out +5V (opt 12V)	AA1	Brown	Positive
2	Anti-collision FW 2 TX	AA1	Yellow	IN Enc CHA / TX2 Opt
3	Anti-collision FW 2 TX	AA1	Green	IN Enc CHB / RX2 Opt
4	Negative	AA1	White	Negative

3.2.10 Traction Controller

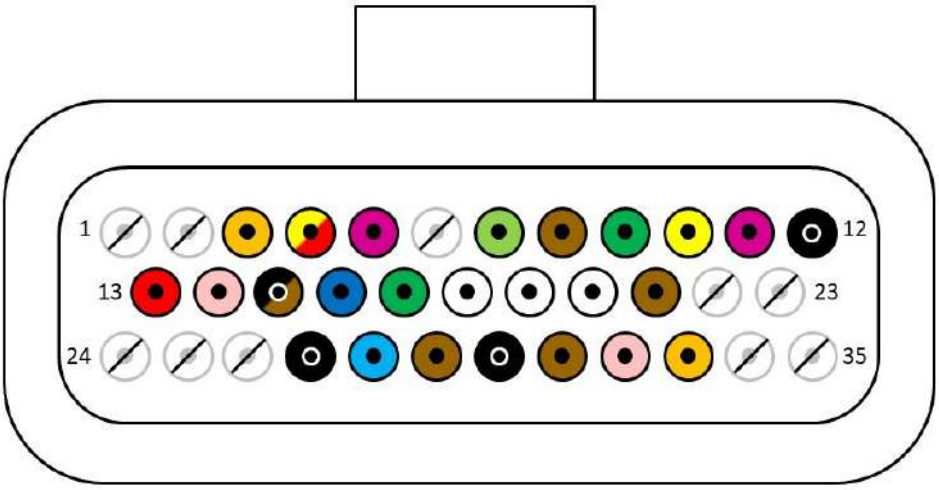
The traction board receives consent from the functions board and manages the two rear motor wheels. The table shows the legend of the connector cables and the legend of the power contacts.



Controller Cables Detail

Power Output	
CNA	Traction Functions
CNB	Not Used
WS	Rightside Traction Motorwheel
VS	Rightside Traction Motorwheel
US	Rightside Traction Motorwheel
WM	Leftside Traction Motorwheel
VM	Leftside Traction Motorwheel
UM	Leftside Traction Motorwheel
B+	Battery Positive
B-	Battery Negative

CNA



Pin	Type	wire	Info	Motorwheel	Description
A03	IN	Orange	+KEY		Key
A04	OUT	Red/ Yellow	+5V PENC_L	Sin.	POT ACC (Vcc) / ENC S (Vcc) / POT STEER (Vcc)
A05	IN	Purple	CPOT1	Sin.	POT ACC (signal)
A07	IN	Green	FW/BW INV.		Backward Paddle
A08	IN	Brown	SEAT		Seat Micros.
A09	IN	Green	CHA_R	Des.	Encoder CHA M
A10	OUT	Yellow	+5V PENC_R	Des.	ENC M (Vcc)
A11	IN	Purple	PEDAL BRAKE		Brake Pedal
A12	IN	Black	LOWER		Power steering
A13	IN	Red	PIN		AUX Power Input
A14	IN	Pink	ENAB.(CPOT3)		ACC Micro
A15	OUT	Black/ Brown	NENC_L	Sin.	POT ACC (Gnd) / ENC S (Gnd) / POT STEER (Gnd)
A16	IN	Blue	CPOT2_STEER		POT STEER (signal)
A17	IN	Green	CHA_L	Sin.	Encoder CHA S
A18	COMM	Gray	CAN L	Sin.	Can L
A19	IN	White	CHB_L	Sin.	Encoder CHB S
A20	IN	White	CHB_R	Des.	Encoder CHB M
A21	OUT	Brown	NENC_R	Des.	ENC N (Gnd)
A27	OUT	Black	NLC		Contactor Coil
A28	OUT	L.Blue	NEB_R	Des.	-Electro-brake M
A29	OUT	Brown	PEB		+Electro-brake M/S
A30	OUT	Black	NEB_L	Sin.	-Electro-brake S
A31	COMM	Purple	CAN H	Des.	Can H
A32	IN	Pink	PTH_R	Des.	Motor Probe M
A33	IN	Orange	PTH_L	Sin.	Motor Probe S

3.2.11 Batteries

The power supply is 36V with a dedicated battery box. Below is the list of available batteries.

Number	Model	Type	Voltage [V]	Capacity [Ah]
1	MIDAC	WET	36	775
1	MIDAC	Litio	36	720

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	Lithium*
100 %	≥	35.3	36.1	36.2	35.3	36.1	38.0
90 %	≤	35.3	36.1	36.2	35.3	36.1	37.8
80 %	≤	34.1	34.8	36.0	34.0	34.8	37.5
70 %	≤	33.5	34.5	35.9	33.5	34.4	37.2
60 %	≤	33.0	34.2	35.8	32.9	34.0	37.0
50 %	≤	32.5	33.9	35,7	32.3	33,6	36.8
40 %	≤	32.1	33.6	35.5	31.7	33.2	36.5
30 %	≤	31.7	33.3	35.4	31.1	32.8	36.0
20 %	≤	31.2	33.0	35.2	30.5	32.4	35.0
10 %	≤	30.8	32.7	34.9	30.1	32.0	34.0
0 %	≤	30.4	32.4	34.6	29.8	31.7	33.0

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.

***** = If **Lithium** is selected, the board receives the remaining charge level from the CAN of the battery, and uses the received value as % battery.

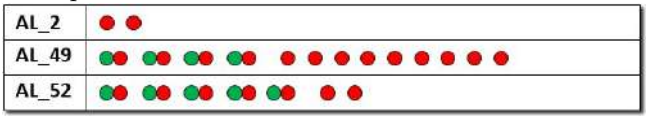
If there is no communication with the battery when turned on:
1. **Alarm 5** appears for 10 seconds
2. The % is calculated with the voltages in the table.

If during operation there is no communication with the battery:
1. 10 second timeout occurs
2. **Alarm 5** appears for 10 seconds
3. The % is calculated with the voltages in the table.

3.3 Anomaly resolution Guide

In the event of anomalies, the alarm code is signaled (See Alarm Table) with the following code:
- Green flashing + red indicates the tens value;
- Red flashing indicates the value of the units.

Examples:



Block Alarms
Errors that can only be reset by switching off the machine and involve the immediate stop of the entire machine or part of it.

Warning Alarms
Errors that can be manually reset via the user interface. They can lead to the immediate stop of the entire machine or part of it.

3.3.1 General Alarms

Id Alarm	Meaning	Solution	Block	Warning
AL_1 General	EEPROM failure	Detected an Error in the internal memory of the controller. Turn off and on again. If the error persists, replace the function controller.	√	
AL_2 General	Key-off failure	Return on the key signal. Turn off the machine, wait at least 2 seconds, and then turn it on again. If the problem persists, replace the key block.	√	
AL_3 General	Undervoltage	Detected supply voltage less than 15V (even instantly). Check the batteries and their connection and the connection between the batteries and the function controller. If the error persists, replace the function controller.	√	
AL_4 General	Overvoltage	Detected supply voltage more than 45V (even instantly). Check the batteries and their connection and the connection between the batteries and the function controller. If the error persists, replace the function controller.	√	
AL_5 General	Battery not connected	Detected no voltage on the battery poles but present on the key input (disabled for this machine).	√	
AL_6 General	Keyboard Communication	No communication between display and function controller. Check the connection between the controllers. If the problem persists, replace the function controller or the display controller.		√
AL_7 General	Communication FFM	Lack of communication between the BB and the function controller. Check the connection between the controllers. If the problem persists, replace the function controller or the BB.		√

3.3.2 Function Alarms

Id Alarm	Meaning	Solution	Block	Warning
AL_8 General	Communication 1	Internal error in the function controller BUS data, turn off and on again. If the problem persists, replace the function controller.	√	
AL_9 General	Communication 2	Internal error in the function controller BUS data, turn off and on again. If the problem persists, replace the function controller.	√	
AL_10 General	Insert Tag	One of the enabled TAGs is not inserted. Enter one of the enabled TAGs in the Slot.	√	
AL_11 General	Invalid Tag	The inserted TAG is not enabled. Enter one of the enabled TAGs in the Slot.	√	
AL_12 General	Update in progress...	The machine is updating the parameter list. Wait for the end of the operation.	√	
AL_13 General	Restart the Machine	After updating the parameters (AL_12) indicates that is necessary to restart the machine.	√	
AL_14 General	Recovery Full	The Recovery Tank is Full. Drain it.		√
AL_15 General	Brakes Oil Empty	The brakes oil tank is empty. Refill the tank.		√
AL_16 General	Open footrest	Rear inspection footrest open		√
AL_39 Function	Emergency Button	1) Emergency button already pressed when switching on 2) Emergency button pressed with the machine on release the mushroom, switch the machine off and on again	√	
AL_41 Function	Over temperature	The temperature of the functions power mosfets exceeds 90°C. Switch off the machine, wait for the cooling and then switch on again.	√	
AL_42 Function	Powerstage failure	Verify the machine model setting, turn it off and on again. If the problem persists, replace the function controller.	√	
AL_43 Function	Main fuse failure	Check the Function fuse. If the problem persists, replace the function controller.	√	
AL_44 Function	Main relay failure	Replace the function controller.	√	
AL_45 Function	Main relay failure CC	Replace the function controller.	√	

3.3.3 Function Alarms

Id Alarm	Meaning	Solution	Block	Warning
AL_46 Function	Overcurrent brush motor 1-2-3	Brushes Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_47 Function	Overcurrent vacuum motor 1-2	Vacuum Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_48 Function	Overcurrent pump	Pumps Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_49 Function	Brushes motor 1 Ammeter	Overcurrent of the Rightside Brush Motor (Disc) or Front (Cylindrical)		√
AL_50 Function	Brushes motor 2 Ammeter	Overcurrent of the Leftside Brush Motor (Disc) or Rear (Cylindrical)		√
AL_51 Function	Brushes motor 3 Ammeter	Overcurrent of the Lateral Brush Motor / Motors	√	
AL_52 Function	Vacuum motor 1 Ammeter	Overcurrent of the Vacuum Motor.		√
AL_53 Function	Vacuum motor 2 Ammeter	Overcurrent of the second Vacuum Motor	√	
AL_54 Function	Brush Motor not connected	Detected Brush motor not connected, check connections, if problem persists, replace function controller.	√	
AL_55 Function	Brush Motor 2 not connected	Detected Brush motor not connected, check connections, if problem persists, replace function controller.	√	
AL_56 Function	Brush Motor 3 not connected	Detected Brush motor not connected, check connections, if problem persists, replace function controller.	√	
AL_57 Function	Vacuum Motor not connected	XD Detected Suction Motor not connected, check connections, if problem persists, replace function controller.	√	
AL_58 Function	Vac. Motor 2 not connected	XD Detected Suction Motor not connected, check connections, if problem persists, replace function controller.	√	
AL_59 Function	Unbalanced brushdeck	On Disc version, if the difference in current absorbed by Brushes 1 and 2 remains greater than 8A for 10 seconds.	√	

3.3.4 Function Alarms

Id Alarm	Meaning	Solution	Block	Warning
AL_60 Function	Brushes Actuator: timeout	If the actuator does not come into position within a preset time.	√	
AL_61 Function	Brushes Actuator: Ammeter	Overcurrent of the Central brushdeck Actuator.	√	
AL_62 Function	Brushes Actuator: Overcurrent	Brushes Actuator Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_63 Function	Brushes Actuator: endsw failure	Anomaly of the actuator microswitches. Check the connections and perform the adjustment of the microswitch, if the problem persists replace the actuator.	√	
AL_64 Function	Squeegee Actuator: timeout	If the actuator does not come into position within a preset time.	√	
AL_65 Function	Squeegee Actuator: Ammeter	Overcurrent of the Squeegee Actuator.	√	
AL_66 Function	Squeegee Actuator: Overcurrent	Squeegee Actuator Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_67 Function	Squeegee Actuator: endsw failure	Anomaly of the actuator microswitches. Check the connections and perform the adjustment of the microswitch, if the problem persists replace the actuator.	√	
AL_68 Function	Side Brush Actuator: timeout	If the actuator does not come into position within a preset time.	√	
AL_69 Function	Side Brush Actuator: Ammeter	Overcurrent of the Side Brush Actuator.	√	
AL_70 Function	Side Brush Actuator: Overcurrent	Side Brush Actuator Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_71 Function	Side Brush Actuator: endsw failure	Anomaly of the actuator microswitches. Check the connections and perform the adjustment of the microswitch, if the problem persists replace the actuator.	√	

3.3.5 Function Alarms

Id Alarm	Meaning	Solution	Block	Warning
AL_76 Function	Brush pcb 1 error	The alarm comes if the function controller receives alarm 4, 5 or 6 from the Brushless controller Br1 in J6(12).	√	
AL_77 Function	Brush pcb 2 error	The alarm comes if the function controller receives alarm 4, 5 or 6 from the Brushless controller Br2 in J6(13).	√	
AL_78 Function	Vacuum pcb 1 error	The alarm comes if the function controller receives alarm 4 or 5 from the Brushless controller Asp1 in J6(14).	√	
AL_79 Function	Vacuum pcb 2 error	The alarm comes if the function controller receives alarm 4 or 5 from the Brushless controller Asp2 in J6(15).	√	

3.3.6 Traction Alarms

Id Alarm	Meaning	Solution
AL_81 WATCH-DOG	Self-diagnosis of the controller under resting or working conditions has detected an anomaly. The logic of the controller is damaged	- Verify that the motor is connected - Verify the continuity of the 3 phases of the motor - Replace the controller.
AL_82 EEPROM KO	The controller memory has lost the adjustment parameters	Switch off and switch on the key. If the alarm occurs again, replace the controller.
AL_83 LOGIC FAIL #3	The controller memory does not work correctly	Switch off and switch on the key. If the problems occurs again, replace the controller.
AL_84 LOGIC FAIL #2	The controller memory does not work correctly	Switch off and switch on the key. If the problems occurs again, replace the controller.
AL_85 LOGIC FAIL #1	The controller memory ha lost the adjustment parameters	Check the batteries. Switch off and switch on the key. If the alarm occurs again, replace the controller.
AL_86 VMN LOW	- General remote control switch broken - Metal parts that make a shortcircuit - Mosfet in shortcircuit or broken - Sticked contacts	- Check the right wiring of the cables 9-10 and the good connections of the controller clamps and of the motor clamps; - Check if there are shortcircuits - If the problem continues, replace the controller.
AL_87 VMN HIGH	- Wrong wiring - Current leakage or motor shortcircuit - controller power system damaged - Sticked contacts of the remote control switch	- Check if one phase of the motor is not connected at the controller or if it is broken - Check leakage or shortcircuit taking out the cable of the phase. If the alarm disappear, replace the motor - If the problem continues, replace the controller.

Id Alarm	Meaning	Solution
AL_88 AUX Output KO (electrobrake)	The Controller detects the electrobrake released and does not allow the activation of the traction	- Check the lever and activate the electrobrake - Check the wiring of the electrobrake - If the problem persists, replace the controller.
AL_89 CONTACTOR CLOSED	One remote control switch or both don't open. - Remote control switch broken or overcharged - Power of the controller broken.	- Check the contacts of the remote control switch and eventually replace it - Replace the controller.
AL_90 CONTACTOR OPEN	One or both remote control switches are not closed, when the traction is activated. - Dirt, Dust or anything else does prevent a good connection to the remote control switch - Motor-Isolation or interrupted contacts - Remote control switch damaged or overloaded - Damaged controller	- Clean the contacts with compressed air and if necessary slightly scrub off the dirt - Check wiring and connections to the remote control switch - Check the motor wiring and replace if necessary - Replace the controller.
AL_92 STBY I HIGH	The controller checks the closure and opening of the remote control switch of the controller. - The remote control switch is damaged - The controller memory is damaged	- Verify the functionality of the remote control switch of the controller and eventually replace it - Replace the controller
AL_93 CAPACITOR CHARGE	The test is executed in total conduction. - The voltage is low and does not increase when the main remote control switch is open	- One phase of the motor is not correctly connected at the controller or is broken. - If the problem continues, replace the controller.
AL_94 HIGH TEMPERATURE	The controller works with a temperature under 78°c (172°F). After this value, the maximum current will be reduced until the value zero will be achieved at a temperature of 100°c (212°F). - If the alarm occur at environment temperature (±20°c/68°F): Malfunction of the controller, Machine blocked through the brakes, Thermal sensor damaged or loosened, Interrupted connections, Damaged controller - Stressing working conditions with high environment temperature - Insufficient heat derivation	- Check the thermal sensor inside the controller - Check the brakes of the machine - Check the connections to the motor - Let the controller in dormant state and let it cool down - Check if the nuts are fixed and the right installation - If the problem persists replace the controller.

Id Alarm	Meaning	Solution
AL_95 MOTOR TEMPERATURE	The controller works with a temperature under 78°c (172°F). After this value, the maximum current will be reduced until the value zero will be achieved at a temperature of 100°c (212°F). - If the alarm occur at environment temperature (±20°c68°F): - Malfunction of the controller, Machine blocked through the brakes, Thermal sensor damaged or loosened, Interrupted connections, Damaged controller - Stressing working conditions with high environment temperature - Insufficient heat derivation	- Check the thermal sensor inside the controller - Check the brakes of the machine - Check the connections to the motor - Let the controller in dormant state and let it cool down - Check if the nuts are fixed and the right installation - If the problem persists replace the controller
AL_96 CAN BUS KO	Communication protocol error between function controller and traction controller	- Turn the machine off and on again - Check the connection cables between the boards - If the problem persists, replace the traction controller.
AL_97 ENCODER ERROR	The controller checks the functionality of the encoder and its reading. - The encoder is damaged - The encoder wiring is damaged	- Check the encoder using the TESTER function of the console - Replace the encoder
AL_98 SPEED ENCODER ERROR	Encoder fault	Check both the electrical and mechanical functionality of the encoder. - Check the crimp of the wires. - Check the mechanical installation of the encoder, if the encoder slips inside its seat it could trigger this alarm. - Electromagnetic noise on the sensor can cause an alarm. - Replace the encoder. - If the problem persists, replace the traction controller.
AL_99 THERMIC SENS KO	The controller checks the output of the thermic sensor, that has to be between 4,95 V and 0,1 V. When it is out of that range the controller shows an alarm. - The logic of the controller is damaged	- Replace the controller
AL_100 DRIVER SHORTED	There is an overcharging of the current. - The logic is damaged	- Turn the machine off and on again - Replace the controller
AL_101 CONTACTOR DRIVER	There is an overcharging of current due to a shortcircuit of the logic on the controller. - The logic is damaged	- Turn the machine off and on again - Replace the controller

Id Alarm	Meaning	Solution
AL_102 COIL SHORTED	There is an overcurrent due to a short-circuit of the logic of the controller. - Overcharging of the main remote control switch of the controller - The logic is damaged	- Turn the machine off and on again - Verify the main remote control switch of the controller - Replace the controller
AL_103 VACC NOT OK	The controller checks if under resting conditions the voltage of the accelerator is under the memorised min. value with the function PROGRAM VACC. If the value exceeds 1 Volt the alarm will be released. - A cable of the potentiometer is interrupted - The potentiometer is not connected - The potentiometer is damaged.	- Check the continuity of the connection between potentiometer, accelerator, and controller - Check the functionality of the potentiometer (can be damaged) and if necessary replace this part.
AL_104 INCORRECT START	Incorrect starting sequence - Error in the sequence made by the operator - The pedal microswitch and/or drive-selection microswitch are sticking - Wiring not correct.	- Check that the starting sequence was carried out as follows: - Sit down on the machine and close the seat-microswitch, Switch on the general key, Select gear (forward/backward), Push the acceleration pedal - Check that the microswitch of drive and drive manipulator don't have the contacts sticked and can work correctly - Check the continuity in the circuit between pedal microswitch, controller and gear selector - Check the continuity between the microseat and the controller - If you have not found any irregularities and the problem persists, replace the controller.
AL_105 FORW+BACK	Incorrect starting sequence. - Micro of forward and backward directions activated at the same time	- Check the cables until the microswitches of forward and backward directions - Check the state of the microswitches - Replace the controller.
AL_106 PEDALWIRE KO	The controller checks continuosly the endstroke of the accelerator pedal and appears the alarm when the minimum value is below 0,3V or the maximum value is more than 2V. - One wire of the potentiometer is interrupted - The resistance of the potentiometer is broken - The potentiometer is overcharged.	- Verify the wiring of the potentiometer - Verify the potentiometer by the function TESTER
AL_109 WRONG SET BATT.	The controller verify the battery voltage - The battery is no correct.	- Check the battery and eventually replace it with a correct one.

Id Alarm	Meaning	Solution
AL_110 INPUT MISMATCH	Double signal H&S input (pin A6) and seat	Check if there are bad connections in the external harness. - Using the TESTER function of the controller verify that the readings related to the input conform to the actual state of the external input switches. - Check for shorts between pins A6 and A1 - If no problems have been found, replace the traction board
AL_111 SMART DRIVER KO	Driver problem	Check that the coil is connected correctly between terminals PEB A29 (A19) and NEB (pin A28). - The software carries out a correct diagnosis according to the parameter; an incorrect setting could generate a false fault. - If no problems are found, replace the traction board
AL_112 CURRENT PROFILE	Error in choosing the parameters of the current profile.	Check in CURRENT PROFILE and SLV CURRENT PROF. - The alarm ends when the acquisition is complete.
AL_113 TRACTION GENERIC ALARM	Problema alla lettura del software	Configurazione mancante. Configurare scheda.
AL_114 STEER SENSOR KO	Steering Sensor Problem	Steering sensor not detected. Check connections.

3.3.7 (COMBINATA) General Alarms

Id Alarm	Meaning	Solution	Block	Warning
AL_151 General	EEPROM failure	Detected an Error in the internal memory of the controller. Turn off and on again. If the error persists, replace the function controller.	√	
AL_152 General	Key-off failure	Return on the key signal. Turn off the machine, wait at least 2 seconds, and then turn it on again. If the problem persists, replace the key block.	√	
AL_153 General	Undervoltage	Detected supply voltage less than 15V (even instantly). Check the batteries and their connection and the connection between the batteries and the function controller. If the error persists, replace the function controller.	√	
AL_154 General	Overvoltage	Detected supply voltage more than 45V (even instantly). Check the batteries and their connection and the connection between the batteries and the function controller. If the error persists, replace the function controller.	√	
AL_158 General	Communication 1	Internal error in the function controller BUS data, turn off and on again. If the problem persists, replace the function controller.	√	
AL_159 General	Communication 2	Internal error in the function controller BUS data, turn off and on again. If the problem persists, replace the function controller.	√	

3.3.8 (COMBINATA) Function Alarms

Id Alarm	Meaning	Solution	Block	Warning
AL_191 Function	Overtemperature	The temperature of the functions power mosfets exceeds 90°C. Switch off the machine, wait for the cooling and then switch on again.	√	
AL_192 Function	Powerstage failure	Verify the machine model setting, turn it off and on again. If the problem persists, replace the function controller.	√	
AL_193 Function	Main fuse failure	Check the Function fuse. If the problem persists, replace the function controller.	√	
AL_194 Function	Main relay failure	Replace the function controller.	√	
AL_195 Function	Main relay failure CC	Replace the function controller.	√	
AL_196 Function	Overcurrent brush motor 1-2-3	Brushes Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_197 Function	Overcurrent vacuum motor 1-2	Vacuum Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_198 Function	Overcurrent pump	Pumps Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_199 Function	Brushes motor 1 Ammeter	Overcurrent of the Rightside Brush Motor (Disc) or Front (Cylindrical)		√
AL_200 Function	Brushes motor 2 Ammeter	Overcurrent of the Leftside Brush Motor (Disc) or Rear (Cylindrical)		√
AL_201 Function	Brushes motor 3 Ammeter	Overcurrent of the Lateral Brush Motor / Motors	√	
AL_202 Function	Vacuum motor 1 Ammeter	Overcurrent of the Vacuum Motor.		√
AL_203 Function	Vacuum motor 2 Ammeter	Overcurrent of the second Vacuum Motor	√	
AL_204 Function	Brush Motor not connected	Detected Brush motor not connected, check connections, if problem persists, replace function controller.	√	
AL_205 Function	Brush Motor 2 not connected	Detected Brush motor not connected, check connections, if problem persists, replace function controller.	√	
AL_206 Function	Brush Motor 3 not connected	Detected Brush motor not connected, check connections, if problem persists, replace function controller.	√	
AL_207 Function	Vacuum Motor 1 not connected	XD Detected Suction Motor not connected, check connections, if problem persists, replace function controller.	√	
AL_208 Function	Vacuum Motor 2 not connected	XD Detected Suction Motor not connected, check connections, if problem persists, replace function controller.	√	

3.3.9 (COMBINATA) Function Alarms

Id Alarm	Meaning	Solution	Block	Warning
AL_210 Function	Brushes Actuator: timeout	If the actuator does not come into position within a preset time.	√	
AL_211 Function	Brushes Actuator: Ammeter	Overcurrent of the Central brushdeck Actuator.	√	
AL_212 Function	Brushes Actuator: Overcurrent	Brushes Actuator Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_213 Function	Brushes Actuator: endsw failure	Anomaly of the actuator microswitches. Check the connections and perform the adjustment of the microswitch, if the problem persists replace the actuator.	√	
AL_214 Function	Hopper rotation Actuator: timeout	If the actuator does not come into position within a preset time.	√	
AL_215 Function	Hopper rotation Actuator: Ammeter	Overcurrent of the Hopper rotation Actuator.	√	
AL_216 Function	Hopper rotation Actuator: Overcurrent	Hopper rotation Actuator Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_217 Function	Hopper rotation Actuator: endsw failure	Anomaly of the actuator microswitches. Check the connections and perform the adjustment of the microswitch, if the problem persists replace the actuator.	√	
AL_218 Function	Side Brush Actuator: timeout	If the actuator does not come into position within a preset time.	√	
AL_219 Function	Side Brush Actuator: Ammeter	Overcurrent of the Side Brush Actuator.	√	
AL_220 Function	Side Brush Actuator: Overcurrent	Side Brush Actuator Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_221 Function	Side Brush Actuator: endsw failure	Anomaly of the actuator microswitches. Check the connections and perform the adjustment of the microswitch, if the problem persists replace the actuator.	√	

3.3.10 (COMBINATA) Function Alarms

Id Alarm	Meaning	Solution	Block	Warning
AL_226 Function	Brush pcb 1 error	The alarm comes if the function controller receives alarm 4, 5 or 6 from the Brushless controller Br1 in J6(12).	√	
AL_227 Function	Brush pcb 2 error	The alarm comes if the function controller receives alarm 4, 5 or 6 from the Brushless controller Br2 in J6(13).	√	
AL_228 Function	Vacuum pcb 1 error	The alarm comes if the function controller receives alarm 4 or 5 from the Brushless controller Asp1 in J6(14).	√	
AL_229 Function	Vacuum pcb 2 error	The alarm comes if the function controller receives alarm 4 or 5 from the Brushless controller Asp2 in J6(15).	√	
AL_230 Function	Left lifting Actuator: timeout	If the actuator does not come into position within a preset time.	√	
AL_231 Function	Left lifting Actuator: Ammeter	Overcurrent of the Central brushdeck Actuator.	√	
AL_232 Function	Left lifting Actuator: Overcurrent	Brushes Actuator Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_233 Function	Left lifting Actuator: endsw failure	Anomaly of the actuator microswitches. Check the connections and perform the adjustment of the microswitch, if the problem persists replace the actuator.	√	
AL_234 Function	Right lifting Actuator: timeout	If the actuator does not come into position within a preset time.	√	
AL_235 Function	Right lifting Actuator: Ammeter	Overcurrent of the Central brushdeck Actuator.	√	
AL_236 Function	Right lifting Actuator: Overcurrent	Brushes Actuator Short Circuit. Check the connections, if the problem persists, replace the function controller.	√	
AL_237 Function	Right lifting Actuator: endsw failure	Anomaly of the actuator microswitches. Check the connections and perform the adjustment of the microswitch, if the problem persists replace the actuator.	√	

3.3.11 Brush motor controller Alarms

The brush motor control controller function is the electronic management of the relative motor.
If a fault occurs, it interrupts the power supply to the motor for protection and produces a series of flashes.

Flashes	Meaning	Solution
1	Undervoltage	Check the output voltage from the function controller, if it is equal to Vb, replace the motor control controller.
2	Overcurrent	Check the motor absorptions, if they are too high, the motor is mechanically hindered or faulty, replace the motor. If the problem persists, replace the motor control controller.
3	Stuck Motor	the motor is mechanically hindered or faulty, replace the motor.
4	PCB Error	Internal electronic error, replace the motor control controller.
5	Hall Error	Check the wiring (white connector with thin wires between the motor control controller and the motor). If wiring is ok, the Hall Sensor is damaged, replace the motor.
6	Lacking Phase	One or more signals lose power. It could be low input voltage or a problem on the motor control controller in one of the power outputs. If wiring is ok, replace the motor control controller.

3.3.12 Combinata vacuum motor Controller Alarms

The vacuum motor control controller of the pre-sweeping part is responsible for the electronic management of the relative motor.
If a fault occurs, it interrupts the power supply to the motor for protection and produces a series of flashes.

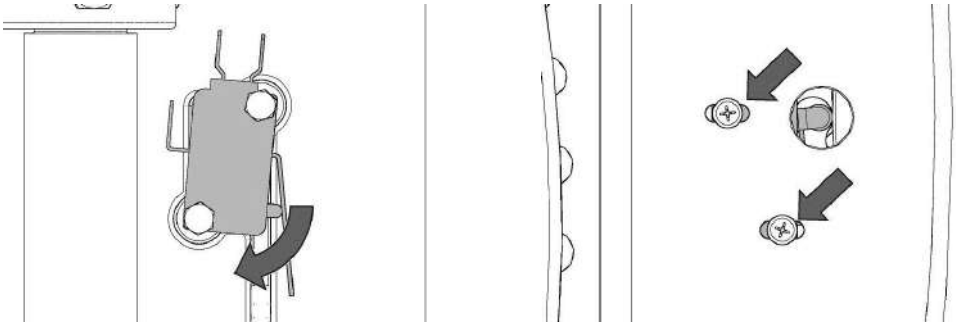
Flashes	Meaning	Solution
1	Undervoltage	Check the output voltage from the function controller, if it is equal to Vb, replace the motor control controller.
2	Overcurrent	Check the motor absorptions, if they are too high, the motor is mechanically hindered or faulty, replace the motor. If the problem persists, replace the motor control controller.
3	Stuck Motor	the motor is mechanically hindered or faulty, replace the motor.
4	PCB Error	Internal electronic error, replace the motor control controller.
5	Hall Error	Check the wiring (white connector with thin wires between the motor control controller and the motor). If wiring is ok, the Hall Sensor is damaged, replace the motor.

3.4 Adjustments

3.4.1 Microswitches

Check functionality and conditions of the microswitches. Check that with microswitch pressed, remains about 0.5 mm clearance between the lever and the body of the microswitch. Make sure the lever of the micro is working properly. Otherwise, proceed as follows:

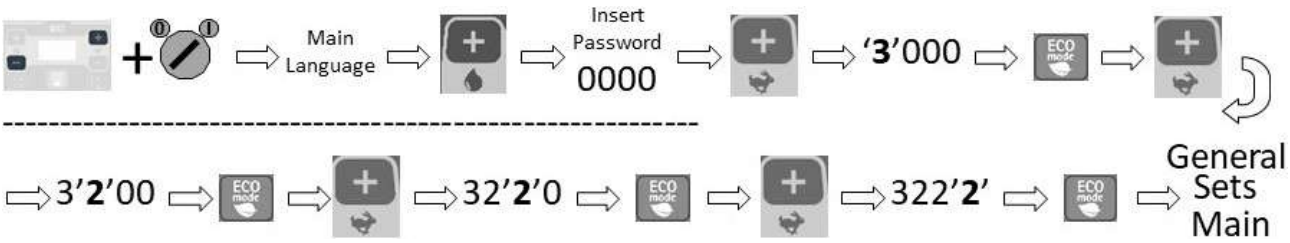
- Unscrew the fixing screws.
- Move the microswitches using the loop adjustment.
- Fix the screws to lock the microswitches taking care not to over tighten in order not to ruin the devices.
- When the setting is finished, verify the correct functionality of the microswitches.



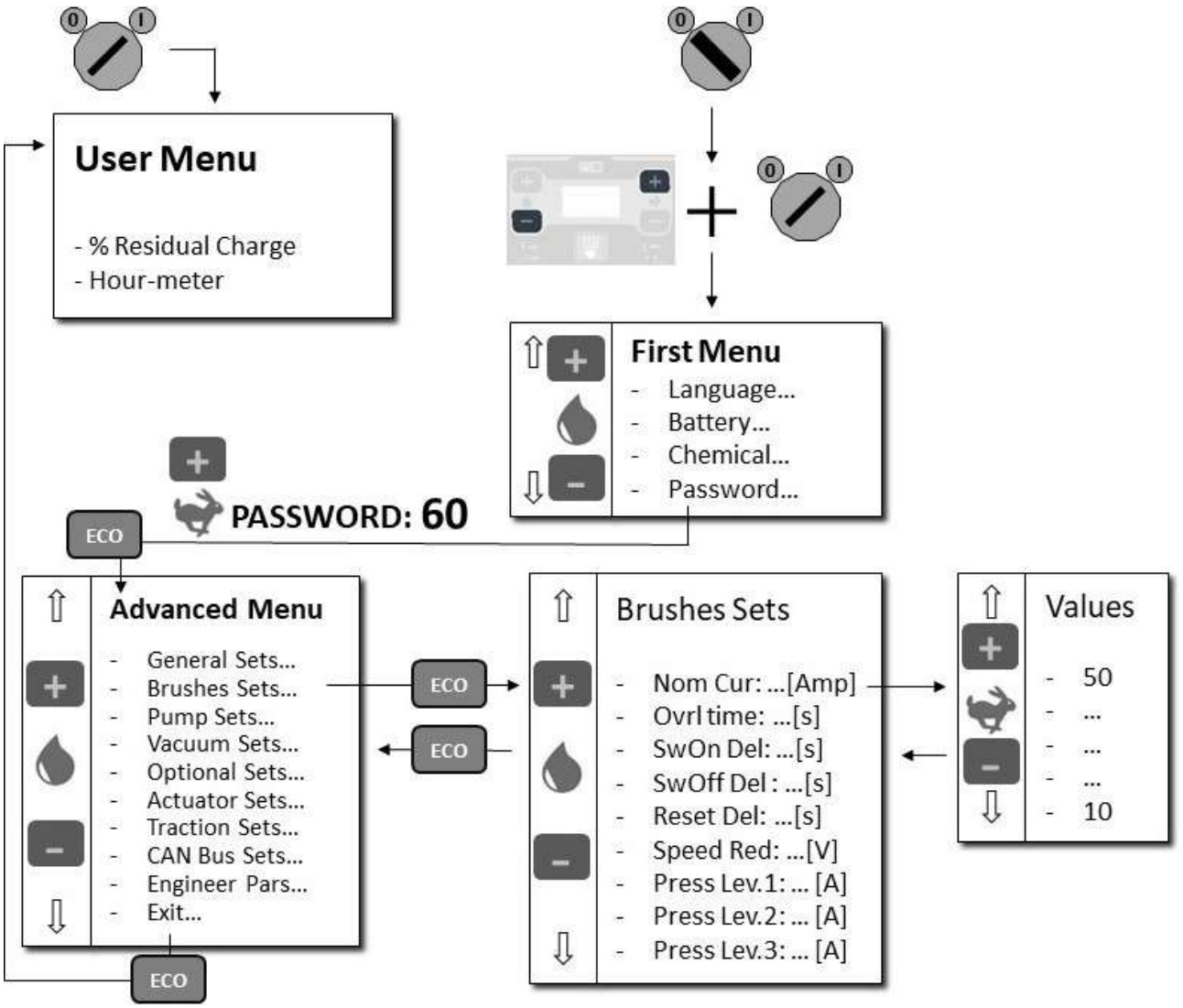
3.5 Programming

3.5.1 GMG PRO

The dashboard allows access to the basic settings with free access and to the parameter list protected by password (**3222**). To enter the password, follow the instructions on the diagram.



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



3.5.2 Buttons Overview

	Function of the buttons in Programming Mode
1	SCROLL UP (Scroll up)
2	SCROLL DOWN (Scroll down)
3	SCROLL UP (Increase the Value)
4	SCROLL DOWN (Decrease the Value)
5	ENTER (Confirm/Exit)

3.5.3 How to access the Menu

To entry the *Menu* proceed as follows:

- With the machine off, press in the same time button 2 & 3
- Turn on the key, with the three buttons pressed
- Waiting the upload of the –**ID check**– interface for the Password entering.
- Release the buttons and enter the Password (**3222**)
- With button 3 enter the **first** number of the password (**3**) and confirm with button 5.
- With button 3 enter the **second** number of the password (**2**) and confirm with button 5.
- With button 3 enter the **third** number of the password (**2**) and confirm with button 5.
- With button 3 enter the **fourth** number of the password (**2**) and confirm with button 5.

To move inside of the menu, use the buttons 1 & 2.
To access a group of parameters use the button 5.
To modify a parameter, use button 3 & 4.
To exit a group of parameters scroll to the item **EXIT** and confirm with button 5.

3.5.4 How to Change a Parameter

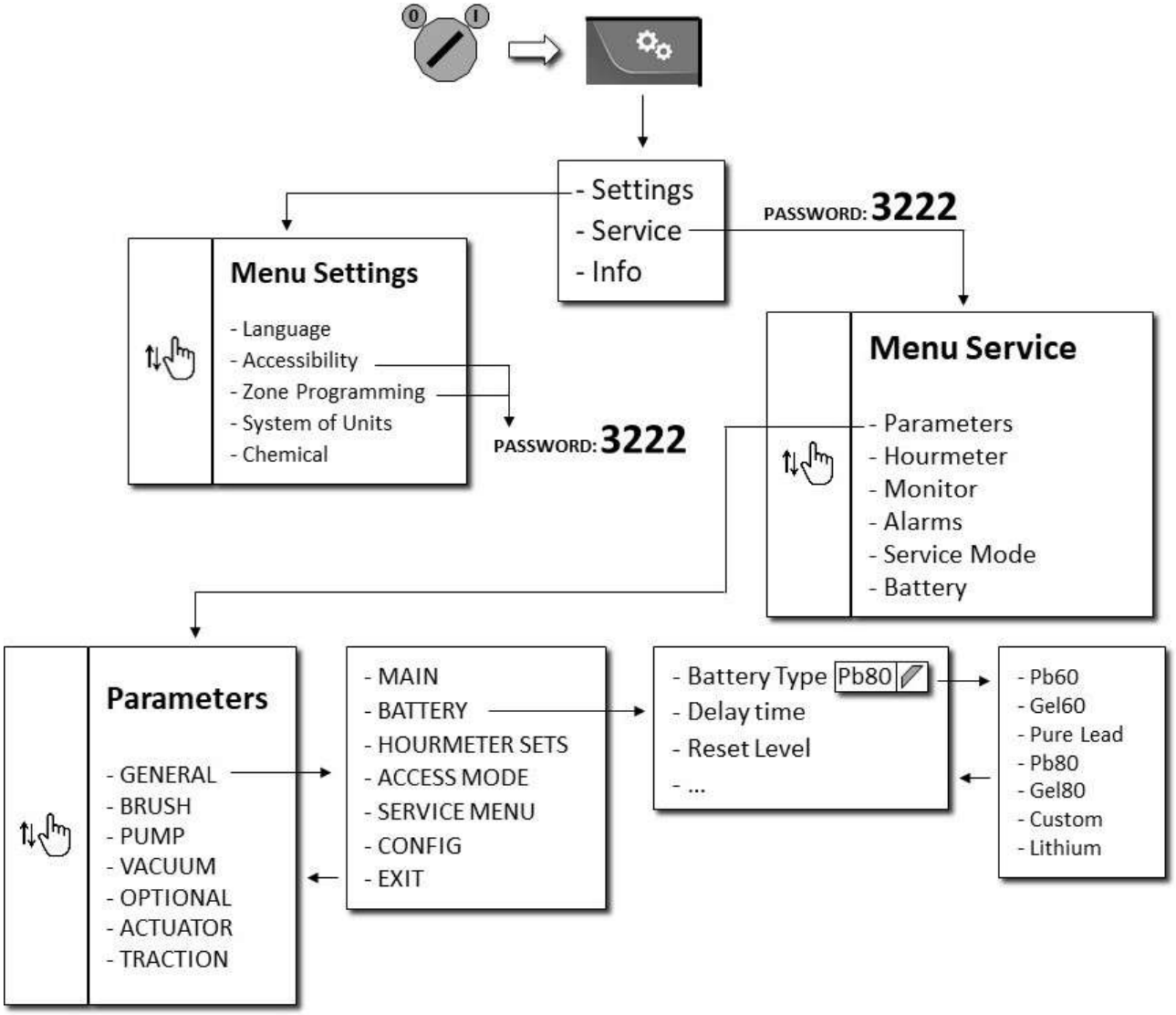
For example, to modify the battery set from GEL60 to Pb60

- Access the Menu entering the password (**3222**).
- Use button 1 & 2 until you find the Battery parameter and access with button 5.
- Use the 3 & 4 keys to scroll through the values for battery type selection until the Pb60 value is found.
- Exit the Parameter group with button 5.
- Scroll through the values the buttons 1 & 2 until you find **exit** and confirm by pressing button 5.

3.5.5 GMG PLUS

The Display allows the access to basic settings with free access and to the parameter list protected by Password (3222). The structure of the menu can be shown in the following image.

Turn on the machine and access the menus by following the icons in the diagram

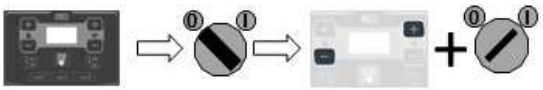


3.5.6 Parameters

Parameters Menu

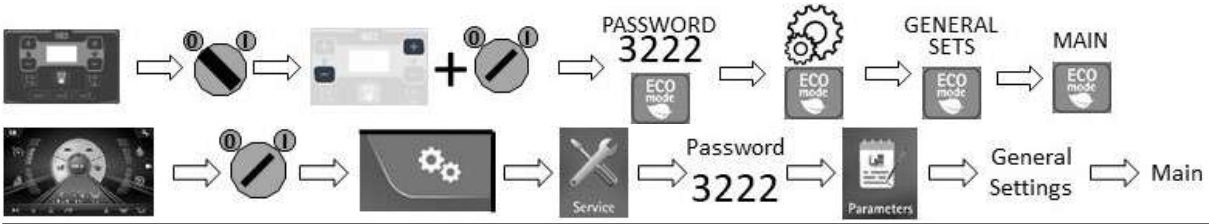
MENU'	DESCRIPTION
GENERAL SETTINGS	Access to the general parameters (main, battery, hourmeter, accessibility, setting).
BRUSHES MOTOR	Access to the parameters of the brushdeck function.
PUMPS	Access to the parameters of the water pump and chemical pump function.
VACUUM MOTOR	Access to the parameters of the vacuum function.
OPT BRUSH MOTOR	Access to the parameters of the side brush function.
ACTUATORS	Access to the parameters of the actuators function.
TRACTION MENU	Access to the parameters of the traction function.
DIGITAL INPUTS	Factory parameters and settings.
ENG PARAMETERS	Factory parameters and settings.
EXIT	Return to the Home screen.

General Main Parameters PRO



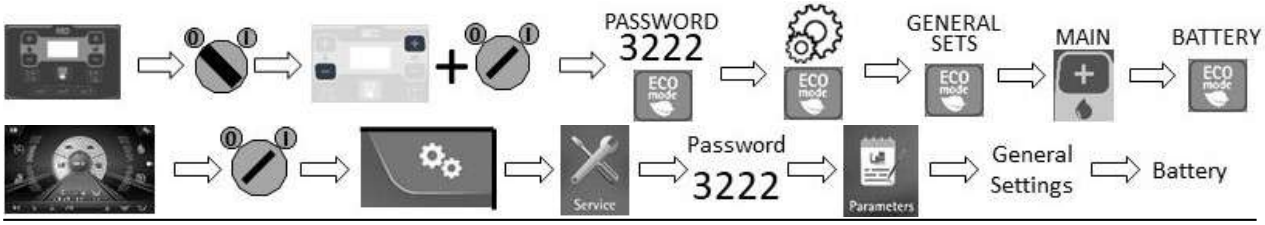
Parameter	Default	Min ÷ Max	Description
General - Main Language selection	ENG	÷	Menu Language setting.
General - Main Battery Type	36PP	0 ÷ 5	Battery Type (36Pb60; 36Gel60; 36PP=Pure Lead; 36Pb80; 36Gel80; 36Custom; 36LiPo=Lithium).
Pump - Water Percentage chemical %	2	0.5 ÷ 3.0	Detergent dilution percentage.
Insert password Password 2 (Dealer)	3222	3000 ÷ 3999	Dealer Password.

General Main Parameters



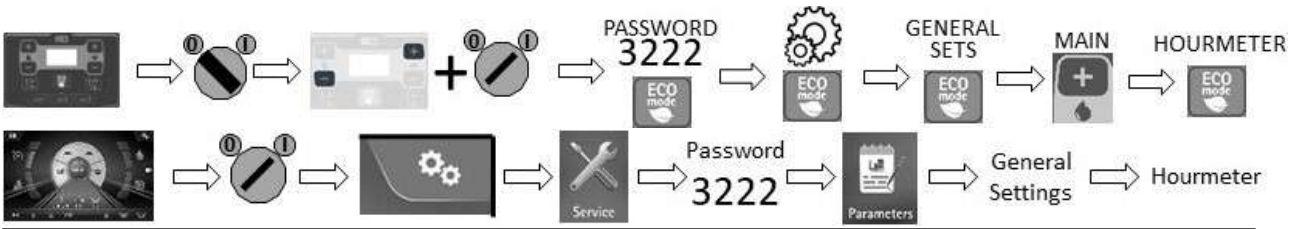
Parameter	Default	Min ÷ Max	Description
General - Main Reset	No	No ÷ Yes	Reset to factory settings.
General - Main Language	ENG	÷	Menu Language setting.
General Setup: Display Tune	15	0 ÷ 50	(**PRO**) Display contrast
General Setup: Display Brightness	0	0 ÷ 10	(**PRO**) Display Brightness

General Battery Parameters



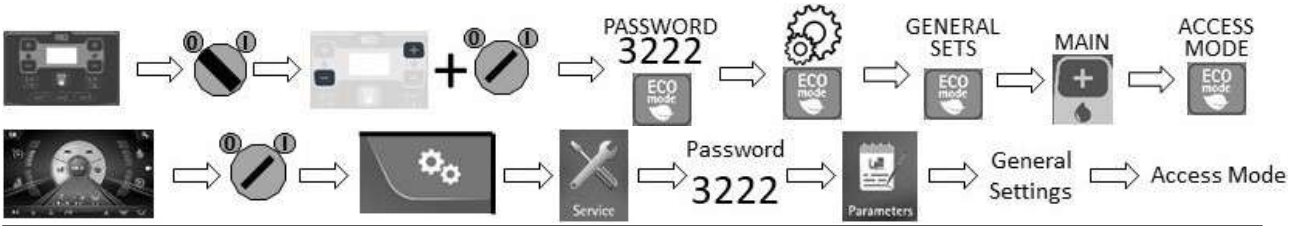
Parameter	Default	Min ÷ Max	Description
General - Battery Battery Type	36PP	0 ÷ 5	(**PRO**) Battery Type (36Pb60; 36Gel60; 36PP=Pure Lead; 36Pb80; 36Gel80; 36Custom; 36LiPo=Lithium).
General - Battery Battery Type	Pb80	0 ÷ 5	(**PLUS**) Battery Type (Pb60; Gel60; Pure Lead; Pb80; Gel80; Custom; Lithium).
General - Battery Delay Time #sec	30	5 ÷ 300	Battery status refresh rate.
General - Battery Reset Level #%	80	10 ÷ 100	The charge level necessary to reset the hormeter.
General - Battery Brushes off Level #%	20	0 ÷ 100	Charge threshold beyond which the Brush Motor is inhibited.
General - Battery Vacuum off Level #%	10	0 ÷ 100	Charge threshold beyond which the Vacuum Motor is inhibited.
General - Battery Traction off Level #%	0	0 ÷ 100	Charge threshold beyond which the Traction Motor is inhibited.
General - Battery Custom Level 5/5 #V	33.5	15.0 ÷ 40.0	Valid on Custom Battery Parameter: Battery Level 100%.
General - Battery Custom Level 4/5 #V	33.0	15.0 ÷ 40.0	Valid on Custom Battery Parameter: Battery Level 80%.
General - Battery Custom Level 3/5 #V	32.5	15.0 ÷ 40.0	Valid on Custom Battery Parameter: Battery Level 60%.
General - Battery Custom Level 2/5 #V	32.0	15.0 ÷ 40.0	Valid on Custom Battery Parameter: Battery Level 40%.
General - Battery Custom Level 1/5 #V	31.5	15.0 ÷ 40.0	Valid on Custom Battery Parameter: Battery Level 20%.
General - Battery Custom Level 0/5 #V	31.0	15.0 ÷ 40.0	Valid on Custom Battery Parameter: Battery Level 0%.

General Hourmeter Parameters



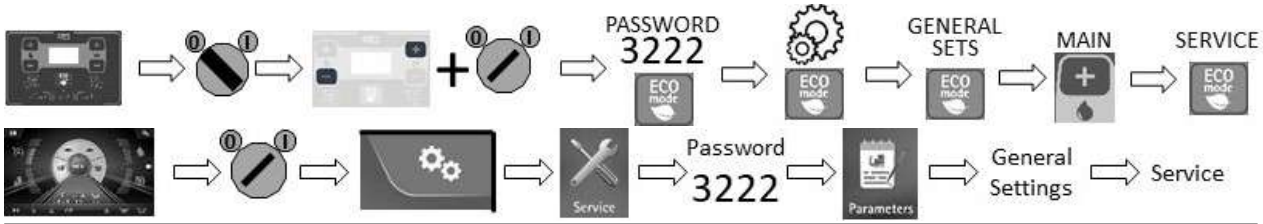
Parameter	Default	Min ÷ Max	Description
General - Hourmeter Partial Hourmeter display	Tr	÷	Available hourmeters (Key=Chiave; Tr=trazione; Br=spazzola; Vac=Aspirazione).
General - Hourmeter Reset Partial Hourmeter	No	÷	Reset of the single hourmeters (No; Key=Chiave; Tr=Trazione; Br=Spazzola; Vac=Aspirazione; All=Tutti).

General Access Parameters



Parameter	Default	Min ÷ Max	Description
General - Access Mode Password 2 (Dealer)	3222	3000 ÷ 3999	Dealer Password.
General - Access Mode Password 3 (Customer)	2234	2000 ÷ 2999	Customer Password.
General - Access Mode Password 4 (User)	1000	1000 ÷ 1999	User Password.
General - Access Mode Password 5 (PIN)	123	100 ÷ 999	PIN.
General - Access Mode Password Enable: User	1	0 ÷ 1	User Password Enable; 0=OFF; 1=ON
General - Access Mode Password Enable: PIN	0	0 ÷ 1	PIN Enable; 0=OFF; 1=ON

General Service Parameters

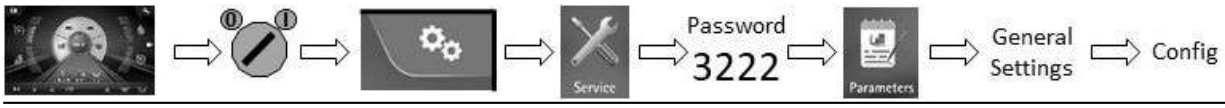


Parameter	Default	Min ÷ Max	Description
General - Service Service Start	100	0 ÷ 1000	Amount of hours after which the notice of expired maintenance is proposed.
General - Service Service Warning	10	5 ÷ 50	(PLUS) How many hours before expiry is the notice of maintenance due to be proposed.
General - Service Service Time	2	5 ÷ 60	How many seconds does the display of the maintenance expired or expiring notice last. The warning appears at each start-up for the seconds set.
General - Service Service Count	2	0 ÷ 2	Defines the hour meter used to decrease the time for maintenance. (0=Key; 1=Traction; 2=Work)
General - Service Service Reset	0	0 ÷ 1	Reset the hour counter.

PRO General Setting Parameters

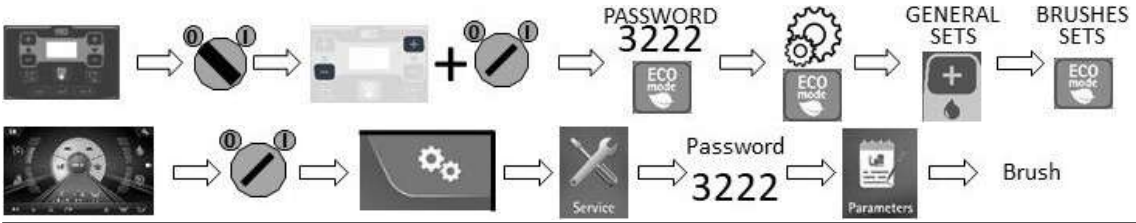
Parameter	Default	Min ÷ Max	Description
General - Config Model	Pro		Machine Model; **Pro**, **Plus**.
General - Config Base version	2 Brush	÷	Versione Macchina; (2 Brush=Disc; Brush=Cylindrical; Orbit.=Orbital).
General - Config Side brush	YES	NO ÷ YES	Side Brush enable; NO=OFF; YES=ON
General - Config Solution Management	FSS	- ÷ -	Solution Management (No=None; FSS=Dosing system; FLR=Recycle).
General - Config Wand	YES	NO ÷ YES	Vacuum wand enabling
General - Config Spray Gun	YES	NO ÷ YES	Water gun enabling
General - Config Anticollision	Brake	- ÷ -	anti- collision sensors enabling (No=Disabled; YES=Enabled; Brake=Enabled with backward braking).
General - Config Hazard Lights	NO	NO ÷ YES	Position Lights Enabling; NO=OFF; YES=ON
General - Config Manual Op. Enable	YES	NO ÷ YES	Manual version enable; NO=OFF; YES=ON
General - Config Zone Op. Enable	YES	NO ÷ YES	Zone enable; NO=OFF; YES=ON

PLUS General Setting Parameters



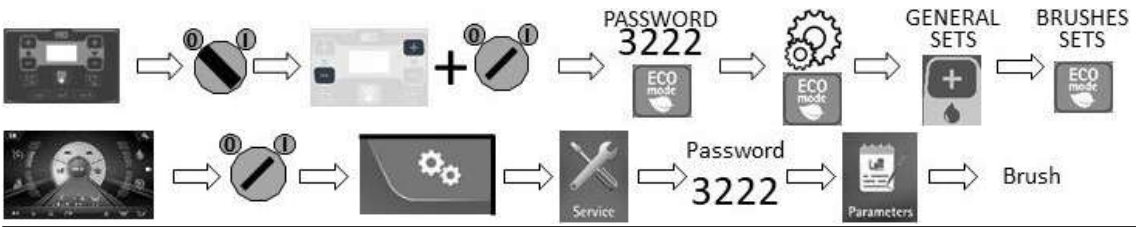
Parameter	Default	Min ÷ Max	Description
General - Config Lateral brush	ON	ON ÷ OFF	Side Brush enabling
General - Config Solution Management	FSS	- ÷ -	Solution Management (No=None; FSS=Dosing system; FLR=Recycle).
General - Config Variable Flow	ON	ON ÷ OFF	Enable Variable Flow system. ON = flow variable as a function of speed (to keep the ml/m2 constant). The % of water level parameter is related to the maximum speed. OFF = fixed flow, independent of speed.
General - Config Spray Gun	ON	ON ÷ OFF	Chemical gun enabling
General - Config Anticollision	Brake	- ÷ -	anti- collision sensors enabling (No=Disabled; YES=Enabled; Brake=Enabled with backward braking).
General - Config Hazard Lights	OFF	ON ÷ OFF	Position Lights Enabling
General - Config Manual Op. Enable	ON	ON ÷ OFF	Manual version enable
General - Config Zone Op. Enable	ON	ON ÷ OFF	Zone enable

Brushes Parameters (Disc & Cylindrical)



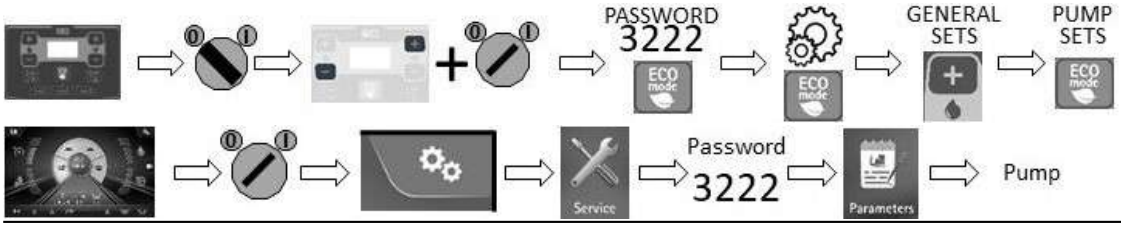
Parameter	Default	Min ÷ Max	Description
Brush - Brush Motor Nominal Current # Amp.	50	10 ÷ 50	Brush Motor Rated current; with T_ Nom manages the amperometric protection (alarm + stop brush motor).
Brush - Brush Motor Overload Time # sec.	20	1 ÷ 60	Brush Motor Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop brush motor).
Brush - Brush Motor Switch-On Delay # sec.	1.5	0.1 ÷ 10.0	Brush Motor Switch on Delay when the traction pedal is pressed.
Brush - Brush Motor Switch-Off1 Delay # sec.	0.1	0.1 ÷ 10.0	Brush Motor Switch off Delay when the traction pedal is released.
Brush - Brush Motor Reset Delay # sec.	20	1 ÷ 300	Reset Timing from amperometric protection.
Brush - Brush Motor Speed Reduction # %	100	10 ÷ 100	Reset Voltage from amperometric protection.
Brush - Brush Motor Pressure Level #1 - # Amp.	45 BS=50	10 ÷ 100	(Sum) Pressure Level 1 setting.
Brush - Brush Motor Pressure Level #2 - # Amp.	60 BS=68	10 ÷ 100	(Sum) Pressure Level 2 setting.
Brush - Brush Motor Pressure Level #3 - # Amp.	75 BS=80	10 ÷ 100	(Sum) Pressure Level 3 setting.
Brush - Brush Motor Pressure Range # Amp.	4.0	1.0 ÷ 4.0	Maximum allowed current range for each level before the amperometric protection intervention.

Pre-sweeping Brushes Parameters (Combinata)



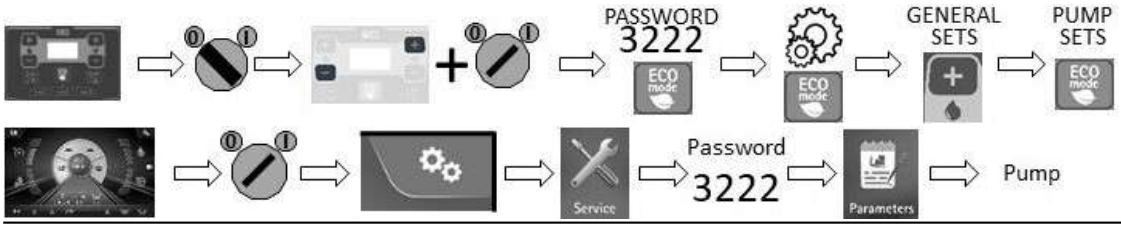
Parameter	Default	Min ÷ Max	Description
Brush - Brush Motor Nominal Current # Amp.	20	10 ÷ 50	Brush Motor Rated current; with T_ Nom manages the amperometric protection (alarm + stop brush motor).
Brush - Brush Motor Overload Time # sec.	2	1 ÷ 60	Brush Motor Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop brush motor).
Brush - Brush Motor Switch-On Delay # sec.	1.5	0.1 ÷ 10.0	Brush Motor Switch on Delay when the traction pedal is pressed.
Brush - Brush Motor Switch-Off1 Delay # sec.	0.1	0.1 ÷ 10.0	Brush Motor Switch off Delay when the traction pedal is released.
Brush - Brush Motor Reset Delay # sec.	20	1 ÷ 300	Reset Timing from amperometric protection.
Brush - Brush Motor Speed Reduction # %	100	10 ÷ 100	Reset Voltage from amperometric protection.
Brush - Brush Motor Pressure Level #1 - # Amp.	20	10 ÷ 100	(Sum) Pressure Level 1 setting.
Brush - Brush Motor Pressure Range # Amp.	2.0	1.0 ÷ 4.0	Maximum allowed current range for each level before the amperometric protection intervention.

Water Pump Parameters



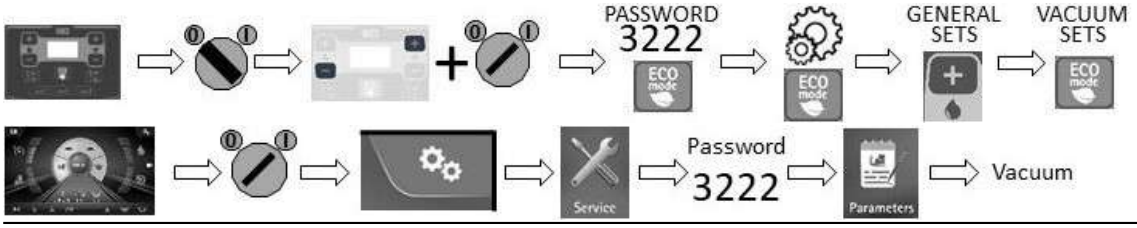
Parameter	Default	Min ÷ Max	Description
Pump - Water EV Switch-On Delay # sec.	0.2	0.1 ÷ 5.0	Solenoid Valve activation Delay.
Pump - Water EV Switch-Off Delay # sec.	1.0	0.1 ÷ 5.0	Solenoid Valve deactivation Delay.
Pump - Water Pump Sw-On Delay # sec.	0.5	0.1 ÷ 5.0	Water Pump activation delay when the traction pedal is pressed.
Pump - Water Pump Sw-Off Delay # sec.	0.2	0.1 ÷ 5.0	Water Pump deactivation delay when the traction pedal is released.
Pump - Water Pump level #1 #%	50	0 ÷ 100	Setting of the First dispensing level.
Pump - Water Pump level #2 #%	70	0 ÷ 100	Setting of the Second dispensing level.
Pump - Water Pump level #3 #%	90	0 ÷ 100	Setting of the Third dispensing level.

Chemical Pump Parameters



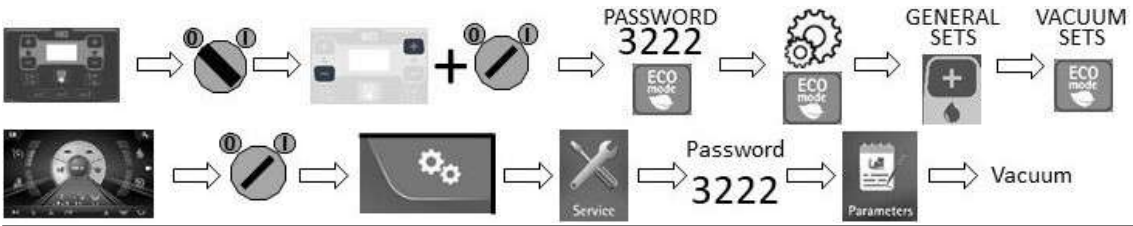
Parameter	Default	Min ÷ Max	Description
Pump - Chemical Pump Sw-On Delay # sec.	0.5	0.1 ÷ 5.0	Chemical Pump activation delay when the traction pedal is pressed.
Pump - Chemical Pump Sw-Off Delay # sec.	0.5	0.1 ÷ 5.0	Chemical Pump deactivation delay when the traction pedal is released.
Pump - Chemical Percent. chemical %	2	0.5 ÷ 3.0	Percentage of chemical dilution.

Squeegee Vacuum Parameters (Disc & Cylindrical)



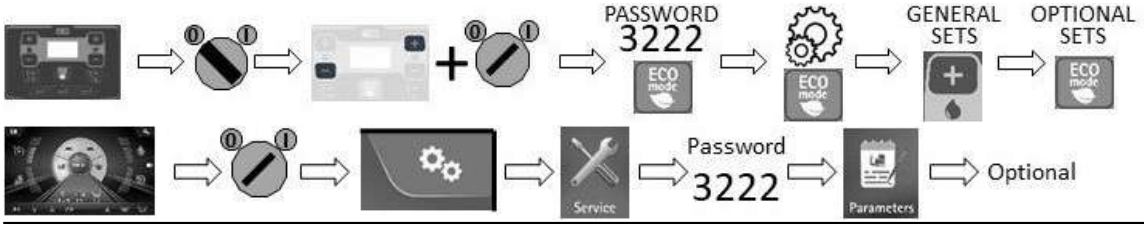
Parameter	Default	Min ÷ Max	Description
Vacuum - Vac.Motor Nominal Current # Amp.	27	10 ÷ 40	Vacuum Motor Rated current; with T_ Nom manages the amperometric protection (alarm + stop brush motor).
Vacuum - Vac.Motor Overload Time # sec.	30	1 ÷ 60	Vacuum Motor Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop brush motor).
Vacuum - Vac.Motor Switch-On Delay # sec.	0.2	0.1 ÷ 5.0	Brush Motor Switch on Delay when the traction pedal is pressed.
Vacuum - Vac.Motor Switch-Off1 Delay # sec.	10	1 ÷ 300	(Off function) Brush Motor Switch off Delay when the traction pedal is released.
Vacuum - Vac.Motor Reset Delay # sec.	300	1 ÷ 300	Reset Timing from amperometric protection. From 1 to 299 the parameter is valid, only with a value of 300 the actuator remains in the working position until the next function change.
Vacuum - Vac.Motor Vacuum Noise Level 1 # %	60	10 ÷ 100	Motor working Voltage, Level 1.
Vacuum - Vac.Motor Vacuum Noise Level 2 # %	70	10 ÷ 100	Motor working Voltage, Level 2.
Vacuum - Vac.Motor Vacuum Noise Level 3 # % Voltage set for motor operation.	80	10 ÷ 100	Motor working Voltage, Level 3.
Vacuum - Vac.Motor Max Current # Amp.	-	10 ÷ 40	Not Used.

Presweeping Hopper Vacuum Parameters (Combinata)



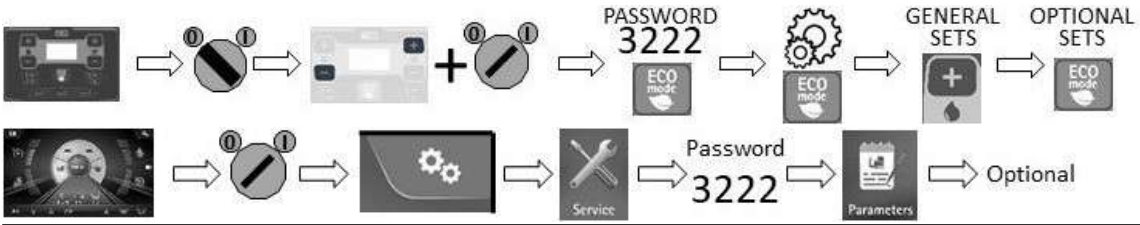
Parameter	Default	Min ÷ Max	Description
Vacuum - Vac.Motor Nominal Current # Amp.	15	10 ÷ 40	Corrente Nominale Motore Aspirazione (assieme a Overload Time individua la condizione di intervento protezione amperometrica, segnalazione di allarme + sgancio motore).
Vacuum - Vac.Motor Overload Time # sec.	30	1 ÷ 60	Timer nominale Motore Aspirazione (assieme a Nominal Current individua la condizione di intervento protezione amperometrica, segnalazione di allarme + sgancio motore).
Vacuum - Vac.Motor Switch-On Delay # sec.	0.2	0.1 ÷ 5.0	Ritardo di accensione del motore spazzola alla pressione del pedale di comando marcia.
Vacuum - Vac.Motor Switch-Off1 Delay # sec.	10	1 ÷ 30	(Off function) Ritardo spegnimento del motore aspirazione al rilascio del pedale di comando marcia.
Vacuum - Vac.Motor Reset Delay # sec.	300	1 ÷ 300	Al rilascio del pedale trazione, tempo dopo il quale il martinetto torna in posizione di riposo. Da 1 a 299 il parametro è valido, solo con valore a 300 il martinetto resta in posizione di lavoro fino al prossimo cambio di funzione.
Vacuum - Vac.Motor Vacuum Noise Level 1 # %	80	10 ÷ 100	Tensione di funzionamento del motore a Livello 1.
Vacuum - Vac.Motor Vacuum Noise Level 2 # %	90	10 ÷ 100	Tensione di funzionamento del motore a Livello 2.
Vacuum - Vac.Motor Vacuum Noise Level 3 # %	100	10 ÷ 100	Tensione di funzionamento del motore a Livello 3. Tensione impostata per funzionamento del motore.
Vacuum - Vac.Motor Max Current # Amp.	-	10 ÷ 40	Parametro non utilizzato.

Side Brush/es Parameters (Disc & Cylindrical)



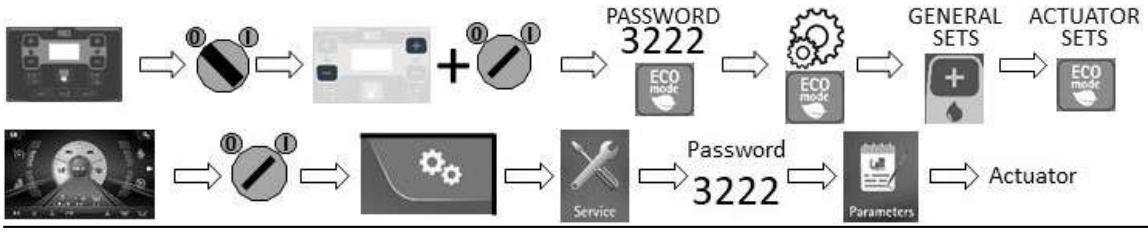
Parameter	Default	Min ÷ Max	Description
Optional - Brush Func. Nominal Current # Amp.	20	5 ÷ 25	Side brush motor Rated current; with T_ Nom manages the amperometric protection (alarm + stop brush motor).
Optional - Brush Func. Overload Time # sec.	5	5 ÷ 60	Side brush motor Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop brush motor).
Optional - Brush Func. Switch-On Delay # sec.	0.1	0.1 ÷ 10.0	Brush motor Switch on Delay when the traction pedal is pressed.
Optional - Brush Func. Switch-On 2 Delay # sec.	0.1	0.1 ÷ 10.0	Brush motor Switch on Delay when the traction pedal is pressed.
Optional - Brush Func. Switch-Off 1 Delay # sec.	0.1	0.1 ÷ 10.0	Brush motor Switch Off Delay when the traction pedal is released.
Optional - Brush Func. Switch-Off 2 Delay # sec.	0.1	0.1 ÷ 10.0	Brush motor Switch Off Delay when the traction pedal is released.
Optional - Brush Func. Reset Delay # sec.	20	1 ÷ 300	Side brush lifting delay when the traction pedal is released.

Pre-sweeping side Brushes Parameters (Combinata)



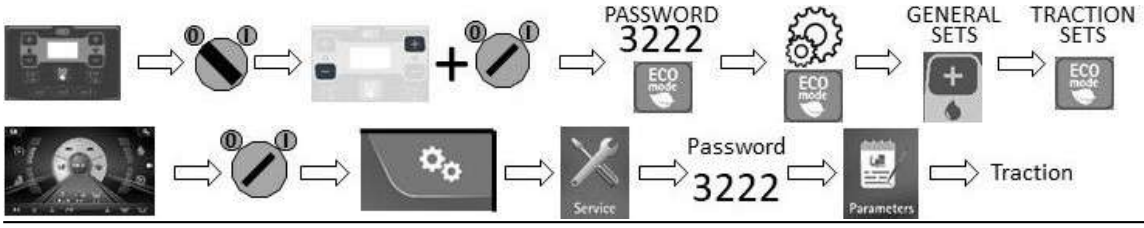
Parameter	Default	Min ÷ Max	Description
Optional - Brush Func. Nominal Current # Amp.	20	5 ÷ 25	Side brush motor Rated current; with T_ Nom manages the amperometric protection (alarm + stop brush motor).
Optional - Brush Func. Overload Time # sec.	5	5 ÷ 60	Side brush motor Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop brush motor).
Optional - Brush Func. Switch-On Delay # sec.	0.1	0.1 ÷ 10.0	Brush motor Switch on Delay when the traction pedal is pressed.
Optional - Brush Func. Switch-On 2 Delay # sec.	0.1	0.1 ÷ 10.0	Brush motor Switch on Delay when the traction pedal is pressed.
Optional - Brush Func. Switch-Off 1 Delay # sec.	0.1	0.1 ÷ 10.0	Brush motor Switch Off Delay when the traction pedal is released.
Optional - Brush Func. Switch-Off 2 Delay # sec.	0.1	0.1 ÷ 10.0	Brush motor Switch Off Delay when the traction pedal is released.
Optional - Brush Func. Reset Delay # sec.	20	1 ÷ 300	Side brush lifting delay when the traction pedal is released.

Actuators Parameters



Parameter	Default	Min ÷ Max	Description
Actuator - Brushes Timeout # sec.	15	0 ÷ 30	Max working time of the brushdeck Actuator.
Actuator - Brushes Overload Level # Amp.	5.0	2.0 ÷ 10.0	Brushdeck Actuator Rated current; with T_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Brushes Overload Time # sec.	2.0	0.1 ÷ 5.0	Brushdeck Actuator Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Opt. Brushes Timeout # sec.	5 BS=25	0 ÷ 30	Max working time of the Side brush Actuator.
Actuator - Opt. Brushes Overload Level # Amp.	5.0	2.0 ÷ 10.0	Side brush Actuator Rated current; with T_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Opt. Brushes Overload Time # sec.	2.0	0.1 ÷ 5.0	Side brush Actuator Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Squeegee Timeout # sec.	10	0 ÷ 30	Max working time of the Squeegee Actuator.
Actuator - Squeegee Overload Level # Amp.	5.0	2.0 ÷ 10.0	Squeegee Actuator Rated current; with T_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Squeegee Overload Time # sec.	2.0	0.1 ÷ 5.0	Squeegee Actuator Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Squeegee Traction reverse Delay # sec.	1.0	0.0 ÷ 10.0	With reverse gear, Time after which the Actuator lifts the Squeegee.
Actuator - Sweep Br Timeout # sec.	30	0 ÷ 60	Max working time of the pre-sweeping Brushes Actuator.
Actuator - Sweep Br Overload Level # Amp.	5.0	2.0 ÷ 10.0	Pre-sweeping Brushes Actuator Rated current; with T_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Sweep Br Overload Time # sec.	2.0	0.1 ÷ 5.0	Pre-sweeping Brushes Actuator Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Sweep Opt. Timeout # sec.	10	0 ÷ 60	Max working time of the pre-sweeping side Brushes Actuator.
Actuator - Sweep Opt. Overload Level # Amp.	5.0	2.0 ÷ 10.0	Pre-sweeping side Brushes Actuator Rated current; with T_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Sweep Opt. Overload Time # sec.	2.0	0.1 ÷ 5.0	Pre-sweeping side Brushes Actuator Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Sweep lift Timeout # sec.	5	0 ÷ 30	Max working time of the Lifting Actuator.
Actuator - Sweep lift Overload Level # Amp.	5.0	2.0 ÷ 10.0	Lift Actuator Rated current; with T_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Sweep lift Overload Time # sec.	2.0	0.1 ÷ 5.0	Lift Actuator Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Sweep tilt Timeout # sec.	10	0 ÷ 30	Max working time of the tilting Actuator.
Actuator - Sweep tilt Overload Level # Amp.	10.0	2.0 ÷ 10.0	Tilt Actuator Rated current; with T_ Nom manages the amperometric protection (alarm + stop Actuator).
Actuator - Sweep tilt Overload Time # sec.	2.0	0.1 ÷ 5.0	Tilt Actuator Rated Timer; with I_ Nom manages the amperometric protection (alarm + stop Actuator).

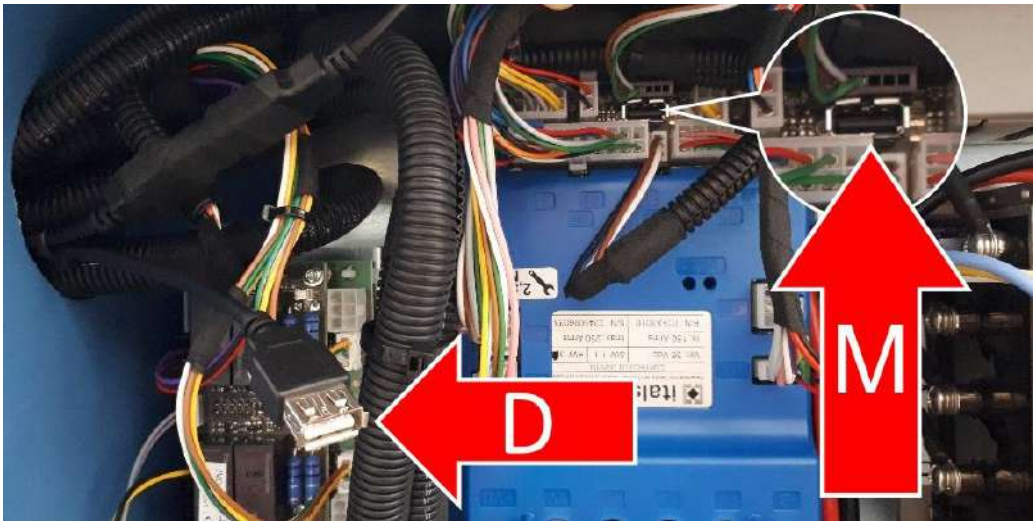
Traction Parameters



Parameter	Default	Min ÷ Max	Description
Traction - Par Change Acceleration Delay - # Lev.	2.0	0.1 ÷ 25.5	Determines the acceleration ramp. At level 9 it takes a long time to accelerate.
Traction - Par Change Release Braking - # Lev.	1.2	0.1 ÷ 25.5	Check the deceleration ramp when the traction pedal is released. At level 9 brakes sharply.
Traction - Par Change Inverse Braking - # Lev.	1.5	0.1 ÷ 25.5	Controls the deceleration ramp when reversing. At level 9 brakes sharply.
Traction - Par Change Max Speed Forward # %	97	0 ÷ 100	In Transfer function, Maximum forward speed.
Traction - Par Change Max Speed Backward # %	50	0 ÷ 100	In function Transfer, Maximum speed allowed in reverse.
Traction - Speed Sets Mode2 Speed # %	90	10 ÷ 100	In Work function, Maximum forward speed.
Traction - Speed Sets Speed level 1 - #%	50	0 ÷ 100	Maximum forward speed at Level 1.
Traction - Speed Sets Speed level 2 - #%	75	0 ÷ 100	Maximum forward speed at Level 2.
Traction - Speed Sets Speed level 3 - #%	100	0 ÷ 100	Maximum forward speed at Level 3.
Traction - Speed Ref Min acc Forward # V	0.2	0.0 ÷ 5.0	Minumum Voltage in forward.
Traction - Speed Ref Max acc Forward # V	2.0	0.0 ÷ 5.0	Max Voltage in forward.
Traction - Speed Ref Min acc Backward # V	0.3	0.0 ÷ 5.0	Minumum Voltage in reverse.
Traction - Speed Ref Max acc Backward # V	4.8	0.0 ÷ 5.0	Max Voltage in reverse.
Traction - Speed Ref Steer right Volt # V	2.2	0.0 ÷ 5.0	Max Voltage in reverse.
Traction - Speed Ref Steer left Volt # V	0.2	0.0 ÷ 5.0	Max Voltage in reverse.
Traction - Speed Ref Steer zero Volt # V	1.2	0.0 ÷ 5.0	Max Voltage in reverse.
Traction - Adjustments Max Motor temp	150°	60 ÷ 175	Maximum temperature reachable by the drive gearmotor between 150° e 170° traction controller reduces performance.
Traction - Adjustments Stop Motor temp	170°	60 ÷ 190	Maximum temperature reachable by the drive gearmotor Once the 170° is reached, the traction board stops traction.
Traction - Adjustments Steer angle 1	20°	1 ÷ 90	Angle of first speed reduction.
Traction - Adjustments Steer angle 2	85°	0 ÷ 90	Angle of second speed reduction.
Traction - Adjustments Curve Speed 1	80%	0 ÷ 100	Angle of first speed reduction.
Traction - Adjustments Curve Speed 2	20%	0 ÷ 100	Angle of second speed reduction.

3.6 Updates Installation

If the function controller or Display controller is replaced, it may be necessary to update the software of the existing controller on the machine in order to align the functions. The software is always available upon request at service@fimap.com
M: Functions Controller USB socket (Master & Slave)
D: Display Controller USB socket



3.6.1 Function Controller (Master & Slave)

1. Extract the File contained in the compressed folder.
2. Upload the File to a USB stick (at the root, don't put in subfolders).
3. With the machine off, insert the key in the function controller (M) of the machine to be updated.
4. Turn the machine on and wait for the end of the check phase:
5. If the update was successful:
   GMG PRO:
   Master function controller: emits a Double beep.
   Slave function controller (Combinata): emits a Single beep.
   PLUS model:
   on the screen you will see the writing "software update: DONE".
6. Switch the machine off.
7. Remove the USB stick.

In case of non-update:

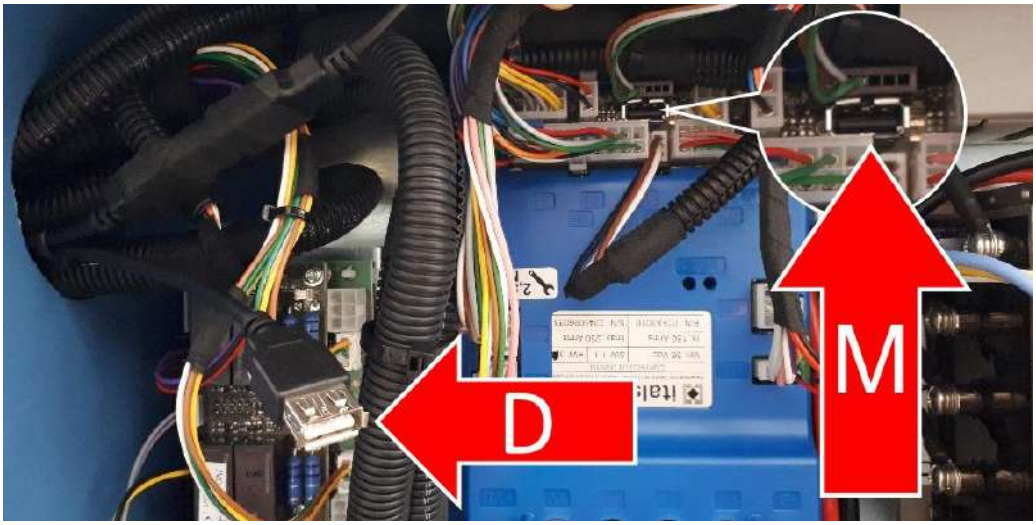
- Check that the software is not already updated (point 10)
- The key must be 8GB maximum.
- Some keys for reading speed problems do not work. The only solution is to change the key.

3.6.2 Display Controller

1. Extract the Folder contained in the compressed folder.
2. Upload the Folder to a USB stick (at the root, do not put in subfolders).
3. Disconnect the battery, insert the key into the display controller cable (D) of the machine to be updated.
4. Connect the battery with key OFF and wait for the operating system to start.
5. At the end of the update, the operating system restarts automatically.
6. Remove the USB stick.
7. Check that the update has taken place: in the info menu, check the display software version.

In case of non-update:

- The key must be 8GB maximum.
- Some keys for reading speed problems do not work. The only solution is to change the key.



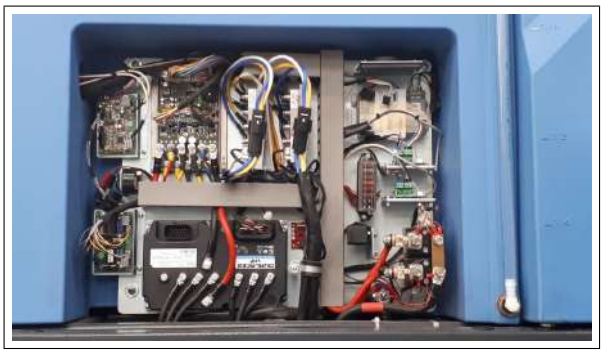
3.7 Maintenance and Checks

3.7.1 Electrical System

Check *(to perform every **150h**)*
Check the functions and the proper connections of the switches, microswitches, motors, power fuses, battery loop wires, function controller. Check periodically, the wiring connections status. To get access to the electrical system, remove the carter under the seat.

3.7.2 Batteries

Check *(to perform every **150h**)*
Check the proper connection of the Loop wire on the batteries and the cleanliness of the contacts. Verify that there is no rust on the battery connections.



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 Lubrication Points

For lubrication use standard grease.

- Lifting Arms
- Bushings

4.3 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.
3. The machine is on.
4. The electrobrakes are activated.
5. The functions setting on the display is Washing or Washing + Drying.
6. The recovery tank is not full.
7. The brake pedal is not pressed.
8. The accelerator pedal is pressed.

4.4 Operating mode

WASHING

Premise: Operator Seated, Seat Microswitch Closed

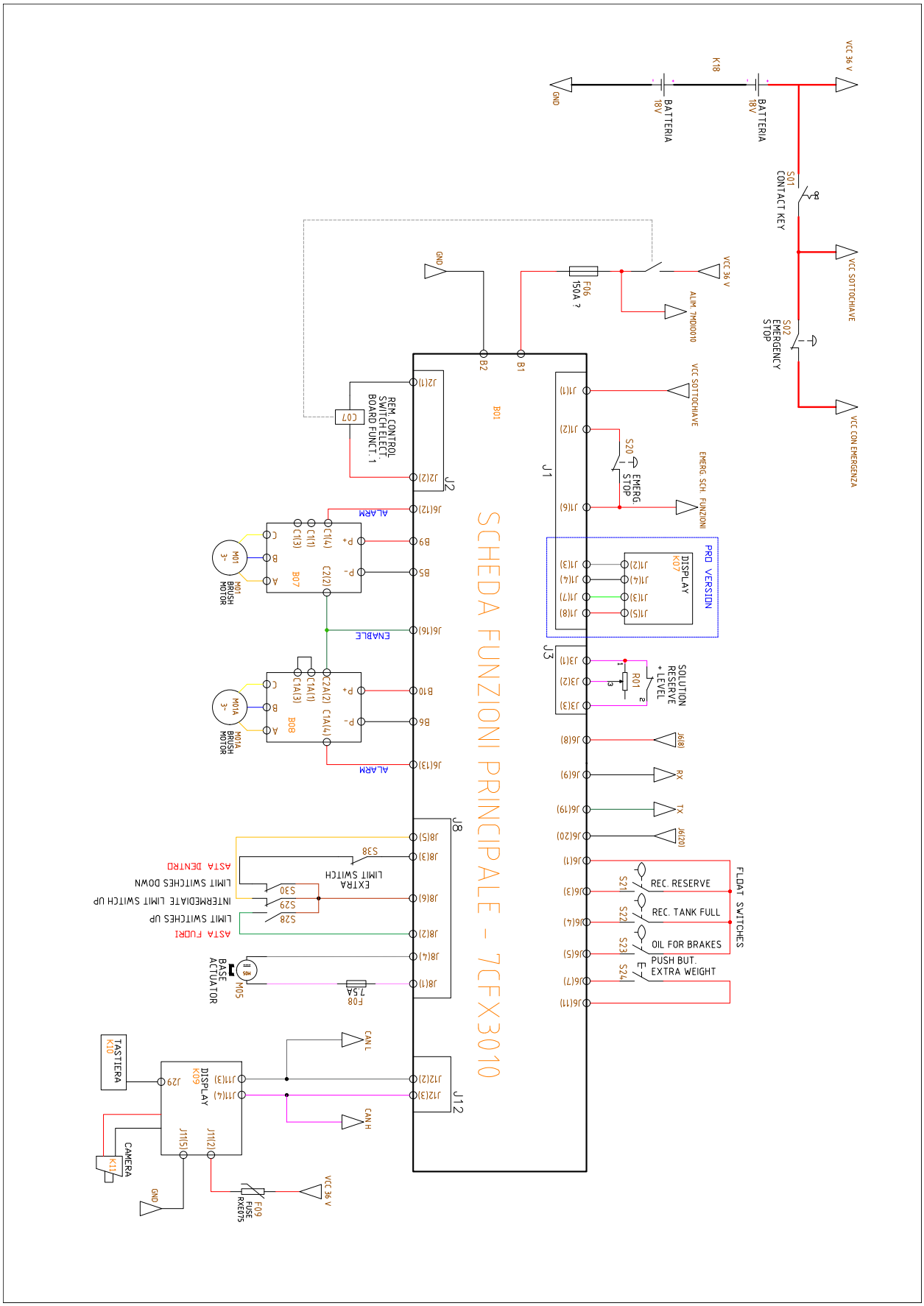
Action	Result
Washing Enabled Forward pedal pressed	Brushdeck Actuator goes down (+36V to M05) Brush Motors ON after 1,5 seconds (+36V to M01-M01A) Solution Pump ON if water level is different than 0 (+36V to Pa) Solenoid Valve ON if water level is different than 0 (+36V to C02)
Dosing system enabled during work	Chemical Pump ON if water level is different than 0 (+36V to M07)
Backward function enabled during work	Brushdeck Actuator goes down (+36V to M05) Brush Motors ON (+36V to M01-M01A) Solution Pump OFF, Solenoid Valve OFF, Chemical Pump OFF (if available)
Traction Pedal not pressed during work	Brushdeck Actuator rises after 20 seconds (-36V to M05) Brush Motors OFF, Solution Pump OFF, Solenoid Valve OFF, Chemical Pump OFF (if available)
Washing disabled during work	Brushdeck Actuator rises (-36V to M05) Brush Motors OFF, Solution Pump OFF, Solenoid Valve OFF, Chemical Pump OFF (if available)

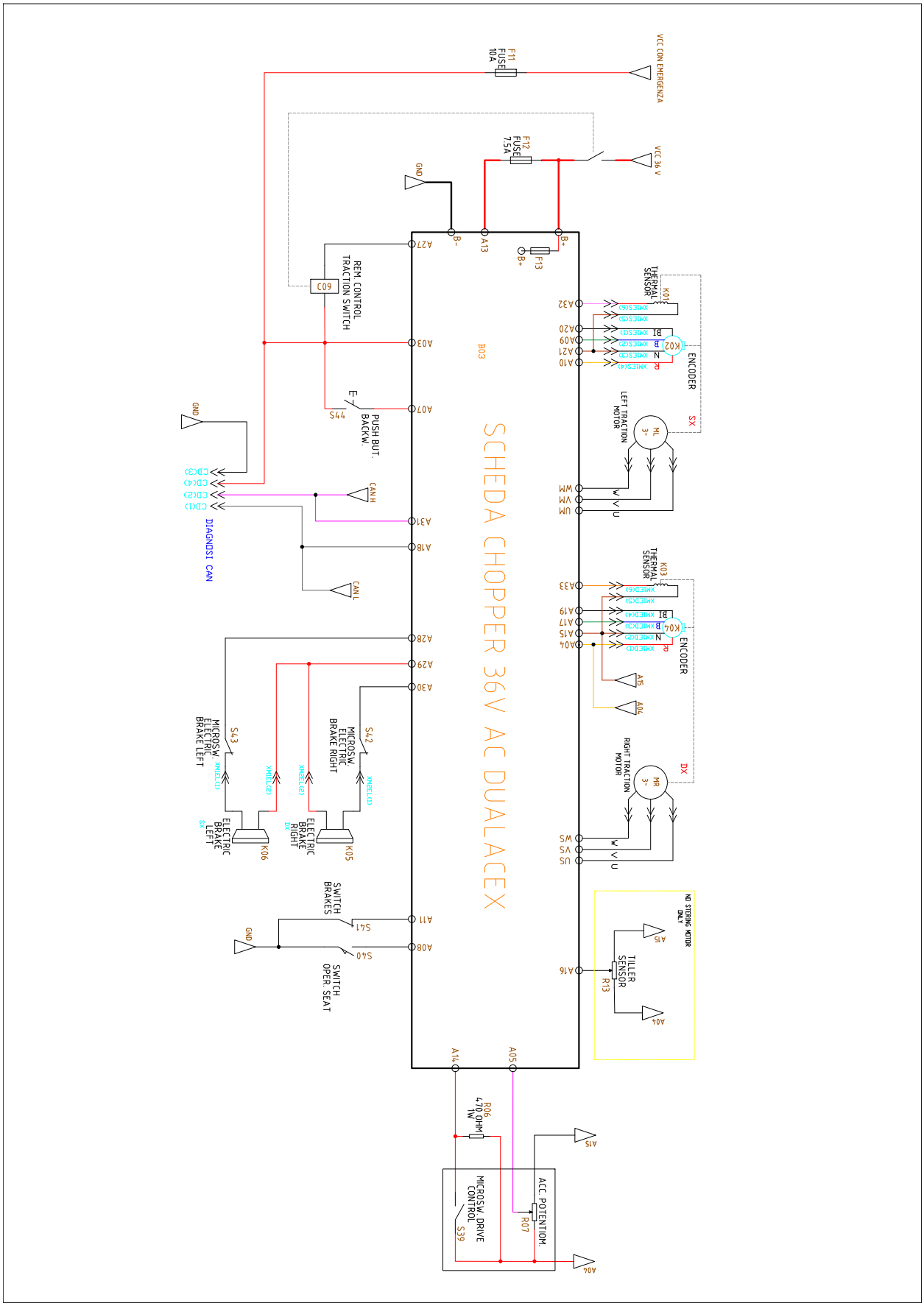
RECOVERY TANK FLOATER

Premise: Operator Seated, Seat Microswitch Closed

Action	Result
Floater enabled (full tank)	Floater ON (+36V to J6(4)) Vacuum motors OFF (ref to M03-M03A) Brush motors OFF (ref to M01-M01A)

4.5 Related electrical circuit




SCHEDA CHOPPER 36V AC DUALACEX
VCC CON EMERGENZA
F11 FUSE 10A
VCC 36 V
F12 FUSE 7.5A
GND
B-
A13
B+
F13
B+
A27
603
REM CONTROL TRACTION SWITCH
A03
B03
A07
S44
PUSH BUT. BACKW.
GND
CAN H
CAN L
DIAGNOSI CAN
A31
A18
A28
A29
A30
S43
MICROSW. ELECTRIC BRAKE LEFT
S42
MICROSW. ELECTRIC BRAKE RIGHT
ELECTRIC BRAKE LEFT
SX
K06
ELECTRIC BRAKE RIGHT
DX
K05
SWITCH BRAKES
S41
S40
GND
SWITCH OPER. SEAT
A11
A08
A14
A05
R06 470 OHM 1W
A15
MICROSW. DRIVE CONTROL
S39
ACC POTENTION
R07
A04
A32
A20
A09
A21
A10
K01
THERMAL SENSOR
K02
ENCODER
LEFT TRACTION MOTOR
ML
3~
SX
U
V
W
U
V
W
A33
A19
A17
A15
A04
K03
THERMAL SENSOR
K04
ENCODER
A15
A04
RIGHT TRACTION MOTOR
MR
3~
DX
U
V
W
U
V
W
NO STEERING MOTOR ONLY
A15
TILLER SENSOR
R13
A04
A16

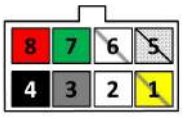
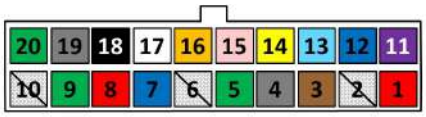
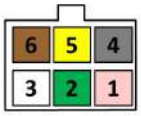
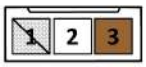
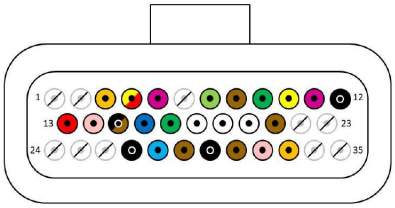
Functionality Check - Brush Deck

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
Brush Motor M01 Activated	J6M(12) ref to J6M(16)	$+V_b$	$-V_b$
Brush Motor M01 Activated	B9 ref to B5	$+V_b$	$-V_b$
Brush Motor M01A Activated	J6M(13) ref to J6M(16)	$+V_b$	$-V_b$
Brush Motor M01A Activated	B10 ref to B6	$+V_b$	$-V_b$
Rightside Electrobrake Activated	A29 ref to A30	$+V_b$	$-V_b$
Leftside Electrobrake Activated	A29 ref to A28	$+V_b$	$-V_b$
Traction pedal pressed	A05 ref to A14	$+V_b$	$-V_b$
Brake pedal pressed	A08 ref to A11	$-V_b$	$+V_b$
Recovery Tank Floater activated	J6M(1) ref to J6M(4)	$-V_b$	$+V_b$
Seated Operator	A08 ref to A11	$+V_b$	$-V_b$
Brush M01 Alarm	J6M(12) ref to J6M(16)	$-V_b$	$+V_b$
Brush M01A Alarm	J6M(13) ref to J6M(16)	$-V_b$	$+V_b$
PRO Display Negative	J1M(4)	$-V_b$	$-V_b$
PRO Display Transmitting	J1M(3)	$+V_b$	$-V_b$
PRO Display Receiving	J1M(7)	$+V_b$	$-V_b$
PRO Display Positive	J1M(8)	$+V_b$	$+V_b$
PLUS Display Negative	J12M(2)	$-V_b$	$-V_b$
PLUS Display Positive	J12M(3)	$+V_b$	$+V_b$
Brushes Actuator in motion	J8M(1) ref to J8M(4)	$+V_b$	$-V_b$
Brushes Actuator Rod OUT	J8M(2) ref to J8M(6)	$-V_b$	$+V_b$
Brushes Actuator Rod IN	J8M(5) ref to J8M(6)	$-V_b$	$+V_b$
Maximum pressure limit switch pressed	J8M(3) ref to J8M(6)	$-V_b$	$+V_b$

J1M		J6M	
J8M		J12M	
CNA			

4.5.1 Relative electrical Components

Brush Motor

The brush motors are of the Brushless type, connected to their control board through a connector accessible from the electrical system.
The single brush motor with no load (M01 e M01A) absorbs 6,0 Amps ± 0.1. The single brush motor with load (M01 e M01A) absorbs 37,5 Amps ± 2.0.

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.

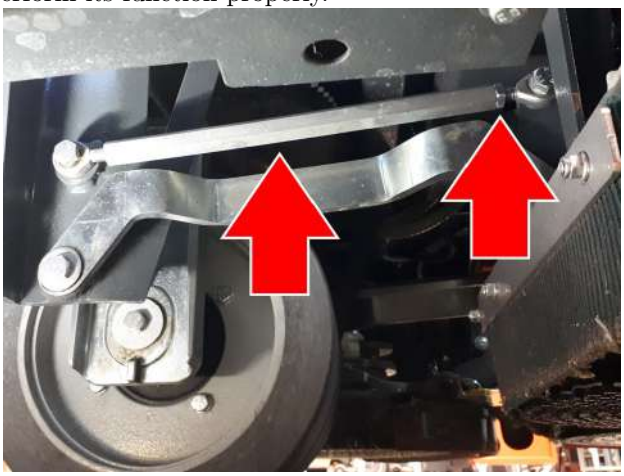
Pressure Control Microswitch

The pressure control microswitch is mounted on a bracket. It intervenes if the motors have a too low absorption to prevent the scrubdeck actuator from continuing to push. If the pin falls below its limit, the micro opens and stops the actuator.

4.6 Adjustments

4.6.1 Brush Deck

The scrub deck is tilted in the transverse direction and should be adjusted longitudinally inclined to the machine so that the brushes have a distance of about 3-5 mm from the floor, larger on the front than on the rear side. This allows the brush to evenly lean to the ground and perform its function properly.

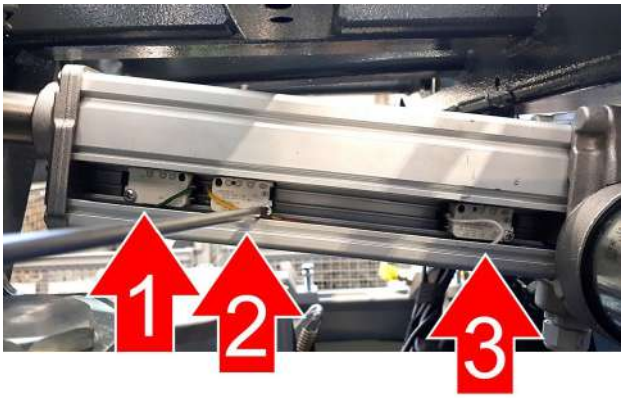


Procedure:

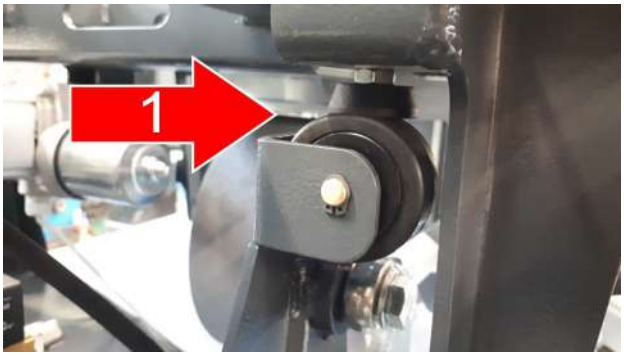
- Remove the brushes and the splash guards from the brush deck.
- Lower the brush deck to the floor and turn off the machine.
- Loosen the fixing nut of the upper arms.
- Act on the hexagonal fixing screws of the upper arms.
- Tighten the fixing nut.

4.6.2 Brush Deck Actuator

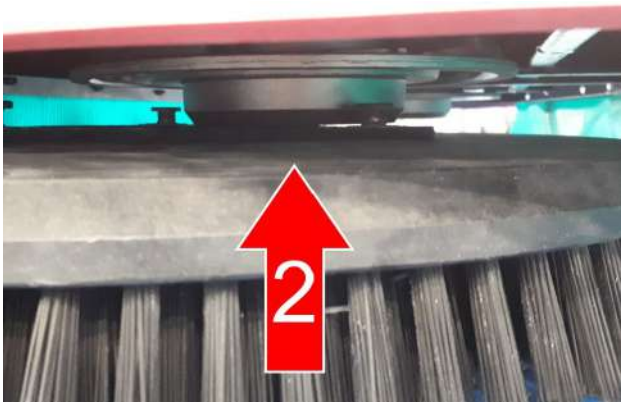
Adjust the microswitches inside the actuator using the relative adjusting screws.
Take the attached picture as an example, or in case of replacement, the actuator removed from the machine.
Remove the plastic cover from the actuator.
Adjust the microswitches.
1. Lifted Brushdeck
2. Maintenance Position
3. Lowered Brushdeck



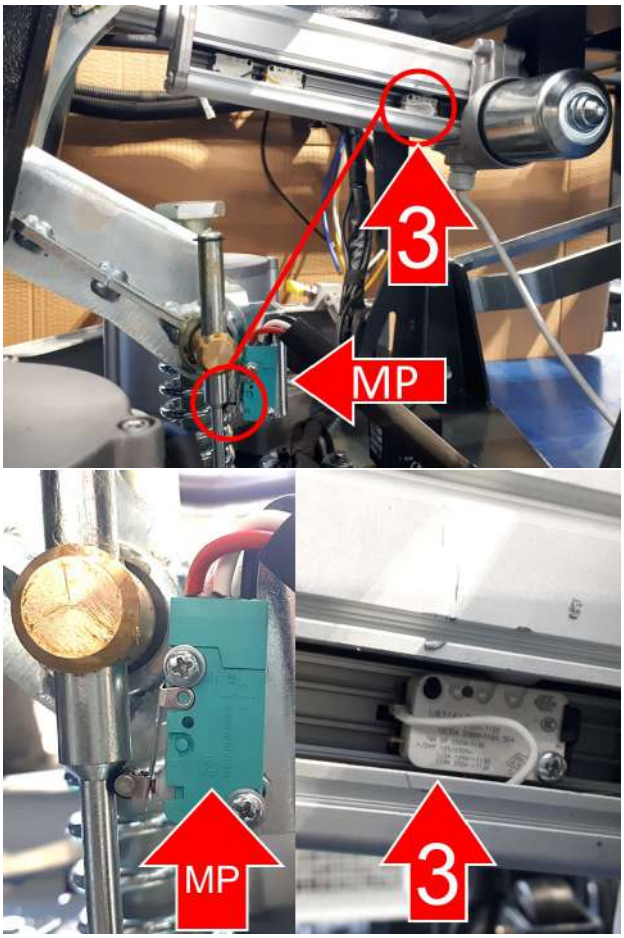
LIFTED BRUSHDECK (1):
Check that the scroll wheel comes into contact with the up limit switch.
Act on the regulation of the microswitch (1).



MAINTENANCE POSITION (2):
Check that it is possible to insert the brush under the base.
Act on the regulation of the microswitch (2).



LOWERED BRUSHDECK (3):
The working area of the jack is located between the central microswitch and the working microswitch (3). Check that microswitch 3 activates simultaneously with the maximum pressure microswitch (MP).
Act on the regulation of the microswitches.

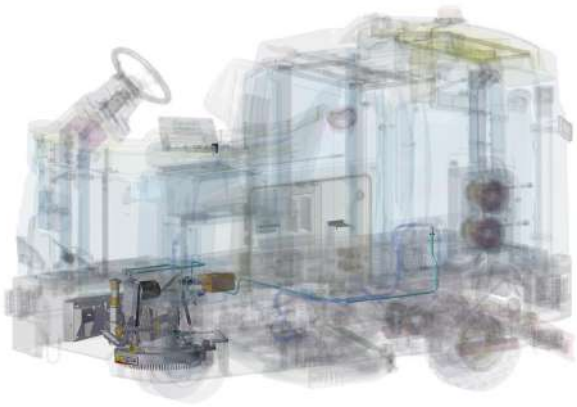


Chapter 5

Side Brush Unit

5.1 Location on machine

The side brush unit is located under the machine body in the right lateral position, the side brush unit control is assembled above it.



5.2 Lubrication Points

For lubrication use standard grease.

- Lifting Arms

5.3 Work requirements

The side brush 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.
3. The machine is on.
4. The electrobrakes are activated.
5. The functions setting on the display is Washing or Washing + Drying with side brush function enabled.
6. The recovery tank is not full.
7. The brake pedal is not pressed.
8. The accelerator pedal is pressed.

5.4 Operating mode

SIDE BRUSH WASHING

Premise: Operator Seated, Seat Microswitch Closed

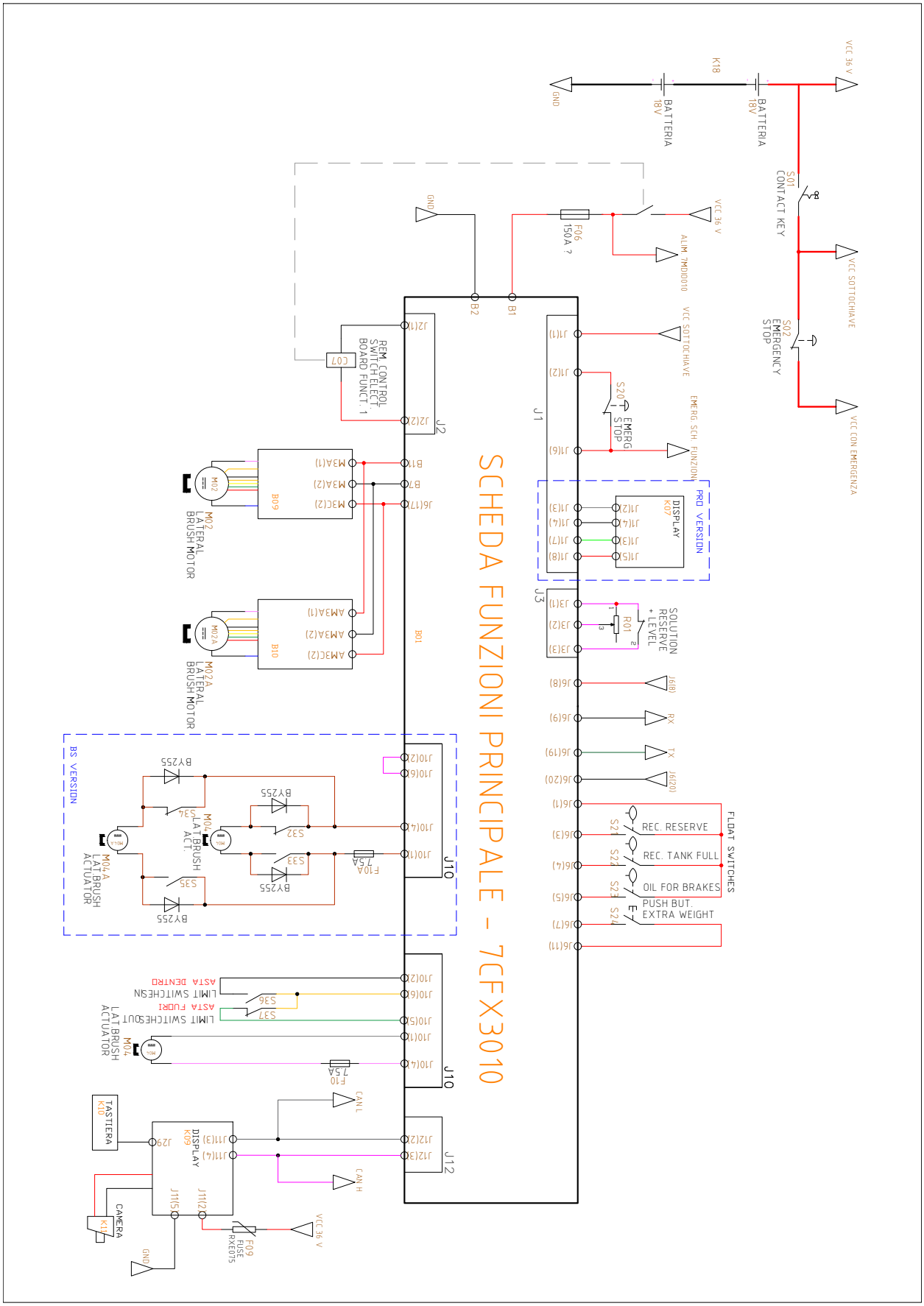
Action	**Result**
Washing Enabled Forward pedal pressed	Side Brush Actuator goes down (+36V to M04) Brush Motor ON after 1,5 seconds (+36V to M02) Solution Pump ON if water level is different than 0 (+36V to Pa) Side brush solenoid Valve ON if water level is different than 0 (+36V to C03)
Backward function enabled during work	Side Brush Actuator goes down (+36V to M04) Brush Motor ON (+36V to M02) Solution Pump OFF, Side brush solenoid Valve OFF, Chemical Pump OFF (is present)
Forward pedal not pressed during work	Side Brush Actuator rises after 20 seconds (-36V to M04) Brush Motor OFF, Solution Pump OFF, Side brush solenoid Valve OFF, Chemical Pump OFF (is present)
Washing Disabled during work	Side Brush Actuator rises (-36V to M04) Brush Motor OFF, Solution Pump OFF, Side brush solenoid Valve OFF, Chemical Pump OFF (is present)

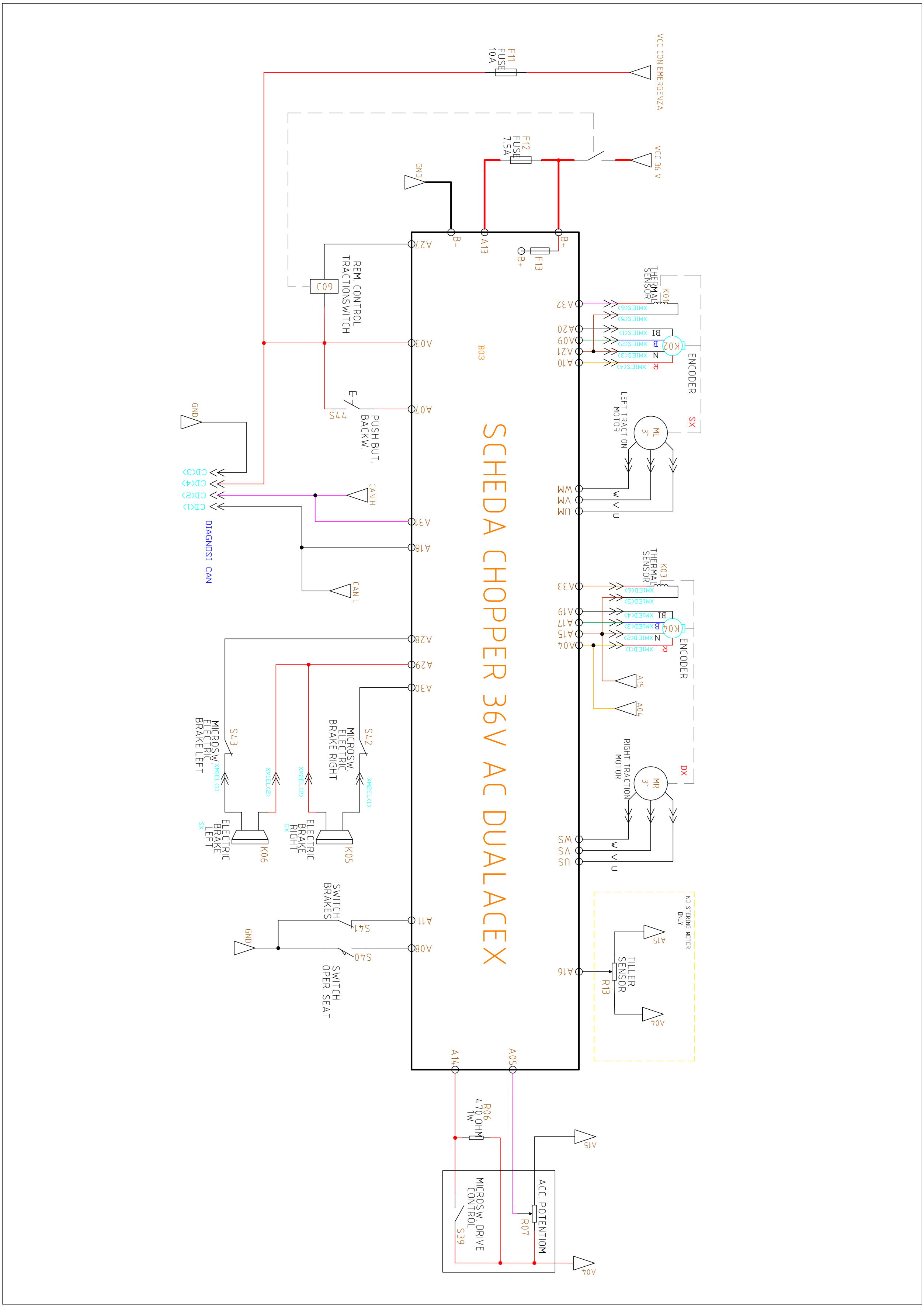
RECOVERY TANK FLOATER

Premise: Operator Seated, Seat Microswitch Closed

Action	**Result**
Floater enabled (full tank)	Floater ON (+36V to J6(4)) Vacuum motor OFF (ref to M03-M03A) Brush motor OFF (ref to M02)

5.5 Related electrical circuit




SCHEDA CHOPPER 36V AC DUALACEX
VCC CON EMERGENZA
VCC 36 V
F11 FUSE 10A
F12 FUSE 7.5A
F13
GND
B-
B+
A13
B03
REM CONTROL TRACTIONSWITCH
C09
PUSH BUT. BACKW.
S44
CAN H
CAN L
DIAGNOSI CAN
LEFT TRACTION MOTOR
ML
RIGHT TRACTION MOTOR
MR
THERMAL SENSOR
ENCODER
K01
K02
K03
K04
SX
DX
MICROSW. ELECTRIC BRAKE LEFT
S43
MICROSW. ELECTRIC BRAKE RIGHT
S42
ELECTRIC BRAKE LEFT
K06
ELECTRIC BRAKE RIGHT
K05
SWITCH BRAKES
S41
SWITCH OPER. SEAT
S40
TILLER SENSOR
R13
R06 470 OHM 1W
ACC. POTENTIOM
R07
MICROSW. DRIVE CONTROL
S39

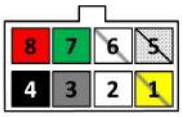
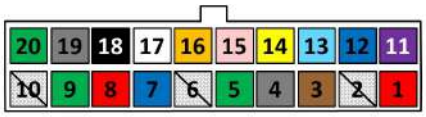
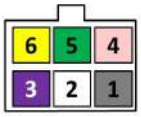
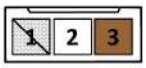
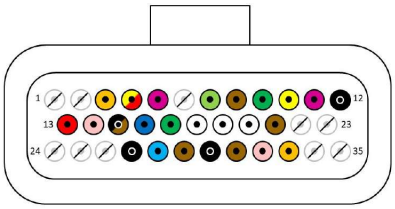
Functionality Check - Side Brush

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
Brush Motor M02 Activated	J6M(17)	$+V_b$	$-V_b$
Brush Motor M02 Activated	B11 ref to B7	$+V_b$	$-V_b$
Rightside Electrobrake Activated	A29 ref to A30	$+V_b$	$-V_b$
Leftside Electrobrake Activated	A29 ref to A28	$+V_b$	$-V_b$
Traction pedal pressed	A05 ref to A14	$+V_b$	$-V_b$
Brake pedal pressed	A08 ref to A11	$-V_b$	$+V_b$
Recovery Tank Floater activated	J6M(1) ref to J6M(4)	$-V_b$	$+V_b$
Seated Operator	A08 ref to A11	$+V_b$	$-V_b$
Brush M02 Alarm	J6M(17)	$-V_b$	$+V_b$
PRO Display Negative	J1M(4)	$-V_b$	$-V_b$
PRO Display Transmitting	J1M(3)	$+V_b$	$-V_b$
PRO Display Receiving	J1M(7)	$+V_b$	$-V_b$
PRO Display Positive	J1M(8)	$+V_b$	$+V_b$
PLUS Display Negative	J12M(2)	$-V_b$	$-V_b$
PLUS Display Positive	J12M(3)	$+V_b$	$+V_b$
Brushes Actuator in motion	J10M(1) ref to J10M(4)	$+V_b$	$-V_b$
Brushes Actuator Rod OUT	J10M(5) ref to J10M(6)	$-V_b$	$+V_b$
Brushes Actuator Rod IN	J10M(2) ref to J10M(6)	$-V_b$	$+V_b$

J1M		J6M	
J10M		J12M	
CNA			

5.5.1 Relative electrical Components

Brush Motor

The brush motor is Brushless, connected to its control board through a connector accessible from the electrical system.
The single brush motor with no load (M02) absorbs 2,0 Amps ± 0,5. The single brush motor with load (M02) absorbs 8,5 Amps ± 1,0.

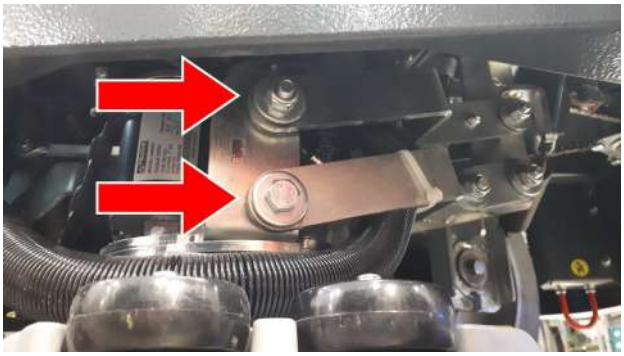
5.6 Adjustments

5.6.1 Side Brush

The scrub deck is tilted in the transverse direction and should be adjusted longitudinally inclined to the machine so that the brushes have a distance of about 3-5 mm from the floor, larger on the front than on the rear side. This allows the brush to evenly lean to the ground and perform its function properly. The side brush enlarge the the working capacity of the scrubber-dryer machine.

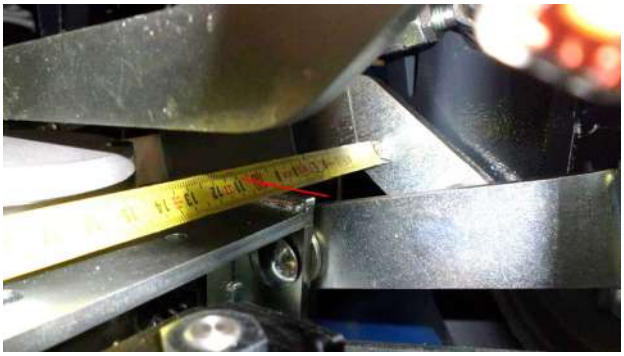
Procedure:

- Remove the brush and loosen the fixing nuts of the two support arms, both on the external side in the image and on the internal side.
- Lower the side brush until it touches the floor.
- Tighten the fixing nuts of the two support arms.



Adjust the crankcase extension using the screw and the limit stop nut. The screw marked in the photo is used to adjust the side brush outflow; the more you screw in the more the brush comes out.

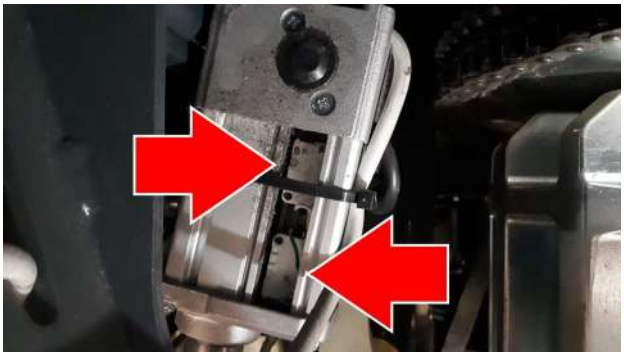
The recessed crankcase must have 8cm (3 1/6") between the crankcase support bracket and the side crankcase support castle.



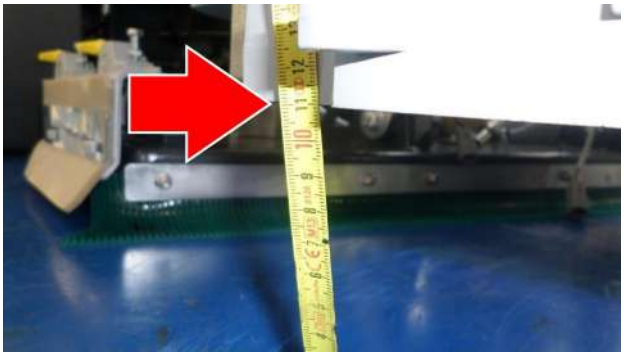
The extended crankcase must have 36cm (14 1/6") between the crankcase support bracket and the outer side crankcase support bracket.

5.6.2 Side Brush Actuator

Adjust the micro switches inside the actuator using the appropriate adjusting screws.
Take the attached picture as an example, or in case of replacement, the actuator removed from the machine.
Remove the plastic cover from the actuator.
Adjust the microswitches.



The entered deck should have 11cm (4 1/3") clearance from the floor.



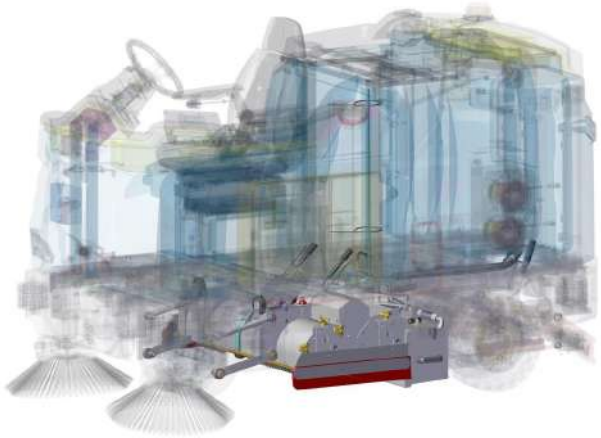
With the brushdeck on the ground, the lifting arm must have 1cm (1/3") distance from the gearmotor head.

Chapter 6

Sweeping Unit

6.1 Location on machine

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



6.2 Lubrication Points

For lubrication use standard grease.

- Lifting Arms
- Bushings

6.3 Work requirements

The sweeping 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.
3. The machine is on.
4. The electrobrakes are activated.
5. The functions setting on the display is Washing or Washing + Drying.
6. The recovery tank is not full.
7. The brake pedal is not pressed.
8. The accelerator pedal is pressed.

6.4 Operating mode

WASHING

Premise: Operator Seated, Seat Microswitch Closed

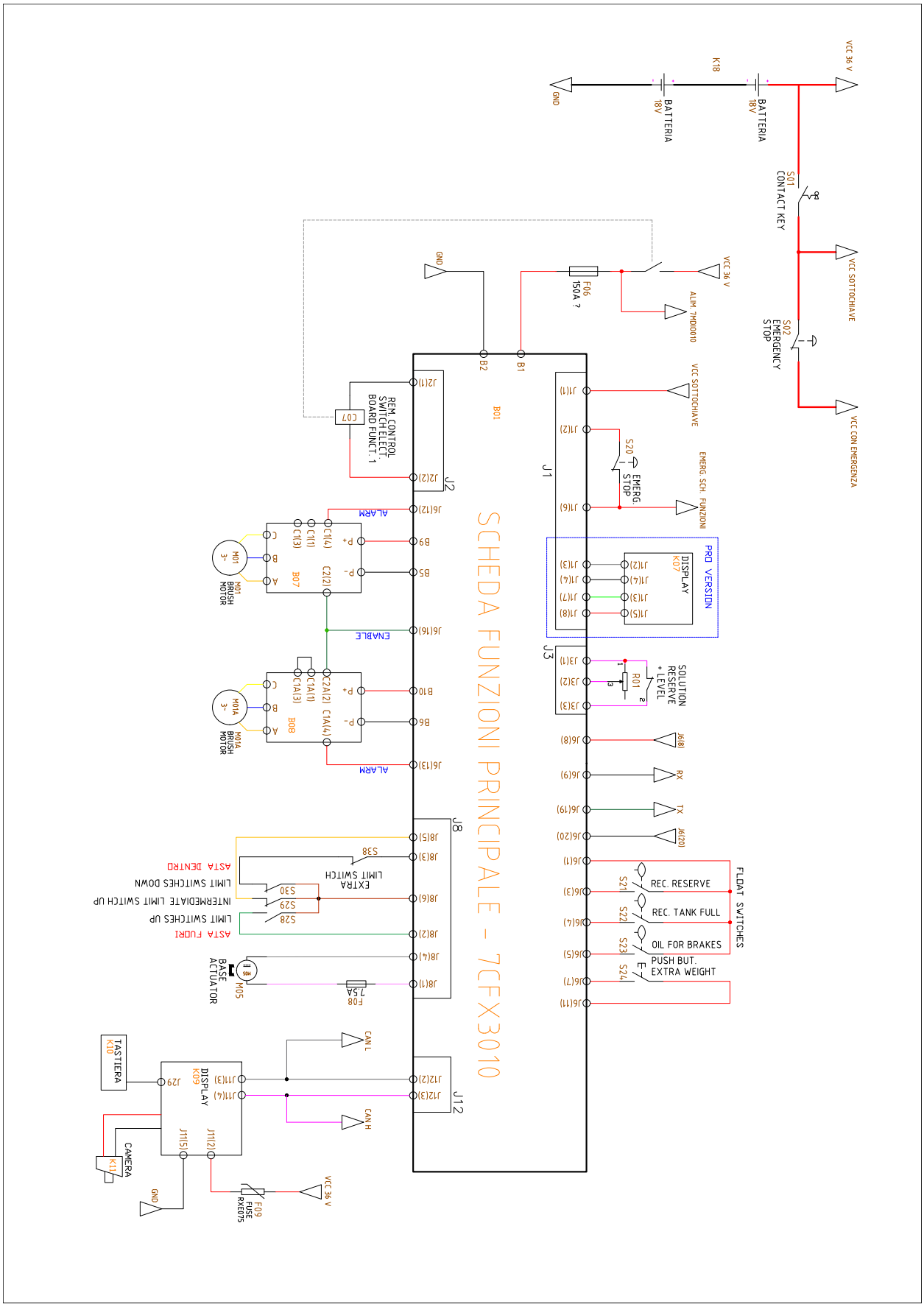
Action	Result
Washing Enabled Forward pedal pressed	Brushdeck Actuator goes down (+36V to M05) Brush Motors ON after 1,5 seconds (+36V to M01-M01A) Solution Pump ON if water level is different than 0 (+36V to Pa) Solenoid Valve ON if water level is different than 0 (+36V to C02)
Dosing system enabled during work	Chemical Pump ON if water level is different than 0 (+36V to M07)
Backward function enabled during work	Brushdeck Actuator goes down (+36V to M05) Brush Motors ON (+36V to M01-M01A) Solution Pump OFF, Solenoid Valve OFF, Chemical Pump OFF (if available)
Traction Pedal not pressed during work	Brushdeck Actuator rises after 20 seconds (-36V to M05) Brush Motors OFF, Solution Pump OFF, Solenoid Valve OFF, Chemical Pump OFF (if available)
Washing disabled during work	Brushdeck Actuator rises (-36V to M05) Brush Motors OFF, Solution Pump OFF, Solenoid Valve OFF, Chemical Pump OFF (if available)

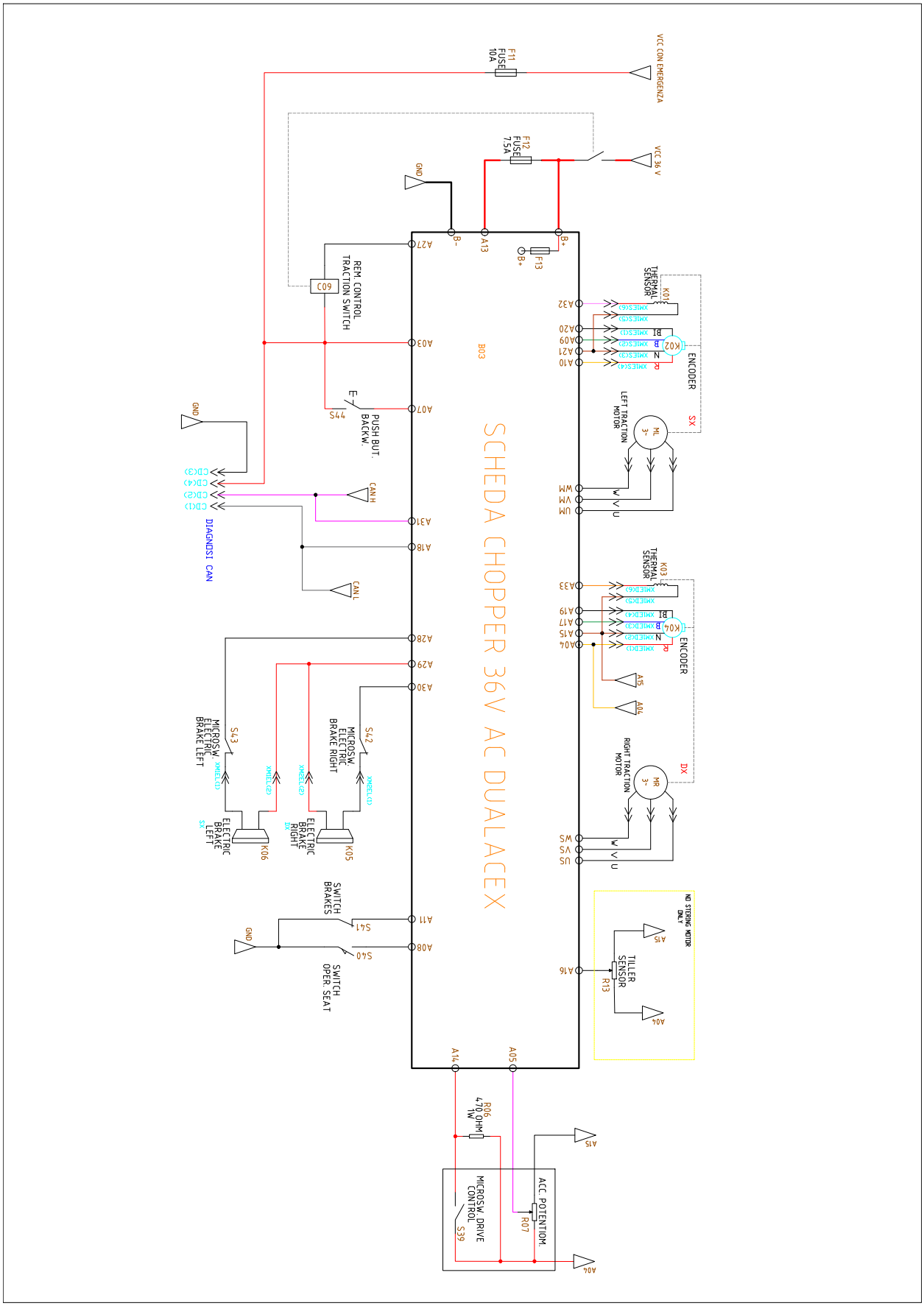
RECOVERY TANK FLOATER

Premise: Operator Seated, Seat Microswitch Closed

Action	Result
Floater enabled (full tank)	Floater ON (+36V to J6(4)) Vacuum motors OFF (ref to M03-M03A) Brush motors OFF (ref to M01-M01A)

6.5 Related electrical circuit




SCHEDA CHOPPER 36V AC DUALACEX
VCC CON EMERGENZA
F11 FUSE 10A
VCC 36 V
F12 FUSE 7.5A
GND
B-
A13
B+
F13
B+
A27
REM CONTROL TRACTION SWITCH
603
A03
B03
A07
S44
PUSH BUT. BACKW.
GND
CD(3)
CD(4)
CD(2)
CD(1)
CAN H
CAN L
DIAGNOSI CAN
A31
A18
A28
A29
A30
S43
MICROSW. ELECTRIC BRAKE LEFT
S42
MICROSW. ELECTRIC BRAKE RIGHT
XMEL(1)
XMEL(2)
XMEL(2)
XMEL(1)
ELECTRIC BRAKE LEFT
SX
K06
ELECTRIC BRAKE RIGHT
DX
K05
SWITCH BRAKES
S41
S40
GND
SWITCH OPER. SEAT
A11
A08
A14
A05
A32
K01
THERMAL SENSOR
XMEC(6)
XMEC(5)
XMEC(1)
XMEC(2)
XMEC(3)
XMEC(4)
A20
A09
A21
A10
K02
ENCODER
LEFT TRACTION MOTOR
ML
3~
SX
UM
VM
WM
A33
K03
THERMAL SENSOR
XMED(6)
XMED(5)
XMED(1)
XMED(2)
XMED(3)
XMED(4)
A19
A17
A15
A04
K04
ENCODER
A15
A04
RIGHT TRACTION MOTOR
MR
3~
DX
US
VS
WS
NO STEERING MOTOR ONLY
A15
A16
TILLER SENSOR
R13
A04
R06 470 OHM 1W
A15
MICROSW. DRIVE CONTROL
S39
ACC POTENTIOM.
R07
A04

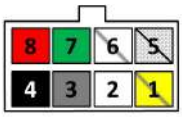
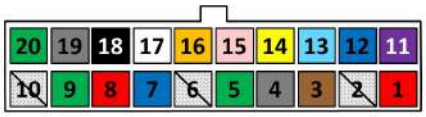
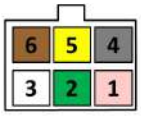
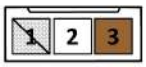
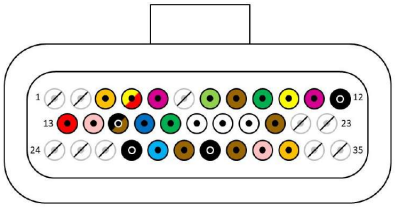
Functionality Check - Brush Deck

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
Brush Motor M01 Activated	J6M(12) ref to J6M(16)	$+V_b$	$-V_b$
Brush Motor M01 Activated	B9 ref to B5	$+V_b$	$-V_b$
Brush Motor M01A Activated	J6M(13) ref to J6M(16)	$+V_b$	$-V_b$
Brush Motor M01A Activated	B10 ref to B6	$+V_b$	$-V_b$
Rightside Electrobrake Activated	A29 ref to A30	$+V_b$	$-V_b$
Leftside Electrobrake Activated	A29 ref to A28	$+V_b$	$-V_b$
Traction pedal pressed	A05 ref to A14	$+V_b$	$-V_b$
Brake pedal pressed	A08 ref to A11	$-V_b$	$+V_b$
Recovery Tank Floater activated	J6M(1) ref to J6M(4)	$-V_b$	$+V_b$
Seated Operator	A08 ref to A11	$+V_b$	$-V_b$
Brush M01 Alarm	J6M(12) ref to J6M(16)	$-V_b$	$+V_b$
Brush M01A Alarm	J6M(13) ref to J6M(16)	$-V_b$	$+V_b$
PRO Display Negative	J1M(4)	$-V_b$	$-V_b$
PRO Display Transmitting	J1M(3)	$+V_b$	$-V_b$
PRO Display Receiving	J1M(7)	$+V_b$	$-V_b$
PRO Display Positive	J1M(8)	$+V_b$	$+V_b$
PLUS Display Negative	J12M(2)	$-V_b$	$-V_b$
PLUS Display Positive	J12M(3)	$+V_b$	$+V_b$
Brushes Actuator in motion	J8M(1) ref to J8M(4)	$+V_b$	$-V_b$
Brushes Actuator Rod OUT	J8M(2) ref to J8M(6)	$-V_b$	$+V_b$
Brushes Actuator Rod IN	J8M(5) ref to J8M(6)	$-V_b$	$+V_b$
Maximum pressure limit switch pressed	J8M(3) ref to J8M(6)	$-V_b$	$+V_b$

J1M		J6M	
J8M		J12M	
CNA			

6.5.1 Relative electrical Components

Brush Motor

The brush motors are Brushless, connected to their control board through a connector accessible from the electrical system.
The single brush motor with no load (M01 e M01A) absorbs 13.0 Amps ± 0.5. With a constant supply of 31 V DC (low battery) the absorption is 40.0 Amps ± 2.5.

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.

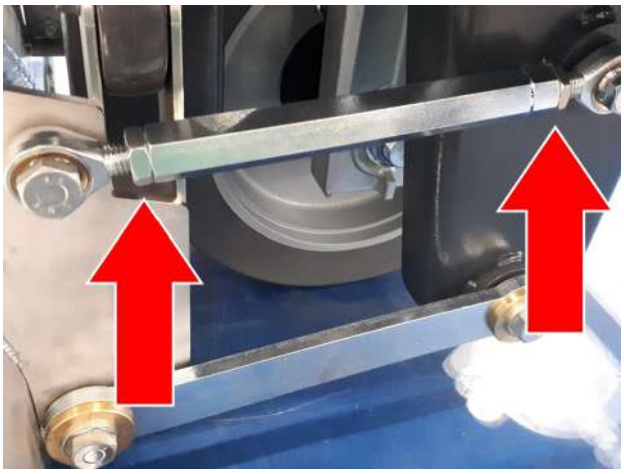
6.6 Adjustments

6.6.1 Cylindrical Brush Deck

The scrub deck is fixed to the support arms, which have to be adjusted so that the brush motors have an absorption with maximum gap of 1 Amp among them. This is to ensure that during the work the brushes are aligned to the ground uniformly and perform their function properly.
Requirements: Mounted brush, switched ON machine, and Amperometric Clamp on the motor wires.

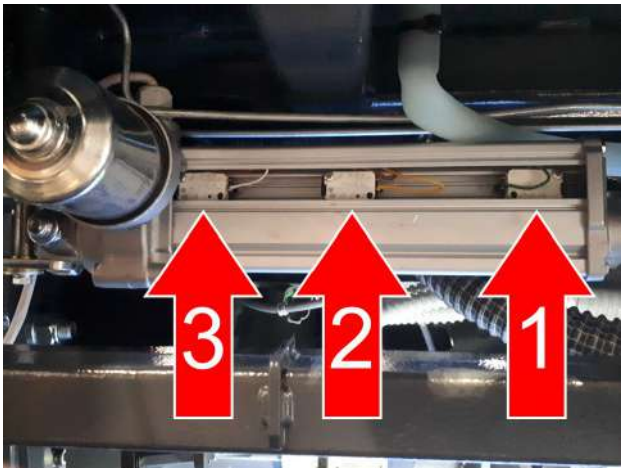
Procedure:

- Hook the brushes to the scrub deck.
- Adjust the left and right hexagons while the absorption is measured on the working scrub deck in operation.
- Once the adjustment has been made, tighten the lock nuts.

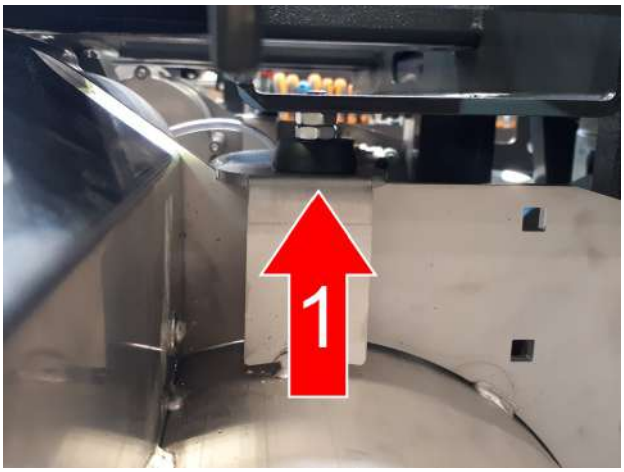


6.6.2 Cylindrical Brush Deck Actuator

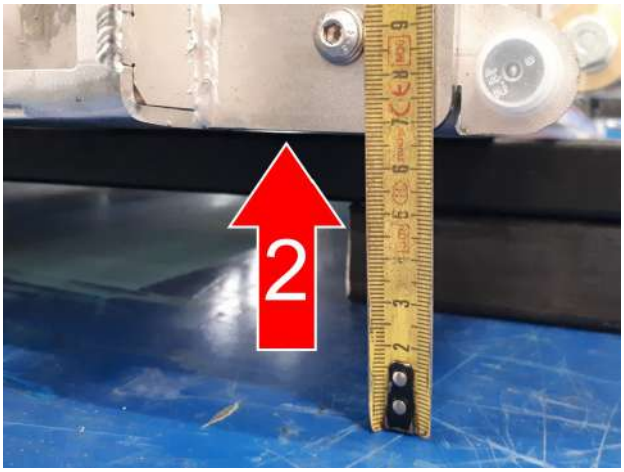
Remove the brushes from the brushdeck.
Adjust the microswitches inside the actuator using the relative adjusting screws.
Take the attached picture as an example, or in case of replacement, the actuator removed from the machine.
Remove the plastic cover from the actuator.
Adjust the microswitches.
1. Lifted Brushdeck
2. Maintenance Position
3. Lowered Brushdeck



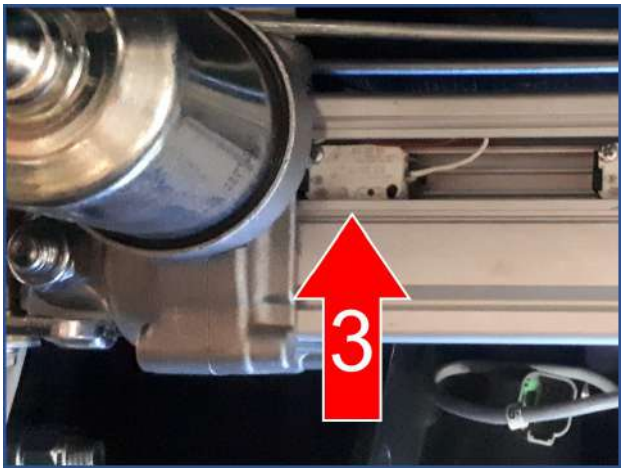
LIFTED BRUSHDECK (1):
Check that the base body comes into contact with the upward limit switch.
Act on the regulation of the microswitch (1).



MAINTENANCE POSITION (2):
Adjust the height to 7cm (2 3/4") from the floor.
Act on the regulation of the microswitch (2).



LOWERED BRUSHDECK (3):
Adjust the microswitch (3) to the limit switch.



Chapter 7

Side Sweeping Unit

7.1 Location on machine

The side sweeping unit is located under the machine body in the right and leftside position, the side sweeping unit control is assembled above it.

7.2 Lubrication Points

For lubrication use standard grease.

- Rotation Pins
- Actuator Push Pin

7.3 Work requirements

The side sweeping 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.
3. The machine is on.
4. The electrobrakes are activated.
5. The functions setting on the display is Washing or Washing + Drying with side brush function enabled.
6. The recovery tank is not full.
7. The brake pedal is not pressed.
8. The accelerator pedal is pressed.

7.4 Operating mode

SIDE BRUSHES

Premise: Operator Seated, Seat Microswitch Closed

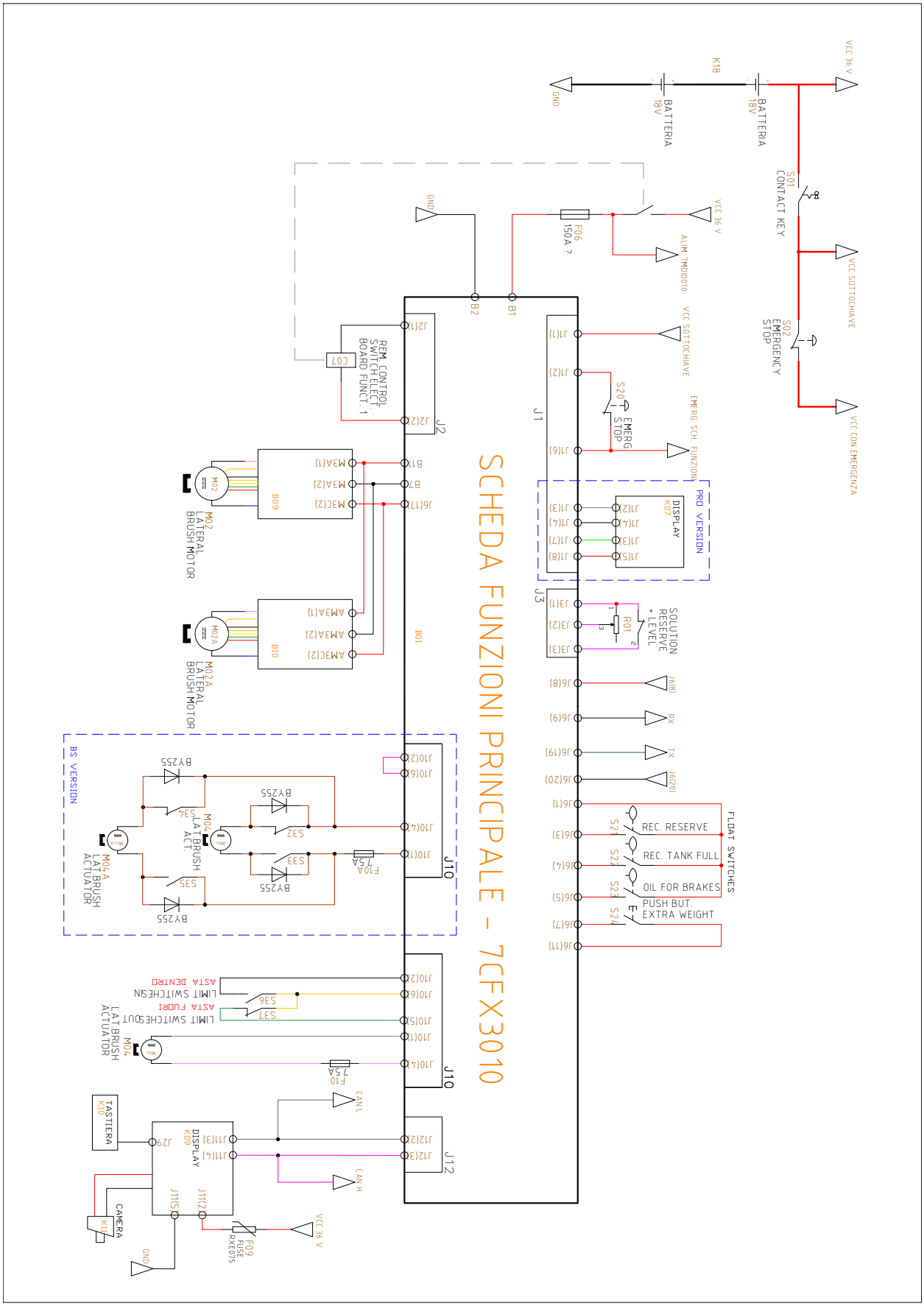
Action	**Result**
Washing Enabled Forward pedal pressed	Side Brush Actuator goes down (+36V to M04) Brush Motor ON after 1,5 seconds (+36V to M02-M02A)
Backward function enabled during work	Side Brush Actuator goes down (+36V to M04-M04A) Brush Motor ON (+36V to M02)
Forward pedal not pressed during work	Side Brush Actuator rises after 20 seconds (-36V to M04) Brush Motor OFF
Washing Disabled during work	Side Brush Actuator rises (-36V to M04) Brush Motor OFF

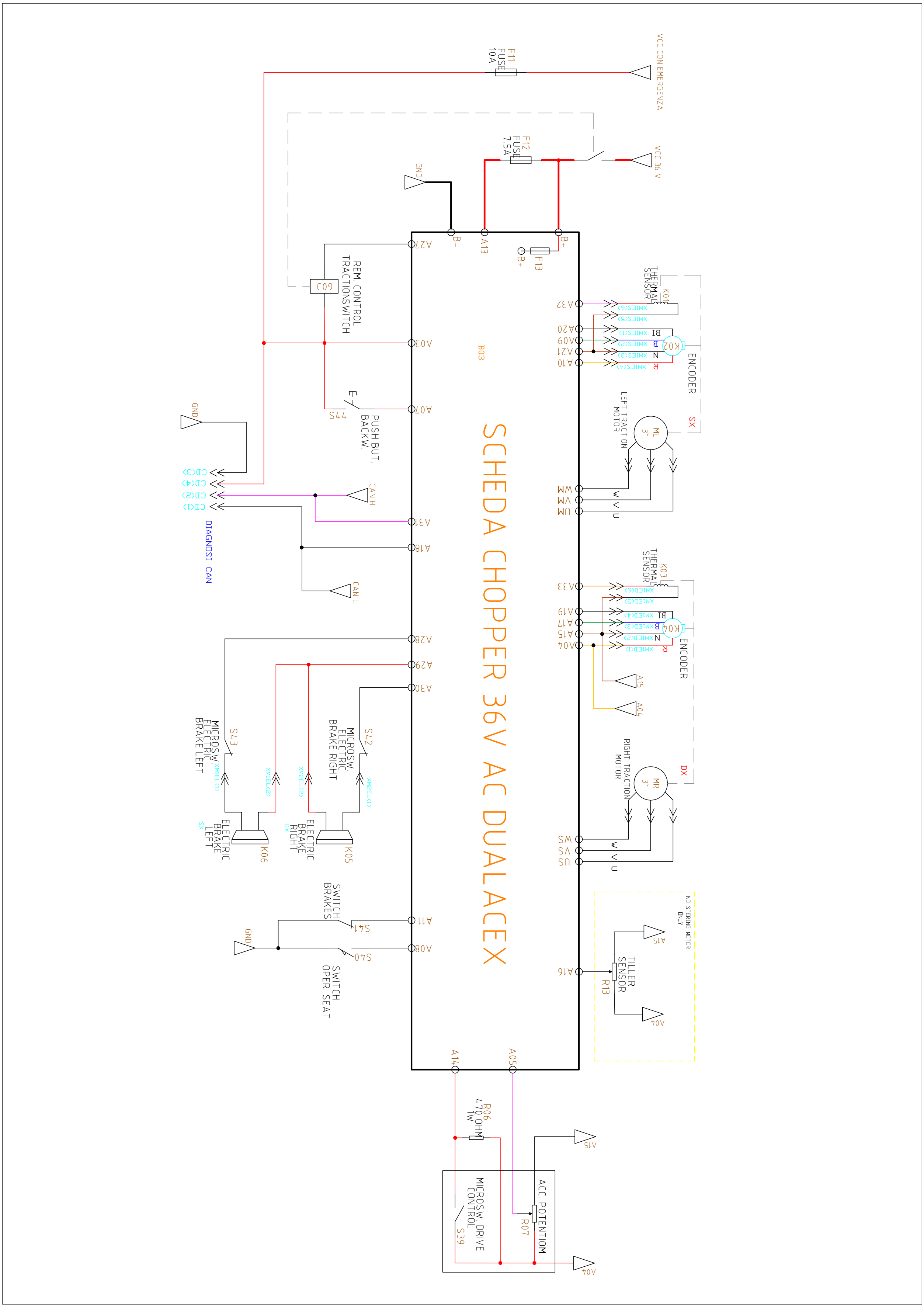
RECOVERY TANK FLOATER

Premise: Operator Seated, Seat Microswitch Closed

Action	**Result**
Floater enabled (full tank)	Floater ON (+36V to J6(4)) Vacuum motors OFF (ref to M03-M03A) Brush motor OFF (ref to M02-M02A)

7.5 Related electrical circuit




SCHEDA CHOPPER 36V AC DUALACEX
B03
VCC CON EMERGENZA
VCC 36 V
F11 FUSE 10A
F12 FUSE 7.5A
F13
GND
B-
A13
B+
A27
REM CONTROL TRACTIONSWITCH
C09
A03
A07
PUSH BUT. BACKW.
S44
A31
A18
CAN H
CAN L
DIAGNOSI CAN
A28
A29
A30
MICROSW. ELECTRIC BRAKE RIGHT
S42
MICROSW. ELECTRIC BRAKE LEFT
S43
ELECTRIC BRAKE RIGHT
K05
ELECTRIC BRAKE LEFT
K06
A11
A08
SWITCH BRAKES
S41
SWITCH OPER. SEAT
S40
A14
A05
R06 470 OHM 1W
ACC. POTENTIOM
R07
MICROSW. DRIVE CONTROL
S39
A15
A04
A32
A20
A09
A21
A10
THERMAL SENSOR
K01
K02
ENCODER
SX
LEFT TRACTION MOTOR
ML
WM
VM
UM
W
V
U
A33
A19
A17
K03
K04
DX
RIGHT TRACTION MOTOR
MR
WS
VS
US
A16
TILLER SENSOR
R13

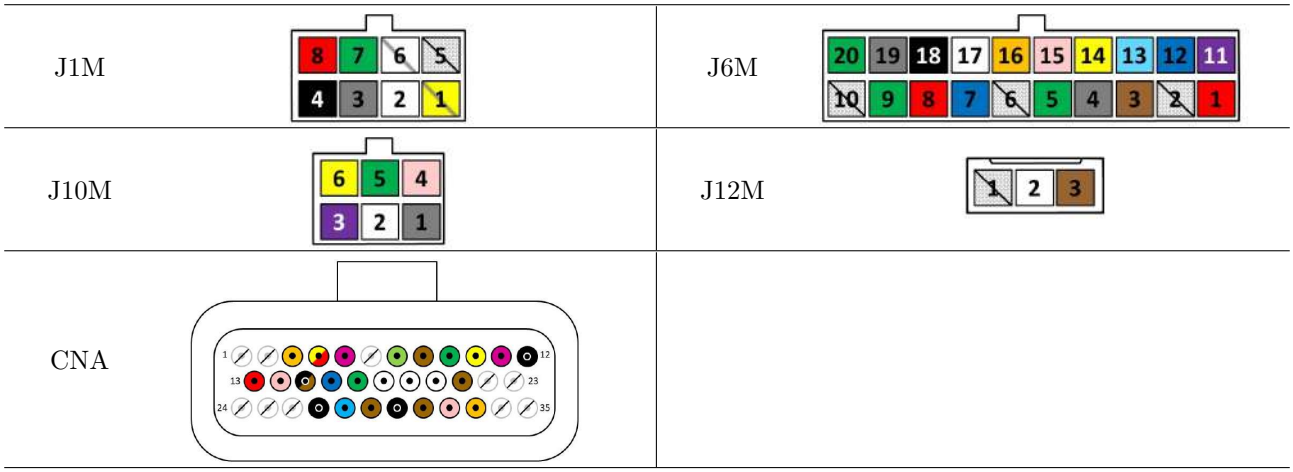
Functionality Check - Side Brush

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
Brush Motor M02 Activated	J6M(17)	$+V_b$	$-V_b$
Brush Motor M02 Activated	B11 ref to B7	$+V_b$	$-V_b$
Brush Motor M02A Activated	J6M(17)	$+V_b$	$-V_b$
Brush Motor M02A Activated	B11 ref to B7	$+V_b$	$-V_b$
Rightside Electrobrake Activated	A29 ref to A30	$+V_b$	$-V_b$
Leftside Electrobrake Activated	A29 ref to A28	$+V_b$	$-V_b$
Traction pedal pressed	A05 ref to A14	$+V_b$	$-V_b$
Brake pedal pressed	A08 ref to A11	$-V_b$	$+V_b$
Recovery Tank Floater activated	J6M(1) ref to J6M(4)	$-V_b$	$+V_b$
Seated Operator	A08 ref to A11	$+V_b$	$-V_b$
Brush M02 Alarm	J6M(17)	$-V_b$	$+V_b$
Brush M02A Alarm	J6M(17)	$-V_b$	$+V_b$
PRO Display Negative	J1M(4)	$-V_b$	$-V_b$
PRO Display Transmitting	J1M(3)	$+V_b$	$-V_b$
PRO Display Receiving	J1M(7)	$+V_b$	$-V_b$
PRO Display Positive	J1M(8)	$+V_b$	$+V_b$
PLUS Display Negative	J12M(2)	$-V_b$	$-V_b$
PLUS Display Positive	J12M(3)	$+V_b$	$+V_b$
Brushes Actuator in motion	J10M(1) ref to J10M(4)	$+V_b$	$-V_b$



7.5.1 Relative electrical Components

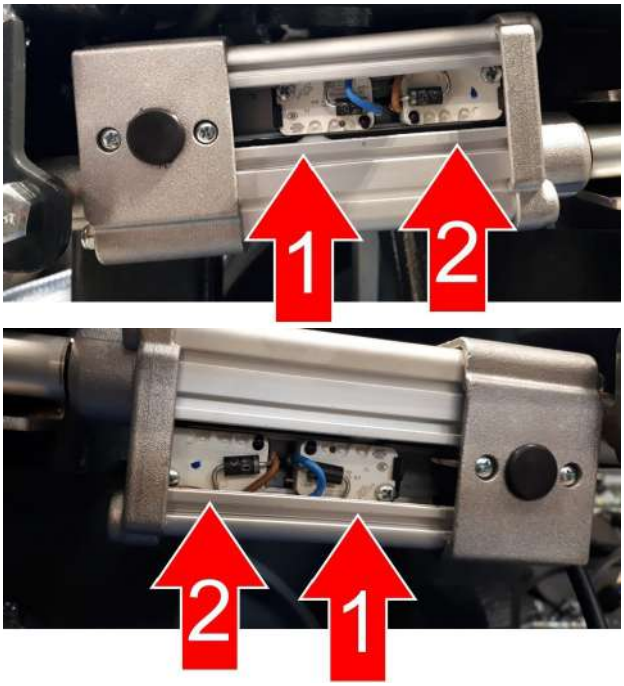
Brush Motor

The brush motor transfers the motion to the brushes.
The single brush motor with no load (M02 & M02A) absorbs 1.0 Amps ± 0.1. The single brush motor with load (M02 & M02A) absorbs 9.0 Amps ± 1.0.

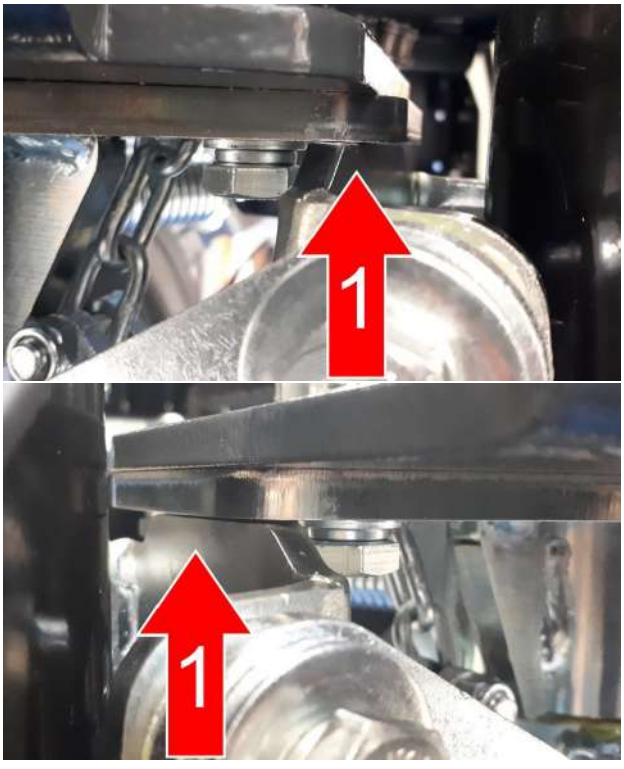
7.6 Adjustments

7.6.1 Side Brushes Actuator

Adjust the microswitches inside the jack using the appropriate adjusting screws.
Take the attached picture as an example, or if replacing, the actuator removed from the machine.
Remove the plastic cover from the actuator.
Act on the regulation of the microswitches.

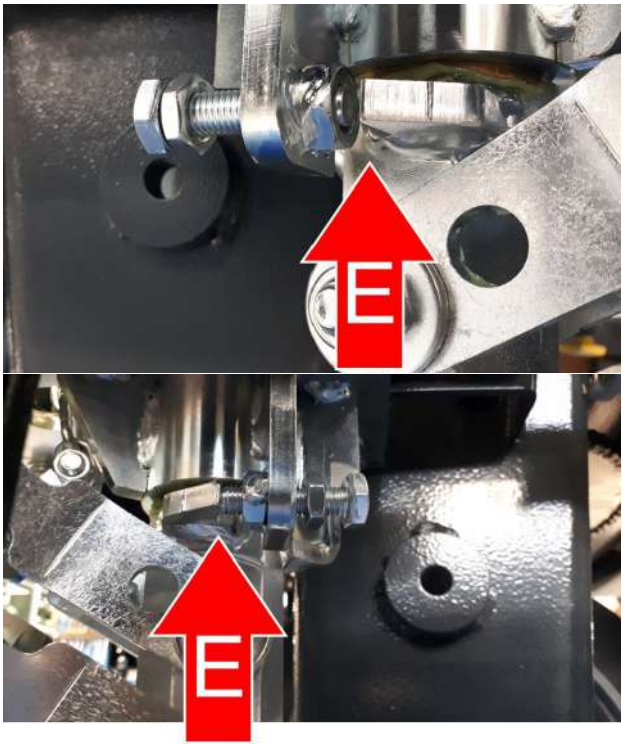


LIFTED BRUSHDECK (1):
Check that the base body comes into contact with the upward limit switch.
Act on the regulation of the microswitch (1).



LOWERED BRUSHDECK (2):
Adjust the microswitch (2) to the limit switch.
Act on the adjustment screw for the maximum descent of the brush, until the bristles touch the floor for 1 cm.

7.6.2 Side Brushes



Adjust the crankcase extension using the screw and the limit stop nut. The screw marked in the photo is used to adjust the side brush outflow; the more you screw it in, the less the brush comes out.

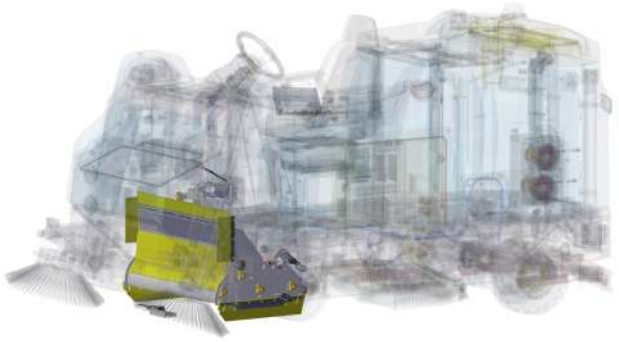
LOWERED BRUSHDECK (2):
The brushes should extend until the bumper wheels are halfway out from under the machine.

Chapter 8

Cylindrical Pre-Sweeping Unit

8.1 Location on machine

The pre-sweeping unit is located under the machine body in a central position, The sweeping unit control is assembled above it.



8.2 Lubrication Points

For lubrication use standard grease.

- Lifting Arms
- Bushings

8.3 Work requirements

The pre-sweeping 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.
3. The machine is on.
4. The electrobrakes are activated.
5. The pre-sweeping function is activated on the display.
6. The brake pedal is not pressed.
7. The accelerator pedal is pressed.

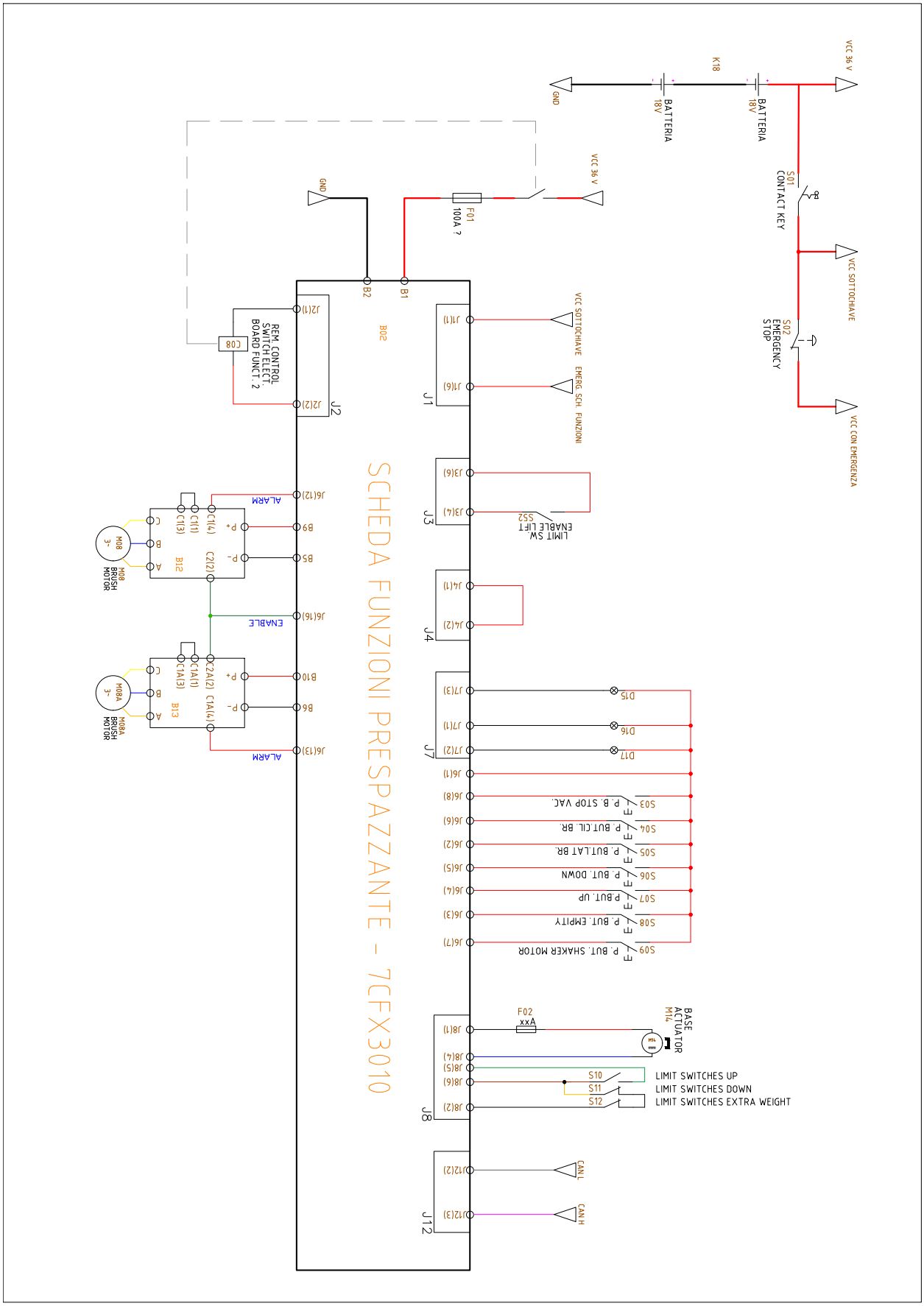
8.4 Operating mode

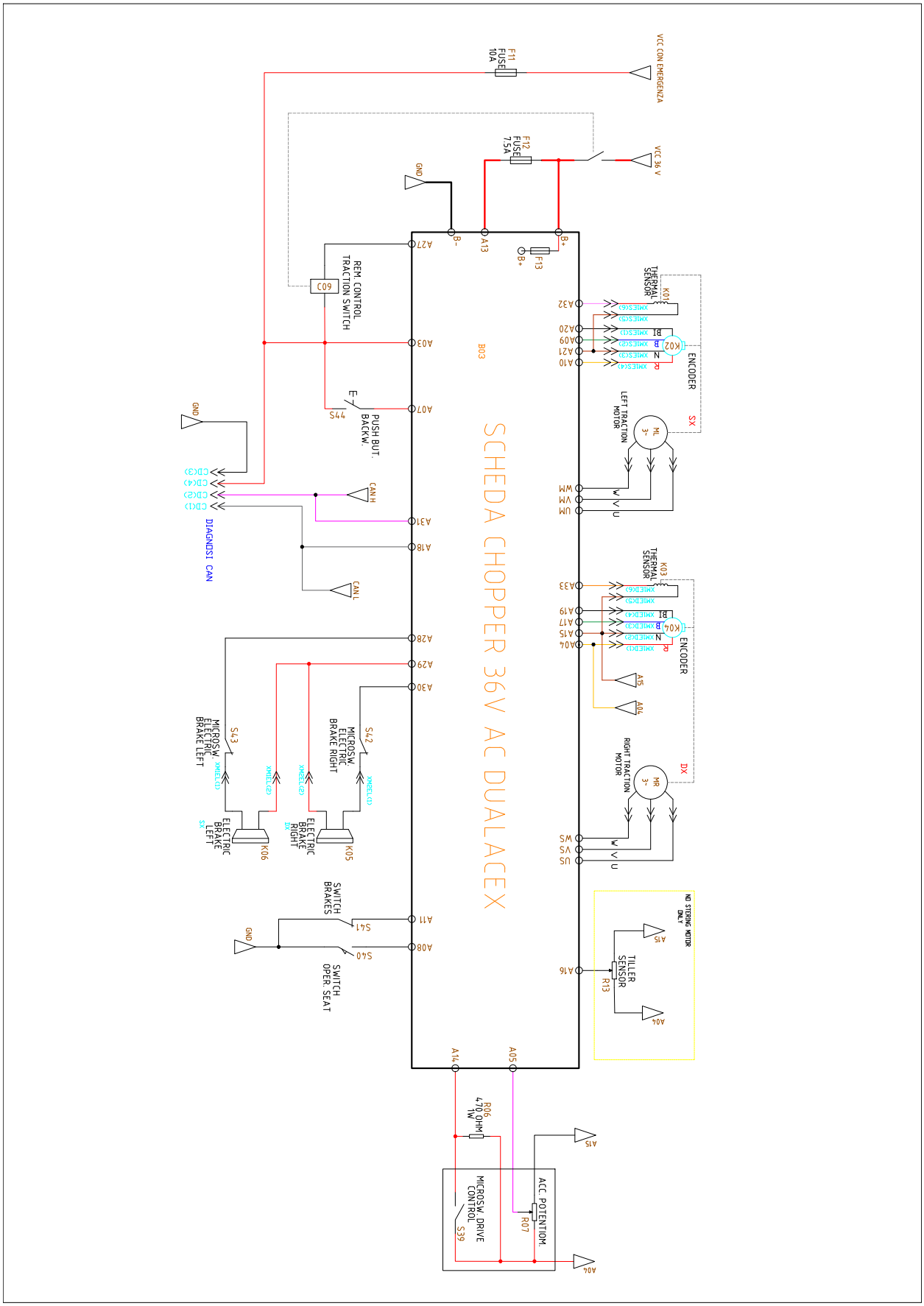
PRESWEEPING

Premise: Operator Seated, Seat Microswitch Closed

Action	**Result**
Washing Enabled Forward pedal pressed	Brushdeck Actuator goes down (+36V to M14) Brush Motors ON after 1,5 seconds (+36V to M08-M08A) Hopper Vacuum Motor ON after 1,5 seconds (+36V to M10)
Backward function enabled during work	Brushdeck Actuator goes down (+36V to M14) Brush Motors ON (+36V to M08-M08A) Hopper Vacuum Motor ON after 1,5 seconds (+36V to M10)
Traction Pedal not pressed during work	Brushdeck Actuator rises after 20 seconds (-36V to M14) Brush Motors OFF Hopper Vacuum Motor OFF
Pre-sweeping unit disabled during work	Brushdeck Actuator rises (-36V to M14) Brush Motors OFF Hopper Vacuum Motor OFF

8.5 Related electrical circuit




SCHEDA CHOPPER 36V AC DUALACEX
VCC CON EMERGENZA
F11 FUSE 10A
VCC 36 V
F12 FUSE 7.5A
GND
B-
A13
B+
F13
B+
A27
REM CONTROL TRACTION SWITCH
603
A03
B03
A07
S44
PUSH BUT. BACKW.
GND
CAN H
CAN L
DIAGNOSI CAN
A31
A18
A28
A29
A30
S43
MICROSW. ELECTRIC BRAKE LEFT
S42
MICROSW. ELECTRIC BRAKE RIGHT
ELECTRIC BRAKE LEFT
SX
K06
ELECTRIC BRAKE RIGHT
DX
K05
SWITCH BRAKES
S41
S40
SWITCH OPER. SEAT
A11
A08
GND
A32
K01
THERMAL SENSOR
A20
A09
A21
A10
K02
ENCODER
LEFT TRACTION MOTOR
ML
3~
SX
U
V
W
U
V
W
A33
K03
THERMAL SENSOR
A19
A17
A15
A04
K04
ENCODER
A15
A04
RIGHT TRACTION MOTOR
MR
3~
DX
U
V
W
U
V
W
NO STEERING MOTOR ONLY
A15
TILLER SENSOR
R13
A04
A16
A14
A05
R06 4,7 OHM 1W
A15
MICROSW. DRIVE CONTROL
S39
ACC POTENTIOM.
R07
A04

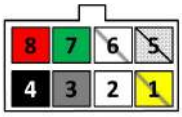
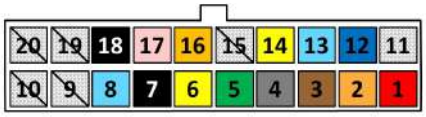
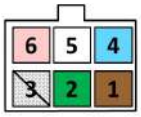
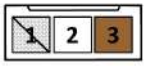
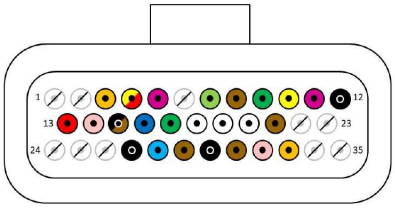
Functionality Check - Brush Deck

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
Brush Motor M08 Activated	J6S(12) ref to J6S(16)	$+V_b$	$-V_b$
Brush Motor M08 Activated	B9 ref to B5	$+V_b$	$-V_b$
Brush Motor M08A Activated	J6S(13) ref to J6S(16)	$+V_b$	$-V_b$
Brush Motor M08A Activated	B10 ref to B6	$+V_b$	$-V_b$
Vacuum Motor M10 Activated	J6S(14) ref to J6S(18)	$+V_b$	$-V_b$
Vacuum Motor M10 Activated	B8 ref to B3	$+V_b$	$-V_b$
Rightside Electrobrake Activated	A29 ref to A30	$+V_b$	$-V_b$
Leftside Electrobrake Activated	A29 ref to A28	$+V_b$	$-V_b$
Traction pedal pressed	A05 ref to A14	$+V_b$	$-V_b$
Brake pedal pressed	A08 ref to A11	$-V_b$	$+V_b$
Seated Operator	A08 ref to A11	$+V_b$	$-V_b$
Brush M08 Alarm	J6S(12) ref to J6S(16)	$-V_b$	$+V_b$
Brush M08A Alarm	J6S(13) ref to J6S(16)	$-V_b$	$+V_b$
Vacuum Motor M10 Alarm	J6S(14) ref to J6S(18)	$+V_b$	$-V_b$
PRO Display Negative	J1M(4)	$-V_b$	$-V_b$
PRO Display Transmitting	J1M(3)	$+V_b$	$-V_b$
PRO Display Receiving	J1M(7)	$+V_b$	$-V_b$
PRO Display Positive	J1M(8)	$+V_b$	$+V_b$
PLUS Display Negative	J12M(2)	$-V_b$	$-V_b$
PLUS Display Positive	J12M(3)	$+V_b$	$+V_b$
Brushes Actuator in motion	J8S(1) ref to J8M(4)	$+V_b$	$-V_b$
Brushes Actuator Rod OUT	J8S(5) ref to J8M(6)	$-V_b$	$+V_b$
Brushes Actuator Rod IN	J8S(2) ref to J8M(6)	$-V_b$	$+V_b$
Maximum pressure limit switch pressed	J8S(2) ref to J8M(6)	$-V_b$	$+V_b$

J1M		J6S	
J8S		J12M	
CNA			

8.5.1 Relative electrical Components

Brush Motor

The brush motors are Brushless, connected to their control board through a connector accessible from the electrical system.
The single brush motor with no load (M08 e M08A) absorbs 5.0 Amps ± 0.5. The single brush motor with Load (M08 e M08A) absorbs 20.0 Amps ± 2.5.

Actuator

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

Debris Hopper Vacuum Motor

(see section 10.4.1 at page 121)

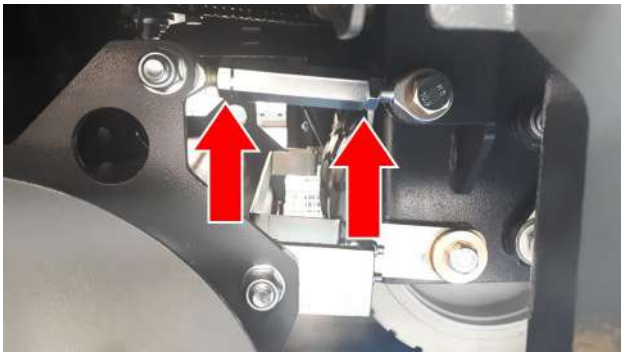
8.6 Adjustments

8.6.1 Pre-sweeping Brush Deck

The scrub deck is fixed to the support arms, which have to be adjusted so that the brush motors have an absorption with maximum gap of 1 Amp among them. This is to ensure that during the work the brushes are aligned to the ground uniformly and perform their function properly.
Requirements: Mounted brush, switched ON machine, and Amperometric Clamp on the motor wires.

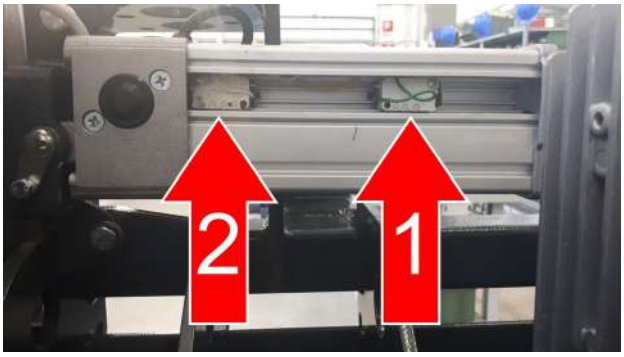
Procedure:

- Hook the brushes to the scrub deck.
- Adjust the left and right hexagons while the absorption is measured on the working scrub deck in operation.
- Once the adjustment has been made, tighten the lock nuts.



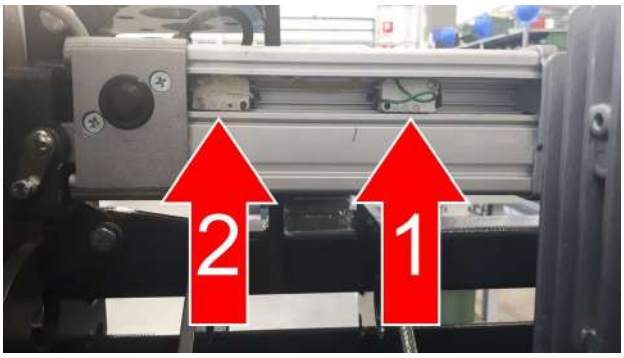
8.6.2 Pre-sweeping Brush Deck Actuator

Remove the brushes from the brushdeck.
On the driver's place, remove the understeer panels to gain access to the actuator.
Adjust the microswitches inside the actuator using the relative adjusting screws.
Take the attached picture as an example, or in case of replacement, the actuator removed from the machine.
Remove the plastic cover from the actuator.
Adjust the microswitches.



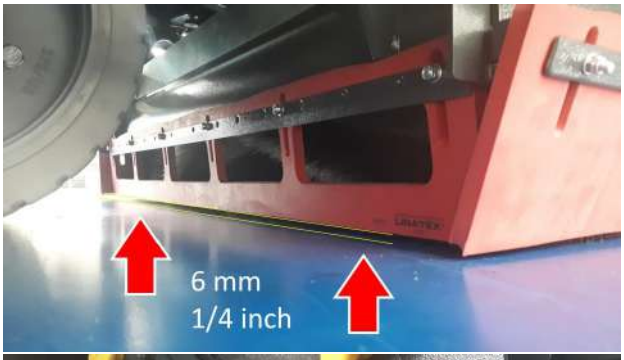
LIFTED BRUSHDECK (1):
Check that the base body comes into contact with the upward limit switch.
Act on the regulation of the microswitch (1).

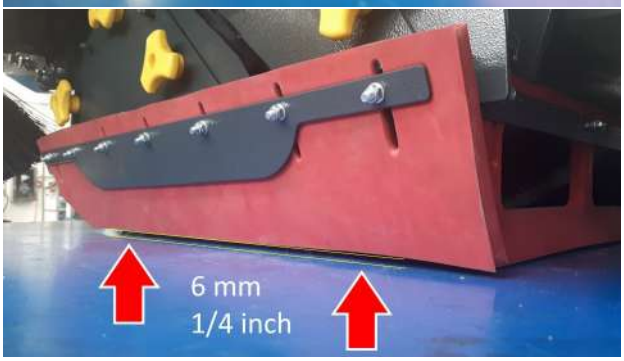
LOWERED BRUSHDECK (2):
Adjust the microswitch (2) to the limit switch.



8.6.3 Dust Rubbers

Hook the brushes to the scrub deck.
Loosen the retaining nuts of the side and rear rubber holder blades.
Insert a 6 mm (1/4") shim under the dust seals and tighten the retaining nuts.





Chapter 9

Side Pre-Sweeping Unit

9.1 Location on machine

The side pre-sweeping unit is located under the machine body in the right and leftside position, the side pre-sweeping unit control is assembled above it.

9.2 Lubrication Points

For lubrication use standard grease.

- Rotation Pins
- Actuator Push Pin

9.3 Work requirements

The side pre-sweeping 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.
3. The machine is on.
4. The electrobrakes are activated.
5. The pre-sweeping function is activated on the display.
6. The side pre-sweeping function is activated.
7. The brake pedal is not pressed.
8. The accelerator pedal is pressed.

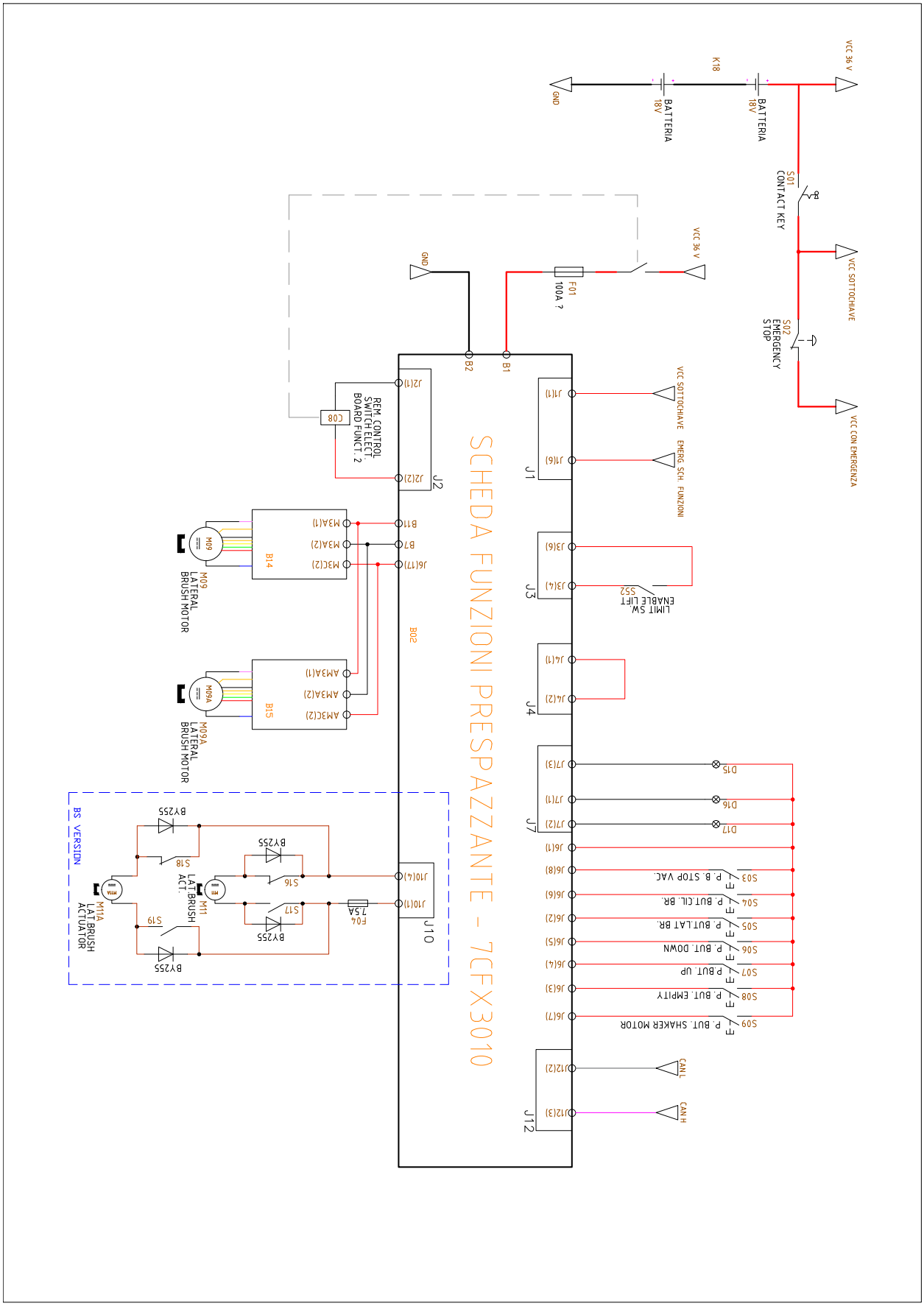
9.4 Operating mode

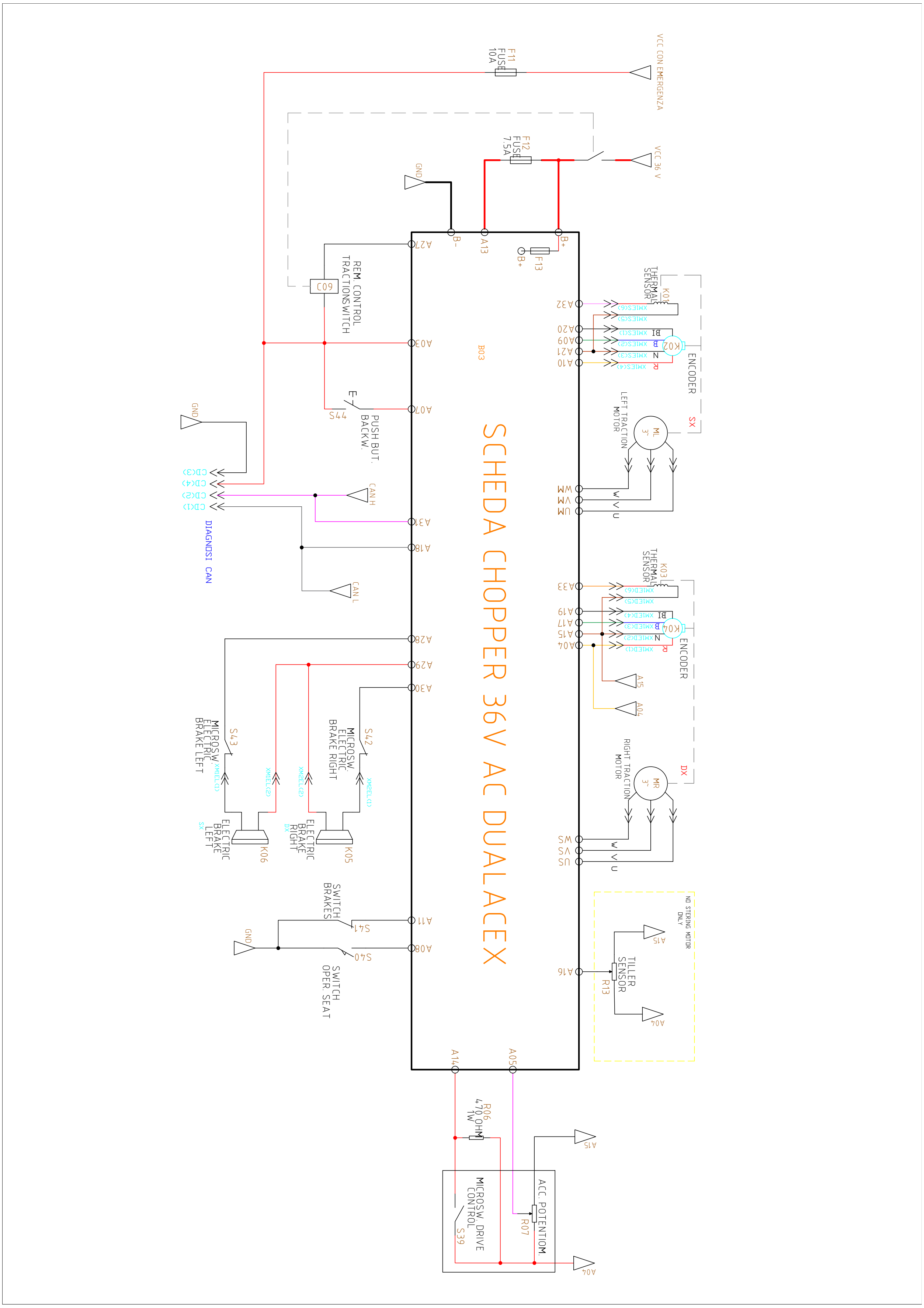
SIDE BRUSHES

Premise: Operator Seated, Seat Microswitch Closed

Action	**Result**
Washing Enabled Forward pedal pressed	Side Brush Actuator goes down (+36V to M11-M11A) Brush Motor ON after 1,5 seconds (+36V to M02-M02A)
Backward function enabled during work	Side Brush Actuator goes down (+36V to M11-M11A) Brush Motor ON (+36V to M02)
Forward pedal not pressed during work	Side Brush Actuator rises after 20 seconds (-36V to M11-M11A) Brush Motor OFF
Washing Disabled during work	Side Brush Actuator rises (-36V to M04) Brush Motor OFF

9.5 Related electrical circuit




SCHEDA CHOPPER 36V AC DUALACE X
B03
VCC CON EMERGENZA
VCC 36 V
F11 FUSE 10A
F12 FUSE 7.5A
F13
GND
B-
B+
REM CONTROL TRACTIONSWITCH
C09
PUSH BUT. BACKW.
S44
CAN H
CAN L
DIAGNOSI CAN
THERMAL SENSOR
ENCODER
LEFT TRACTION MOTOR
ML 3~
SX
RIGHT TRACTION MOTOR
MR 3~
DX
K01
K02
K03
K04
MICROSW. ELECTRIC BRAKE LEFT
S43
MICROSW. ELECTRIC BRAKE RIGHT
S42
ELECTRIC BRAKE LEFT
K06
ELECTRIC BRAKE RIGHT
K05
SWITCH BRAKES
S41
SWITCH OPER. SEAT
S40
TILLER SENSOR
R13
R06 470 OHM 1W
ACC. POTENTIOM.
R07
MICROSW. DRIVE CONTROL
S39

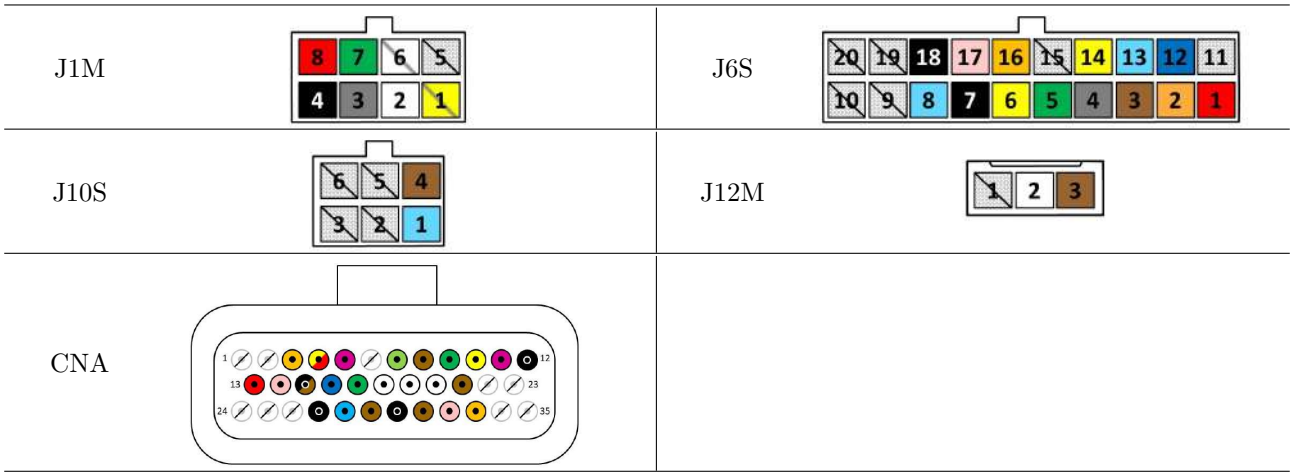
Functionality Check - Side Brush

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
Brush Motor M09 Activated	J6S(17)	$+V_b$	$-V_b$
Brush Motor M09 Activated	B11 ref to B7	$+V_b$	$-V_b$
Brush Motor M09A Activated	J6S(17)	$+V_b$	$-V_b$
Brush Motor M09A Activated	B11 ref to B7	$+V_b$	$-V_b$
Rightside Electrobrake Activated	A29 ref to A30	$+V_b$	$-V_b$
Leftside Electrobrake Activated	A29 ref to A28	$+V_b$	$-V_b$
Traction pedal pressed	A05 ref to A14	$+V_b$	$-V_b$
Brake pedal pressed	A08 ref to A11	$-V_b$	$+V_b$
Seated Operator	A08 ref to A11	$+V_b$	$-V_b$
Brush M09 Alarm	J6S(17)	$-V_b$	$+V_b$
Brush M09A Alarm	J6S(17)	$-V_b$	$+V_b$
PRO Display Negative	J1M(4)	$-V_b$	$-V_b$
PRO Display Transmitting	J1M(3)	$+V_b$	$-V_b$
PRO Display Receiving	J1M(7)	$+V_b$	$-V_b$
PRO Display Positive	J1M(8)	$+V_b$	$+V_b$
PLUS Display Negative	J12M(2)	$-V_b$	$-V_b$
PLUS Display Positive	J12M(3)	$+V_b$	$+V_b$
Brushes Actuator in motion	J10S(1) ref to J10S(4)	$+V_b$	$-V_b$



9.5.1 Relative electrical Components

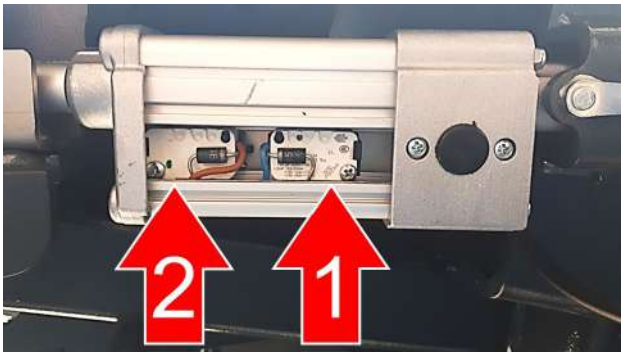
Brush Motor

The brush motor transfers the motion to the brushes.
The single brush motor with no load (M02 & M02A) absorbs 1.0 Amps ± 0.1. The single brush motor with load (M02 & M02A) absorbs 9.0 Amps ± 1.0.

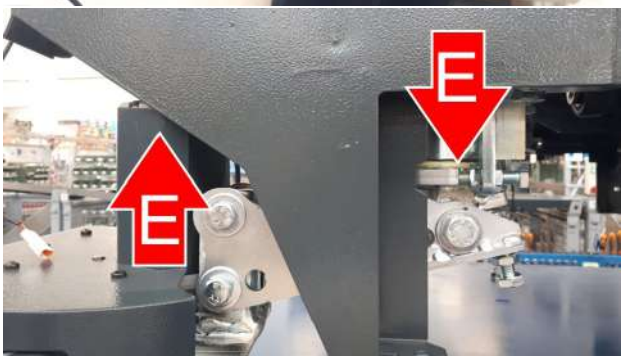
9.6 Adjustments

9.6.1 Side Brushes Actuator

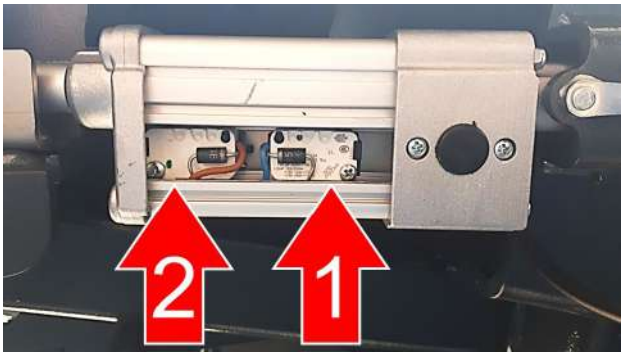
Adjust the microswitches inside the jack using the appropriate adjusting screws.
Take the attached picture as an example, or if replacing, the actuator removed from the machine.
Remove the plastic cover from the actuator.
Act on the regulation of the microswitches.



LIFTED BRUSHDECK (1):
Check that the base body comes into contact with the upward limit switch (1).
Act on the regulation of the microswitch (1).
Adjust the side movement of the deck (E) using the screw and the limit lock nut, so that the brush motor protection casing (E) does not collide with the machine frame when it rises.

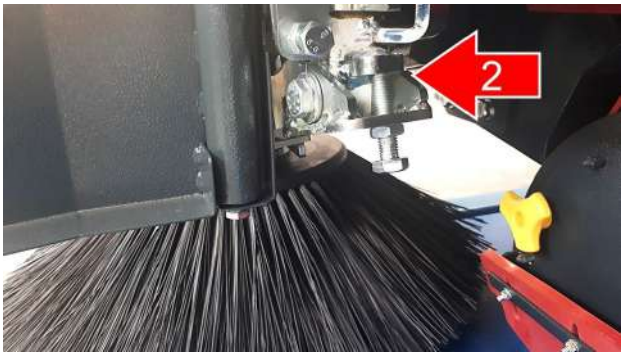


LOWERED BRUSHDECK (2):
Adjust the microswitch (2) to the limit switch.



9.6.2 Sweeping Side Brushes

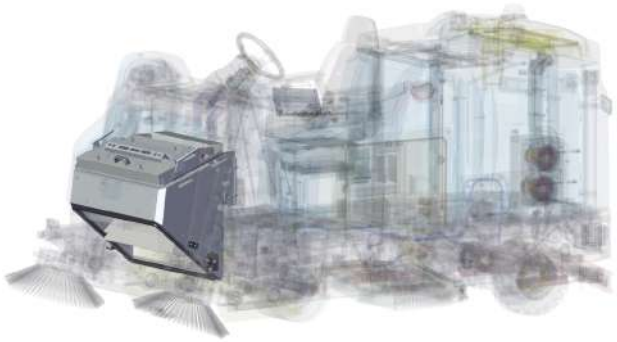
Act on the adjustment screw (2) for the maximum descent of the brush, until the bristles touch the floor for 1 cm.



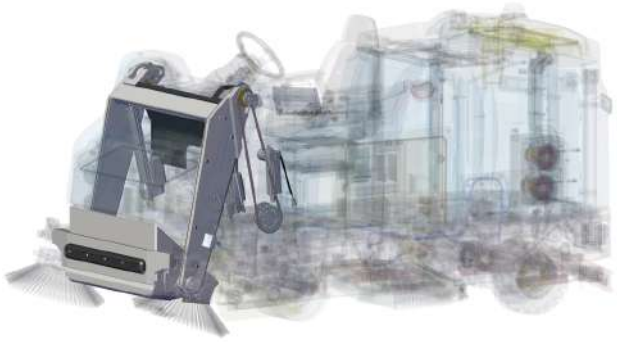
Chapter 10

Debris Hopper Unit

10.1 Location on machine



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



10.2 Work requirements

The control of the debris hopper unit only works if the following conditions are met:

1. The batteries are not discharged.
2. The machine is on.
3. Movement control buttons are pressed.

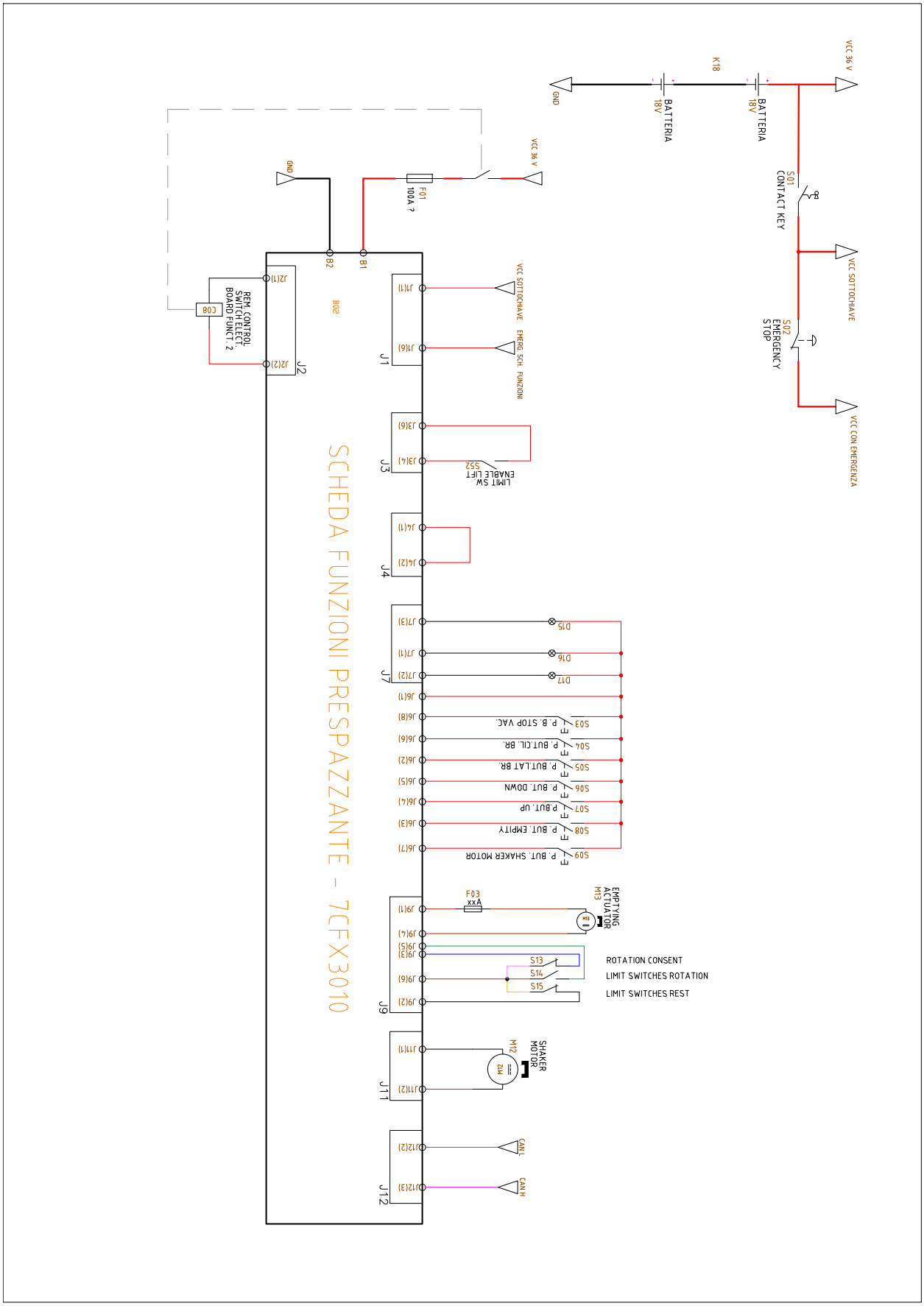
10.3 Operating mode

HOPPER MOVEMENT

Premise: Machine ON

Action	Result
Lifting activated Rotation activated	Actuators Lift (+36V to M15 & M15A) Rotation disabled until the rotation enable microswitch is reached (S13), once consent has been received, the actuator rotates the hopper (+36V to M13)
Lifting released	Actuators stop in the reached position
Lowering activated	Actuators lower (-36V to M15 & M15A)
Lowering released	Actuators stop in the reached position
Movement consent Micro activated (S52)	It is possible to lift the hoper (+36V to M15 & M15A) but it is not possible to lower it
Rotation activated	After the consent of the microswitch (S13), the actuator rotates the hopper (+36V to M13)
Rotation released	The jack brings the hopper back into position (-36V to M13)
Filter shaker activated	The Filter Shaker is activated for 3 seconds (+36V to M12)

10.4 Related electrical circuit



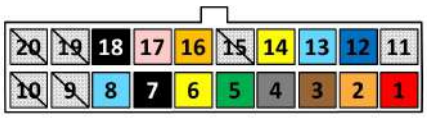
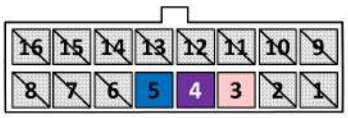
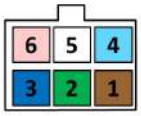
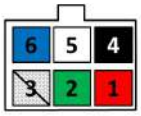
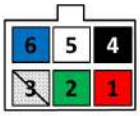
Functionality Check - Hopper Movement

Conventions:

- $+V_b$: Positive voltage of the battery.
- $-V_b$: Negative voltage of the battery.

Input/output:

Satisfied condition	Pin	V at work	V at rest
Lifting Actuator M15 in motion	J7D(1) ref to J7D(4)	$+V_b$	$-V_b$
Lifting Actuator M15 in motion	J7D(5) ref to J7D(6)	$-V_b$	$+V_b$
Lifting Actuator M15 in motion	J7D(2) ref to J7D(6)	$-V_b$	$+V_b$
Lifting Actuator M15 Lifting	J6S(4) ref to J6S(1)	$-V_b$	$+V_b$
Lifting Actuator M15 Lowering	J6S(5) ref to J6S(1)	$-V_b$	$+V_b$
Lifting Actuator M15A in motion	J4D(1) ref to J4D(4)	$+V_b$	$-V_b$
Lifting Actuator M15A in motion	J4D(5) ref to J4D(6)	$-V_b$	$+V_b$
Lifting Actuator M15A in motion	J4D(2) ref to J4D(6)	$-V_b$	$+V_b$
Lifting Actuator M15A Lifting	J6S(4) ref to J6S(1)	$-V_b$	$+V_b$
Lifting Actuator M15A Lowering	J6S(5) ref to J6S(1)	$-V_b$	$+V_b$
Rotation Actuator M13 in motion	J9S(4) ref to J9S(1)	$+V_b$	$-V_b$
Rotation Actuator M13 in motion	J9S(5) ref to J9S(6)	$-V_b$	$+V_b$
Rotation Actuator M13 in motion	J9S(2) ref to J9S(6)	$-V_b$	$+V_b$
Rotation Actuator M13 in motion	J9S(3) ref to J9S(6)	$-V_b$	$+V_b$
Rotation Actuator M13 opening	J6S(3) ref to J6S(1)	$+V_b$	$-V_b$
Rotation Actuator M13 closing	J6S(3) ref to J6S(1)	$-V_b$	$+V_b$
Filter Shaker activated	J11S(1) ref to J11S(2)	$+V_b$	$-V_b$
Filter Shaker activated	J6S(7)	$+V_b$	$-V_b$

J6S		J7S	
J9S		J11S	
J4D		J7D	

10.4.1 Relative electrical Components

Debris Hopper Vacuum Motor

The vacuum motor produces a depression in the Debris Hopper which causes an air flow that runs through the entire hopper and allows the dust and debris to be sucked up after the sweeping action of the brooms.
The vacuum motor (M10) absorbs:
- in 1st speed 2 Amps ± 0.2.
- in 2nd Speed 4 Amps ± 0.3.
- in 3rd speed 6 Amps ± 0.3.

Lowering consent Microswitch

The lowering consent microswitch, which can be activated via the safety pin only in the condition of the body completely raised, inhibits lowering, while allowing the body to be raised up to the end of its stroke.

Lifting Actuators

The lifting actuators lift the hopper with the arms.

Rotation enable microswitch

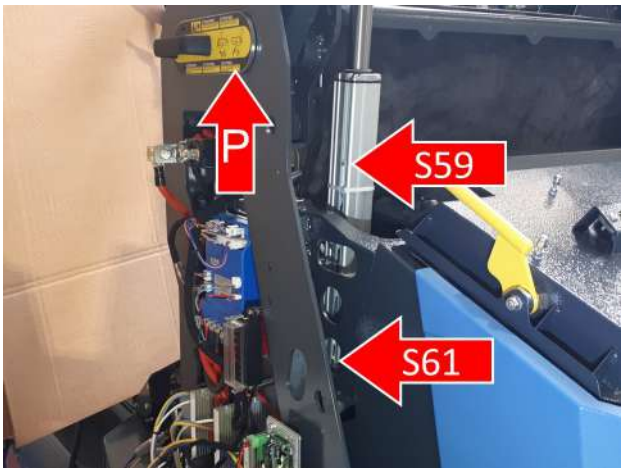
The Rotation Enable Microswitch allows the container to rotate only when it has been raised enough not to collide with the machine frame.

Rotation Actuator

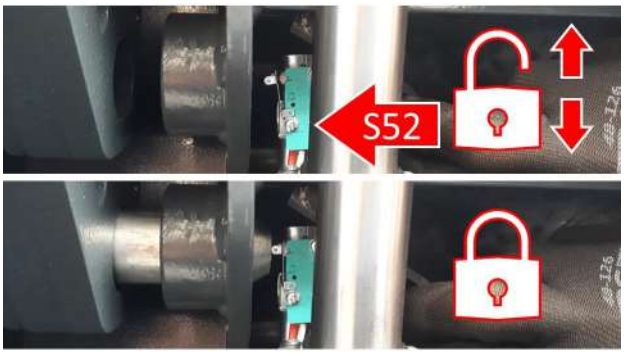
The rotation actuator, through a crown and chain system, rotates the hopper for emptying.

10.5 Adjustments

10.5.1 Hopper Lifing Actuators

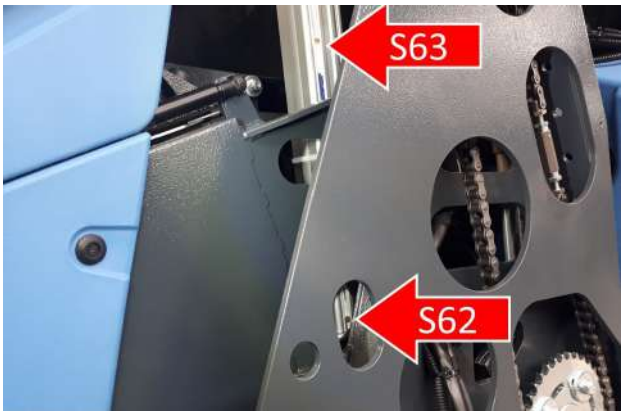


Remove the right and left side covers and disconnect the headlight connector.
Adjust the microswitches on the actuator using the appropriate adjusting screws.
The aim of the adjustment is to obtain an easy passage of the safety pin (P).
Adjust the microswitch settings.
1. Raised hopper
2. Closed hopper



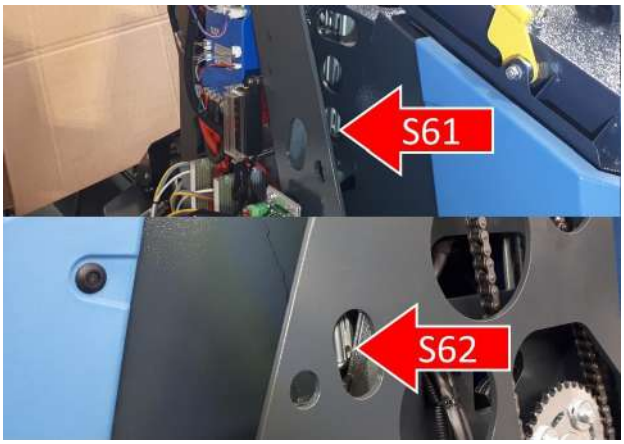
RAISED HOPPER (1):
Check that the safety pin (P) passes easily until it can activate the descent block microswitch (S52).
Act on the regulation of the microswitch (S59).

Once the microswitch (S59) of the right actuator has been adjusted, adjust the microswitch (S63) of the left actuator



So that the ground clearance of the hopper is equal at the ends

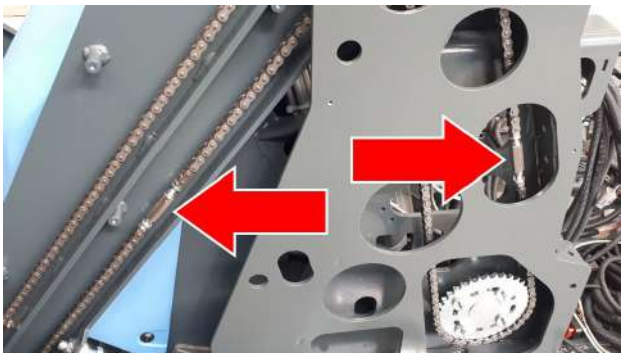
CLOSED HOPPER (2):
Using the holes on the frame, adjust the microswitches (S61) and (S62) so that the hopper adheres to the gasket and correctly closes the collection suction system.



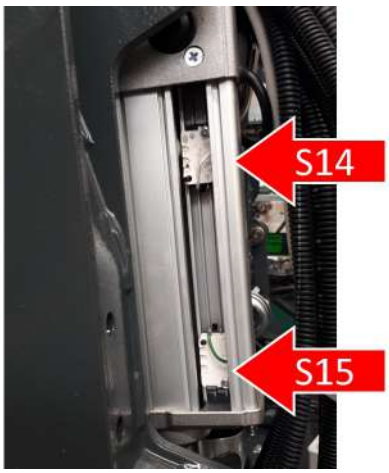
10.5.2 Hopper Rotation Actuator

Remove the left side covers and disconnect the headlight connector.
Check the adjustment of the rotation enable microswitch (S13).

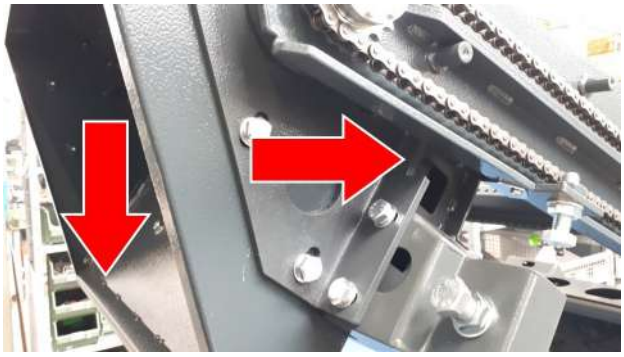
Check the correct tension of the hopper movement chains. If necessary, adjust using the hexagonal columns



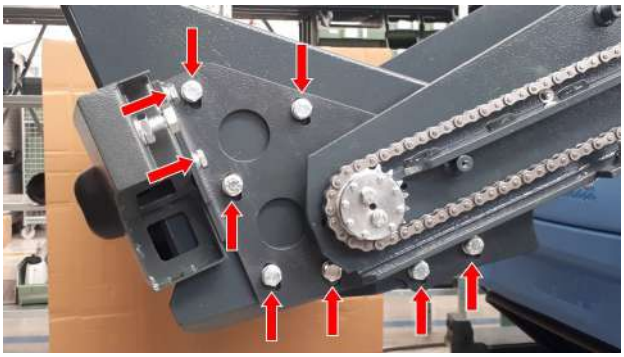
The aim of the adjustment is to obtain a homogeneous adhesion of the hopper to the gasket.
Remove the plastic cover from the actuator.
Adjust the microswitches (S14) and (S15) using the appropriate adjusting screws.
1. Download position
2. Collection position



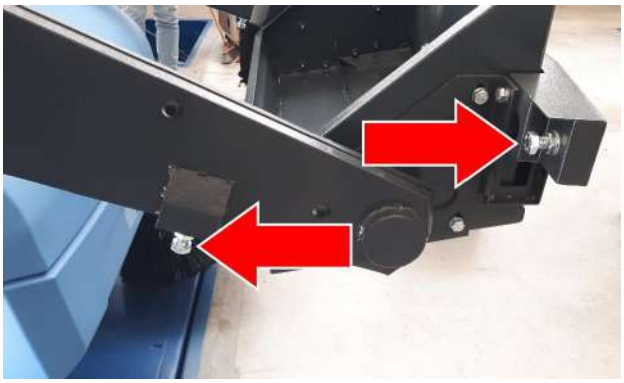
DOWNLOAD POSITION (1):
Act on the regulation of the microswitch (S14). The hopper must rotate until it can empty completely, but not collide with the lift arm.



COLLECTION POSITION (2):
Adjust the microswitch (S15) so that the hopper adheres to the gasket and correctly closes the collection suction system. If necessary, loosen the bolts on the sides of the hopper, adjust their position on the brackets and retighten the bolts.



After adjusting the hopper rotation, adjust and tighten the body support bolts to the machine frame.



Chapter 11

Vacuum Unit

11.1 Location on machine

The vacuum unit is located in central rear position.

11.2 Lubrication Points

For lubrication use standard grease.

- Lifting Lever
- Bushings and Pins

11.3 Work requirements

The Vacuum 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.
3. The machine is on.
4. The electrobrakes are activated.
5. The functions setting on the display is Drying or Washing + Drying.
6. The recovery tank is not full.
7. The brake pedal is not pressed.
8. The accelerator pedal is pressed.

11.4 Operating mode

VACUUM

Premise: Operator Seated, Seat Microswitch Closed

Action	**Result**
Vacuum Enabled Forward pedal pressed	Squeegee Actuator goes down (+36V to M06) Vacuum motors ON (+36V to M03-M03A)
Backward function enabled during work	Squeegee Actuator rises (-36V to M06).
Traction Pedal not pressed during work	Vacuum motor OFF after 10 seconds at maximum level.
Vacuum Disabled during work	Squeegee Actuator rises (-36V to M06) Vacuum Motor OFF after 10 seconds at maximum level.

RECOVERY TANK FLOATER

Premise: Operator Seated, Seat Microswitch Closed

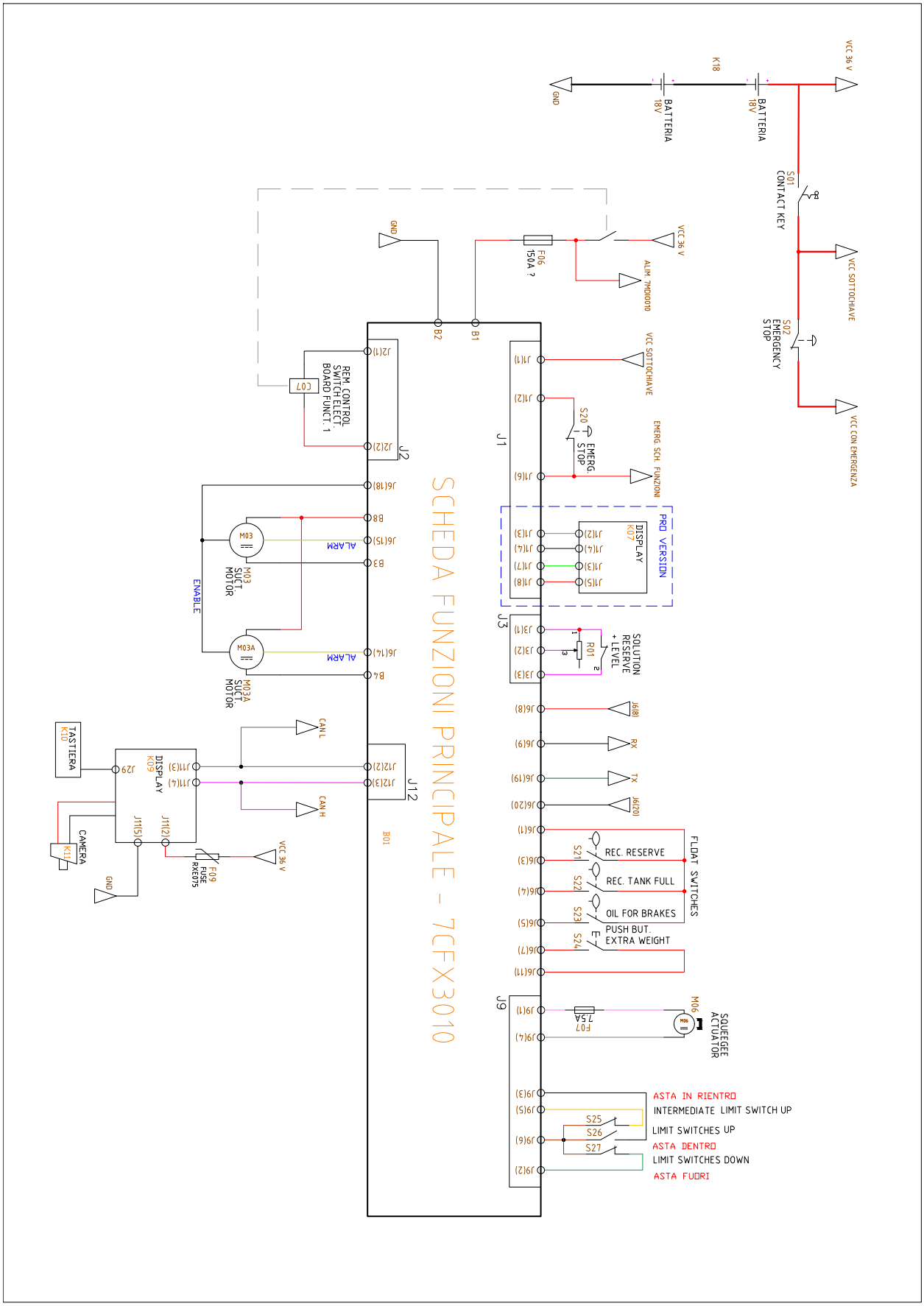
Action	Result
Floater enabled (full tank)	Floater ON (+36V to J6(4)) Vacuum motor OFF (ref to M03-M03A)

VACUUM WAND

Premise: Operator Seated, Seat Microswitch Closed

Action	Result
Wand button enabled	Vacuum motor ON (+36V to M03-M03A) Squeegee Actuator goes down (+36V to M06)
Wand button disabled	Vacuum motor OFF (+0V to M03-M03A) after 10 seconds at maximum level. Squeegee Actuator rises (-36V to M06) after the next traction consent.

11.5 Related electrical circuit



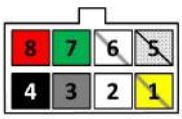
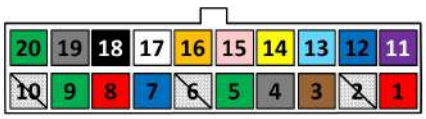
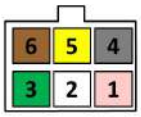
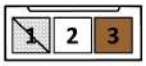
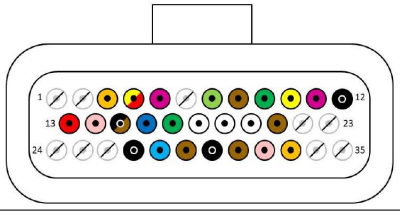
Functionality Check - Vacuum Unit

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
Vacuum Motor M03 Activated	J6M(15) ref to J6M(18)	$+V_b$	$-V_b$
Vacuum Motor M03 Activated	B8 ref to B3	$+V_b$	$-V_b$
Vacuum Motor M03A Activated	J6M(14) ref to J6M(18)	$+V_b$	$-V_b$
Vacuum Motor M03A Activated	B8 ref to B4	$+V_b$	$-V_b$
Rightside Electrobrake Activated	A29 ref to A30	$+V_b$	$-V_b$
Leftside Electrobrake Activated	A29 ref to A28	$+V_b$	$-V_b$
Traction pedal pressed	A05 ref to A14	$+V_b$	$-V_b$
Brake pedal pressed	A08 ref to A11	$-V_b$	$+V_b$
Recovery Tank Floater activated	J6M(1) ref to J6M(4)	$-V_b$	$+V_b$
Seated Operator	A08 ref to A11	$+V_b$	$-V_b$
Brush M02 Alarm	J6M(15) ref to J6M(18)	$-V_b$	$+V_b$
Brush M02A Alarm	J6M(14) ref to J6M(18)	$-V_b$	$+V_b$
PRO Display Negative	J1M(4)	$-V_b$	$-V_b$
PRO Display Transmitting	J1M(3)	$+V_b$	$-V_b$
PRO Display Receiving	J1M(7)	$+V_b$	$-V_b$
PRO Display Positive	J1M(8)	$+V_b$	$+V_b$
PLUS Display Negative	J12M(2)	$-V_b$	$-V_b$
PLUS Display Positive	J12M(3)	$+V_b$	$+V_b$
Squeegee Actuator in motion	J9M(6) ref to J9M(3)	$+V_b$	$-V_b$
Squeegee Actuator Rod OUT	J9M(6) ref to J9M(2)	$-V_b$	$+V_b$
Squeegee Actuator Rod IN	J9M(6) ref to J9M(5)	$-V_b$	$+V_b$

J1M		J6M	
J9M		J12M	
CNA			

11.5.1 Relative electrical Components

Actuator

The squeegee lifting actuator, by means of the lever and the tie rod, lowers the squeegee and pushes it to the ground.

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.
The single vacuum motor with no load (M03 & M03A) absorbs 17,0 Amps ± 2.0. The single vacuum motor with load (M03 & M03A) absorbs 11.5 Amps ± 1.0.

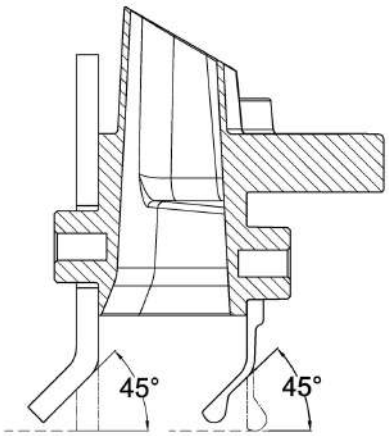
Floater microswitch

The Floater microswitch by means of the lever, indicates when the water level is at critical level of overflow or empty in the case of recycling system (optional).

11.6 Adjustments

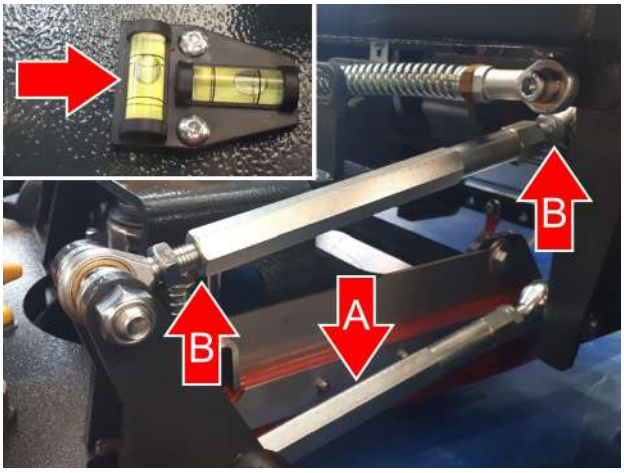
11.6.1 Squeegee

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.



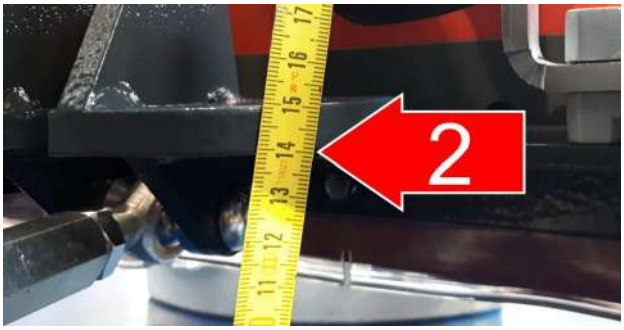
Procedure:

Switch ON the machine and lower the squeegee to the floor.
Slowly advance by pressing the traction pedal.
The fixed adjustment lower arm (A), if necessary, must be adjusted to 29cm (11,2/5") between the center of the two eyelets.
During advancement, adjust the squeegee using the upper arms (B) so as to obtain an inclination of the squeegee rubbers with respect to the floor of 45 degrees along their entire length. Also use the level bubble for confirmation.

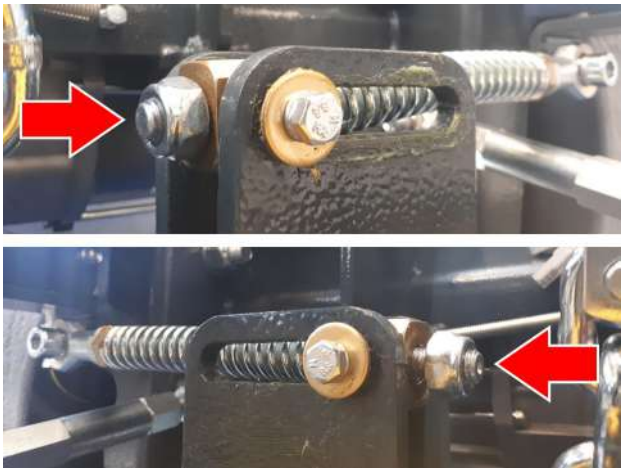


Turn the adjustment knobs on the support wheels to adjust the height of the squeegee. Also use the level bubble for confirmation.

The height of the wiper support indicated must be 14cm (5.1/2") from the ground.



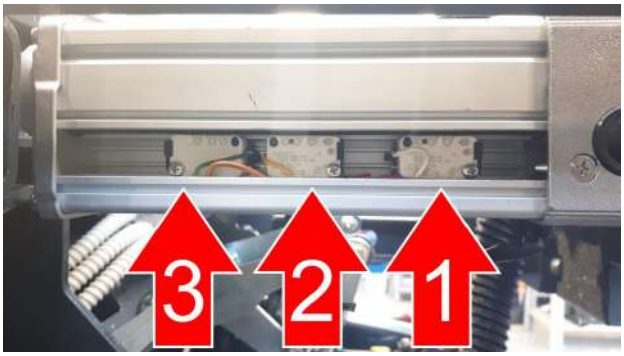
Adjust the two lateral springs so that the squeegee has no lateral play. Refer to the adjustment in the figure



Adjust the side squeegee rubbers using the adjustment nut, leaving two screw threads protruding.

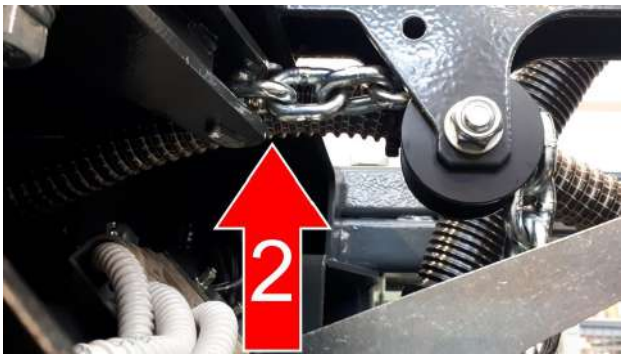
11.6.2 Squeegee Actuator

Adjust the micro switches inside the actuator using the appropriate adjusting screws.
Take the attached picture as an example, or in case of replacement, the actuator removed from the machine.
Remove the plastic cover from the actuator.
Adjust the microswitch settings.
1. Raised Squeegee
2. Maintenance Position
3. Lowered Squeegee

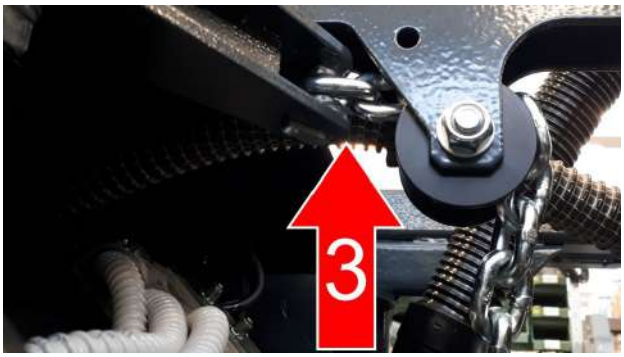


1. LIFTED SQUEEGEE
Check that the chain comes out about 4 links.

2. MAINTENANCE POSITION
Check that the chain comes out about 2 links.



3. LOWERED SQUEEGEE
Check that the bracket does not collide with the machine frame. At least 5mm (1/5") of space should remain.



Chapter 12

Frame and Traction Unit

GMG B / GMG BS

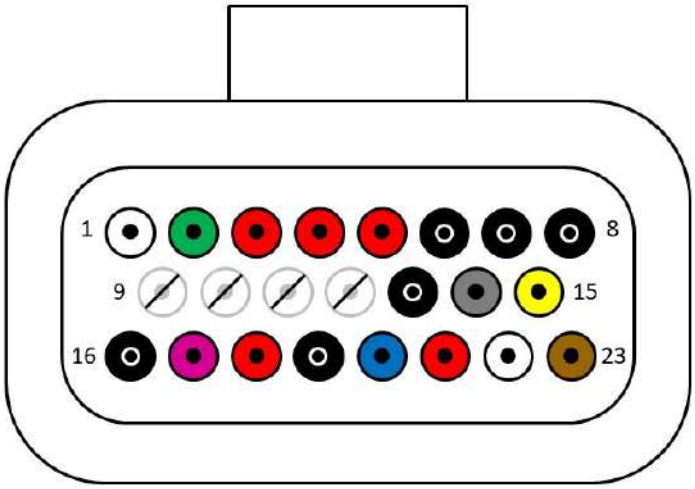
GMG Combinata

12.1 Location on machine

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

12.1.1 Power steering

GMG B and GMG BS can mount power steering on request.
GMG Combinata presents power steering as standard.
The electrical system connector that connects to the power steering motor has the following diagram.



Pin	Type	Wire	Info	Description
A01	IN	White	182	Steering axis signal
A02	OUT	Green	183	Steering axis signal
A03	IN	Red	193	Power steering Positive
A04	IN	Red	193	Power steering Positive
A05	IN	Red	193	Power steering Positive
A06	IN	Black	GND	Power steering Negative
A07	IN	Black	GND	Power steering Negative
A08	OUT	Black	GND	Power steering Negative
A13	IN	Black	188	Steering axis Negative
A14	IN	Gray	192	Power steering relay Positive
A15	OUT	Yellow	5	Key Positive
A16	OUT	Black	105	Power steering relay Negative
A17	OUT	Purple	196	Torque Sensor Signal
A18	OUT	Red	179	Steering axis Positive
A19	OUT	Black	195	Torque Sensor Negative
A20	OUT	Blue	197	Torque Sensor Signal
A21	OUT	Red	198	Torque Sensor Positive
A22	IN	White	173	CAN L
A23	IN	Brown	177	CAN H

12.2 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.
3. The machine is on.
4. The electrobrakes are activated.
5. The brake pedal is not pressed.
6. The accelerator pedal is pressed.

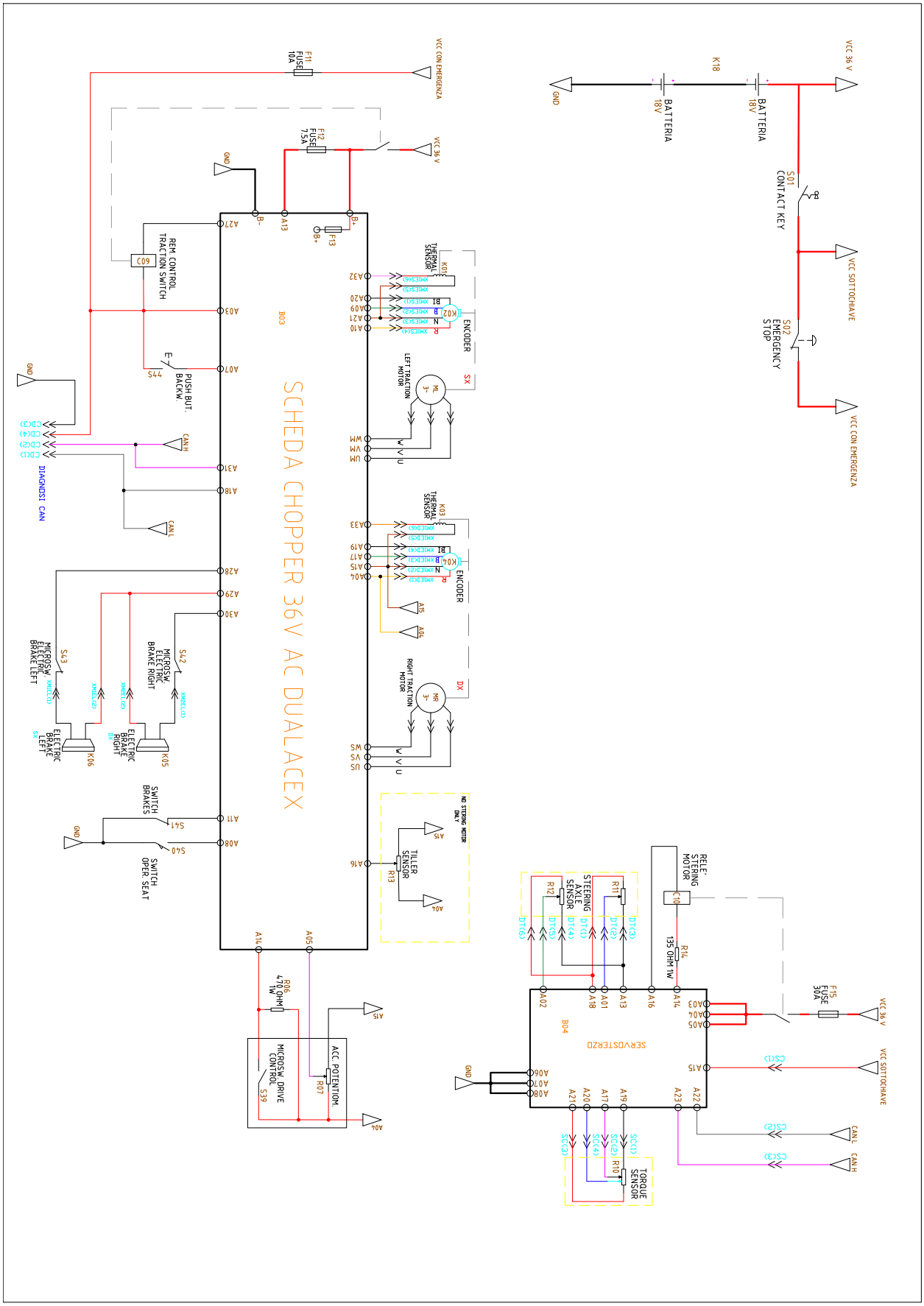
12.3 Operating mode

TRACTION

Premise: Operator Seated, Seat Microswitch Closed

Action	**Result**
Forward pedal pressed	Rightside Motorwheel ON (ref to US-VS-WS traction controller) Leftside Motorwheel ON (ref to UM-VM-WM traction controller)
Backward function enabled	Rightside Motorwheel ON (ref to US-VS-WS traction controller) Leftside Motorwheel ON (ref to UM-VM-WM traction controller)
Backwards activated while driving forward	Right and Left Drivewheel stop according to the deceleration ramp, then they start the reverse according to the acceleration ramp
Released pedal while driving	Right and Left Drivewheel stop according to the deceleration ramp
Brake pedal pressed while driving	Right and Left Drivewheel stop according to the deceleration ramp

12.4 Related electrical circuit



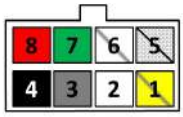
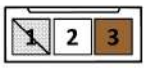
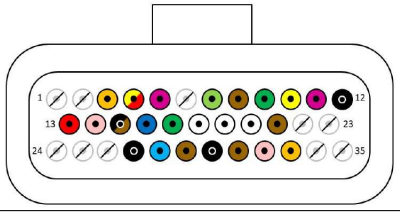
Functionality Check - Traction Unit

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
Traction pedal pressed	A05 ref to A14	$+V_b$	$-V_b$
Brake pedal pressed	A08 ref to A11	$-V_b$	$+V_b$
Seated Operator	A08 ref to A11	$+V_b$	$-V_b$
Traction Contactor Activated	A03 ref to A27	$+V_b$	$-V_b$
Rightside Electrobrake Activated	A29 ref to A30	$+V_b$	$-V_b$
Leftside Electrobrake Activated	A29 ref to A28	$+V_b$	$-V_b$
Rightside Motorwueel Activated	US ref to B-	$+V_b$	$-V_b$
Rightside Motorwueel Activated	VS ref to B-	$+V_b$	$-V_b$
Rightside Motorwueel Activated	WS ref to B-	$+V_b$	$-V_b$
Leftside Motorwueel Activated	UM ref to B-	$+V_b$	$-V_b$
Leftside Motorwueel Activated	VM ref to B-	$+V_b$	$-V_b$
Leftside Motorwueel Activated	WM ref to B-	$+V_b$	$-V_b$
Rightside Encoder Activated	A04 ref to A15	$+V_b$	$-V_b$
Leftside Encoder Activated	A10 ref to A21	$+V_b$	$-V_b$
Rightside Thermic Probe activated	A33	$+V_b$	$-V_b$
Leftside Thermic Probe activated	A32	$+V_b$	$-V_b$
PRO Display Negative	J1M(4)	$-V_b$	$-V_b$
PRO Display Transmitting	J1M(3)	$+V_b$	$-V_b$
PRO Display Receiving	J1M(7)	$+V_b$	$-V_b$
PRO Display Positive	J1M(8)	$+V_b$	$+V_b$
PLUS Display Negative	J12M(2)	$-V_b$	$-V_b$
PLUS Display Positive	J12M(3)	$+V_b$	$+V_b$

J1M		J12M	
CNA			

12.4.1 Relative electrical Components

Traction Motorwheels

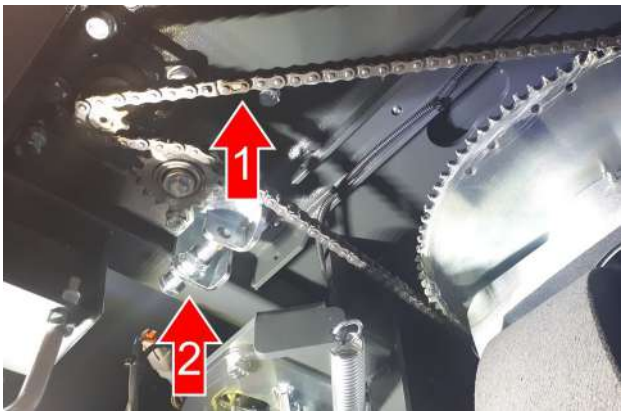
The traction of the machine is ensured by two rear motor wheels controlled by an electronic board.
The single traction motor wheel (NL and NR) depending on the working mode can have different absorptions:
ECO: 32.0 Amps ± 2.0
COMFORT: 32.0 Amps ± 2.0
DYNAMIC: 45.0 Amps ± 3.0
HEAVY: 32.0 Amps ± 2.0
POWER: 17.0 Amps ± 1.5

Batteries

The batteries must have a voltage of 36V. Six 6V monoblock elements or a 36V single box can be installed (see section 3.2.11 at page 42).

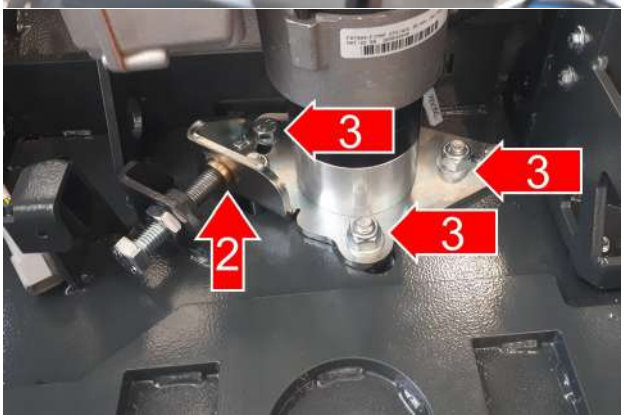
12.5 Adjustments

12.5.1 Steering Chain



Remove the front metal bumper.
If necessary, remove the chain via the link (1), clean and grease the chain.
When reassembling the chain, keep the link 3 links away from the steering column crown.
Adjust with the chain tensioner (2) until obtaining a medium tension of the chain, which must have no backlash.

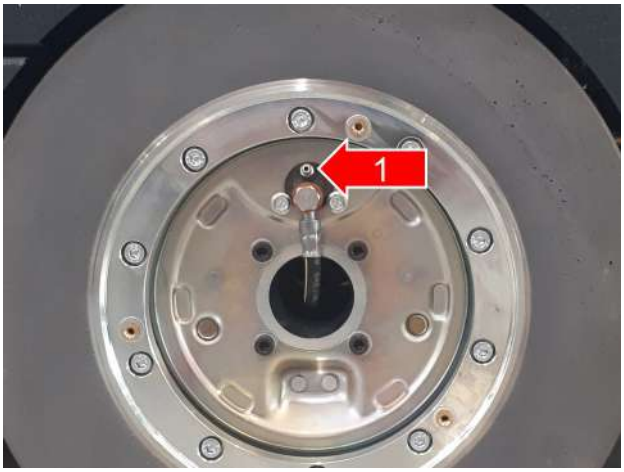
12.5.2 Power Steering Chain



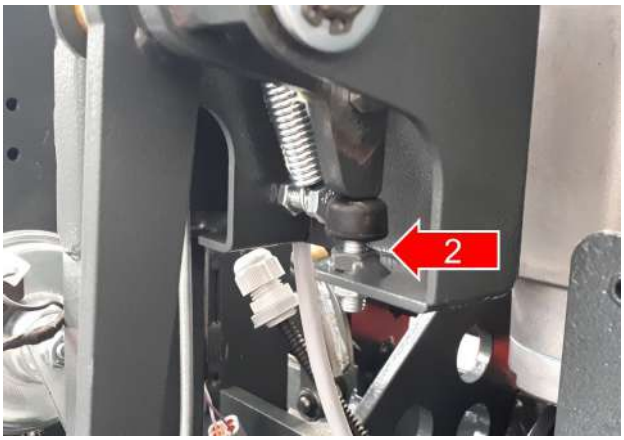
On GMG B/BS remove the front metal bumper.
On GMG Combinata, lift the waste container and insert the safety catch.
On the driver's seat, remove the understeer panels to gain access to the power steering.
Loosen the power steering fastening nuts (3).
If necessary, remove the chain using the pin (1), clean and grease the chain.
When reassembling the chain, keep the pin at a distance from the chainring that allows you to operate.
Adjust with the chain tensioner (2) until obtaining a medium tension of the chain, which must have no backlash.
Tighten the power steering fixing nuts (3).

12.5.3 Brakes Oil Bleeding

For the braking system use the oil type DOT 4 or equivalent oil. If the brake oil level needs to be restored, proceed as follows.



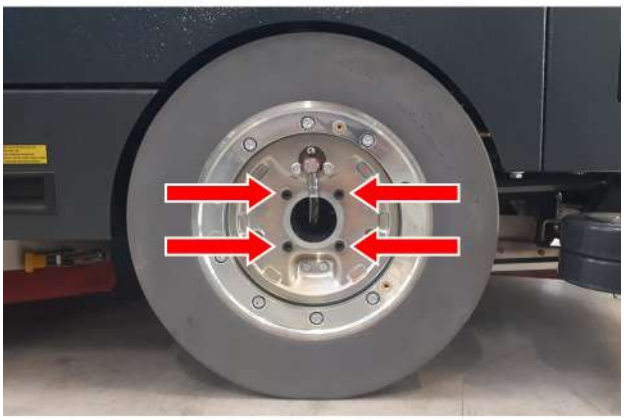
Remove the right rear wheel cover.
Loosen the bleeder outlet nut (1) to let the air bubbles out, and prepare a drain pipe for bleeding the oil from the system .



On the driver's seat, remove the understeer panels to gain access to the oil bottle.
Fill the brake oil bottle.
Fully press the brake pedal 3-4 times to pump the oil inside the circuit.
Tighten the bleeder outlet nut (1).
Repeat the operation for the other wheel.
Repeat this operation until no more air comes out and the brake pedal is harder to press.
If necessary, adjust the pedal limit switch (2) to give it a few millimeters of backlash.

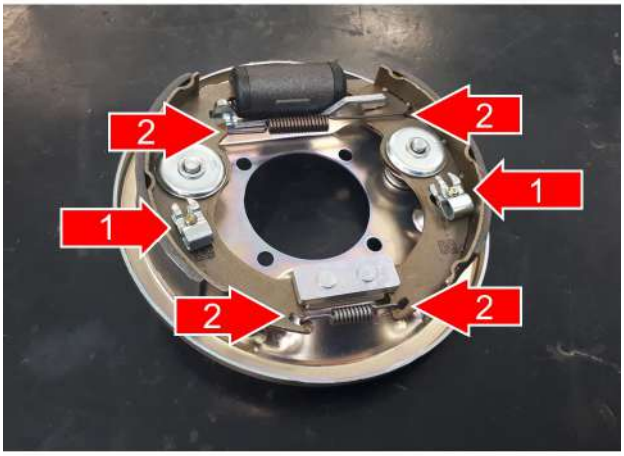
12.6 Disassembly

12.6.1 Brake group



Remove the rear wheel cover.
Remove the screws fixing the brake unit to the motor.

Remove the fixing clips (1).
Remove the springs (2) from their housings.
Remove the brake blocks from their housings.
Fit new logs and reassemble.
The brakes are self-adjusting, they do not require adjustment.

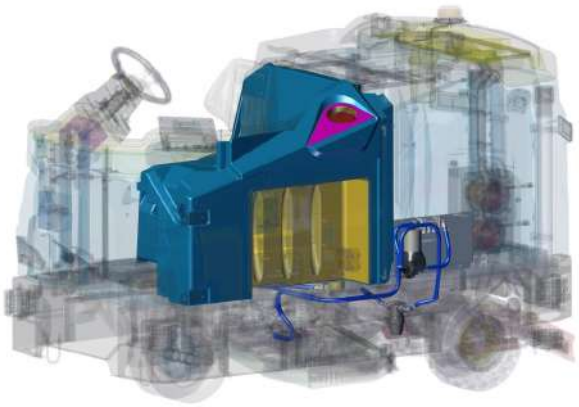


Chapter 13

Water Unit

13.1 Location on machine

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



13.2 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.
3. The machine is on.
4. The electrobrakes are activated.
5. The water valve is open, and the water level on the display is ECO mode or greater than zero.
6. The recovery tank is not full.
7. The brake pedal is not pressed.
8. The accelerator pedal is pressed.

13.3 Operating mode

WASHING

Premise: Operator Seated, Seat Microswitch Closed

Action	Result
Washing Enabled Forward pedal pressed	Solution Pump ON if water level is different than 0 (+36V to Pa) Solenoid Valve ON if water level is different than 0 (+36V to C02)
Dosing system enabled during work	Chemical Pump ON if water level is different than 0 (+36V to M07)
Backward function enabled during work	Solution Pump OFF, Solenoid Valve OFF, Chemical Pump OFF (if available)
Traction Pedal not pressed during work	Solution Pump OFF, Solenoid Valve OFF, Chemical Pump OFF (if available)
Washing disabled during work	Solution Pump OFF, Solenoid Valve OFF, Chemical Pump OFF (if available)

RECOVERY TANK FLOATER

Premise: Operator Seated, Seat Microswitch Closed

Action	Result
Floater enabled (full tank)	Floater ON (+36V to J6(4)) Vacuum motors OFF (ref to M03-M03A) Brush motors OFF (ref to M01-M01A)

SPRAY GUN

Premise: Operator Standing, Seat Microswitch Open

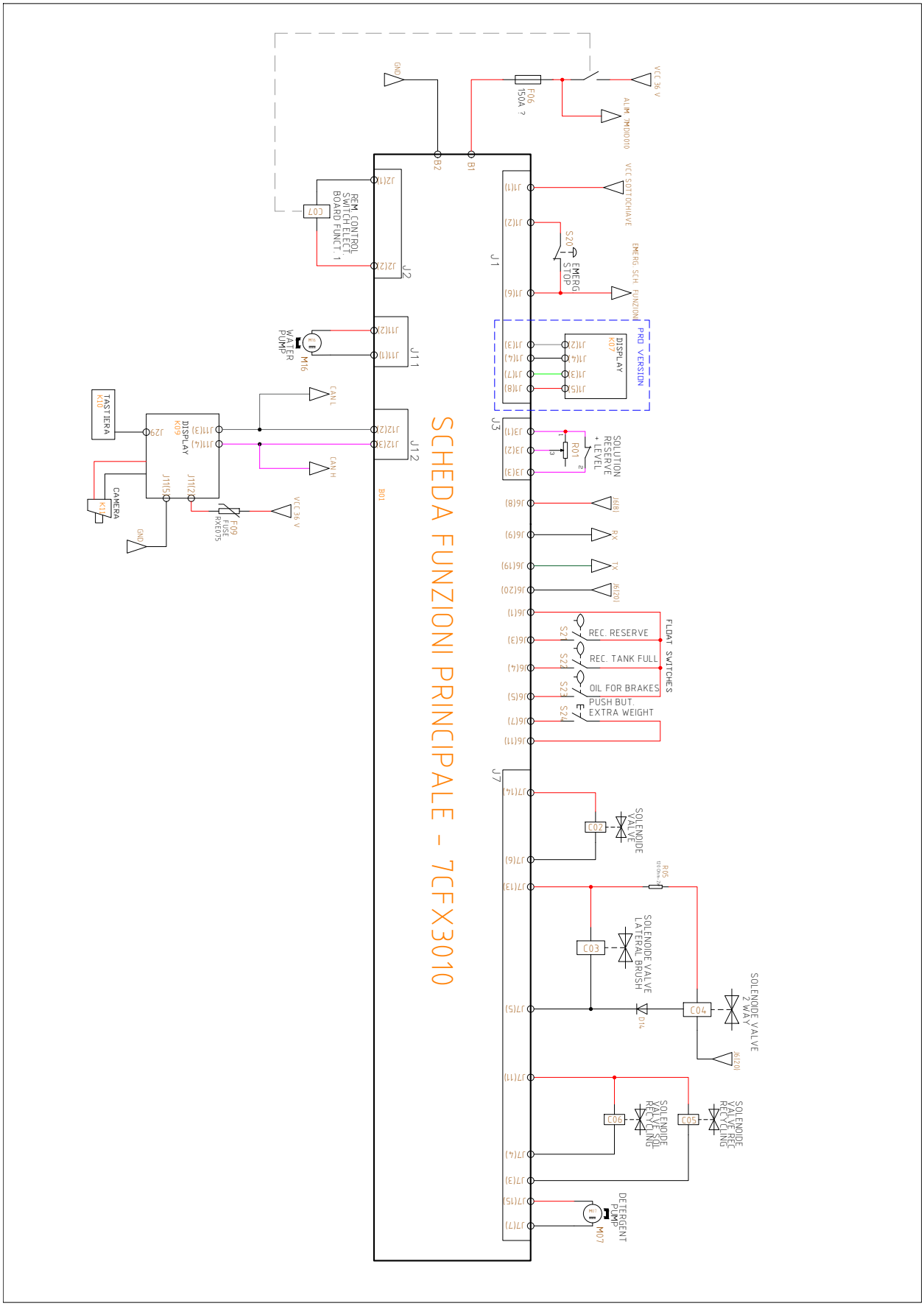
Action	Result
Gun button enabled trigger pushed	Solution Pump ON (+36V ref to PA).
Gun button disabled	Solution Pump OFF (+0V ref to PA).

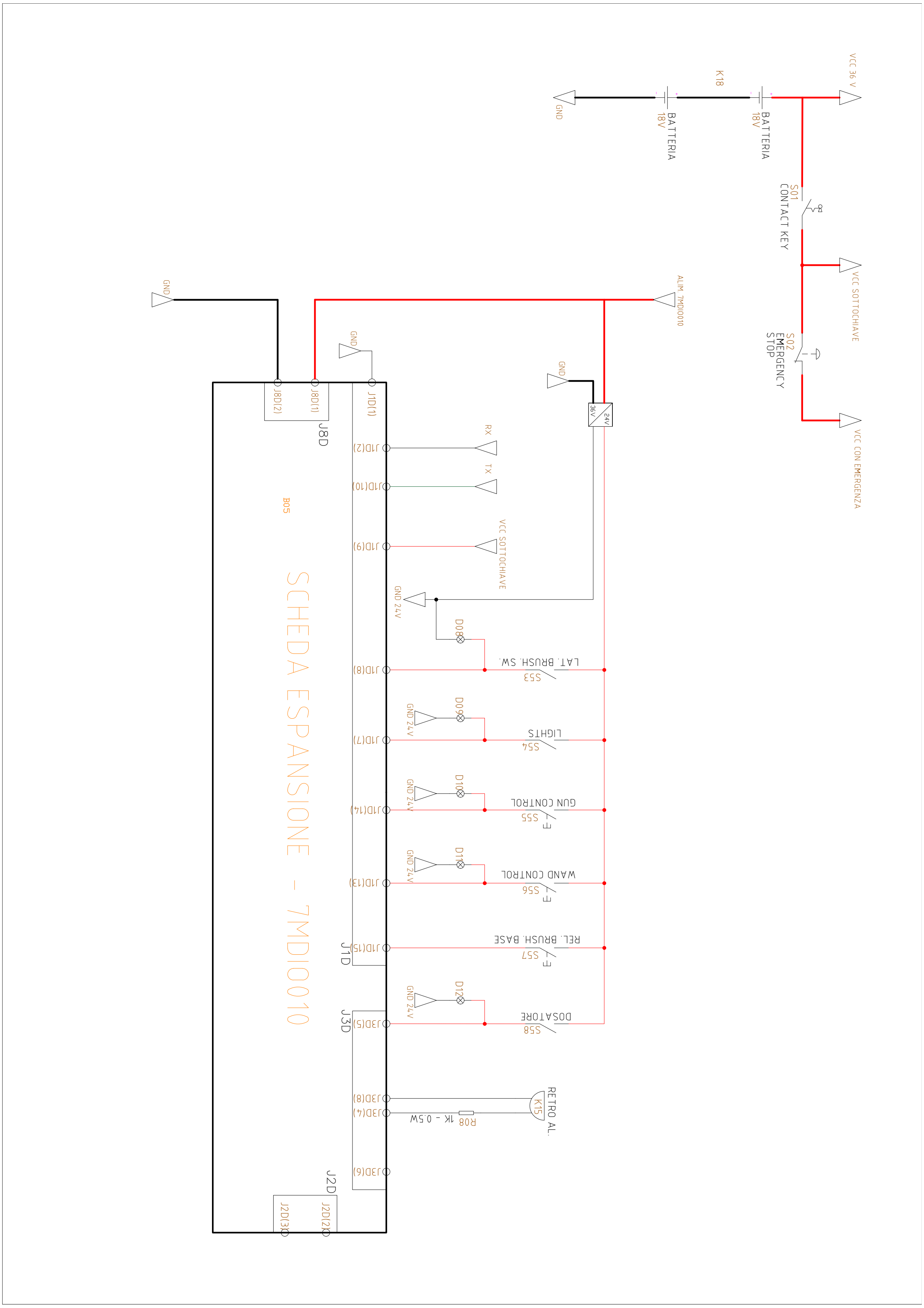
RECYCLE SYSTEM

Premise: Operator Standing, Seat Microswitch Open

Action	Result
Recycled button enabled Solution tank reserve floater enabled Recovery tank reserve floater disabled Forward pedal pressed	Solution tank Recycle Pump ON (+36v ref to C06). Recovery tank Recycle Pump OFF (+0V to C05).
Recovery tank reserve floater enabled	Solution tank Recycle Pump OFF (+0v ref to C06). Recovery tank Recycle Pump ON (+36V to C05).
Recycled button disabled	Solution tank Recycle Pump ON (+36v ref to C06). Recovery tank Recycle Pump OFF (+0V to C05).

13.4 Related electrical circuit




VCC 36 V
K18
BATTERIA
18V
BATTERIA
18V
GND
S01
CONTACT KEY
VCC SOTTOCHIAVE
S02
EMERGENCY
STOP
VCC CON EMERGENZA
ALIM. 7MDI0010
GND
GND
GND
36V
24V
J8D
J8D(1)
J8D(2)
J1D(1)
RX
J1D(2)
TX
J1D(10)
B05
VCC SOTTOCHIAVE
J1D(9)
SCHEDA ESPANSIONE - 7MDI0010
GND 24V
D08
LAT. BRUSH. SW.
S53
J1D(8)
GND 24V
D09
LIGHTS
S54
J1D(7)
GND 24V
D10
GUN CONTROL
S55
J1D(14)
GND 24V
D11
WAND CONTROL
S56
J1D(13)
REL. BRUSH. BASE
S57
J1D(15)
J1D
J3D
GND 24V
D12
DOSATORE
S58
J3D(5)
RETRO AL.
K15
J3D(8)
J3D(4)
R08
1K - 0.5W
J3D(6)
J2D
J2D(2)
J2D(3)

Functionality Check - Water Unit

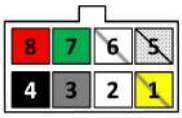
Conventions:

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

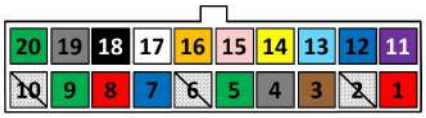
Input/output:

Satisfied condition	Pin	V at work	V at rest
Water Pump PA Activated	J1M(2) ref to J1M(1)	$+V_b$	$-V_b$
Chemical Pump Activated	J7M(15) ref to J7M(7)	$+V_b$	$-V_b$
Solenoid Valve activated	J7M(14) ref to J7M(6)	$+V_b$	$-V_b$
Side Brush Solenoid Valve activated	J7M(13) ref to J7M(5)	$+V_b$	$-V_b$
Two ways Solenoid Valve activated	J7M(13) ref to J7M(5)	$+V_b$	$-V_b$
Solution Tank Recycle Sol. Valve activated	J7M(11) ref to J7M(4)	$+V_b$	$-V_b$
Recovery Tank Recycle Sol. Valve activated	J7M(11) ref to J7M(3)	$+V_b$	$-V_b$
Rightside Electrobrake Activated	A29 ref to A30	$+V_b$	$-V_b$
Leftside Electrobrake Activated	A29 ref to A28	$+V_b$	$-V_b$
Traction pedal pressed	A05 ref to A14	$+V_b$	$-V_b$
Brake pedal pressed	A08 ref to A11	$-V_b$	$+V_b$
Recovery Tank Floater activated	J6M(1) ref to J6M(4)	$-V_b$	$+V_b$
Seated Operator	A08 ref to A11	$+V_b$	$-V_b$
PRO Display Negative	J1M(4)	$-V_b$	$-V_b$
PRO Display Transmitting	J1M(3)	$+V_b$	$-V_b$
PRO Display Receiving	J1M(7)	$+V_b$	$-V_b$
PRO Display Positive	J1M(8)	$+V_b$	$+V_b$
PLUS Display Negative	J12M(2)	$-V_b$	$-V_b$
PLUS Display Positive	J12M(3)	$+V_b$	$+V_b$

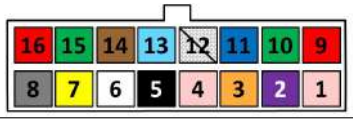
J1M



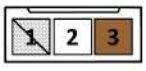
J6M



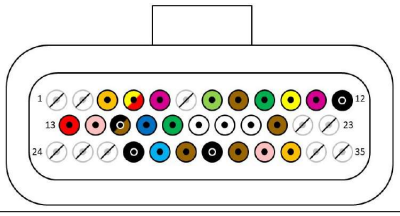
J7M



J12M



CNA



13.4.1 Relative electrical Components

Water Pump

The water pump, connected to the solution tank and to the solenoid valve, allows a regular flow to the brushes.

Solenoid Valve

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

Side Brush Solenoid Valve

The solenoid valve is located on the central brush deck, which can be easily accessed from the right side.

Chapter 14

Consumable and Recommended Spare Parts

14.1 Consumable

14.1.1 Washing Unit

GMG Disc					
Central Brush					
PN	**Description**	**Width ϕ**	**Bristle**	**ϕ Bristle**	**Color**
405552	BRUSH PPL 0,3	510 mm 20 in	PPL	0,3 mm 0,3 in	L.Blue
405553	BRUSH PPL 0,6	510 mm 20 in	PPL	0,6 mm 0,023 in	White
405554	**BRUSH PPL 0,9**	510 mm 20 in	PPL	0,9 mm 0,035 in	Black
405556	BRUSH NYLON 0,9	510 mm 20 in	PPL	0,9 mm 0,035 in	Black
405555	BRUSH TYNEX	510 mm 20 in	ABRASIVA	1,0 mm 0,039 in	Gray
405517	PAD HOLDER	510 mm 20 in	-	-	-
Side Brush					
456309	**SIDE BRUSH PPL 0,9**	340 mm 13 in	PPL	0,9 mm 0,035 in	Black
456310	SIDE BRUSH TYNEX	340 mm 13 in	ABRASIVE	1,2 mm 0,047 in	Gray
409088	SIDE PAD HOLDER	340 mm 13 in	-	-	-

Blue = Standard

GMG Disc			
Central Brush Splashguard Rubbers			
PN	**Description**	**Measures mm**	**Measures inch**
452245	**Front Splashguard PU Green**	1142 x 90 x 3,5	45 x 3 1/2 x 1/6
452243	**Rear Splashguard PU Green**	620 x 90 x 3,5	24 1/2 x 3 1/2 x 1/6
454719	**RS/LS Splashguard Linatex**	622 x 115 x 6	24 1/2 x 3 1/5 x 1/4
454718	RS/LS Splashguard PARA 33SH	622 x 115 x 6	24 1/2 x 3 1/5 x 1/4
452035	RS/LS Splashguard PARA 40SH	622 x 115 x 6	24 1/2 x 3 1/5 x 1/4
455022	RS/LS Splashguard Polyurethane 40SH	622 x 115 x 6	24 1/2 x 3 1/5 x 1/4
Side Brush Splashguard Rubbers			
454726	**RS/LS Splashguard Linatex**	427 x 55 x 3	16 4/5 x 2 1/6 x 1/10
454725	RS/LS Splashguard PARA 33SH	427 x 55 x 3	16 4/5 x 2 1/6 x 1/10
452280	RS/LS Splashguard PARA 40SH	427 x 55 x 3	16 4/5 x 2 1/6 x 1/10
454724	RS/LS Splashguard POLYUR. 40SH	427 x 55 x 3	16 4/5 x 2 1/6 x 1/10

GMG Cylindrical					
Central Brush					
PN	**Description**	**Measures ϕ x L**	**Bristle**	**ϕ Bristle**	**Color**
456054	CYL. BRUSH PPL 0,7	230 x 973 mm 9 x 38 in	PPL	0,7 mm 0,027 in	White
456053	**CYL. BRUSH PPL 1,0**	230 x 973 mm 9 x 38 in	PPL	1,0 mm 0,039 in	White
456527	CYL. BRUSH PPL 1,2	230 x 973 mm 9 x 38 in	PPL	1,2 mm 0,047 in	Blue
456528	CYL. BRUSH PPL 1,5	230 x 973 mm 9 x 38 in	PPL	1,5 mm 0,059 in	Green
456055	CYL. BRUSH TYNEX	230 x 973 mm 9 x 38 in	ABRASIVE	1,4 mm 0,055 in	Gray
408326	BELT POLY V J10 L610	L=610 mm 9 x 38 in	-	- L=24 in	-
Side Brush					
456550	**SIDE BRUSH PPL 1,0**	550 x 160 mm 22 x 6 in	PPL	1,0 mm 0,039 in	Black
456551	SIDE BRUSH PPL 1,1 + Steel 0,7	550 x 160 mm 22 x 6 in	PPL	1,0/0,7 mm 0,039/0,027 in	Black
456552	SIDE BRUSH PPL 1,5	550 x 160 mm 22 x 6 in	PPL	1,5 mm 0,059 in	White

GMG Cylindrical			
Central Brush Splashguard Rubbers			
PN	**Description**	**Measures mm**	**Measures inch**
455873	**RS/LS Splashguard Linatex**	569 x 95 x 8	22 1/2 x 3 3/4 x 1/3
455871	RS/LS Splashguard PARA 33SH	569 x 95 x 8	22 1/2 x 3 3/4 x 1/3
455872	RS/LS Splashguard PARA 40SH	569 x 95 x 8	22 1/2 x 3 3/4 x 1/3

Blue = Standard

GMG Combinata					
Pre-sweeping Central Brush					
PN	**Description**	**Measures ϕ x L**	**Bristle**	**ϕ Bristle**	**Color**
456654	CYL. BRUSH PPL 0,3/0,7	240 x 840 mm 9.5 x 33 in	PPL	0,3/0,7 mm 0,012/0,027 in	L.Blue/White
456140	**CYL. BRUSH PPL 0,7/1,2**	240 x 840 mm 9.5 x 33 in	PPL	0,7/1,2 mm 0,027/0,047 in	White/Black
456655	CYL. BRUSH PPL 0,7 + Steel 0,5	240 x 840 mm 9.5 x 33 in	PPL/Steel	0,7/0,5 mm 0,027/0,02 in	White/Steel
Pre-sweeping Side Brushes					
456550	**SIDE BRUSH PPL 1,0**	550 x 160 mm 22 x 6 in	PPL	1,0 mm 0,039 in	Black
456551	SIDE BRUSH PPL 1,1 + Steel 0,7	550 x 160 mm 22 x 6 in	PPL	1,0/0,7 mm 0,039/0,027 in	Black/Steel
456552	SIDE BRUSH PPL 1,5	550 x 160 mm 22 x 6 in	PPL	1,5 mm 0,059 in	White

GMG Combinata			
Pre-sweeping Central Brush Dust Rubbers			
PN	**Description**	**Measures mm**	**Measures inch**
456042	REAR DUST RUBBER Linatex	845 x 105 x 10	33 1/4 x 4 1/6 x 2/5
456018	SIDE DUST RUBBER Linatex	535 x 113 x 9	21 x 4 2/5 x 2/5
456050	SIDE SEALING RUBBER Linatex	240 x 110 x 4	9 2/5 x 4 1/3 x 1/6
456047	LOWER SEALING RUBBER Linatex	855 x 250 x 4	33 2/3 x 9 5/6 x 1/6
456043	UPPER SEALING RUBBER Linatex	854 x 95 x 4	33 2/3 x 3 3/4 x 1/6

GMG Combinata			
Debris Hopper Filters			
PN	**Description**	**Measures mm**	**Measures inch**
456164	PAPER FILTER PANEL	734 x 252 x 102	29 x 10 x 4
458689	POLYESTER FILTER PANEL	734 x 252 x 102	29 x 10 x 4
456155	CLOTH FILTER 8-POCKET	725 x 390 x 197	28 1/2 x 15 2/5 x 7 3/4
457010	TETRATEX FILTER 8-POCKET	725 x 390 x 197	28 1/2 x 15 2/5 x 7 3/4

14.1.2 Frame and Traction Unit

			GMG	
PN	**Description**	**Measures ϕ**	**Pro**	**Plus**
451652	ANTISKID FRONT WHEEL	370 x 105 mm 14 1/2 x 4 1/6 in	√	√
455543	ANTISKID REAR WHEEL	412 x 156 mm 16 1/5 x 6 1/6 in	√	√
449014	SUPERELASTIC FRONT WHEEL	377 x 121 mm 14 5/6 x 4 3/4 in	√	√
455533	SUPERELASTIC REAR WHEEL	412 x 156 mm 16 1/5 x 6 1/6 in	√	√

Blu = Standard

14.1.3 Vacuum Unit

PN	Description	Measures	GMG	
			Disc	Cylindrical
	Central Squeegee			
202290	**Front Rubber (Polyurethane)**	1300 x 50 mm 51 x 2 in	√	√
454720	**Rear Rubber (Linatex)**	1400 x 115 x 8 mm 55 x 4.5 x 0.3 in	√	√
454137	Rear Rubber (PARA 33Sh)	1400 x 115 x 8 mm 55 x 4.5 x 0.3 in	√	√
454138	Rear Rubber (PARA 40Sh)	1400 x 115 x 8 mm 55 x 4.5 x 0.3 in	√	√
454141	Rear Rubber (Polyurethane 40Sh)	1400 x 115 x 8 mm 55 x 4.5 x 0.3 in	√	√
454139	Rear Rubber (Oilproof white)	1400 x 115 x 8 mm 55 x 4.5 x 0.3 in	√	√
451858	Bumping Wheel	D=140 d=35 mm D=5 1/2 d=1/ 2/5 in	√	√
	Side Squeegee			
454723	**Side squeegee rubber (Linatex)**	350 x 56 x 3 mm 13 3/4 x 2 1/5 x 1/10 in	√	√
454722	Side squeegee rubber (PARA 33Sh)	350 x 56 x 3 mm 13 3/4 x 2 1/5 x 1/10 in	√	√
452302	Side squeegee rubber (PARA 40Sh)	350 x 56 x 3 mm 13 3/4 x 2 1/5 x 1/10 in	√	√
452303	Side squeegee rubber (Polyurethane 40Sh)	350 x 56 x 3 mm 13 3/4 x 2 1/5 x 1/10 in	√	√
	Side Brush			
229849	S.Brush Sq. Rubber Kit (PARA 33Sh)	590 x 48 x 3 mm 23 x 2 x 0.1 in	√	
231886	**S.Brush Sq. Rubber Kit (Linatex)**	590 x 48 x 3 mm 23 x 2 x 0.1 in	√	
229850	S.Brush Sq. Rubber Kit (PARA 40Sh)	590 x 48 x 3 mm 23 x 2 x 0.1 in	√	
229851	S.Brush Sq. Rubber Kit (Polyurethane 40Sh)	590 x 48 x 3 mm 23 x 2 x 0.1 in	√	
451560	Squeege Wheel Polyur.	D=40 d=10 L=15-8 mm D=1 1/2 d=2/5 L=3/5-1/3 in	√	
451560	Bumping Wheel Polyur.	D=30 d=6 L=8-6 mm D=1 1/5 d=1/4/ L=1/3-1/4 in	√	
451560	Carter Bumping Wheel	D=80 d=23 mm D=3 1/6 d=9/10 in	√	

Blue = Standard

14.2 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

14.2.1 Electrical System (GMG Disc/Cylindrical)

		GMG			
		DISC		CYLINDRICAL	
PN	Description	PRO	PLUS	PRO	PLUS
455065	FUNCTION CONTROLLER 7CFX3010 (Master)	√	√	√	√
455063	TRACTION CONTROLLER FZ2264 36V 180A	√	√	√	√
455053	AUXILIARY CONTROLLER 7MDIO010 (Master)	√	√	√	√
455053	AUXILIARY CONTROLLER 7MDIO010 (Slave)	√	√	√	√
448717	CONVERSION CONTROLLER 36V/24V 2A DISPLAY	√	√	√	√
452143	CENTRAL DISC BRUSH MOTOR CONTROLLER	√	√		
446395	SIDE DISC BRUSH MOTOR CONTROLLER	√	√		
456613	CYLINDRICAL BRUSH MOTOR CONTROLLER			√	√
456613	SWEEPING SIDE BRUSH MOTOR CONTROLLER			√	√
450291	TRACTION PEDAL	√	√	√	√
409593	FUSE 5A A FASTON	√	√	√	√
409615	FUSE 7,5A A FASTON	√	√	√	√
409596	FUSE 10A A FASTON	√	√	√	√
439281	FUSE CF 58V-200A	√	√	√	√
435955	FUSE CF 58V-300A	√	√	√	√
443683	RELAY FITRE R502/024Z3C9	√	√	√	√
407588	CONTACTOR 36V 180A SW180-6	√	√	√	√
409673	CONNECTOR BIP.FT 320A MALE	√	√	√	√
409674	CONNECTOR BIP.FT 320A FEMALE	√	√	√	√
407588	CONTACTOR 36V 180A SW180-6	√	√	√	√
454976	SWITCH INTER. KR352A	√	√	√	√
231331	DISPLAY COVER + CONTROLLERS		√		√
454986	DISPLAY CONTROLLER 7T100009	√		√	
454967	MEMBRANE DASHBOARD	√		√	
443042	STEERING PADDLE BUTTON	√	√	√	√

14.2.2 Electrical System (GMG Combinata)

Codice	Descrizione
455065	FUNCTION CONTROLLER 7CFX3010 (Slave)
456713	PRE-SWEEPING CYLINDRICAL BRUSH MOTOR CONTROLLER
456578	PRE-SWEEPING SIDE BRUSH MOTOR CONTROLLER
456661	DEBRIS HOPPER VACUUM MOTOR CONTROLLER
409593	FUSE 5A A FASTON
409615	FUSE 7,5A A FASTON
409596	FUSE 10A A FASTON
435486	FUSE CF 58V-150A
407587	CONTACTOR 36V SW80-65

14.2.3 Washing Unit

		GMG		
PN	Description	Disc	Cylindrical	Combinata
452144	RIGHTSIDE GEARMOTOR 36V 1100W 250RPM	√		
452142	LEFTSIDE GEARMOTOR 36V 1100W 250RPM	√		
205990	BRUSH HOLDER PLATE	√		
455078	DISC SIDE BRUSH GEARMOTOR	√		
451365	DISC SIDE BRUSH FLANGE	√		
456001	CYLIN. BRUSH GEARMOTOR 36V 1500W		√	
231888	BRUSH COUPLING PENTAGON		√	
456066	CYL. RIGHTSIDE BRUSH GEARMOTOR		√	
456072	CYL. RIGHTSIDE BRUSH FLANGE		√	
456064	CYL. LEFTSIDE BRUSH GEARMOTOR		√	
437873	CYL. LEFTSIDE BRUSH FLANGE		√	
452409	VENTRAL BRUSHDECK ACTUATOR	√	√	
231348	MAX PRESSURE MICROSWITCH	√		
452748	DISC SIDE BRUSH ACTUATOR	√		
232111	CYL. SIDE BRUSH ACTUATOR		√	
232080	CYL. BRUSH GEARM. 36V 750W + CONTROLLER			√
456066	SWEEPING RIGHTSIDE BRUSH GEARMOTOR			√
456072	SWEEPING RIGHTSIDE BRUSH FLANGE			√
456064	SWEEPING LEFTSIDE BRUSH GEARMOTOR			√
456073	SWEEPING LEFTSIDE BRUSH FLANGE			√
456123	PRE-SWEEPING BRUSHDECK ACTUATOR			√
232111	PRE-SWEEPING SIDE BRUSHDECK ACTUATOR			√

14.2.4 Hopper Unit (GMG Combinata)

PN	Description
231819	HOPPER LIFTING ACTUATOR
456123	HOPPER EMTPYING ACTUATOR
231348	HOPPER MOVEMENT CONSENT MICROSWITCH
231348	HOPPER ROTATION CONSENT MICROSWITCH
456664	COLLECTING HOPPER VACUUM MOTOR
232073	PANEL FILTER SHAKER
232135	CLOTH FILTER SHAKER

14.2.5 Vacuum Unit

PN	Description
230177	VACUUM MOTOR ASSEMBLY 36V 525W
230232	SQUEEGEE ACTUATOR
446862	SQUEEGEE/JOINT HOSE D=50 L=695
454703	JOINT/REC.TANK HOSE D=60 L=886
454701	DRAIN HOSE D=63 L=1000
454320	VAC.MOTOR/REC.TANK MANIFOLD D.38X650
445704	ANTI WAVE TRAY
229018	RECOVERY TANK FULL FLOAT

14.2.6 Frame and Traction

PN	Description
452050	STEERING ANGLE SENSOR (CROWN)
452052	ELECTROBRAKE LEVER MICROSWITCH
456756	BRAKES OIL PUMP SENSOR
410503	BRAKES OIL ELECTRONIC CAP
456603	(POWER STEERING) STEERING ANGLE SENSOR (STEERING)
456601	(POWER STEERING) POWER STEERING MOTOR

14.2.7 Cleaning Solution Supply Unit

		GMG	
PN	Description	Disc	Cylindrical
405408	CLEAN WATER COMPLETE FILTER	√	√
447111	COMPLETE SOLENOID VALVE 24V 1/2” ACL 3	√	√
453413	SIDE BRUSH SOLENOID VALVE	√	
231237	WATER PUMP	√	√
442630	CHEMICAL PUMP	√	√
407887	RECYCLE SOLENOID VALVE (OPTIONAL)	√	√
409252	CHEMICAL TANK RESERVE FLOAT		
454331	SOLUTION TANK LEVEL FLOAT (PLUS)		
450146	SOLUTION TANK RESERVE FLOAT (PRO)		

Fimap S.p.A.
Service Manual GMG

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