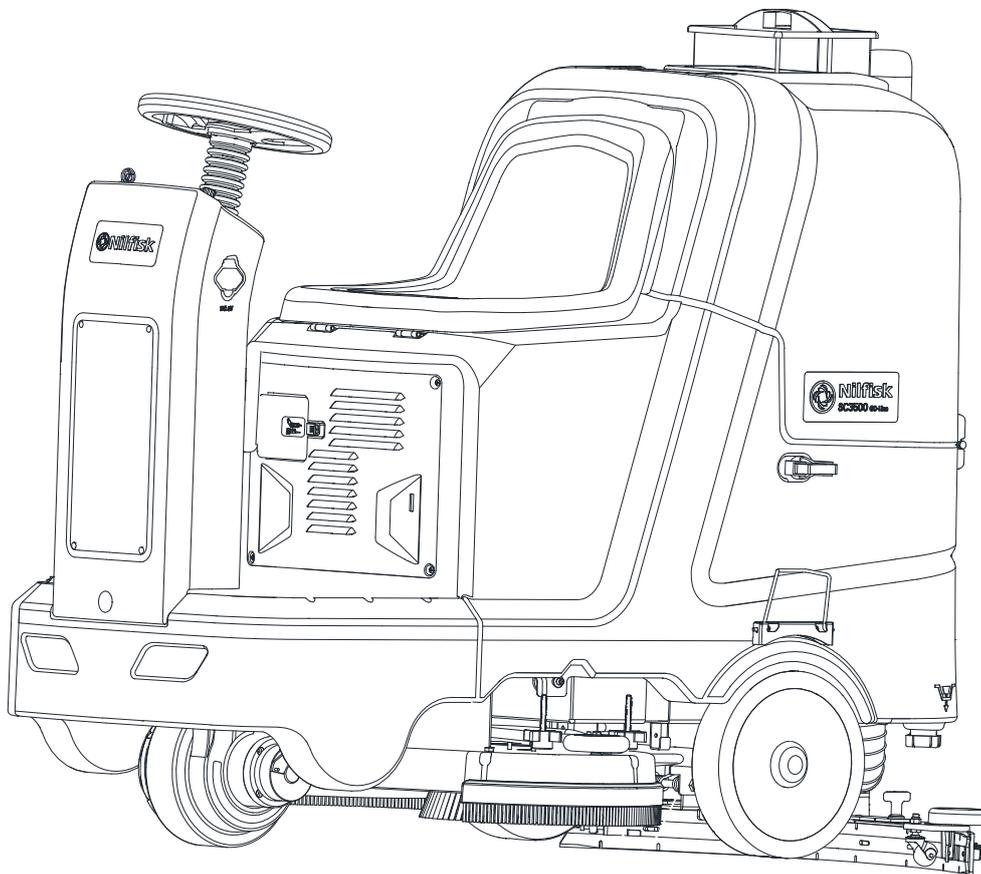


SC3500

INSTRUCTION FOR USE



04/2019 REV B
Form No. VR38003



Model: SC3500



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INTRODUCTION



NOTE

The numbers in brackets refer to the components shown in Machine Description chapter.

MANUAL CONTENT AND PURPOSE

The purpose of this Instruction for Use Manual is to provide the operator with necessary information to use the machine properly and safely. It contains information about technical data, safety, operation, storage, maintenance, spare parts and how to scrap it.

Before performing any procedure on the machine, no matter the operators and qualified technicians must read this Manual carefully. Contact our company’s service center for any query about this manual or for any further information is needed.

The operators must not perform procedures that should be done by qualified technicians. Our company will not be answerable for damages coming from the non-observance of this prohibition.

HOW TO KEEP THIS MANUAL

The Manual must be kept near the machine, inside an adequate case, away from liquids and other substances that can cause any damage to it.

DECLARATION OF CONFORMITY

Declaration of Conformity is supplied with the machine and certifies machine conformity with the law in force.



NOTE

The copies of the original declaration of conformity are provided together with the machine documentation.

ACCESSORIES AND MAINTENANCE

All the necessary operation, maintenance and repair procedures must be performed by qualified personnel, or by our company appointed service center. ONLY authorized spare parts and accessories should be used.

Contact our company customer service for any service or purchase of accessories or spare parts if necessary.

CHANGES AND IMPROVEMENTS

We committed to continuous improvement of the products, the company reserves the right to the machine changes and improvements without informing in additional.

SCOPE OF APPLICATION

The scrubber applies to commercial and industrial use. It is suitable for cleaning smooth and solid floors, operating by a qualified personnel in safety circumstance. It is not suitable for outdoor use, carpet or rough floor cleaning.

MACHINE IDENTIFICATION DATA

The machine serial number and model name are marked on the serial label.

This information is useful. Use the following table to write down the machine identification data when requiring spare parts for the machine.

MACHINE MODEL.....
MACHINE SERIAL NUMBER.....

TRANSPORT AND UNPACKING

When the carrier delivers the machine, make sure the packaging and machine are both whole and undamaged. If any damaged, make the carrier know the damage and before accepting the goods, reserve the right in compensation of the damage.

Follow the instructions on packing strictly when unpacking the machine.

Check the package to ensure following items are included:

1. Technical documentations including Quick Start Guide manual, Instruction for Use Disk and on-board charger manual if on-board charger is equipped.
2. Charger cable if on-board charger is equipped.

SAFETY

The following symbols indicate potentially dangerous situations. Always read this information carefully and take all necessary precautions to safeguard people and property.

VISIBLE SYMBOLS ON THE MACHINE



WARNING!

Read all the instructions carefully before performing any operation on the machine.



WARNING!

Do not wash the machine with direct or pressurized water jets.



WARNING!

Do not use the machine on slopes with a gradient exceeding that is defined in the specification.

SYMBOLS THAT APPEAR ON THE INSTRUCTION FOR USE MANUAL



DANGER!

It indicates a dangerous situation with risk of death for the operator.



WARNING!

It indicates a potential risk of injury for people.



CAUTION!

It indicates a caution or a remark related to important or useful functions. Pay attention to the paragraphs marked by this symbol.



NOTE

It indicates a remark related to important or useful functions.



CONSULTATION

It indicates the necessity to refer to the Instruction for Use manual before performing any procedure.

GENERAL SAFETY INSTRUCTION

Specific warnings and cautions to inform about potential damages to people and machine are shown below.



DANGER!

- This machine must be operated by trained and authorized personnel according to guidance of the manual.
- Before performing any cleaning, maintenance, repair or replacement procedure, read all the instructions carefully, ensure to turn the machine OFF and disconnect the battery connector.
- Do not operate the machine near toxic, dangerous, flammable and/or explosive powders, liquids or vapour. This machine is not suitable for collecting dangerous powders.
- Do not wear jewels when working near electrical components.
- Do not work under the lifted machine without supporting it with safety stands.
- When using lead (WET) batteries, they may emit inflammable gas under normal use, must keep sparks, flames, smoking materials and radiating, illuminating and burning items away from the batteries.
- When charging lead (WET) batteries, they may emit hydrogen gas which may cause explosive. Must ensure the charging environment is well ventilated and away from naked flames.



WARNING!

- This machine is intended for **COMMERCIAL USE**, for example in hotels, schools, hospitals, factories, shops, offices and rental businesses.
- Machines left unattended shall be secured against unintentional movement.
- In order to prevent unauthorized use of the machine, the power source shall be switched off or locked, for example by removing the key of the main switch or the ignition key.
- Check the machine carefully before each use. Ensure that all the components have been well assembled before use. Or it may causes damages to people and properties.
- Before using the battery charger, ensure that the values of frequency and voltage indicated on the machine serial number label match those of mains.
- Never move the machine by pulling the battery charger cable. Do not let the cable through a closed door, or winding on sharp edges or corners. Do not run the machine on the battery charger cable. Keep the battery charger cable away from heated surfaces.
Do not charge the batteries if the battery charger cable or the plug are damaged.
- To reduce the risk of fire, electric shock, or injury, make sure machine is off before leaving.
- Use or store the machine indoors in dry conditions, it is not allowed for outdoor use.
- The machine both storage and working temperature must be between 0 °C and +40 °C, the humidity of air must be between 30% - 95%.
- Do not use the machine on slopes with a gradient exceeding as specification show.
- When using and handling floor cleaning detergents, follow the instructions on the labels of the detergent bottles and wear suitable gloves and protections.
- Use brushes and pads supplied with the machine or defined in the manual. Using other brushes or pads could reduce safety.
- In case of machine malfunctions, ensure that these are not due to lack of maintenance. If necessary, request assistance from the authorized personnel or from an authorized Service Center.
- Take all necessary precautions to prevent hair, jewels and loose clothes from being caught by the machine moving parts.
- Do not use the machine in particularly dusty areas.
Do not wash the machine with direct or pressured water jets, or with corrosive substances.

- Do not bump into shelves or scaffoldings, especially where there is a risk of falling objects.
- Do not lean liquid containers on the machine, use the relevant can holder.
- To avoid damaging the floor, do not allow the brush/pad to operate while the machine is stationary.
- In case of fire, use a dry powder fire extinguisher. Do not use liquid fire extinguishers.
- Do not remove or modify the machine stickers.
- Do not tamper with the machine safety guards and follow the ordinary maintenance instructions scrupulously.
- Pay attention during machine transportation when temperature is below freezing point. The water in the recovery tank and in the hoses could freeze and cause seriously damage to the machine.
- If spare parts need be replaced, order ORIGINAL spare parts from an Authorized Dealers or Retailers.
- Return the machine to the Service Center if it doesn't work as usual or it is in condition such as damaged, placed outdoors, dropped into water.
- To ensure machine proper and safe operation, the scheduled maintenance shown in the relevant chapter of this Manual, must be performed by the authorized personnel or an authorized Service Center.
- The machine must be properly disposed of, because the presence of toxic-harmful materials (batteries, etc.), which are subject to standards that require disposal in special centers (see Scrapping chapter).
- This machine as a cleaning tool only, not for any other purpose use.
- Always keep the openings free from dust, hairs and any other foreign material which could reduce the air flow. Do not use the machine if the openings are clogged.
- Use the machine only where a proper lighting is provided.
- This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge.
- Close attention is necessary when used near children.
- Children should be supervised to ensure that they do not play with the machine.
- While using this machine, take care not to cause damage to people or objects.

MACHINE DESCRIPTION

MACHINE STRUCTURE (as shown in Figure 1)

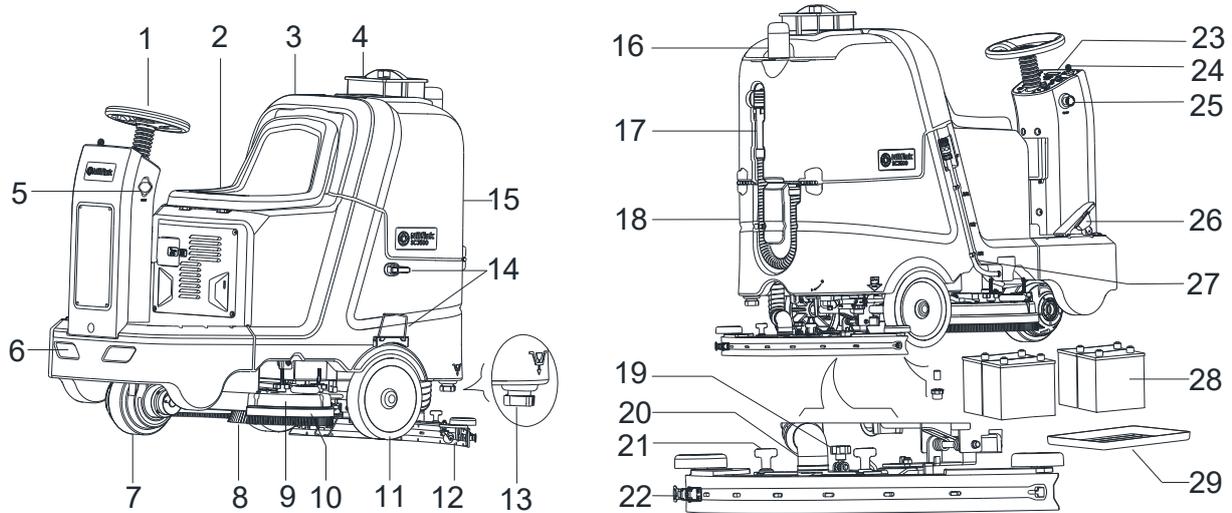


Figure 1

- | | |
|------------------------------|--------------------------------------|
| 1. Steering wheel | 16. Warning light (*) |
| 2. Seat cushion | 17. Recovery tank drain hose |
| 3. Recovery tank cover | 18. Tank |
| 4. Utility caddy (*) | 19. Squeegee adjustment knob |
| 5. USB charging port | 20. Vacuum hose |
| 6. Front lights | 21. Squeegee knob |
| 7. Front wheel & Drive motor | 22. Squeegee hasp |
| 8. Brush | 23. Control panel |
| 9. Brush assembly | 24. Key switch |
| 10. Brush deck | 25. Emergency switch |
| 11. Rear wheel | 26. Accelerate pedal |
| 12. Squeegee assembly | 27. Solution level indicator |
| 13. Solution outlet cover | 28. Batteries (*) |
| 14. Mop frame (*) | 29. Battery tray for wet battery (*) |
| 15. Recovery tank | |

(*): Optional

MACHINE DESCRIPTION

CONTROL PANEL (as shown in Figure 2)

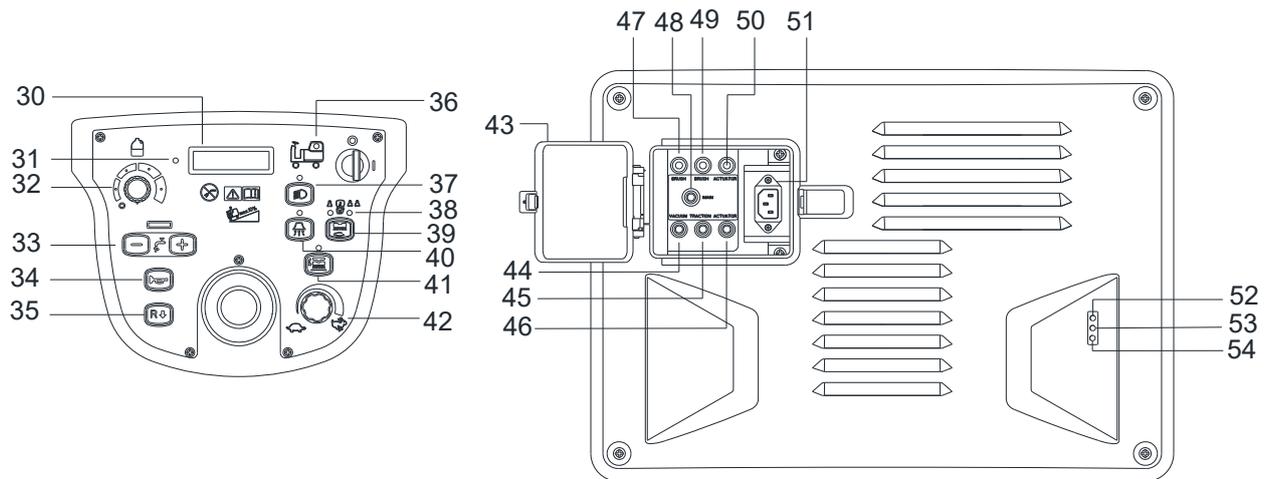


Figure 2

- | | |
|--|---|
| 30. LCD screen | 43. Charger plug cover |
| 31. Speed controller light | 44. Vacuum motor overload protector |
| 32. Detergent flow control knob (*) | 45. Drive motor overload protector |
| 33. Solution volume adjusting button (- +) | 46. Brush lift overload protector |
| 34. Horn button | 47. Brush motor overload protector |
| 35. Forward-Backward switch | 48. Main motor overload protector |
| 36. Recovery tank full indicated light | 49. Brush motor overload protector |
| 37. Front lights | 50. Squeegee lift overload protector |
| 38. Brush pressure indicated light | 51. Charger plug |
| 39. One-Start button | 52. Battery fully charged indicator (Green) |
| 40. Vacuum system switch | 53. Battery semi-charged indicator (Yellow) |
| 41. Brush unload button | 54. Battery charge indicator (Red) |
| 42. Speed adjusting knob | |

(*): Optional

INFORMATION DISPLAY BY LCD SCREEN (29)

- Running time. For example, “0001.5Hour” indicates that the machine has been used for 1.5hour.
- “STOP” indicates there is nobody on the seat, the machine won’t move, brushes don’t work, only vacuum motor is active for work.
- Battery level. For example, “80%■■■■_” indicates that the battery capacity is 80% remaining. When the battery capacity is 10%, only drive motor is active for work, other functions don’t work anymore. Must charge the batteries before it works normally.
- Battery type. The default setting of battery type is “GEL”. “WET” indicates that wet batteries are installed.
- Error 1 display. “ERROR-01 Battery Vol Low” indicates the batter voltage is lower than 18V. All the functions of the machine cannot be used, please charge the batteries.
- Error 2 display. “ERROR-02 Brush Actuator Fault” indicates that brush actuator is current overload, please check if there is something be stuck in the actuator. Turn off the power to remove the fault before using the machine.

DISPLAY WINDOW OF CHARGER INDICATON LIGHT (as shown in Figure 2)

- At the charging beginning, red light indicator (53) stays on.
- After charging for some time, the red LED (53) on charger turns off, the yellow LED (52) turns on, this is the second stage of charging.
- When charging is completed, the yellow LED (52) turns off, the green LED (51) turns on to indicate that the battery is fully charged.

**NOTE**

In the process of charging, if the yellow light (52) is on, it may be caused by: Battery and charger doesn't match, battery is not connected well, or output is short-circuited.

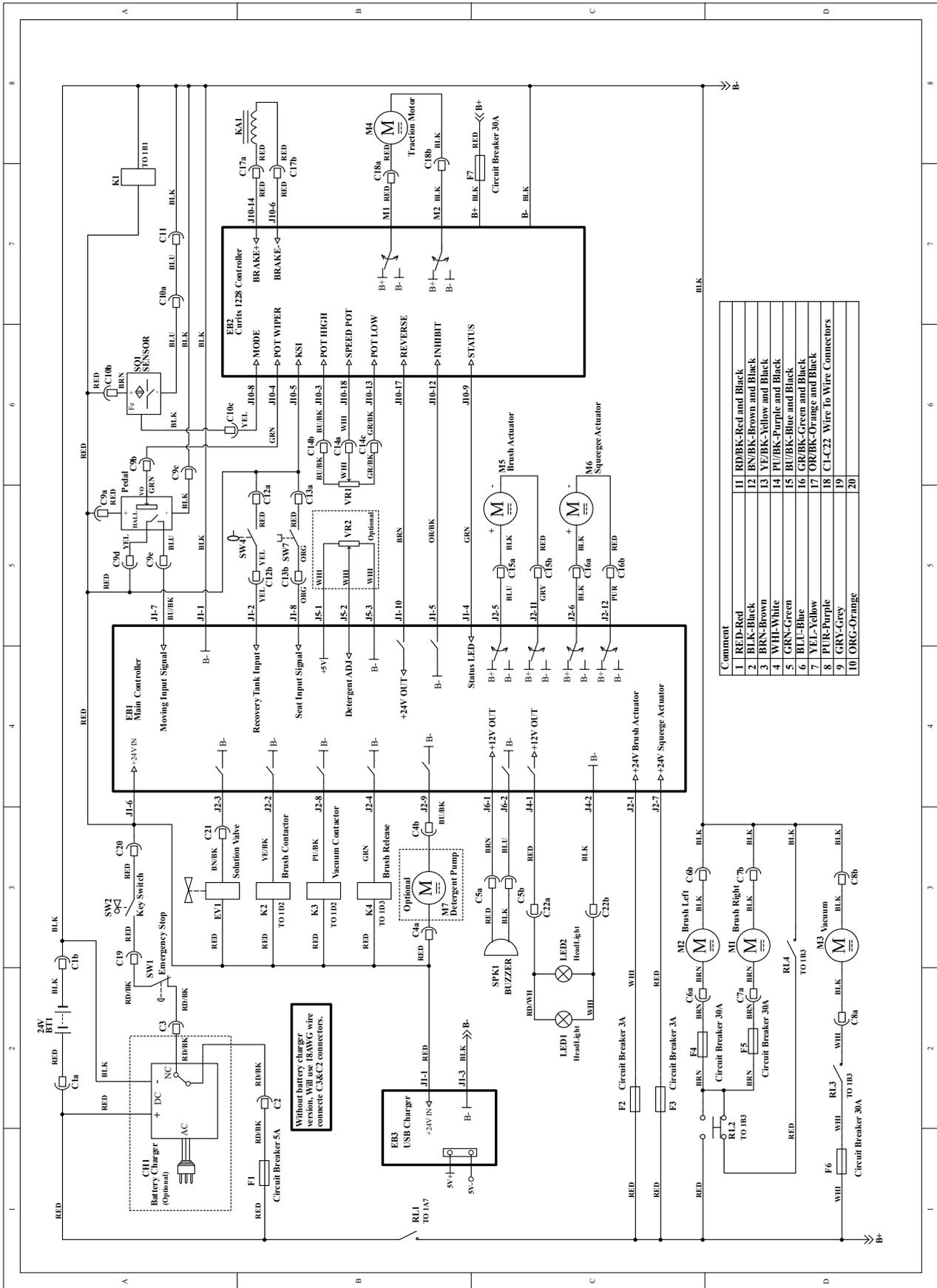
The red light of charger flashing may be caused by the charger internal short circuit.

MACHINE DESCRIPTION

TECHNICAL PARAMETERS

Technical Specification	Technical Specification Value
Rated power (W)	2658
Airflow (l/sec.)	19.46
Vacuum (kPa)	15.5
Voltage (V)	24
Sound pressure level at 1.5 m (dB(A) ISO 3744)	69
Max. speed (km/h)	6
Length x width x height (mm)	1620x760x1250
Brush speed (RPM)	180
Solution/recovery tank (l)	110/110
Brush pressure (kg)	35/50
Scrubbing width (mm)	710
Min. turn-around aisle width (cm)	225
Max. climbing rate (%)	10
Productivity theoretical/actual (m ² /h)	4260/2980
Insulation class	III
Brush/pad diameter (mm)	355/355
IP protection class	IP24
Net weight (kg)	230
Water flow (l/m)	1.2/3.5
Vacuum motor power (W)	500
Max. running time	4
Brush motor (W)	500
Battery compartment size (L x W x H) (mm)	590x390x350
Gross weight (gvw) (kg)	545
Brush quantity and type	2 Disc

CIRCUIT DIAGRAM



OPERATING GUIDE

**WARNING!**

On some points of the machine there are some adhesive plates indicating:

- DANGER!
- WARNING!
- CAUTION!
- CONSULTATION

While reading this Manual, the operator must pay particular attention to the symbols shown on the plates. Do not cover these plates for any reason and immediately replace them if damaged.

BATTERY CHECK/SETTING ON A NEW MACHINE

**WARNING!**

The electric components of the machine can be seriously damaged if the batteries are either improperly installed or connected. The batteries must be installed by qualified personnel. Set the battery charger (optional) and machine PCBA according to the battery type (WET or GEL or AGM or DIS-EV). Check the batteries whether it is damaged before installation. Disconnect the battery connector and the battery charger plug. Handle the batteries with great care.

**NOTE**

The machine requires two 12V batteries or four 6V batteries, connecting according to Figure3.

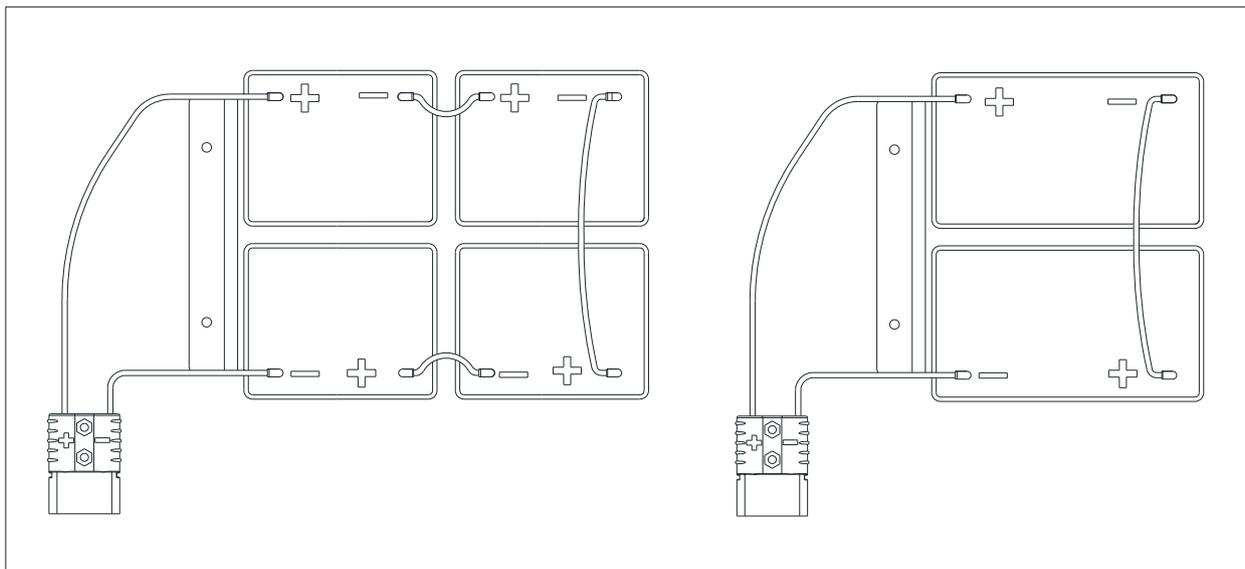


Figure 3

The machine can be operated in one of following battery modes:

A) (WET OR GEL OR AGM OR DIS-EV) batteries are already installed and ready to be used

1. Check the batteries and connect the battery connector to the machine.
2. Insert the ignition key (24) and turn it on. If the LED screen (29) shows battery level is 100% power remaining, cleaning work can be started; if only 10% battery power remaining, charge the batteries first.

B) Without Batteries

1. If your machine isn't equipped with batteries, buy appropriate batteries [See the Technical Data Paragraph]. For battery choice and installation, turn to qualified battery Retailers.
2. When batteries are ready, set the machine and the battery charger according to the type of installed batteries, then follow the procedures shown in the next paragraph.

BATTERY INSTALLATION AND BATTERY TYPE SETTING (WET OR GEL OR AGM OR DIS-EV)

Set the electronic circuit board of the machine and battery charger according to battery types (WET or GEL or AGM or DIS-EV) following steps below:

1. Turn off the machine.
2. Press flow adjusting buttons “+” and “-“ (B, C Figure4). Turn the ignition key (D, Figure4) to “I” tap position.
3. Release flow adjusting buttons. “Set Battery Type BAT=AGM 0” will be showed on LCD screen (as Figure 4 A).
4. Then, you can setting the battery type through pressing button “+” and “-“ (B, C Figure4).
 - a. AGM
 - b. WET
 - c. DIS-EV
 - d. GEL
5. Turn off the machine, the battery type setting will be saved. The battery type can be showed at the bottom of LCD screen when re-turn on the machine.

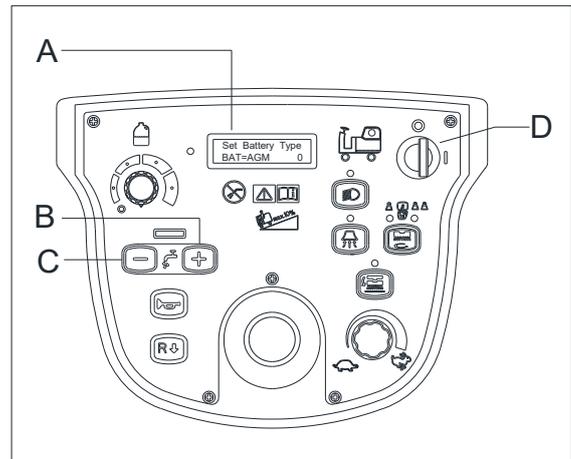


Figure 4

Note: The default setting of battery type is GEL.



NOTE

Setting the battery type according to your new batteries, or the batteries may be damaged. Make sure the charger is adapted to the batteries. If any query, contact our service center or your supplier.

Battery Installation

1. Open the recovery tank cover (3 figure 1) and check the recovery tank (15 figure 1) is empty, otherwise, empty it with drain hose (17 figure 1).
2. Close the recovery tank cover (3 figure 1).
3. Turn over the seat, press the lock catch (as figure5 B), then turn over the recovery tank (15 figure 1) carefully.
4. The machine is supplied with cables suitable to install 4X6V batteries. Carefully put the batteries into the compartment, then install them correctly.
5. Route and install the battery cable as shown in (Figure 3), then carefully tighten the nut on each battery terminal. Connect batteries to connector on machine.
6. Place the protection cap on each terminal, and then connect the battery connector.
7. Get the recovery tank (3 figure 1) back, lock the lock catch.
8. Need to order battery tray, if customer use the wet battery.

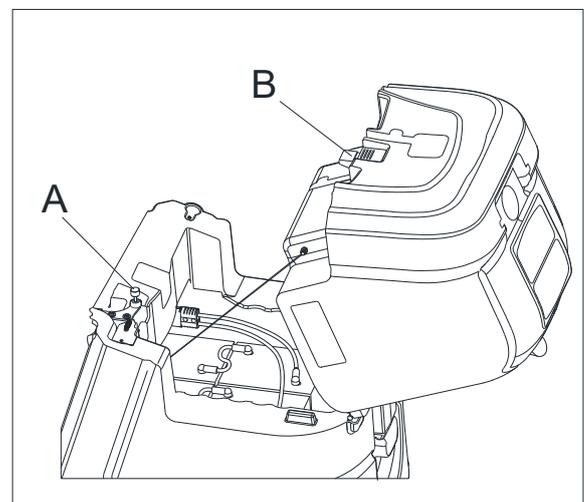


Figure 5



NOTE

Ensure the hand protection device (as Figure 5 A) for turning over recovery tank is in the correct position to security the safety when turning over the recovery tank.

Charging the Batteries

9. Charging the batteries. [Refer to MAINTENANCE chapters]

BATTERY MODE SET UP METHOD OF THE CHARGER



Do not to set charger unless you have professional training

1. Turn off the machine and disassemble the control cover (A as Figure 6) from the machine. Then pry open the label on the charger cover (B as Figure 6). you will find the 2 sets of dipswitches (SW1 and SW2) in the charger.
2. Only the set of dipswitch SW1 (the one on the left side) has effect on charging curve selection accordingly to the table below.

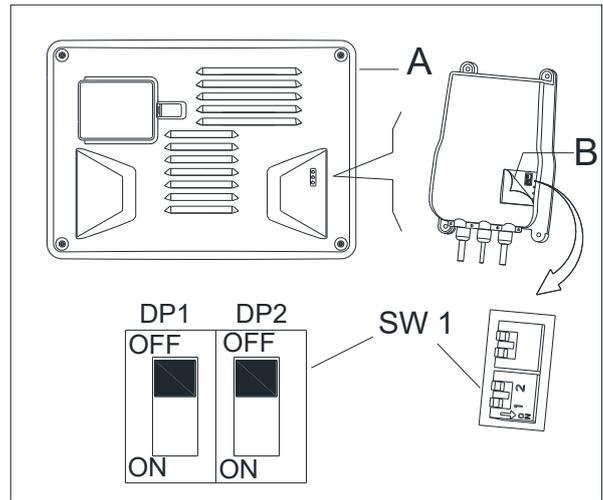


Figure 6

DP1	DP2	CHARGING CURVE
ON	OFF	IUIa-ACD for Lead-acid (Wet) batteries
OFF	OFF	IUIa-GEL for Gel batteries of Exide-Sonnenschein
OFF	ON	IUU0-GEL for HAZE Gel and AGM batteries of other manufacturers
ON	ON	IUIUa-AGM for Discover AGM batteries

EMERGENCY BRAKING

If there is any emergency during machine operating, press the emergency switch (A, Figure 6), then all functions of machine will stop, no display on control panel (B, Figure 6)

BRUSH/PAD INSTALLATION AND UNINSTALLATION



NOTE
Install suitable brush (A, Figure 8) or Pad (B and C, Figure 8) according to the type of floor to be cleaned.



CAUTION
Before installation or uninstallation of brush or pad, make sure all the switches on machine are in off position and lifting up the squeegee from the floor. The operator must be equipped with suitable personnel protection devices such as gloves to reduce the risk of accidents. Proceed as following:

1. Turn off the machine and lift up the brushes (9 as figure 1) from the floor.
2. Put the brush/pad holder on the floor under the brush hub and align their center, then rotary the brush/pad holder in the direction (D as Figure 8) show to install it manually.
3. Press One-Start button (38 as Figure 2) on control panel, lift the brushes (9 as Figure 2) up from the floor, then press brush release button (40 as Figure 2) to release brushes automatically. Rotary in the opposite direction (D as Figure 7) can manually disassemble the brush/pad holder.

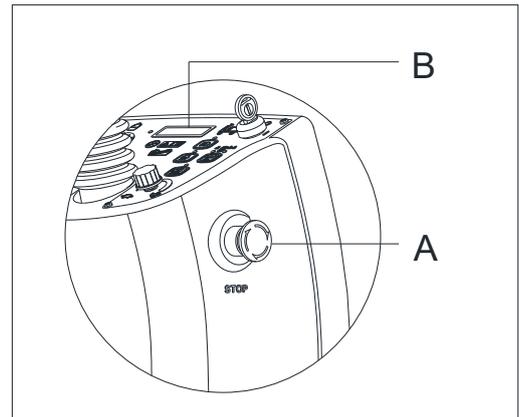


Figure 7

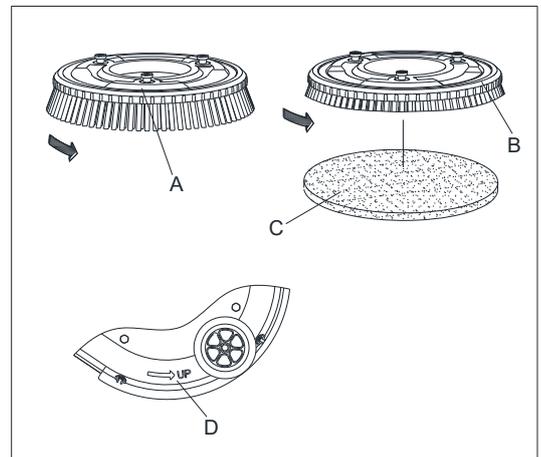


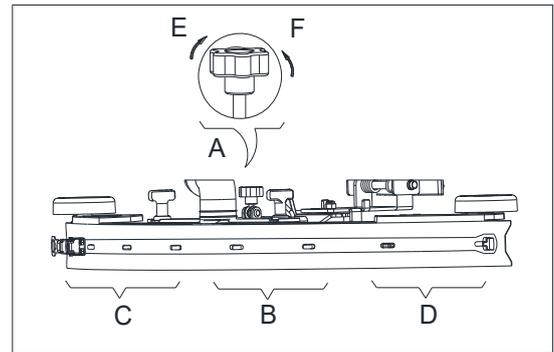
Figure 8

**CAUTION!**

Rotate the speed adjusting knob (41 as Figure 2) to the minimum speed before depressing accelerate pedal (26 as Figure 1) to avoid the machine running too quickly when it is started. Make sure the brush/pad is installed correctly before machine operating.

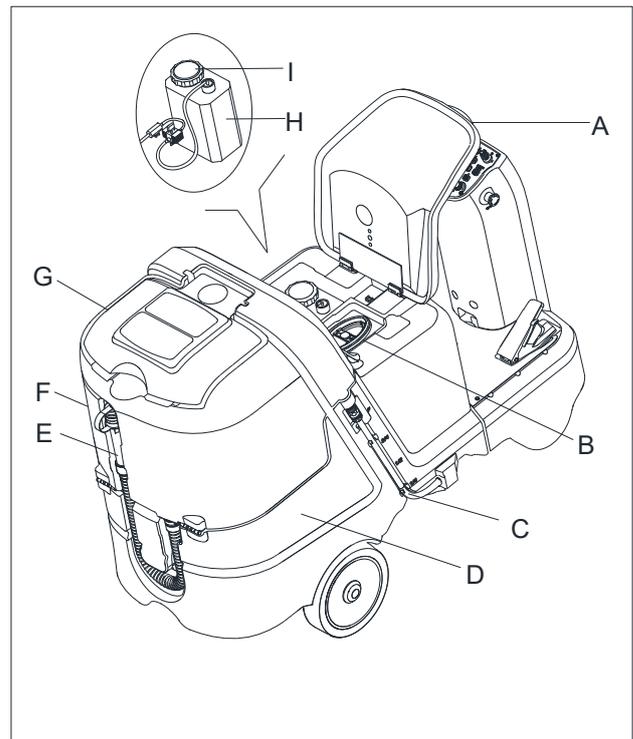
SQUEEGEE INSTALLATION AND ADJUSTMENT

- Turn the ignition key (24 as Figure 1) to "I", press One-Start button (38 as Figure 2), the squeegee (12 as Figure 1) is lowered down to the floor automatically.
- Unscrew two of adjusting knobs (21 as Figure 1) on the squeegee, then install the squeegee to the squeegee bracket and tighten the adjusting knobs. After that, connect the vacuum hose (20 as Figure 1) to the squeegee to complete the squeegee installation.
- Adjust the squeegee by squeegee adjusting handle (A, Figure 9).
 - If there is gap between the ground and middle section of rear squeegee blade (B), adjust the knob (A) in counterclockwise direction (F) until all section of rear blade good touches with the ground, the front blade touch the ground slightly.
 - If there is gap between the ground and both end section of rear squeegee blade (C and D), adjust the knob (A) in clockwise direction (E) until all section of rear squeegee blade good touch with the ground, the front blade touch the ground slightly.

**Figure 9****SOLUTION TANK FILLING****NOTE**

If the machine is equipped with Chemical Mixing System (optional) the tank must be filled with clean water, otherwise the tank can be filled with solution.

- Turn over the seat (A, Figure 10).
- (For machines without Chemical Mixing System) Use the front filler neck (B Figure 10) and the rear filler neck (C Figure 10) to fill the tank (D Figure 10) with a solution suitable for the work to be performed. Refill to the reference mark "F" of the level check hose (C Figure 10). Always follow the dilution instructions on the label of the chemical product used to prepare the solution. The solution temperature must not exceed + 104°F (+40°C).

**Figure 10****WARNING!**

Use only low-foam and non-flammable detergents, intended for automatic scrubber applications.

- (For machines with Chemical Mixing System) Fill the tank (D Figure 10) with clean water by using the filler neck (B Figure 10) and the rear filler neck (C Figure 10). Refill to the reference mark "F" of the level check hose (C Figure 10). The water temperature must not exceed + 104°F (+40°C).

DETERGENT TANK FILLING (FOR MACHINES WITH CHEMICAL MIXING SYSTEM)

- Open the cover (G Figure 10) and check that the recovery tank (F Figure 10) is empty, otherwise empty it with the drain hose (E Figure 10).

2. Carefully overturn the recovery tank (F, Figure 10).
3. Open the cap (I Figure 10).
4. Replace or fill the jug (H Figure 10) with any standard gallon container of detergent suitable for the work to be performed (highly concentrated detergents). Do not fill the detergent tank completely, leave a few centimeters from the edge.



WARNING!

Use only low-foam and non-flammable detergents, intended for automatic scrubber applications.



NOTE

To install a new jug container, determine the cap size and if it is the smaller cap, remove the reducing adapter from the hose cap (I Figure 10). Insert the suction tube into the jug (H Figure 10). Pushdown firmly on the cap (I) and twist at the same time to put the cap back onto the jug (H Figure 10). In case of new system, system emptied for cleaning, etc., wait for the hoses to fill up, before starting the Chemical Mixing System.

DRIVE MOTOR INSPECTION

1. Turn the key switch (G Figure 11) to “ON”
2. Depress the accelerate pedal (D Figure 11) slightly then loosen it to check if the machine can be steered forward and stopped.
3. To ensure the security, confirm if the machine can be stopped immediately by pressing the emergency button (F Figure 11). Rotate the emergency button to reset it.



CAUTION

Climbing capacity of the machine must not exceed 10%.



CAUTION

The brake of drive motor is unstuck when the motor works normally, it locks when the motor stops working. In some special cases, such as machine packing/unpacking, machine fault etc., need to move the machine without drive motor working, please insert A screwdriver (Figure 11 A) drive motor brake (Figure 11 B) and motor (Figure 11 C) between the grooves (Figure 11), the machine brake is released, the machine can be moved, after completion, please take out the screwdriver, otherwise will not be able to start the machine.

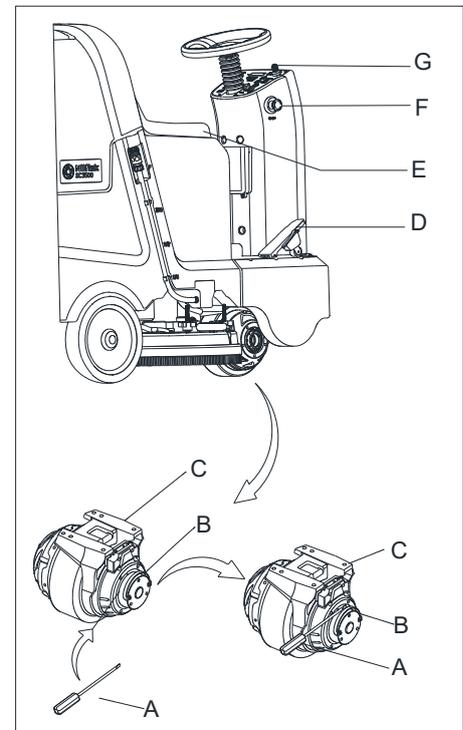


Figure 11

MACHINE START AND STOP

Starting the machine

1. Prepare the machine as shown in previous paragraph.
2. Sit on the seat (J, Figure 12), insert the key switch (B) and turn it to “I”. If the LCD (A, Figure 12) is 100%, the batteries are fully charged for use. If the LCD (A, Figure 12) is 10%, batteries must be charged before operation. [Refer to MAINTENANCE chapters for batteries charging]
3. Press One-Start button (D, Figure 12) to start the machine, the squeegee and brushes are released to the floor automatically, vacuum motor begins to work.



NOTE

Make sure the squeegee assembly is lifted before the machine steer backward, or the Machine will be stopped and LCD screen show “Error” information.



NOTE

Make sure to turn off brush button before brush assembly is lifted, and lift the brush assembly before machine steers forward/backward.

4. Depress the accelerate pedal (N Figure 12), operate the machine forward or backward by steering wheel (L Figure 12) together with forward-backward switch (I Figure 12), you can adjust speed by speed adjusting knob (F Figure 12).
5. Adjust solution flow by solution adjusting button (G Figure 12) base on cleaning requirement.
6. You can charge your phone or pad through USB charging port (K Figure 12) when the key switch (A Figure 12) is turned to “ON”.
7. Press the horn button (H Figure 12) to warn people when necessary.
8. If necessary, press the emergency button (M Figure 12) for machine emergency stop.



NOTE

The brush motor, vacuum motor, drive motor and control circuit are protected by overload protector (P Figure 12). When the overload protector trip, do not reset it immediately without finding out the root cause, and make sure the motor is cooling-off before reset.

Stopping the machine

9. Loosen the accelerate pedal (N, Figure 12), the machine stops running.
10. Press One-Start button (D, Figure 12) to stop brushes and vacuum motor. The brushes and squeegee are lifted up from the floor automatically. The vacuum system is closed after a few seconds delay.
11. Turn the key switch to “OFF”.
12. Ensure the machine is stopped.

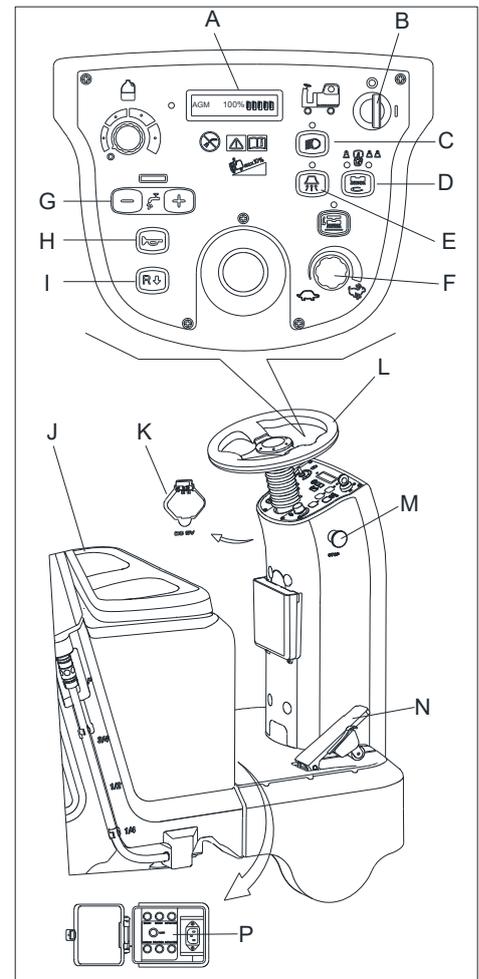


Figure 12

MACHINE OPERATION (SCRUBBING AND DRYING)

1. Start the machine according to procedures in previous paragraphs.
2. Start cleaning by following procedures in section of “Starting the machine”.
3. If necessary, stop the machine to adjust squeegee according to section “Adjusting the balance of squeegee”.



CAUTION!

To avoid any damage to the floor surface, turn off the brush/pad-holder when the machine stop in one place.



NOTE

For correct scrubbing/drying of floors at the sides of walls, we suggest to go near the walls with right side (Bumper wheel side) of the machine as shown in below Figure 13.

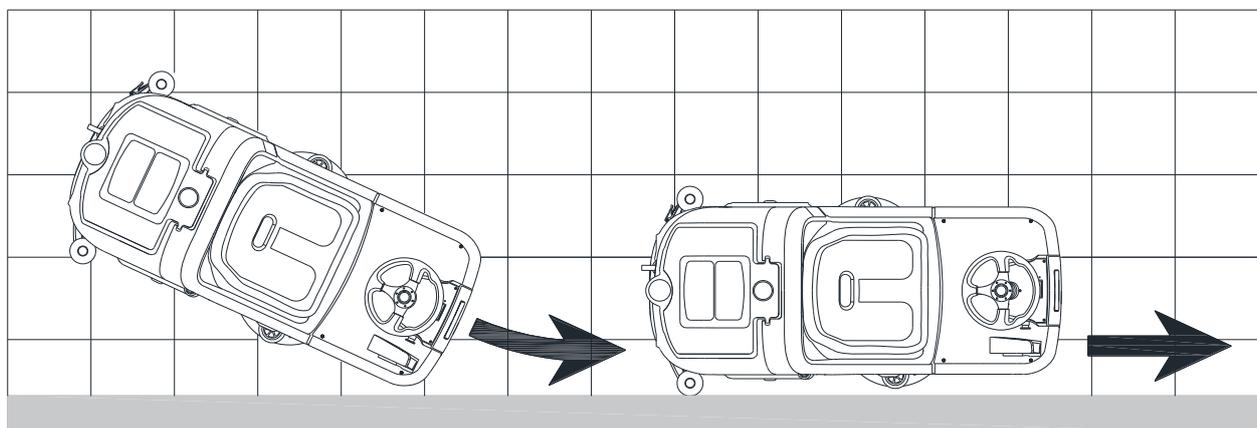


Figure 13

DETERGENT AMOUNT ADJUSTMENT

(Only for machine with Chemical System)



With the same detergent amount, solution concentration can be changed by adjusting water flow through water flow adjusting buttons (C, D, Figure 14).

1. Twist the rotary knob (B, Figure 14) by clockwise or anti-clockwise to increase or reduce the detergent amount. Turn the rotary knob anti-clockwise to the end to stop using detergent.
2. There are four level detergent amount indicated by four colors as shown on the control panel (A, Figure 14)
 - a. Level 1: () --- average detergent amount 0.4%
 - b. Level 2: () --- average detergent amount 0.75%
 - c. Level 3: () --- average detergent amount 1.5%
 - d. Level 4: () --- average detergent amount 2.5%

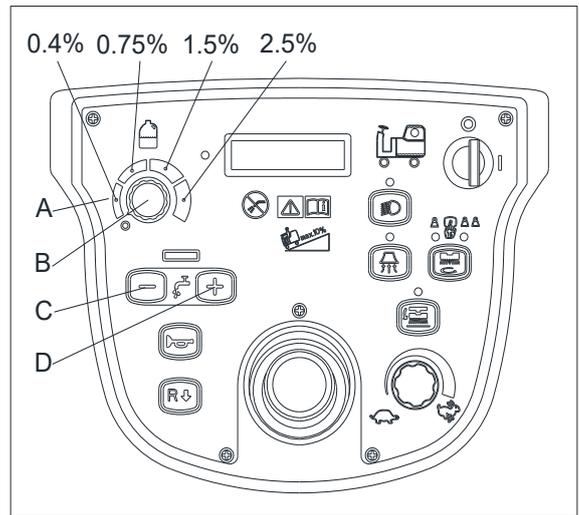


Figure 14

BATTERY POWER DISPLAY

When the batteries are full of power, five rectangular together with “100%” at the right bottom of LCD screen are shown. (A, Figure 15). When only one rectangular together with “10%” is shown (B, Figure 15) indicates the battery power is low, the brush motor and vacuum motor stop work. Please re-charge the batteries.



CAUTION!

To avoid damaging the batteries and shortening their working life, do not use the machine once the batteries are flat.

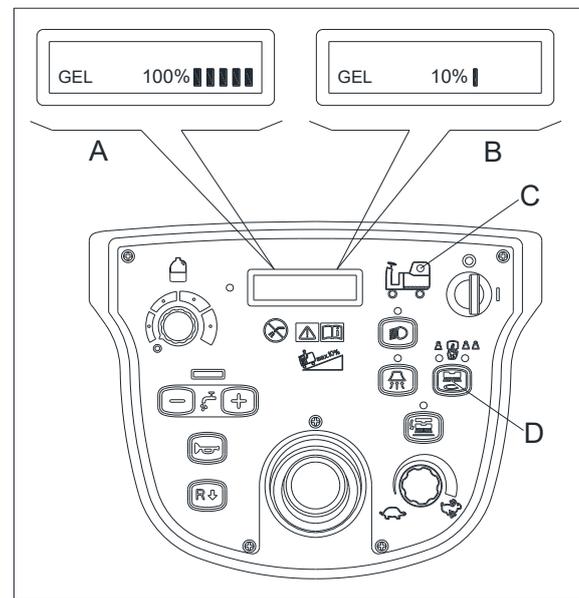


Figure 15

RECOVERY TANK EMPTYING

When the red LCD (C, Figure 15) turns on indicates the recovery tank (A, Figure 16) is full, the vacuum motor stops work to dry the floor, please empty the recovery tank as flowing steps:

1. Turn off the brush system and vacuum system, lift up squeegee and brushes.
2. Drive the machine to draining area.
3. Drain the recovery tank using the drain hose (B, Figure 16), then clean the recovery tank.



CAUTION!

When draining the wastewater, the drain hose must be folded (C, Figure 16) and put to a low position (D, Figure 16) before opening the drain hose cover. Do not make the outlet of the drain hose upward to drain the water vertically in order to avoid wastewater spilling onto the operator.

Solution/clean water tank emptying

1. Perform steps 1 to 4 in chapter “Recovery water tank emptying”.
2. Empty the solution tank through the outlet cover (E, Figure 16). And then, rinse the tank with clean water. The water can also be drained by unplugging the drain connection (F, Figure 16).

AFTER USING THE MACHINE

After working, before leaving the machine:

1. Remove the brushes/pad holder according to disassembly description in previous section.
2. Empty the solution tank and recover tank as shown in previous paragraph.
3. Perform the daily maintenance procedures (see the Maintenance chapter).
4. Store the machine in a clean and dry place, with the brushes/ pad-holders and the squeegee lifted or removed.

MACHINE LONG INACTIVITY

If the machine is not going to be used for more than 30 days, proceed as follows:

1. Perform the procedures shown in “AFTER USING THE MACHINE” paragraph.
2. Disconnect the battery connector (G, Figure17).

USING FOR THE FIRST TIME

After nine hours using of the machine for the first time, please check if any damage or abnormal situation, check whether the fasteners or fittings is loose.

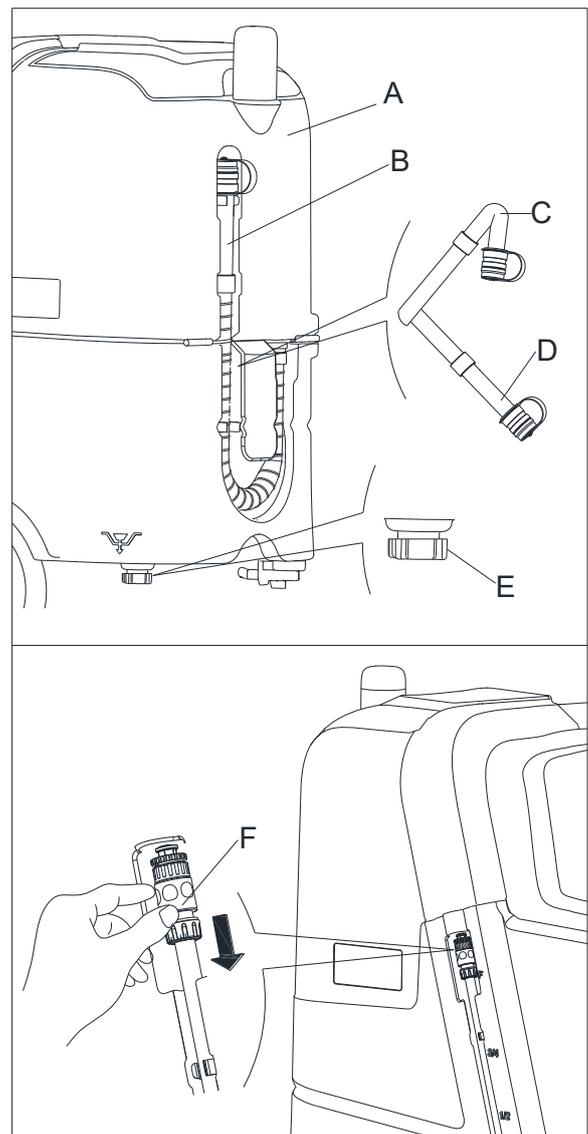


Figure 16

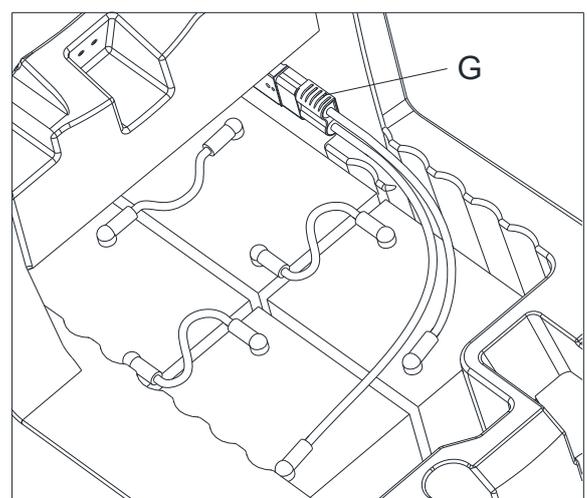


Figure 17

MAINTENANCE



WARNING!

Maintenance procedures must be performed after the machine is turned off and the battery charger cable is disconnected. In addition, carefully read the safety chapters in the guide.

All scheduled or extraordinary maintenance procedures must be performed by qualified personnel or an authorized Service Center. This guide only describes the general and common maintenance procedures.

For other maintenance procedures that are in below maintenance schedule table, please refer to the Service Manual that can be consulted at any Service Center.

SCHEDULED MAINTENANCE TABLE



CAUTION!

The procedure marked with (1) must be performed when the machine is used after 9 hours for the first time. The procedure marked with (2) must be done by Service Center that qualified by Nilfisk.

Procedure	Daily, after each use	Weekly	semiannually	Yearly
Battery charging				
Squeegee cleaning				
Brush/Pad-holder cleaning				
Tank cleaning				
Tank sealing strip inspection				
Squeegee blade check and replacement				
Cleaning water filter cleaning				
Suction filter cleaning				
WET battery fluid level check				
Screw and nut tightness inspection			(1)	
Brush/Pad-holder carbon brush check or replacement				(2)
Suction motor carbon brush check or replacement				(2)
Drive system motor carbon brush check or replacement				(2)
Add lubricating oil for rotating parts			(1)	

BATTERY CHARGING



NOTE

Re-charge the batteries when there is only two or less two rectangular show at the right bottom LCD screen (A, Figure18), or after every time cleaning work.



CAUTION

Always keep the battery in a state of charged can extend its lifetime.



CAUTION

Please charge the battery as soon as possible if the battery level is low. Otherwise, the lifespan of battery can be reduced. It is better to check the battery at least once a week.



Warning!

When using lead (WET) batteries, they may emit inflammable gas under normal use, must keep sparks, flames, smoking materials and radiating, illuminating and burning items away from batteries. When charging lead (WET) batteries, they may emit hydrogen gas which may cause explosive. Must ensure the charging environment is well ventilated and away from naked flames and recovery tank is opened.



CAUTION!

To be especial careful when battery is charging, because there may be leaked acid in the process of charging.

Battery acid is corrosive, if it accidentally comes into contact with the skin or eyes, rinse immediately with plenty of clean water and go to see a doctor.

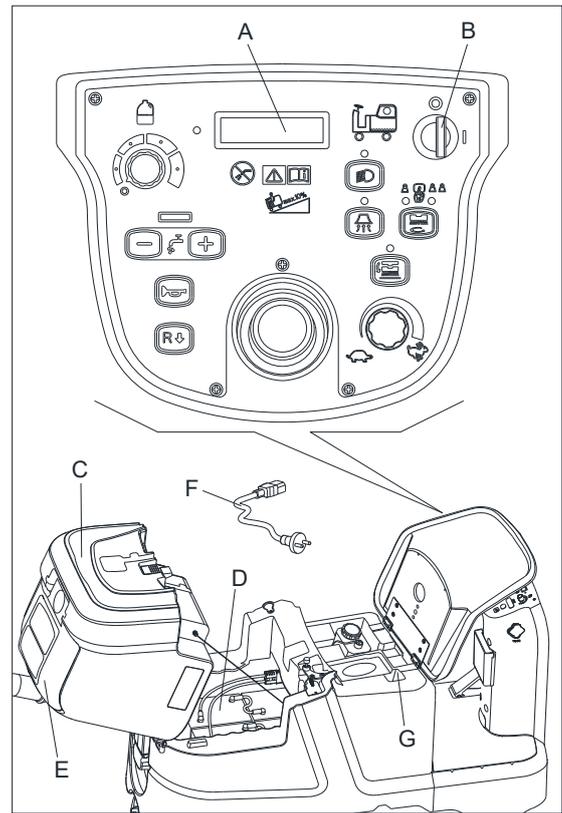


Figure 18

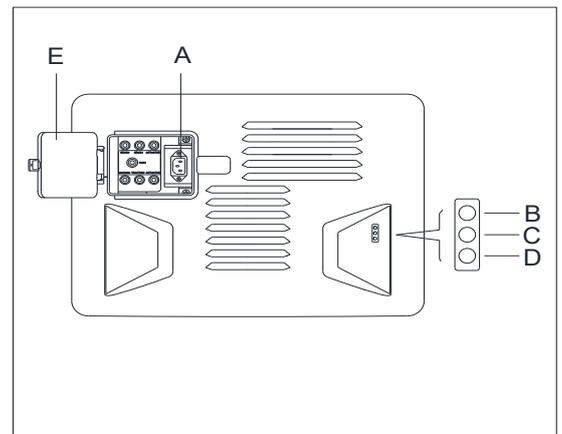


Figure 19

The preparation steps to charge the batteries

1. Open the recovery tank cover (E, Figure 18) to check if the recovery tank (C Figure 18) is empty, or empty the recovery tank through the drain hose.
2. Drive the machine to designated charging area.
3. Turn the key switch (B Figure 18) to “O”.
4. Carefully lift the recovery tank (C Figure 18).
5. This step only for WET batteries:
 - Clean the battery surface if necessary.
 - Check the battery electrolyte level of the batteries (D Figure 18), if necessary, open the cover to full fill electrolyte, and then recover it.
 - Keep the cover opened during charging.
6. Select one of below charging mode base on the selected charger type.

Use on-board charger for battery charging

7. Open the protection cover (E, Figure 19), connect the charger connector (A, Figure 19) to the main power supply, all machine functions are shut off. The red LED (D, Figure 19) turns on means the charging is ongoing.
8. The batteries are fully charged when the green LED (C) becomes on.
9. Disconnect battery charge cable from electric mains after charging is completed, and then store the battery charger cable (F, Figure 19) in the storage box (G, Figure 19).



NOTE

For further information about on-board charger (A, Figure 19), please refer to relevant manual from service center.

BRUSH/PAD CLEANING



CAUTION!

It is advisable to use protective gloves when cleaning the brush/pad because there may be sharp debris.

1. Remove the brush/pad from the machine, as shown in the Use chapter.
2. Clean and wash the brush/pad with water and detergent.
3. Check that the brushes/pads are in working condition and not excessively worn; if necessary replace them.

SOLUTION FILTER CLEANING

1. Drive the machine on a level floor.
2. Ensure that the machine is off and the ignition key (24) has been removed.
3. Turn the valve (A, Figure 20) to off "0".
4. Remove the filter cover (D, Figure 20), clean the filter (E, Figure 20), then assemble it to the filter body (F, Figure 20).



NOTE

The filter screen (E) must be correctly positioned to the housing of filter support (H).

5. Turn the valve to open "1".

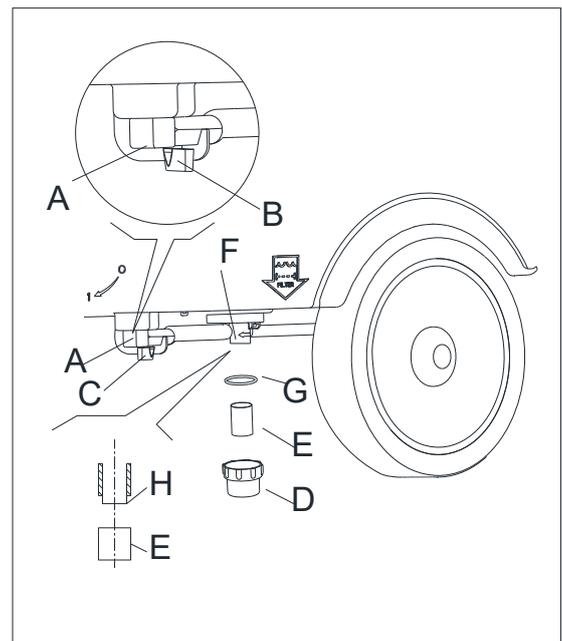


Figure 20

SQUEEGEE CLEANING



NOTE

The squeegee must be clean and its blades must be in good conditions in order to get good drying.



CAUTION

It is advisable to wear protective gloves when cleaning the squeegee because there may be sharp debris.

1. Drive the machine on a level floor.
2. Turn the ignition key (A, Figure 22) to "I".
3. Press vacuum system switch (C Figure 21) to release squeegee(G, Figure 21).
4. Loosen the knobs (F Figure 21) and remove the squeegee.
5. Disconnect the vacuum hose (E Figure 21) from the squeegee.
6. Clean the steel or the aluminum squeegee (Figure 21). Clean the compartments (A) and the hole (B) especially. Check the front blade (C) and the rear blade (D) for integrity, cuts and tears; if necessary replace them (see the procedure in the following paragraph).
7. Assemble the squeegee in the reverse order of disassembly.
8. After clean the squeegee, carefully lift the recovery tank lid (D Figure 22), take the squeegee hung in recovery tank's grooves (B Figure 22), so that the recovery tank has been ventilated and the machine through the narrow passage easy.

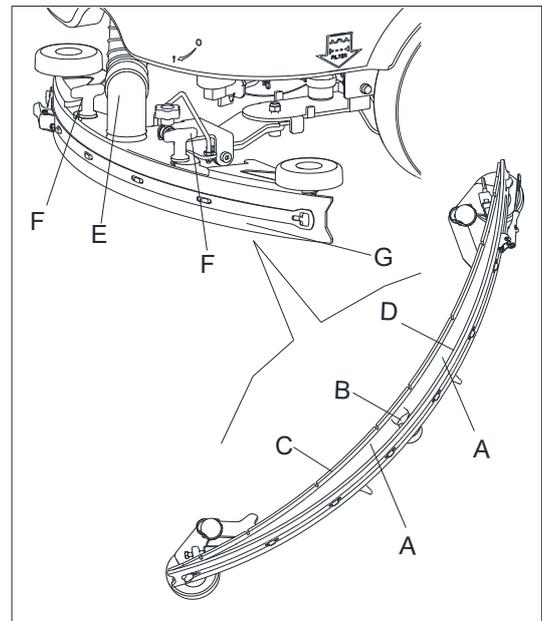


Figure 21

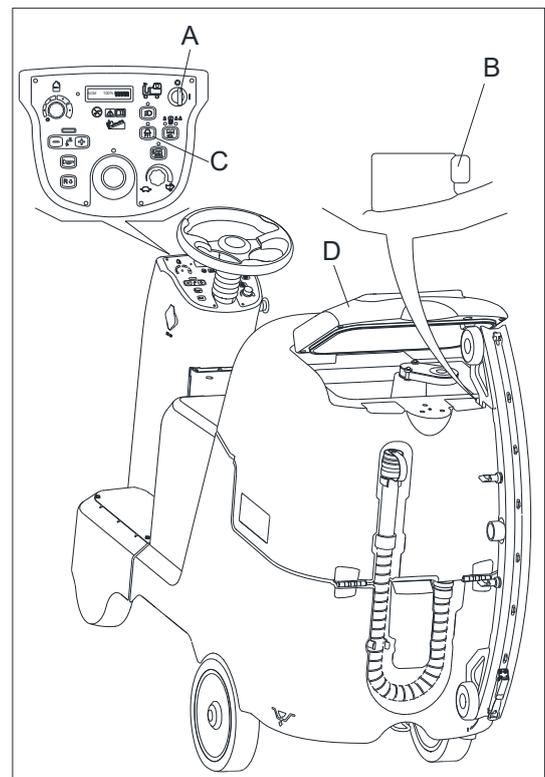


Figure 22

SQUEEGEE BLADE CHECK AND REPLACEMENT

1. Clean the steel or the aluminum squeegee, as shown in the previous paragraph.
2. Check that the edges (E, Figure 23) of the front blade (C) and the edges (F) of the rear blade (D) lay down on the same level, along with their length; if necessary adjust their height according to the following procedure:
 - Remove the tie rod (G), disengage the fasteners (M) and adjust the rear blade (D), then engage the fasteners (M) and install the tie rod (G).
 - Loosen the knobs (I) and adjust the front blade (C), then tighten the knobs.
3. Check the front blade (C) and rear blade (D) for wear, cuts and tears; if necessary replace them according to the following procedure. Check that the front corner (J) of the rear blade (D) is not worn; if necessary overturn the blade to replace the worn corner with an integral one. If the other corners are worn too, replace the blade according to the following procedure:
 - Remove the tie rod (G), disengage the fastener (M) and remove the retaining strip (K), then replace/overturn the rear blade (D). Assemble the blade in the reverse order of disassembly.
 - Unscrew the knobs (I) and remove the retaining strip (L), then replace front blade (C). Assemble the blade in the reserve order of disassembly. After the blade replacement (or overturning), adjust the height as shown in the previous step.
4. Connect the vacuum hose (A, Figure 24) to the squeegee.
5. Install the squeegee (B Figure 24) and screw down the knows (C Figure 24).
6. If necessary, adjust the squeegee balance adjusting knob (D Figure 24).

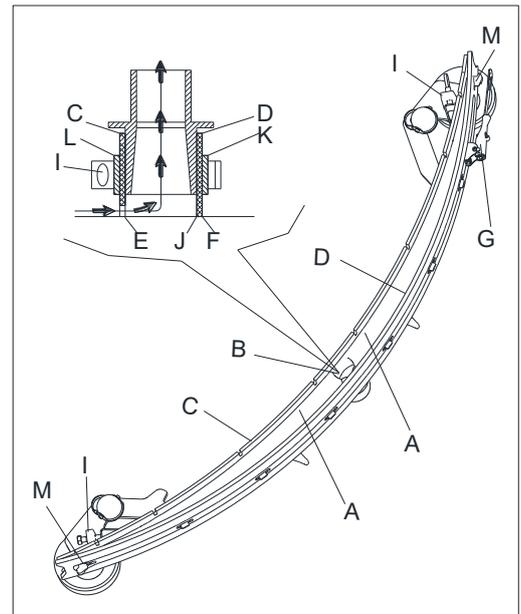


Figure 23

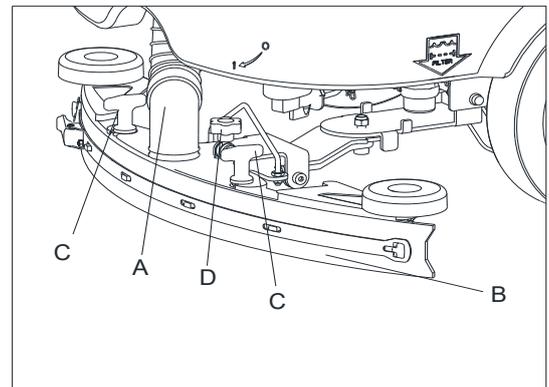


Figure 24

TANK AND DEBRIS COLLECTION BOX CLEANING, AND COVER GASKET CHECK

1. Drive the machine on a level floor.
2. Ensure the machine is off and the ignition key (40) has been removed.
3. Turn the recovery tank lid (A, Figure 25) 90 degree position where it can be took off from the tank, and then take down the Debris collection box (D, E Figure 25) from the tank.
4. Clean the recovery tank lid (A), recovery tank (B), clean water tank (C), Debris collection box (D, E Figure 25), Empty the recovery tank with the drain hose (G, Figure 25).
5. Inspect the integrity of the tank sealing strip.



NOTE

Tank sealing strip (G) makes to produce the vacuum inside the tank when suction motor works. The tank must be sealed can effectively absorb the water from the ground to recovery tank.

6. Check whether the contact surface of sealing strip (G) is integrity and sealing is sufficient. If necessary, take the sealing strip of the tank out of the groove (H) and replace it. Assembly the new sealing strip as shown in Figure 25, the joint should be back in the middle area.
7. Close the recovery tank lid (A Figure 25).

DETERGENT TANK CLEANING

(For machines with Chemical Mixing System)

Clean the detergent tank (E, Figure 26) as shown below:

1. Drive the machine on a level floor.
2. Turn the ignition key (A) to "0".
3. Open the cover (B) and check that the recovery water tank (C) is empty; if necessary empty it with the drain hose (H, Figure 26). Close the cover (B).
4. Carefully lift the tank (C).
5. Unscrew the plug (E) and disconnect the hose (F) from the tank (G).
6. Remove the tank.
7. Wash the tank in the appointed disposal area.
8. Install the tank (G) and connect the hose (F).
9. After draining the detergent tank, drain the Chemical Mixing System too by running the system with clean water only.

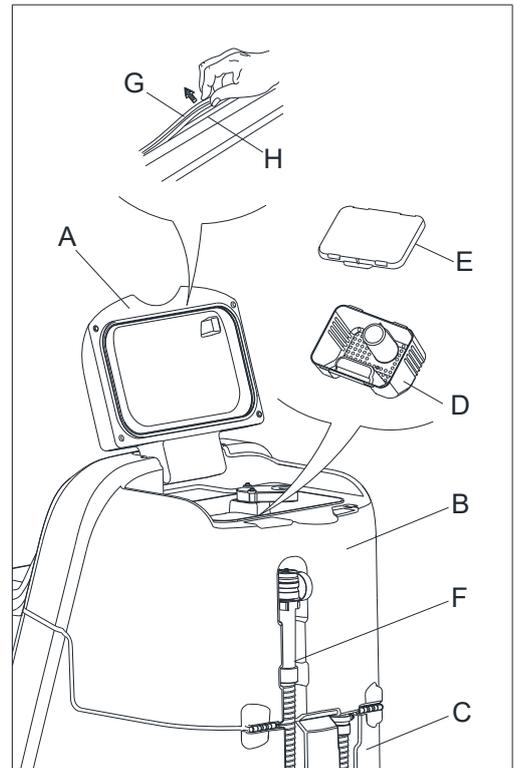


Figure 25

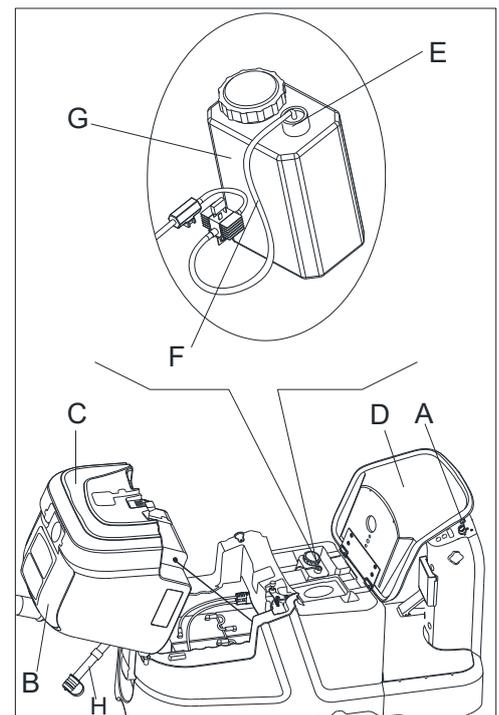


Figure 26

MACHINE WORKING HOUR CHECK

1. Turn the ignition key (A, Figure 27) to "I".
2. Press the switch (B Figure 27), the hour meter (C Figure 27) begins to work and it at the same time shows the total number of working hours (scrubbing/drying) performed by the machine.
3. Release the switch (B Figure 27).
4. Turn the ignition key (A Figure 27) to "0".

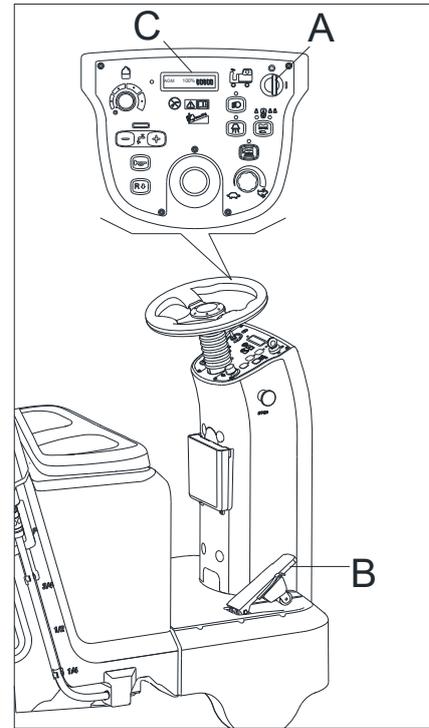


Figure 27

OVER LOAD PROTECTOR POSITION AND FUNCTION

1. Open the waterproof cover (Figure 28, A)
2. Check overload protector
 - B) F1 is main overload protector (5A)
 - C) F4 is brush motor overload protector (30A)
 - D) F5 is brush motor overload protector (30A)
 - E) F3 is squeegee lift overload protector (3A)
 - F) F6 is vacuum motor overload protector (30A)
 - G) F7 is drive motor overload protector (30A)
 - H) F2 is brush motor lift overload protector (3A)

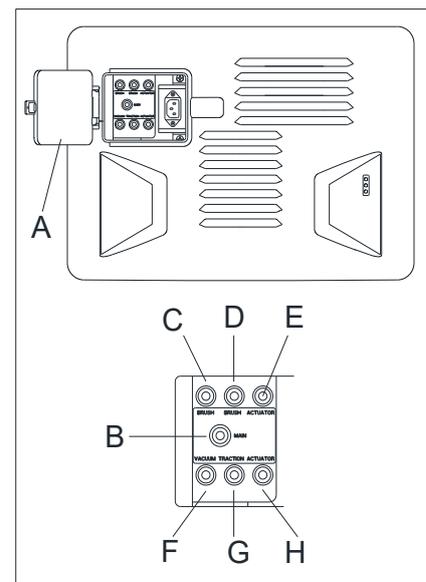


Figure 28

ACCESSORIES/OPTIONS

In addition to the standard components, the machine can be equipped with the following accessories/options, according to the machine specific use.

For further information concerning the above mentioned optional accessories, contact an authorized retailer.

Accessories/Options

See “Parts List” section

1. WET or GEL/AGM batteries
2. Mop and trash kit
3. Pads of different materials
4. Chemical Mixing System
5. Debris collection box
6. Warning light
7. Battery tray

TROUBLE SHOOTING

Trouble	Probable causes	Remedy
The motors do not work; no warning light turns on (C9)	The battery connector is disconnected	Connect the battery connector
	The batteries are completely discharged	Charge the batteries
The machine do not work, red battery capacity warning light turns on (C8)	The batteries level is too low	Charge the batteries
The machine do not go-forward /backward	the control circuit board fault	Replace the control circuit board
	The drive motor controller fault	Refer to “DRIVE MOTOR ERROR INDICATOR INFORMATION”
	The operator not on the seat	Sit on the seat
	Squeegee is not lifted during machine goes backward	Lift the squeegee
The brush motor does not work	The control circuit board fault	Replace the control circuit board
	Brush motor overload	Use soft bristle brush that is suitable for cleaning, and reset the brush motor overload protector
	Brush motor contactor fault	Contact after-sales service
	Brush motor carbon brush wearing	Contact after-sales service
	Obstacles prevent the brush rotating	Clean the brush
The drive motor does not work	Drive motor trouble light turns on	Refer to “DRIVE MOTOR ERROR INDICATOR INFORMATION”
	Drive motor overload	Reset drive motor overload protector and check drive motor/circuit
The vacuum motor does not work	Vacuum motor overload	Reset vacuum motor overload protector and check vacuum motor
	Relay of vacuum motor fault	Contact after-sales service
	Control board fault	Replace the control board
Insufficient suction, the floor cannot be dried	Recovery tank is full	Empty the recovery tank
	Drain hose and squeegee poor connection	Connect the drain hose and squeegee correctly
	Float ball filter block	Clean the float ball filter and check the float ball position status
	Squeegee is dirty or wearing	Check and clean the squeegee
	The The recovery tank cover is not closed properly, or the gasket is damaged, or the Bend tube is clogged	Close the cover correctly, or replace the gasket or clean the Bend tube.
	The Recovery tank is dirty	Clean the recovery tank
Insufficient solution supply to brush plate	The solution filter is dirty	Clean the filter
	The solution tank empty indicator is on	Fill the solution tank
	The solution tank is too dirty	Clean the solution tank
Squeegee leaves scratch on the floor	There are debris under the squeegee blade	Remove the debris
	Squeegee blade wear, crack, aged	Replace the squeegee blades
	The squeegee balance is not adjusted	Adjust the squeegee balance
Drive motor brake failure	The brake is locked	Set the brake unstuck

DRIVE MOTOR ERROR INDICATOR INFORMATION

LED CODES		FAULT	POSSIBLE CAUSE
1.1	□ □	THERMAL FAULT	1. Temperature >80°C or < -10°C. 2. Excessive load on vehicle. 3. Operation in extreme environments. 4. Electromagnetic brake not releasing.
1.2	□ □□	THROTTLE FAULT	1. Throttle input wire open or shorted. 2. Throttle pot defective. 3. Wrong throttle type selected.
1.3	□ □□□	SPEED POT FAULT	1. Speed limit pot wire(s) broken or shorted. 2. Broken speed limit pot.
1.4	□ □□□□	UNDERVOLTAGE FAULT	1. Battery voltage <17 volts. 2. Bad connection at battery or controller.
1.5	□ □□□□□	OVERVOLTAGE FAULT	1. Battery voltage >36 volts. 2. Vehicle operating with charger attached. 3. Intermittent battery connection.
2.1	□□ □	MAIN OFF FAULT	1. Main contactor driver failed open.
2.3	□□ □□□	MAIN FAULT *	1. Main contactor welded or stuck open. 2. Main contactor driver fault.
2.4	□□ □□□□	MAIN ON FAULT	1. Main contactor driver failed closed.
3.1	□□□ □	WIRING FAULT *	1. Misadjusted throttle. 2. Broken throttle pot or throttle mechanism.
3.2	□□□ □□	BRAKE ON FAULT	1. Electromagnetic brake driver shorted. 2. Electromagnetic brake coil open.
3.3	□□□ □□□	PRECHARGE FAULT *	1. Brake driver shorted. 2. Precharge circuit damaged. 3. MOSFET failure.
3.4	□□□ □□□□	BRAKE OFF FAULT	1. Electromagnetic brake driver open. 2. Electromagnetic brake coil shorted.
3.5	□□□ □□□□□	HPD FAULT	1. Improper sequence of throttle and KSI, push, or inhibit inputs. 2. Misadjusted throttle pot.
4.1	□□□□ □	CURRENT SENSE FAULT *	1. Short in motor or in motor wiring. 2. Controller failure.
4.2	□□□□ □□	HARDWARE FAILSAFE *	1. Motor voltage does not correspond to throttle request. 2. Short in motor or in motor wiring. 3. Controller failure.
4.3	□□□□ □□□	EEPROM CHECKSUM FAULT †	1. EEPROM failure or fault.
4.4	□□□□ □□□□	POWER SECTION FAULT*	1. EEPROM failure or fault. 2. Short in motor or in motor wiring 3. Controller failure.

*= Must cycle keyswitch to clear.

†= Must use programmer to clear, as follows: select Program menu, alter data value of any parameter, cycle keyswitch.



NOTE

Machine with battery charger installed, cannot operate if the charger is not on board. In case of battery charger malfunction, contact an authorized Service Center. For further information refer to the Service Manual, available at any Service Center.

SCRAPPING

Scrap the machine by the qualified waste treatment institution.

Before the machine is scrapped, please take away and segregate below subassembly that relevant laws and regulations request must be disposed in appropriate way.

- Battery
- Brush/Pad-holder
- Plastic hose and plastic parts
- Electrical and electronic components (*)

(*) Please contact our service center to destroy any of electrical and electronic components.

Machine material composition and recyclability

Type	Recyclable percentage	Weight%
Aluminium	100 %	2%
Electric motors - various	29%	32%
Ferrous materials	100 %	14%
Wiring harness	80%	3%
Liquids	100 %	0%
Plastic - non-recyclable material	0%	1%
Plastic - recyclable material	100 %	6%
Polyethylene	92%	40%
Rubber	20%	2%



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