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SCRUBTEC 653B – 653BL 651BCL – 661BL



Nilfisk ALTO

Why Compromise

ENGLISH

USER MANUAL
ORIGINAL INSTRUCTION

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Сертификат за съответствие	Conformity certificate	Declaração de conformidade
Osvědčení o shodě	Πιστοποιητικό συμμόρφωσης	Deklaracja zgodności
Konformitätserklärung	Megfelelősségi nyilatkozat	Certificat de conformitate
Overensstemmelsecertifikat	Dichiarazione di conformità	Заявление о соответствии
Declaración de conformidad	Atitikties deklaracija	Överensstämmelsecertifikat
Vastavussertifikaat	Atbilstības deklarācija	Certifikát súladu
Déclaration de conformité	Konformitetssertifisering	Certifikat o ustreznosti
Yhdenmukaisuustodistus	Conformiteitsverklaring	Uyumluluk sertifikası

Модел / Model / Modell / Model / Modelo / Mudel / Modèle / Malli / Model / Μοντέλο / Modell / Modello / Modelis / Modelis / Modell / Model / Modelo / Model / Model / Модель / Modell / Model / Model / Model :

SCRUBTEC 653B – 653BL – 651BCL – 661BL

Тип / Typ / Typ / Type / Tipo / Tüüp / Type / Τυππι / Type / Τύπος / Típus / Tipo / Típas / Típs / Type / Type / Tipo / Typ / Tip / Тип / Typ / Typ / Tip / Tip :

SCRUBBER-DRYER

Сериен номер / Výrobní číslo / Seriennummer / Seriennummer / Número de serie / Seerianumber / Numéro de série / Sarjanumero / Serial number / Σειριακός αριθμός / Sorozatszám / Numero di serie / Serijos numeris / Sērijas numurs / Seriennummer / Seriennummer / Número de série / Numer seryjny / Număr de serie / Серийный номер / Seriennummer / Výrobné číslo / Serijska številka / Seri Numarası :

Година на производство / Rok výroby / Baujahr / Fabrikationsår / Año de fabricación / Väljallaskeasta / Année de fabrication / Valmistusvuosi / Year of construction / Έτος κατασκευής / Gyártási év / Anno di costruzione / Pagaminimo metai / Izgatavošanas gads / Byggeår / Bauwjaar / Ano de fabrico / Rok produkcji / Anul fabricației / Год выпуска / Tillverkningsår / Rok výroby / Leto izdelave / Leto izdelave / İmal yılı :

BG Долуподписаният потвърждава, че гореспоменатият модел е произведен в съответствие със следните директиви и стандарти.	GB The undersigned certify that the above mentioned model is produced in accordance with the following directives and standards.	P A presente assinatura serve para declarar que os modelos supramencionados são produtos em conformidade com as seguintes directivas e normas.
CZ Níže podepsaný stvrzuje, že výše uvedený model byl vyroben v souladu s následujícími směrnicemi a normami.	GR Ο κάτωθι υπογεγραμμένος πιστοποιεί ότι η παραγωγή του προαναφερθέντος μοντέλου γίνεται σύμφωνα με τις ακόλουθες οδηγίες και πρότυπα.	PL Niżej podpisany zaświadcza, że wymieniony powyżej model produkowany jest zgodnie z następującymi dyrektywami i normami.
D Der Unterzeichner bestätigt hiermit dass die oben erwähnten Modelle gemäß den folgenden Richtlinien und Normen hergestellt wurden.	H Alulírottak igazoljuk, hogy a fent említett modellt a következő irányelvek és szabványok alapján hoztuk létre.	RO Subsemnatul atest că modelul susmenționat este produs în conformitate cu următoarele directive și standarde.
DK Undertegnede attesterer herved, at ovennævnte model er produceret i overensstemmelse med følgende direktiver og standarder.	I Il sottoscritto dichiara che i modelli sopra menzionati sono prodotti in accordo con le seguenti direttive e standard.	RUS Настоящим удостоверяется, что машина вышеуказанной модели изготовлена в соответствии со следующими директивами и стандартами.
E El abajo firmante certifica que los modelos arriba mencionados han sido producidos de acuerdo con las siguientes directivas y estándares.	LT Toliau pateiktu dokumentu patvirtinama, kad minėtas modelis yra pagamintas laikantis nurodytų direktyvų bei standartų.	S Underteknad intygar att ovannämnda modell är producerad i överensstämmelse med följande direktiv och standarder.
EST Allakirjutanu kinnitab, et ülalnimetatud mudel on valmistatud kooskõlas järgmiste direktiivide ja normidega.	LV Ar šo tiek apliecināts, ka augstākminētais modelis ir izgatavots atbilstoši šādām direktīvām un standartiem.	SK Dolu podpísaný osvedčuje, že hore uvedený model sa vyrába v súlade s nasledujúcimi smernicami a normami.
F Je soussigné certifie que les modèles ci-dessus sont fabriqués conformément aux directives et normes suivantes.	N Undertegnede attesterer att ovennævnte modell är produceret i överensstemmelse med följande direktiv och standarder.	SLO Spodaj podpisani potrjujem, da je zgoraj omenjeni model izdelan v skladu z naslednjimi smernicami in standardi.
FIN Allekirjoittaja vakuuttaa että yllämainittu malli on tuotettu seuraavien direktiivien ja standardien mukaan.	NL Ondergetekende verzekert dat de bovengenoemde modellen geproduceerd zijn in overeenstemming met de volgende richtlijnen en standaards.	TR Aşağıda İmzası olan kişi, yukarıda bahsedilen model cihazın aşağıda verilen direktiflere ve standartlara uygunlukta imal edildiğini onaylar.

EC Machinery Directive 2006/42/EC	EN ISO 12100-1, EN ISO 12100-2, EN 294, EN 349, EN 982
EC Low Voltage Directive 2006/95/EC	EN 60335-1, EN 60335-2-72, EN 50366
EC EMC Directive 2004/108/EC	EN 55014-1, EN 55014-2

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INTRODUCTION

**NOTE**

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

MANUAL PURPOSE AND CONTENTS

The purpose of this Manual is to provide the operator with all necessary information to use the machine properly, in a safe and autonomous way. It contains information about technical data, safety, operation, storage, maintenance, spare parts and disposal. Before performing any procedure on the machine, the operators and qualified technicians must read this Manual carefully. Contact Nilfisk Alto in case of doubts concerning the interpretation of the instructions and for any further information.

TARGET

This Manual is intended for operators and technicians qualified to perform the machine maintenance.

The operators must not perform procedures reserved for qualified technicians. Nilfisk Alto will not be answerable for damages coming from the non-observance of this prohibition.

HOW TO KEEP THIS MANUAL

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

DECLARATION OF CONFORMITY

The Declaration of Conformity, supplied with the machine, certifies the machine conformity with the law in force.

**NOTE**

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

IDENTIFICATION DATA

The machine model and serial number are marked on the plate (34).

The machine production year is written in the declaration of conformity and it is also indicated by the first two figures of the machine serial number.

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

MACHINE model
MACHINE serial number

OTHER REFERENCE MANUALS

– Electronic Battery Charger Manual (if equipped), to be considered as integral part of this Manual

Moreover, the following Manuals are available:

- Service Manual (that can be consulted at Nilfisk Alto Service Centers)
- Spare Parts List (supplied with the machine)

SPARE PARTS AND MAINTENANCE

All necessary operating, maintenance and repair procedures must be performed by qualified personnel or by Alto Service Centers.

Only original spare parts and accessories must be used.

Contact Nilfisk Alto for service or to order spare parts and accessories, specifying the machine model and serial number.

CHANGES AND IMPROVEMENTS

Nilfisk Alto constantly improves its products and reserves the right to make changes and improvements at its discretion without being obliged to apply such benefits to the machines that were previously sold.

Any change and/or addition of accessories must be approved and performed by Nilfisk Alto.

OPERATION CAPABILITIES

These scrubber-dryers are used to clean (scrubbing and drying) smooth and solid floors, in civil or industrial environment, under safe operation conditions by a qualified operator.

The scrubber-dryers cannot be used for fitted carpet and carpet cleaning.

CONVENTIONS

Forward, backward, front, rear, left or right are intended with reference to the operator's position, that is to say in driving position with the hands on the handlebar (2).

UNPACKING/DELIVERY

To unpack the machine, carefully follow the instructions on the packing.

When the machine is delivered, check that the packing and the machine were not damaged during transportation. In case of visible damages, keep the packing and have it checked by the carrier that delivered it. Call the carrier immediately to fill in a damage claim.

Check that the machine is equipped with the following features:

1. Technical documents:
 - Scrubber-dryer User Manual
 - Electronic Battery Charger Manual (if equipped)
 - Scrubber-dryer Spare Parts List
2. No. 1 connector for battery charger (for machines without on board battery charger)
3. No. 2 lamellar fuses

SAFETY

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

The operator's cooperation is essential in order to prevent injury. No accident prevention program is effective without the total cooperation of the person responsible for the machine operation. Most of the accidents that may occur in a factory, while working or moving around, are caused by failure to comply with the simplest rules for exercising prudence. A careful and prudent operator is the best guarantee against accidents and is essential for successful completion of any prevention program.

SYMBOLS



DANGER!

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



WARNING!

It indicates a potential risk of injury for people or damage to objects.



CAUTION!

It indicates a caution or a remark related to important or useful functions. Pay careful 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 User Manual before performing any procedure.

GENERAL INSTRUCTIONS

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



DANGER!

- Before performing any cleaning, maintenance, repair or replacement procedure disconnect the battery connector and remove the ignition key.
- This machine must be used by properly trained operators only. Children or disabled people cannot use this machine.
- Keep the battery away from sparks, flames and incandescent material. During the normal operation explosive gases are released.
- Do not wear jewels when working near electrical components.
- Do not work under the lifted machine without supporting it with safety stands.
- Do not operate the machine near toxic, dangerous, flammable and/or explosive powders, liquids or vapours: This machine is not suitable for collecting dangerous powders.
- Battery charging produces highly explosive hydrogen gas. Keep the tank assembly open during battery charging and perform this procedure in well-ventilated areas and away from naked flames.



WARNING!

- Carefully read all the instructions before performing any maintenance/repair procedure.
- Before using the battery charger, ensure that frequency and voltage values, indicated on the machine serial number plate, match the electrical mains voltage.
- Do not pull or carry the machine by the battery charger cable and never use the battery charger cable as a handle. Do not close a door on the battery charger cable, or pull the battery charger cable around 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 use the machine if the battery charger cable or plug is damaged. If the machine is not working as it should, has been damaged, left outdoors or dropped into water, return it to the Service Center.
- To reduce the risk of fire, electric shock, or injury, do not leave the machine unattended when it is plugged in. Before performing any maintenance procedure, disconnect the battery charger cable from the electrical mains.
- Do not smoke while charging the batteries.
- Do not allow to be used as a toy. Close attention is necessary when used near children.
- Use only as shown in this Manual. Use only Nilfisk Alto's recommended accessories.
- Take all necessary precautions to prevent hair, jewels and loose clothes from being caught by the machine moving parts.
- To avoid any unauthorised use of the machine, remove the ignition key (if equipped).
- Do not leave the machine unattended without being sure that it cannot move independently.

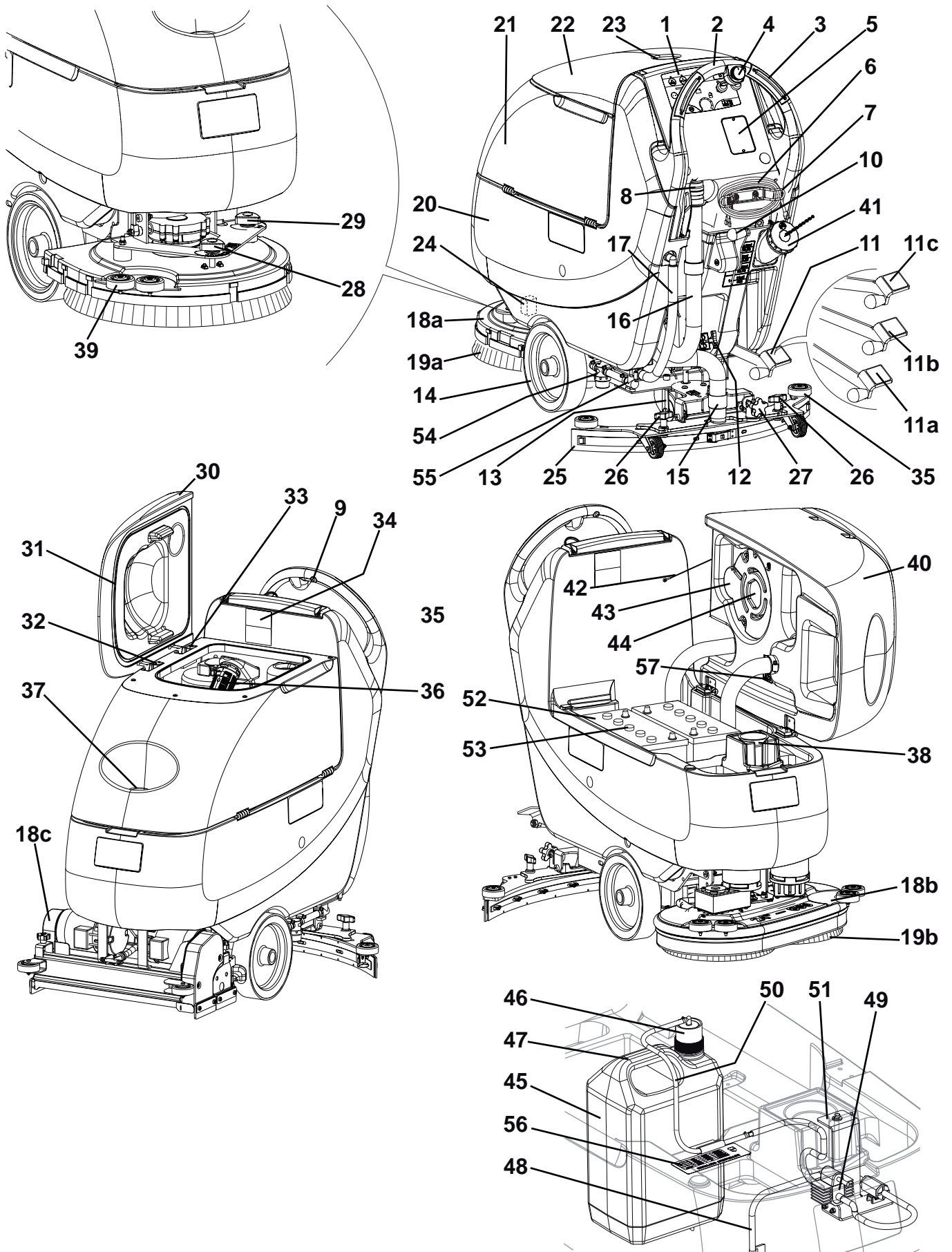
**WARNING!**

- *Do not use the machine on slopes with a gradient exceeding the specifications.*
- *Do not use the machine in particularly dusty areas.*
- *While using this machine, take care not to cause damage to people or objects.*
- *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.*
- *The machine working temperature must be between 0°C and +40°C.*
- *The machine storage temperature must be between 0°C and +40°C.*
- *The humidity must be between 30% and 95%.*
- *Always protect the machine against the sun, rain and bad weather, both under operation and inactivity condition. Store the machine indoors, in a dry place: This machine must be used in dry conditions, it must not be used or kept outdoors in wet conditions.*
- *Before using the machine, close all doors and/or covers.*
- *When using floor cleaning detergents, follow the instructions on the labels of the detergent bottles.*
- *To handle floor cleaning detergents, wear suitable gloves and protections.*
- *Do not use the machine as a means of transport.*
- *Do not allow the brushes to operate while the machine is stationary to avoid damaging the floor.*
- *In case of fire, use a powder fire extinguisher, not a water one.*
- *Do not tamper with the machine safety guards and follow the ordinary maintenance instructions scrupulously.*
- *Do not allow any object to enter into the openings. Do not use the machine if the openings are clogged. Always keep the openings free from dust, hairs and any other foreign material which could reduce the air flow.*
- *Do not remove or modify the plates affixed to the machine.*
- *This machine cannot be used on roads or public streets.*
- *Pay attention during machine transportation when temperature is below freezing point. The water in the recovery tank or in the hoses could freeze and seriously damage the machine.*
- *Use brushes and pads supplied with the machine and those specified in the User Manual. Using other brushes or pads could reduce safety.*
- *In case of machine malfunctions, ensure that these are not due to lack of maintenance. Otherwise, request assistance from the authorised personnel or from an authorised Service Center.*
- *If parts must be replaced, require ORIGINAL spare parts from an Authorised Dealer or Retailer.*
- *To ensure machine proper and safe operation, the scheduled maintenance shown in the relevant chapter of this Manual, must be performed by the authorised personnel or by an authorised Service Center.*
- *Do not wash the machine with direct or pressurised water jets, or with corrosive substances.*
- *The machine must be disposed of properly, because of the presence of toxic-harmful materials (batteries, etc.), which are subject to standards that require disposal in special centres (see Scrapping chapter).*

MACHINE DESCRIPTION

MACHINE STRUCTURE

1. Control panel
 2. Handlebar
 3. Brush/forward gear switch (*). Brush switch (***)
 4. Drive speed adjuster (*)
 5. Battery charger data inspection window (optional)
 6. Battery charger cable (optional)
 7. Battery charger cable holder (optional)
 8. Recovery water drain hose plug
 9. Reverse gear switch
 10. Squeegee lifting/lowering lever
 11. Deck lifting/lowering pedal
 - 11a. Pedal position when deck is lifted
 - 11b. Pedal position when deck is lowered
 - 11c. Extra pressure activation (optional)
 12. Battery connector (red). This connector also works as EMERGENCY push-button, to stop immediately all functions.
 13. Rear steering wheel
 14. Front wheels on fixed axle. Driving wheels (*)
 15. Squeegee vacuum hose
 16. Recovery water drain hose
 17. Solution/clean water drain and level check hose
 - 18a. Deck with one brush/pad-holder
 - 18b. Deck with two brushes/pad-holders
 - 18c. Deck with two cylindrical brushes
 - 19a. Brushes/pad-holders
 - 19b. Cylindrical brushes
 20. Solution/clean water tank
 21. Recovery tank
 22. Recovery tank cover
 23. Can holder
 24. Solenoid valve
 25. Squeegee
 26. Squeegee mounting handwheels
 27. Squeegee adjusting handwheel
 28. Machine straight forward movement adjusting handwheel
 29. Machine forward speed adjusting handwheel (***)
 30. Recovery tank cover
 31. Tank cover gasket
 32. Cover movable retaining plate
 33. Cover fixed retaining plate (do not remove!)
 34. Serial number plate/technical data/conformity certification
 35. Squeegee bumper wheel
 36. Vacuum grid with automatic shut-off float
 37. Solution/clean water front filler neck
 38. Filter
 39. Brush bumper wheels
 40. Recovery water tank (opened)
 41. Solution/clean water rear filler neck
 42. Tank safety cable
 43. Vacuum system motor cover
 44. Vacuum system motor sound-deadening filter
 45. Detergent tank (**)
 46. Detergent tank plug (**)
 47. Detergent tank handle (**)
 48. Detergent feed hose (**)
 49. Detergent pump (**)
 50. Detergent tank - pump connecting hose (**)
 51. Detergent pump holder (**)
 52. Batteries
 53. Battery caps
 54. Solution/clean water filter
 55. Solution/clean water tap
 56. Reference table for detergent proportioning (**)
 57. Battery connection diagram
- (*) Only for SCRUBTEC 653BL, SCRUBTEC 651BCL, SCRUBTEC 661BL
- (**) Only for machines with Chemical Mixing System (optional)
- (***) Only for SCRUBTEC 653B



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CONTROL PANEL

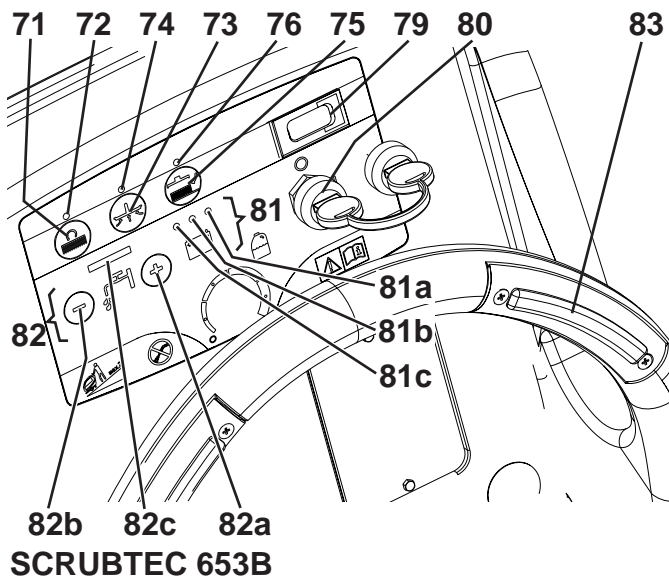
- 71. Brush/pad-holder switch
- 72. Brush/pad-holder switch warning light
- 73. Vacuum system switch
- 74. Vacuum system switch warning light
- 75. Brush/pad-holder release switch
- 76. Brush/pad-holder release switch warning light
- 77. Detergent flow control knob (**)
- 78. Reverse gear switch (*)
- 79. Hour counter (optional)
- 80. Ignition key (0 - I)
- 81. Battery charge indicator
- 81a. Charged battery warning light (green)
- 81b. Semi-discharged battery warning light (yellow)

- 81c. Discharged battery warning light (red)
- 82. Washing water flow control switches
- 82a. Flow increase switch
- 82b. Flow decrease switch
- 82c. Washing water flow indicator
- 83. Brush/forward gear switch (*). Brush switch (***)
- 84. Speed adjuster (*)

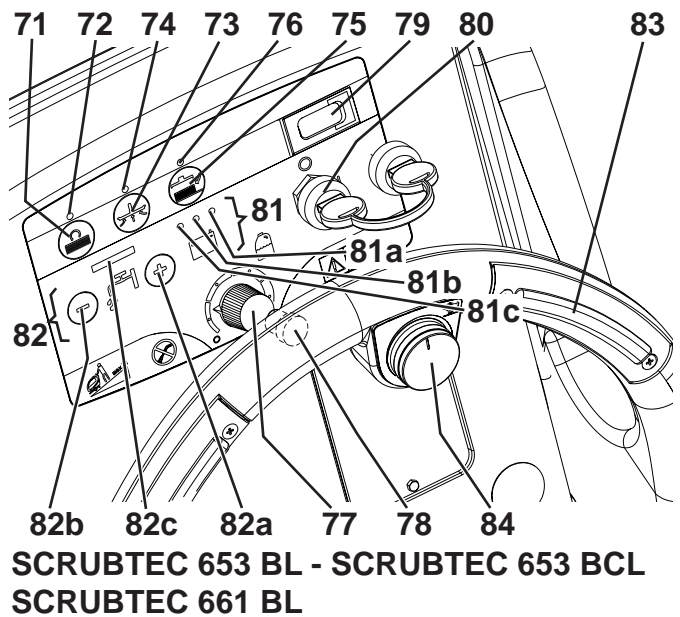
(*) Only for SCRUBTEC 653BL, SCRUBTEC 651BCL, SCRUBTEC 661BL

(**) Only for machines with Chemical Mixing System (optional)

(***) Only for SCRUBTEC 653B



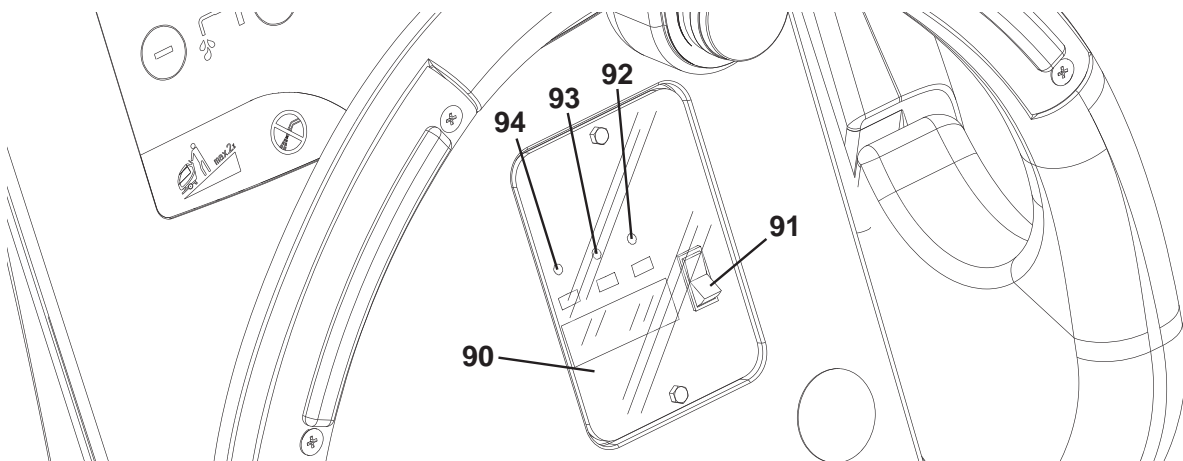
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BATTERY CHARGER DATA INSPECTION WINDOW (optional)

- 90. Electronic battery charger
- 91. Lead (WET) or gel (GEL) battery selector
- 92. Green warning light (ON: the battery charger is on and batteries are charged)
- 93. Yellow warning light (ON: the battery charger is on and batteries are semi-discharged)
- 94. Red warning light (ON: the battery charger is on and it is charging the batteries)



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ACCESSORIES/OPTIONS

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

1. GEL batteries
2. Electronic battery charger
3. Brushes and cylindrical brushes of different materials
4. Pads of different materials
5. Polyurethane squeegee blades
6. Chemical Mixing System
7. Front and rear wheels of different materials
8. Hour counter

For further information concerning the optional accessories, contact an authorised Retailer.

TECHNICAL DATA

General technical data

Model	SCRUBTEC 653B (1 brush/pad-holder, without drive system)	SCRUBTEC 653BL (1 brush/pad-holder, with drive system)	SCRUBTEC 651BCL (2 cylindrical brushes, with drive system)	SCRUBTEC 661BL (2 brushes/pad- holders, with drive system)
Machine height	1,088 mm			
Solution/clean water tank capacity	55 litres			
Recovery tank capacity	55 litres			
Front wheel diameter	250 mm			
Front and rear wheel specific pressure on the floor	0.8 N/mm ² 2.8 N/mm ²	0.8 N/mm ² 6.1 N/mm ²		
Rear wheel diameter	100 mm			
Vacuum system motor power	330 W			
Drive system motor power	—	200 W		
Drive speed (variable)	—	0 to 5.6 km/h		
Gradeability	2%			
Sound pressure level at workstation (ISO 11201, ISO 4871) (LpA)	65.8 dB(A) ± 3 dB(A)			
Machine sound pressure level (ISO 3744, ISO 4871) (LwA)	84 dB(A)			
Vibration level at the operator's arms (ISO 5349-1)	< 2.5 m/s ²			
Standard batteries	(2 x 12 V) 95 - 165 Ah @ 20 h			
Battery compartment size (width x length x height)	350 x 350 x 300 mm			
Vacuum system circuit capacity	1,055 mm H ₂ O			

Technical data for machines with brush/pad-holder deck

Model	SCRUBTEC 653B (1 brush/pad-holder, without drive system)	SCRUBTEC 653BL (1 brush/pad-holder, with drive system)	SCRUBTEC 661BL (2 brushes/pad- holders, with drive system)
Cleaning width	530 mm	530 mm	610 mm
Squeegee width	760 mm		810 mm
Machine maximum length	1,323 mm		1,311 mm
Machine width without squeegee	541 mm		646 mm
Brush diameter	530 mm		305 mm
Weight without batteries and with empty tanks	87 kg	95 kg	
Maximum weight with batteries and full tanks	234 kg	241 kg	
Brush motor power	480 W		350 W
Brush speed	153 rpm		230 rpm
Brush/pad-holder pressure with extra-pressure function turned off	20 kg		
Brush/pad-holder pressure with extra-pressure function turned on	Optional	40 kg	

Technical data for machines with cylindrical brush deck

Model	SCRUBTEC 651BCL (2 cylindrical brushes, with drive system)
Cleaning width	510 mm
Squeegee width	760 mm
Machine maximum length	1,253 mm
Machine width without squeegee	575.5 mm
Cylindrical brush size (diameter x length)	110 x 485 mm
Weight without batteries and with empty tanks	105 kg
Maximum weight with batteries and full tanks	251 kg
Brush motor power	400 W
Cylindrical brush speed	570 rpm
Cylindrical brush pressure	26.5 kg

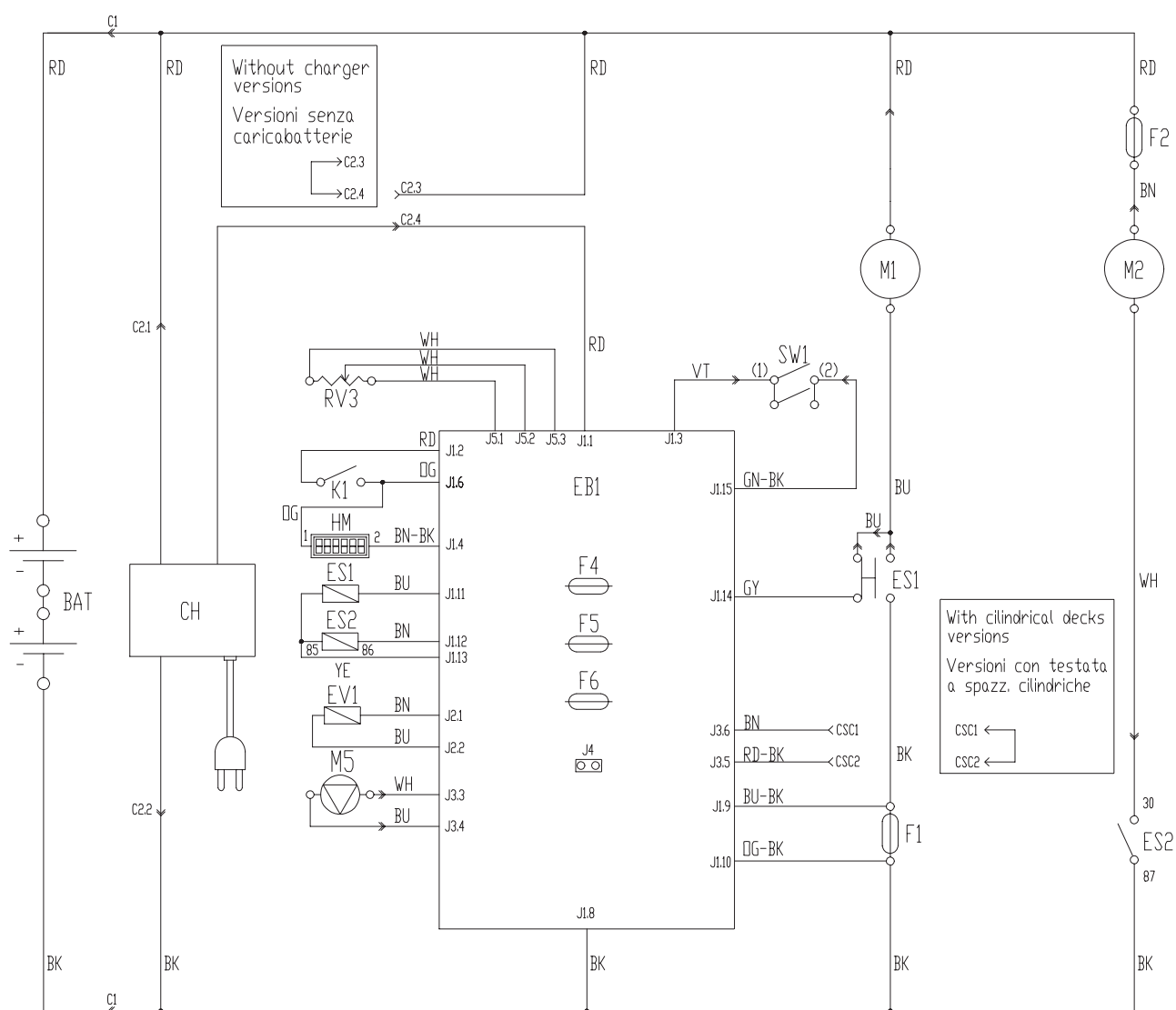
WIRING DIAGRAM (SCRUBTEC 653B)

Key

BAT	24 V battery
C1	Battery connector
C2	Battery charger connector
CH	Battery charger (optional)
CS	Deck connector
EB1	Function electronic board
ES1	Brush electromagnetic switches
ES2	Vacuum system relay
EV1	Water solenoid valve
F1	Deck fuse
F2	Vacuum system fuse
F4	Signal circuit fuse
F5	Brush release fuse
F6	Pump fuse
HM	Hour counter (optional)
K1	Ignition key
M1	Brush/pad-holder motor
M2	Vacuum system motor
M5	Detergent pump (optional)
RV3	Detergent % potentiometer (optional)
SW1	Brush/drive system enabling switch

Colour codes

BK	Black
BU	Blue
BN	Brown
GN	Green
GY	Grey
OG	Orange
PK	Pink
RD	Red
VT	Violet
WH	White
YE	Yellow



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WIRING DIAGRAM (SCRUBTEC 653BL, SCRUBTEC 651BCL, SCRUBTEC 661BL)

Key

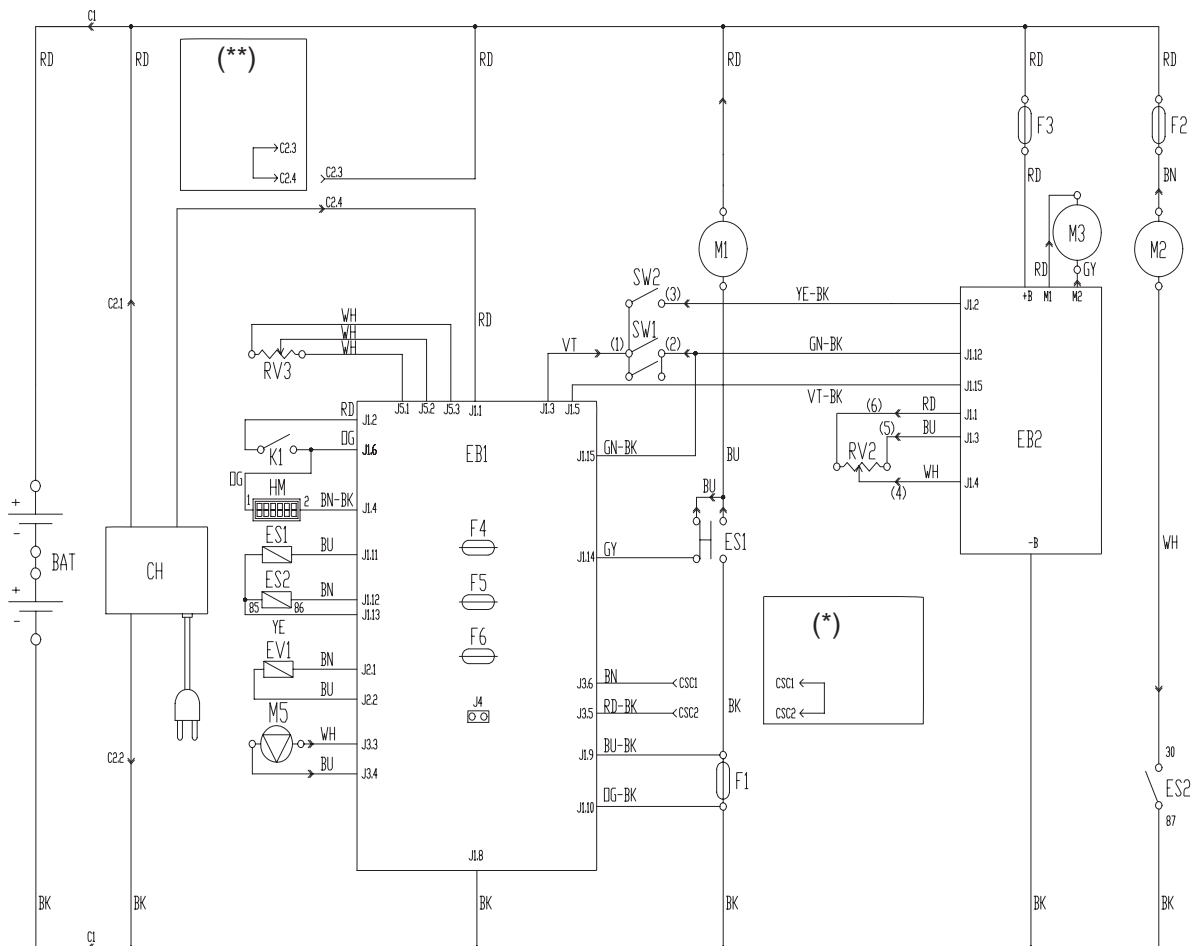
BAT	24 V battery
C1	Battery connector
C2	Battery charger connector
CH	Battery charger (optional)
CSC	Cylindrical brush deck sub-connector
EB1	Function electronic board
EB2	Drive system electronic board
ES1	Brush electromagnetic switches
ES2	Vacuum system relay
EV1	Detergent solenoid valve (optional)
F1	Deck fuse
F2	Vacuum system fuse
F3	Drive system fuse
F4	Signal circuit fuse
F5	Brush/pad-holder release fuse
F6	Pump fuse
HM	Hour counter (optional)
K1	Ignition key
M1	Brush/pad-holder motor
M2	Vacuum system motor
M3	Drive system motor
M5	Detergent pump (optional)
RV2	Maximum speed potentiometer
RV3	Detergent % potentiometer (optional)
SW1	Brush/drive system enabling switch
SW2	Reverse gear switch

Colour codes

BK	Black
BU	Blue
BN	Brown
GN	Green
GY	Grey
OG	Orange
PK	Pink
RD	Red
VT	Violet
WH	White
YE	Yellow

(*) Only for machines with cylindrical brush deck

(**) Only for machines without on-board battery charger



USE

**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 only. Set the function electronic board and the battery charger (optional) according to the type of batteries used (WET or GEL).

Check the batteries for damage before installation.

Disconnect the battery connector and the battery charger plug.

Handle the batteries with great care.

Install the battery terminal protection caps supplied with the machine.

The machine requires two 12 V batteries, connected according to the diagram (57).

The machine can be supplied in one of the following modes:

A) Batteries (WET or GEL) already installed and ready to be used

1. Check that the batteries are connected to the machine with the connector (12).
2. Insert the ignition key (80) and turn it to "I".
If the green warning light (81a) turns on, the batteries are ready to be used.
If the yellow or red warning light (81b or 81c) turns on, the batteries must be charged (see the procedure in Maintenance chapter).

B) Batteries (WET) installed on the machine, but without electrolyte

1. Open the cover (22) and check that the recovery tank (21) is empty, otherwise empty it with the drain hose (16).
2. Carefully lift the tank (40).
3. Remove the caps (53) of the batteries (52).

**WARNING!**

Pay attention when using sulphuric acid, as it is corrosive. If it comes in contact with skin or eyes, rinse thoroughly with water and consult a physician.

Batteries have to be filled in a well-ventilated area. Wear protective gloves.

4. Fill up the battery cells with sulphuric acid for batteries (density 1.27 to 1.29 kg at 25°C) in accordance with the instructions shown in the Battery Manual. The correct quantity of sulphuric acid is shown in the Battery Manual.
5. To avoid damaging the floor, dry with a cloth both acid and water on the top of the batteries after charging.
6. Let the batteries rest and fill in with sulphuric acid as shown in the Battery Manual.
7. Charge the batteries (see the procedure in Maintenance chapter).

C) Without batteries

1. Buy appropriate batteries (see Technical Data paragraph).
2. For battery choice and installation, apply to qualified battery Retailers.
3. Set the machine and the battery charger (if equipped) according to the type of batteries installed (WET or GEL) as shown in the following paragraph.

BATTERY INSTALLATION AND BATTERY TYPE SETTING (WET OR GEL)

Set the electronic board of the machine and of the battery charger (if equipped) according to the type of batteries installed (WET or GEL) according to the following procedure:

Machine setting

1. Turn the ignition key (80) to "I" and pay attention to the following in the very first seconds of machine operation:
 - If the green warning light (81a) is flashing, the machine is set to GEL.
 - If the red warning light (81c) is flashing, the machine is set to WET.
2. If the setting is to be changed, perform the following procedure.
3. Turn off the machine by turning the ignition key (80) to "0".
4. Press and hold the switches (71) and (73) at the same time, then turn the ignition key (80) to "I".
5. Release the switches (71) and (73) at least 8 seconds after starting the machine.
6. Within 3 seconds, press the switch (73) again for a few seconds and check that the warning light for the required setting is flashing (as shown in step 1).

Battery charger setting (for machines with on-board battery charger)

7. Remove the battery charger data inspection window screws (A, Fig. 1).
8. Remove the window (B).
9. Turn the battery charger selector (C) to WET position for lead batteries, or to GEL position for gel batteries.
10. Install the window (B) and tighten the screws (A).

Battery installation

11. Open the cover (22) and check that the recovery tank (21) is empty, otherwise empty it with the drain hose (16).
12. Carefully lift the tank (40).
13. Install the batteries.

Battery charging

14. Charge the batteries (see the procedure in Maintenance chapter).

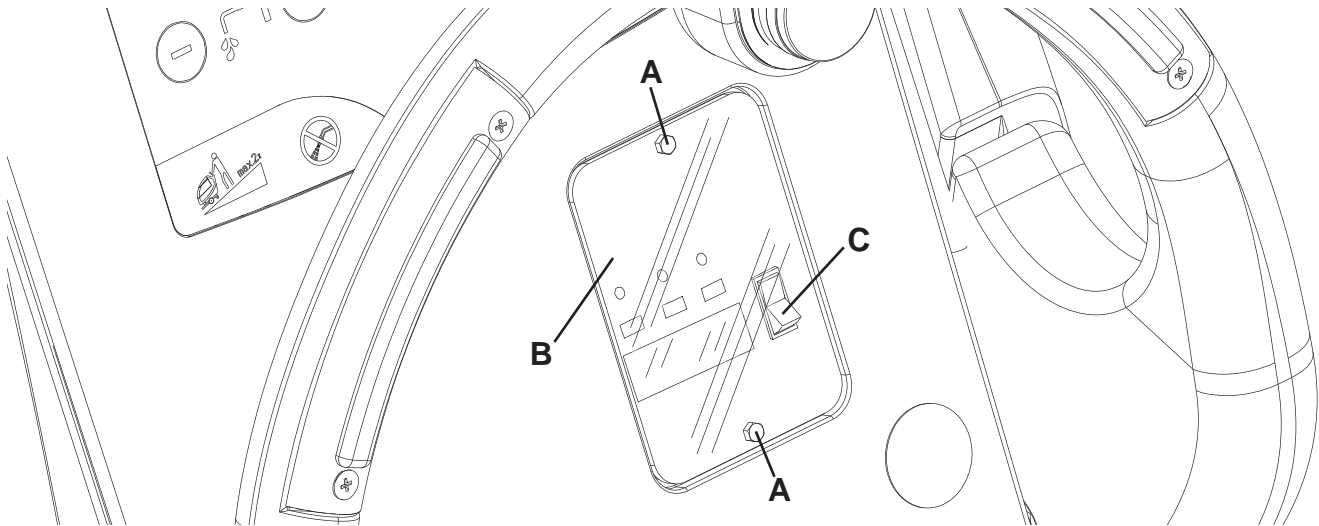


Figure 1

P100105

BEFORE MACHINE START-UP

Brush/pad-holder deck or cylindrical brush deck installation/removal

The machine can be equipped with either the brush/pad-holder deck (18a and 18b) or the cylindrical brush deck (18c). For deck installation/removal see the procedure in Maintenance chapter.



NOTE

When the deck is installed/removed, it may be necessary to change the squeegee too, because they must have the same width. For correct matching of deck and squeegee, see the Squeegee Installation paragraph.

Brush/pad-holder installation/removal

1. According to the kind of cleaning to be performed, the machine can be equipped either with brushes (A, Fig. 2) or pad-holders (B) with pads (C) together with the appropriate deck.
2. Insert the ignition key (80) and turn it to "I".
3. If equipped, turn the speed adjuster (84) to idle by turning it counter-clockwise.
4. Place the brushes (A) or the pad-holders (B) under the appropriate deck (18a) or (18b).
5. Lower the deck on the brushes/pad-holders by pressing the pedal (11).
6. Turn the ignition key (80) to "I".
7. Press the brush/pad-holder switch (71).
8. Press one of the switches (83) to engage the brush/pad-holder, then release it. If necessary, repeat the procedure until the brushes/pad-holders are engaged.

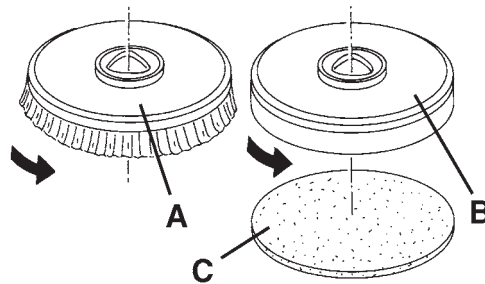


Figure 2

S311334



WARNING!

(Only for SCRUBTEC 653BL, SCRUBTEC 651BCL, SCRUBTEC 661BL): Turn the speed adjuster (84) counter-clockwise to drive the machine at the minimum speed.

To engage the brush/pad-holder press the switch (83) which turns on the brush/pad-holder motor.

9. To remove the brushes/pad-holders, the deck must be lifted by pressing the pedal (11), then press the switch (75) and wait for the brush/pad-holder to fall on the floor. Turn the ignition key (80) to "0".

Types of brushes available

305 mm-models

PROLENE
MIDLITE GRIT 180
MIDGRIT 240
PROLITE
UNION MIX

530 mm-models

PROLENE
MIDLITE GRIT 180
MIDGRIT 240
PROLITE
UNION MIX

Brush/pad application guide (suggestions only)

Models	MIDLITE GRIT 180	MIDGRIT 240	PROLENE	PROLITE	UNION MIX
General cleaning:					
Concrete					
Terrazzo floor					
Ceramic tiles/quarystones					
Marble					
Vinyl tiles					
Rubber tiles					
Polishing:					
Rubber tiles					
Marble					
Vinyl tiles					

Cylindrical brush installation/removal (only for SCRUBTEC 651BCL)

1. Turn the ignition key (80) to "0".
2. Lift the cylindrical brush deck by pressing the pedal (11).
3. Remove the handwheels (A, Fig. 3) and the lids (B) by pushing them downwards and pressing on the handwheels.
4. Install the cylindrical brushes (C).
- The cylindrical brushes can be installed on either sides.
5. Install the lids (B) and fasten them with the handwheels (A).
6. To remove the cylindrical brushes, perform steps 1 to 5 in the reverse order.

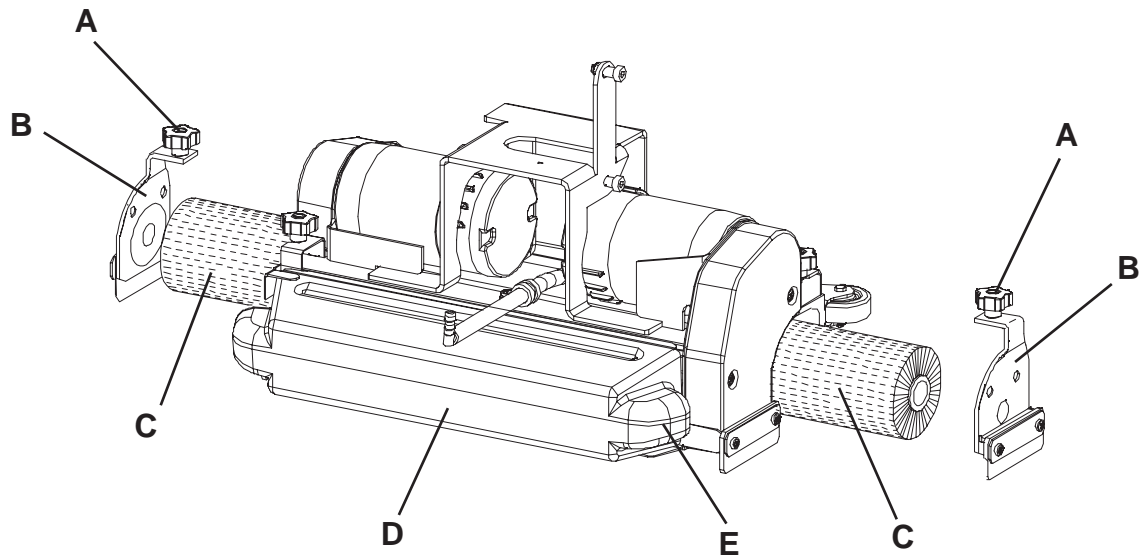


Figure 3

S311318

Types of cylindrical brushes available

485 mm-models

POLYPROPYLENE 0.40

HARD NYLON 0.60

SOFT NYLON 0.45

Cylindrical brush application guide (suggestions only)

Models	POLYPROPYLENE 0.40	HARD NYLON 0.60	SOFT NYLON 0.45
General cleaning:			
Concrete			
Terrazzo floor			
Ceramic tiles/quarrrystones			
Marble			
Vinyl tiles			
Rubber tiles			

Squeegee installation

1. Install the squeegee (25) and fasten it with the handwheels (26), then connect the vacuum hose (15) to the squeegee.
2. Adjust the squeegee with the handwheel (27) so that the rear blade - in all its length - touches the floor.

Guide to match squeegees and brush/pad-holder decks

Deck model	Squeegee model
Deck with one brush (18a), brush diameter: 530 mm	Aluminium (Fig. 7), width 760 mm
Deck with two brushes (18b), brush diameter: 305 mm	Steel (Fig. 6), width 810 mm
Deck with two cylindrical brushes (18c), brush length: 485 mm	Aluminium (Fig. 7), width 760 mm

Solution or washing water tank filling



NOTE

If the machine is equipped with Chemical Mixing System (switch (77) (optional)) the tank must be filled with clean water, otherwise the tank must be filled with solution.

1. Open the filler neck (8).
2. **(For machines without Chemical Mixing System)**
Use the rear filler neck (41) or the front filler neck (37) to fill the tank (20) with a solution suitable for the work to be performed. Do not fill the solution tank completely, leave a few centimetres from the edge. Use the removable hose (17) as reference. Always follow the dilution instructions on the label of the chemical product used to prepare the solution. The solution temperature must not exceed 40°C.



WARNING!

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

(For machines with Chemical Mixing System)

Fill the tank (20) with clean water by using the rear filler neck (41) or the front filler neck (37). Do not fill the clean water tank completely, leave a few centimetres from the edge. The water temperature must not exceed 40°C.

Detergent tank filling (For machines with Chemical Mixing System)

1. Open the cover (22) and check that the recovery tank (21) is empty, otherwise empty it with the drain hose (16).
2. Carefully lift the tank (40).
3. Open the plug (46).
4. Fill the tank (45) with a detergent suitable for the work to be performed (highly concentrated detergent).
Do not fill the detergent tank completely, leave a few inches from the edge.



CAUTION!

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



NOTE

In case of new system, system emptied for cleaning, etc., wait for the hoses to fill up, before starting the Chemical Mixing System.

MACHINE START AND STOP

Starting the machine

1. Prepare the machine as shown in the previous paragraph.
2. Insert the ignition key (80) and turn it to "I".
Check that the green warning light (81a) turns on (charged batteries).
If the yellow or red warning light (81b or 81c) turns on, turn the ignition key back to "0" and charge the batteries (see the procedure in Maintenance chapter).
3. Drive the machine to the working place:
 - By pushing it with the hands on the handlebar (2) (only for SCRUBTEC 653B).
 - By pushing it with the hands on the handlebar (2) and pressing the switch (83) to move forward, or pressing the switch (83) together with the switch (78) to move rearward (only for SCRUBTEC 653BL, SCRUBTEC 651BCL, SCRUBTEC 661BL).
The forward speed can be adjusted with the adjuster (84).
4. Lower the squeegee (25) with the lever (10).
5. Lower the brush/pad-holder deck by pressing the pedal (11).
6. Press the brush/pad-holder and vacuum system switch (71).
7. Press the washing water flow control switches (82) as necessary, depending on the type of cleaning to be performed.
8. Start cleaning, by moving the machine as shown in step 3.
If necessary, adjust the maximum speed with the adjuster (84).
9. If it is necessary to use the vacuum system only, stop the brush/pad-holder and the vacuum system with the switch (71), and press the vacuum system switch (73).



NOTE

To move the machine forward, press either the left or right switch (83) or both.

Stopping the machine

10. Stop the machine with the handlebar (2) (only for SCRUBTEC 653B).
Stop the machine by releasing the switches (83) (only for SCRUBTEC 653BL, SCRUBTEC 651BCL, SCRUBTEC 661BL).
11. Turn off the brushes and the vacuum system by pressing the switches (71 and 73).
12. Lift the brush/pad-holder deck by pressing the pedal (11).
13. Lift the squeegee (25) with the lever (10).
14. Make sure that the machine cannot move independently.

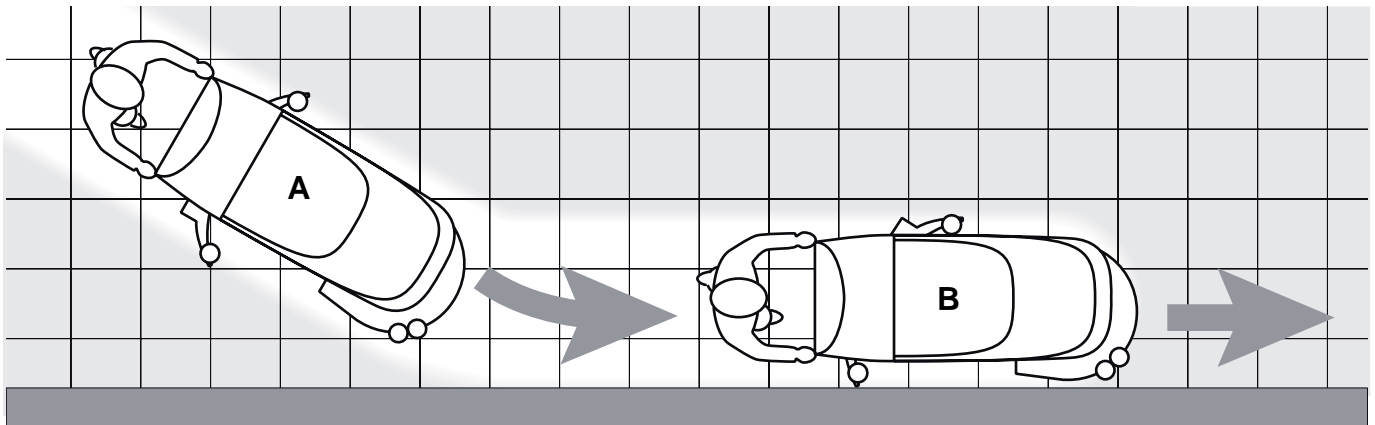
MACHINE OPERATION (SCRUBBING/DRYING)

1. Start the machine as shown in the previous paragraph.
2. If necessary, press the washing water flow control switches (82) as necessary, depending on the type of cleaning to be performed.
3. If necessary, stop the machine and turn the squeegee adjusting handwheel (27) so that the rear blade - in all its length - touches the floor.
4. If necessary, stop the machine and turn the adjusting handwheel (28); when turning it clockwise or counter-clockwise the machine forward speed can be adjusted.
5. If necessary, stop the machine and turn the machine forward speed adjusting handwheel (29) (only for SCRUBTEC 653B) as shown below:
 - Turn it counter-clockwise to increase the forward speed;
 - Turn it clockwise to decrease the forward speed.



NOTE

For correct scrubbing/drying of floors at the sides of the walls, Nilfisk Alto suggests to go near the walls with the right side of the machine as shown in figure 4.



P100106A

Figure 4



CAUTION!

To avoid any damage to the floor surface, turn off the brushes/pad-holders when the machine stops in one place, especially when the extra pressure function is on.

Detergent flow adjustment

(For machines with Chemical Mixing System)

1. Turn the knob (A, Fig. 5) clockwise or counter-clockwise to increase or decrease the detergent concentration.
2. The average detergent concentration values, matching the 4 coloured areas of the scale (B), are shown in the figure.
3. To set the detergent quantity to zero, fully turn the knob (A) counter-clockwise.



NOTE

The detergent concentration is kept constant even if the washing water flow is changed with the switches (C) or (D).

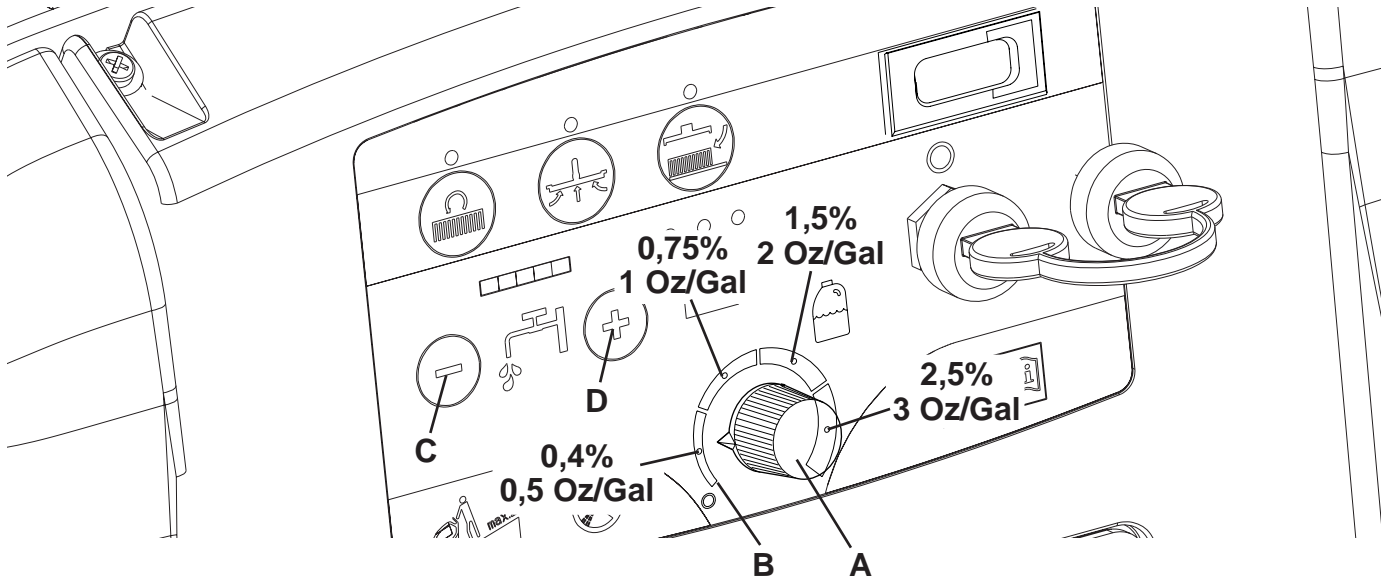


Figure 5

P100107

Working with brush/pad-holder extra pressure function turned on

If the floor proves to be particularly difficult to clean, it is possible to turn on the brush/pad-holder extra pressure function by pressing the pedal (11) to position (11c).



CAUTION!

When the cylindrical brush deck (18c) is installed, the extra pressure function is not enabled.



CAUTION!

In case of brush/pad-holder motor overload, due to foreign bodies which prevent them from turning, or to excessively aggressive floors/brushes, the safety system stops the brush/pad-holder after about one minute of continuous overload.

The overload is shown by the three warning lights (81a, 81b, 81c) flashing simultaneously.

If the overload takes place when the extra pressure function (11c) is on, the pedal position must be changed to (11b). If the overload persists, the brush/pad-holder stops.

To start scrubbing again after a brush/pad-holder stop due to overload, stop the machine by turning the ignition key (80) to "0". Turn on the machine by turning the ignition key (80) to "I".

Battery discharge during operation

Until the green warning light (81a) stays on, the batteries allow the machine to work normally.

When the green warning light (81a) turns off, and the yellow warning light (81b) turns on, it is advisable to charge the batteries, because the residual autonomy will last for a few minutes (depending on battery characteristics and work to be performed).

When the red warning light (81c) turns on, the autonomy is over. After a few seconds, the brush/pad-holder is automatically tuned off, while the vacuum system and (only for SCRUBTEC 653BL, SCRUBTEC 651BCL, SCRUBTEC 661BL) the drive system stay on, to finish drying the floor and drive the machine to the appointed recharging area.



WARNING!

Do not use the machine with discharged batteries, to avoid damaging the batteries and reducing the battery life.

TANK EMPTYING

An automatic float shut-off system (36) turns off the vacuum system when the recovery tank (21) is full.

The vacuum system deactivation is signalled by a sudden increase in the vacuum system motor noise frequency, and the floor is not dried.



CAUTION!

If the vacuum system turns off accidentally (for example, when the float is activated because of a sudden machine movement), to resume the operation: turn off the vacuum system by pressing the switch (73), then open the cover (22) and check that the float inside the grid (36) has gone down to the water level. Then close the cover (22) and turn on the vacuum system by pressing the switch (73).

When the recovery tank (21) is full, empty it according to the following procedure.

Recovery tank emptying

1. Stop the machine.
2. Lift the brush/pad-holder deck by pressing the pedal (11).
3. Lift the squeegee (25) with the lever (10).
4. Drive the machine to the appointed disposal area.
5. Empty the recovery tank with the hose (16). Then, rinse the tank with clean water.

Solution/clean water tank emptying

6. Perform steps 1 to 4.
7. Empty the solution tank with the hose (17). Then, rinse the tank with clean water.

Cylindrical brush debris container emptying (only for cylindrical brush deck)

8. Stop the machine.
9. Lower the cylindrical brush deck and remove the debris container (D, Fig. 3) by pulling it on one side with the handle (E).
10. Empty and wash the debris container (D), and then install it by engaging it on the fasteners.

AFTER USING THE MACHINE

After working, before leaving the machine:

1. Remove the brushes/pad-holders as shown in the relevant paragraph.
2. Empty the tanks (20 and 21) and the debris container (D, Fig. 3) as shown in the relevant 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 (12).

FIRST PERIOD OF USE

After the first 8 hours, check the machine fastening and connecting parts for proper tightening and check the visible parts for integrity and leakage.

MAINTENANCE

The lifespan of the machine and its maximum operating safety are ensured by correct and regular maintenance.

The following table provides the scheduled maintenance. The intervals shown may vary according to particular working conditions, which are to be defined by the person in charge of the maintenance.



WARNING!

The procedures must be performed with the machine off and the battery disconnected.

Moreover, read carefully the instructions in Safety chapter before performing any maintenance procedure.

All scheduled or extraordinary maintenance procedures must be performed by qualified personnel, or by an authorised Service Center.

This Manual describes only the easiest and most common maintenance procedures.

For other maintenance procedures shown in the Scheduled Maintenance Table, refer to the Service Manual that can be consulted at any Service Center.

SCHEDULED MAINTENANCE TABLE

Procedure	Daily, after using the machine	Weekly	Every six months	Yearly
Battery charging				
Squeegee cleaning				
Brush/pad cleaning				
Tank and vacuum grid with float cleaning, and cover gasket check				
Chemical Mixing System cleaning and draining (optional)				
Squeegee blade check and replacement				
Solution/clean water filter cleaning				
Vacuum system motor cleaning				
WET battery fluid level check				
Screw and nut tightening check			(1)	
Brush/pad-holder motor carbon brush check or replacement				(2)
Vacuum system motor carbon brush check or replacement				(2)
Drive system motor carbon brush check or replacement (Only for SCRUBTEC 653BL, SCRUBTEC 651BCL, SCRUBTEC 661BL)				(2)

(1) And after the first 8 working hours.

(2) This maintenance procedure must be performed by Nilfisk Alto authorised Service Center.

BATTERY CHARGING

**NOTE**

Charge the batteries when the yellow or red warning light (81b or 81c) turns on, or at the end of every working cycle.

**CAUTION!**

Keeping the batteries charged make their life last longer.

**CAUTION!**

When the batteries are discharged, charge them as soon as possible, as that condition makes their life shorter. Check for battery charge at least once a week.

**CAUTION!**

If the machine is not equipped with on-board battery charger, choose an external battery charger suitable for the type of batteries installed.

**WARNING!**

WET battery charging produces highly explosive hydrogen gas. Charge the batteries in well-ventilated areas and away from naked flames. Do not smoke while charging the batteries. Keep the tank assembly open while charging the batteries.

**WARNING!**

Pay careful attention when charging the batteries as there may be battery fluid leakages. The battery fluid is corrosive. If it comes in contact with skin or eyes, rinse thoroughly with water and consult a physician.

Preliminary operations

1. Open the cover (22) and check that the recovery tank (21) is empty, otherwise empty it with the drain hose (16).
2. Drive the machine to the appointed recharging area.
3. Turn the ignition key (80) to "0".
4. Carefully lift the tank (40).
5. For WET batteries only:
 - Check the level of electrolyte inside the batteries (52); if necessary, top up through the caps (53).
 - Then leave all the caps (53) open for battery charging.
 - If necessary, clean the upper surface of the batteries.
6. Charge the batteries according to one of the following procedures, depending on the presence of the battery charger (90).

Charging the batteries with an external battery charger

7. Check that the external battery charger is suitable by referring to the relevant Manual. The battery charger voltage rating must be 24 V.
8. Disconnect the battery connector (12) and connect it to the external battery charger.
9. Connect the battery charger to the electrical mains.
10. After charging, disconnect the battery charger from the electrical mains and from the battery connector (12).
11. (For WET batteries only) Check the level of electrolyte inside the batteries and close all the caps (53).
12. Connect the battery connector (12) to the machine.
13. Carefully lower the tank (40).

Battery charging with (optional) battery charger installed on the machine

14. Connect the battery charger cable (6) to the electrical mains (the electrical mains voltage and frequency must be compatible with the battery charger values shown on the machine serial number plate (34)).
When the battery charger is connected to the electrical mains, all machine functions are automatically cut off.
If the red warning light (94) on the battery charger control panel stays on, the battery charger is charging the batteries.
15. When the green warning light (92) turns on, the battery charging is completed.
16. When the battery charging is completed, disconnect the battery charger cable (6) from the electrical mains and wind it round its housing (7).
17. Carefully lower the tank (40).

**NOTE**

For further information about the battery charger (90) operation, see the relevant Manual.

MACHINE WORKING HOUR CHECK

(Only if the machine is equipped with hour counter)

1. Turn the ignition key (80) to "I".
2. Press the switch (73) and read on the hour counter (79) the total number of working hours (scrubbing/drying) performed by the machine.
3. Press the switch (73) again.
4. Turn the ignition key (80) to "0".

SQUEEGEE CLEANING**NOTE**

The squeegee must be clean and its blades must be in good conditions in order to get a 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 (80) to "0".
3. Lower the squeegee (25) with the lever (10).
4. Loosen the handwheels (26) and remove the squeegee (25).
5. Disconnect the vacuum hose (15) from the squeegee.
6. Clean the steel squeegee (Fig. 5) or the aluminium squeegee (Fig. 6). Clean the compartments (A, Fig. 5 or 6) 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. Install the squeegee in the reverse order of removal.

SQUEEGEE BLADE CHECK AND REPLACEMENT

1. Clean the steel squeegee (Fig. 6) or the aluminium squeegee (Fig. 7), as shown in the previous paragraph.
2. Check that the edges (E, Fig. 6 or 7) of the front blade (C) and the edges (F) of the rear blade (D) lay down on the same level, along their length; otherwise adjust their height according to the following procedure:
 - Release the tie rod (G, Fig. 6 or 7) and loosen the wing nuts (H, Fig. 6), or disengage the retainers (M, Fig. 7) and adjust the rear blade (D, Fig. 6 or 7), then tighten the wing nuts, or engage the retainers, and then engage the tie rod.
 - Loosen the handwheels (I) and adjust the front blade (C, Fig. 6 or 7); then tighten the handwheels.
3. Check the front blade (C, Fig. 6 or 7) and rear blade (D) for integrity, cuts and tears; if necessary replace them according to the following procedure. Check that the front corner (J) of the rear blade is not worn; otherwise, 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:
 - Release the tie rod (G), remove the wing nuts (H) or disengage the retainers (M), remove the retaining strip (K), then replace/overturn the rear blade (D). Install the blade in the reverse order of removal.
 - Unscrew the handwheels (I) and remove the retaining strip (L), then replace the front blade (C). Install the blade in the reverse order of removal.

After the blade replacement (or overturning), adjust the height as shown in the previous step.

4. Connect the vacuum hose (15) to the squeegee.
5. Install the squeegee (25) and screw down the handwheels (26).
6. If necessary, adjust the squeegee balance adjusting handwheel (27).

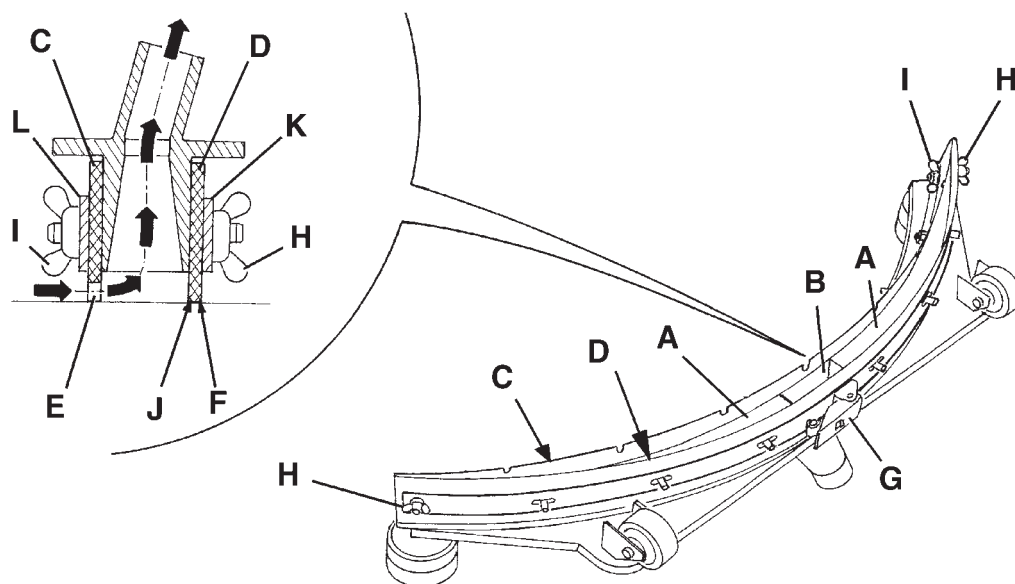


Figure 6

S311320

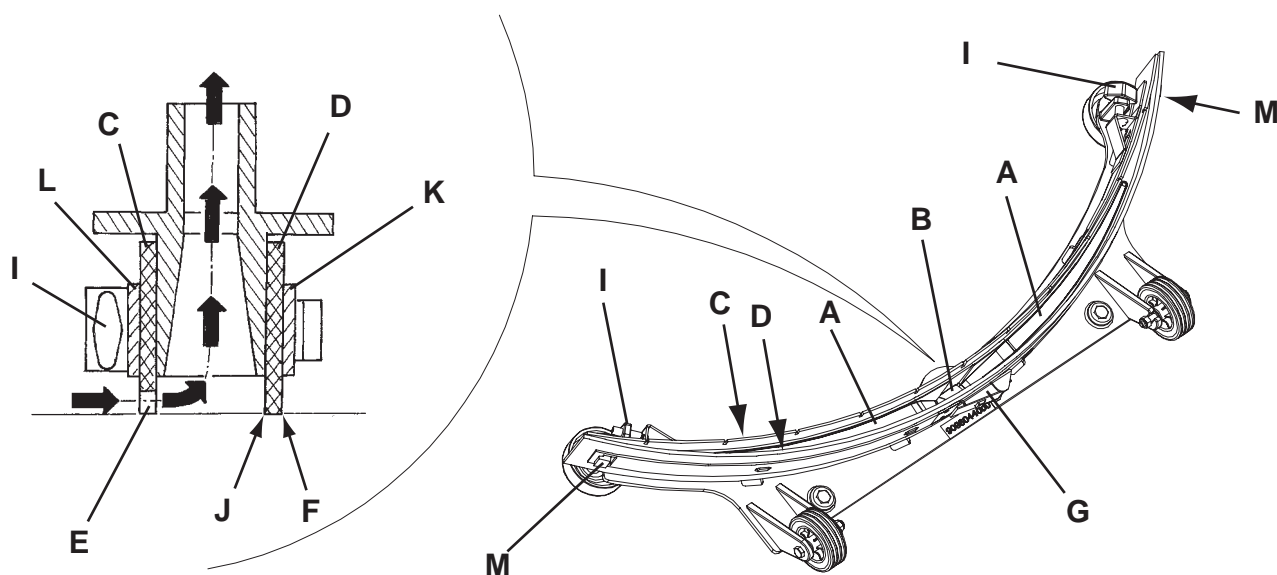


Figure 7

S311321

BRUSH/PAD CLEANING



CAUTION!

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

1. Remove the brushes/pads from the machine, as shown in Use chapter.
 2. Clean and wash the brushes/pads with water and detergent.
 3. Check the brushes/pads for integrity and wear; if necessary, replace them.
 4. On the machines equipped with the cylindrical brush deck, remove the debris container (D, Fig. 3) by pulling it on one side with the handle (E).
- Empty and wash the debris container (D), and then install it by engaging it on the retainers.

VACUUM SYSTEM MOTOR FILTER CLEANING

1. Drive the machine on a level floor.
2. Turn the ignition key (80) to "0".
3. Open the recovery water tank.
4. If necessary, drain the water from the tank in order to make the filter visible.
5. Check that the pre-filter is clean. If necessary clean it with water and compressed air, then install it.
6. Perform steps 1, 2 and 3 in the reverse order.

SOLUTION/CLEAN WATER FILTER CLEANING

1. Drive the machine on a level floor.
2. Turn the ignition key (80) to "0".
3. Close the solution tap (A, Fig. 8) under the machine, behind the right rear wheel. The tap (A) is closed when it is in the position (B) and it is open when it is in the position (C).
4. Remove the transparent cover (D), then remove the filter strainer (E). Clean and install them on the support (F).



NOTE

The filter strainer (E) must be correctly positioned on the housing (G) of the support (F).

5. Open the tap (A).

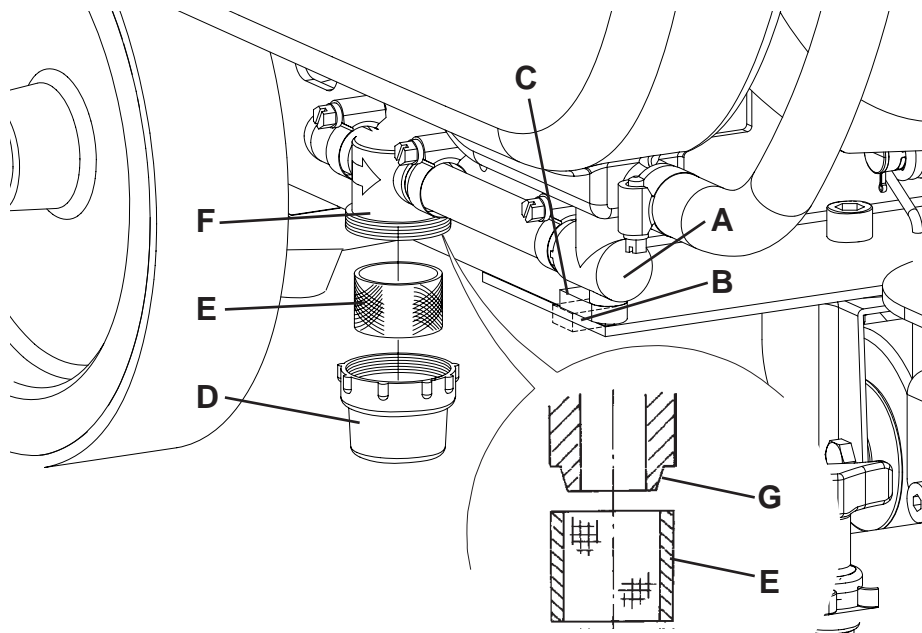


Figure 8

P100118

TANK AND VACUUM GRID WITH FLOAT CLEANING, AND COVER GASKET CHECK

1. Drive the machine to the appointed disposal area.
2. Turn the ignition key (80) to "0".
3. Open the cover (A, Fig. 9) to washing position (L).
4. Wash with clean water the cover (A), the tanks (B and C) and the vacuum grid with automatic shut-off float (D).
5. Drain the water from the tanks with the hoses (16 and 17).
If necessary, release the fasteners (E) and open the grid (D), recover the float (F), clean all the components and then reinstall them.
6. Check the tank cover gasket (G) for integrity.



NOTE

The gasket (G) creates vacuum in the tank that is necessary for vacuuming the recovery water.

If necessary replace the gasket (G) by removing it from its housing (H). When assembling the new gasket, install the joint (I) in the rear central area, as shown in the figure.

7. Check that the seating surface (J) of the gasket (G) is integral and adequate for the gasket itself.



NOTE

The hole (K), allowing to compensate the air in the cover air gap, contributes to create vacuum in the tank.

8. Close the cover (A).

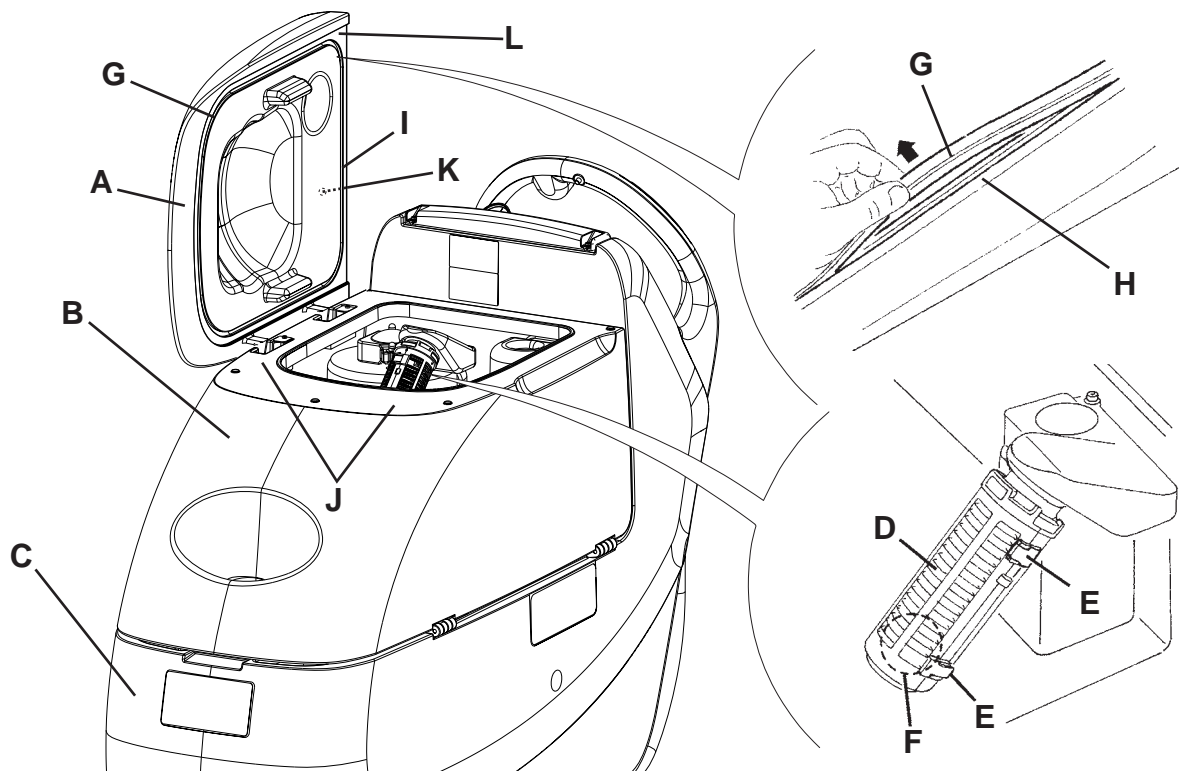


Figure 9

P100119

FUSE CHECK/REPLACEMENT

1. Disconnect the battery connector (12).
2. Move aside the recovery water drain hose (16).
3. Remove the battery charger cable (I, Fig. 10), if equipped, from the cable holder (J).
4. Remove the screws (A) and carefully move aside the panel (B) by disengaging the grommet (K) from its housing on the panel (B).
5. Check/replace the following fuses:
 - (5a) Brush deck fuse F1: (40 A)
 - (5b) Vacuum system fuse F2: (30 A)
 - (5c) Drive system fuse F3: (30 A) (*)
 - (5d) Signal circuits fuse F4: (3 A)
 - (5e) Brush/pad-holder release fuse F5: (20 A)
 - (5f) Pump fuse F6: (3 A)
- (*) Only for SCRUBTEC 653BL, SCRUBTEC 651BCL, SCRUBTEC 661BL
6. Perform steps 1 to 4 in the reverse order.

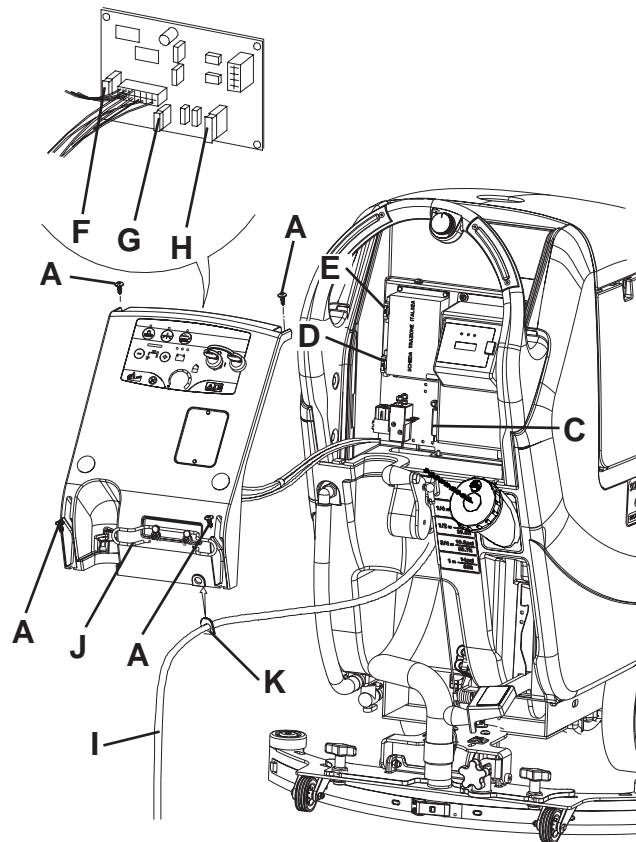


Figure 10

P100120

BRUSH/PAD-HOLDER/CYLINDRICAL BRUSH DECK DISASSEMBLY/ASSEMBLY

The machine can be equipped with either the brush/pad-holder deck (18a and 18b) or the cylindrical brush deck (18c).



NOTE

When the deck is installed/removed, it may be necessary to change the squeegee too, because they must have the same width. For correct matching of deck and squeegee, see the Squeegee Installation paragraph.

Disassembly

1. Drive the machine on a level floor.
2. Remove the brushes/pad-holders as shown in the relevant paragraph. Do not remove the cylindrical brushes.
3. Lower the brush/pad-holder deck by pressing the pedal (11).
4. If equipped, remove the cotter pins (B, Fig. 11) and the gas spring (A).
5. Disconnect the brush/pad-holder motor electrical connection (D).
6. Disconnect the solution hose union (E).
7. Remove the screws (C), then remove the brush/pad-holder deck (F).

Assembly

8. Assemble the components in the reverse order of disassembly, and note the following:
 - When the machine is equipped with the cylindrical brush deck (18c), the gas spring (A) must not be installed.

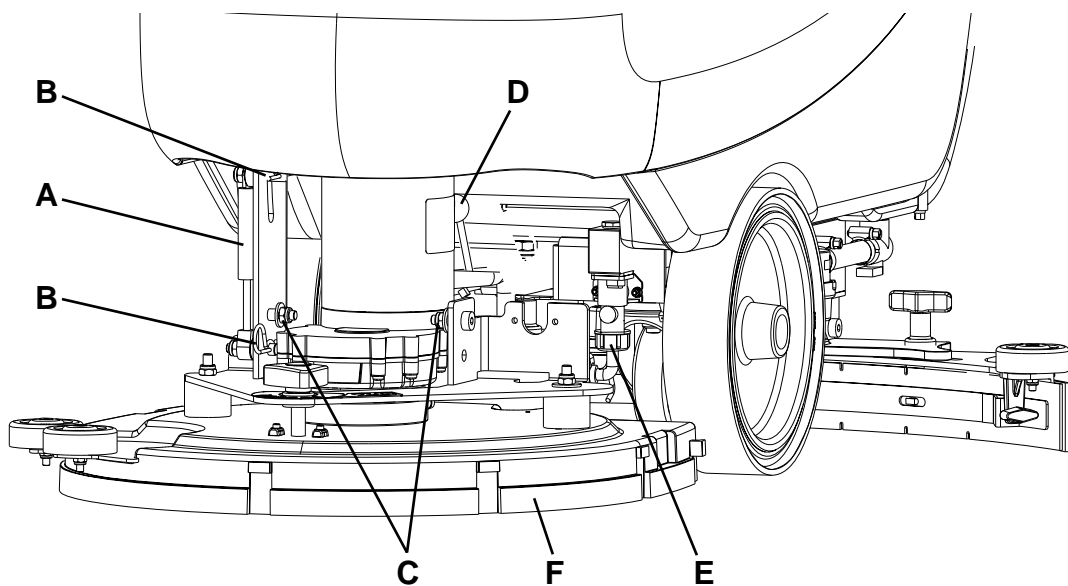


Figure 11

P100121

DETERGENT TANK CLEANING

(For machines with Chemical Mixing System)

Clean the detergent tank (45) according to the following procedure:

1. Drive the machine to the appointed disposal area.
2. Open the cover (22) and check that the recovery tank (21) is empty, otherwise empty it with the drain hose (16). Close the cover (22).
3. Carefully lift the tank (40).
4. Unscrew the plug (46) and disconnect the hose (50) from the tank (45).
5. Remove the tank.
6. Wash the tank in the appointed disposal area.
7. Install the tank (45) and connect it to the hose (50).
8. After draining the detergent tank, drain the Chemical Mixing System too by running the system with clean water only.



NOTE

Drain the Chemical Mixing System when it is dirty/clogged and after long inactivity/uncleaning of the machine.

TROUBLESHOOTING

Trouble	Possible Cause	Remedy
The motors do not work; no warning light turns on.	The battery connector is disconnected.	Connect.
	The batteries are completely discharged.	Charge the batteries.
The machine does not move (Only for SCRUBTEC 653BL, SCRUBTEC 651BCL, SCRUBTEC 661BL)	The machine has been turned on by using the ignition key and by keeping the switches pressed.	Turn the ignition key to "0", then try to start the machine again without pressing the switches.
The warning lights (81) flash simultaneously.	The brush deck motor is overloaded.	Use a less aggressive brush suitable for the floor to be cleaned or avoid working with extra pressure function turned on.
The brushes do not work, the red warning light (81c) is on.	Discharged batteries	Charge the batteries.
The recovery water vacuuming is insufficient.	The recovery tank is full.	Empty the tank.
	The hose is disconnected from the squeegee.	Connect.
	The vacuum grid is clogged or the float is stuck closed.	Clean the grid or check the float.
	The squeegee is dirty or the squeegee blades are worn or damaged.	Clean and check the squeegee.
	The tank cover is not properly closed or the gasket is damaged.	Close the cover or clean/replace the gasket.
The solution flow to the brushes is insufficient.	The solution/clean water filter is dirty.	Clean the filter.
	The tank is dirty (the drain hole is clogged).	Clean.
	The Chemical Mixing System tank (optional) is dirty/clogged.	Clean with the drain cycle.
The squeegee leaves marks on the floor.	There are debris under the squeegee blades.	Remove the debris.
	The squeegee blades are worn, chipped or torn.	Replace the blades.
	The squeegee has not been adjusted with the handwheel.	Adjust it.



NOTE

If the machine has a battery charger installed, the machine cannot operate if the charger is not on board. In case of battery charger malfunction, contact an authorised Service Center.

For further information refer to the Service Manual, available at any Nilfisk Alto Service Center.

SCRAPPING

Have the machine scrapped by a qualified scrapper.

Before scrapping the machine, remove and separate the following materials, which must be disposed of properly according to the Law in force:

- Batteries
- Brushes/pads
- Plastic hoses and components
- Electrical and electronic components (*)

(*) Refer to the nearest Nilfisk Alto Center especially when scrapping electrical and electronic components.

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