BA 551 / 551D / 551CD / 611D

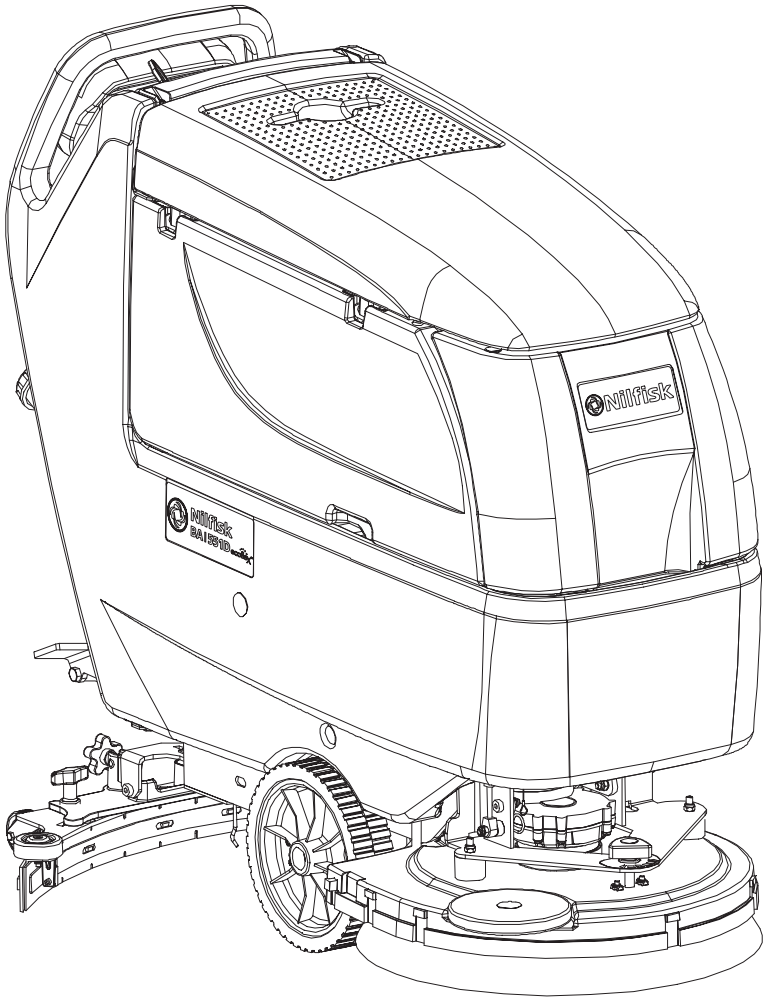
Instructions for use

Bedienungshandbuch
Instructions d'utilisation
Instructions for use
Gebruiksaanwijzing

07/2006 - Revised 03/2010
(3)
909 6752 000

ecoflex™

Deutsch
Français
English
Nederlands



Model:
908 7146 020 - 908 7147 020 - 908 7157 020 - 908 7148 020
908 7158 020 - 908 7149 020 - 908 7159 020

Nilfisk

Сертификат за съответствие
Osvědčení o shodě
Konformitätserklärung
Overensstemmelsescertifikat
Declaración de conformidad
Vastavussertifikaat
Déclaration de conformité
Yhdenmukaisuustodistus
Conformity certificate

Πιστοποιητικό συμμόρφωσης
Megfelelősségi nyilatkozat
Potvrda sukladnosti
Dichiarazione di conformità
Atitikties deklaracija
Atbilstības deklarācija
Konformitetssertifisering
Conformiteitsverklaring
Declaração de conformidade

Deklaracja zgodności
Certificat de conformitate
Заявление о соответствии
Överensstämmelsecertifikat
Certifikát súladu
Certifikat o ustreznosti
Uyumluluk sertifikası

CE

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

BA 551 - BA 511D - BA 551CD - BA 661D

Тип / Typ / Typ / Type / Tipo / Tüüp / Type / Tyyppi / Type / Τύπος / Típus / Vrsta / Tipo / Tipas / Tips / Type / Type / Tipo / Typ / Tip / Тип / Typ / Typ / Tip / Tip :

SCRUBBER-DRYER

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

Година на производство / Rok výroby / Baujahr / Fabrikationsår / Año de fabricación / Väljalaskeaasta / Année de fabrication / Valmistusvuosi / Year of construction / Έτος κατασκευής / Gyártási év / Godina izgradnje / Anno di costruzione / Pagaminimo metai / Izgatavošanas gads / Byggeår / Bauwjaar / Ano de fabrico / Rok produkcji / Anul fabricaţiei / 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. Техническият файл е съставен от производителя.

CZ Níže podepsaný stvrzuje, že výše uvedený model byl vyroben v souladu s následujícími směrnicemi a normami. Autorem technického listu je výrobce.

D Der Unterzeichner bestätigt hiermit dass die oben erwähnten Modelle gemäß den folgenden Richtlinien und Normen hergestellt wurden. Die technische Dokumentation wird vom Hersteller erstellt.

DK Undertegnede attesterer herved, at ovennævnte model er produceret i overensstemmelse med følgende direktiver og standarder. Den tekniske fil er udarbejdet af fabrikanten.

E El abajo firmante certifica que los modelos arriba mencionados han sido producidos de acuerdo con las siguientes directivas y estandares. El fascículo técnico está redactado por el fabricante

EST Allakirjutanu kinnitab, et ülalnimetatud mudel on valmistatud kooskõlas järgmiste direktiivide ja normidega. Tehnilise dokumentatsiooni koostab tootja.

F Je soussigné certifie que les modèles ci-dessus sont fabriqués conformément aux directives et normes suivantes. Le dossier technique est rédigé par le fabricant.

FIN Allekirjoittaia vakuuttaa että yllämainittu malli on tuotettu seuraavien direktiivien ja standardien mukaan. Valmistaja kääntää teknisen tiedoston.

GB The undersigned certify that the above mentioned model is produced in accordance with the following directives and standards. The technical file is compiled by the manufacturer.

GR Ο κάτωθι υπογεγραμμένος πιστοποιεί ότι η παραγωγή του προαναφερθέντος μοντέλου γίνεται σύμφωνα με τις ακόλουθες οδηγίες και πρότυπα. Το τεχνικό αρχείο συντάσσεται από τον κατασκευαστή.

H Alulírottak igazoljuk, hogy a fent említett modellt a következő irányelvek és szabványok alapján hoztuk létre. A műszaki fájlt a gyártó készítette.

HR Potpisani potvrđujem da gore spomenuti model proizveden u skladu sa sljedećim direktivama i standardima.Tehničku dokumentaciju sastavlja proizvođač.

I Il sottoscritto dichiara che i modelli sopra menzionati sono prodotti in accordo con le seguenti direttive e standard. Il fascicolo tecnico è redatto dal costruttore.

LT Toliau pateiktu dokumentu patvirtinama, kad minėtas modelis yra pagamintas laikantis nurodytų direktyvų bei standartų. Techninę bylą sudarė gamintojas.

LV Ar šo tiek apliecināts, ka augstākminētais modelis ir izgatavots atbilstoši šādām direktīvām un standartiem. Tehnisko aprakstu ir sastādījis ražotājs.

N Undertegnede attesterer att ovennevnte modell är produsert i overensstemmelse med følgende direktiv og standarder. Den tekniske filen er opprettet av produsenten.

NL Ondergetekende verzekert dat de bovengenoemde modellen geproduceerd zijn in overeenstemming met de volgende richtlijnen en standaards. Het technische bestand is door de fabrikant samengesteld.

P A presente assinatura serve para declarar que os modelos supramencionados são produtos em conformidade com as seguintes directivas e normas. A ficha técnica é redigida pelo fabricante.

PL Niżej podpisany zaświadcza, że wymieniony powyżej model produkowany jest zgodnie z następującymi dyrektywami i normami. Dokumenty techniczne zostały przygotowane przez producenta.

RO Subsemnatul atest că modelul sus-menţionat este produs în conformitate cu următoarele directive şi standarde. Fişierul tehnic este redactat de către producător.

RUS Настоящим удостоверяется, что машина вышеуказанной модели изготовлена в соответствии со следующими директивами и стандартами. Техническая документация составлена производителем.

S Undertecknad intygar att ovannämnda modell är producerad i överensstämmelse med följande direktiv och standarder. Den tekniska filen är sammanställd av tillverkaren.

SK Dolu podpísaný osvedčuje, že hore uvedený model sa vyrába v súlade s nasledujúcimi smernicami a normami. Technický súbor vytvoril výrobca.

SLO Spodaj podpisani potrjujem, da je zgoraj omenjeni model izdelan v skladu z naslednjimi smernicami in standardi. Spis s tehnično dokumentacijo pripravi izdelovalec.

TR Aşağıda İmzası olan kişi, yukarıda bahsedilen model cihazın aşağıda verilen direktiflere ve standartlara uygunlukta imal edildiğini onaylar. Teknik dosya üretici tarafından derlenmiştir.

EC Machinery Directive 2006/42/EC	**EN ISO 12100, EN ISO 13857, EN 349, EN 982**
	EN 60335-1, EN 60335-2-72, EN 50366
EC EMC Directive 2004/108/EC	**EN 55022, EN 55014-2, EN 61000-6-2**

Производителя / Výrobce / Hersteller / Fabrikanten / Fabricante / Tootja / Fabricant / Valmistaja / Manufacturer / Κατασκευαστή / Gyártó / Proizvođač / Costruttore / Gamintojas / Ražotājs / Produsenten / Fabrikant / Fabricante / Producenta / Producător / Производителем / Tillverkaren / Výrobca / Izdelovalec / Üretici :

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Date: Signature:

FAC-SIMILE

TABLE OF CONTENTS

INTRODUCTION **2**
MANUAL PURPOSE AND CONTENTS 2
TARGET 2
HOW TO KEEP THIS MANUAL 2
DECLARATION OF CONFORMITY 2
IDENTIFICATION DATA 2
OTHER REFERENCE MANUALS 3
SPARE PARTS AND MAINTENANCE 3
CHANGES AND IMPROVEMENTS 3
OPERATION CAPABILITIES 3
CONVENTIONS 3

UNPACKING/DELIVERY **3**

SAFETY **4**
SYMBOLS 4
GENERAL INSTRUCTIONS 4

MACHINE DESCRIPTION **6**
MACHINE STRUCTURE 6
CONTROL PANEL 8
BATTERY CHARGER DATA INSPECTION WINDOW (optional) 8
ACCESSORIES/OPTIONS 9
TECHNICAL DATA 9
WIRING DIAGRAM FOR BA 551 11
WIRING DIAGRAM FOR BA 451D AND BA 531D 12

USE **13**
BATTERY CHECK/SETTING ON A NEW MACHINE 13
BATTERY INSTALLATION AND BATTERY TYPE SETTING (WET OR GEL) 14
BEFORE MACHINE START-UP 15
MACHINE START AND STOP 18
MACHINE OPERATION (SCRUBBING/DRYING) 18
TANK EMPTYING 20
AFTER USING THE MACHINE 21
MACHINE LONG INACTIVITY 21
FIRST PERIOD OF USE 21

MAINTENANCE **21**
SCHEDULED MAINTENANCE TABLE 21
BATTERY CHARGING 22
MACHINE WORKING HOUR CHECK 23
SQUEEGEE CLEANING 23
SQUEEGEE BLADE CHECK AND REPLACEMENT 24
BRUSH/PAD CLEANING 25
TANK AND VACUUM GRID WITH FLOAT CLEANING, AND COVER GASKET CHECK 25
VACUUM SYSTEM MOTOR FILTER CLEANING 26
SOLUTION FILTER CLEANING 26
FUSE CHECK/REPLACEMENT 27
BRUSH/PAD-HOLDER/CYLINDRICAL BRUSH DECK DISASSEMBLY/ASSEMBLY 28
DETERGENT TANK CLEANING 29
ECOFLEX™ SYSTEM DRAINING 29

TROUBLESHOOTING **30**

SCRAPPING **30**

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 in case of doubts regarding 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 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 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 Nilfisk Service Centers.
Only original spare parts and accessories must be used.
Contact Nilfisk for service or to order spare parts and accessories, specifying the machine model and serial number.

CHANGES AND IMPROVEMENTS
Nilfisk 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 accessory must be approved and performed by Nilfisk.

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 maintenance, repair, cleaning 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.***

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.*
- *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.*
- *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.*
- *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's recommended accessories.*
- *Take all necessary precautions to prevent hair, jewels and loose clothes from being caught by the machine moving parts.*
- *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%.*
- *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.*
- *(Only for BA 551D, BA 551CD, BA 611D): When the machine is to be pushed for service reasons (missing or discharged batteries, etc.), the speed must not exceed 4 km/h.*
- *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. Drive paddle (*)
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. Water removable filler hose (optional)
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. Driving wheels (*). Front wheels on fixed axle (***)
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

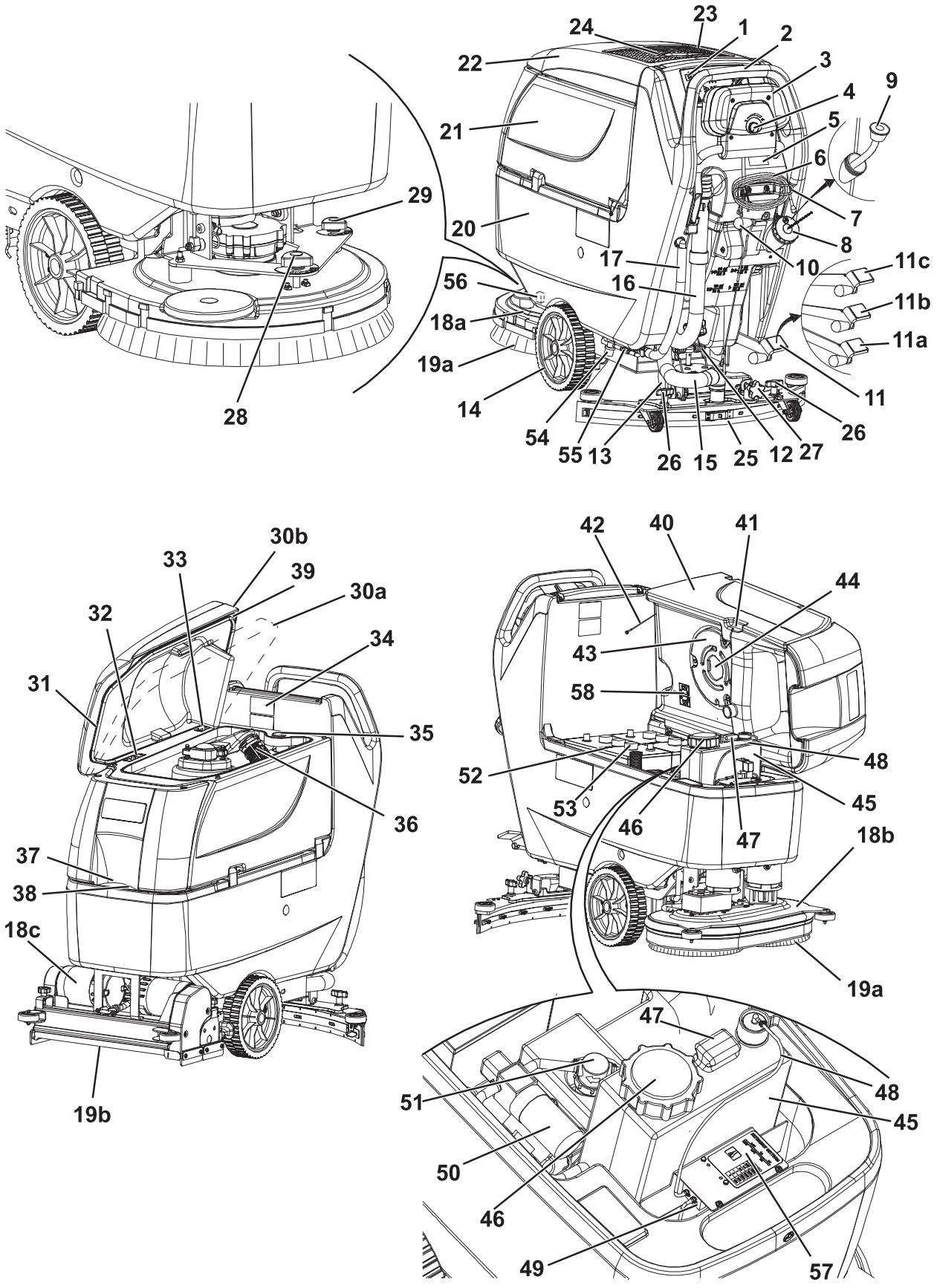
19a. Brushes/pad-holders
19b. Cylindrical brushes

20. Solution/clean water tank
21. Recovery tank
22. Recovery tank cover
23. Can holder
24. Document fastener (optional)
25. Squeegee
26. Squeegee mounting handwheels
27. Squeegee adjusting handwheel
28. Machine straight forward movement adjusting handwheel
29. Machine forward speed adjusting handwheel (***)

30a. Recovery tank cover (opened to be cleaned)
30b. Recovery tank cover (completely opened)

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. Plug for squeegee vacuum hose cleaning
36. Vacuum grid with automatic shut-off float
37. Solution front filler neck
38. Foam filter
39. Compensation hole
40. Recovery tank (open)
41. Tank lifting handle
42. Tank safety cable
43. Vacuum system motor cover
44. Vacuum system motor sound-deadening filter
45. Detergent tank (**)
46. Detergent tank filler plug (**)
47. Detergent tank handle (**)
48. Detergent feed hose (**)
49. Detergent pump (**)
50. Water pump (**)
51. Clean water filter (**)
52. Batteries
53. Battery caps
54. Solution filter (**)
55. Solution/clean water tap
56. Solenoid valve
57. Reference table for detergent proportioning (**)
58. Battery connection diagram

(*) Only for **BA 551D**, **BA 551CD**, **BA 611D**
(**) Only for machine with EcoFlex™ system (optional)
(***) Only for **BA 551**

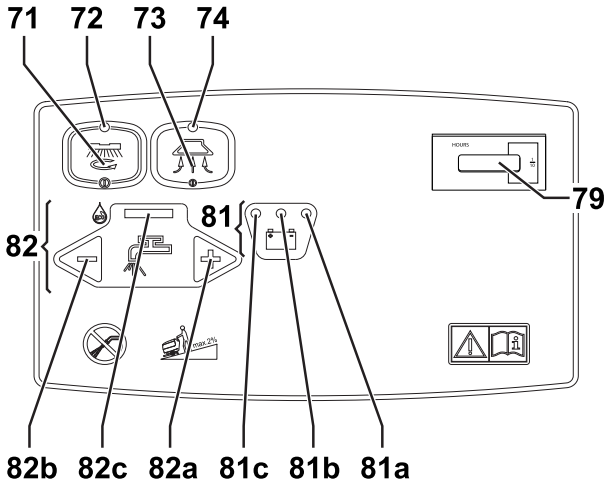

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S311310

CONTROL PANEL

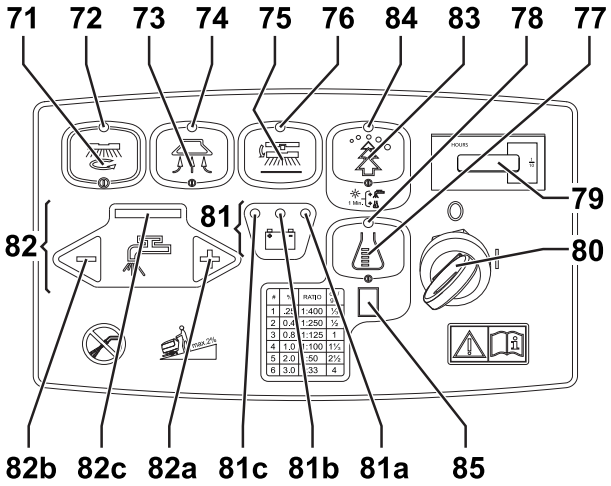
71. Brush/pad-holder and vacuum system switch
72. Brush/pad-holder and vacuum system switch warning light
73. Vacuum system switch
74. Vacuum system switch warning light
75. Brush/pad-holder release switch (*)
76. Brush/pad-holder release switch warning light (*)
77. Washing detergent flow control switch (**)
78. Washing detergent flow control switch warning light (**)
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. Solution flow control switches
82a. Flow increase switch
82b. Flow decrease switch
82c. Solution flow indicator
83. EcoFlex™ system switch (**)
84. EcoFlex™ system switch led indicator (**):
    - Led ON - EcoFlex™ system ON
    - Led flashing - EcoFlex™ system override
85. Detergent concentration level display (**)

(*) Only for **BA 551D**, **BA 551CD**, **BA 611D**
(**) Only for machine with EcoFlex™ system (optional)



BA 551

S311311

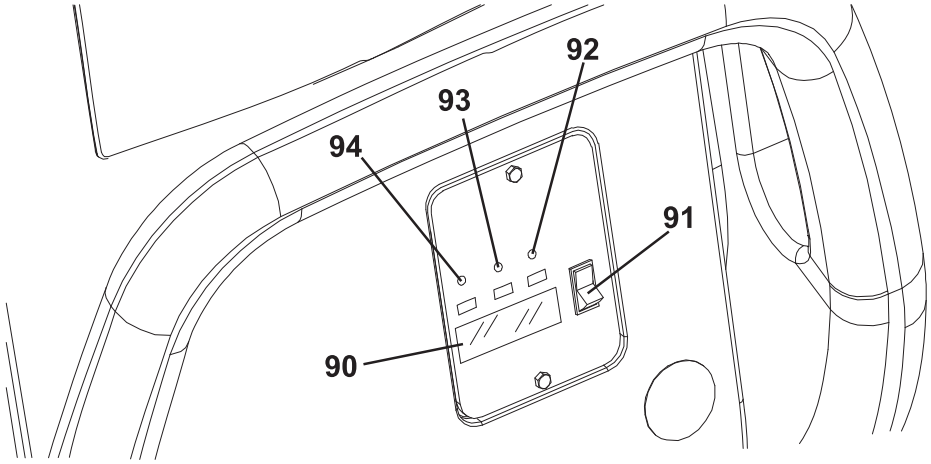


BA 551D, BA 551CD, BA 611D

S311312

BATTERY CHARGER DATA INSPECTION WINDOW (optional)

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



S311313

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. EcoFlex™
7. Front and rear wheels of different materials
8. Hour counter
9. Solution/clean water removable filler hose
10. Pocket

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

TECHNICAL DATA

General technical data

Model	**BA 551** 1 brush/pad-holder, without drive system	**BA 551D** 1 brush/pad-holder, with drive system	**BA 551CD** 2 cylindrical brushes, with drive system	**BA 611D** 2 brushes/pad-holders, with drive system
Machine height	1,088 mm			
Solution/clean water tank capacity	58 litres			
Recovery tank capacity	60 litres			
Front wheel diameter	250 mm			
Front wheel specific pressure on the floor	1.2 N/mm^2 - 4.6 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	GEL: (2 x 12 V) 24 V 110 Ah / 5 h			
Battery compartment size (width x length x height)	350 x 350 x 300 mm			
Vacuum system circuit capacity	1,055 mm H_2O			

Technical data for machines with brush/pad-holder deck

Model	**BA 551** 1 brush/pad-holder, without drive system	**BA 551D** 1 brush/pad-holder, with drive system	**BA 611D** 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	88 kg	102 kg	
Maximum weight with batteries and full tanks	236 kg	250 kg	
Brush motor power	480 W		350 W
Brush speed	153 rpm		230 rpm
Brush/pad-holder pressure with extra-pressure function turned off	20.5 kg		
Brush/pad-holder pressure with extra-pressure function turned on	27.8 kg		

Technical data for machines with cylindrical brush deck

Model	**BA 551CD** 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	112 kg
Maximum weight with batteries and full tanks	260 kg
Brush motor power	400 W
Cylindrical brush speed	570 rpm
Cylindrical brush pressure	26.5 kg

WIRING DIAGRAM FOR BA 551

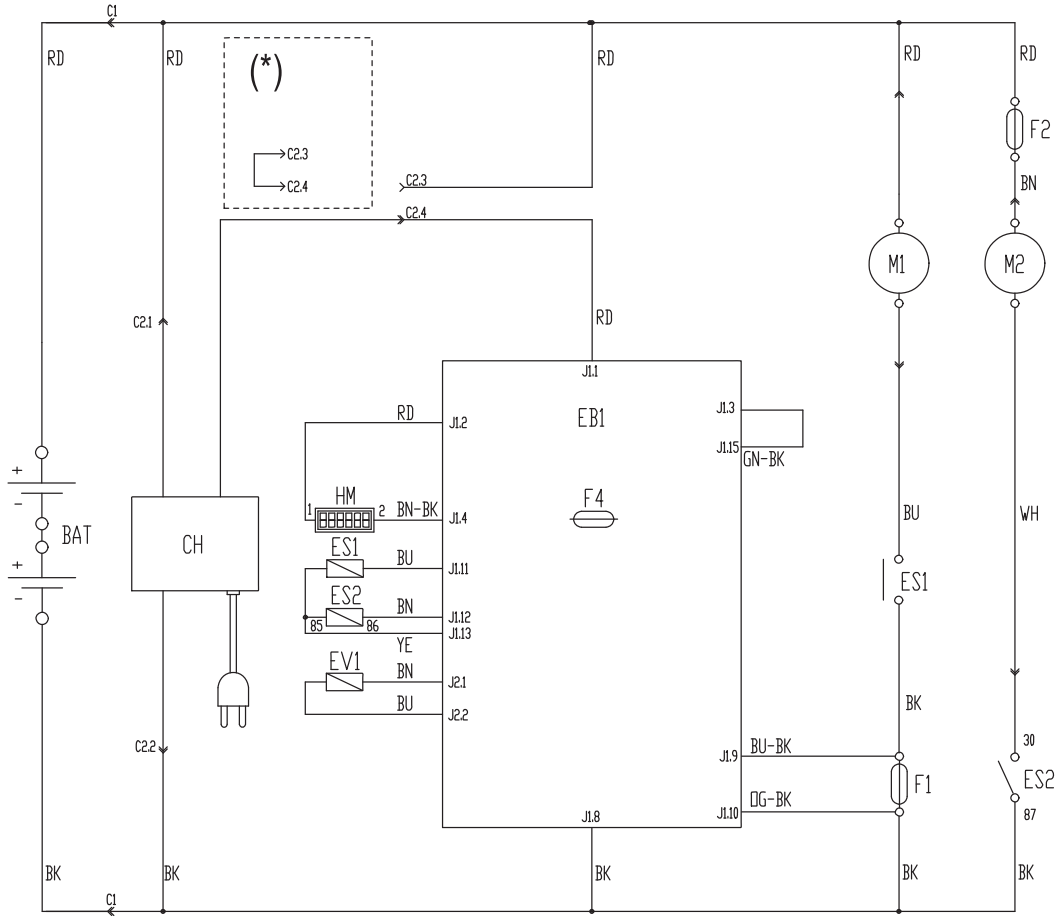
Key

BAT	24 V battery
C1	Battery connector
C2	Battery charger connector
CH	Battery charger (optional)
CS	Deck connector
EB1	Function electronic board
ES1	Brush motor electromagnetic switches
ES2	Vacuum system relay
EV1	Water solenoid valve
F1	Deck fuse
F2	Vacuum system fuse
F4	Signal circuit fuse
HM	Hour counter (optional)
M1	Brush/pad-holder motor
M2	Vacuum system motor

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 without on-board battery charger



S311314

WIRING DIAGRAM FOR BA 451D AND BA 531D

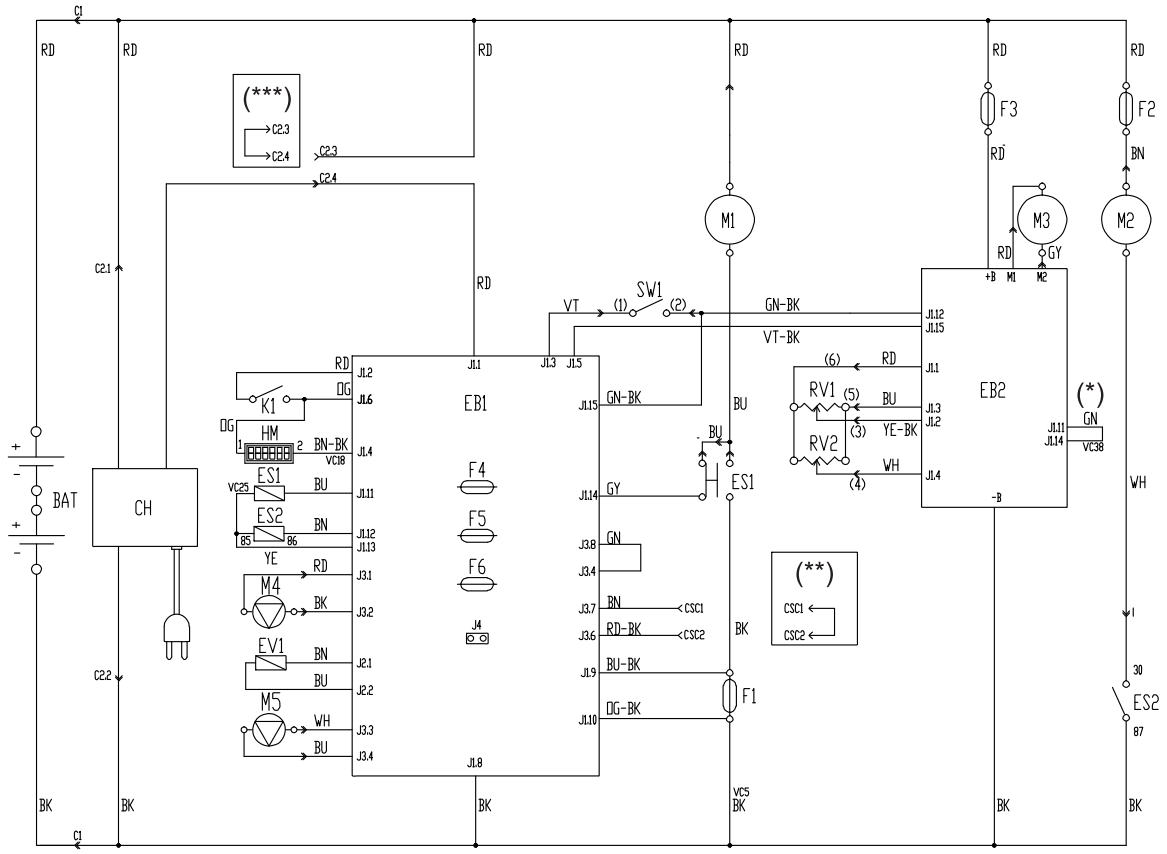
Key

BAT	24 V battery
C1	Battery connector
C2	Battery charger connector
CH	Battery charger (optional)
CSC	Cylindrical brush deck secondary connector
EB1	Function electronic board
EB2	Drive system electronic board
ES1	Brush motor 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
M4	Water pump (optional)
M5	Detergent pump (optional)
RV1	Speed potentiometer
RV2	Maximum speed potentiometer
SW1	Brush/drive system enabling microswitch

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 machine with wheel diameter of 250 mm
(**) Only for machines with cylindrical brush deck
(***) Only for machines without on-board battery charger



S3113332

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 (58).

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

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. (Only for **BA 551D**, **BA 551CD**, **BA 611D**): Insert the ignition key (80) and turn it to “I”.
   (Only for **BA 551**): Turn on the machine by pressing the switch (71) and/or (73).
   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).

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. Grasp the handle (41) and 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 in accordance with the instructions shown in the Battery Manual.
7. Charge the batteries (see the procedure in Maintenance chapter).

Without batteries
1. Buy appropriate batteries (see the 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), according to the procedure 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) as shown below:

Machine setting (only for BA 551)

1. Press the switch (71) or (73) 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 pressing the switch (71) and/or (73).
4. Press and hold the switches (71) and (73) at the same time.
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).

Machine setting (only for BA 551D, BA 551CD, BA 611D)

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)

1. Remove the battery charger data inspection window screws (A, Fig. 1).
2. Remove the window (B).
3. Turn the battery charger selector (C) to WET for lead batteries, or to GEL for gel batteries.
4. Install the window (B) and tighten the screws (A).

Battery installation

1. Open the cover (22) and check that the recovery tank (21) is empty, otherwise empty it with the drain hose (16).
2. Grasp the handle (41) and carefully lift the tank (40).
3. Install the batteries.

Battery charging

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

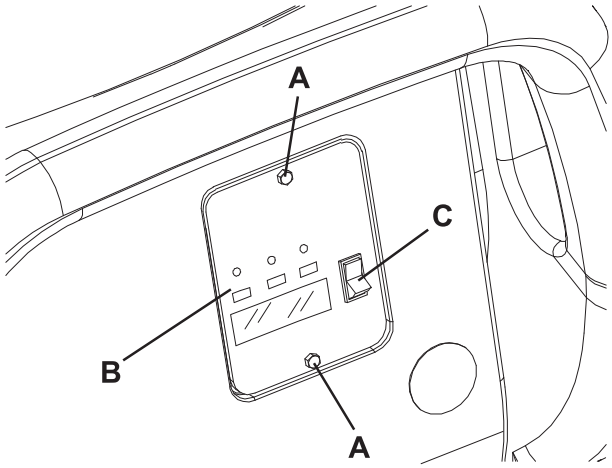


Figure 1

S311316

BEFORE MACHINE START-UP

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. (Only for **BA 551D**, **BA 551CD**, **BA 611D**): Turn the ignition key (80) to “0”.
   (Only for **BA 551**): Turn off the machine by pressing the switch (71) and/or (73).
3. If equipped, turn the speed adjuster (4) 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. (Only for **BA 551D**, **BA 551CD**, **BA 611D**): Turn the ignition key (80) to “I”.
7. Press the brush/pad-holder and vacuum system switch (71).
8. Slightly press the paddle (3) forward to engage the brushes/pad-holders, then release it. If necessary, repeat the procedure until the brushes/pad-holders are engaged.

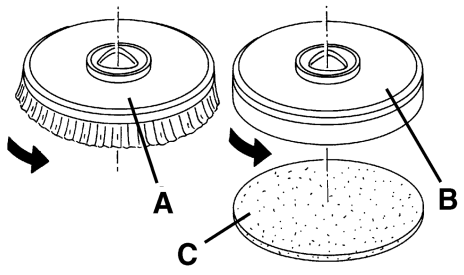


Figure 2

S311317

WARNING!
(Only for BA 551D, BA 551CD, BA 611D): Do not press the paddle (3) completely, otherwise the machine will start moving.
A slight pressure on the paddle (3) is enough to engage the brushes/pad-holders and to turn on the relevant motors.

9. To remove the brushes/pad-holders, the deck must be lifted by pressing the pedal (11), then press the switch (75) (if equipped) and wait for the brush/pad-holder to fall on the floor.
   (Only for **BA 551D**, **BA 551CD**, **BA 611D**): Turn the ignition key (80) to “0”.
   (Only for **BA 551**): Press the switch (71).
   If the machine is not equipped with the automatic release system (switch 75), manually remove the brush/pad-holder from the hub, by turning it in the opposite direction to the normal rotation direction.

Available brushes and their relevant application guides (suggestions only)

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

Cylindrical brush installation/removal (only for BA 551CD)

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.

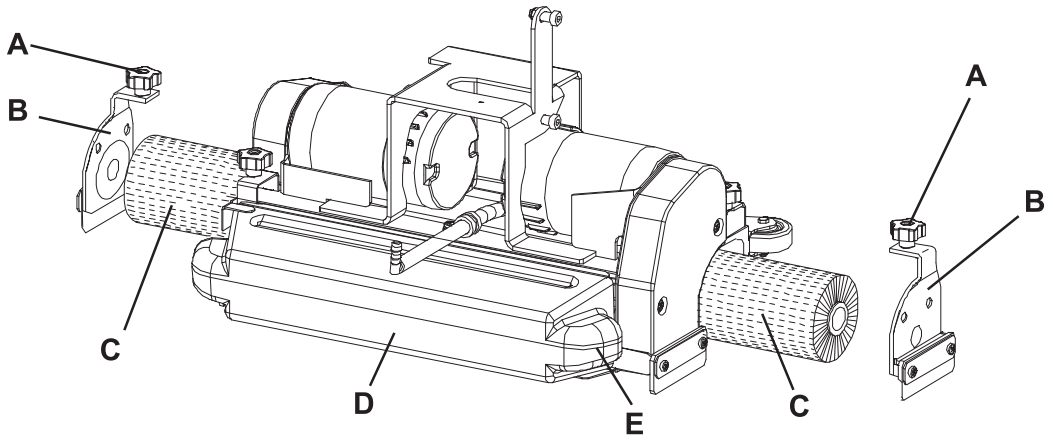


Figure 3

S311318

Available cylindrical brushes and their relevant application guides (suggestions only)

Models	POLYPROPYLENE 0.40	HARD NYLON 0.60	SOFT NYLON 0.45
General cleaning:			
Concrete	■	■	
Terrazzo floor	■	■	■
Ceramic tiles/quarrystones	■	■	■
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. With the handwheel (27), adjust the squeegee so that the rear blade - in all its length - touches the floor and the front blade is slightly detached from 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. 6), width 760 mm
Deck with two brushes (18b), brush diameter: 305 mm	Steel (Fig. 7), width 810 mm
Deck with two cylindrical brushes (18c), brush length: 485 mm	Aluminium (Fig. 6), width 760 mm

Solution or washing water tank filling

NOTE
If the machine is equipped with EcoFlex™ system (optional) (switches (83 and 77) activated) pour clean water in the tank, otherwise pour solution.

1. Open the filler neck (8).
2. **(For machine without EcoFlex™ system)**
   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.
   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.

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

   (For machine with EcoFlex™ system)
   Fill the tank (20) with clean water.
   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 machine with EcoFlex™ system)

1. Open the cover (22) and check that the recovery tank (21) is empty, otherwise empty it with the drain hose (16).
2. Grasp the handle (41) and 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
If the detergent hose (48) is empty (in case of new system, system emptied for cleaning, etc.), in order to fill the hose quickly, it may be useful to drain EcoFlex™ system once or several times (see the procedure in Maintenance chapter).

MACHINE START AND STOP

Starting the machine

1. Prepare the machine as shown in the previous paragraph.
2. (Only for **BA 551D**, **BA 551CD**, **BA 611D**): Turn the ignition key (80) to “I”.
   (Only for **BA 551**): Turn on the machine by pressing the switch (71) and/or (73).
   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 switch 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 **BA 551**).
   - By starting it with the hands on the handlebar (2) and pushing the paddle (3) forward to move forward, and backwards to move in reverse (only for **BA 551D**, **BA 551CD**, **BA 611D**).

   The maximum forward speed can be adjusted with the adjuster (4).
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 solution 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 (4).

Stopping the machine

9. Stop the machine with the handlebar (2) (only for **BA 551**).
   Stop the machine by releasing the paddle (3) (only for **BA 551D**, **BA 551CD**, **BA 611D**).
10. Turn off the brushes and the vacuum system by pressing the switches (71 and 73).
11. Lift the brush/pad-holder deck by pressing the pedal (11).
12. Lift the squeegee (25) with the lever (10).
13. 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 solution flow control switches (82) as necessary, depending on the type of cleaning to be performed.
3. If necessary, stop the machine and adjust the squeegee balancing handwheel (27).
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. (Only for **BA 551**): If necessary, stop the machine and turn the forward speed adjusting handwheel (29) 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 suggests to go near the walls with the right side of the machine as shown in figure 4.

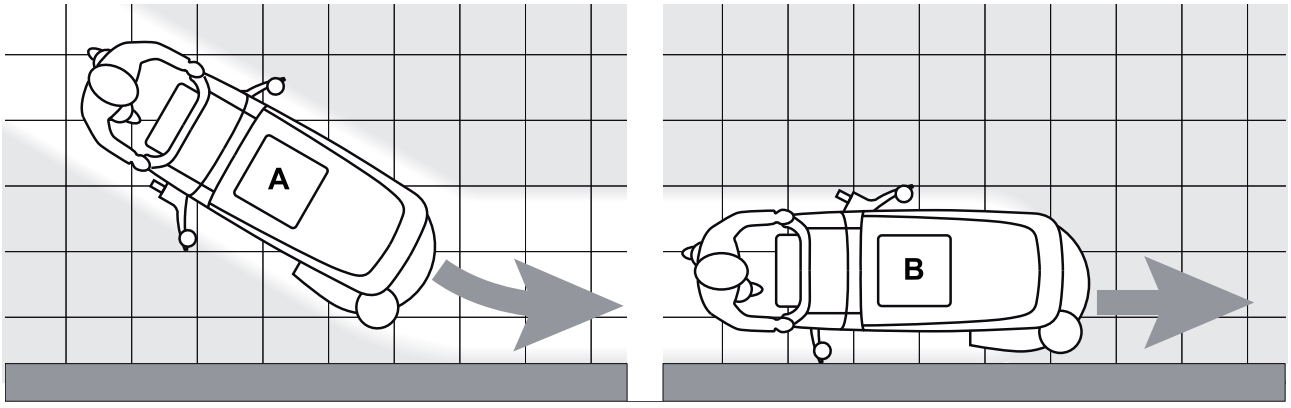


Figure 4

P100300

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.

Adjustment of the detergent concentration in the solution
(For machine with EcoFlex™ system)

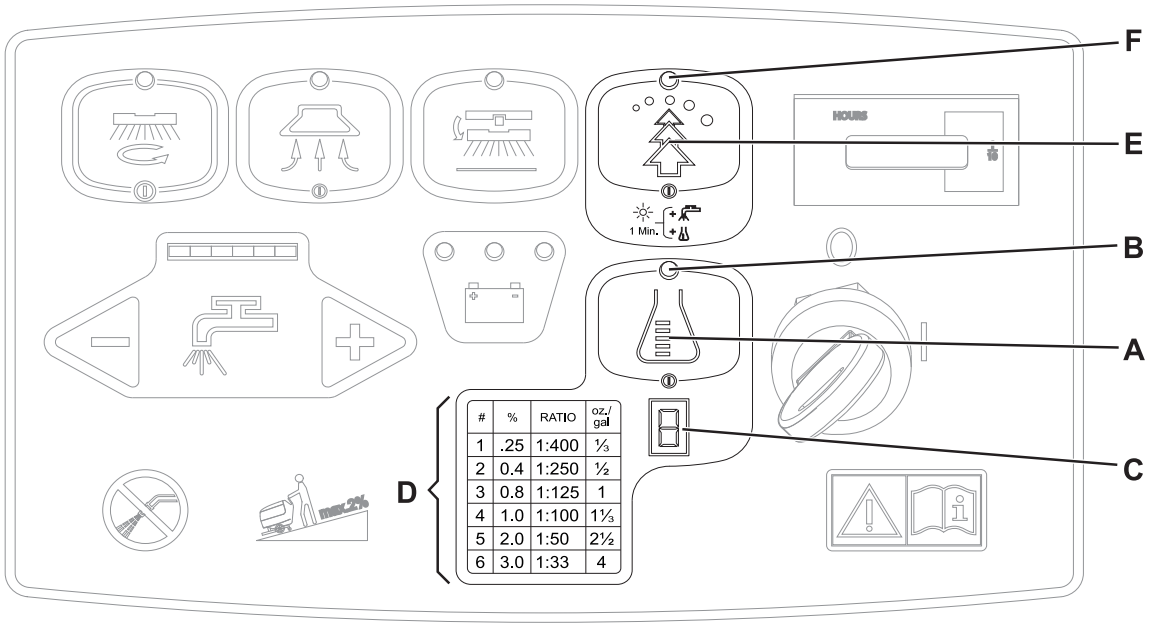
The system used to mix the detergent with the washing water can be activated by pressing the detergent flow control switch (A, Fig. 5): when the led indicator (B) is ON, the detergent is added to the washing water.
The display (C) shows the detergent concentration level (1 to 6) in the solution: for the related percentage values refer to the table (D).
In order to change the actual detergent concentration, proceed as follows:

1. Turn off the detergent flow control switch (A) (the led indicator (B) must be OFF).
2. Press and hold the detergent flow control switch (A) until the led indicator (B) flashes.
3. Release the switch (A). Press it again shortly to go to the next level shown by the display (C); repeat the operation until the desired setting is reached.
4. Wait until the led indicator (B) stops flashing: the new level is now set.

NOTE
Detergent percentage setting is stored into memory, even if the machine is turned off.

EcoFlex™ switch
Press the EcoFlex™switch (E, Fig. 5) whenever you temporarily need a greater washing power.
When you press the switch (E) (the led indicator (F) is flashing) the solution flow increases (for machine with EcoFlex™ system) and the detergent concentration in the solution increases (moreover, if the detergent mixing function is not activated, it is automatically activated).
The original settings can be restored by pressing the switch (E) once again (the led indicator (F) is ON).

NOTE
If the switch (E) is not pressed once again, the original settings are restored automatically after 60 seconds.



#	%	RATIO	oz./gal
1	.25	1:400	⅓
2	0.4	1:250	½
3	0.8	1:125	1
4	1.0	1:100	1⅓
5	2.0	1:50	2½
6	3.0	1:33	4

Figure 5

S311318

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 motor 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 is on (11c), press the pedal to position (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 **BA 551D**, **BA 551CD**, **BA 611D**) the drive system stay on, to finish drying the floor and drive the machine to the appointed recharging area.

CAUTION!
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 according to the procedure 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 the 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	■			
EcoFlex™ system cleaning and draining (optional)		■		
Squeegee blade check and replacement		■		
Solution/clean water filter cleaning		■		
Vacuum system motor filter 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 **BA 551D**, **BA 551CD**, **BA 611D**)				■ (2)

(1) And after the first 8 working hours.
(2) This maintenance procedure must be performed by an authorised Nilfisk 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 procedures

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. (Only for **BA 551D**, **BA 551CD**, **BA 611D**): Turn the ignition key (80) to “0”.
   (Only for **BA 551**): Turn off the machine by pressing the switch (71) and/or (73).
4. Grasp the handle (41) and 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), which is fitted with a handle, 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. Grasp the handle (41) and carefully lower the tank (40).

WARNING!
Never connect the battery charger to the opposing part of the connector fixed to the machine. The electronic system could be irreparably damaged.

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. Grasp the handle (41) and carefully lower the tank (40).

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

MACHINE WORKING HOUR CHECK

(Only if the machine is equipped with hour counter)

1. (Only for **BA 551D**, **BA 551CD**, **BA 611D**): 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. (Only for **BA 551D**, **BA 551CD**, **BA 611D**): 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. (Only for **BA 551D**, **BA 551CD**, **BA 611D**): Turn the ignition key (80) to “0”.
   (Only for **BA 551**): Turn off the machine by pressing the switch (71) and/or (73).
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. 6) or the aluminium squeegee (Fig. 7). Clean the compartments (A, Fig. 6 or 7) 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), according to the procedure 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 fasteners (M, Fig. 7) and adjust the rear blade (D, Fig. 6 or 7), then tighten the wing nuts, or engage the fasteners, 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 the front corner (J) of the rear blade for wear; 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:
   - Release the tie rod (G), remove the wing nuts (H) or disengage the fasteners (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).

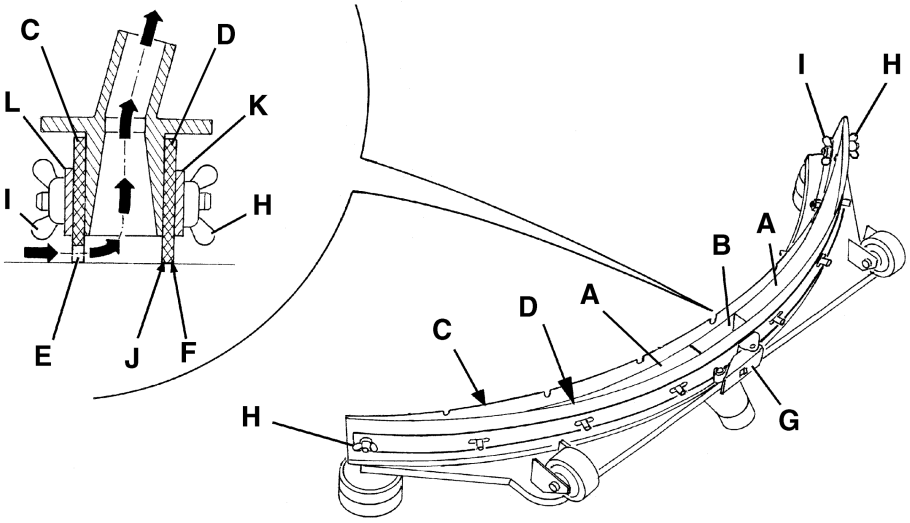


Figure 6

S311318

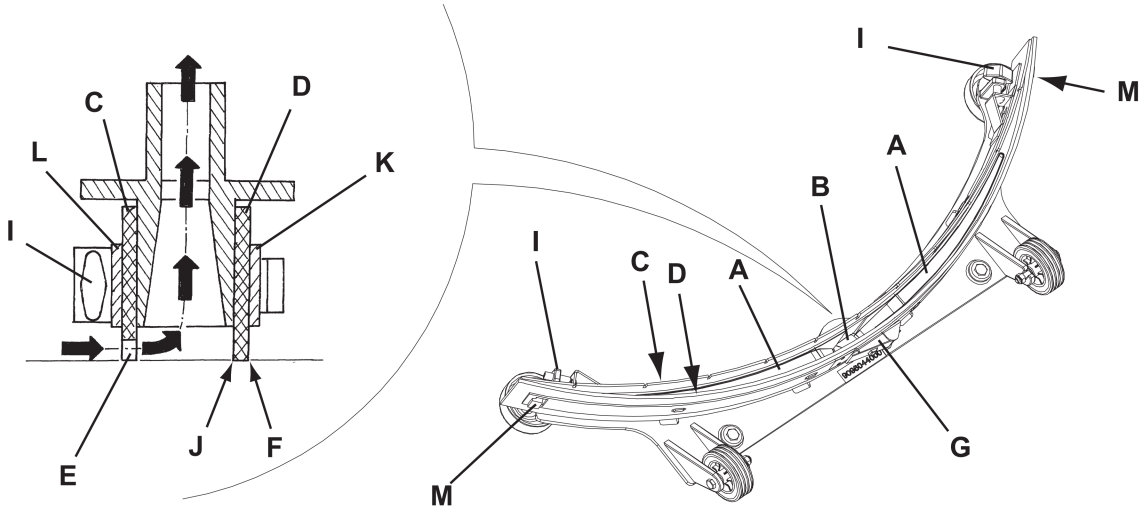


Figure 7

S311318

BRUSH/PAD CLEANING

CAUTION!
It is advisable to wear protective gloves when cleaning the brushes/pads/cylindrical brushes because there can be sharp debris.

1. Remove the brushes/pads from the machine, as shown in the 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 fasteners.

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

1. Drive the machine to the appointed disposal area.
2. (Only for **BA 551D**, **BA 551CD**, **BA 611D**): Turn the ignition key (80) to “0”.
   (Only for **BA 551**): Turn off the machine by pressing the switch (71) and/or (73).
3. Open the cover (A, Fig. 8) 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).
   Drain the water from the tanks with the hoses (16 and 17).
5. 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.
8. Check the compensation hole (K) for clogging, and clean it if necessary.

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

9. Close the cover (A).

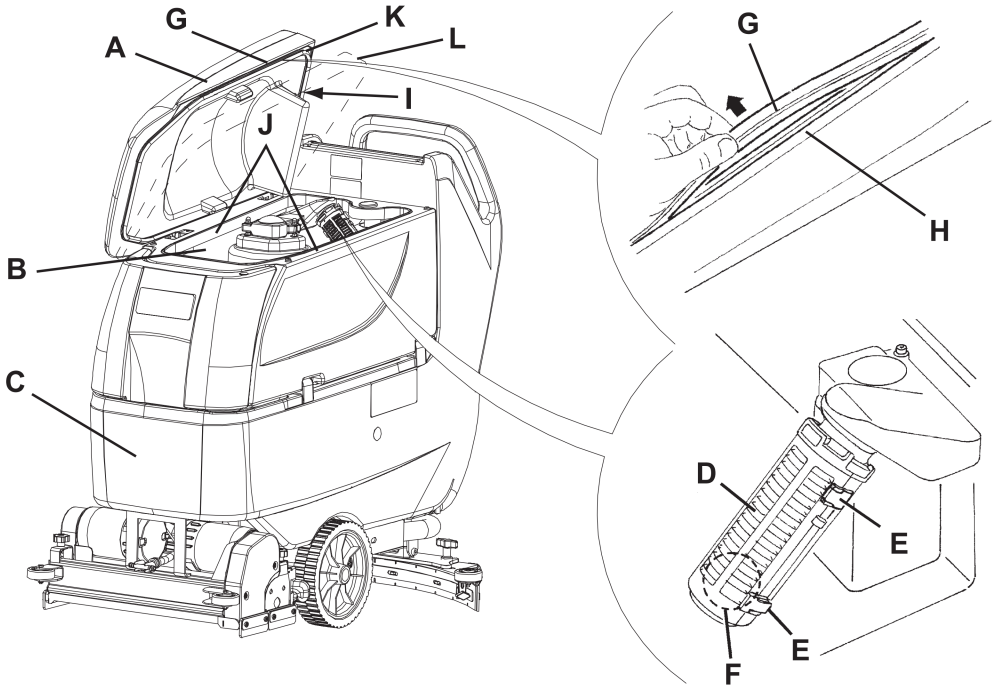


Figure 8

S311318

VACUUM SYSTEM MOTOR FILTER CLEANING

1. Drive the machine on a level floor.
2. (Only for **BA 551D**, **BA 551CD**, **BA 611D**): Turn the ignition key (80) to “0”.
   (Only for **BA 551**): Turn off the machine by pressing the switch (71) and/or (73).
3. Open the recovery 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 FILTER CLEANING

(For machine without EcoFlex™ system)

1. Drive the machine on a level floor.
2. (Only for **BA 551D**, **BA 551CD**, **BA 611D**): Turn the ignition key (80) to “0”.
   (Only for **BA 551**): Turn off the machine by pressing the switch (71) and/or (73).
3. Close the solution tap (A, Fig. 9) 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).

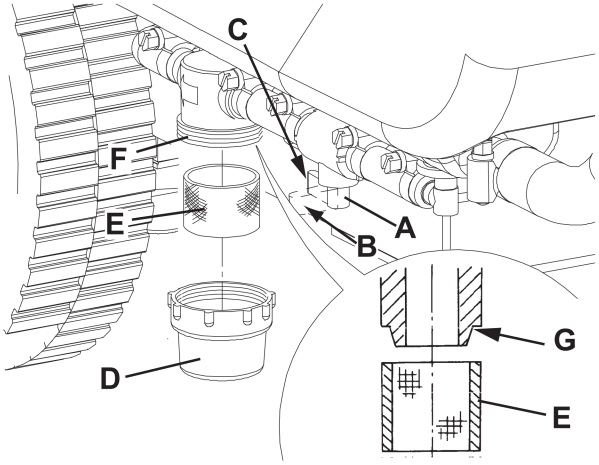


Figure 9

S311318

CLEAN WATER FILTER CLEANING

(For machine with EcoFlex™ system)

1. Drive the machine on a level floor.
2. Turn the ignition key (80) to “0”.
3. Open the cover (22) and check that the recovery tank (21) is empty, otherwise empty it with the drain hose (16).
4. Grasp the handle (41) and carefully lift the tank (40).
5. Slightly lift the hoses (A, Fig. 10), then, operating on the clean water filter assembly (F) unscrew the transparent cover (B) and remove the filter strainer (C). Clean and install them on the support (D).

NOTE
The filter strainer (C) must be correctly positioned on the housing (E) of the support (D).

6. Install the hoses (A) and the filter assembly (F).

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. 11), 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:
   C) Brush deck fuse F1: (40 A)
   D) Vacuum system fuse F2: (30 A)
   E) Drive system fuse F3: (30 A) (*)
   F) Signal circuits fuse F4: (3 A)
   G) Brush/pad-holder release fuse F5: (20 A) (*)
   H) Pump fuse F6: (3 A) (*)

   (*) Only for **BA 551D**, **BA 551CD**, **BA 611D**
6. Perform steps 1 to 4 in the reverse order.

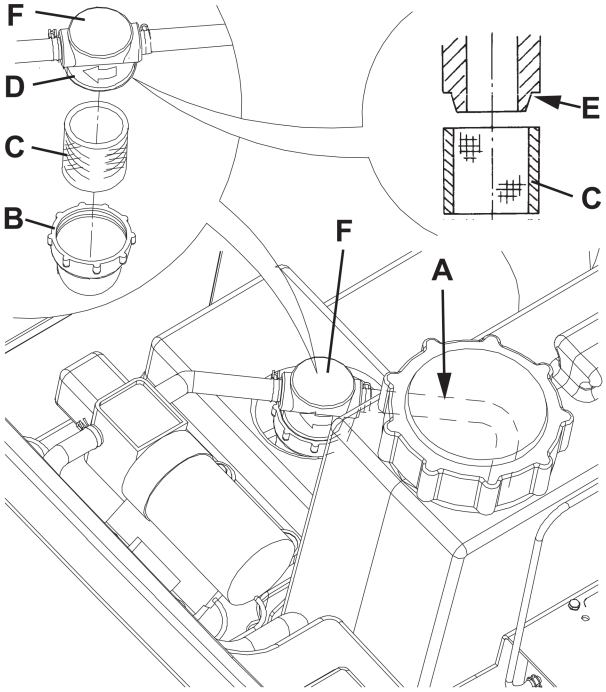


Figure 10

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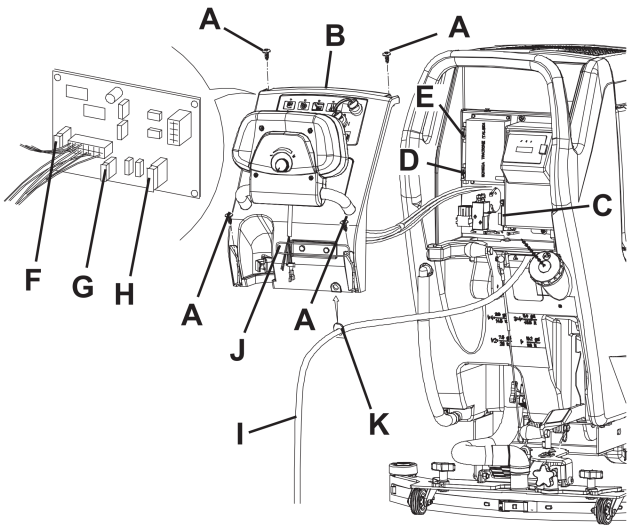


Figure 11

S311318

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 according to the procedure 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. 12) 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.

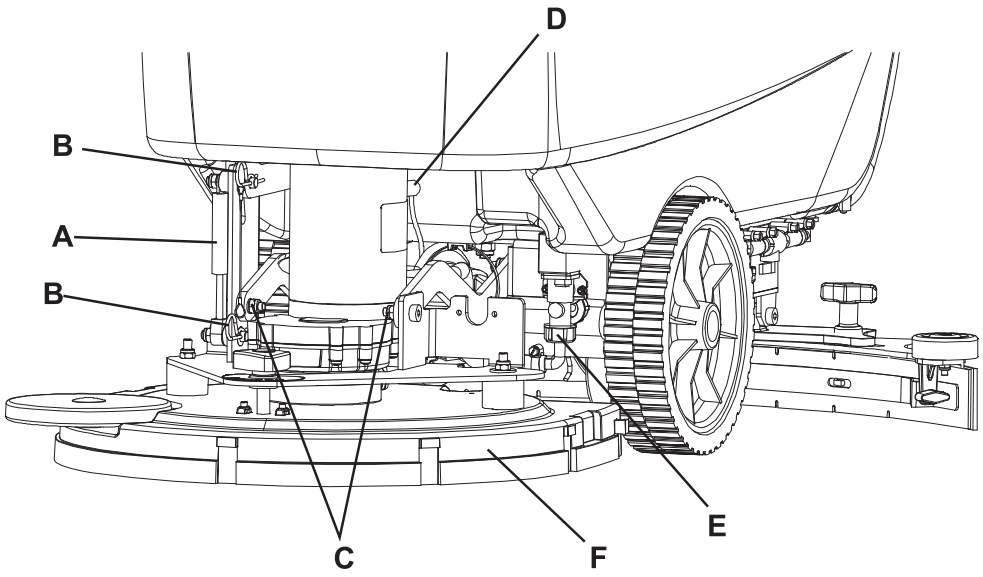


Figure 12

S311318

DETERGENT TANK CLEANING

(For machine with EcoFlex™ 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. Grasp the handle (41) and carefully lift the tank (40).
4. Unscrew the plug and disconnect the hose (48) from the tank (45).
5. Remove the tank by releasing it from the fasteners.
6. Wash the tank in the appointed disposal area.
7. Install the tank (45) and connect it to the hose (48).
8. When the detergent tank has been drained, the EcoFlex™ system must be drained too (see the procedure in the following paragraph).

ECOFLEX™ SYSTEM DRAINING

(For machine with EcoFlex™ system)

1. Clean the detergent tank according to the procedure shown in the previous paragraph. To remove the detergent remained in the hoses and in the pump, perform the following procedure.
2. Grasp the handle (41) and carefully lower the tank (40).
3. Turn on the machine by turning the ignition key (80) to “I”.
4. Press the switch (77). Check that the switch warning light (78) turns on.
5. Press the switches (77) and (82a) at the same time, until the switch warning light (78) starts flashing (after about 5 seconds).
6. Release the switches and wait for the warning light (78) to stop flashing and for the vacuum system to turn on.
7. Collect the detergent remained on the floor.
8. Turn the ignition key (80) to “0”.
9. Grasp the handle (41) and carefully lift the tank (40), then check that the hose (48) is empty, otherwise perform steps 3 to 9 again.

NOTE

The draining cycle lasts about 30 seconds, then the vacuum function automatically turns on, which allows to remove the detergent remained.

The draining cycle can also be performed with the detergent tank (45) full of water, thus cleaning the system thoroughly. It is advisable to perform this type of draining to clean the EcoFlex™ system from dirt and deposits if the machine has not been used/cleaned for a long time.

The draining cycle can be performed also to quickly fill the detergent supply hose when the tank (45) is full but the system is still empty.

If necessary, the draining cycle can be repeatedly performed.

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 **BA 551D**, **BA 551CD**, **BA 611D**)	The machine has been turned on by using the ignition key and by keeping the paddle pressed.	Turn the ignition key to “0”, then try to start the machine without pressing the paddle.
The warning lights (81) flash simultaneously.	The deck motor is overloaded.	Use less aggressive brushes 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 is on.	Discharged batteries	Charge the batteries.
The dirty 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 closing.	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 properly or replace the gasket.
The solution flow is insufficient.	The solution/clean water filter is dirty.	Clean the filter.
	The recovery tank is dirty (the drain hole is clogged).	Clean.
	Dirty/encrusted EcoFlex™ system tank (optional).	Drain.
The squeegee leaves marks on the floor.	There is debris under the squeegee blades.	Remove the debris.
	The squeegee blades are worn, chipped or torn.	Replace the blades.
	The squeegee is not balanced with the handwheel.	Balance.

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 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 Center especially when scrapping electrical and electronic components.