

# SW4000, FLOORTEC R 870

## Instructions for use

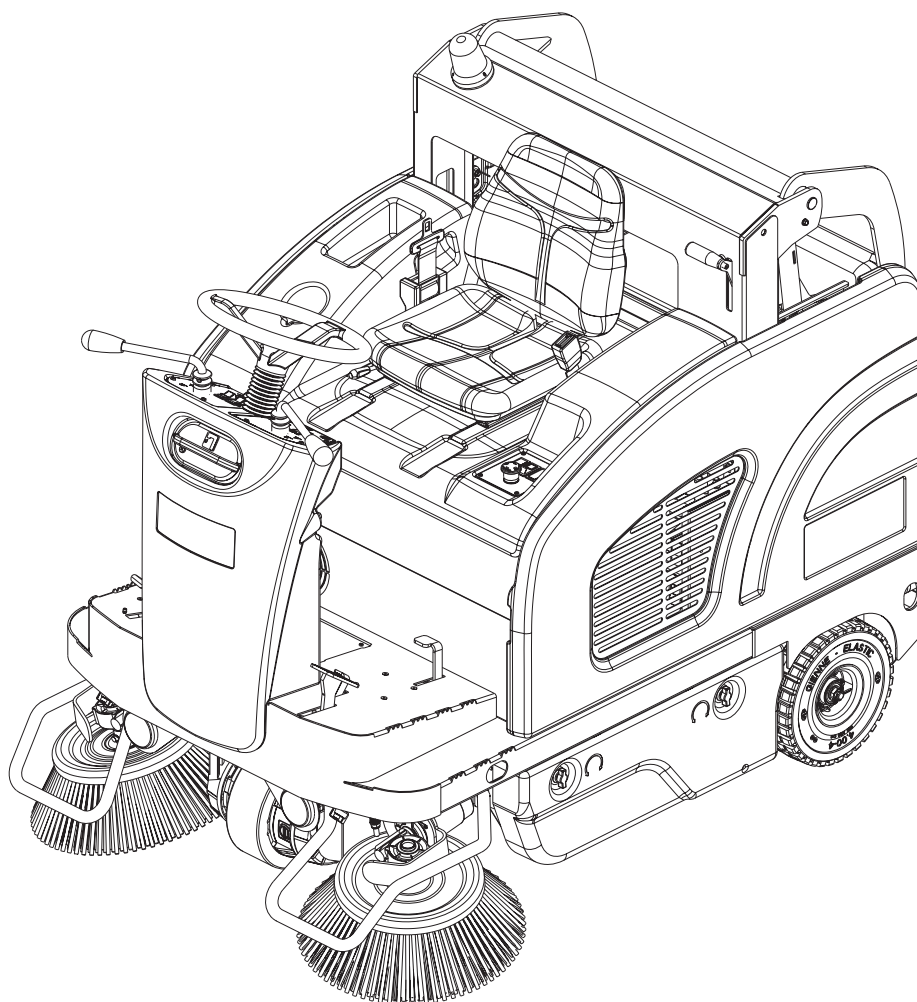
Bedienungshandbuch  
Instructions d'utilisation  
Instructions for use  
Gebruiksaanwijzing



03/2013 Revised 02/2017  
(2)  
1464809000



Deutsch  
Français  
English  
Nederlands



Model:  
9084400010, 9084404010

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

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

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



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

SW4000 B, FLOORTEC R 870 B

Тип / Тур / Typ / Type / Tipo / Tüüp / Type / Туурпи / Type / Τύπος /  
Tipus / Vrsta / Tipo / Tipos / Type / Type / Tipo / Typ / Tip / Тип /  
Typ / Typ / Tip / Tip :

SWEeper

Сериен номер / Výrobní číslo / Seriennummer / Seriennummer / Número de serie / Seerianumber / Numéro de série / Sarjanumero / Serial number /  
Σειριακός αριθμός / Sorozatszám / Serijski broj / 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 / Godina izgradnje / Anno di costruzione / Pagaminimo metai / Izgatavošanas gads / Byggeår / Baujaar /  
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. Техническият файл е съставен от производителя.

**CZ** Niže podepsaný stvrzuje, že výše uvedený model byl vyroben v souladu s následujícími směrnici 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 estándares. El fascículo técnico está redactado por el fabricante

**EST** Allkirjutanu kinnitab, et ülalnimetatud model on valmistatud kooskõlas järgmistega 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** Allekirjoittaja 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 fájl 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 ovennævnte model er produceret i overensstemmelse med følgende direktiv og standarder. Den tekniske filen er oprettet 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 diretivas 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 susmenționat este produs în conformitate cu următoarele directive și standarde. Fișierul 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 2014/30/EU

EN 55014-1, EN 55014-2, EN 61000-6-2

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

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Date:

Signature:

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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 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 will not be responsible for damages coming from failure to follow these instructions.

## HOW TO KEEP THIS MANUAL

The Instructions for Use 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 serial number and model name are marked on the plate (30).

Product code and year of production are marked on the same plate (Date code: A17, means January 2017).

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

MACHINE model .....
PRODUCT code .....
MACHINE serial number .....

## OTHER REFERENCE MANUALS

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

Moreover, the following Manuals are available:

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

## 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, product code 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

This sweeper has been approved to clean (sweeping and vacuuming) compact and solid floors, in commercial and industrial environments, under safe operation conditions by a qualified operator.

## CONVENTIONS

Forward, backward, front, rear, left or right are intended with reference to the operator's position, that is to say on the driver's seat (3).

## UNPACKING/DELIVERY



### CAUTION!

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

Upon delivery carefully check that the machine and its packing have not been 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:

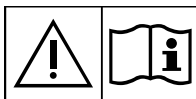
- Technical documents:
  - Sweeper Instructions for Use Manual (this document)
  - Electronic Battery Charger Manual (if equipped)
  - Sweeper Spare Parts List
- No. 1 150 A main fuse (F0)
- No. 1 10 A fuse
- No. 1 battery charger connector

## 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.

## VISIBLE SYMBOLS ON THE MACHINE



### WARNING!

*Carefully read all the instructions before performing any operation on the machine.*



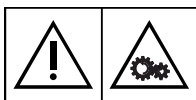
### WARNING!

*Do not wash the machine with direct or pressurised water jets.*



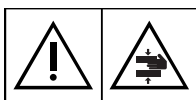
### WARNING!

*Do not use the machine on slopes with a gradient exceeding the specifications.*



### WARNING!

*Moving parts.*



### WARNING!

*Moving parts. Danger of crushing.*



### WARNING!

*Parts under voltage. Presence of corrosive fluids.*

## SYMBOLS THAT APPEAR ON THIS MANUAL



### 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 Instructions for use 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, remove the ignition key and engage the parking brake.*
- *This machine must be used by properly trained operators only.*
- *Sharp turns must be made at slowest possible speed. Avoid abrupt turns, particularly on slopes, and turns with the hopper lifted.*
- *Do not lift the hopper when the machine is on a slope.*
- *Keep the batteries away from sparks, flames and incandescent material. Explosive gases are released when charging the batteries.*
- *Do not wear jewels when working near electrical components.*
- *Do not work under the lifted machine without supporting it with safety stands.*
- *When working under the open hood, ensure that it cannot be closed by accident.*
- *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.*
- *If the machine is equipped with lead (WET) batteries, battery charging produces highly explosive hydrogen gas. Keep the hood open when charging the batteries and perform this procedure in well-ventilated areas and away from naked flames.*
- *When lead batteries (WET) are installed, do not tilt the machine for more than 30° from the horizontal plane to prevent the highly corrosive acid from leaking out of the batteries. When the machine is to be tilted to perform maintenance procedures, remove the batteries.*



### WARNING!

- *Carefully read all the instructions before performing any maintenance/repair procedure.*
- *When working near the hydraulic system, always wear protective clothes and safety glasses.*
- *(For machines equipped with optional battery charger). 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.*
- *Before performing any maintenance procedure, disconnect the battery charger cable from the electrical mains to avoid any risk of fire, electric shock or injuries.*

**WARNING!**

- *Do not smoke while charging the batteries.*
- *This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the machine by a person responsible for their safety. Children should be supervised to ensure that they do not play with the machine.*
- *Close attention is necessary when used near children.*
- *Use only as shown in this Manual. Use only Nilfisk recommended accessories.*
- *Check the machine carefully before each use, always check that all the components have been assembled before use. If the machine is not perfectly assembled it can cause damages to people and properties.*
- *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.*
- *Do not leave the machine unattended without being sure that it cannot move independently.*
- *Do not use the machine on slopes with a gradient exceeding the specifications.*
- *Do not tilt the machine more than the angle indicated on the machine itself, in order to prevent instability.*
- *Use only brooms supplied with the machine or those specified in the Instructions for Use Manual. Using other brooms could reduce safety.*
- *Before using the machine, close all doors and/or covers as shown in the Instructions for Use Manual.*
- *Do not wash the machine with direct or pressurised water jets, or with corrosive substances.*
- *Use the machine only where a proper lighting is provided.*
- *Working lights (optional) have to be used only to enhance visibility on the floor to be cleaned, but they do not authorize anyone to use the sweeper in dark environments.*
- *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 storage temperature must be between 0 °C and +40 °C.*
- *The machine working 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 indoor, in a dry environment: this machine must be used in dry conditions, it must not be used or kept outdoors in wet conditions.*
- *Do not use the machine as a means of transport, or for pushing/towing.*
- *The machine maximum capacity, operator's weight not included, is 100 kg (the weight of waste).*
- *In case of fire, use a powder fire extinguisher, not a water one.*
- *Adjust the operation speed to suit the floor conditions.*
- *Avoid sudden stops when the machine is going downhill. Avoid sharp turns. Drive at slow speed when going downhill.*
- *This machine cannot be used on roads or public streets.*
- *Do not tamper with the machine safety guards.*
- *Follow the routine maintenance procedures 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.*
- *(Only for versions equipped with DustGuard™ system). Pay attention during machine transportation when temperature is below freezing point. The water in the tank or in the hoses could freeze and seriously damage the machine.*
- *Do not remove or modify the plates affixed to the machine.*
- *When the machine is to be pushed for service reasons (missing or discharged batteries, etc.), the speed must not exceed 4 km/h.*
- *In case of machine malfunctions, ensure that these are not due to lack of maintenance. If necessary, 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.*
- *The machine must be disposed of properly, because of the presence of toxic-harmful materials (batteries, oils, etc.), which are subject to standards that require disposal in special centres (see the Scrapping chapter).*

Guide lines to bacteria control and other dangers coming from the presence of microbes in the DustGuard™ system (optional).



**WARNING!**

*To prevent the operators and other people from developing infections caused by microbes and Legionella that may flourish in the dust guard system, take the following precautions:*

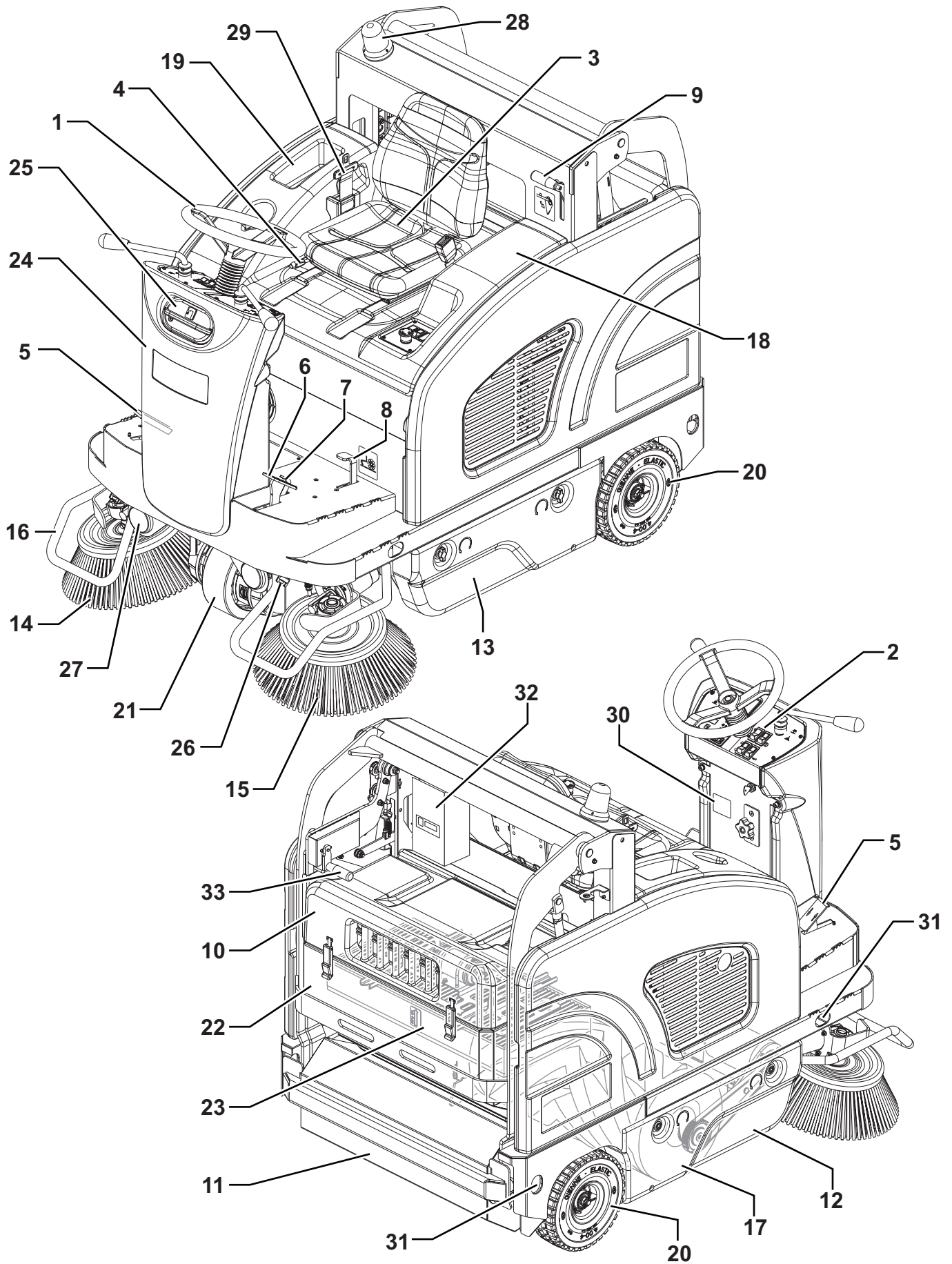
- *If possible, fill the tank with cold water (< 20°C).*
- *DO NOT use stagnant water to fill the tank.*
- *DO NOT use recycled water, undrinkable water or water that has been in contact with the soil.*
- *Adjust and turn the nozzles towards the floor only, from preventing possible inhaling.*
- *Do not store the machine outdoors or near sources of heat.*
- *Do not over-fill the tank. Fill the tank sufficiently so that it can be emptied by using the system.*
- *Empty the tank every 10 hours or once a week, according to the use.*
- *If the machine is not used for more than one week, empty the tank completely, and let it dry before storing it.*
- *If the tank cannot be cleaned regularly, consider using a biocide that can kill or exert a controlling effect on Legionella bacteria. Biocide must be chosen according to the local regulations and must be used according to the relevant instructions and cautions, to avoid that the personnel gets affected by dangerous chemical substances.*
- *If chemical products have to be used in the water tank, it is mandatory to apply the relevant information and caution labels of the product.*

## MACHINE DESCRIPTION

### MACHINE STRUCTURE

- |  |   |
|--|---|
| 1. Steering wheel  | 18. Battery compartment hood  |
| 2. Control panel (see the following paragraph)   | 19. Can holder  |
| 3. Driver's seat with safety microswitch   | 20. Rear wheels   |
| 4. Seat position adjusting lever   | 21. Front driving and steering wheel                                  |
| 5. Drive pedal   | 22. Dust filter container   |
| 6. Service brake pedal   | 23. Panel filter with filter-shaker                                   |
| 7. Parking brake lever: press both the service brake (6) and the lever (7) to switch from the service brake to the parking brake | 24. Front column / Dust guard system water tank (optional)            |
| 8. Front skirt lifting pedal   | 25. Dust guard system water filler neck plug (optional)               |
| 9. Hopper release and discharge lever  | 26. Dust guard system nozzles (optional)                              |
| 10. Rear hood with vacuum system   | 27. Working lights (optional)   |
| 11. Hopper (empty it when it is full)  | 28. Flashing light (always on when the ignition key is turned to "I") |
| 12. Right door (to be opened for performing maintenance procedures only)   | 29. Safety belt (optional)  |
| 13. Left door (for main broom removal)   | 30. Serial number/technical data/conformity certification plate       |
| 14. Right side broom   | 31. Anchoring slots for transport (not for lifting)                   |
| 15. Left side broom (optional)   | 32. Electronic battery charger (optional)                             |
| 16. Side broom guards (optional)   | 33. Hopper manual returning handle                                    |
| 17. Main broom   |   |

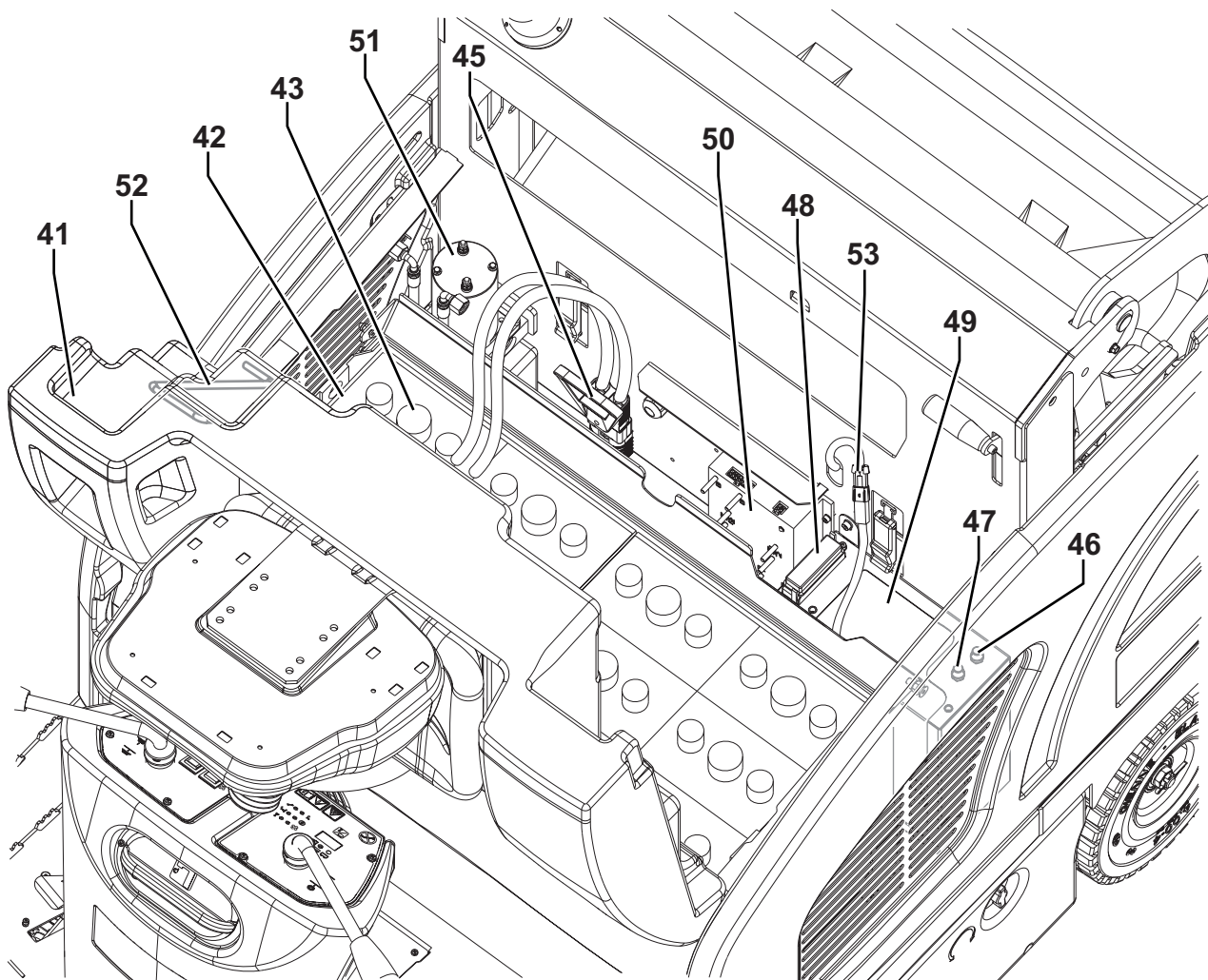
MACHINE STRUCTURE (Continues)



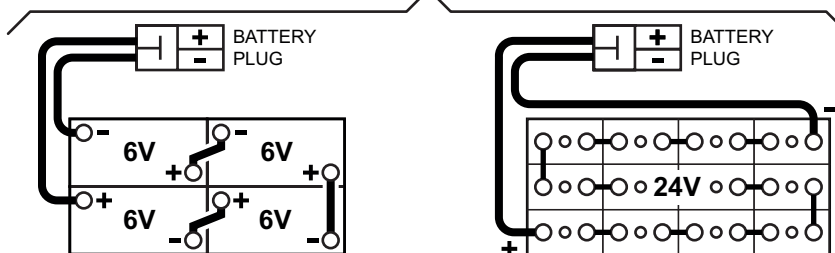
P100588

**MACHINE STRUCTURE (Continues)**

- 41. Battery compartment hood opening handle
- 42. Lead batteries (WET) or optional gel batteries (GEL-AGM)
- 43. Battery caps (for WET batteries only)
- 44. Battery connection diagrams
- 45. Battery connector
- 46. Right side broom motor resettable thermal fuse
- 47. Left side broom motor resettable thermal fuse (optional)
- 48. Lamellar fuse box
- 49. Electrical component box
- 50. Drive system electronic board
- 51. Hydraulic unit with tank for hopper lifting
- 52. Open hood safety rod
- 53. Vacuum system motor connector



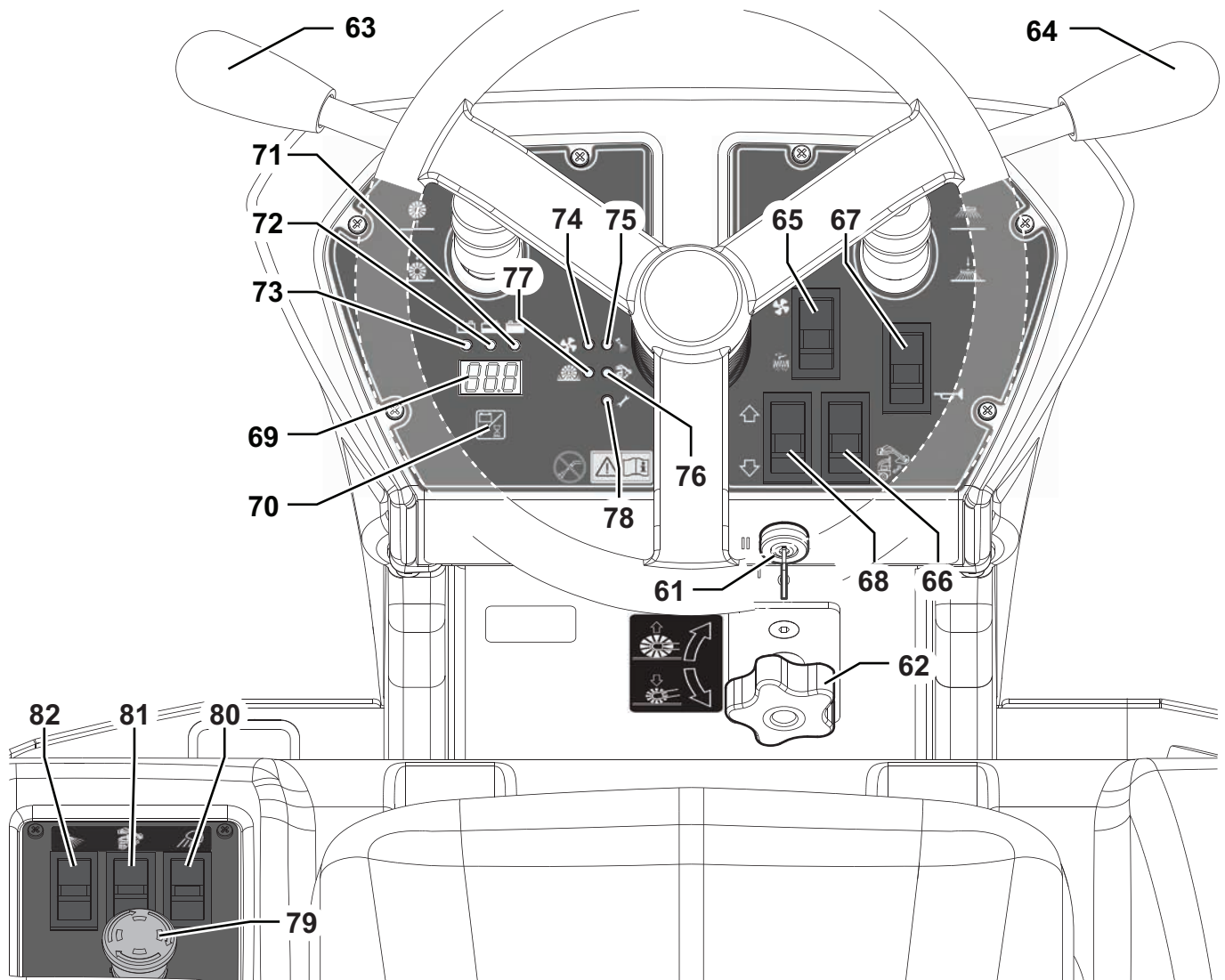
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**CONTROL PANEL**

61. Ignition key:
- When turned to "0", it turns the electrical system off and disables all machine functions
  - When turned to "II", it starts the machine. When the machine starts, release the key, which will return to "I" (machine ON)
62. Main broom height adjusting knob:
- Turn it counter-clockwise to increase the broom pressure on the floor
  - Turn it clockwise to decrease the broom pressure on the floor
63. Main broom lifting/lowering lever
64. Side broom lifting/lowering lever
65. Switch for:
- Vacuum system activation/deactivation (upper part)
  - Filter shaker activation (lower part)
66. Hopper movement enabling switch
67. Horn switch
68. Forward/reverse gear switch
69. Display
70. Display switch for selecting the following functions:
- Working hours
  - Battery voltage (V)
71. Charged battery warning light (green). Residual autonomy depends on battery capacity and working conditions.
72. Semi-discharged battery warning light (yellow). Residual autonomy is few minutes.
73. Discharged battery warning light (red). The autonomy is over, the batteries must be recharged.
74. Vacuum system warning light (green)
75. Dust guard system (optional) warning light (green)
76. Hopper lifting system warning light (yellow)
77. Main broom overpressure warning light (red)
78. Drive system malfunction warning light (red)
79. Emergency push-button. Press it in case of emergency to stop all the machine functions. To deactivate the emergency push-button, turn it in the direction shown by the arrow.
80. Working light switch (optional)
81. Hopper lifting/lowering switch
82. Dust guard system switch (optional)



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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:

- Left side broom
- Safety belts
- Main and side brooms with harder or softer bristles
- Right and left armrests
- Electronic battery charger (standard for FLOORTEC R 870)
- Non-marking wheels
- Paper dust filter (standard for FLOORTEC R 870)
- FOPS protective roof
- Non-marking skirts
- Roof cover
- Working lights
- Side broom guards
- DustGuard™ system

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

## TECHNICAL DATA

Model	<b>SW4000 B FLOORTEC R 870 B</b>	
Cleaning width	with one side broom	975 mm
	with two side brooms	1,250 mm
Main broom size (length x diameter)		700 x 340 mm
Side broom diameter		450 mm
Theoretical working capacity	main broom	4,900 m <sup>2</sup> /h
	with one side broom	6,825 m <sup>2</sup> /h
	with two side brooms	8,750 m <sup>2</sup> /h
Hopper	capacity	75 litres
	maximum liftable weight	100 kg
	maximum lifting height	1,590 mm
Filter	cleaning system	Electrical filter shaker
	area	7 m <sup>2</sup>
	filtering capacity	4 µm
Power		Lead acid battery for cyclical/drive use 24V (180 - 360 Ah C5)
Main broom	motor power	600 W
	speed	550 rpm
Side broom	motor power	90 W
	speed	110 rpm
Vacuum	motor power	260 W
Drive	type	Electric drive on front wheel
	gearmotor power	1,000 W
	forward speed	7 km/h
	reverse speed	4.5 km/h
Maximum gradient when working		20 %
Hopper hydraulic control unit		250 W
Filter shaker motor		90 W
Total absorbed power		2.0 kW
Working autonomy		4.5 h
Dimensions (length x width x height)	machine body	1,640 x 1,035 x 1,330 mm
	machine with side brooms	1,640 x 1,050 x 1,330 mm
	machine with flashing light	1,640 x 1,035 x 1,390 mm
	machine with FOPS protective roof (optional)	1,640 x 1,035 x 1,990 mm
	battery compartment	370 x 812 x 390 mm

**TECHNICAL DATA (Continues)**

Model		SW4000 B FLOORTEC R 870 B
Weight	kerb weight without batteries	433 Kg
	total kerb weight (*)	824 Kg
	front axle kerb weight (*)	316 Kg
	rear axle kerb weight (*)	508 Kg
	gross vehicle weight (GVW)	1,005 Kg
Wheel specific pressure on the floor (front - rear wheels, in running conditions)		0.9 - 0.4 N/mm <sup>2</sup>
Sound pressure level at workstation (ISO 11201, ISO 4871, EN 60335-2-72) (LpA)		65 dB(A) ± 3 dB(A)
Machine sound pressure level (ISO 3744, ISO 4871, EN 60335-2-72) (LwA)		86 dB(A)
IP protection class		X3
Dust guard system water tank (optional) capacity		20 litres
U-turn space (right - left)		1,920 - 1,890 mm
Vibration level at the operator's arms (ISO 5349-1) (**)		< 2.5 m/s <sup>2</sup>
Vibration level at the operator's body (ISO 2631-1) (**)		< 0.5 m/s <sup>2</sup>

(\*) With operator on board, without batteries and with hopper empty.

(\*\*) Under normal working conditions, on a level asphalt surface.

**Machine Material Composition and Recyclability**

Type	Recyclable percentage	SW4000 B FLOORTEC R 870 B weight percentage
Aluminium	100 %	0.0 %
Electric motors - various	29 %	10.8 %
Ferrous materials	100 %	53.5 %
Wiring harnesses	80 %	1.2 %
Liquids	100 %	0.4 %
Plastic - non-recyclable material	0 %	1.0 %
Plastic - recyclable material	100 %	9.8 %
Polyethylene	92 %	7.0 %
Rubber	20 %	4.1 %
Cardboard - paper - wood	100 %	12.2 %

**Hydraulic oil technical data**

Viscosity at 40 °C	mm <sup>2</sup> /s	45	32
Viscosity at 100 °C	mm <sup>2</sup> /s	7.97	6.40
Viscosity index	/	150	157
Flash point COC	°C	215	202
Pour point	°C	-36	-36
Density at 15 °C	kg/l	0.87	0.865

**CAUTION!**

*If the machine is to be used at ambient temperatures below +10 °C, the oil should be changed with equivalent oil having a viscosity of 32 cSt. For temperatures below 0 °C, use an oil with lower viscosity.*

**WIRING DIAGRAM****Key**

BAT	24 V batteries
BZ1	Reverse gear buzzer
BE	Flashing light
C1	Battery connector
CH	Battery charger
EB1	Drive system electronic board
EB2	Dashboard electronic board
ES0	Line electromagnetic switch
ES1	Main broom electromagnetic switch
FA	Main broom fuse (50 A)
F0	Main fuse (150 A)
F1	Vacuum system fuse (25 A)
F2	Filter shaker fuse (25 A)
F3	Display electronic board (3 A)
F4	Key circuit fuse (10 A)
F5	Dust guard system pump fuse (5 A) (optional)
F6	Hopper pump fuse (25 A)
FR1	Right side broom circuit breaker (15 A)
FR2	Left side broom circuit breaker (15 A) (optional)
HN	Horn
K1	Vacuum system relay
K2	Filter shaker relay
K3A+,-	Hopper lifting relay
K3B+,-	Hopper lowering relay
K4	Machine on relay
K5	Side broom relay
K6	Dust guard system pump relay (optional)
L1, L2	Working lights (optional)
M0	Driving wheel
M1	Vacuum system motor
M2	Filter shaker motor
M3	Hopper pump motor
M4	Main broom motor
M6	Right side broom motor
M7	Left side broom motor (optional)
M8	Dust guard system pump motor (optional)
R1	Drive pedal
S1	Hopper lifting sensor
S2	Main broom lever sensor
S3	Side broom lever sensor
SW0	Emergency push-button
SW1	Ignition key
SW2	Forward/reverse gear switch
SW3	Filter shaker/vacuum system switch
SW4	Hopper enabling switch
SW5	Hopper lifting/lowering switch
SW6	Horn switch
SW7	Driver's seat safety microswitch
SW8	Dust guard system switch (optional)
SW9	Working light switch (optional)

**Colour codes**

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



**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 (see the Visible Symbols On The Machine paragraph).

Do not cover these plates for any reason and immediately replace them if they are damaged.

If the machine has not been used after being transported, check that all the blocks have been removed.

**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.*

*According to the type of batteries (WET or GEL-AGM), set the electronic board of the machine.*

*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 one 24 V battery, or four 6 V batteries connected according to the diagram (44).

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

- a) Batteries already installed and ready to be used
- b) Without batteries

According to machine configuration, proceed as follows.

**a) WET or GEL-AGM batteries already installed on the machine**

1. Open the hood (18) and fasten it with the support rod (52).
2. Check that the batteries are connected to the machine with the connector (45).
3. Remove the support rod (52) and close the hood (18).
4. Insert the ignition key (61) and turn it to "I", without pressing the pedal (5).  
If the green warning light (71) turns on, the batteries are ready to be used.  
If the yellow or red warning light (72 or 73) turns on, the batteries must be charged (see the procedure in Maintenance chapter).

**b) Without batteries**

1. Buy appropriate batteries (see Technical Data paragraph).  
For battery choice and installation, apply to qualified battery Retailers.
2. Install the batteries, then set the machine according to the type of batteries (WET or GEL-AGM) (see the procedure in Maintenance chapter).
3. Charge the batteries (see the procedure in Maintenance chapter).

**BEFORE MACHINE START-UP****Checklist**

1. Have a full knowledge of the machine operating controls and their functions.
2. Insert the key (61) and start the machine (see the procedure in the following paragraph).
3. Check the battery warning light:
  - If the green warning light (71) turns on, the batteries are ready to be used.
  - If the yellow or red warning light (72 or 73) turns on, the batteries must be charged (see the procedure in Maintenance chapter).
4. Check the horn with switch (67), the reverse gear buzzer with switch (68) and the working light switch (80, optional) for proper operation.
5. Check the parking brake (7 and 6). The brake must hold its (locked parked) setting firmly without easily being released (report all defects immediately to Nilfisk Service Center).
6. Check the service brake pedal (6) for proper operation.

**WARNING!**

*If the pedal is "spongy" or fades under pressure without an efficient braking force, do not drive the machine (report all defects immediately to Nilfisk Service Center).*

7. Make sure that there are no open doors/hoods and that the machine is in normal operating conditions.

## Cleaning planning

1. Arrange long runs with a minimum of stopping or starting.
2. Allow a small amount of broom path overlap to ensure complete coverage.
3. Avoid making sharp turns, bumping or scraping the side of the machine.

## Filling the DustGuard™ system water tank (optional)

1. Remove the plug (25) to reach the filler neck.
2. Fill the tank (24) with clean water. Do not fill the tank completely, leave a few centimetres from the edge.

## STARTING AND STOPPING THE MACHINE

### Starting the machine

1. Sit on the driver's seat (3) and adjust it with the lever (4) to allow easy reach of all controls.



#### NOTE

*The driver's seat (3) is equipped with a safety sensor, which allows the machine to be driven only when the operator is on the driver's seat.*

2. Insert the ignition key (61) and turn it clockwise to "II", then release it. Wait (a few seconds) for the display (69) to turn on and showing the working hours.



#### CAUTION!

**When starting do not press the drive pedal (5).**

**If the drive system warning light (78) flashes, turn off the machine and repeat the start-up procedure.**

3. Check that the green battery warning light (71) is on. If the yellow or red warning light (72 or 73) turns on, turn the ignition key to "0" and remove it. Charge the batteries (see the procedure in Maintenance chapter).
4. Disengage the parking brake.
5. Drive the machine to the working area, by keeping the hands on the steering wheel (1) and pressing the pedal (5). The drive speed can be adjusted from zero to maximum speed by increasing the pressure on the pedal.
6. The forward/reverse direction is selected with the relevant switch (68) on the dashboard. When the reverse gear is selected, the relevant buzzer turns on.
7. Lower the main broom with the lever (63).
8. Lower the side brooms with the lever (64).



#### NOTE

*When the brooms are lowered, the brooms, the vacuum system and the dust guard system (optional - if turned on with the switch (82)) automatically activates only when the machine is moving.*

9. Start sweeping by driving the machine with the hands on the steering wheel (1) and by pressing the drive pedal (5).



#### NOTE

*The brooms (14, 15 and 17) can be lowered and lifted even when the machine is moving.*

*The brooms do not turn when they are lifted or when the machine is stationary.*

*When the machine is stationary, the vacuum system and dust guard system (optional), turn off automatically.*



#### WARNING!

**When steering, avoid abrupt direction changes, pay careful attention and drive the machine at slow speed, especially when the hopper is full or when operating on inclines.**

**Drive the machine slowly on inclines. Use the brake pedal (6) to control machine speed while descending inclines.**

**Do not turn the machine on an incline; drive straight up or down.**

### Stopping the machine

1. To stop the machine, release the drive pedal (5).
2. To stop the machine quickly, also press the service brake pedal (6).



#### WARNING!

**Frequent and extended use of the service brake (6), especially on slopes, can cause a rapid wear of the pads.**

**Keep the braking system in maximum efficiency (see paragraphs Brake Cable Adjustment and Scheduled Maintenance Table in Maintenance chapter).**

3. In case of emergency, press the emergency push-button (79) to immediately stop the machine. To deactivate the emergency push-button (79), turn it clockwise.
4. Turn the ignition key (61) to "0" and remove it.

## DISPLAY

The display (69) shows the machine working hours; the time counted is the one during which the main broom is moving.



### NOTE

*When the working hour count exceeds 999, hours are then displayed in thousands with two decimal digits (for example 1.23 = 1,230 hours).*

By pressing the push-button (70) it is possible to shortly display the battery voltage in Volts, with one decimal digit.

## PARKING BRAKE

1. Engage the parking brake by pressing the pedal (6) and engaging the lever (7).
2. Disengage the parking brake by pressing and releasing the pedal (6).



### WARNING!

***Before performing any maintenance, repair, cleaning or replacement procedure engage the parking brake. Engage the parking brake when parking the machine on a slope.***



### WARNING!

***Before leaving the machine unattended, be sure that the parking brake can stop the machine with a large safety margin.***

## MACHINE OPERATION

1. Drive the machine to the work area as shown in the previous paragraph.
2. Lower the main broom with the lever (63), and the side brooms with the lever (64).
3. If equipped, turn on the dust guard system with the switch (82).
4. Drive the machine straight forward at a quick walking speed. Drive the machine slower when sweeping large amounts of dust or debris or when safe operation dictates slower speeds. Overlap passes 10 cm.
5. To collect light and bulky waste materials, lift the front skirt by pressing the pedal (8); take into consideration that the machine vacuum capability is reduced when the front skirt is lifted.



### WARNING!

***When operating on wet floors, it is essential to turn off the vacuum system by pressing the switch (65) to prevent the dust filter from being damaged.***

6. For machine proper operation, the dust filter must be as clean as possible. For cleaning it while sweeping, turn on the filter shaker by pressing the lower side of the switch (65). While working, repeat the procedure every 10 minutes on average (depending on the dustiness of the area to be cleaned).



### NOTE

*This procedure can also be performed when the machine is moving.*



### CAUTION!

***When the dust filter is clogged and/or the hopper is full, the machine cannot collect dust and debris any more.***

7. The hopper (11) should be dumped after each working period and whenever it is full (see the procedure in the next paragraph).



### CAUTION!

***If the main broom motor overload warning light (77) flashes repeatedly while sweeping, there may be debris that slows down the broom (for checking this, see the procedure in Main Broom Replacement paragraph, under Maintenance chapter), or the pressure on the ground may be excessive (see the procedure in Main Broom Height Check and Adjustment paragraph, under Maintenance chapter). If the overload persists, the brooms may stop. In this case, stop and restart the machine to restore the broom operation.***

## HOPPER DUMPING



### WARNING!

*The hopper (11) must be emptied on level grounds only. Do not lift the hopper when the machine is on a slope.*



### WARNING!

*When lifting and dumping the hopper (11), make sure that there are no people around the machine, especially near the hopper.*



### NOTE

*When the hopper (11) is lifted, the vacuum system turns off automatically and the machine maximum speed is reduced for safety reasons.*

To empty the hopper, move the machine close to the dustbin and proceed as follows.

1. Lift the side and main brooms.
2. Press the enabling switch (66) while pressing the hopper lifting switch (81) to lift the hopper (A, Fig. 1) up to the desired position.
3. Drive the machine to the disposal area and engage the parking brake.
4. Dump the hopper (B) with the lever (C) to discharge all dust and debris collected (D).



### NOTE

*If necessary, manually engage the hopper in position (A) with the returning handle (E) when the hoisting system is lifted and the hopper is disengaged (B).*



### CAUTION!

*The hopper (A) can be dumped only when lifted at a minimum height of 35 cm approximately. The maximum dumping height is approx. 150 cm.*

5. Lower the hopper by pressing both the enabling switch (66) and the switch (81).



### NOTE

*To ensure that the hopper (11) is fully retracted, check that the warning light (76) is off.*

6. The machine is ready to start sweeping again.

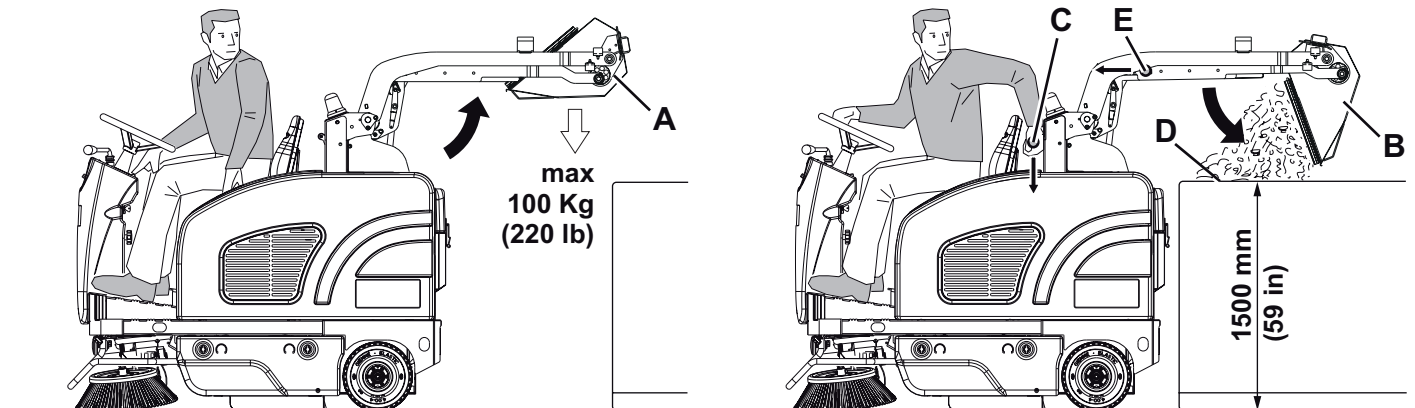


Figure 1

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## AFTER USING THE MACHINE

After working, before leaving the machine, perform the following procedures.

- Turn on the filter shaker shortly, by pressing the lower part of the switch (65).
- Empty the hopper (11) (see the procedure in the previous paragraph).
- Lift the main broom with the lever (63).
- Lift the side brooms with the lever (64).
- Turn off the machine by turning the ignition key (61) to “0”, then remove it.
- Engage the parking brake.
- If necessary, charge the batteries (see the procedure in Maintenance chapter).

## MACHINE LONG INACTIVITY

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

- Perform the procedures shown in After Machine Use paragraph.
- Check that the machine storage area is dry and clean.
- Disconnect the battery connector (45).
- (For machines equipped with dust guard system). Empty the tank (24) and clean the water filter (see the procedure in Maintenance chapter).

## 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.

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.



### **WARNING!**

***To perform maintenance procedures, the machine must be off, the ignition key removed, and, if necessary, the batteries must be disconnected.***

***Read carefully the instructions in the Safety chapter before performing any maintenance procedure.***

**SCHEDULED MAINTENANCE TABLE**

Procedure	Upon delivery	Every 10 hours	Every 50 hours	Every 100 hours	Every 200 hours	Every year
Battery charging	(1)					
Battery (WET) fluid level check		(2)				
Side and main broom height check						
Brake cable check and adjustment			(3)			
Hopper dust filter check and cleaning ("A" method)			(4)			
Hopper hydraulic lifting system oil level check			(2)			
Skirt height and operation check						
Dust guard system water filter check and cleaning (optional)						
Hopper dust filter check and cleaning ("B" method)				(4)		
Filter shaker operation check				(*)		
Main broom driving belt check				(*)		
Steering chain cleaning				(*)		
Safety system operation check				(2)		
Brake pad check/adjustment/replacement				(*)(3)		
Hopper dust filter check and cleaning ("C" method)					(4)	
Main broom driving belt check and/or replacement					(*)	
Hopper gasket integrity check					(*)	
Lifted hopper sensor operation check/adjustment					(*)	
Motor carbon brush check and/or replacement						(*)
Hydraulic system oil change						(*)(5)

(\*) For the relevant procedure, refer to the Service Manual.

- (1) Daily or after using the machine.  
(2) Or before start-up.  
(3) Or more frequently if the machine is used on slopes.  
(4) Or more often in dusty areas.  
(5) Change the hydraulic system oil after 500 hours or every year.

## BATTERY INSTALLATION/REMOVAL AND BATTERY TYPE SETTING (WET OR GEL-AGM)



### WARNING!

*Do not tilt the lead batteries (WET) to prevent the highly corrosive acid from leaking out of the batteries. Do not connect, not even accidentally, the battery positive and negative terminals by using tools, keys, etc. This could cause dangerous short-circuits.*

### Battery Installation

For approved battery types, see the Technical Data paragraph. According to the battery dimensions, check if it is possible to place them inside the relevant plastic container, supplied with the machine.

If the batteries are larger than the container, use the square guides, supplied with the machine, to ensure the stability inside the battery compartment.



### WARNING!

*Non-sealed WET batteries always need an appropriate container to prevent the acid from leaking.*

*Do not install the WET batteries without an appropriate container.*

1. Engage the parking brake.
2. Check that the ignition key (61) has been removed.
3. Open the battery compartment hood (18) with the handle (41) and fasten it with the support rod (52).
4. Disconnect the battery connector (45).
5. With the help of an assistant and an appropriate hoisting system, install the batteries (42).
6. Connect the batteries according to one of the diagrams shown in figure 2, on the basis of their type.
7. Connect the battery connector (45).
8. Set the battery type (WET or GEL-AGM), according to the following procedure.

### Battery Setting (WET or GEL-AGM)

1. Start the machine by turning the ignition key (61) to "I" and keeping the switch (A, Fig 3) pressed.
2. Hold it (5" approx., but release it within 10") until the warning light corresponding to the current setting flashes:
  - Red warning light (B): WET batteries
  - Green warning light (C): GEL-AGM batteries
3. If necessary, release and press again the switch (A) within 5 seconds to change setting.
4. Wait until the warning light corresponding to the new setting stops flashing (5 seconds approx.).
5. The new setting is properly stored.

### Battery Removal

1. Engage the parking brake.
2. Remove the ignition key (61).
3. Open the battery compartment hood (18) with the handle (41) and fasten it with the support rod (52).
4. Disconnect the battery connector (45).
5. Disconnect the battery wiring harness (42).
6. Remove any square guide or bracket fastening the batteries.
7. Check that WET battery caps (43) are closed, to prevent the highly corrosive acid from leaking out of the batteries.
8. With the help of an assistant and an appropriate hoisting system, remove the batteries (42).

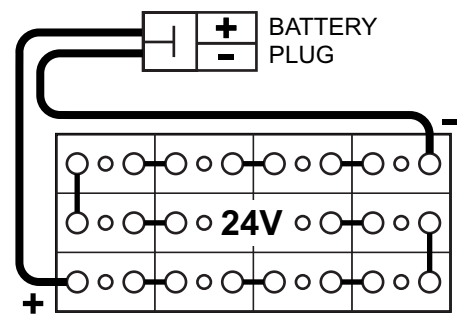
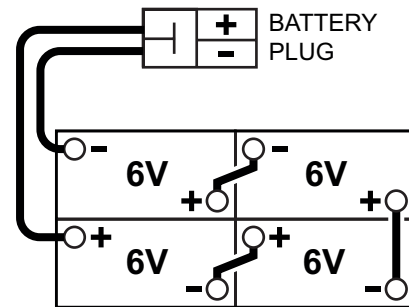


Figure 2

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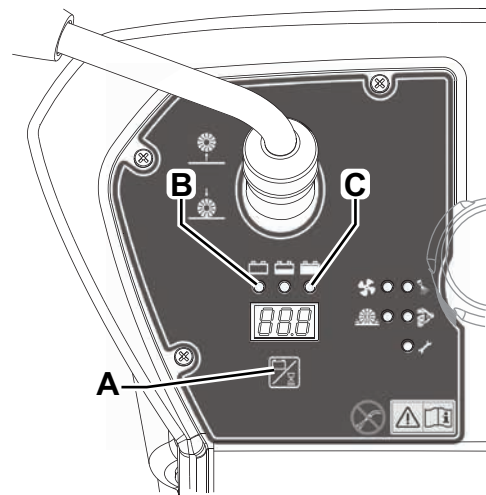


Figure 3

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## BATTERY CHARGING



### CAUTION!

*Charge the batteries when the yellow (73) or red warning light (74) turns on and at the end of each working cycle. Keeping the batteries charged make their life last longer.*



### WARNING!

*When the batteries are discharged, charge them as soon as possible, as that condition makes their life shorter.*



### WARNING!

*If the machine is equipped with lead (WET) batteries, 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.*

*While charging the batteries always keep the hood open.*



### WARNING!

*Pay careful attention when charging lead batteries (WET) 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.*

1. Drive the machine on a level ground and engage the parking brake.
2. Turn the ignition key (61) to "0".
3. Open the battery compartment hood (18) with the handle (41) and fasten it with the support rod (52).
4. (For WET batteries only). Check the level of electrolyte inside the batteries (42). If necessary, top up through the caps (43). Leave the caps (43) open for the next battery charge. If necessary, clean the upper surface of the batteries.
5. Charge the batteries according to one of the following methods, depending on the presence of the electronic battery charger (32) (optional).

### Charging the batteries with an external battery charger

1. Check that the battery charger is suitable by referring to the Battery Charger Manual.  
The battery charger voltage rating is 24 V.



### CAUTION!

*Use a battery charger suitable for the type of batteries installed.*

2. Disconnect the battery connector (45) and connect it to the external battery charger.
3. Connect the battery charger to the electrical mains.
4. After charging, disconnect the battery connector (45) from the battery charger.
5. (For WET batteries only). Check the level of electrolyte inside the batteries and close all the caps (43).
6. Reconnect the battery connector (45) to the machine connector.
7. Remove the support rod (52) and close the hood (18). Now the machine is ready to be used.

### Charging the batteries with on-board battery charger (optional for SW4000, standard for FLOORTEC R 870)



### NOTE

*Turn the battery charger switch on WET or GEL-AGM according to the battery type.*

1. (For WET batteries only). Check the level of electrolyte inside the batteries. If necessary, top up through the caps (43).  
Then leave all the caps (43) open for battery charging.  
When the correct level is reached, clean, if necessary, the upper surface of the batteries.
2. Connect the battery charger plug (32) to the electrical mains.



### WARNING!

*Check that the voltage and frequency shown on the machine serial number plate (30) match the electrical mains values.*



### NOTE

*When the battery charger is connected to the electrical mains, all machine functions are automatically cut off.*

3. When the battery charger green warning light (32) turns on, the batteries are charged.
4. For further information about the battery charger operation (32), see the Battery Charger Manual.
5. Disconnect the battery charger cable (32) from the electrical mains.
6. (For WET batteries only). Close all caps (43).
7. Remove the support rod (52) and close the hood (18). Now the machine is ready to be used.

**BRAKE CABLE CHECK AND ADJUSTMENT****WARNING!**

*Frequent and extended use of the service brake (6), especially on slopes, can cause a rapid wear of the pads. Keep the braking system in maximum efficiency.*

If the stroke of the brake pedal exceeds 1/3 of the total stroke (A, Fig. 4) before starting to operate on the braking masses, adjust the brake cable as shown:

1. Drive the machine on a level ground.
2. Turn the ignition key (61) to "0".
3. Ensure that the machine cannot move by placing opposite wedges on the rear wheels.
4. Steer the front wheel to the right, about 90°, so that the brake system becomes accessible.
5. Check braking masses (B, Fig. 5) for wear. The thickness (C) of the pads must be 1 mm or more. If necessary, contact a Service Center for braking masses adjustment/replacement.
6. Loosen the locknut and the nut (D) to adjust the brake cable.
7. Turn the nut until the gap between brake disc and braking masses is 0.5 mm.
8. Tighten the locknut on the nut (D).
9. Remove the wedges from the rear wheels.

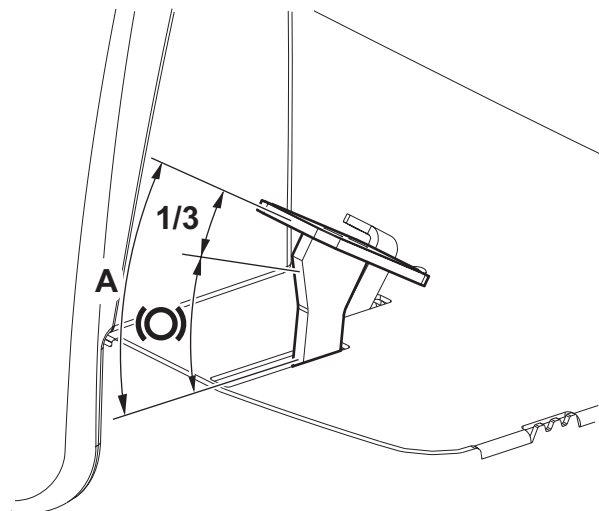
Check the proper adjustment of the brake cable by pushing the machine manually (do not apply the brake).

Perform brake tests and check the proper operation of the service and parking brake.

If the brake cable adjustment is no longer possible and the braking system cannot be properly adjusted, contact a Service Center.

**CAUTION!**

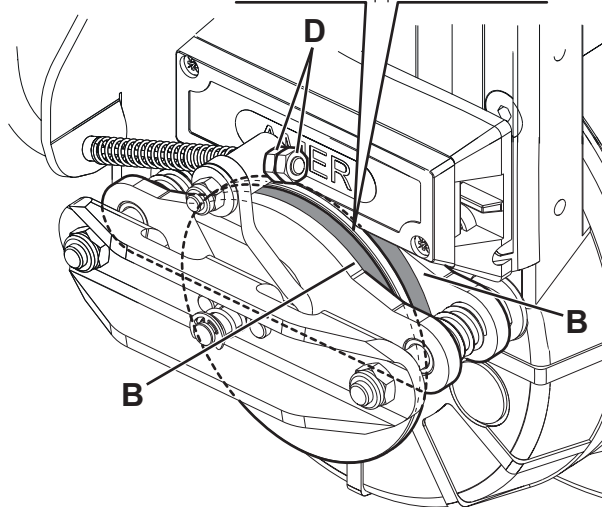
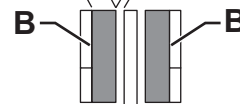
*The service manual shows all braking system check/adjustment and replacement procedures.*



P100769

**Figure 4**

C → 0,5 mm  
0,02 in



P1007670

**Figure 5**

## MAIN BROOM HEIGHT CHECK AND ADJUSTMENT



### NOTE

Brooms with harder or softer bristles are available. This procedure is applicable to all types of brooms.

1. Check the main broom height as shown below:
  - Drive the machine on a level ground.
  - Engage the parking brake.
  - Lower the main broom and turn it pressing the accelerator pedal for approx. one minute. Do not operate the broom continuously in order not to overheat the drive motor braked.
  - Stop and lift the main broom, then move the machine and switch it off.
  - Check that the main broom print (A, Fig. 6), along its length, is 2 to 4 cm wide.

If the print (A) is not within specifications, adjust the main broom height according to the following procedure.

2. Turn the knob (B, Fig. 7) as shown below:
  - To increase the print width, turn the knob counter-clockwise
  - To decrease the print width, lift the broom with the lever (63) and then turn the knob clockwise



### NOTE

The knob can be used both to adjust the print and to adjust the broom according to the bristle wear.

3. Perform step 1 again to check that the main broom is at the correct distance from the ground.
4. When the broom is too worn to be adjusted, replace it as shown in the next paragraph.



### NOTE

If it is not possible to adjust the print (A, Fig. 6) properly, because the pressure on the floor at the ends of the broom is different, refer to the Service Manual.

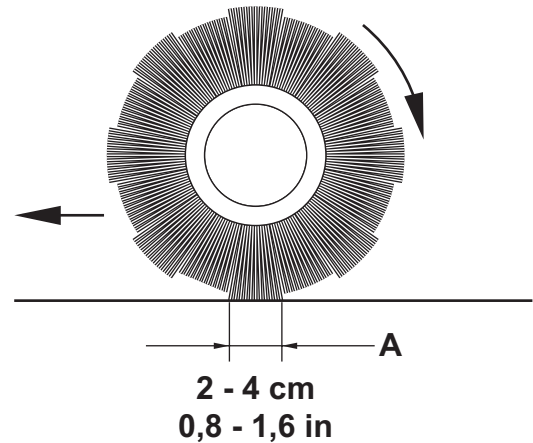


Figure 6

P100593

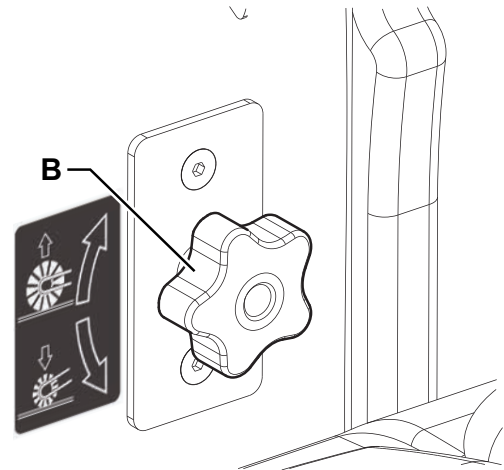


Figure 7

P100594

## MAIN BROOM REPLACEMENT



### WARNING!

*It is advisable to wear protective gloves when replacing the main broom because there can be sharp debris between the bristles.*

1. Drive the machine on a level ground and engage the parking brake.
2. Turn the ignition key (61) to "0" and remove it.
3. Remove the left door (13) by turning the fasteners.
4. Unscrew and remove the knob (A, Fig. 8).
5. Turn the levers (B).
6. Remove the broom compartment latch (C) by grabbing it from its fold (D).
7. Remove the main broom (E, Fig. 9).
8. Check that the drive hub (F) is free from dirt or foreign materials (cords, rags, etc.) accidentally rolled up.
9. The new main broom must be installed with the bristles rows bent as shown in the figure (G).
10. Install the new broom and ensure that the hexagonal mesh (H) fits into the relevant drive hub (F).
11. Install the broom compartment latch (C, Fig. 8) by turning the levers (B) and screwing down the knob (A).
12. Close the left door (13) by turning the fasteners.
13. Check and adjust the main broom height as shown in the previous paragraph.

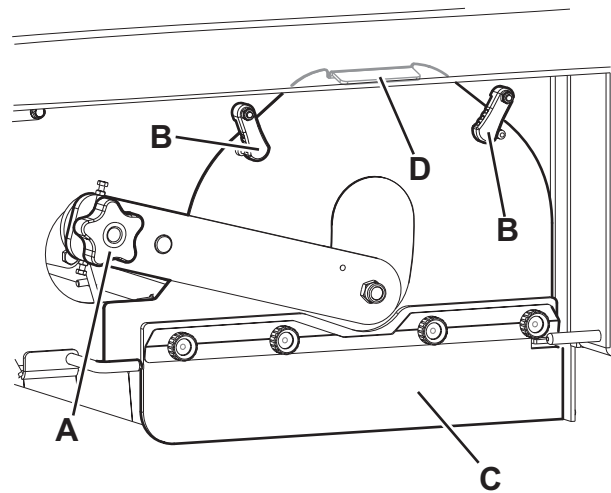


Figure 8

P100595

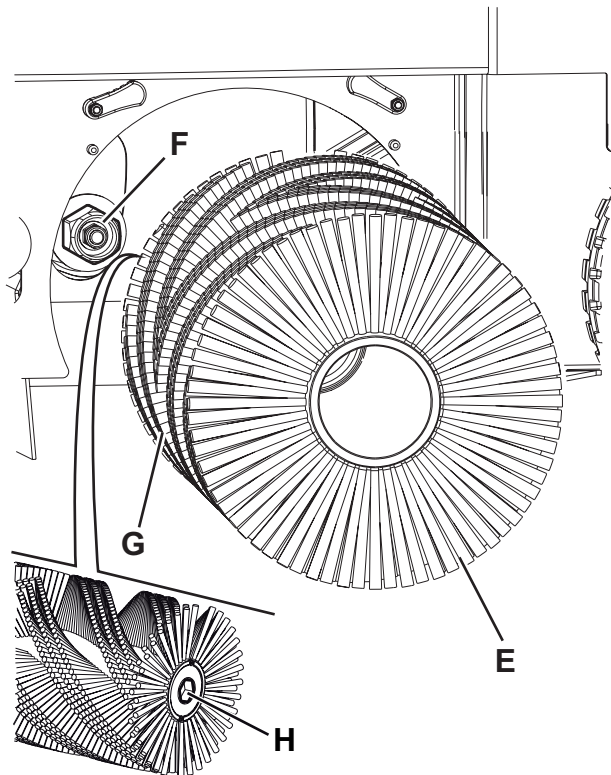


Figure 9

P100596

## SIDE BROOM HEIGHT CHECK AND ADJUSTMENT



### NOTE

Brooms with harder or softer bristles are available. This procedure is applicable to all types of brooms.

1. Check the side broom distance from the ground, according to the following procedure:
  - Drive the machine on a level ground.
  - Keep the machine stationary, lower the side brooms and turn them on for a few seconds.
  - Stop and lift the side brooms, then move the machine.
  - Check that the side broom prints are as shown in the figure (A and B, Fig. 10).

If the print is not within specifications, adjust the side broom height according to the following procedure.

2. Engage the parking brake.
3. Turn the ignition key (61) to "0".
4. Remove the right or left door (12 or 13) by turning the fasteners.



### NOTE

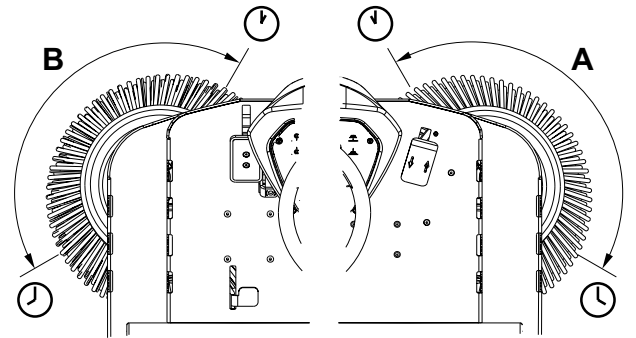
The right door fasteners must be turned with a tool.

5. For the right side broom, operate on the idle gear by loosening the ring nut (C, Fig. 11) and by adjusting the adjuster (D) until the correct print (A, Fig. 10) is achieved. Then fasten the adjuster with the ring nut (C, Fig. 11). For the left side broom, operate on the idle gear by loosening the ring nut (E) and by adjusting the adjuster (F) until the correct print (B, Fig. 10) is achieved. Then fasten the adjuster with the ring nut (E, Fig. 11).
6. Perform step 1 again to check the proper adjustment of the side broom height.
7. When the broom is too worn to be adjusted, replace it as shown in the next paragraph.



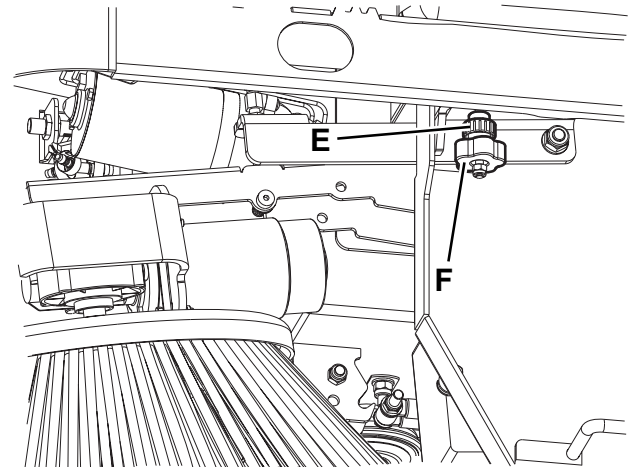
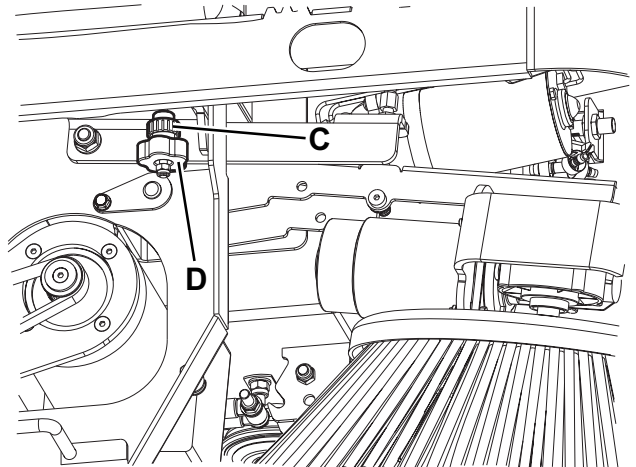
### NOTE

If necessary, the side broom tilting can be adjusted too (see the procedure in the Service Manual).



P100597

Figure 10



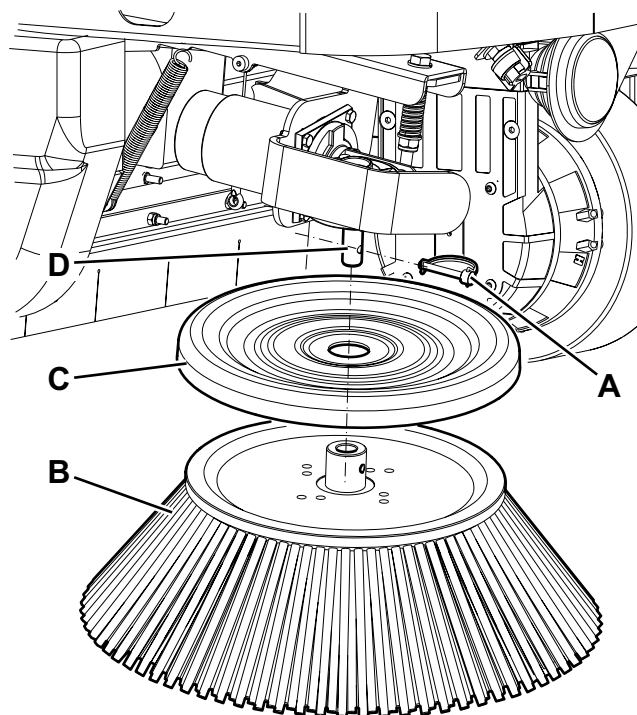
P100598

Figure 11

**SIDE BROOM REPLACEMENT****WARNING!**

*It is advisable to wear protective gloves when replacing the side broom because there can be sharp debris between the bristles.*

1. Drive the machine on a level ground and engage the parking brake.
2. Turn the ignition key (61) to "0".
3. Lift the side broom with the lever (64).
4. Remove the pin clip (A, Fig. 12), then remove the pin.
5. Remove the broom (B) and recover the protection flange (C).
6. Install on the hub (D) the new side broom with the protection flange.
7. Insert the fastening pin and engage its safety clip.
8. Check and adjust the side broom height as shown in the previous paragraph.

**Figure 12**

P100599

## PANEL DUST FILTER CLEANING AND INTEGRITY CHECK

The dust filter must be regularly cleaned to maintain the efficiency of the vacuum system. Follow the recommended filter service intervals for the longest filter life.



### WARNING!

- **Wear safety glasses when cleaning the filter.**
- **Do not puncture the filter.**
- **Clean the filter in a well-ventilated area.**
- **Wear appropriate dust mask to avoid breathing in dust.**

1. Drive the machine on a level ground, engage the parking brake and turn the ignition key (61) to "0".
2. Open the battery compartment hood (18) with the handle (41) and fasten it with the support rod (52), then disconnect the battery connector (45).
3. Disconnect the vacuum system motor connector (53).
4. Release the fasteners (A, Fig. 13) and remove the vacuum system cover (B).
5. Unscrew the knobs (C, Fig. 14) and remove the filter shaker assembly (D).
6. Fasten the filter shaker assembly to the holder (E).
7. Lift the dust filter (F) and remove it from the machine.
8. Clean the filter using one of the methods below:

### Method "A"

Collect dust from the filter. Gently tap the filter against a flat surface (with the dirty side down) to remove dust and dirt.



### NOTE

*Take care not to damage the metal lip which extends past the gasket.*

### Method "B"

Collect dust from the filter. Blow compressed air (maximum pressure 6 Bar) into the clean side of the filter (in the opposite direction of the airflow).

### Method "C"



### CAUTION!

**For the paper filter (standard for FLOORTEC R 870): do not use water or detergents to clean it; the filter could be damaged.**

Collect dust from the filter. Then soak the filter in warm water for 15 minutes, then rinse it under a gentle stream of water (maximum pressure 2.5 Bar). Let the filter dry completely before installing it back into the machine.

For a better cleaning, it is allowed to wash the filter with water and non-lathering detergents.

This provides better quality cleaning but reduces the life of the filter, which will have to be replaced more frequently. The use of inadequate detergents can damage the filter.

9. Install the filter in the reverse order of removal and note the following:
  - Clean the filter housing.
  - Install the filter with the strainer facing upwards (arrow (G, Fig. 14) upwards).
  - If the filter gasket is damaged or missing, it must be replaced.

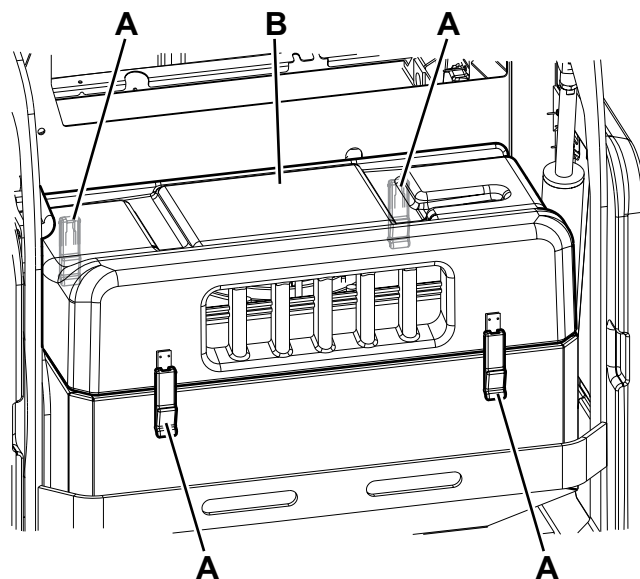


Figure 13

P100600

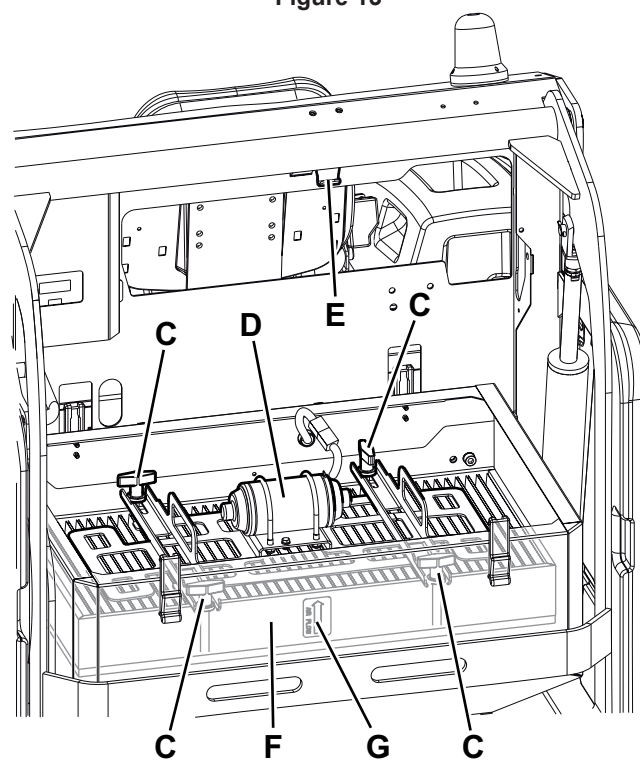


Figure 14

P100601

## SKIRT HEIGHT AND OPERATION CHECK

### Preliminary Operations

1. Empty the hopper (as shown in Use chapter), because the weight of the waste inside the hopper can affect the skirt height check.
2. Drive the machine on a level ground that is suitable for checking the skirt height.
3. Turn the ignition key (61) to "0" and engage the parking brake.

### Side Skirt Check

4. Remove the left and right doors (13 and 12) by turning the fasteners.
5. Check the side skirts (A, Fig. 15) for integrity. Replace the skirts when they have cuts (C, Fig. 16) larger than 20 mm or cracks/tears (D) larger than 10 mm (for skirt replacement, refer to the Service Manual).
6. Check that the distance from the floor of the side skirts (A, Fig. 15) is within 0 - 3 mm (Fig. 17). If necessary, loosen the knobs (B, Fig. 15) and adjust the skirt position. Then tighten the knobs (B).

### Front and Rear Skirt Check

7. Remove the main broom as shown in the relevant paragraph.
8. Check the front skirt (E, Fig. 18) and rear skirts (F) and (G) for integrity. Replace the skirts when they have cuts (C, Fig. 16) larger than 20 mm or cracks/tears (D) larger than 10 mm.
9. Check that the front (E, Fig. 18) and rear skirt (G) slightly rub ground without being detached from it (Fig. 19).
10. For the skirt replacement, see the Service Manual.

### Reassembly

11. Assemble the components in the reverse order of disassembly.

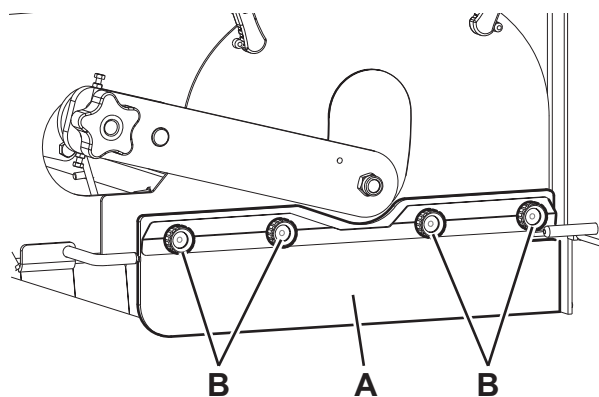


Figure 15

P100602

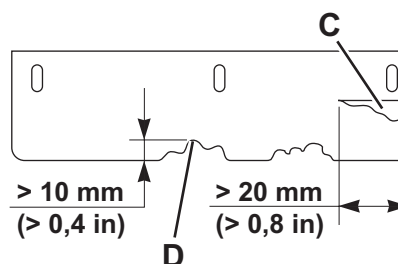


Figure 16

P100603

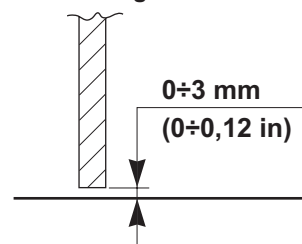


Figure 17

P100604

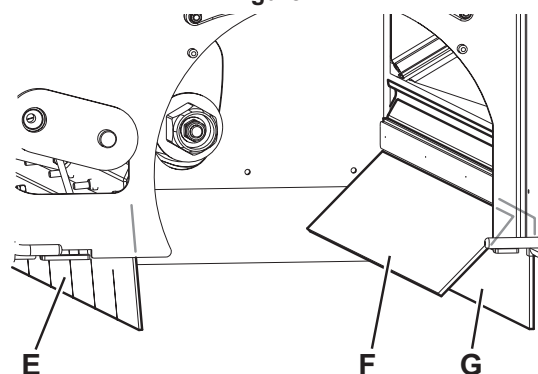


Figure 18

P100605

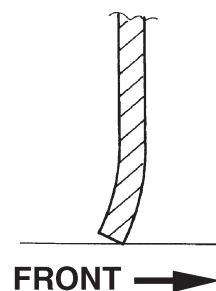


Figure 19

P100606

## DUSTGUARD™ SYSTEM WATER FILTER CLEANING (OPTIONAL)



### NOTE

To prevent water from flowing out when cleaning the filter, turn on the dust guard system and empty the system tank (24).

1. Drive the machine on a level ground.
2. Turn the ignition key (61) to "0" and engage the parking brake.
3. From under the machine (A, Fig. 20), reach the water filter assembly (B) of the dust guard system.
4. Unscrew and remove the transparent cover (C) with the gasket (D), then remove the filter strainer (E).
5. Clean and install them on the holder (F).



### NOTE

Install the gasket (D) and the filter strainer (E) in the housings of the cover and of the filter assembly holder.

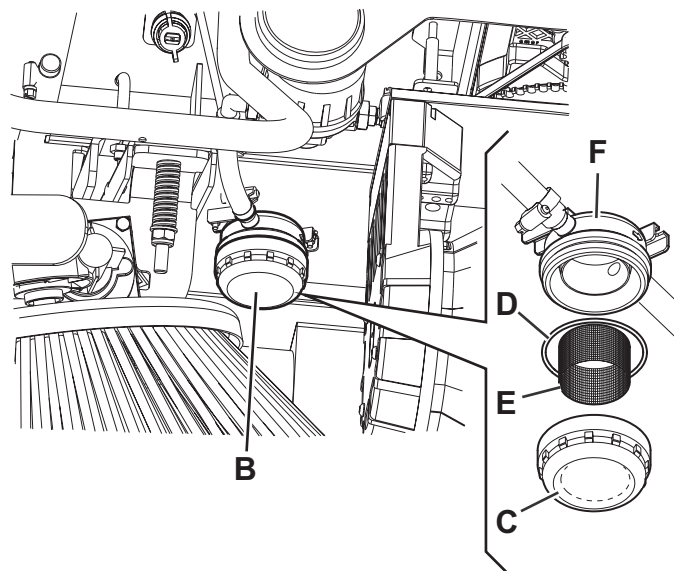
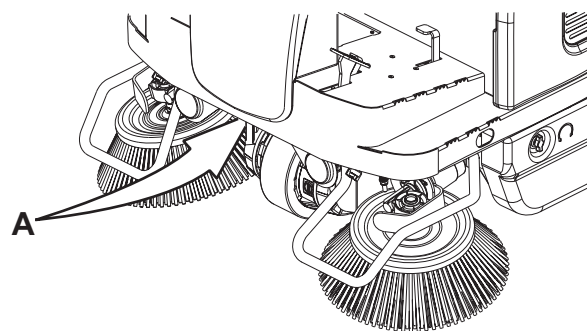


Figure 20

P100651

## HOPPER HYDRAULIC LIFTING SYSTEM OIL LEVEL CHECK



### WARNING!

Procedure to be performed with the hopper (11) fully retracted.

1. Turn the ignition key (61) to "0" and engage the parking brake.
2. Open the battery compartment hood (18) with the handle (41) and fasten it with the support rod (52).
3. Check that the oil level in the tank (51) is between the minimum (MIN) and maximum (MAX) marks shown in figure 21.
4. If necessary, add oil through the plug (A, Fig. 21), using the oil specified in Technical Data paragraph.
5. Remove the support rod (52) and close the hood (18).

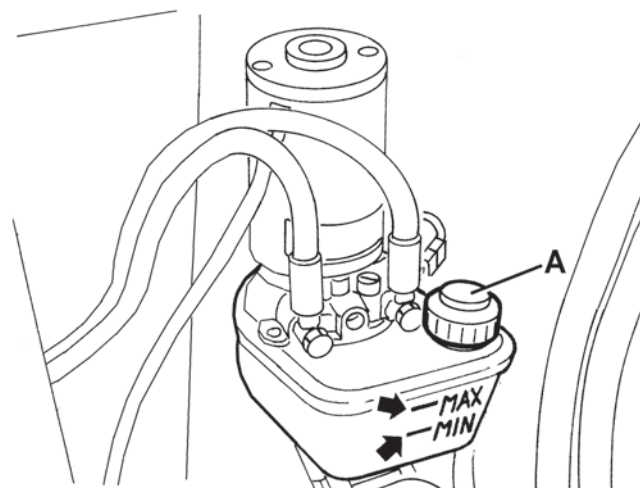


Figure 21

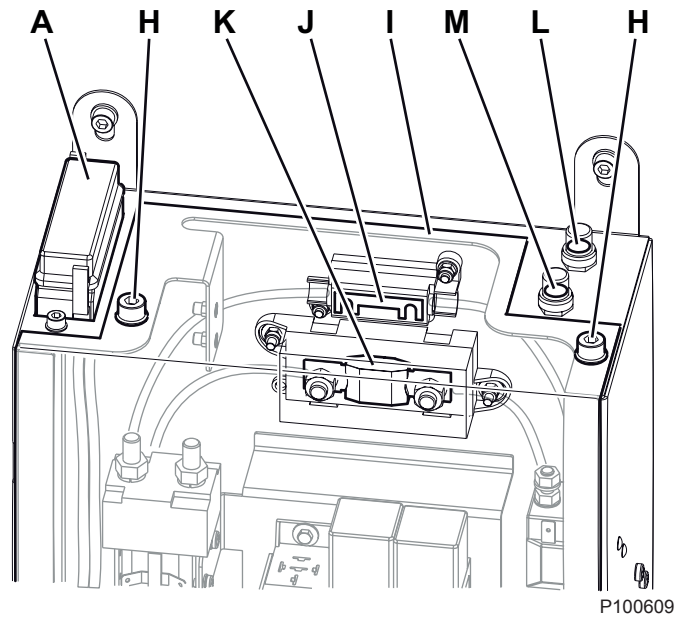
P100607

## FUSE CHECK/REPLACEMENT/RESET

1. Drive the machine on a level ground and engage the parking brake.
2. Turn the ignition key (61) to "0".
3. Open the battery compartment hood (18) with the handle (41) and fasten it with the support rod (52).
4. Disconnect the battery connector (45).

### Lamellar Fuse Check/Replacement

5. Remove the fuse box cover (A, Fig. 22).
6. Check/replace the relevant fuse among the following (Fig. 23):
  - (B): F1 vacuum system motor fuse (25 A).
  - (C): F2 filter shaker motor fuse (25 A).
  - (D): F3 display electronic board fuse (3 A).
  - (E): F4 main fuse (key circuit) (10 A).
  - (F): F5 dust guard system fuse (5 A) (optional).
  - (G): F6 hopper lifting fuse (25 A).
7. Remove the screws (H, Fig. 20), then remove the cover (I) of the electrical component box (49).
8. Check/replace the following fuses:
  - (J): FA main broom motor fuse (50 A).
  - (K): F0 main fuse (150 A).



P100609

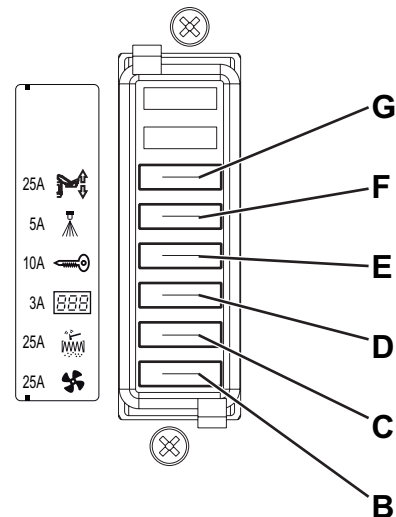
Figure 22

### Fuse Check

9. Check one of the following fuses (Fig. 22) for deactivation:
  - (L): FR1 right side broom motor fuse (15 A).
  - (M): FR2 left side broom motor fuse (15 A) (optional).
 Reset any deactivated fuse, when the component that caused deactivation has fully cooled down.

### Reassembly

10. Connect the battery connector (45).
11. Remove the support rod (52) and close the hood (18).



P100610B

Figure 23

## SAFETY FUNCTIONS

The machine is equipped with the following safety functions.

### EMERGENCY PUSH-BUTTON

It is to the left side of the operator (79). It has to be pressed in case of emergency, to stop all the machine functions.

### DRIVER'S SEAT MICROSWITCH

It is located inside the driver's seat (3) and it does not allow the machine drive system to operate if the operator is not seated on the driver's seat.

### HOPPER POSITION SENSOR

When the hopper is lifted, the sensor reduces the machine speed, turns off the vacuum fan and stops the broom rotation.

### HOPPER SAFETY VALVE

When the hopper is lifted, the safety valve on the hydraulic lifting cylinder prevents the hopper to accidentally lower.

## TROUBLESHOOTING

Trouble	Possible cause	Remedy
The machine operates only when stationary, otherwise it turns off and the red warning light (73) flashes.	The batteries are discharged.	Charge the batteries. If the trouble persists, replace the batteries.
The battery autonomy is low.	The batteries are no more efficient.	Replace the batteries. If necessary, install batteries with higher capacity (see Technical Data paragraph).
When turning the ignition key (61) to "II", the display does not turn on and the machine does not operate.	The battery connector is disconnected.	Connect the battery connector.
	The F3 and/or F0 fuse is open.	Check/replace the fuses.
	The emergency push-button has been pressed.	Check and release the emergency push-button.
The machine does not move when pressing the drive pedal and the warning light (78) flashes.	The drive pedal has been pressed while turning the ignition key (61) to "II".	Turn the ignition key to "0", then restart without pressing the drive pedal.
	Drive system failure.	Turn off the machine and then turn it on again. If the trouble persists, contact the Service Center.
The main broom does not work and the warning light (77) flashes.	The safety system has activated.	Turn off the machine and then turn it on again. Check the condition of the main broom (debris that slows down the broom or excessive pressure on the ground).
	The FA fuse is open.	Wait for the main broom motor to cool down, then replace the fuse.
The side brooms do not operate.	The FR1 or FR2 circuit breaker of the side brooms is open.	Wait for the side broom motor to cool down, then reset the fuse by pressing the relevant push-button.
The machine collects little debris/dust.	The dust filter is clogged.	Clean the dust filter by using the filter shaker or by disassembling it.
	The hopper is full.	Empty the hopper.
	The skirts are not properly adjusted or are broken.	Adjust/replace the skirts.
	The brooms are not properly adjusted.	Adjust the broom height.
	The F1 fuse is open.	Replace the fuse.
The hopper does not lift.	The hydraulic system oil level is incorrect.	Check the hydraulic system oil level in the tank.
	The F6 fuse is open.	Replace the fuse.
The hopper does not dump.	The hopper is too low.	Lift the hopper at a minimum height of 350 mm.
The hopper does not lower.	In case of low temperatures, the hydraulic system oil is slow in flowing through the safety valve.	Wait a few moments to let the hydraulic system oil flow.
The filter shaker does not work.	The F2 fuse is open.	Replace the fuse.
	The filter shaker is disconnected.	Connect the filter shaker connector.
The dust guard system (optional) does not work.	The water tank is empty.	Fill the tank.
	The nozzles or the water filter are clogged.	Clean.
	The pump is faulty.	Replace. (*)
	The F5 fuse is open.	Replace the fuse.

(\*) Procedure to be performed by Nilfisk Service Center.

For further information contact a Nilfisk Service Center, where it is possible to consult the Service Manual.

## 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
- Polyester dust filter
- Main and side brooms
- Hydraulic system oil
- Hydraulic system oil filter
- Plastic hoses and components
- Electrical and electronic components (\*)

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