

SR 1101 B

Instructions for use

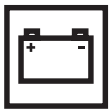
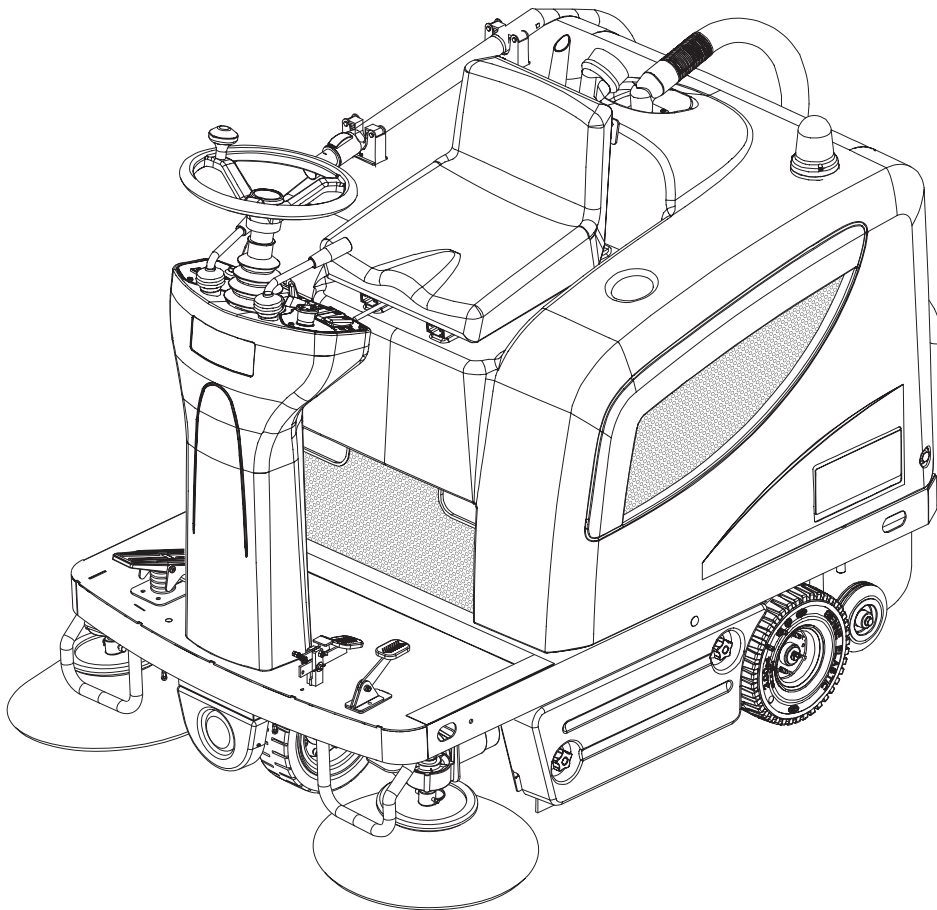
Bedienungshandbuch
Instructions d'utilisation
Instructions for use
Gebruiksaanwijzing



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Deutsch
Français
English
Nederlands



Model:
9084310010

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

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



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

SR 1101 B

Тип / Тур / Typ / Type / Tipo / Tyyppi / Type / Tuotyyppi / Type / Τύπος /
Típus / Vrsta / Tipo / Tipas / Tips / 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 serijny / Număr de serie / Серийный номер / Seriennummer / Výrobné číslo / Serijska številka / Seri Numarası :

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

BG Долуподписаният потвърждава, че гореспоменатият модел е произведен в съответствие със следните директиви и стандарти. Техническият файл е съставен от производителя.

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.

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.

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

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.

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

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.

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

RO Subsemnatul atest că modelul susmenționat este produs în conformitate cu următoarele directive și standarde. Fișierul tehnic este redactat de către producător.

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

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

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

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

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.

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

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

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

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

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.

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

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

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

N Undertegnede attesterer att ovennævnte modell är produceret i överensstemmelse med följande direktiv och standarder. Den tekniske filen er opprettet av produsenten.

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 / Produzenten / Fabrikant /
Fabricante / Producenta / Producător / Производителем /
Tillverkaren / Výrobca / Izdelovalec / Üretici :

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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 carry out operations reserved for qualified technicians. Nilfisk will not be responsible for damages coming from failure to follow these instructions.

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 (37).

The machine model 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

Other manuals supplied with the machine:

- Electronic Battery Charger Manual (if equipped), to be considered an integral part of this Manual
- Sweeper Spare Parts List

Other available manuals:

- Service Manual (that can be consulted at any Nilfisk Service Center)

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.

Call 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

This sweeper has been designed and built to be used by a qualified operator to sweep/clean smooth and solid floors, in civil and industrial environments, and to collect dust and light debris under safe operation conditions.

CONVENTIONS

Forward, backward, front, rear, left or right are intended with reference to the operator's position, while on the driver's seat (25).

UNPACKING/DELIVERY

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

Upon delivery 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 as follows:

- Technical documents:
 - Sweeper User Manual
 - Electronic Battery Charger Manual (if equipped)
 - Sweeper Spare Parts List
- No. 1 70 A fuse
- No. 1 external battery charger connector (if the machine is not equipped with on board battery charger)

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 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 that it is necessary to consult 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, remove the ignition key and engage the parking brake.***
- ***This machine must be used by properly trained operators only. Children or disabled people cannot use this machine.***
- ***Sharp turns must be made at slowest possible speed. Avoid abrupt turns on incline.***
- ***Do not wear jewels when working near electrical components.***
- ***Keep the battery away from sparks, flames and incandescent material. During the normal operation explosive gases are released.***
- ***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 on this machine, do not tilt the machine more than 30° from its horizontal position to prevent the highly corrosive acid to leak out of the batteries. When the machine is to be tilted to perform maintenance procedures, remove the batteries.***

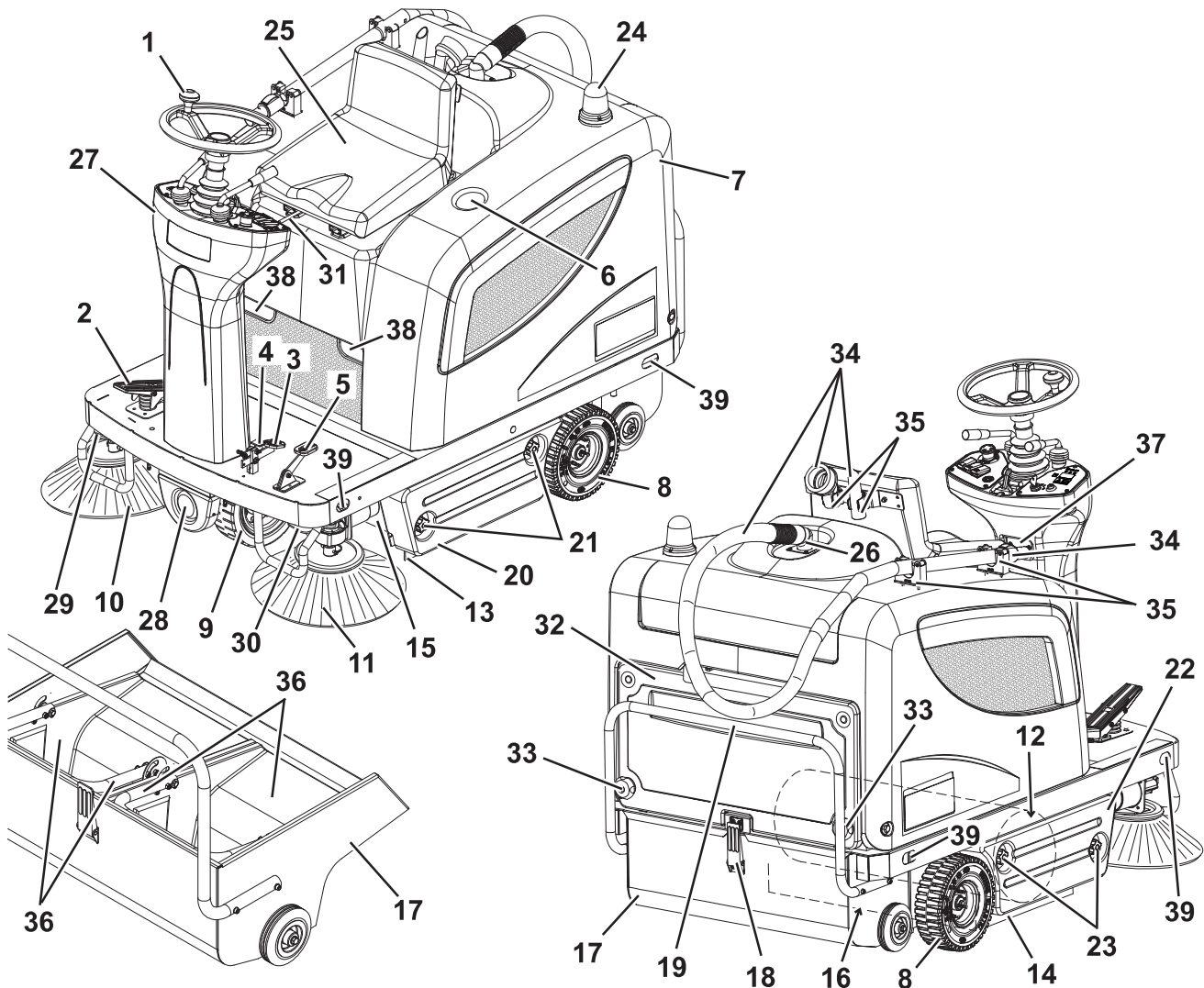
**WARNING!**

- Carefully read all the instructions before performing any maintenance/repair procedure.
- Take all necessary precautions to prevent hair, jewels and loose clothes from being caught by the machine moving parts.
- For machines with electronic battery charger (optional):
 - Before using the battery charger, ensure that frequency and voltage values, shown 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 charge the batteries if the battery charger cable or the plug are damaged. If the battery charger cable is damaged, contact Nilfisk 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.
- 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.
- Use only brooms supplied with the machine and those specified in the User Manual. Using other brooms could reduce safety.
- Before using the machine, close all doors and/or covers.
- Do not use the machine in particularly dusty areas.
- Use the machine only where a proper lighting is provided.
- If the machine is to be used where there are other people besides the operator, it is necessary to install the pivoting light (optional).
- Do not wash the machine with direct or pressurised water jets, or with corrosive substances. Do not use compressed air to clean this type of machine, except for the filters (see the relevant paragraph).
- While using this machine, take care not to cause damage to people and children especially.
- Do not put any can containing fluids on the machine.
- The machine storage temperature must be 0°C to +40°C.
- The machine working temperature must be 0°C to +40°C.
- The humidity must be between 30% and 95%.
- Always protect the machine against the sun, rain and bad weather, both under operation and inactivity condition. Store the machine indoors, in a dry place. This machine must be used in dry conditions, it must not be used or kept outdoors in wet conditions.
- Do not use the machine as a means of transport, or for pushing/towing.
- Do not allow the brooms 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 bump into shelves or scaffoldings, particularly where there is a risk of falling objects.
- 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 remove or modify the plates affixed to the machine.
- 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.
- In case of part replacement, order ORIGINAL spare parts from an authorised Dealer or Retailer.
- To ensure the proper and safe operation of the machine, have the scheduled maintenance, detailed in the relevant chapter of this Manual, performed by the authorised personnel or an authorised Service Center.
- The machine must be disposed of properly, because of the presence of toxic-harmful materials (batteries, oil, plastics, etc.), which are subject to standards that require disposal in special centres (see Scrapping chapter).

MACHINE DESCRIPTION

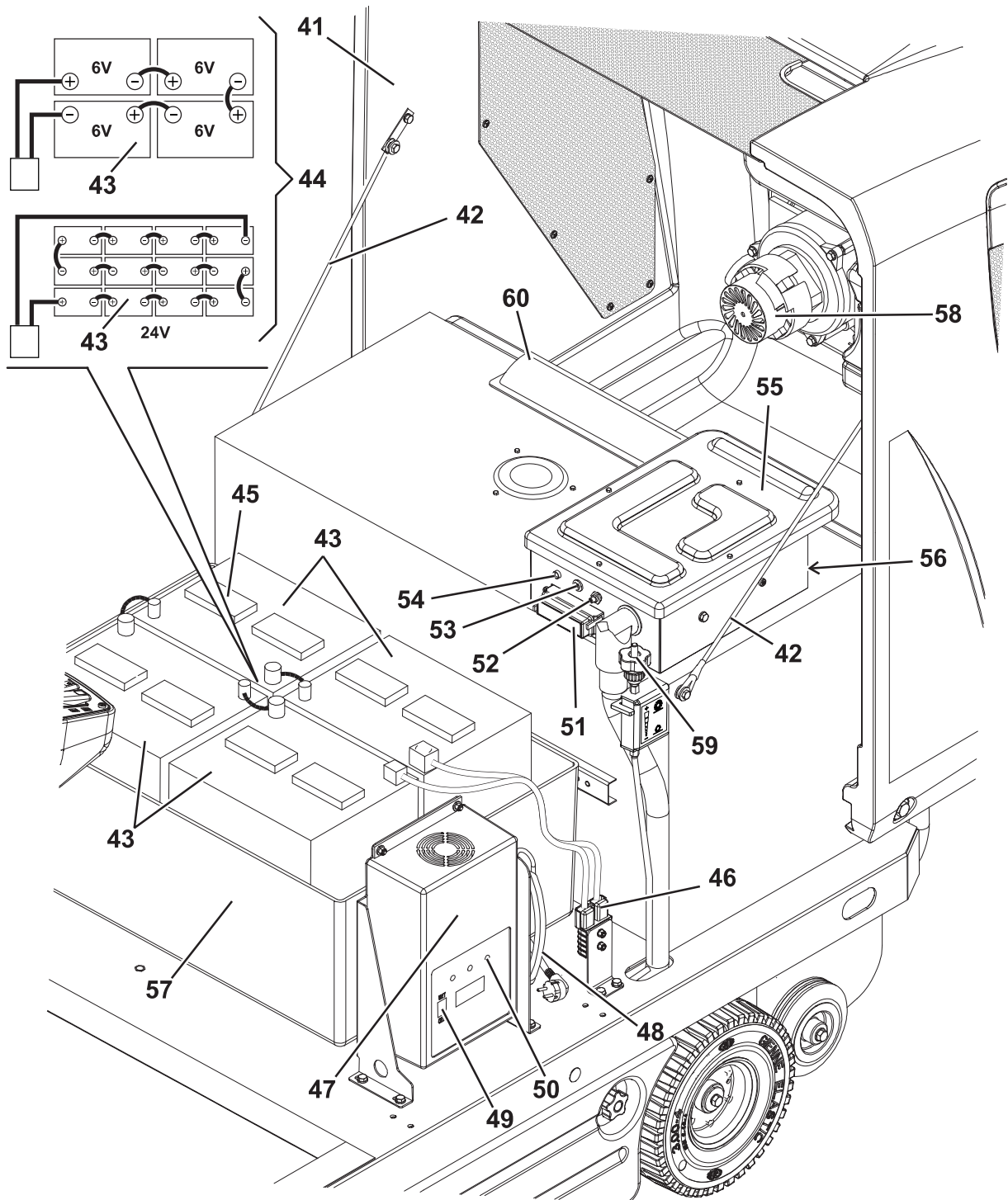
MACHINE NOMENCLATURE

1. Steering wheel
2. Forward/reverse gear pedal
3. Service brake pedal
4. Parking brake lever
Press the brake pedal (3), then use the lever (4) to switch from the service brake to the parking brake.
5. Front skirt lifting pedal
6. Can holder
7. Hood
8. Rear driving wheels on fixed axle
9. Front steering wheel
10. Right side broom
11. Left side broom (optional)
12. Main broom
13. Left side skirt
14. Right side skirt
15. Front skirt
16. Rear skirt
17. Hopper (empty it when it is full)
18. Hopper fastening hook
19. Hopper handle
20. Left door (to be opened for performing maintenance procedures only)
21. Door knobs
22. Left door (for main broom removal)
23. Door knobs
24. Flashing light (always on when the ignition key is turned to "I") (optional)
25. Driver's seat with safety microswitch
26. Additional hole for manual vacuum system kit (optional)
27. Adjustable steering column
28. Working light (optional)
29. Right side broom height adjusting knob
30. Left side broom height adjusting knob (optional)
31. Seat longitudinal position adjusting lever
32. Vacuum filter compartment cover
33. Cover knobs
34. Manual vacuum system (optional)
35. Manual vacuum system fasteners
36. Internal containers with handle for dumping (optional)
37. Serial number plate/technical data/conformity certification
38. Hood opening handles
39. Machine lifting anchors



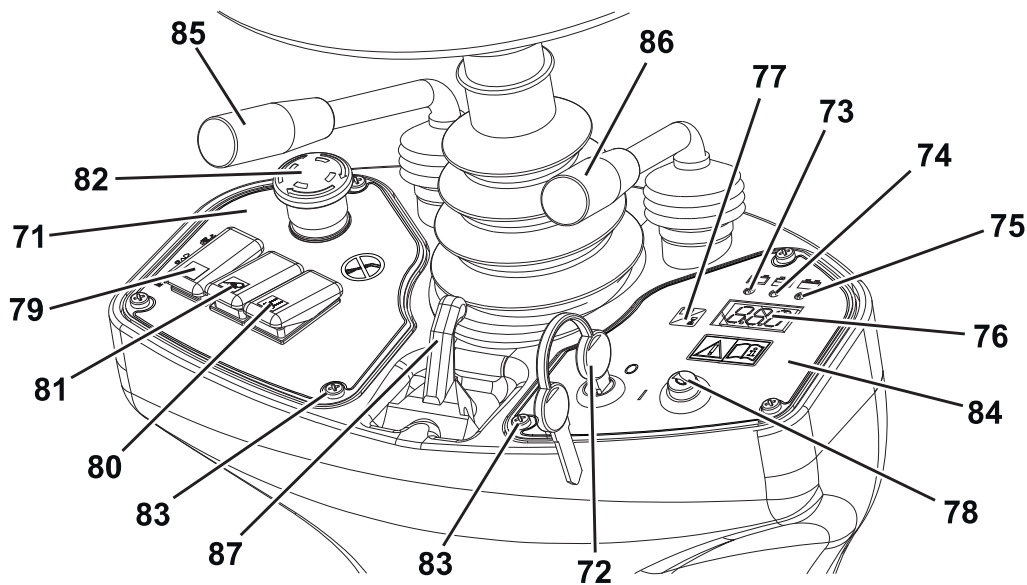
MACHINE NOMENCLATURE (Continues)

- 41. Hood (open)
- 42. Hood support tie rods
- 43. Lead batteries (WET) or optional gel batteries (GEL)
- 44. Battery connection diagram
- 45. Battery caps (for WET batteries only)
- 46. Battery connector
- 47. Electronic battery charger (optional)
- 48. Battery charger cable
- 49. Lead (WET) or gel (GEL) battery selector on the optional electronic battery charger
- 50. Charged battery warning light
- 51. Lamellar fuse box
- 52. Main broom motor fuse
- 53. Side broom motor fuse
- 54. Drive system malfunction led.
If the led is on, the drive system is operating, if the led flashes, the drive system is malfunctioning.
- 55. Electrical component box
- 56. Drive system electronic board
- 57. Battery case
- 58. Manual vacuum system (optional)
- 59. Main broom height adjusting knob
- 60. Air baffle plate



CONTROL PANEL

71. Left control panel
72. Ignition key (when turned to "0" it turns the machine off and disables all functions; when turned to "1" it enables all machine functions; it also turns on the flashing light)
73. Discharged battery warning light (red). When it is on, the batteries are discharged. The autonomy is over, the batteries must be recharged (see the procedure in the relevant paragraph).
74. Semi-discharged battery warning light (yellow). When it is on, the batteries are semi-discharged. Residual autonomy is few minutes.
75. Charged battery warning light (green). When it is on, the batteries are charged. Residual autonomy depends on battery capacity and working conditions.
76. Display. When pressed, it shows in sequence:
 - Working hours
 - Last digit of the hours - (dot) - minutes
 - Battery voltage (V)
77. Display selection push-button: hour counter/hour and minute counter/battery voltage (V)
78. Horn switch
79. Vacuum fan/filter shaker switch
80. Manual vacuum system additional hole switch (optional)
81. Working light switch (optional)
82. 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.
83. Panel fastening screws
84. Right control panel
85. Left and right side broom lifting/lowering lever
86. Main broom lifting/lowering lever
87. Steering wheel adjusting lever



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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:

- GEL batteries
- Electronic battery charger
- Main and side brooms with harder or softer bristles
- Antistatic polyester or polyester BIA C dust filter
- Left side broom
- Manual vacuum system
- Working light
- Flashing light
- Skirts of various materials
- Protective roof

For further information about the above-mentioned accessories, contact an authorised Retailer.

TECHNICAL DATA

General	Values
Machine length	1,480 mm
Machine width (without side brooms)	930 mm
Machine maximum height (at the steering wheel)	1,220 mm
Cleaning width (without side brooms)	700 mm
Working width (with one side broom)	980 mm
Working width (with two side brooms)	1.160 mm
Minimum distance from the floor (skirts not included)	55 mm
Main broom size (diameter x length)	300 mm x 700 mm
Side broom diameter	420 mm
Main broom speed	550 rpm
Side broom speed	80 rpm
Front steering wheel diameter	250 mm
Rear driving wheel diameter	250 mm
Front wheel specific pressure on the floor	1.1 N/mm ²
Rear wheel specific pressure on the floor	0.7 N/mm ²
Total machine weight (without batteries)	255 kg
Hopper capacity	70 litres
Main broom motor	500 W
Side broom motors	60 W
Drive system motor	600 W, 110 rpm
Vacuum system motor	310 W
Filter shaker motor	90 W, 6,000 rpm
Sound pressure level at workstation (ISO 11201, ISO 4871) (LpA)	63.8 ± 3 dB(A)
Machine output acoustic power (ISO 3744, ISO 4871) (LwA)	84 dB(A)
Vibration level at the operator's arms (ISO 5349-1) (*)	<2.5 m/s ²
Vibration level at the operator's body (ISO 2631-1) (*)	0.6 m/s ²

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

Performance	Values
Maximum forward/reverse speed	6 km/h
Maximum reverse speed	3 km/h
Gradeability	20%
Minimum turning radius	1,310 mm

Batteries	Values
Battery voltage	24 V
Standard battery	Lead with acid electrolyte (WET)
Optional battery	Gel, hermetic (GEL)
Battery minimum capacity (with optional battery charger)	185 Ah C5
Battery maximum capacity	256 Ah C5
Battery case inner size (length x width x height)	630 x 420 x 370 mm
Battery compartment maximum size (width x length x height)	660 x 440 x 370 mm

Dust vacuuming and filtering	Values
Paper dust filter 5-10 µm	3,6 m ²
Main broom compartment vacuum	11 mm H ₂ O
Filter shaker activation	Electric

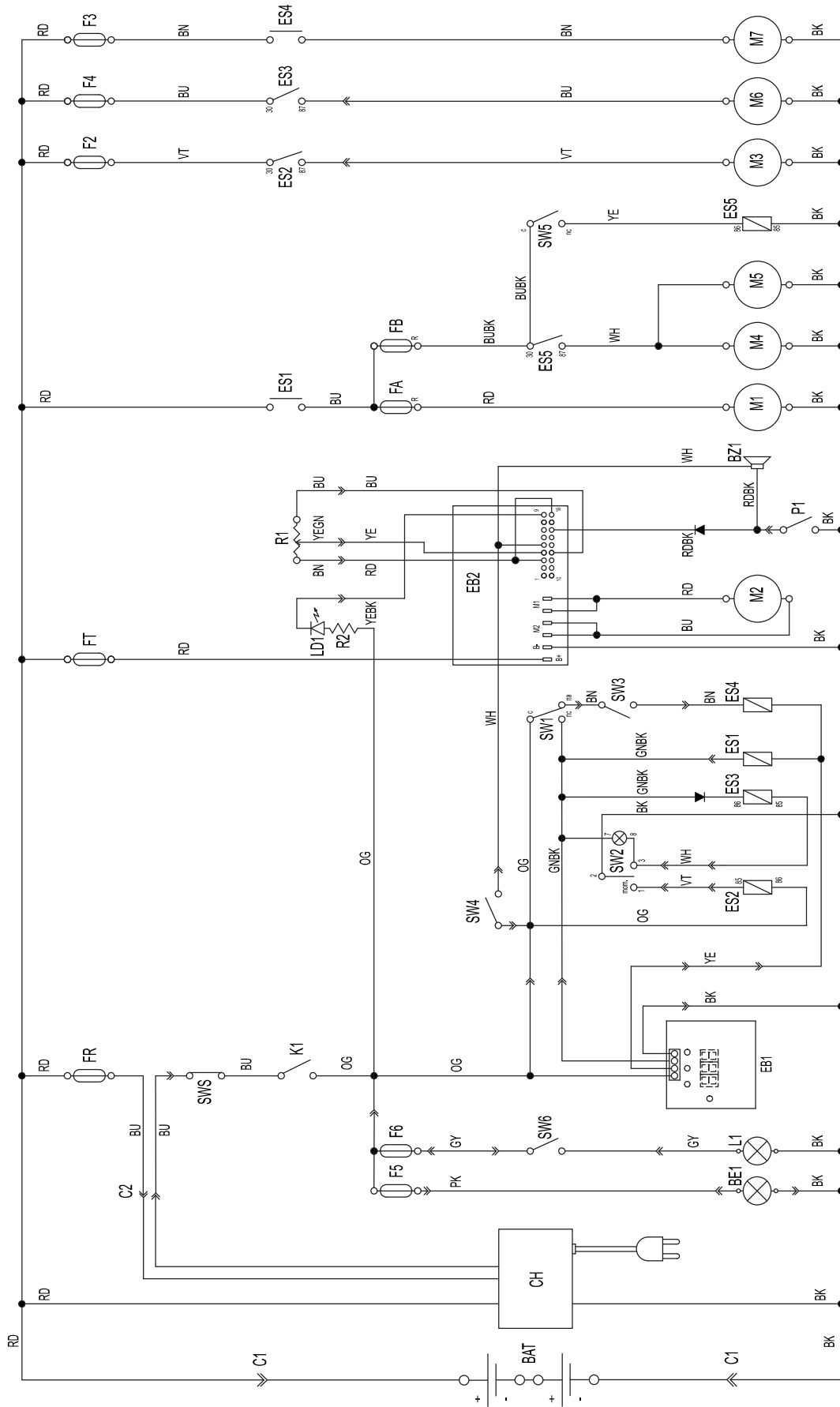
WIRING DIAGRAM**Key**

BAT	Batteries
BE1	Flashing light (optional)
BZ1	Reverse gear buzzer/horn
C1	Battery connector
C2	Battery charger sub-connector (optional)
CH1	Battery charger (optional)
EB1	Hour counter and battery voltage display
EB2	Drive system electronic board
ES1	Main broom relay
ES2	Filter shaker relay
ES3	Vacuum system relay
ES4	Manual vacuum system relay (optional)
ES5	Side broom relay
FA	Main broom fuse
FB	Side broom fuse
FT	Drive system fuse (70 A)
F1	Main fuse (key circuit) (15 A)
F2	Filter shaker motor fuse (25 A)
F3	Manual vacuum system fuse (40 A) (optional)
F4	Vacuum system motor fuse (30 A)
F5	Horn and pivoting light fuse (10 A)
F6	Working light fuse (10 A) (optional)
K1	Ignition key
LD1	Drive system electronic board diagnostic led
L1	Working light (optional)
M1	Main broom motor
M2	Drive system motor
M3	Filter shaker motor
M4	Right side broom motor
M5	Left side broom motor (optional)
M6	Vacuum system motor
M7	Manual vacuum system motor (optional)
P1	Horn switch
R1	Drive speed potentiometer (pedal)
R2	Led resistance
SWS	Emergency push-button
SW1	Main broom microswitch
SW2	Vacuum system/filter shaker switch
SW3	Manual vacuum system switch (optional)
SW4	Driver's seat safety microswitch
SW5	Side broom microswitch
SW6	Working light switch (optional)

Colour code

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

WIRING DIAGRAM (Continues)



S311411

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 they are damaged.

BATTERY CHECK/SETTING ON A NEW MACHINE

**NOTE**

If the machine is equipped with electronic battery charger (optional), this must be connected to the batteries to allow the machine to operate.

The machine requires four 6 V batteries, connected according to the diagram (44), or one 24 V battery box.

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

- A) WET or GEL batteries already installed on the machine
- B) WET batteries installed on the machine but without electrolyte
- C) Without batteries

According to machine configuration, proceed as follows.

A) WET or GEL batteries already installed on the machine

1. Open the machine hood (7) and check that the batteries are connected to the machine with the connector (46).
2. Close the hood (7).
3. Insert the ignition key (72) and turn it to "I" [without pressing the pedal (2)].
If the green warning light (75) turns on, the batteries are charged.
If the yellow (74) or red (73) warning light turns on, the batteries must be charged (see the procedure in Maintenance chapter).

B) WET batteries installed on the machine but without electrolyte

1. Open the machine hood (7).
2. Remove all battery caps (45).

**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.

3. Fill the battery cells with sulphuric acid for batteries (density from 1.27 to 1.29 kg at 25 °C) according to the instructions shown in the Battery Manual.
The correct quantity of sulphuric acid is shown in the Battery Manual.
4. Let the batteries rest and fill in with sulphuric acid according to the instructions shown in the Battery Manual.
5. Charge the batteries (see the procedure in Maintenance chapter).

C) Without batteries

1. Buy appropriate batteries (see the Technical Data paragraph and the diagram (44)).
For the battery choice and installation, apply to qualified battery Retailers.
2. Install the batteries.
3. Set the machine and the battery charger (if equipped) according to the type of batteries installed, as shown in the next paragraph.

WET OR GEL BATTERY SETTING



NOTE

If the machine is equipped with electronic battery charger (optional), this must be connected to the batteries to allow the machine to operate.

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

1. Turn the ignition key (72) to "0".
2. Open the hood (7).

Machine setting

1. The machine factory setting is for lead (WET) batteries. If this setting corresponds to the type of batteries installed on the machine, go to the next paragraph, otherwise perform the following procedures:
 - Disconnect the battery connector (46).
 - Remove the screws (83) and carefully remove the right control panel (84).
 - Install a jumper wire (A, Fig. 1) on "GEL" connectors (B) for gel batteries.
 - Carefully install the control panel (84) and the relevant screws.
 - Connect the battery connector (46).

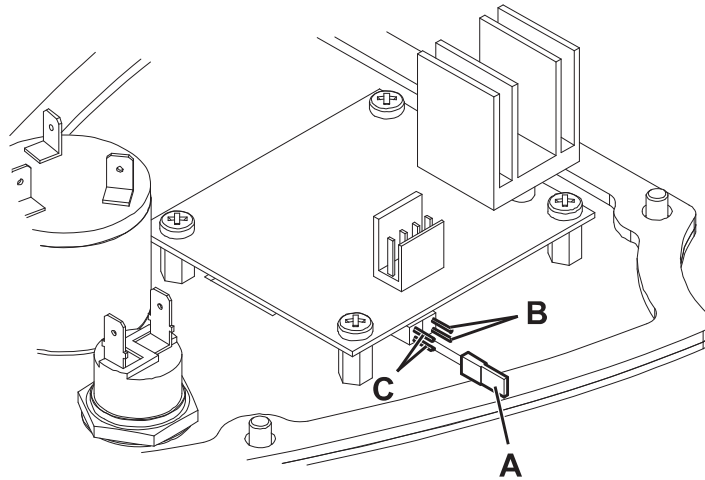


Figure 1

S311412

Battery charger setting

1. Turn the battery selector (49) to WET for lead batteries or to GEL for gel batteries.
2. Charge the batteries (see the procedure in Maintenance chapter).

BEFORE MACHINE START-UP



CAUTION!

*Make sure that there are no open doors/hoods and that the machine is in normal operating conditions.
Make sure that the hopper (17) is properly closed.*

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

STARTING AND STOPPING THE MACHINE

Starting the machine

1. Sit on the driver's seat (25).
2. If necessary, adjust the seat to a comfortable position by using the lever (31).
If necessary, use the lever (87) to tilt the steering column (1) forward or backward in order to reach a comfortable position.
3. Turn the ignition key (72) to "I" and do not press the pedal (2). Check that the green warning light (75) (charged battery) turns on.
If the yellow (74) or red warning light (73) turns on, turn the ignition key to "0" and 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 and pressing the pedal (2) on the front side to move forward and on the rear side to move backward.
The drive speed can be adjusted from zero to maximum speed by increasing the pressure on the pedal (2).



NOTE

The seat (25) is equipped with a safety sensor, which allows the machine to be driven by pressing the pedal (2) only when the operator is on the driver's seat.

6. Lower the main broom with the lever (86); it will start turning.
7. Turn on the vacuum system by pushing the switch (79) backward.



NOTE

The vacuum system turns on only when the main broom is lowered.

8. Lower the side brooms (10 and 11) with the lever (85).



NOTE

*The side brooms (10 and 11) can be lowered and lifted even when the machine is moving.
The side brooms do not turn when they are lifted or when the main broom is lifted.*

9. Start sweeping by turning the steering wheel (1) and moving the machine forward by pressing the pedal (2).

Stopping the machine

1. To stop the machine release the pedal (2).
To stop the machine quickly, also press the service brake pedal (3).
In case of emergency, press the emergency push-button (82) to immediately stop the machine. To deactivate the emergency push-button (82), turn it in the direction shown by the arrow.
2. Lift the side brooms (10 and 11) with the lever (85).
3. Turn off the vacuum system by bringing back the switch (79) to the centre.
4. Lift the main broom (12) with the lever (86).
5. To stop the machine, turn the ignition key (72) to "0".
6. Engage the parking brake.

PARKING BRAKE

1. Engage the parking brake by pressing the pedal (3) and engaging the lever (4).
2. Disengage the parking brake by pressing and releasing the pedal (3).



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 or incline.***

MACHINE OPERATION



WARNING!

Pay careful attention when operating the machine at high speed: sudden steering could cause this three-wheel machine to become unstable due to weight distribution.

Always reduce the speed before steering.

1. Avoid stopping for a long time with the machine in the same position and the brooms rotating; this could create unwanted marks on the floor.
2. To collect light and bulky waste materials, lift the front skirt by pressing the pedal (5); take into consideration that the machine vacuum capability is reduced when the front skirt is lifted.



CAUTION!

When operating on wet floors, it is essential to turn off the vacuum system by pressing the switch (79) to prevent the dust filter from being damaged.

3. For machine proper operation, the dust filter must be as clean as possible. To clean it while sweeping, turn on the filter shaker by pressing the switch (79) forward for a few seconds.
During this operation the vacuum fan is automatically shut off.
After cleaning the filter, press the switch (79) backward to restart the vacuum system; then start sweeping again.
While working, repeat the procedure every 10 minutes on average (depending on the dustiness of the area to be cleaned).



NOTE

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

4. The hopper (17) should be emptied after each working cycle and whenever it is full (see the procedure in the following paragraph).

HOPPER DUMPING

1. Stop the machine by releasing the drive pedal.
2. Turn the ignition key (72) to "0".
3. Engage the parking brake.
4. Disengage the hook (18) by pulling its lower end.
5. Remove the hopper (17) by using the handle (19) and by disengaging it from the inner guides.
Discharge all the debris into special containers. To make discharging procedure easier, inside the hopper there are two different containers (optional) with handle (36).
6. Install the containers with handle (36), if equipped.
7. Install the hopper (17) and engage it to the inner guides, then fasten it with the hook (18).
8. The machine is ready to start sweeping again.

AFTER USING THE MACHINE

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

1. Lift the side brooms with the lever (85).
2. Lift the main broom with the lever (86).
3. Turn on the filter shaker with the switch (79).
4. Empty the hopper (17) (see the procedure in the previous paragraph).
5. Remove the ignition key (72).
6. Engage the parking brake.

PUSHING/TOWING THE MACHINE

To push/tow the machine when it is turned off, no special prearrangement is necessary.

MACHINE STORAGE

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

1. Check that the machine storage area is dry and clean.
2. Disconnect the battery connector (46).

FIRST PERIOD OF USE

After the first period of use (first 8 hours) it is necessary to perform the following procedures:

- Check the fastening and connecting elements for proper tightening.
- Check the visible parts for integrity and leakages.

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 contained in the Scheduled Maintenance Table or for extraordinary maintenance procedures see 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 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 400 hours
WET battery fluid level check						
Side and main broom height check and adjustment						
Dust filter cleaning and integrity check						
Skirt height and operation check						
Filter shaker operation check			(*)			
Main broom driving belt visual inspection			(*)			
Nut and screw tightening check				(*)(1)		
Service and parking brake check and adjustment				(*)		
Steering chain check and cleaning					(*)	
Main broom driving belt replacement					(*)	
Main motor and drive system motor carbon brush check or replacement						(*)

(*) For the relevant procedure, see the Service Manual.

(1) And after the first 8 running-in hours.

MAIN BROOM HEIGHT CHECK AND ADJUSTMENT



NOTE

Brooms of various hardness are available. This procedure is applicable to all types of brooms.

1. Check the main broom distance from the floor as shown below:
 - Drive the machine on a level floor.
 - Keep the machine stationary, lower the main broom and turn it on for a few seconds.
 - Stop and lift the main broom, then move the machine and switch it off.
 - Check that the main broom print (A, Fig. 2), along its length, is 2 to 4 cm wide.

If the print (A) is not within specifications, adjust the broom height as shown in step 2.

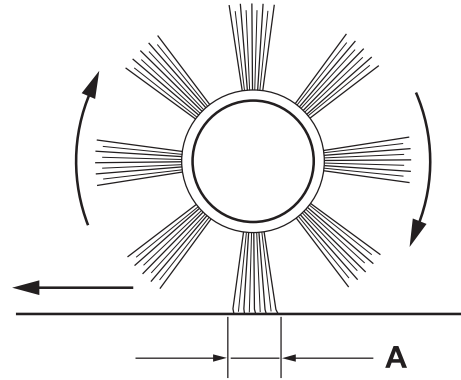
2. Engage the parking brake.
3. Turn the ignition key (72) to "0".
4. Open the hood (7).
5. Loosen the knob (A, Fig. 3) on the left side of the machine.
6. Turn the knob (B), and remind that:
 - It must be screwed to lift the broom;
 - It must be unscrewed to lower the broom.
 After the adjustment, hold the knob (B) and tighten the knob (A).
7. Perform step 1 again to check the proper adjustment of the main broom height.
8. When the broom is too worn out the adjustment is no more possible; replace the broom according to the instructions in the next paragraph.



CAUTION!

If the main broom print is excessive (larger than 4 cm), the machine regular operation is affected and the moving or electrical parts can overheat, thus reducing machine life.

Pay careful attention when performing the above-mentioned checks, and always use the machine according to the indicated conditions.



2 - 4 cm
0,8 - 1,6 in

Figure 2

S311389

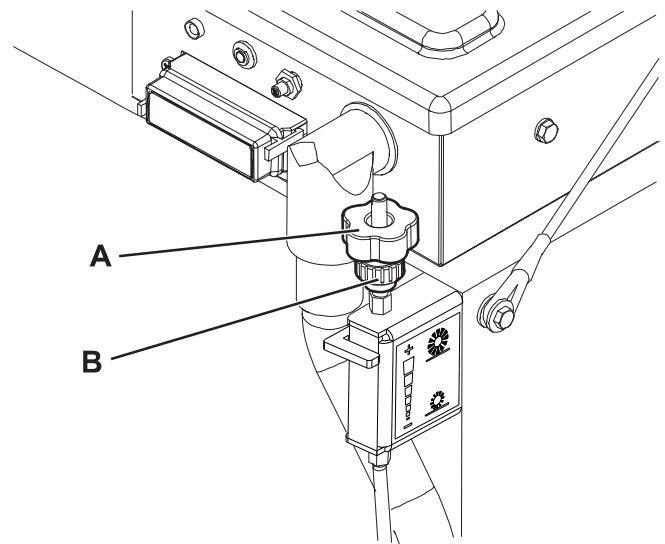


Figure 3

S311390

MAIN BROOM REPLACEMENT



NOTE

Brooms of various hardness are available. This procedure is applicable to all types of brooms.



CAUTION!

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 (72) to "0".
3. Unscrew the knobs (23) and remove the right door (22).
4. Loosen the knob (A, Fig. 4).
5. Unscrew the knobs (B, Fig. 4) and remove the broom compartment cover (C).
6. Remove the broom (A, Fig. 5).
7. Check that the drive hub (A, Fig. 6) is free from dirt or foreign materials (ropes, rags, etc.) accidentally rolled up.
8. The new main broom must be installed with the bristles rows (B) bent as shown in the figure.
9. Install the new main broom (C, Fig. 6) and ensure that the mesh (D) correctly fits into the relevant drive hub (A).
10. Install the broom compartment cover (C, Fig. 4) and tighten the knobs (B) and (A).
11. Install the right door (22), then tighten the knobs (23).
12. Check and adjust the main broom height as shown in the previous paragraph.

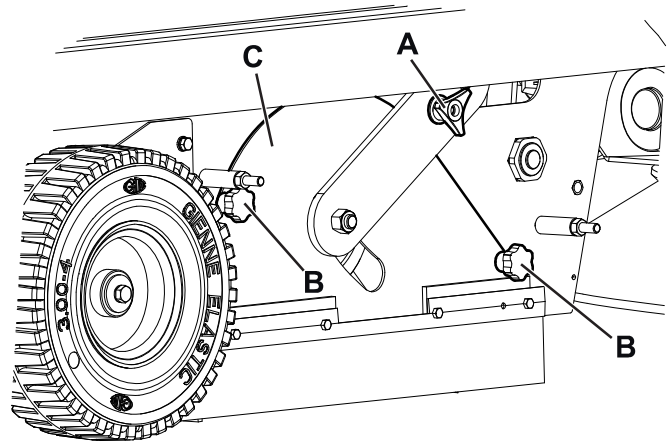


Figure 4

S311391

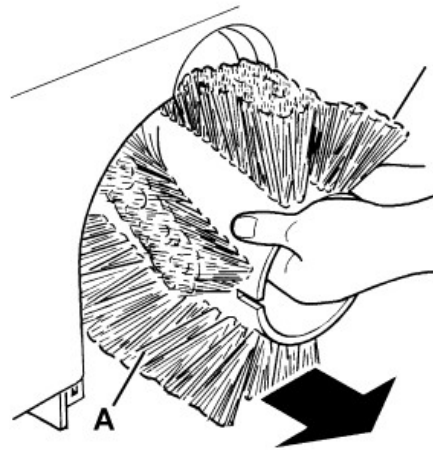


Figure 5

S311392

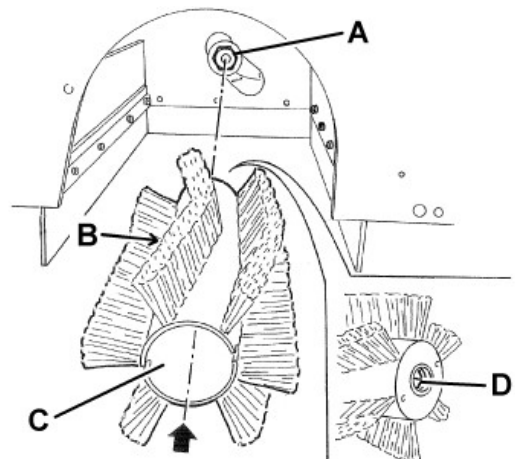


Figure 6

S311393

SIDE BROOM HEIGHT CHECK AND ADJUSTMENT



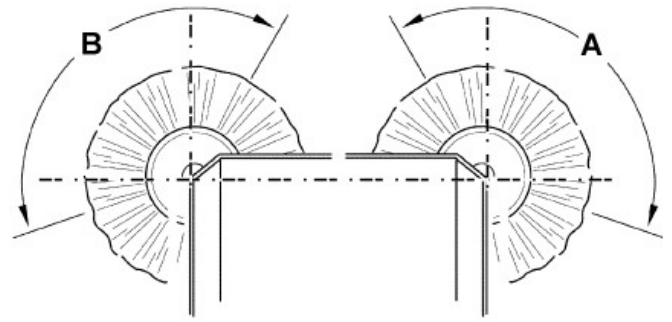
NOTE

Brooms of various hardness are available. This procedure is applicable to all types of brooms.

- Check the side broom distance from the floor, according to the following procedure:
 - Drive the machine on a level ground and lower the side brooms.
 - Keep the machine stationary and turn on the side brooms for a few seconds.
 - Lift the side brooms, then move the machine and turn it off.
 - Check that the side broom prints are as shown in the figure (A and B, Fig. 7).

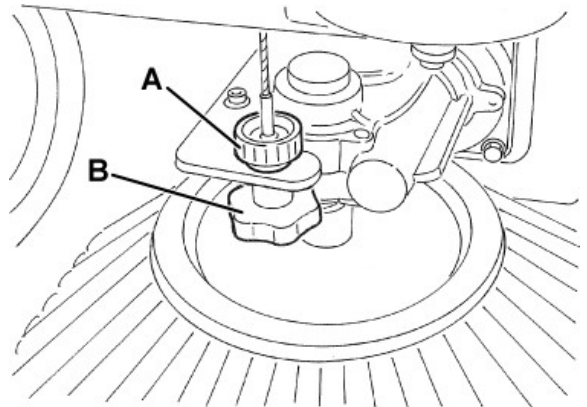
If the print is not within specifications, adjust the broom height, according to the procedure shown in step 2.
- Engage the parking brake.
- Turn the ignition key (72) to "0".
- Loosen the knob (A, Fig. 8) positioned above the broom.
- Turn the knob (B), and remind that:
 - It must be screwed to lift the broom;
 - It must be unscrewed to lower the broom.

After the adjustment, hold the knob (B) and tighten the knob (A).
- Perform step 1 again to check the proper adjustment of the side broom height.
- When the brooms are too worn and can no longer be adjusted, replace them according to the procedure shown in the relevant paragraph.



S311394

Figure 7



S311395

Figure 8

SIDE BROOM REPLACEMENT



NOTE

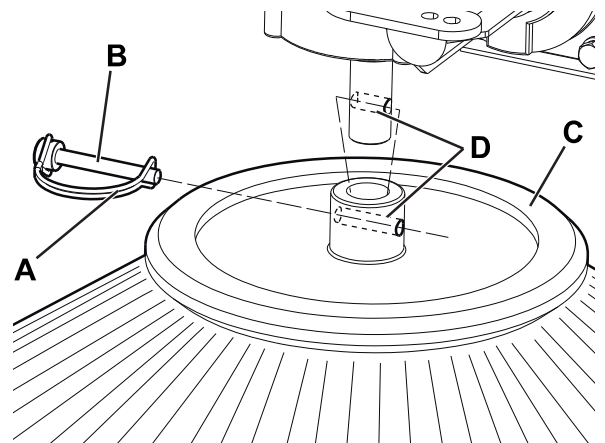
Brooms of various hardness are available. This procedure is applicable to all types of brooms.



CAUTION!

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

- Drive the machine on a level ground and engage the parking brake.
- Turn the ignition key (82) to "0".
- Release the spring (A, Fig. 9), remove the pin (B) and the broom (C) from the gearmotor shaft.
- Install the new broom on the gearmotor shaft, insert the pin (B) in the holes (D), and engage the spring (A).
- Check and adjust the side broom height as shown in the previous paragraph.



P100350

Figure 9

DUST FILTER CLEANING AND INTEGRITY CHECK



NOTE

Besides the standard paper filter, polyester filters are also available. The following procedure is applicable to each type of filter.

1. Drive the machine on a level ground and engage the parking brake.
 2. Turn the ignition key (72) to "0".
 3. Disengage the hook (18) by pulling its lower end.
 4. Remove the hopper (17) by using the handle (19) and by disengaging it from the inner guides.
 5. Unscrew the knobs (33) and remove the filter compartment cover (32).
 6. Loosen the knobs (A, Fig. 10).
 7. Disconnect the filter shaker motor (C) electrical connector (B).
 8. Remove the dust filter fastening frame (D).
 9. Remove the dust filter (E).
 10. In an outdoor area, clean the filter by shaking it on a level and clean surface, tapping the side (A, Fig. 11) opposite to the wire gauze (B).
Complete the cleaning procedure by using compressed air (C) at maximum 6 Bar, blowing only from the side protected by the wire gauze (B), at a minimum distance of 30 cm.
- According to the filter type, observe the following cautions:
- Paper filter (standard): Do not use water or detergents to clean it, otherwise it can be damaged.
 - Polyester filter (optional): 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. Using inadequate detergents can damage the filter.
11. Check the filter body for tears. If necessary, replace the filter.
 12. Clean the rubber gasket (A, Fig. 12) of the cover (32) and check it for integrity and efficiency; if necessary replace it.
 13. Assemble the components in the reverse order of disassembly, and note the following:
 - Install the filter (E, Fig. 10) with the wire gauze (B, Fig. 11) facing upwards.

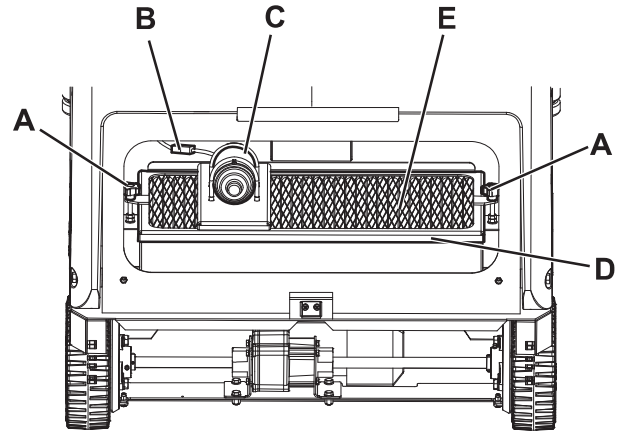


Figure 10

S311397

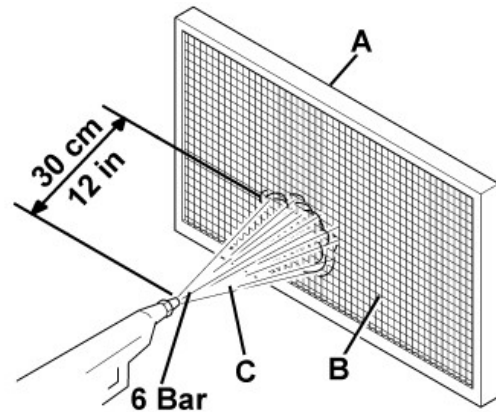


Figure 11

S311399

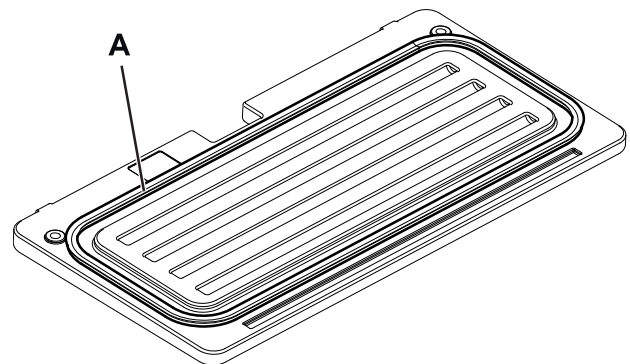


Figure 12

S311398

SKIRT HEIGHT AND OPERATION CHECK

1. Drive the machine on a level floor that is suitable for checking the skirt height.
2. Engage the parking brake.
3. Turn the ignition key (72) to "0".

Side skirt check

1. Unscrew the knobs (23 and 21) and remove both left (20) and right doors (22).
2. Check the side skirts (13 and 14) for integrity. Replace the skirts when they have cuts (A, Fig. 13) larger than 20 mm or cracks (B) larger than 10 mm (for skirt replacement, refer to the Service Manual).
3. Check that distance from the ground of the side skirts (13 and 14) is within 0 – 3 mm (A, Fig. 14). If necessary, adjust the skirt height by using the slots on the screws (A, Fig. 17).
4. Assemble the components in the reverse order of disassembly.

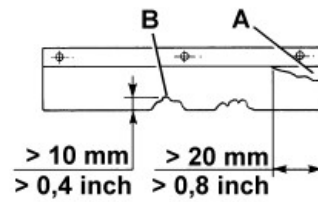


Figure 13

S311400

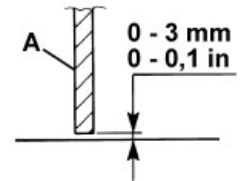


Figure 14

S311401

Front and rear skirt check

1. Remove the main broom as shown in the relevant paragraph.
2. Check the front (15) and rear skirts (16) for integrity. Replace the skirts when they have cuts (A, Fig. 13) larger than 20 mm or cracks (B) larger than 10 mm (for skirt replacement, refer to the Service Manual).
3. Check that:
 - The front skirt (A, Fig. 18) slightly touches the floor (A, Fig. 15).
 - The distance from the ground of the rear skirt (B, Fig. 18) is within 0 – 3 mm (A, Fig. 14).
4. If necessary, adjust the skirt height by using the slots on the screws (C and D, Fig. 18).
5. Press the front skirt lifting pedal (5) and check that the front skirt (A, Fig. 16) turns upward for about 90° (as shown in the figure); then release the pedal and check that the skirt does not remain in an intermediate position but returns to its initial position. If necessary, for the front skirt control cable adjustment or replacement, refer to the Service Manual.
6. Assemble the components in the reverse order of disassembly.

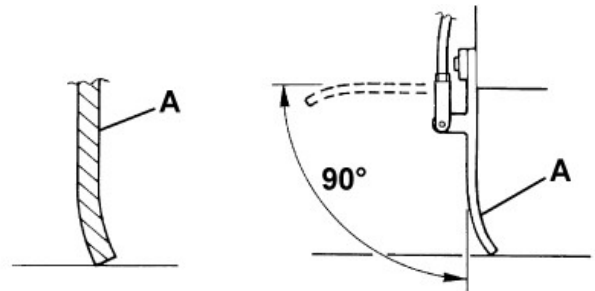


Figure 15

S311402

Figure 16

S311403

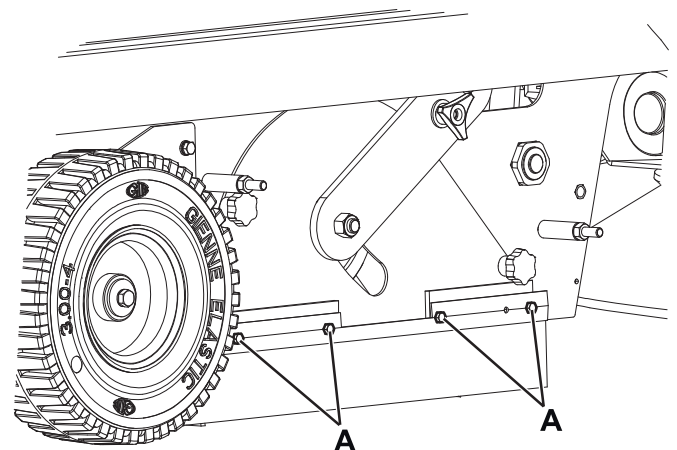


Figure 17

S311404

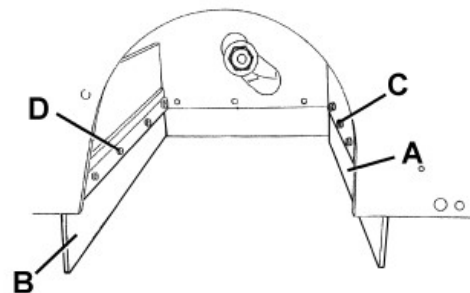


Figure 18

S311405

BATTERY CHARGING

**CAUTION!**

Charge the batteries when the yellow (73) or red warning light (74) turns on and at the end of each cleaning 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 WET 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.

1. Drive the machine on a level ground and engage the parking brake.
2. Turn the ignition key (72) to "0".
3. Open the hood (7).
4. (For WET batteries only) check the level of electrolyte inside the batteries. If necessary, top up through the caps (45). Leave all the caps (45) open for battery charging. 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 (47) (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 (46) and connect it to the external battery charger.
3. Connect the battery charger to the electrical mains.
4. After charging, disconnect the battery charger from the electrical mains and from the battery connector (46).
5. (For WET batteries only) check the level of electrolyte inside the batteries; then close all the caps (45).
6. Reconnect the battery connector (46) to the machine connector.
7. Close the hood (7). The machine is ready to be used.

Charging the batteries with the battery charger (optional)

1. (For WET batteries only) check the level of electrolyte inside the batteries. If necessary, top up through the caps (45). Leave all the caps (45) open for battery charging. When the correct level is reached, clean, if necessary, the upper surface of the batteries.
2. Connect the battery charger cable (48) to the electrical mains.

**WARNING!**

Check that the voltage and frequency shown on the machine serial number plate (37) match the electrical mains values.

**NOTE**

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

3. When the green warning light (50) turns on, the batteries are charged.
4. For further information about the battery charger operation (47), see the Battery Charger Manual.
5. Disconnect the battery charger cable (48) from the electrical mains and place it in its housing on the machine.
6. (For WET batteries only) Close all the caps (45).
7. Close the hood (7). The machine is ready to be used.

FUSE CHECK/REPLACEMENT/RESET

1. Drive the machine on a level ground and engage the parking brake.
2. Turn the ignition key (72) to "0".
3. Open the hood (7).
4. Disconnect the battery connector (46).

Lamellar fuse check/replacement

1. Remove the fuse box cover (51).
2. Check/replace the relevant fuse among the following (Fig. 19):
 - (A): F1 main fuse (key circuit) (15 A)
 - (B): F2 filter shaker motor fuse (25 A)
 - (C): F3 manual vacuum system fuse (40 A) (optional)
 - (D): F4 vacuum system motor fuse (30 A)
 - (E): F5 horn and pivoting light fuse (10 A)
 - (F): F6 working light fuse (10 A) (optional)
3. Remove the electrical component box cover (55).
4. Check/replace the following fuse (Fig. 20):
 - (A): FT drive system fuse (70 A)

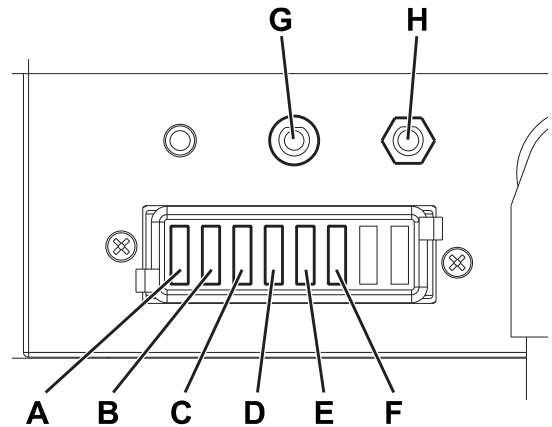


Figure 19

P100348

Fuse check

1. Check one of the following fuses (Fig. 19) for deactivation:
 - (G): FA main broom motor fuse (30 A)
 - (H): FB side broom motor fuse (10 A)
 Reset any deactivated fuse, when the component that caused deactivation has fully cooled down.
2. Close the hood (7).

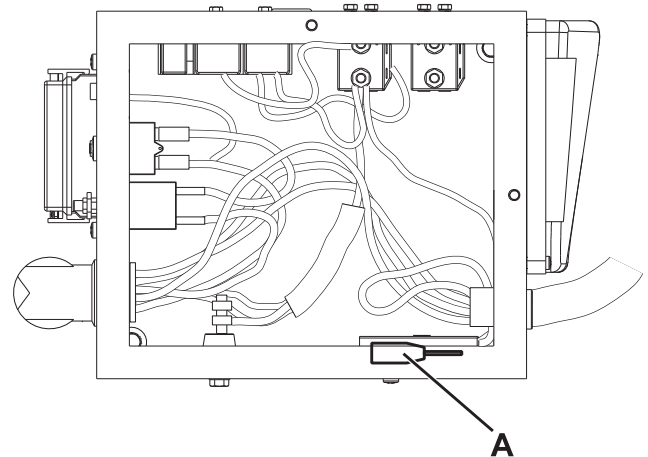


Figure 20

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SAFETY FUNCTIONS

The machine is equipped with the following safety functions.

EMERGENCY PUSH-BUTTON

It is located in an easily accessible position (82). 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 and it does not allow the machine drive system to operate if the operator is not seated on the driver's seat.

TROUBLESHOOTING

Problem	Possible cause	Remedy
The machine does not start when turning the ignition key to "I".	The battery connector is disconnected.	Connect the battery connector.
	The F1 fuse in the box is open.	Replace the fuse.
	The battery charger cable is connected to the electrical mains.	Disconnect the battery charger cable from the electrical mains.
The machine does not move when pressing the pedal.	The parking brake is engaged.	Disengage the parking brake.
	When starting the machine with the ignition key, the pedal is pressed, or the operator is not yet on the driver's seat.	Start the machine with the ignition key, only after being on the driver's seat and without pressing the pedal.
	The FT fuse is open.	Replace the fuse.
The main broom does not work.	The FA fuse is deactivated.	Reset the fuse by pressing the relevant switch.
The side brooms do not operate.	The main broom is not lowered.	Lower the main broom.
	The FB fuse is deactivated.	Reset the fuse by pressing the relevant switch.
The machine collects little debris/dust.	The vacuum system is turned off.	Turn on the vacuum system with the switch.
	The F4 fuse in the box is open.	Replace the fuse.
	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 worn.	Adjust/replace the skirts.
	The brooms are not properly adjusted.	Adjust the broom height.
The filter shaker does not operate.	The F2 fuse in the box is open.	Replace the fuse.
The machine operates only when stationary, otherwise the red warning light turns on.	The batteries are discharged.	Charge the batteries. If the problem persists, replace the batteries.
The battery autonomy is low.	The batteries are dead.	Replace the batteries.
	The battery capacity is low.	Buy batteries with higher capacity (see the Technical Data paragraph).
The drive system electronic board malfunction led is flashing.	The drive system is malfunctioning.	To detect the failure, refer to the Service Manual (at any 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
- Engine oil
- Polyester dust filter
- Main and side brooms
- Plastic components
- Electrical and electronic components (*)

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

