

# SR 1000S B

## Instructions for use

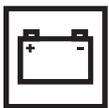
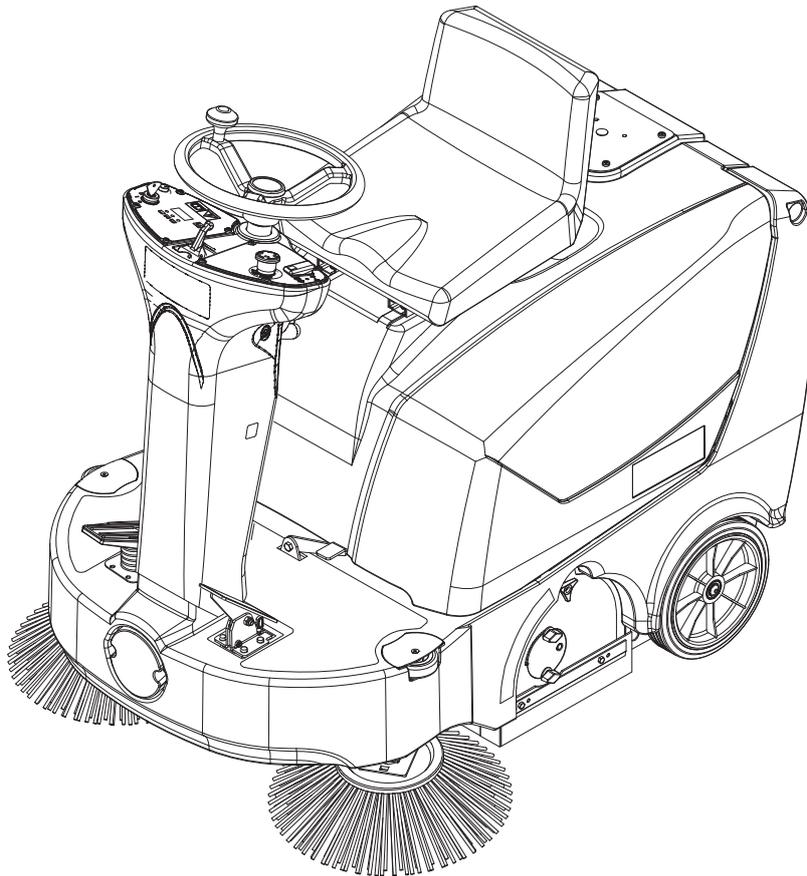
Bedienungshandbuch  
Instructions d'utilisation  
Instructions for use  
Gebruiksaanwijzing



03/2005 Revised 03/2016  
(4)  
146 1957 000



Deutsch  
Français  
English  
Nederlands



Model:  
908 4201 010

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

Πιστοποιητικό συμμόρφωσης  
Megfelelősségi nyilatkozat  
Potvrda sukladnosti  
Dichiarazione di conformità  
Atitikties deklaracija  
Atbilstības deklarācija  
Konformitetscertificering  
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 / Mudel / Modèle / Malli / Model / Μοντέλο / Modell / Model / Modello / Modelis / Modelis / Modell / Model / Modelo / Model / Model / Модель / Modell / Model / Model / Model :

SR 1000S B

Тип / Тур / Тур / Тур / Тур / Tipo / Tüüp / Туре / Туурпи / Туре / Τύπος / Típus / Vrsta / Tipo / Tipas / Tips / Туре / Туре / Tipo / Тур / Tip / Тип / Тур / Тур / 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 / Våljalaskeasta / Année de fabrication / Valmistusvuosi / Year of construction / Έτος κατασκευής / Gyártási év / Godina izgradnje / Anno di costruzione / Pagaminimo metai / Izgatavošanas gads / Byggear / Bauwjaar / Ano de fabrico / Rok produkcji / Anul fabricației / Год выпуска / Tillverkningsår / Rok výroby / Leto izdelave / Leto izdelave / İmal yılı :

**BG** Долуподписаният потвърждава, че гореспоменатият модел е произведен в съответствие със следните директиви и стандарти. 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 diretivas e normas. A ficha técnica é redigida pelo fabricante.

**CZ** Niže podepsaný stvrzuje, že výše uvedený model byl vyroben v souladu s následujícími směrnici 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** Alulirottak igazoljuk, hogy a fent említett modellt a következő irányelvek és szabványok alapján hoztuk létre. A műszaki fájl 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 järgmiste direktiivide 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** Allekirjoittain 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 / Producenten / Fabrikant / Fabricante / Producenta / Producător / Производителем / Tillverkaren / Výrobca / Izdelovalec / Üretici :

**Nilfisk S.p.A.**

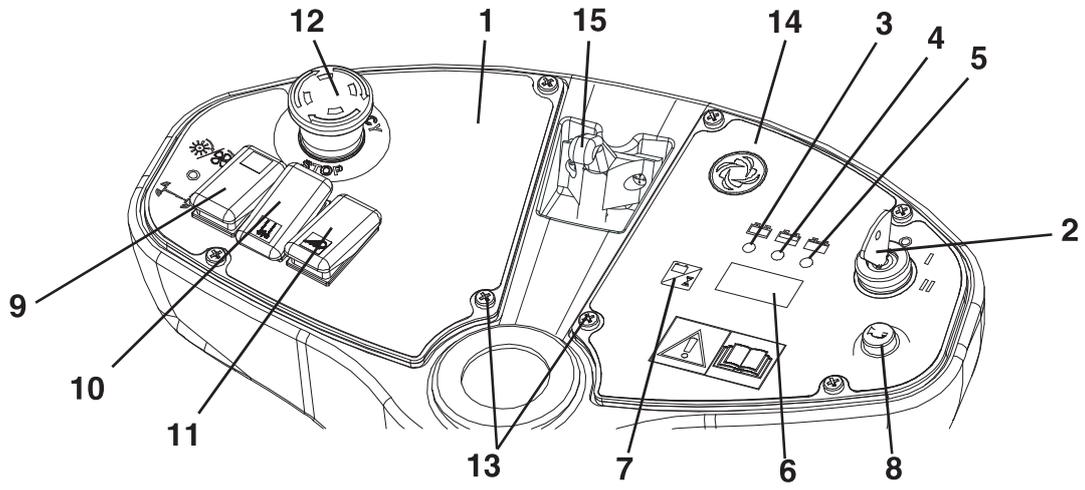
Strada Comunale della Braglia, 18 - 26862 - GUARDAMIGLIO (LO) - ITALY

Tel: +39 (0)377 451124, Fax: +39 (0)377 51443

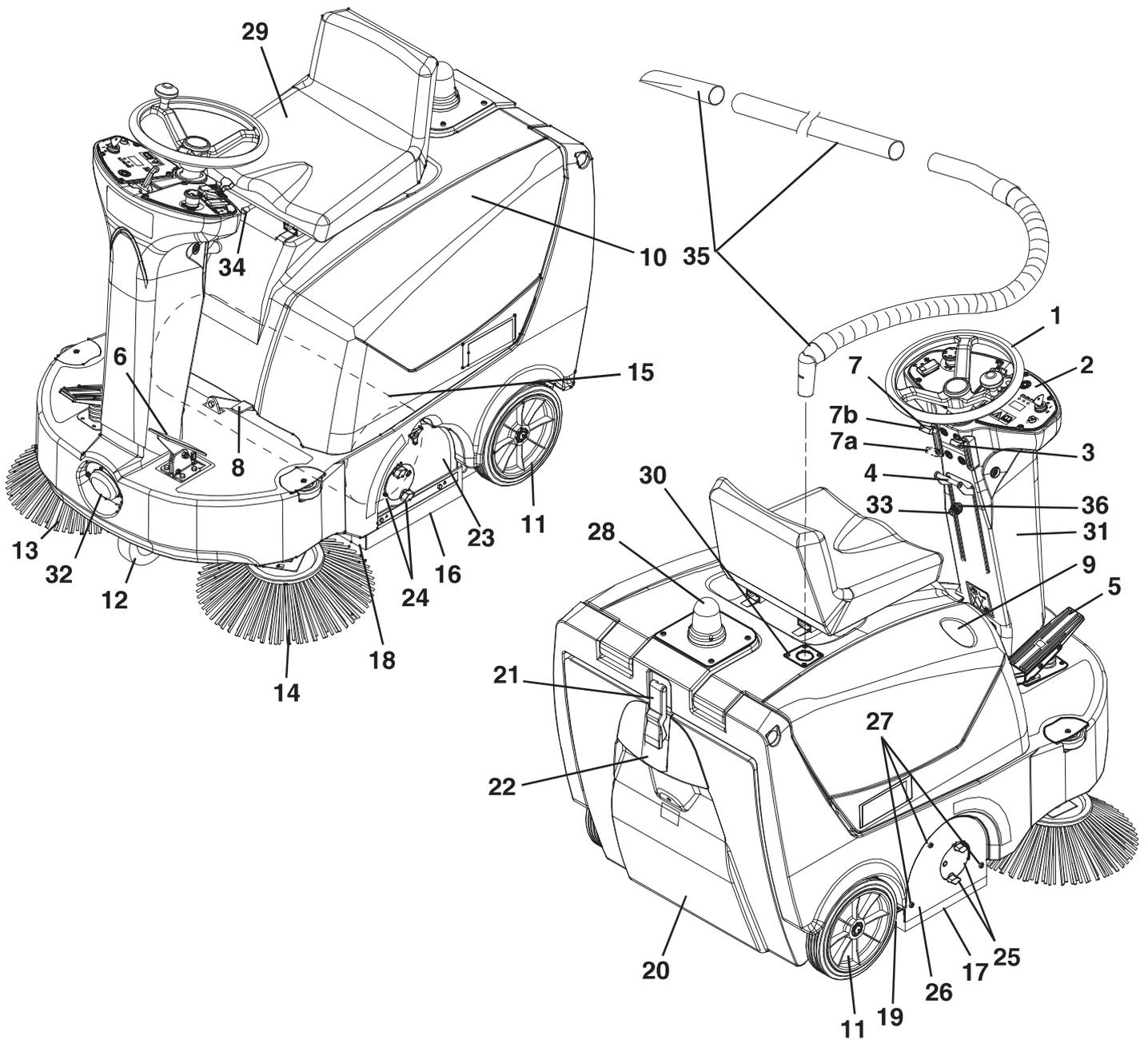
Authorized signatory: Sergio Coccapani, R&D Director

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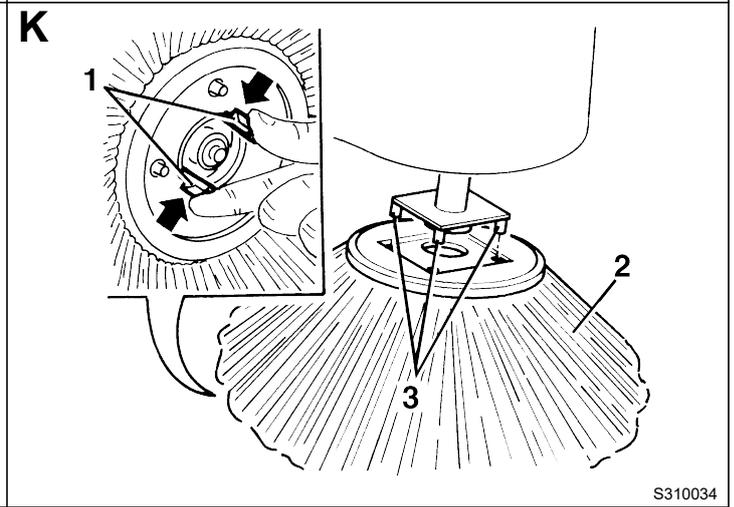
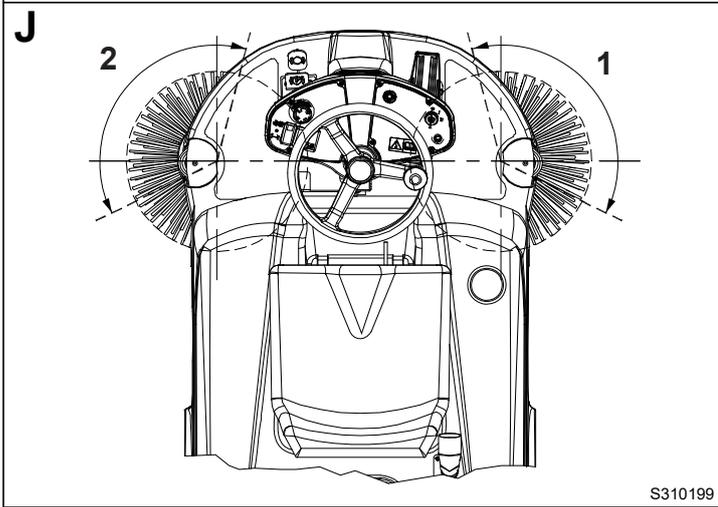
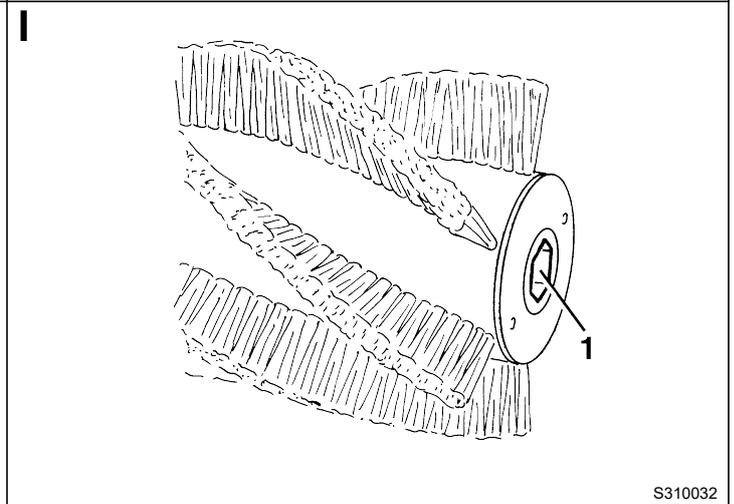
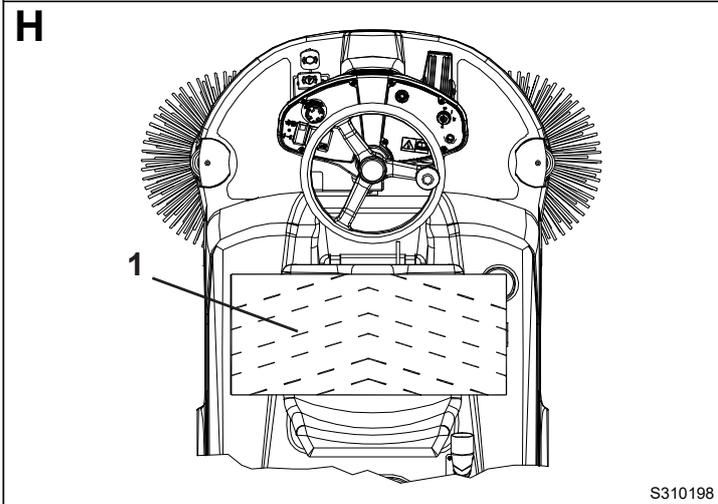
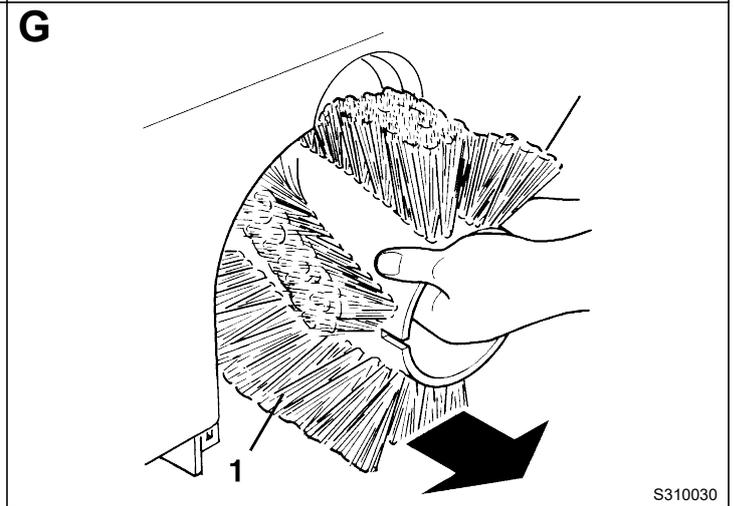
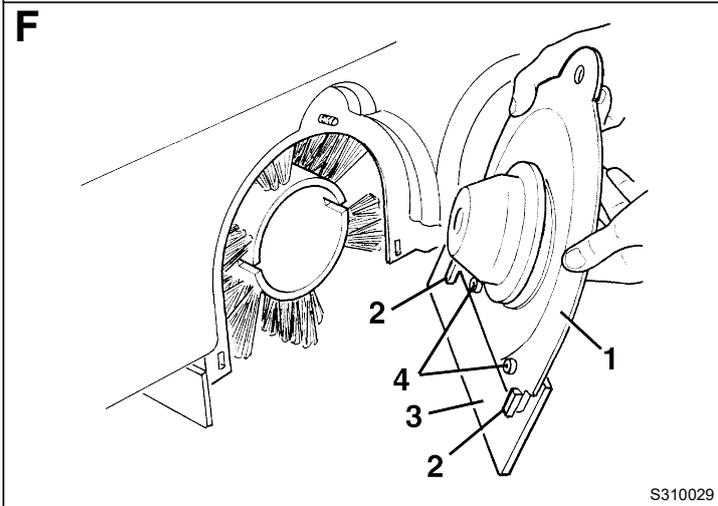
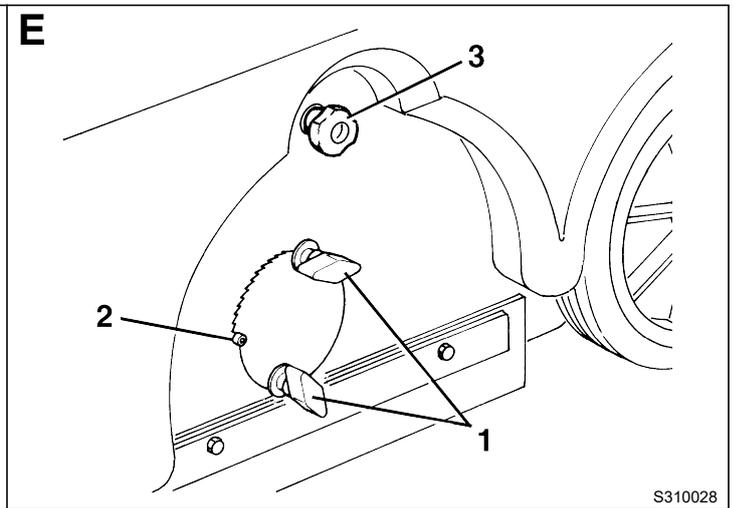
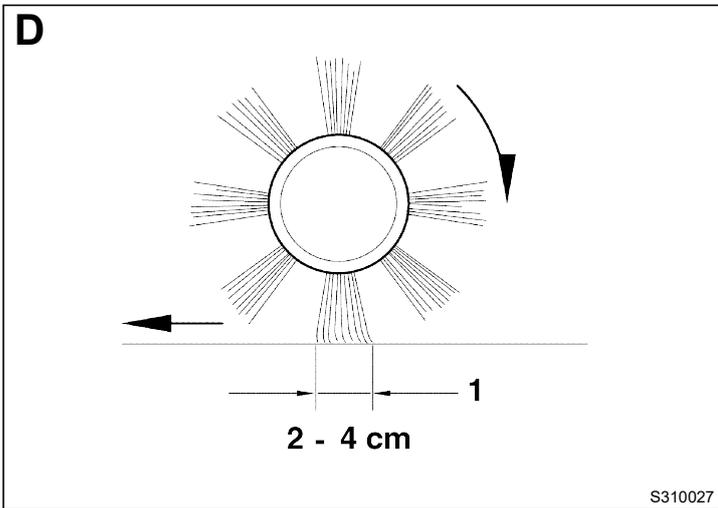
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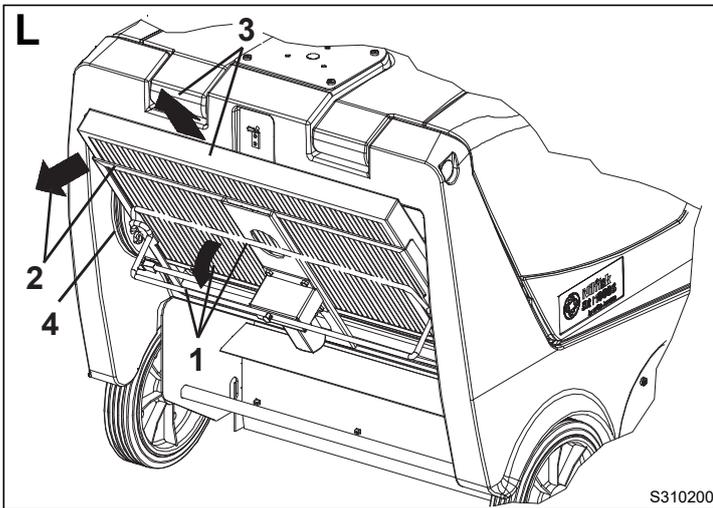
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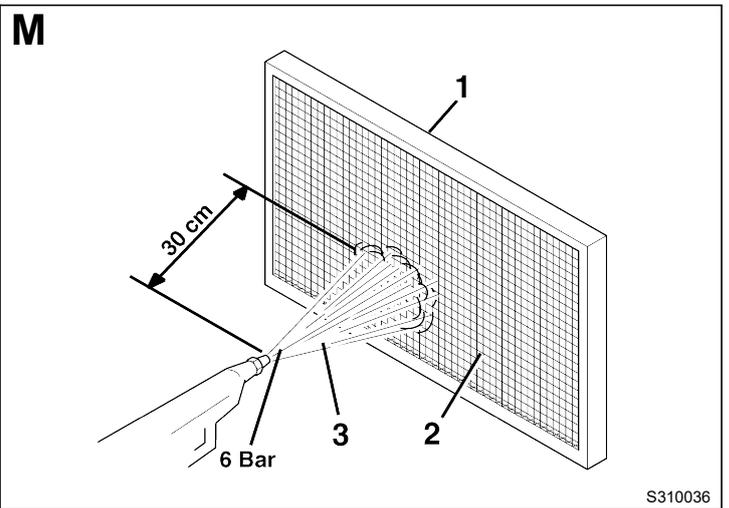
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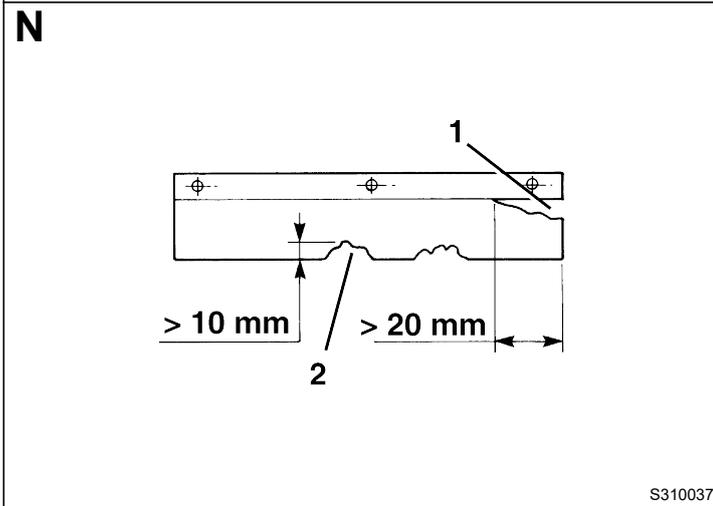




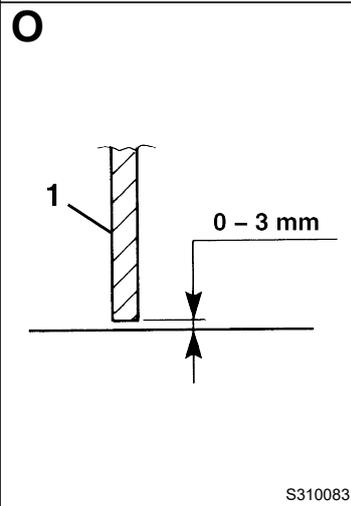
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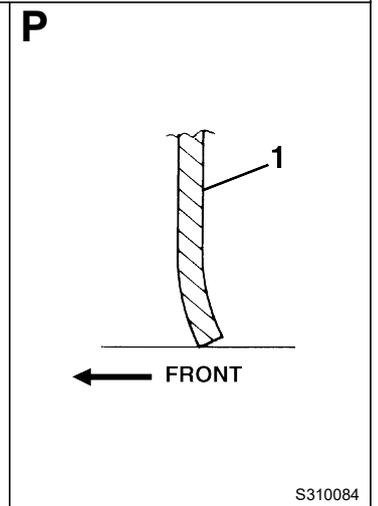
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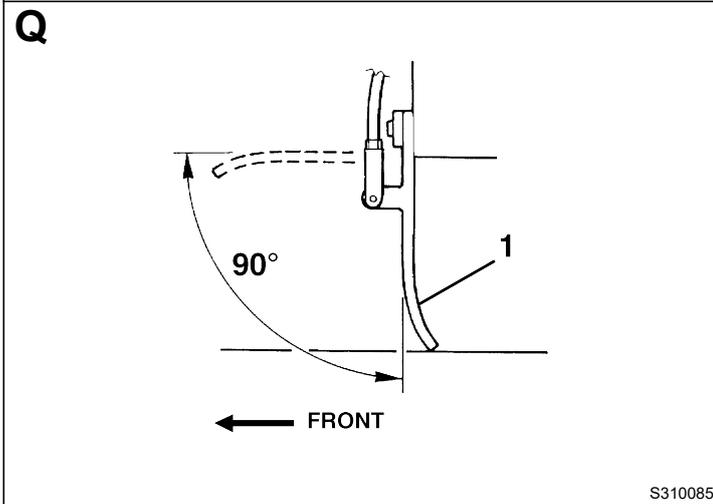
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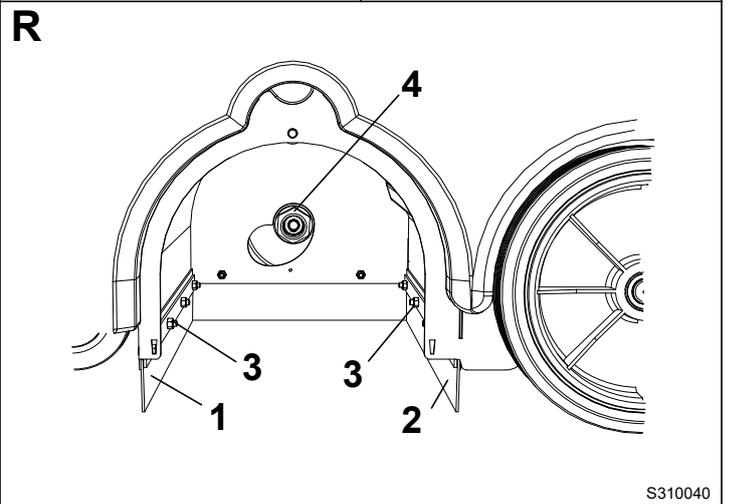
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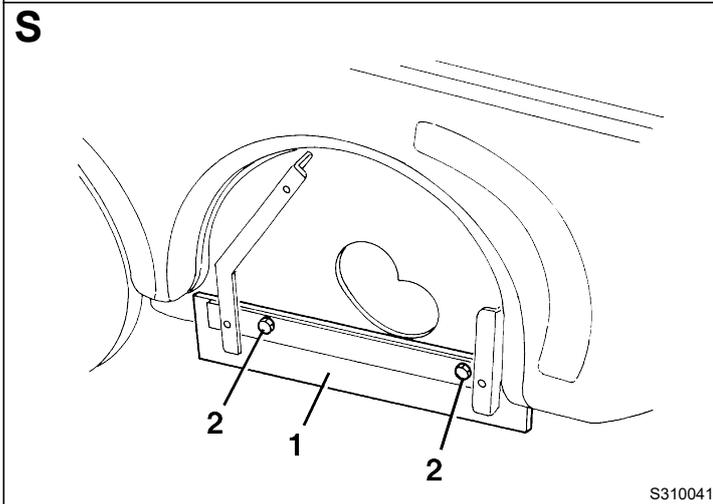
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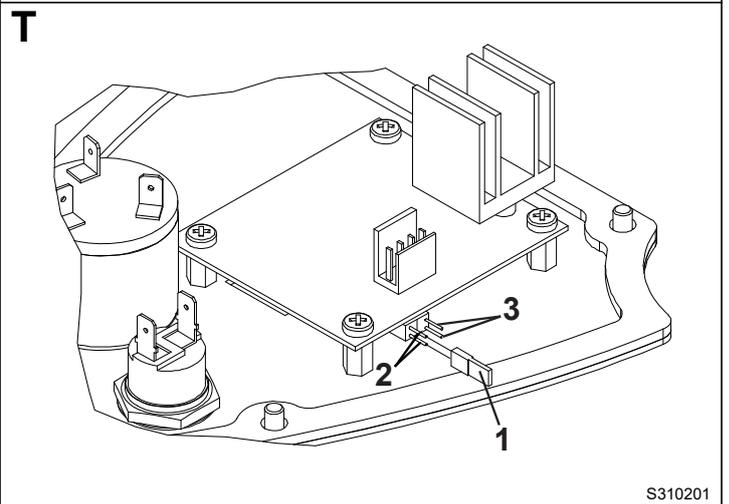
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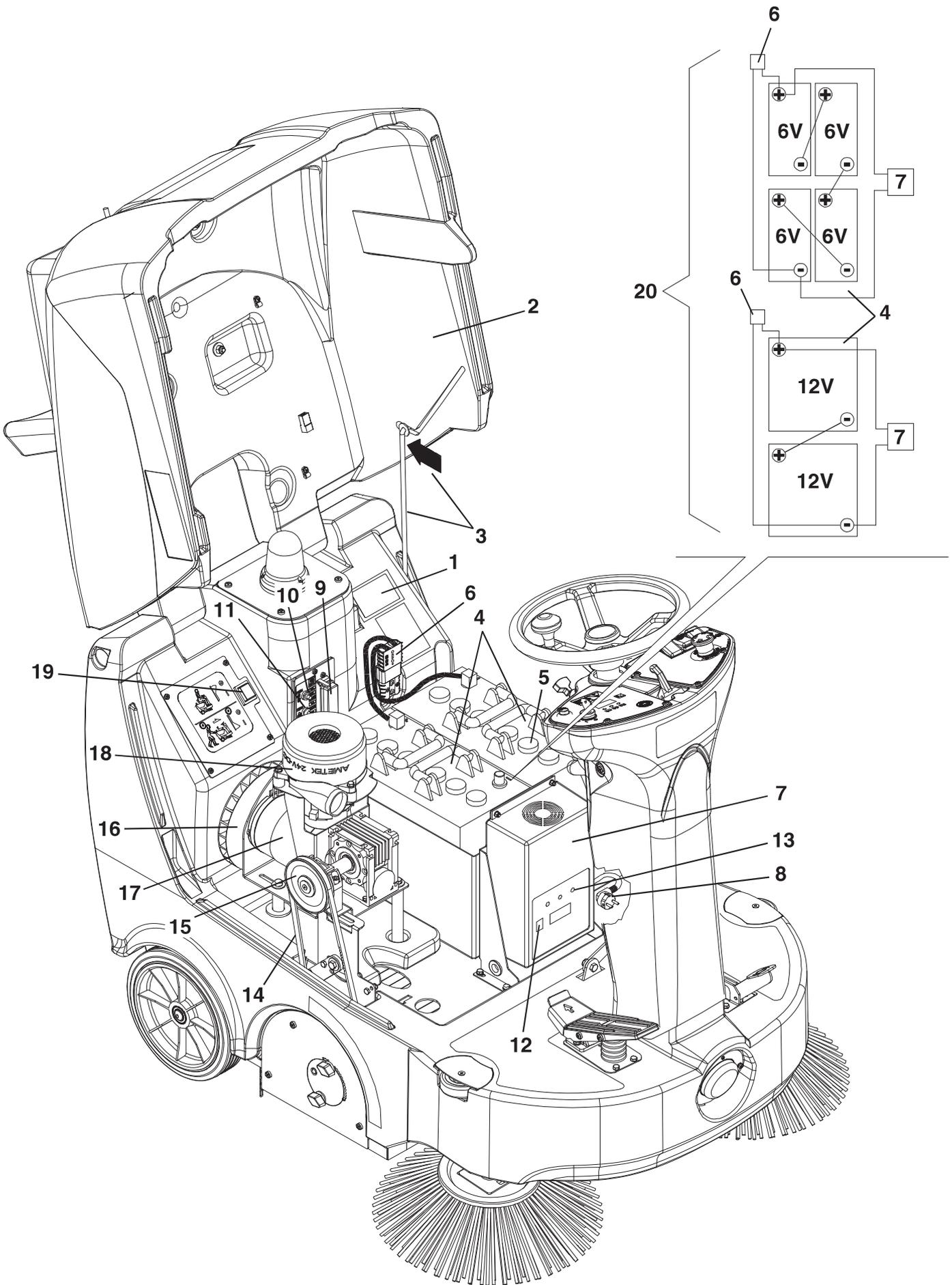


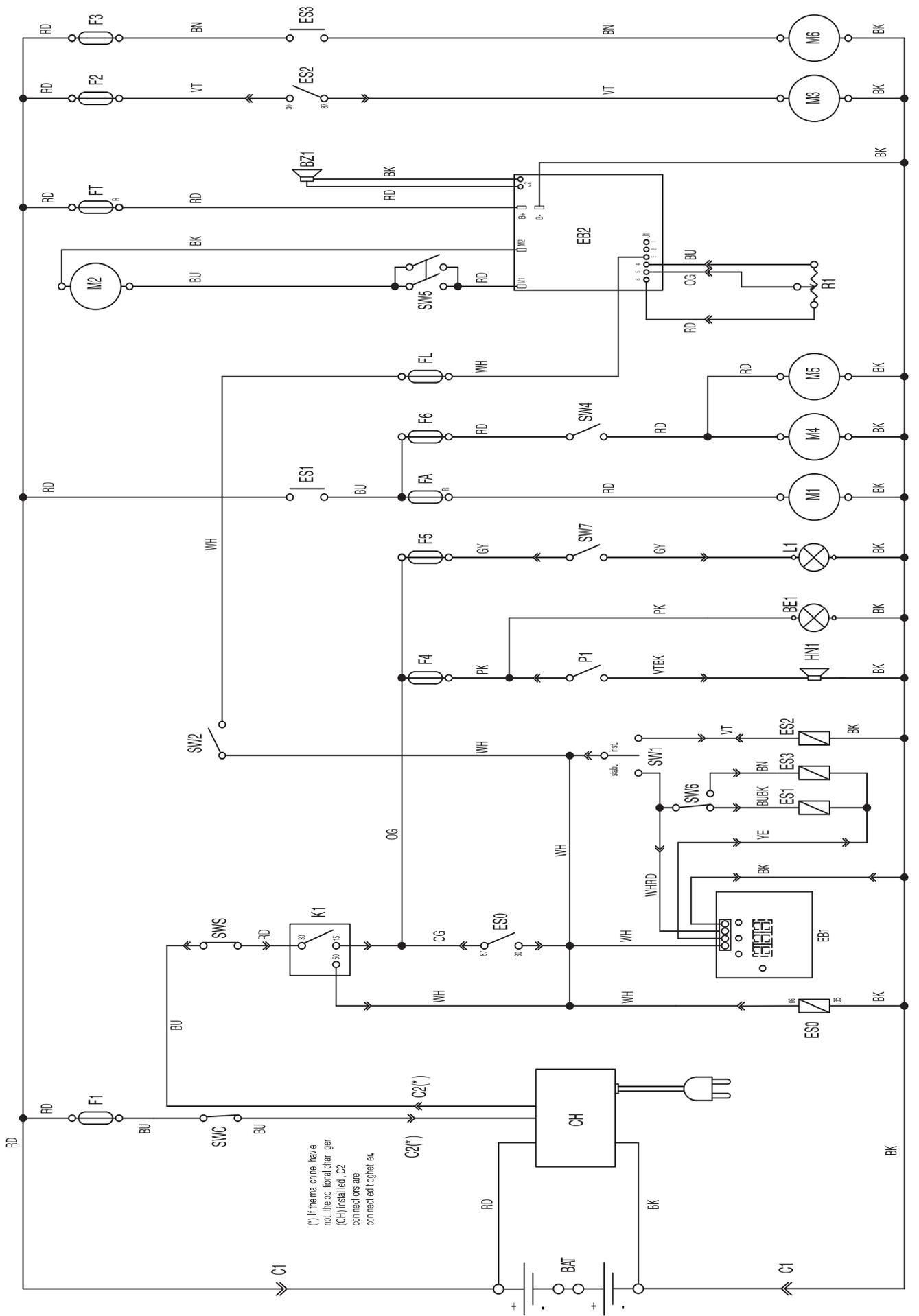
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S310201

U





(\*) If the ma. chine have not the optional charger (CH) installed, C2 connections are connected together. er.

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## **INTRODUCTION**

### **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, operation, storage, maintenance, spare parts and safety.

Before carrying out any procedure on the machine, the operators and qualified technicians must read this Manual carefully. Contact Nilfisk-Advance in case of doubts regarding the interpretation of the instructions and for any further information.

### **TARGET**

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

The Operators must not carry out operations reserved for qualified Technicians. Nilfisk-Advance will not be answerable for damages coming from the non-observance of this prohibition.

### **HOW TO KEEP THIS MANUAL**

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

### **CONFORMITY CERTIFICATE**

Figure A shows the documentation certifying the sweeper conformity with the law in force.



#### **NOTE**

**Two copies of the original EC Declaration of Conformity are provided together with the machine documentation.**

### **IDENTIFICATION DATA**

The machine model and serial number are marked on the plate (1, Fig. U) applied on the frame and can be read by lifting the hood (10, Fig. C).

The machine model year is written in the EC statement and it is also indicated by the first two figures of the machine serial number.

This information is useful when ordering machine spare parts. Use the following table to write down the machine identification data for any further reference.

MACHINE model .....
MACHINE serial number .....

### **OTHER REFERENCE MANUALS**

- Electronic Battery Charger Manual (if equipped), to be considered an 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-Advance Service Centers)

### **SPARE PARTS AND MAINTENANCE**

All necessary operating, maintenance and repair procedures must be carried out by qualified personnel or by Nilfisk-Advance Service Centers listed at the end of this Manual. Only original spare parts and accessories must be used.

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

### **CHANGES AND IMPROVEMENTS**

Nilfisk-Advance 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 sold previously.

Any change and/or addition of accessory must be approved and performed by Nilfisk-Advance.

## SAFETY

The following symbols indicate potentially dangerous situations. Always read this information carefully and take all necessary precautions to safeguard people and property. The machine Operator's cooperation is essential in order to prevent injury. No accident prevention program is effective without the total cooperation of the person responsible for the machine operation. Most of the accidents that may occur in a factory, while working or moving around, are caused by failure to comply with the simplest rules for exercising prudence. A careful and prudent operator is the best guarantee against accidents and is essential for successful completion of any prevention program.

## SYMBOLS



### DANGER!

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



### WARNING!

It indicates a potential risk of injury for people.



### CAUTION!

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



### NOTE

It indicates 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!

- Remove the key from the ignition switch and disconnect the batteries before performing any maintenance/repair procedure.
- This machine must be used by properly trained and authorised personnel only. Children or disabled people cannot use this machine.
- Keep sparks, flames and incandescent materials away from the batteries. During the normal operation explosive gases are released.
- Do not wear jewels when working near electrical components.
- Do not work under the lifted machine, if it is not securely fixed.
- Do not operate the machine near toxic, dangerous, flammable and/or explosive powders, liquids or vapours.
- Battery charging produces highly explosive hydrogen gas. Keep the hood open during battery charging and perform this procedure in well-ventilated areas and away from naked flames.



### WARNING!

- Carefully read all the instructions before carrying out any maintenance/repair procedure.
- Take all necessary precautions to prevent hair, jewels and loose clothes from being caught in the moving parts of the machine.
- Do not smoke while charging the batteries.
- Before connecting the battery charger to the electrical mains, make sure that frequency and voltage shown in the relevant Manual correspond to the mains voltage.
- Do not charge the batteries if the battery charger cable or the plug are damaged. If the machine is not working as it should, has been damaged, left outdoors or dropped into water, return it to the Service Centre.
- 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.
- To reduce the risk of fire, electric shock, or injury, do not leave the machine unattended when it is plugged in.
- To avoid electric shock, do not expose to rain. Store the machine indoors.
- Do not allow to be used as a toy. Close attention is necessary when used near children.
- Use only as described in this Manual. Use only Nilfisk-Advance recommended accessories.
- Do not leave the machine unattended with the key inserted in the ignition switch and the parking brake disengaged.
- Do not use the machine on slopes with a gradient exceeding the value shown on the machine.

- 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.
- Do not use the machine in particularly dusty areas.
- While using this machine, take care not to cause damage to other people, and children especially.
- The storage temperature must be between 0°C and +40°C.
- The machine operating 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.
- Do not use the machine as a means of transport.
- Do not allow the brooms to operate while the machine is stationary to avoid damaging the floor.
- In case of fire, possibly use a powder fire extinguisher, not a water one.
- Do not bump into shelves or scaffoldings, especially where there is a risk of falling objects.
- Adjust the operation speed to suit the floor conditions.
- Avoid stopping the machine movement by turning the ignition switch to "0", and avoid pressing the emergency push-button, before the machine has stopped by releasing the accelerator pedal or by pressing the brake pedal.
- Do not tamper with the machine safety guards and follow the ordinary maintenance instructions 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, oils, etc.), which are subject to standards that require disposal in special centres (see the Scrapping chapter).
- If the machine is used according to the instructions, the vibrations do not cause dangerous situations. The machine vibration level is less than 2.5 m/s<sup>2</sup> (98/37/EEG-EN-1033/1995-EN 1032).
- When lead (WET) batteries 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.

## UNPACKING/DELIVERY

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 as follows.

Technical documents:

- Sweeper User Manual
- Electronic Battery Charger Manual (if equipped)
- Sweeper Spare Parts List

## MACHINE DESCRIPTION

### OPERATION CAPABILITIES

This sweeper has been designed and built to clean (by sweeping and vacuuming) smooth and solid floors, in civil and industrial environments and to collect dust and light debris 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 with the hands on the handlebar (1, Fig. C).

### DESCRIPTION

#### Control panel

##### (See Fig. B)

1. Left control panel
2. Ignition switch
3. Discharged battery warning light (red)
4. Semi-discharged battery warning light (yellow)
5. Charged battery warning light (green)
6. Display
7. Display selection push-button: hour counter/hour and minute counter/battery voltage (V)
8. Horn
9. Switch having the following functions:
  - in the central position: off
  - pushed forward (fixed): it turns on the main broom and the vacuum fan
  - pushed backward (not fixed): it turns on the filter shaker
10. Manual vacuum system switch (optional)
11. Working light switch (optional)
12. Emergency push-button
13. Control panel mounting screws
14. Right control panel
15. Steering column inclination adjusting lever

#### Outside view

##### (See Fig. C)

1. Steering wheel
2. Control panel
3. Vacuum activation/deactivation lever
4. Side broom lifting/lowering lever
5. Forward/reverse gear pedal
6. Service brake pedal
7. Parking brake lever (it acts on the front wheel)
- 7a. Brake engaged
- 7b. Brake disengaged
8. Front skirt lifting pedal
9. Can holder
10. Hood
11. Rear wheels on fixed axle
12. Front driving and steering wheel
13. Right side broom
14. Left side broom
15. Main broom
16. Left side skirt
17. Right side skirt
18. Front skirt
19. Rear skirt
20. Hopper
21. Hopper hook
22. Hopper handle
23. Main broom left door
24. Main broom height left adjusting knob
25. Main broom height right adjusting knob
26. Main broom right door
27. Main broom right door mounting screws
28. Pivoting light (always on when the ignition switch is turned to "I" position) (optional)
29. Driver's seat with safety microswitch
30. Additional hole for manual vacuum system (optional)
31. Adjustable steering column
32. Working light (optional)
33. Side broom height adjusting knob
34. Seat longitudinal position adjusting lever
35. Manual vacuum system (optional)
36. Side broom height adjusting knob ring nut

**Under-hood compartment  
(See Fig. U)**

1. Serial number plate/technical data/EC certification
2. Hood (open)
3. Hood support rod
4. Batteries
5. Battery caps (for WET batteries)
6. Battery connector
7. Electronic battery charger (optional)
8. Battery charger connecting cable
9. Lamellar fuse box (accessories)
10. Drive system circuit breaker
11. Main broom/vacuum fan motor circuit breaker
12. Lead (WET) or gel (GEL) battery selector switch on the optional electronic battery charger
13. Charged battery warning light (green)
14. Main broom belt
15. Main broom drive pulley
16. Vacuum fan
17. Main motor
18. Manual vacuum system (optional)
19. Switch for machine pushing
20. Battery installation diagrams

**TECHNICAL DATA**

<b>General</b>	<b>Values</b>
Machine length	1,255 mm
Machine width (without side brooms)	795 mm
Machine height	1,155 mm
Working width (with/without side brooms)	1,000/600 mm
Minimum height from the ground (skirts not included)	40 mm
Minimum turning radius	983 mm
Main broom size	Ø 265 mm x 600 mm
Side broom size	Ø 420 mm
Front driving and steering wheel	Ø 200 x 50 mm
Rear wheels	Ø 250 x 50 mm
Machine weight (without batteries)	143.89 kg
Maximum forward/reverse speed	5.5 km/h / 4.4 km/h
Gradeability	2%
Hopper capacity	40 litres
Main broom and vacuum fan motor	600 W
Side broom motors	60 W
Drive system motor	400 W
Filter shaker motor	12 W
Sound pressure level (A Lpa)	71.6 dB (A)

<b>Batteries</b>	<b>Values</b>
Battery voltage	24 V
Standard battery	Lead (WET), with acid electrolyte
Optional battery	Gel (GEL), hermetic
Battery capacity	100 – 240 Ah C5
Battery compartment maximum size	357x375x385 mm

<b>Dust vacuuming and filtering</b>	<b>Values</b>
Paper dust filter 5-10 µm	3 m <sup>2</sup>
Main broom compartment vacuum	18.3 mm H <sub>2</sub> O

**Wiring diagram  
(See Fig. V)**

BAT:	Batteries
BE1:	Pivoting light
BZ1:	Reverse gear buzzer
C1:	Battery connector
CH1:	Battery charger
EB1:	Hour counter and battery voltage display
EB2:	Drive system electronic board
ES0:	Starting relay
ES1:	Main broom switch
ES2:	Filter shaker relay
ES3:	Manual vacuum system switch
FA:	Main broom/vacuum fan fuse
FL:	Drive system electronic board fuse (3 A)
FT:	Drive system fuse
F1:	Main fuse (ignition switch circuit) (25 A)
F2:	Filter shaker motor fuse (25 A)
F3:	Manual vacuum system fuse (40 A) (optional)
F4:	Horn and pivoting light fuse (10 A) (optional)
F5:	Working light fuse (10 A) (optional)
F6:	Side broom motor fuse (10 A)
HN1:	Horn
K1:	Ignition switch
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
M6:	Manual vacuum system motor (optional)
P1:	Horn switch
R1:	Drive speed potentiometer
SWC:	Hood safety switch
SWS:	Emergency push-button
SW1:	Main broom, vacuum fan and filter shaker switch
SW2:	Driver's seat safety microswitch
SW3:	Forward/reverse gear microswitch
SW4:	Side broom microswitch
SW5:	Drive system switch
SW6:	Manual vacuum system switch (optional)
SW7:	Working light switch

**Colour code**

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

**Electrical fuses**

The following fuses are located under the hood (10, Fig. C):

- Circuit breakers, which can be reset by pressing the relevant key:
  - Drive system fuse (11, Fig. U)
  - Main broom/vacuum fan motor fuse (10, Fig. U)
- Lamellar fuses, protected by a transparent plastic cover (9, Fig. U), which protect the following circuits:
  - Fuse F1 (25 A): Main fuse (ignition switch circuit)
  - Fuse F2 (25 A): Filter shaker motor
  - Fuse F3 (40 A): Manual vacuum system (optional)
  - Fuse F4 (10 A): Horn and pivoting light
  - Fuse F5 (10 A): Working light (optional)
  - Fuse F6 (10 A): Side broom motors
  - Fuse F7 (25 A): Spare
  - Fuse F8 (10 A): Spare
- On the drive system electronic board there is the following fuse:
  - Drive system electronic board fuse (3 A)

**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
- Manual vacuum system
- Working light
- Pivoting light
- Skirts of various materials

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

## USE

**WARNING!**

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

- DANGER
- WARNING
- CAUTION
- NOTE

While reading this Manual, the operator must pay particular attention to these symbols.

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

### BATTERY CHECK/SETTING ON A NEW MACHINE

The machine requires two 12 V batteries or four 6 V batteries connected according to the diagrams (20, Fig. U).

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

#### a. WET or GEL batteries already installed on the machine

1. Open the machine hood (10, Fig. C) and engage the hood support rod (3, Fig. U), then check that the batteries are connected to the machine with the connector (6, Fig. U).
2. Disengage the support rod and close the hood. Check that the hood is properly closed (the machine must be as shown in Fig. C).
3. Insert the key into the ignition switch (2, Fig. B) and turn it to "I" position (without pressing the pedal (5, Fig. C)), then release it. If the green warning light (5, Fig. B) turns on, the batteries are ready to be used. If the yellow (4, Fig. B) or red (3, Fig. B) warning light turns on, it is necessary to charge the batteries (see the relevant procedure in the Maintenance chapter).

#### b. WET batteries installed on the machine but without electrolyte

1. Open the machine hood (10, Fig. C) and engage the hood support rod (3, Fig. U).
2. Remove all battery caps (5, Fig. U).

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

#### c. Without batteries

1. Buy appropriate batteries (See the Technical Data chapter and the diagrams (20, Fig. U)). 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, according to the procedure shown in the following paragraph.

## WET OR GEL BATTERY SETTING

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

1. Turn the ignition switch (2, Fig. B) to "0" position.
2. Open the hood (10, Fig. C) and engage the hood support rod (3, Fig. U).

### Machine setting

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 (6, Fig. U).
- Remove the screws (13, Fig. B) and carefully remove the right control panel (14).
- Install a jumper wire (1, Fig. T) on the GEL connectors (3) for gel batteries.
- Carefully install the control panel (14, Fig. B) and the screws.
- Reconnect the battery connector (6, Fig. U).

### Battery charger setting

1. Turn the selector switch (12, Fig. U) to WET or GEL according to the type of batteries.
2. Charge the batteries (see the procedure in the 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 (20, Fig. C) 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.**

## MACHINE START AND STOP

### Starting the machine

1. Sit on the driver's seat (29, Fig. C) and, if it is necessary for an easier access to the machine, push the lever (15, Fig. B) and tilt the steering column (31, Fig. C) forward.
2. Push the lever (15, Fig. B) forward and tilt the steering column (31, Fig. C) forward or backward, to reach a comfortable position. Then release the lever (15, Fig. B) and lock the steering column.
3. Without pressing the drive pedal (5, Fig. C), turn the ignition switch (2, Fig. B) to "II" position, then release it; it will go back to "I" position. Check that the green warning light (5, Fig. B) (charged battery) turns on. If the yellow or red warning light (3 or 4, Fig. B) turns on, turn the ignition switch back to "0" position and charge the batteries (see the procedure in the Maintenance chapter).
4. Disengage the parking brake according to the following procedure:
  - Press the pedal (6, Fig. C) and turn the lever (7, Fig. C) from (7a) position to (7b) position.
  - Release the pedal (6).
5. Drive the machine to the working area, by keeping the hands on the steering wheel and pressing the pedal (5, Fig. C) 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 (5, Fig. C).



### NOTE

**The seat (29, Fig. C) is equipped with a safety sensor, which allows the machine to be driven by pressing the pedal (5, Fig. C) only when the operator is on the driver's seat.**

6. Turn on the main broom and the vacuum fan by pressing the switch (9, Fig. B) forward.
7. Turn on the vacuum system with the lever (3, Fig. C).
8. Lower the side brooms (13 and 14, Fig. C) by lowering the lever (4).



### NOTE

**The side brooms (13 and 14, Fig. C) can be lowered and lifted even when the machine is moving. The side brooms do not rotate when they are lifted, but they rotate when they are lowered.**

9. Start sweeping by turning the steering wheel (1, Fig. C) and move the machine forward by pressing the pedal (5).

## Stopping the machine

1. To stop the machine, release the pedal (5, Fig. C). To stop the machine more quickly, also press the service brake pedal (6, Fig. C). In case of emergency, press the emergency push-button (12, Fig. B) to immediately stop the machine. To deactivate the emergency push-button (12), turn it clockwise.



### WARNING!

**Avoid stopping the machine movement by turning the ignition switch to “0”, and avoid pressing the emergency push-button, before the machine has stopped by releasing the accelerator pedal or by pressing the brake pedal.**

2. Lift the side brooms (13 and 14, Fig. C) by using the lever (4).
3. To turn off the main broom and the vacuum fan, turn the switch (9, Fig. B) to “0” (central) position.
4. To stop the machine, turn the ignition switch (2, Fig. B) to “0” position.
5. Engage the parking brake according to the following procedure:
  - Press the pedal (6, Fig. C) as necessary, then engage the brake by turning the lever (7, Fig. C) from (7b) position to (7a) position.
  - Release the pedal (6).

## MACHINE OPERATION

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 debris, lift the front skirt by pressing the pedal (8, Fig. C); remember that while the front skirt is lifted, the machine vacuum power decreases.



### WARNING!

**When operating on wet grounds, it is essential to turn off the vacuum system with the lever (3, Fig. C) to prevent the dust filter from being damaged.**

3. For machine proper operation, the dust filter must be as clean as possible. To keep the dust filter clean while sweeping, turn off the vacuum system with the lever (3, Fig. C), then press the switch (9, Fig. B) for a while. During this procedure the main motor and the vacuum fan are automatically stopped. After cleaning the filter, push the switch (9, Fig. B) forward to turn on the main broom and 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 (20, Fig. C) should be dumped after each working period and whenever it is full (see the procedure in the next paragraph).

## HOPPER DUMPING

1. Stop the machine by releasing the drive pedal.
2. Turn the ignition switch (2, Fig. B) to “0” position.
3. Disengage the hook (21, Fig. C) by pulling its lower end.
4. Remove the hopper (20, Fig. C) by using the handle (22), and dump it into special containers.
5. Reinsert the hopper and fasten it with the hook (21).
6. The machine is ready to start working again.

## AFTER MACHINE USE

After working, before leaving the machine:

- Lift the side brooms with the lever (4, Fig. C).
- Turn on the filter shaker with the switch (9, Fig. B).
- Dump the hopper (20, Fig. C) (see the previous paragraph).
- Remove the key from the ignition switch (2, Fig. B).
- Engage the parking brake according to the following procedure:
  - Press the pedal (6, Fig. C) as necessary, then engage the brake by turning the lever (7, Fig. C) from (7b) position to (7a) position.
  - Release the pedal (6).

## PUSHING/TOWING THE MACHINE

To easily push/tow the machine when it is off, proceed as follows:

- Open the hood (10, Fig. C).
- Turn the switch (19, Fig. U) to “0” and close the hood (10, Fig. C).
- Push or tow the machine.
- After pushing/towing the machine, turn the switch (19, Fig. U) to “I”.

## MACHINE LONG INACTIVITY

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

- Check that the machine storage area is dry and clean.
- Disconnect the battery connector (6, Fig. U).
- Slightly lift the machine so that the skirts, the main broom and the wheels do not touch the ground.
- If the optional battery charger (7, Fig. U) is installed, disconnect the positive terminal (+) directly from the battery (+) pole.

## FIRST PERIOD OF USE

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

1. Check the machine fastening and connecting parts for proper tightening.
2. Check the visible parts for integrity and leakage.

## MAINTENANCE

The lifespan of the machine and its maximum operating safety are ensured by correct and regular maintenance. The following table provides the scheduled maintenance. The intervals shown may vary according to particular working conditions, which are to be defined by the person in charge of the maintenance.



**WARNING!**

To carry out maintenance procedures, switch off the machine (remove the key from the ignition switch) and, if necessary, disconnect the batteries.

Moreover, carefully read the instructions in the Safety paragraph.

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.



**NOTE**

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

### SCHEDULED MAINTENANCE TABLE

Procedure	On delivery	Every 10 hours	Every 50 hours	Every 100 hours	Every 200 hours	Every 400 hours
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			(*)			
Hood safety switch operation check			(*)			
Main broom drive belt visual inspection				(*)		
Nut and screw tightening check				(*) (1)		
Service and parking brake check and adjustment				(*)		
Main broom drive belt replacement					(*)	
Main motor and drive system motor carbon brush check and 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 that the main broom is at the correct height from the ground, according to the following procedure:
  - Drive the machine on a level ground.
  - Keep the machine stationary and rotate the main broom for a few seconds.
  - Stop and lift the main broom, then move the machine.
  - Check that the main broom print (1, Fig. D), along its length, is 2 to 4 cm wide.  
If the print (1) is not within specifications, it is necessary to adjust the broom height, according to the procedure shown in step 2.
2. Drive the machine on a level ground and engage the parking brake (6 and 7, Fig. C).
3. Turn the ignition switch (2, Fig. B) to “0” position.
4. Loosen the knobs (1, Fig. E) on both sides of the machine.
5. Operating on the knobs (1, fig. E) move, on both sides of the machine, the broom height variation indicator (2) as necessary and then screw down the knobs (1). The indicator (2) must be in the same position on both sides of the machine; the maximum difference allowed to obtain the print (1, Fig. D) described in step 1 (2 - 4 cm wide) is 2 notches.
6. Perform step 1 again to check that the main broom is at the correct height from the ground.
7. When the broom is too worn and can no longer be adjusted, replace it according to the instructions in the following paragraph.

**CAUTION!**

An excessive print (larger than 4 cm) of the main broom can lead to the machine malfunction and the overheating of the moving parts, thus reducing machine life. Pay careful attention when performing the above-mentioned checks, and always use the machine according to the indicated conditions.

## MAIN BROOM REPLACEMENT

**NOTE**

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

**CAUTION!**

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

1. Drive the machine on a level ground and engage the parking brake (6 and 7, Fig. C).
2. Turn the ignition switch (2, Fig. B) to “0” position.
3. Loosen the knobs (1, Fig. E) on both sides of the machine.
4. Move the broom height variation indicators (2, Fig. E) until the broom is at the maximum distance from the ground. Screw down the knobs (1).
5. On the left side of the machine, loosen the knob (3, Fig. E).
6. Remove the broom door (1, Fig. F) by pulling it upwards to disengage the retainers (2).
7. Remove the broom (1, Fig. G).
8. The new broom must be installed with the bristles rows bent as shown in the figure H (top view).
9. Install the new broom on the machine and ensure that its mesh (1, Fig. I) correctly fits into the relevant drive hub (4, Fig. R). Check that the drive hub is free from dirt or foreign materials (cords, rags, etc.) accidentally rolled up.
10. Install the broom door (1, Fig. F) by engaging the retainers (2).
11. Screw down the knob (3, Fig. E).
12. Carry out the main broom height check and adjustment, as shown in the previous paragraph.

## SIDE BROOM HEIGHT CHECK AND ADJUSTMENT



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

1. Check the side broom height from the ground, according to the following procedure:
  - Drive the machine on a level ground and lower the side brooms.
  - Keep the machine stationary, lower the side brooms and rotate them for a few seconds;
  - Stop and lift the side brooms, then move the machine and switch it off.
  - Check if the size and orientation of the prints left by the side brooms are as shown in the figure (1 and 2, Fig. J).

**If the print (1) is not within specifications, it is necessary to adjust the broom height, according to the procedure shown in step 2.**

2. Unlock the ring nut (36, Fig. C) by turning it counterclockwise, then turn the knob (33) as necessary, clockwise or counterclockwise, to adjust the broom height; then lock the knob (33) with the ring nut (36).
3. Perform step 1 again to check the proper adjustment of the side broom height from the ground.
4. When the brooms are too worn to be adjusted, replace them as shown in the next paragraph.

## SIDE BROOM REPLACEMENT



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



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

1. Drive the machine on a level ground and engage the parking brake (6 and 7, Fig. C).
2. Turn the ignition switch (2, Fig. B) to “0” position.
3. Introduce the hand inside the side broom and press the tabs (1, Fig. K) inwards, then remove the broom (2) disengaging it from the four pins (3).
4. Install the new broom on the machine engaging it on the pins (3) and on the tabs (1).
5. Carry out the side broom height check and adjustment, as shown in the previous paragraph.

## CLOSED POCKET 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 (6 and 7, Fig. C).
2. Turn the ignition switch (2, Fig. B) to “0” position.
3. Remove the hopper hook (21, Fig. C).
4. Remove the hopper (20, Fig. C) by using the handle (22).
5. Turn the handle (1, Fig. L) downwards (90° approximately) and let the filter frame (2) rotate outwards.
6. Remove the dust filter (3).
7. In an appropriate outdoor area, clean the filter by shaking it on a level and clean surface, tapping the side (1, Fig. M) opposite to the wire gauze (2). Complete the cleaning by using compressed air (3) at maximum 6 bars, blowing only from the side protected by the wire gauze (2), 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; the filter can be damaged.
- Polyester filter (optional): To clean it, see the above-mentioned instructions. If necessary, 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.

8. Check the filter body for tears.
9. If necessary, clean the filter compartment rubber seal (4, Fig. L) along its perimeter and check it for integrity. If necessary, replace it.
10. Assemble in the reverse order of disassembly.



**NOTE**  
Assemble the filter with the wire gauze (2, Fig. M) facing the vacuum fan (16, Fig. U).

## SKIRT HEIGHT AND OPERATION CHECK

1. Drive the machine on a level ground that is suitable for checking the skirt height. Engage the parking brake (6 and 7, Fig. C).
2. Turn the ignition switch (2, Fig. B) to "0" position.

### Side skirt check

1. Check the side skirts (16 and 17, Fig. C) for integrity. Replace the skirts when they have cuts (1, Fig. N) larger than 20 mm or cracks (2) larger than 10 mm (for skirt replacement, refer to the Service Manual).
2. Check that the side skirt (16 and 17, Fig. C) height from the ground is within 0 – 3 mm (Fig. O). If necessary, adjust the skirt height, according to the following procedure:

#### Left skirt:

- Open the hood (10, Fig. C) and engage the hood support rod (3, Fig. U).
- Loosen the knob (3, Fig. E) and remove the broom left door (1, Fig. F), pulling it upwards to disengage the retainers (2).
- Adjust the skirt (3, Fig. F) height by using the slots (4).
- Assemble in the reverse order of disassembly.

#### Right skirt:

- Remove the main broom, as shown in the relevant paragraph.
- Remove the belt (14, Fig. U) from the pulley (15); for a easier removal, turn the pulley (15) by operating on the vacuum fan (16) manually.
- Remove the screws (27, Fig. C) and the right door (26) together with the belt (14, Fig. U). Adjust the skirt (1, Fig. S) height by using the slots (2).
- Assemble in the reverse order of disassembly.

## Front and rear skirt check

1. Remove the main broom, as shown in the relevant paragraph.
2. Check the front (1, Fig. R) and rear (2) skirts for integrity.
3. Replace the skirts when they have cuts (1, Fig. N) larger than 20 mm or cracks (2) larger than 10 mm (for skirt replacement, refer to the Service Manual).
4. Check that:
  - The front skirt (1, Fig. R) slightly touches the ground and that it is not detached from the ground (1, Fig. P).
  - The rear skirt (2, Fig. R) height from ground is within 0 - 3 mm (1, Fig. O).
5. If necessary, adjust the skirt height by using the slots (3, Fig. R).
6. Press the front skirt lifting pedal (8, Fig. C) and check that the front skirt (1, Fig. Q) rotates upward of about 90° (as shown in figure); 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.
7. Assemble in the reverse order of disassembly.

## HOOD SAFETY SWITCH OPERATION CHECK

With the vacuum fan turned on, slightly open the hood (10, Fig. C) and check that the fan immediately turns off.

If opening the hood (10) does not cause the vacuum fan to turn off, contact an authorised Service Center or Retailer.

## CHARGING THE BATTERIES



### WARNING!

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

1. Drive the machine on a level ground and engage the parking brake (6 and 7, Fig. C).
2. Turn the ignition switch (2, Fig. B) to "0" position.
3. Open the hood (10, Fig. C) and engage the hood support rod (3, Fig. U).
4. (For WET batteries only) check the level of electrolyte inside the batteries. If necessary, top up through the caps (5, Fig. U).  
Leave all the caps (5) 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 (7, Fig. U) (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 (6, Fig. U) 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 (6, Fig. U).
5. (For WET batteries only) check the level of electrolyte inside the batteries and close all the caps (5).
6. Reconnect the battery connector (6, Fig. U) to the machine connector.
7. Disengage the hood support rod (3, Fig. U) and close the hood (2); 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 (5, Fig. U). Leave all the caps (5) 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 (8, Fig. U) to the electrical mains.



**WARNING!**  
Check that the voltage and frequency shown on the machine serial number plate (1, Fig. U) correspond to the electrical mains values.

3. When the green warning light (13, Fig. U) turns on, the batteries are charged.
4. For further information about the battery charger operation (7, Fig. U), see the Battery Charger Manual.
5. Disconnect the battery charger connector (8, Fig. U) from the electrical mains and place it in its special housing.
6. (For WET batteries only) Close all the caps (5, Fig. U).
7. Disengage the hood support rod (3, Fig. U) and close the hood (2); the machine is ready to be used.



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

## SAFETY FUNCTIONS

The machine is equipped with the following safety functions.

### EMERGENCY PUSH-BUTTON

It is located in an easily accessible position (12, Fig. B). It has to be pressed in case of emergency, to stop all the machine functions.

To reset it, turn it clockwise.

### HOOD SAFETY SWITCH

It activates when the machine hood is opened: It stops all functions.

If the machine keeps operating when the hood is open, contact an authorised Service Center or Retailer immediately.

### 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

Trouble	Remedy
The machine does not start when turning the ignition switch to "I" position.	Check the battery connector (6, Fig. U) for proper connection.
	Check that the hood (10, Fig. C) is closed.
	Check the fuse F1 in the box (9, Fig. U) for integrity.
	Check that the optional battery charger (7, Fig. U) is disconnected from the electrical mains.
The machine does not move by pressing the pedal (5, Fig. C).	Check that the parking brake (6 and 7, Fig. C) has been released.
	Check that the switch (19, Fig. U) is in "I" position.
	Check that the drive pedal (5, Fig. C) is not pressed while starting the machine with the ignition switch (2, Fig. B), or while the operator is sitting on the driver's seat. The drive pedal (5, Fig. C) has to be pressed only after the operator has sit on the driver's seat and the machine has been started.
The side brooms do not operate.	Check the fuse F6 in the box (9, Fig. U) for integrity.
The machine operates only when stationary, otherwise it switches off and the red warning light (3, Fig. B) flashes.	Charge the batteries. If the trouble persists, replace the batteries.
Battery autonomy is low.	Install batteries having higher capacity (minimum 100 Ah C5).



### NOTE

**If the machine has been supplied with the optional battery charger, the machine cannot operate if the charger is not on board. In case of battery charger malfunction, contact an authorised Service Center.**

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

## SCRAPPING

Have the machine scrapped by a qualified scrapper. Before scrapping the machine, remove the following materials, which must be disposed of properly according to the law in force.

- Batteries
- Polyester dust filter
- Main and side brooms
- Electrical and electronic components (\*)
- Plastic components and hoses

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

