

# WS24

**ORDER #86009**

## **Betco Watchman™ 24 Automatic Scrubber**

### **FEATURES**

- Simple Design for Easy Operation
- Large Tank Capacity Increases Productivity
- Easy Access Parts Design
- Heavy Duty Squeegee Assembly
- Built Durable for Maximum Performance
- Self Propelled

The Betco Watchman™ series of automatic scrubbers bring a new dimension to cleaning maintenance. A simple design makes the WS24 easy to operate and reduces operator training. The 24" cleaning path along with the 13-gallon solution and 15-gallon recovery tank increases productivity. A heavy-duty squeegee assembly provides maximum water recovery, and easy access to all areas of the machine reduces service down time. Betco's Watchman™ Automatic Scrubbers are built durable to last and will help make your cleaning maintenance jobs easier!

### **WARRANTY**

Tank: 10 Year

Other components: 3 Year\*

\*Please refer to Betco Equipment Price/Product Guide for complete equipment warranty information.



### **SPECIFICATIONS**

- Cleaning Path: 24"
- Pad Drivers: (2) 12"
- Brush Motor: (1) .75 hp
- Brush Pressure: 106 lbs
- Brush Speed: 135 rpm
- Vacuum Motor: 0.75 hp
- Drive Motor: 1/8 hp
- Maximum Drive Speed: 2.5 mph
- Solution Control: Gravity Feed - Adjustable
- Solution Tank: 13 Gallon
- Recovery Tank: 15 Gallon
- Volts: 24 volt system
- Weight: 210 lbs. w/o batteries  
310 lbs. w/batteries
- Tires: (2) 8"
- Dimensions: Length 40"  
Width 23"  
Height 39"

### **APPLICATIONS**

- General Cleaning
- Heavy Duty Scrubbing
- Stripping

**Authorized Betco Distributor:**

**Better Resources. Better Results.**  
**BETCO**®

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## 2. GENERAL INFORMATION



**Read this manual carefully before starting any operations on this machine<sup>1</sup>.**

### 2.1. Scope of the manual

This manual has been drawn up by the Manufacturer and is considered as an integral part of the machine.

It defines the purpose for which the machine has been manufactured and contains all information the operators<sup>2</sup> require.

Besides this manual, which contains the necessary information for the users, other publications have been issued, which contain the specific information for the technicians in charge of maintenance<sup>3</sup>.

The constant observance of the instructions guarantee the safety of man and machine, low running costs, quality results and a longer work life of the machine itself. The non-observance of the prescribed rules could injure men, damage the machine, spoil the washed floor and even the environment.

To find the single topics in a fast way, see the descriptive table of contents at the beginning of this manual.

The paragraphs that are not to be neglected are printed in bold letters and preceded by symbols illustrated and defined below.

### **! DANGER**

**Indicates that attention must be paid to avoid serious consequences that could cause the death of the personnel or possible damages to health.**

### **⚠ WARNING**

**Indicates that attention must be paid to avoid serious consequences that could damage the machine, spoil the environment where the machine is used or cause economic losses.**

### **i INFORMATION**

**Particularly important instructions.**

In following a policy of constant development and update of the product, the Manufacturer could implement modifications without any previous notice.

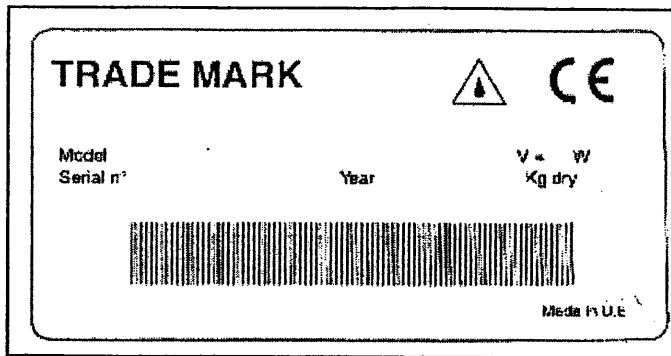
Even though the machine you own is greatly different from the one(s) illustrated in this manual, safety and information thereof are guaranteed anyway.

<sup>1</sup> The definition "machine" substitutes the commercial name to which this manual refers.

<sup>2</sup> People authorised to use the machine without carrying out maintenance operations that require precise technical knowledge.

<sup>3</sup> People having the experience, technical preparation and knowledge of the regulations and laws necessary to carry out the activity and capable to recognize and avoid possible dangers when handling, installing, using the machine and carrying out maintenance operations.

## 2.2. Identification of the machine



**Fig. 1**

The number plate (fig. 1), which is attached at the rear of the machine, shows the following information:

- model code;
- machine model;
- power supply voltage;
- total rated power;
- serial number (registration number);
- year of manufacture;
- dry weight;
- maximum full load weight;
- steepest slope that can be overcome;
- bar code with serial number;
- Manufacturer's identification.

## 2.3. Documentation annexed to the machine

- User's Manual;
- warranty certificate;
- adhesive slips for spare part orders;
- test sheet;
- CE Certificate of conformity.

### 3. TECHNICAL INFORMATION

#### 3.1 General description

The machine is a sweeping scrubber, which can be used in civil and industrial environments for sweeping, washing and drying flat, horizontal, smooth or moderately rough floors, with even surfaces and free from obstacles.

The scrubber distributes on the floor an adequately dosed solution of water and detergent, and brushes it to remove dirt. Choosing with care the right cleaning detergent and brushes (or abrasive discs) in the wide range of accessories available, the machine can adapt itself to all kinds of combinations of floors and dirt.

A liquid suction system, which is embedded in the machine, allows a perfect drying of the just-washed floor: actually thanks to a suction unit which sucks up the air from the recovery tank thus creating a vacuum, the squeegee scrapes the dirty water from the floor, collects it and sends it to the recovery tank.

The storage battery feeding and the high capacity of usable batteries allow the **maximum freedom of movement** and endurance at **any work conditions**.

Moreover, thanks to the electronically driven motor and being the machine provided with forward gear speed and freewheel, any path on the floor to clean can be easily run to and fro.

#### 3.2. Legend

The main components of the machine are the following (fig. 2):

- the detergent solution tank (fig. 2, ref. 7): used to contain and carry the mixture of clean water and detergent;
- the recovery tank (fig. 2, ref. 2): used to collect dirty water sucked up from the floor during washing;
- control panel (fig. 2, ref. 1);
- head unit (fig. 2, ref. 4): the main element is represented by the brushes (fig. 2, ref. 5), which distribute the detergent solution on the floor, removing dirt;
- squeegee unit (or floor wiper, fig. 2, ref. 6): used to wipe and dry the floor, sucking up the water spread on the floor;
- small carriage wheel (fig. 2, ref. 3): makes the machine displacements easier when the drive motor is off;
- drive unit (fig. 2, ref. 8): the main element is represented by the electronically controlled motor, which is started by a proper lever under the handgrip and makes the machine move forward.

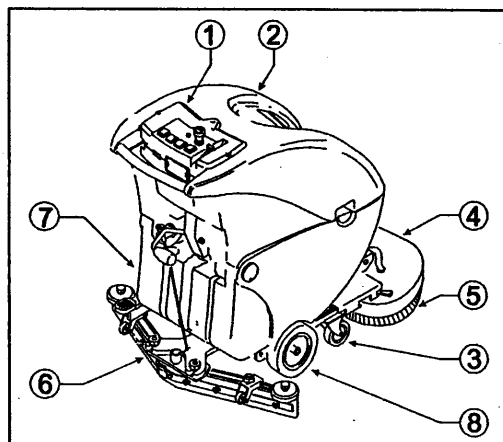
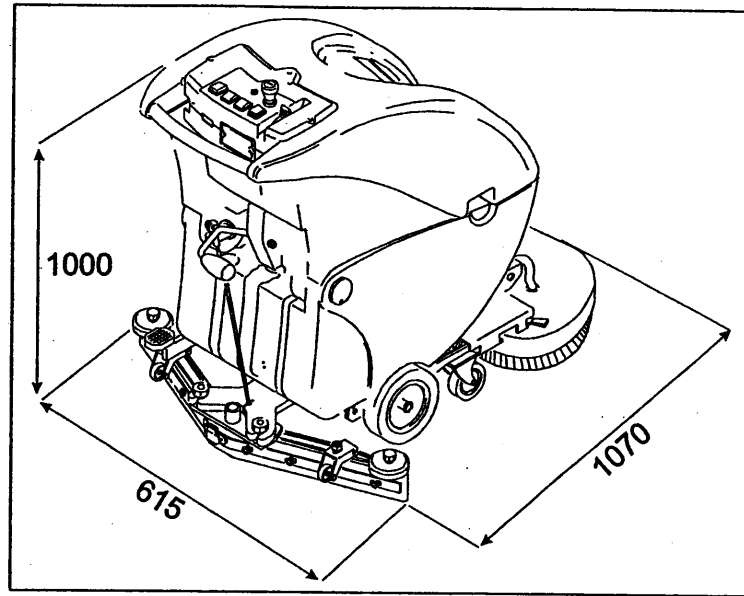


Fig. 2

### 3.3 Overall dimensions



### 3.4. Technical specifications

Cleaned track width	mm	600
Squeegee width	mm	800
Hourly performance	m <sup>2</sup> /h	2400
Number of brushes	n°	2
Brush diameter	mm	310
Max brush pressure	daN	48
Brush rotation speed	G/1°	135
Brush motor power	W	600
Drive control	/	Electronic
Drive motor rated power	W	120
Maximum speed	Km/h	4
Three-stage suction motor power	W	550
Suction motor vacuum	Pa	17000
Noise level	dB(a)	70
Solution tank	l	50
Recovery tank	l	60
Wheel diameter	mm	200
Net weight without batteries	Kg	95
Number of batteries	n°	2
Series battery voltage	V	24
Single battery capacity	Ah (5h) Ah (20h)	100 140
Single battery weight	Kg	36
Battery compartment size (length, width, height)	mm	380x 360x 300
Machine size (length, width, height)	mm	1070x 615x 1000
Dimensions of packing (length, width, height)	mm	1130x 680x 1180

**Table A** Data can be changed without notice.

### 3.5. Danger areas

**A -Tank unit:** in presence of certain detergents, danger of irritation for the eyes, skin, mucous diaphragms, respiratory apparatus and asphyxia. Danger caused by dirt recovered from the environment (germs and chemical substances). Danger of crushing between the recovery tank and solution tank, when the recovery tank is replaced on the solution tank.

**B -Control panel:** danger of shortcircuits.

**C -Bottom of washing head:** danger caused by the brush rotation.

**D -Rear wheels:** danger of crushing between wheels and chassis.

**E -Battery compartment** (located within the solution tank): danger of short circuits between the battery poles and presence of hydrogen during battery charging.



### 3.6. Accessories

- **Bristle brushes:** used for washing delicate floors and for polishing;
- **Polipropilene brushes:** used for normal floor washing;
- **Tynex brushes:** used to remove accumulated stubborn dirt on resistant floors;
- **Drive discs:** allow the use of the following discs:
  - \* yellow discs: used for washing and polishing marble and similar surfaces;
  - \* green discs: used for washing of resistant floors;
  - \* black discs: used for thorough washing of resistant floors with stubborn dirt;

## 4. INFORMATION ON SAFETY

### 4.1. Safety standards



**Read the User's manual carefully before proceeding with start-up, use, maintenance, routine maintenance or any other operations on the machine.**

### **WARNING**

**Stick to all the instructions contained in this Manual (especially those regarding danger and warning) and observe the safety plates attached on the machine.**

**The Manufacturer declines all responsibility for injuries to persons or damage to things deriving from the non-observance of these instructions.**

The machine must be used by trained personnel only, who have shown their skill and have been expressly authorized to use it.

Persons under eighteen cannot use the machine.

This machine must not be used for any other purpose than that for which it has been expressly manufactured. Assess the type of building in which it will be used (e.g. pharmaceutical and chemical companies, hospitals, etc.) and scrupulously respect the regulations and conditions in force.

Do not use the machine in places that are not adequately lighted, in environments with danger of explosions, on public roads, in the presence of dirt harmful to health or improper environments.

The suitable temperature for the use of the machine ranges between +4°C and +35°C; when the machine is not used, the temperature range is between +0°C e +50°C.

The humidity range for the machine under any conditions varies between 30% and 95%.

Never use or suck up inflammable or explosive liquids (e.g. petrol, fuel oil, etc.), inflammable gases, dry dust, acids and solvents (e.g. solvents for paints, acetone, etc.) even if diluted. Never suck up any burning or white-hot objects.

Do not use the machine on slopes or ramps higher than 2%; in the event of light slopes do not use it transversally, handle it with extreme care and do not reverse. When driving along ramps or heavier slopes take great care to avoid overturning or uncontrolled acceleration. Overcome ramps and/or steps exclusively with the brush head and squeegee lifted.

**Never park the machine on slopes.**

Never leave the machine in operation unattended. Leave the machine only after having

switched off the motor, made sure that it cannot move accidentally and unplugged it from the mains.

When using the machine mind the presence of people particularly children in the environment where you are working.

Do not use the machine to carry persons/things or to tow things. Do not drag the machine.

Never lay things on the machine for any reason.

Do not obstruct the air vents and heat dispersion openings.

Do not remove, modify or elude the safety devices.

Various and unpleasant experiences have shown that people wear or carry various objects capable of causing serious accidents: before starting to work, remove trinkets, watches, neckties or other such things.

Always use individual safety protections: apron or protective suit/overalls, non-slip waterproof shoes, rubber gloves, protective goggles and caps, face mask to protect the respiratory system.

Do not put the hands in between moving organs.

Do not use detergents different from those provided for, and stick to the instructions indicated on the respective safety sheets. Keep detergents in a safe place, inaccessible to children, and in case they come in contact with the eyes, wash them immediately with plenty of water or, if swallowed, call for a doctor immediately.

Make sure that the plugs for the power supply of the models with cable or of the battery-chargers are properly grounded and protected by magnetothermal switches and differentials.

Make sure that the electric characteristics of the machine (voltage, frequency, absorbed power) indicated on the identification plate (fig. 1), are compliant with those of the power distribution plant. The machine with cable is equipped with three lead wires and a three-contact ground plug for the use of a proper grounding plug. The yellow and green wire of the cable is the earth wire: never connect this wire to other wires that are not the plug ground tap.

It is fundamental to observe the battery Manufacturer's instructions and stick to the Legislator's provisions. Keep batteries always dry and clean to avoid surface leakage currents. Keep batteries safe from impurities, for instance metal dust.

Do not lay tools on batteries: danger of short circuits and explosions.

Mind the use of battery acid: stick to the relative safety instructions.

When using the machine model with cable mind that you do not crush or tear the power supply cable. Check this cable periodically to control if it is damaged; if this is so, the machine cannot be used.

In presence of particularly high magnetic fields assess the possible effects on the control electronics.

Never wash the machine with jets of water.

The recycled fluids contain detergents, disinfectants, water, organic and inorganic stuff recycled during the work stages: they must be disposed of in compliance with the laws in force.

In case of breakdown and/or bad operation of the machine, switch it off immediately (unplugging it from the mains) and do not tamper with it. Contact a technical assistance centre of the Manufacturer's.

All maintenance operations must be performed in adequately lighted environments and only after having disconnected the machine from the power supply (in models with cable by unplugging the machine from the socket, while in models with battery by detaching the battery connector).

Have any electrical work and all maintenance and repair operations (particularly those not

explicitly described in this manual) carried out a specialised and trained technical staff only.

In case of replacement of the power supply cable, plug or terminals, perform the repair by properly fixing the electric connections and the cable blocking strap that is located in the control panel, to guarantee the resistance of the cable. Then reassemble the panel with care to ensure the protection of the machine user.

Only the use of original accessories and spare parts supplied by the Manufacturer is permitted, as only these offer the certainty that the machine will operate safely and without any inconveniences. Do not use parts removed from other machines or other kits as spares.

This machine has been designed and manufactured for a service endurance of ten years starting from the date of manufacture, which can be seen on the identification plate (see fig. 1). After this time, whether the machine has been used or not, disposal must be considered according to the laws in force in the place of use:

- the machine must be disconnected from the mains, emptied of all liquids and cleaned;
- then it must be dismantled in homogeneous groups of materials (plastics according to the indications of the recycling symbol, metals, rubber, wrapping and packing). In case there are parts composed of different materials, refer to the competent bodies;
- each homogeneous group must be disposed of according to the laws governing the recycling of materials.

Alternatively, the machine can be sent to the Manufacturer for a thorough overhaul.

If the machine is not used anymore, it is recommended that batteries are removed and deposited at an authorized collecting centre.

Moreover, it is recommended that you make harmless those parts of the machine that could be dangerous especially to children, who could use the machine for their games.

## 5. HANDLING AND INSTALLATION

### 5.1. Lifting and carrying the packed machine

#### WARNING

**In all lifting operations make sure that the packed machine has been tightly anchored to the pallet, in order to avoid any overturning or accidental falls. Loading and/or unloading from the motor vehicles must be performed in an adequately lighted environment.**

The machine, which is packed on a wooden pallet by the Manufacturer, must be loaded by means of proper handling machines (refer to the EEC provision 89/392/CEE and following amendments), onto the carrier and, once it has arrived at the appointed destination, unloaded by similar means.

The squeegees are packed in cardboard boxes without a pallet.

The packed machine body must be lifted only with a fork lift truck. Handle with care to avoid bumps or overturnings.

### 5.2. Checking the machine on delivery

On delivery check with attention that the package and the machine are not damaged. In the event that the machine has suffered any damages, report so to the carrier; before accepting the goods, reserve by written the right to present a claim for the refund of the damages.

### 5.3. Unpacking

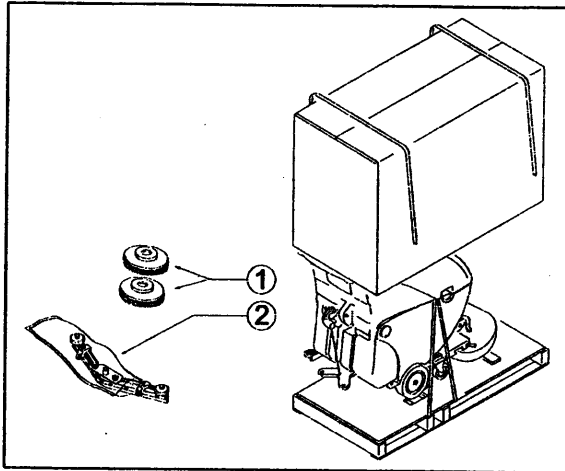
#### WARNING

**On unpacking the machine, the operator must be provided with the necessary accessories (e.g. gloves, protective goggles etc.) to limit possible hazards of accidents.**

Unpack the machine in the following way:

- cut and remove the plastic straps with scissors or nippers;
- remove the cardbox;
- remove the envelopes inside the battery compartment (within the solution tank) and check its contents:
  - envelope 1: - test sheet;
  - warranty coupon;
  - user's and maintenance manual;
  - list of spare parts;
  - cards with serial numbers to order spare parts;
  - envelope 2: - 1 battery bridge with clips;
  - 1 pair of tweezers for fuses;
  - 1 connector for the battery-charger;
- depending on the model, remove the metal brackets or cut the plastic straps, which fix the machine chassis to the pallet;
- let the machine slide down the pallet on an inclined plane, by pushing it into reverse;
- unwrap the brushes (fig. 3, ref. 1) and the squeegee (fig. 3, ref. 2) from their packing;
- clean the outside of the machine observing the safety rules;
- after unpacking the machine, you can install the batteries: see respective paragraphs.

If necessary, preserve the wrapping material as it could be used again to protect the machine in the event of a move or if the machine should be sent to a service centre for repair.



Otherwise, the material must be disposed of in compliance with the laws in force.

Fig. 3

#### 5.4. Feeding batteries

Two different batteries can be fitted on this machine:

- **Tubular leak-proof batteries:** these batteries require the periodical check of the electrolyte level. When it is necessary, top up with distilled water alone until the plates are covered; do not overfill (max. 5 mm. above the plates).
- **Gel batteries:** this kind of batteries requires no maintenance.

The technical specifications must correspond to those indicated in the paragraph concerning the machine technical data: actually, the use of heavier storage batteries can cause serious problems to the machine controllability and overheat the drive motor, whereas storage batteries with a lower capacity require recharges more frequently. They must be kept charged, dry and clean, with their connections tight.

##### 5.4.1. Batteries: preparation

### ! DANGER

**On installing or performing any kind of maintenance on the batteries wear the necessary accessories (e.g. protective gloves, goggles, overalls, etc.) to limit the hazards of accidents, keep away from possible free flames, do not short-circuit the battery poles, cause sparks or smoke.**

The batteries are normally supplied filled with acid and ready-for-use.

If batteries without acid are to be used, before mounting them on the machine, it is necessary to make them active as follows:

- after taking off the battery plugs, fill up all elements with a solution of specific sulphuric acid, until the cells are thoroughly covered (fill each element at least twice);
- let them rest for about 4-5 hours, to give time to air bubbles to come up to the surface and the plates to absorb the electrolyte;
- check that the electrolyte level is still above the plates, otherwise top up with the solution of sulphuric acid;
- reclose the plugs;
- install the storage batteries on the machine (following the procedure described below).

It is now necessary to perform a first recharging before having the machine start; to do so stick to the instructions written in the respective paragraph.

#### 5.4.2. Batteries: installation and connection

### ! DANGER

**Check that all switches on the control panel are at the position "0" (off).  
Mind you connect only the clips marked with the symbol "+" to the positive poles.  
Do not check the battery charge by creating sparkles.  
Stick scrupulously to the instructions described below, as any short circuits of the  
batteries may cause them to explode.**

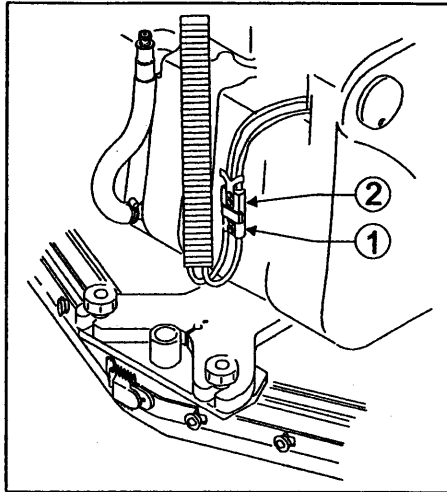


Fig. 4

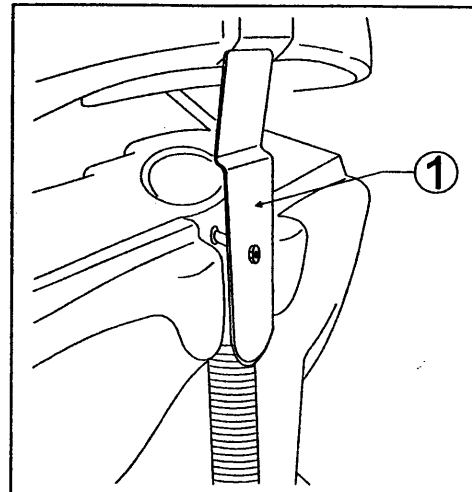


Fig. 5

- 1) Make sure that the two tanks are empty (empty them, if necessary: see respective paragraph);
- 2) disconnect the Anderson connector (fig. 4, ref. 2) of the battery wiring from the corresponding Anderson connector (fig. 4, ref. 1) of the main wiring;
- 3) unhook the recovery tank (fig. 2, ref. 2) from the solution tank (fig. 2, ref. 7) acting on the blocking hook (fig. 5, ref. 1), placed on front of the machine;
- 4) lift the recovery tank, by making it turn backwards around about 90°: in this way you have access to the battery compartment (embedded in the solution tank) from the upper side;
- 5) insert the batteries in the compartment, orienting them as shown in the drawing printed on the solution tank in the compartment.

### ! WARNING

**Install the storage batteries on the machine using suitable means according to their weight.**

**Positive and negative poles have different diameters.**

- 6) Referring to the arrangement of cables in the aforesaid drawing, connect the clips of the battery wiring and the bridge to the poles of the storage batteries. After orienting the cables as shown in the drawing, tighten the clips at the poles and cover them with vaseline;
- 7) insert back the tank unit in its work position and hook it to the solution tank by means of the fixing hook (fig. 5, ref. 1);
- 8) after having checked that all switches on the control panel are at the position "0" (off), connect the battery wiring connector (fig. 4, ref. 2) to the machine wiring connector (fig. 4, ref. 1);
- 9) use the machine in compliance with the instructions written below.

## 5.5. The battery-charger

### WARNING

**Never let the batteries run down excessively, as they could become damaged irreparably.**

#### 5.5.1. Choosing the battery-charger

Check that the battery-charger is compatible with the batteries to be charged:

- **tubular lead batteries:** an automatic battery-charger 24V - 20A is suggested. Anyway, refer to the Manufacturer and read the relative manual to confirm your choice;
- **gel batteries:** use a battery-charger specifically intended for this type of storage batteries.

#### 5.5.2. Preparing the battery-charger

If you wish to use a battery-charger not supplied with the machine, it is necessary to mount on it the connector delivered with the machine (see paragraph "Unpacking" of this manual).

To install the connector proceed as follows:

- remove about 13 mm of sheath from the black and red cables of the battery-charger;
- insert the cables in the connector pins and push strongly with suitable pliers;
- insert the cables in the connector respecting the polarity (red cable +, black cable –).

## 5.6. Lifting and handling the machine

### WARNING

**All stages must be performed in an adequately lighted environment adopting all necessary safety measures.**

**Always wear individual protections for the user's safety.**

The loading of the machine onto a vehicle must be done as follows:

- empty the recovery tank and the solution tank;
- remove the squeegee and the brushes (or drive discs);
- remove the batteries;
- put the machine on the pallet, by anchoring it with plastic straps or the proper metal brackets;
- lift the pallet by means of a fork lift truck and load it on the vehicle;
- anchor the machine to the vehicle with ropes connected to the pallet and to the chassis of the machine.

## 6. PRACTICAL GUIDE FOR THE USER

### 6.1. Control devices - Description

With reference to fig. 6 the machine has the following controls and leds:

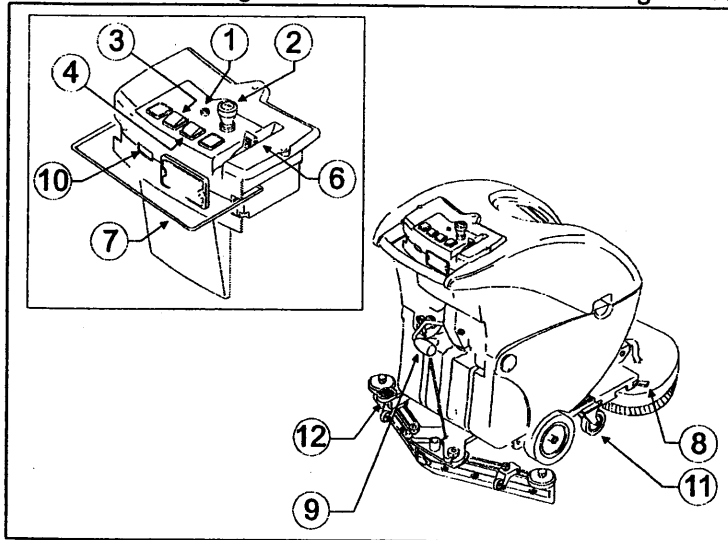


Fig. 6

- 1) **Battery charge check led** (ref. 1): it is red and it indicates that the machine is fed and the level of the battery charge. It can be:
  - a) **off**: the battery is disconnected and all switches are at the position "0" (off);
  - b) **on**: the machine is connected to the batteries and the batteries are charged;
  - c) **flashing at a steady frequency**: the machine is on, but the batteries are nearly flat and therefore must be recharged.
- 2) **Main switch - emergency button with key** (ref. 2): enables or disables the power supply to all the machine functions. It acts as a safety device. To start the machine turn the proper key clockwise. To stop the machine press the button.
- 2) **Brush switch with led** (ref. 3): enables ("1") or disables ("0") the function "Brush".
- 3) **Suction switch with led** (ref. 4): switches on ("1") or off ("0") the suction motor, which allows to dry the floor just washed. The led is on when the suction unit is fed.
- 6) **Cock control lever** (ref. 6): allows to adjust continuously the flow of solution sent to the brushes. On turning it forward, the liquid outlet flow is increased.
- 7) **Drive command lever** (ref. 7): placed under the handgrip, when it is slightly pressed upwards (the mushroom button must be active), it starts the drive motor thus making the machine move forward slowly (1<sup>st</sup> speed). When the lever is lifted completely towards the handgrip, the machine moves on fast (2<sup>nd</sup> speed).
- 8) **Head pressure lever** (ref. 8): placed on the right side of the machine, it exercises a certain pressure on the head during the work in progress (pressure that varies depending on the position of the lever itself); in this way the washing power of the brushes can be adjusted to the various conditions of work.
- 9) **Squeegee lifting lever** (ref. 9): it allows to raise (when lifted) or lower (when pushed down) the squeegee.
- 10) **Hour meter** (ref. 10 - optional): displays the hours of work of the brush.
- 11) **Carriage small wheel** (ref. 11): if lowered, it makes the handling of the machine easier when the drive motor is off.
- 12) **Head lowering pedal** (ref. 12): placed on the left side of the machine, when it is pressed, the brush-head is lowered down. To have the head return to the stand-by position, it is sufficient to press on the handgrip of the machine so as to lift its front



side.

## 6.2. Installing and adjusting the squeegee

The floor wiper, also called squeegee (fig. 2, ref. 6), is the first responsible for drying.

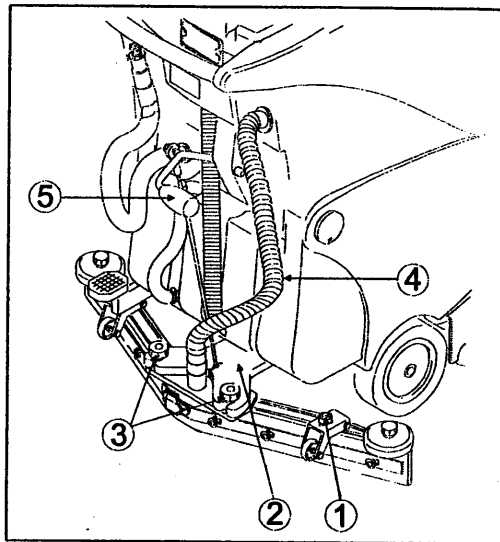


Fig. 7

To install the squeegee on the machine proceed as follows:

- 1) check that the squeegee supporting plate (fig. 7, ref. 2) is raised, otherwise lift it by acting on the proper lever (fig. 7, ref. 5);
- 2) firmly push down the sleeve of the suction tube (fig. 7, ref. 4) into the squeegee;
- 3) slacken the two knobs (fig. 7, ref. 3) placed in the centre of the squeegee;
- 4) insert the two threaded dowels in the slots of the support (fig. 7, ref. 2);
- 5) fix the squeegee by tightening the knobs (fig. 7, ref. 3).

The blades of the squeegee are used to scrub from the floor the film of water and detergent thus allowing a perfect drying. As long as time goes by the continuous scraping rounds off and splits the sharp edge in contact with the floor, thus reducing the drying efficacy and therefore requiring the replacement of the blades. Therefore, often check their state of wear and tear.

To obtain a perfect drying action it is necessary to adjust the squeegee in such a way that when it is in operation, the rear blade lip is bent about 45 degrees with respect to the floor at all points. It is possible to adjust the inclination of the blades by screwing down the nuts (fig. 7, ref. 1): by unscrewing the nuts the blade inclination is reduced, while by screwing the nuts the blade inclination is increased.

## 6.3. Moving the machine

To displace the machine do as follows:

- lift the squeegee;
- lift the head, pushing down the handgrip;
- insert the key to release the emergency button (fig. 6, ref. 2);
- under the handgrip there is a lever (fig. 6, ref. 7): by pulling it up, the motor gets started and the machine starts moving;
- once you have reached the desired spot, lower the head by pushing down the release pedal (fig. 6, ref. 12).

## i INFORMATION

The machine is provided with two speeds of travel depending on whether the drive lever (fig. 6, ref. 7) is pressed upwards slightly (fig. 8, ref. 1) or completely (fig. 8, ref. 2).

## WARNING

Never leave the machine unattended or parked with the head lifted or with the key inserted in the emergency button.

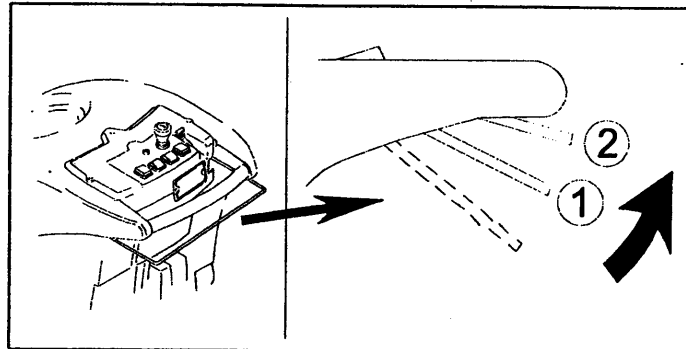


Fig. 8

### 6.4. Installing and replacing the brushes / drive discs

## WARNING

Do not work if the brushes or drive discs are not perfectly installed.

Before disassembling the brushes, stop the machine, lift the head and wait until the brushes are still. Press "0" on the brush switch (fig. 6, ref. 3); press the emergency button (fig. 6, ref. 2) and disconnect the battery connector (fig. 4, ref. 2).

#### Removing (fig. 9):

- press the top edge of the brush B down with both hands.

#### Fitting (fig. 9):

- grip the brush B at the sides with both hands;
- match the brush in-built hexagon with the brush-cover mold;
- press upwards until they are coupled;
- to use the abrasive disc, preassemble the drive disc, preassemble the drive disc and then fit it on the machine.

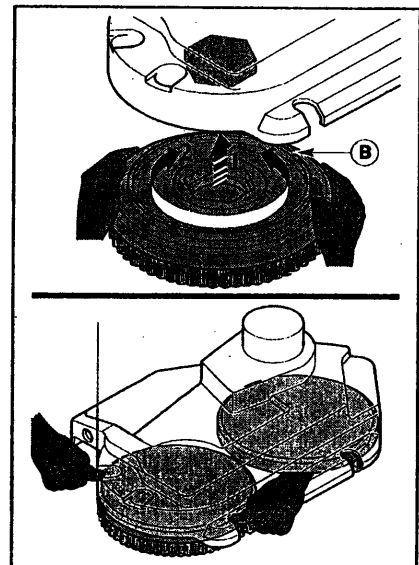


Fig. 9

## 6.5. Detergents - Use

### WARNING

**Always dilute detergents according to the supplier's instructions. Do not use sodium hypochlorite (bleaching solution) or other oxidizers, especially if in high concentrations, and do not use solvents or hydrocarbons. The temperatures for water and detergent must not exceed the maximum temperatures indicated in the technical data and must be free from sand and/or other impurities.**

The machine has been designed to be used with non-foaming and biodegradable detergents specific for sweeping scrubbers.

Contact the Manufacturer to have a complete and updated list of the available detergents and chemical products; you will receive all papers together with the Manual "Complete cleaning system".

Use only products suitable for floors and for removing dirt.

Follow the safety rules concerning the use of detergents indicated in the paragraph "Safety regulations".

## 6.6. Setting up the machine

### WARNING

**Before starting to work wear an apron, cap, non-slip waterproof shoes, a mask to protect the respiratory system, gloves and any other form of protection indicated by the supplier of the detergent or necessary in the environment you are going to work in.**

Before starting to work, perform the following operations:

- check the level of battery charge (recharge, if necessary);
- lower the head using the proper pedal (fig. 6, ref. 12);
- make sure that the recovery tank (fig. 2, ref. 2) is empty; if this is not so, empty it;
- check that the cock control lever (fig. 6, ref. 6) is at the position "off";
- fill the solution tank (fig. 2, ref. 7) through the respective hole on the front with clean water and non-foaming detergent in a suitable concentration: leave a difference in level of at least 5 cm between the liquid surface and the tank opening;
- install brushes or drive discs suitable for the floor and the job to be done;
- check that the squeegee (fig. 2, ref. 6) is fixed well and connected to the suction tube (fig. 7, ref. 4); make sure that the rear blade is not worn.

### INFORMATION

**If you use the machine for the first time, it is advisable that you train with it for a short time on a wide surface without any obstacles, to acquire the necessary familiarity.**

**Always empty the recovery tank before refilling the solution tank.**

For an effective cleaning and long life of the equipment, it is necessary to follow some simple rules:

- prepare the work area, keeping away the possible obstacles;
- begin to work starting from the farthest spot, in order to avoid trampling on the area just-cleaned;
- choose paths that are as much straight as possible;
- on wide floors divide the paths into rectangular and parallel areas.

At the end quickly mop the area, if necessary, to clean spots that are inaccessible to the scrubber.

## 6.7. Work

After setting up the machine, proceed as follows:

- connect the machine to the power supply: connect the ANDERSON connectors with each other (fig. 4, ref. 1 and ref. 2);
- insert and operate the key to release the emergency button (fig. 6, ref. 2), and make all the machine functions active: the power supply led lights up (fig. 6, ref. 1);
- move the cock lever (fig. 6, ref. 6) to the position of minimum flow of solution: the detergent solution begins to reach the brushes;
- lower the head using the proper pedal (fig. 6, ref. 12);
- lower the squeegee by means of the proper lever (fig. 6, ref. 9);
- press "1" on the brush switch (fig. 6, ref. 3) to enable the function "Brush": the brush motor is started. The turning brushes spread the solution all over the floor;
- press "1" on the suction unit switch (fig. 6, ref. 4) to start the suction motor;
- press the drive lever (fig. 6, ref. 7) placed under the handgrip: the drive motor is started and the machine starts moving forward;
- should it be necessary, reduce the brush-head pressure exercised on the floor acting on the pressure lever (fig. 6, ref. 8) (see label attached next to the lever);

## i INFORMATION

**To facilitate rotation around 180° of the gear direction release the drive lever.**

- check periodically that the detergent solution reaches the brushes and fill with solution if it runs out;
- while working, check the quality of washing and, if necessary, adjust the flow of solution sent to the brushes (by turning the lever (fig. 6, ref.6)).

## ⚠ WARNING

**Whenever you fill up the solution tank, always empty the recovery tank.  
Do not leave the machine stationary with the suction motor on and the solution  
cock turned on.**

- if the warning led (fig. 6, ref. 1) starts flashing, it means that the storage batteries are getting flat. Therefore, it is necessary to recharge them, as there is no device blocking the total running of the machine; if you keep on working, the batteries could become damaged irreparably.

## ⚠ WARNING

**If the drive lever (fig. 6, ref. 7) operation is intermittent for a prolonged time, it is possible that the motor becomes overheated with consequent damages to the same motor. For this reason limit the "lever shots" to the sole events when they are strictly necessary.**

**At the end of work:**

- move the cock lever (fig. 6, ref. 6) to the position "CLOSED";
- release the drive lever (fig. 6, ref. 7) placed beneath the handle: the drive motor switches off and the machine stops;
- press "0" on the brush switch (fig. 6, ref. 3) to disable the function "Brush";
- raising the lever (fig. 6, ref. 9), lift the scrubber from the floor to prevent the drying blades from warping due to the continuous pressure;
- let the suction motor run for at least 2 minutes to make sure that it is completely dry; then press "0" on the suction unit switch (fig. 6, ref. 4) to switch off the suction motor;
- press the main switch (fig. 6, ref. 2) to disable all the machine functions;
- disconnect the ANDERSON connectors (fig. 4, ref. 1 and ref. 2);
- empty and clean the recovery tank.

## 6.8. Some useful suggestions for the optimal use of the machine

If the floor presents a particularly resistant type of dirt, it is possible to make the machine wash and dry it in separate stages.

### 6.8.1. Pre-washing

- Turn on the water cock;
- switch on the brush motor and lower the head;
- start washing with the suction motor off and the squeegee lifted.

The flow of water must be dosed in proportion to the desired advance speed: the slower the machine goes, less water comes down.

Insist on washing the dirtiest spots: in this way the detergent has the time to perform its chemical action for the detachment and suspension of dirt, and the brushes to develop an effective mechanical action.

### 6.8.2. Drying

Lower the squeegee and with the suction unit operating pass again on the same area you have previously washed. In this way you obtain a result that is similar to a thorough washing and the following operations of ordinary maintenance will certainly take less time. To wash and dry at the same time, operate the brushes, water, squeegee and suction motor simultaneously.

## 6.9. Draining off dirty water

# ! DANGER

**Use the individual protection devices suitable for the operation to be performed. Perform the draining operations with the machine disconnected from the power supply.**

The drain hose of the recovery tank is located at the rear left side of the machine. To empty the above-mentioned tank:

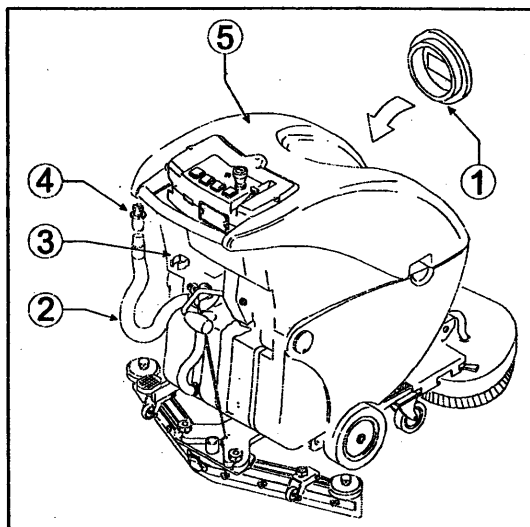


Fig. 10

- take the machine next to a drain;
- take off the tank cap (fig. 10, ref. 1) from the recovery tank (fig. 10, ref. 5);
- detach the drain hose (fig. 10, ref. 2) from its seat, holding it in correspondence with the fixing spring (fig. 10, ref. 3) and pull it horizontally;

- keeping the hose end as much high as possible, take off the drain cock (fig. 10, ref. 4) from the hose by unscrewing it;
- lower the hose end gradually, checking the intensity of the jet of water with reference to its height from the ground;
- check the amount of residual dirt in the recovery tank and wash it inside, if necessary. To facilitate the cleaning and total drain, it is better to unhook it from the solution tank and lift it;
- when the dirty water has been totally drained, lower the recovery tank (if it has been previously lifted) and hook it again to the solution tank;
- put back the cap (fig. 10, ref. 1) on the recovery tank, making sure that it is perfectly closed;
- close the drain hose (fig. 10, ref. 2) with the cock (fig. 10, ref. 4) screw-tightening it; check that it is perfectly closed and refit the hose in its housing.

## ! WARNING

**While washing the recovery tank never remove the suction filter (fig. 12, ref. 2) from its seat and never direct the jet of water towards the filter itself.**

Now it is possible to proceed with a new washing and drying action.

### 6.10 Draining off clean water

## ! DANGER

**Use the individual protection devices suitable for the operation to be performed. Perform the draining off operations with the machine disconnected from the power supply.**

To empty the tank:

- take the machine next to a drain;
- detach the drain hose (fig. 11, ref. 1) from its seat, holding it in correspondence with the fixing spring (fig. 11, ref. 2) and pull it horizontally;
- keeping the hose end as much high as possible, take off the drain cock (fig. 11, ref. 3) from the hose by unscrewing it;
- lower the hose end gradually, checking the intensity of the jet of water with reference to its height from the ground;
- when the contents have been totally drained from the solution tank, close the drain hose with the cock (fig. 11, ref. 3) screw-tightening it; check that it is perfectly closed and refit the hose in its housing.

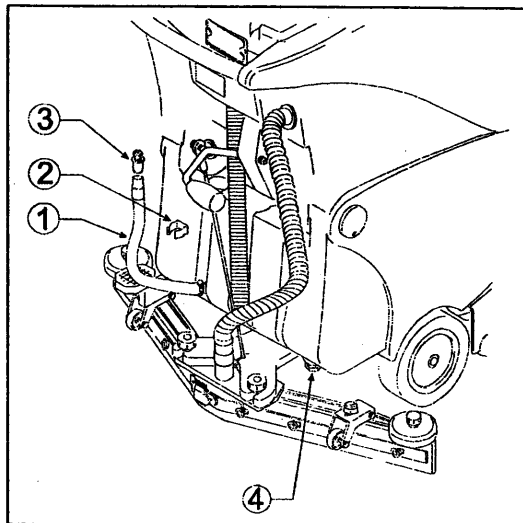


Fig. 11

## i INFORMATION

The water and detergent solution can also be used to wash the recovery tank.

### 7. PERIODS OF INACTIVITY

If the machine is to remain unused for a long time, the squeegee and brushes (or drive discs) must be dismantled, washed and kept in a dry place (preferably packed in a plastic envelope or sheet), sheltered from dust. Park the machine with the head lowered. Furthermore, make sure that the tanks are completely empty and perfectly clean.

Disconnect the machine from the power supply (disconnect the ANDERSON connector from the battery wiring).

Recharge the batteries completely before putting them in the storehouse. During long periods of inactivity recharge the batteries (once every two months at least) to preserve the storage batteries constantly at the maximum charge.

### WARNING

If the batteries are not recharged periodically, they may become damaged irreparably.

### 8. MAINTENANCE AND BATTERY RECHARGING

#### ! DANGER

Do not check the battery charge by producing sparks.

The batteries give off inflammable vapours: put out any fire or embers before checking and filling up the batteries.

Perform the operations described below in airy environments.

To avoid permanent damages to the batteries, never let them get flat completely. Remember that when the proper red led (fig. 6, ref. 1) flashes on the control panel, it is necessary to recharge the batteries.

#### 8.1. Recharging procedures

##### Lead batteries with liquid electrolyte:

It is necessary to check the level of the electrolytic solution in order that it always covers the films of the elements, adding the necessary distilled water.

### WARNING

Do NOT connect the battery-charger to the connector of the machine main wiring. During recharging do not let the temperature of the electrolyte exceed 45°C.

To recharge proceed as follows:

- detach the recovery tank (after having emptied it) from the solution tank, acting on the blocking hook (fig. 5, ref. 1) located on front of the machine;
- lift the recovery tank;
- disconnect the battery wiring connector (fig. 4, ref. 2) from the main wiring connector (fig. 4, ref. 1);
- connect the battery-charger to the battery wiring connector;
- recharge according to the instructions written in the manual to the battery-charger;

- at the end of the recharging time check the battery intensity with a densimeter: if one or more elements are flat and the remaining ones completely charged, the battery is damaged and must be replaced;
- reclose the caps;
- bring the recovery tank back to the work position and hook it to the solution tank by the blocking hook;
- reconnect the battery wiring connector to the machine connector.

**Gel batteries:**

- disconnect the battery wiring connector (fig. 4, ref. 2) from the main wiring connector (fig. 4, ref. 1);
- connect the battery-charger connector to the battery wiring connector;

**⚠ WARNING**

**Do NOT connect the battery-charger to the machine main wiring connector.**

**Use only a battery-charger that is specific for gel storage batteries.**

- recharge following the instructions written in the manual to the battery-charger;
- at the end of the recharging time disconnect the connectors;
- reconnect the battery wiring connector to the machine connector.

## 9. INSTRUCTIONS FOR MAINTENANCE

**! DANGER**

**Before carrying out any maintenance operations disconnect the machine connector from the battery connector.**

**All maintenance operations on the electric system and those not explicitly described in this manual must only be performed by trained technical staff in compliance with the safety regulations in force and recommendations stated in the maintenance manual.**

### 9.1. Maintenance – General rules

A regular maintenance performed according to the Manufacturer's instructions guarantees a better performance and endurance of the machine.

### 9.2. Routine maintenance

#### 9.2.1. Daily cleaning

When cleaning the machine always observe the following instructions:

- avoid using water cleaners, which could let water go inside the electric or the motor compartments with a consequent damage or hazard of short circuits;
- do not use steam in order not to warp the plastic parts;
- do not use solvents or hydrocarbons, which could damage the hoods or the rubber parts.

**i INFORMATION**

**Do not use water on the motors or electric parts.**



### 9.2.2. Suction air filter and floating rod: cleaning

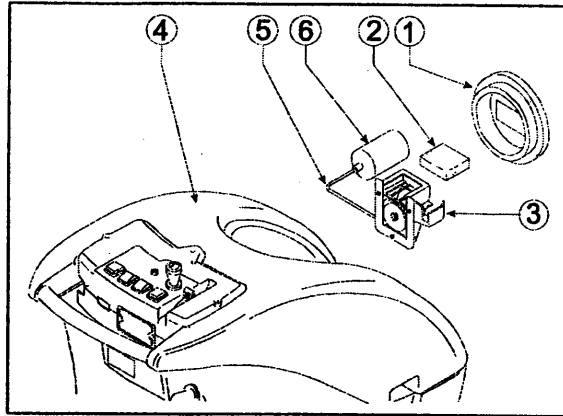


Fig. 12

- Unscrew and take off the tank cap (fig. 12, ref. 1) from the recovery tank (fig. 12, ref. 4);
- make sure that the recovery tank (fig. 12, ref. 4) is empty;
- take out the air filter (fig. 12, ref. 2) of the suction unit from the float support (fig. 12, ref. 3), which is located on the upper inner side of the recovery tank;
- clean the filter with current water or with the detergent used in the machine;
- put the filter back in the support only after having it dried well;
- make sure that the filter has been replaced in its seat correctly;
- check that the floating rod (fig. 12, ref. 5), which is also fixed to the support (fig. 12, ref. 3), moves freely and clean it, if necessary;
- screw again the cap on the recovery tank.

### 9.2.3. Squeegee blades: replacement

The blades of the squeegee are used to scrub from the floor the film of water and detergent thus allowing a perfect drying. As long as time goes by the continuous scraping rounds off and splits the sharp edge in contact with the floor, thus reducing the drying efficacy and therefore requiring the replacement of the blades. Therefore, often check their state of wear and tear.

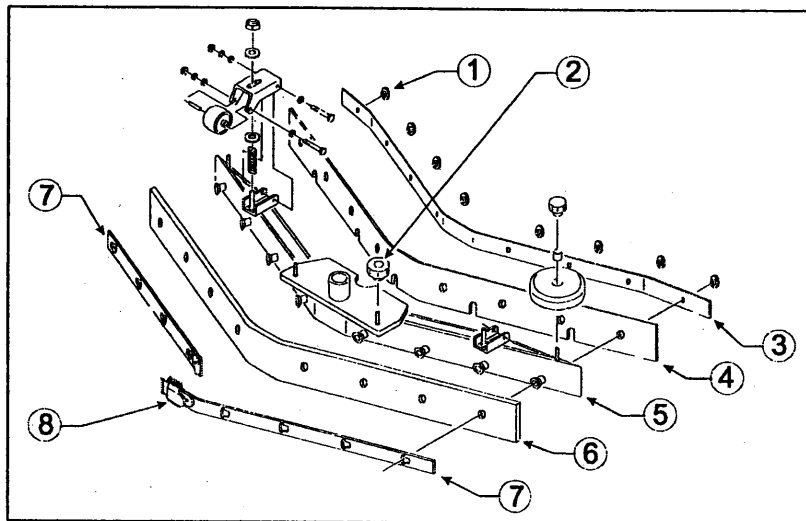


Fig. 13

### **Exchanging or replacing the blades:**

- lower the squeegee by using the proper lever (fig. 6, ref. 9);
- take off the squeegee (fig. 2, ref. 6) from its supporting plate (fig. 7, ref. 2) by unscrewing completely the two knobs (fig. 7, ref. 3);
- slide out the sleeve of the suction tube (fig. 7, ref. 4) from the squeegee.

#### **Front blade:**

- unscrew the knobs (fig. 13, ref. 1);
- remove the blade clamps (fig. 13, ref. 3);
- take out the blade (fig. 13, ref. 4);
- fit in the same blade inverting the edge in contact with the floor until all the four edges are worn, or else fit in a new blade;
- put the blade clamp (fig. 13, ref. 3) back;
- screw down all the knobs (fig. 13, ref. 1).

#### **Rear blade:**

- unhook the hook clamp (fig. 13, ref. 8);
- slide out the two blade clamps (fig. 13, ref. 7) by first pushing them outwards with respect to the squeegee unit (fig. 13, ref. 5) and then taking them out;
- remove the blade (fig. 13, ref. 6);
- fit in the same blade inverting the edge in contact with the floor until all the four edges are worn, or else fit in a new blade embedding it in the screws of the squeegee unit (fig. 13, ref. 5);
- put the two blade clamps (fig. 13, ref. 7) back, centering the largest part of the slots on the fixing screws of the squeegee unit (fig. 13, ref. 5) and then pushing the blade clamps towards the inside of the squeegee itself;
- hook the clamp (fig. 13, ref. 8) again.

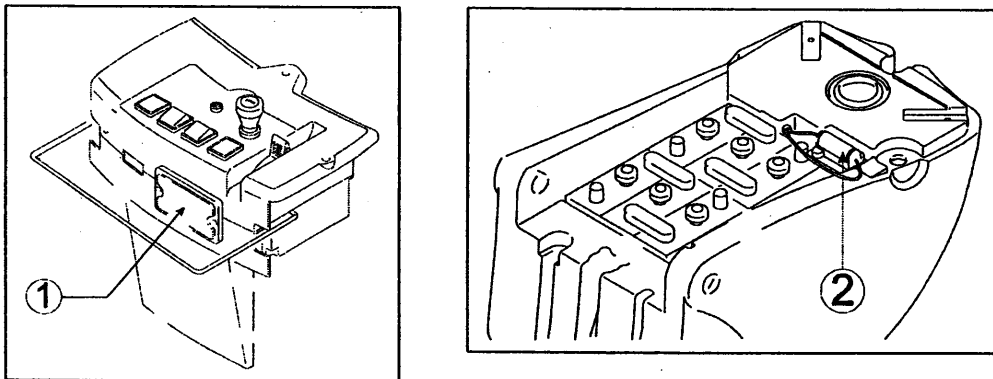
Insert the squeegee back on its support following the instructions reported in §6.2.

### **9.2.4. Fuses: replacement**

To replace the fuses in the control panel of the machine, proceed as follows:

- remove the fuse cover (fig. 14, ref. 1);
- with the tweezers supplied with the machine take out the blown fuses and replace them with new ones of the same amperage;
- reclose the fuse cover.

The 60A fuse, which protects the brush motor, is in the fuse-holder (fig. 14, ref. 2) that is fixed to the solution tank inside the battery compartment of the machine.



**Fig. 14**

To replace it:

- make sure that the recovery tank is empty, otherwise empty it;
- lift the recovery tank;
- lift the fuse cover and take out the fuse, removing the fixing screws;
- install a new fuse and reclose the fuse-holder cover;
- finally, lower the recovery tank.

**Fuse chart:** for a chart of the fuses see the Catalogue of Spare Parts.

## **WARNING**

**Never fit a fuse with a higher Amp value than the intended one.**

If a fuse keeps burning, it is necessary to identify and repair the damages present in the wiring, boards (if fitted) or motors: have the machine checked by trained technical staff.

### **9.3. Periodic maintenance**

#### **9.3.1. Daily maintenance**

Every day at the end of work perform the following operations:

- disconnected the machine from the power supply;
- empty the recovery tank and clean it, if necessary;
- clean the squeegee blades, checking that they are not excessively worn; replace them, if necessary;
- make sure that the squeegee suction hole is not clogged, freeing it from any encrusted dirt;
- recharge the batteries according to the procedure described above.

#### **9.3.2. Weekly maintenance**

- Clean the floating rod of the recovery tank and check that it works correctly;
- clean the suction air filter and check that it is not damaged (replace it, if necessary);
- clean the solution filter placed at the front opening of the solution tank (fig. 2, ref. 7) and check that it is not damaged (replace it, if necessary);
- clean the suction tube;
- clean the recovery tank and the solution tank;
- check the level of the electrolyte in the batteries and top up with distilled water, if necessary.

#### **9.3.3 Six-monthly maintenance**

Have the electric system, calibrations and tension of the brush motor belts checked by qualified staff.

## **10. HOW TO ORDER SPARE PARTS**

For a correct identification by our After-sales Service Office of the spare part(s) you need and, therefore, to help us serving you better, please fill in your orders with the following data:

- machine model;
- machine serial number on the identification plate (see fig. 1);
- chart of the list of spare parts in which the item and its reference number are found;
- code of the item to be found in the list of spare parts;
- amount ordered.

If you ask for a replacement under warranty terms, the order must be completed with a brief description of the fault.

# 11. TROUBLESHOOTING

## 11.1. How to overcome possible failures

Possible failures affecting the whole machine

FAILURES	CAUSES	REMEDIES
<b>The machine does not work</b>	• the battery connector is disconnected	• connect the batteries to the machine
	• the batteries are flat	• recharge the batteries
	• the emergency button is pressed or faulty	• insert the key, turn and release or replace the button
<b>The brushes do not turn</b>	• the emergency button is pressed or faulty	• insert the key, turn and release or replace the button
	• the brush switch is at the position "0"	• turn the brush switch to position "1"
	• the brush motor thermal protection has tripped: the motor has become overheated	• release the brush lever, turn the brush switch to position "0" (off), letting the machine cool down for at least 45'
	• the power supply connector or the motor thermal protection connector are disconnected	• connect again the power supply connector or the motor thermal protection connector
	• the thermal protection fuse (F6) and/or the 60A (F7) fuse of the brush motor have blown	• check and remove the causes that made the fuse blow, then replace it
	• the brush microswitch is not calibrated or is faulty	• have the microswitch calibrated or replaced
	• the brush motor contactor is faulty	• have the contactor replaced
	• the batteries are flat	• recharge the batteries
	• the belt is broken	• have the belt replaced
	• the motor is faulty	• have the motor replaced
<b>The machine does not wash evenly</b>	• the brushes or abrasive discs are worn	• replace them
	• the pressure exercised by the head on the floor is not right	• adjust the brush pressure on the floor acting on the proper lever
<b>The brush keeps on turning also when the main switch and/or brush switch have been pressed</b>	• the brush contactor is faulty	• have it replaced
<b>The solution does not come out</b>	• the cock control lever is at the position "CLOSED"	• move the lever to the position "OPEN"
	• the solution tank is empty	• fill it up
	• there is an obstruction in the tube through which the solution is pumped to the brush	• remove the clogging, cleaning the ducts
	• the tap is dirty or does not work	• clean or replace the tap, unscrewing the screw ref. 4 in fig. 11
<b>The flow of solution keeps coming to the brush</b>	• the tap remains open, because it is damaged or very dirty	• have the tap cleaned or replaced

<b>The suction motor does not work</b>	• the suction unit switch is at the position '0' (off)	• operate the suction unit switch
	• the suction motor is not fed or is faulty	• check that the motor power supply connector is connected to the main wiring in the right way; in the second case have the motor replaced
	• the fuse has blown (F3)	• replace the fuse F3
	• the batteries are flat	• recharge the batteries

<b>The squeegee does not clean or suck well</b>	• the edge of the rubber blades in contact with the floor is rounded off	• replace the rubber blade
	• there is an obstruction or damage in the squeegee or in the tube	• remove the obstruction and repair the damage
	• the float has intervened (recovery tank full), or is blocked by dirt or broken	• empty the recovery tank or make the necessary repairs to the float
	• there is an obstruction in the suction tube	• free the tube from the obstruction
	• the suction tube is not connected to the squeegee or is damaged	• connect or repair the tube
	• the suction unit motor is not fed or is faulty	• check that the motor power supply connector is connected to the main wiring in the right way and that the protection fuse has not blown; in the second case replace the motor

<b>The machine does not move forward</b>	• the drive motor is not fed or is faulty	• in the first case turn the emergency switch key clockwise, set the brush switch to "1" and press the drive lever; in the second case check that the brush motor is connected to the main wiring in the right way; in the third case replace the motor
	• the thermal protection of the drive motor has tripped: the motor has become overheated	• stop the machine and switch it off, letting it cool down for at least 45'
	• the microswitch is faulty or not calibrated	• replace or calibrate it
	• the batteries are flat	• recharge the batteries

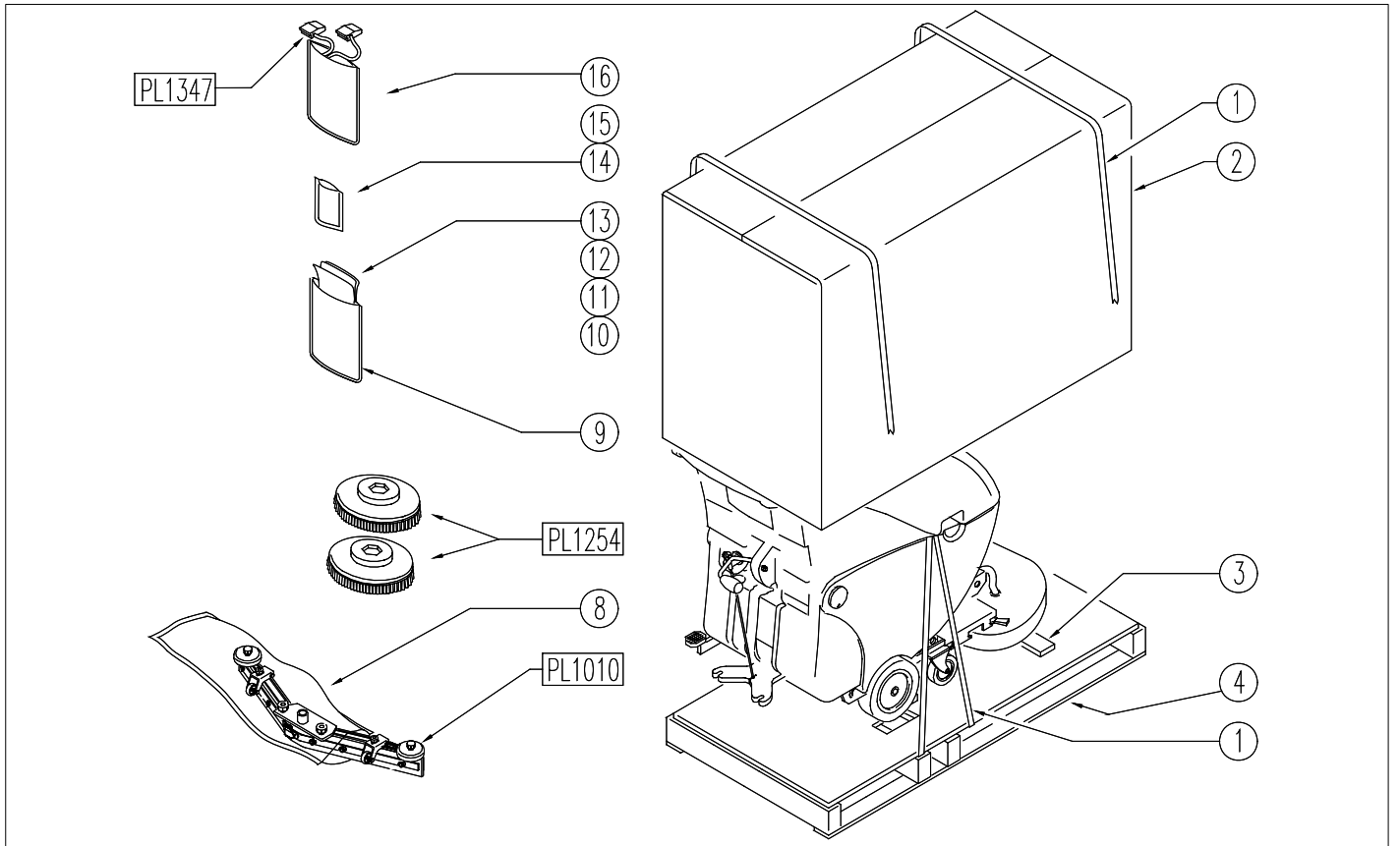
<p><b>The batteries do not ensure the normal work time</b></p>	<ul style="list-style-type: none"> <li>• the poles and charging clips of the batteries are dirty and oxydized</li> </ul>	<ul style="list-style-type: none"> <li>• clean and grease the poles and clips, recharge the batteries</li> </ul>
	<ul style="list-style-type: none"> <li>• the electrolyte level is low</li> </ul>	<ul style="list-style-type: none"> <li>• add distilled water topping up all elements according to the instructions</li> </ul>
	<ul style="list-style-type: none"> <li>• the battery-charger does not work or is unsuitable</li> </ul>	<ul style="list-style-type: none"> <li>• see instructions relative to the battery-charger</li> </ul>
	<ul style="list-style-type: none"> <li>• there are considerable differences in density between the various elements of the battery</li> </ul>	<ul style="list-style-type: none"> <li>• replace the damaged battery</li> </ul>
	<ul style="list-style-type: none"> <li>• the machine is working with a too high pressure on the brush</li> </ul>	<ul style="list-style-type: none"> <li>• reduce pressure on the brush</li> </ul>

<p><b>The storage battery gets flat too fast during use, although it has been charged in the correct way and when tested with a densimeter at the end of recharging, it turned out to be uniformly charged</b></p>	<ul style="list-style-type: none"> <li>• the storage battery is new and does not give 100% of its expected capacity</li> </ul>	<ul style="list-style-type: none"> <li>• it is necessary to "run-in" the storage battery by 20-30 charges and discharges to obtain maximum performance</li> </ul>
	<ul style="list-style-type: none"> <li>• the machine is used at its maximum capacity for continuous periods and the autonomy is not sufficient</li> </ul>	<ul style="list-style-type: none"> <li>• use, if possible, storage batteries with larger capacity or replace the storage batteries with others already charged</li> </ul>
	<ul style="list-style-type: none"> <li>• the electrolyte has evaporated and does not cover the plates completely</li> </ul>	<ul style="list-style-type: none"> <li>• add distilled water, topping up all elements until the plates are covered and recharge the storage battery</li> </ul>

<p><b>The storage battery gets flat too fast during use, the recharging with an electronic battery-charger is too fast and at the end the storage battery gives the right voltage (about 2,14V for each empty element), but it turns out to be not uniformly charged when tested with densimeter</b></p>	<ul style="list-style-type: none"> <li>• the storage battery, already filled with acid by the Manufacturer, has been stored for a too long time before being recharged and used for the first time</li> </ul>	<ul style="list-style-type: none"> <li>• if the recharging with a normal storage-charger is not effective, it is necessary to carry out a double recharging consisting in: <ul style="list-style-type: none"> <li>- a slow recharging of about 10 hours with a current equal to 1/10 of the rated capacity expressed in 5 hours (ex.: for a storage battery of 100Ah(5), the current should be 10A, realized by a manual battery-charger);</li> <li>- one-hour pause;</li> <li>- charging with a normal battery-charger</li> </ul> </li> </ul>
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<p><b>After recharging with an electronic battery-charger the storage-battery does not show the correct voltage (about 2,14V for each empty element) and only one or few elements turn out to be flat when tested with densimeter</b></p>	<ul style="list-style-type: none"> <li>• the storage battery has not been connected to the battery-charger (for instance because the low voltage connector of the battery-charger has been erroneously connected to the machine connector)</li> </ul>	<ul style="list-style-type: none"> <li>• connect the battery-charger to the storage battery connector</li> </ul>
	<ul style="list-style-type: none"> <li>• the battery-charger and the power socket to which the storage battery is connected are not compatible</li> </ul>	<ul style="list-style-type: none"> <li>• check that the power supply characteristics indicated on the battery-charger plate are compliant with those of the mains</li> </ul>
	<ul style="list-style-type: none"> <li>• the battery-charger has not been installed correctly</li> </ul>	<ul style="list-style-type: none"> <li>• taking into account the actual voltage available at the socket, check that the connections of the transformer primary circuit in the battery-charger are correct (at this purpose read the manual to the battery-charger)</li> </ul>
	<ul style="list-style-type: none"> <li>• the battery-charger does not work</li> </ul>	<ul style="list-style-type: none"> <li>• check that there is voltage at the battery-charger, that the fuses are not interrupted and that there is current at the storage battery; in addition try to charge by means of another rectifier: if the battery-charger does not work, call the after-sales service staff communicating the serial number of the battery-charger</li> </ul>
<p><b>After recharging with an electronic battery-charger the storage-battery does not show the correct voltage (about 2,14V for each empty element) and only one or few elements turn out to be flat when tested with densimeter</b></p>	<ul style="list-style-type: none"> <li>• one or more elements are damaged</li> </ul>	<ul style="list-style-type: none"> <li>• replace, if possible, the damaged elements. For monoblock storage batteries at 6V or 12V, replace the whole storage battery</li> </ul>
<p><b>The electrolyte that is present in the storage battery has a cloudy colour</b></p>	<ul style="list-style-type: none"> <li>• the storage battery has completed the charge/discharge cycles indicated by the Manufacturer</li> </ul>	<ul style="list-style-type: none"> <li>• replace the storage battery</li> </ul>
	<ul style="list-style-type: none"> <li>• the storage battery has been recharged with a too high current</li> </ul>	<ul style="list-style-type: none"> <li>• replace the storage battery</li> </ul>
	<ul style="list-style-type: none"> <li>• the storage battery has been charged beyond the limit suggested by the Manufacturer</li> </ul>	<ul style="list-style-type: none"> <li>• replace the storage battery</li> </ul>

## PACKAGING

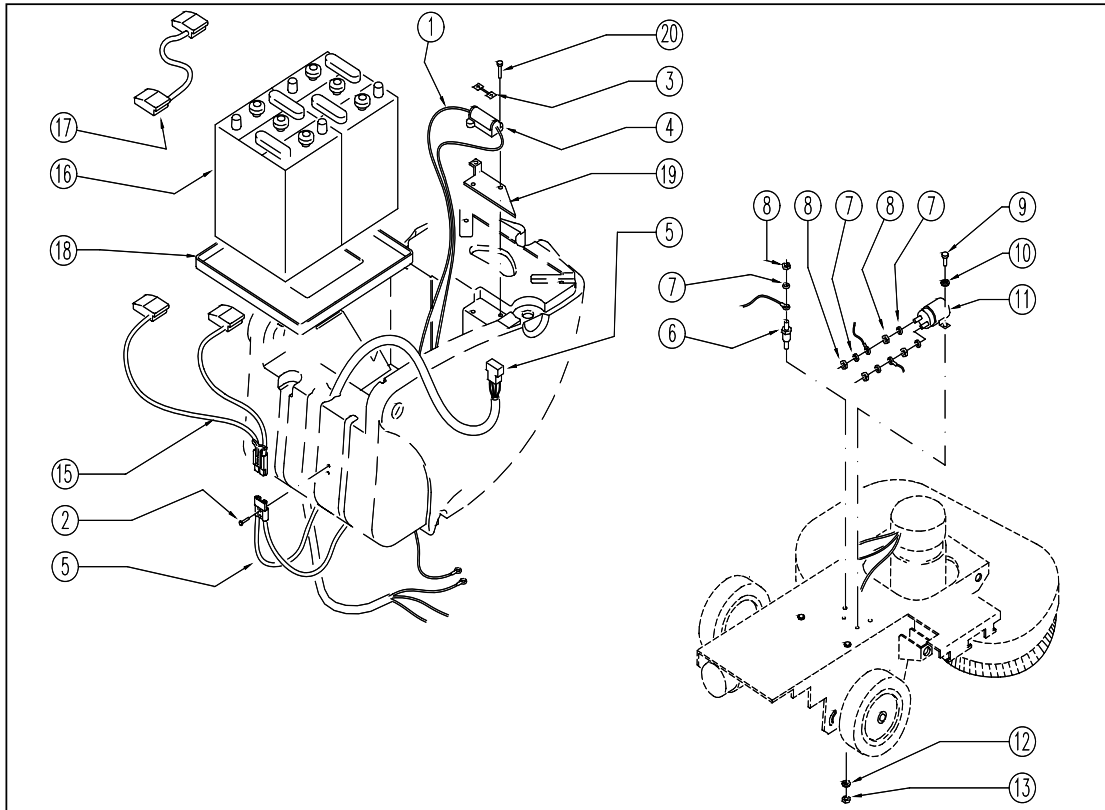


ITEM	SKU	DESCRIPTION	QTY
1	MP14300	STRAP	/
2	SL26133	CARDBOARD	1
3	SL26011	REINFORCEMENT	1
4	SL26132	PALLET	1
8	MP14302	ENVELOPE	1
9	SL25374N	ENVELOPE	1
10	SL25303N	SHEET	1
11	SL25401-3	WARRANTY COUPON	1
12	SL25401-8	EC CERTIFICATION	1
13	SL25888-4	MANUAL	1
14	SL26029	ENVELOPE	1
15	SL23010K	CONNECTOR	1
16	SL26017	ENVELOPE	1

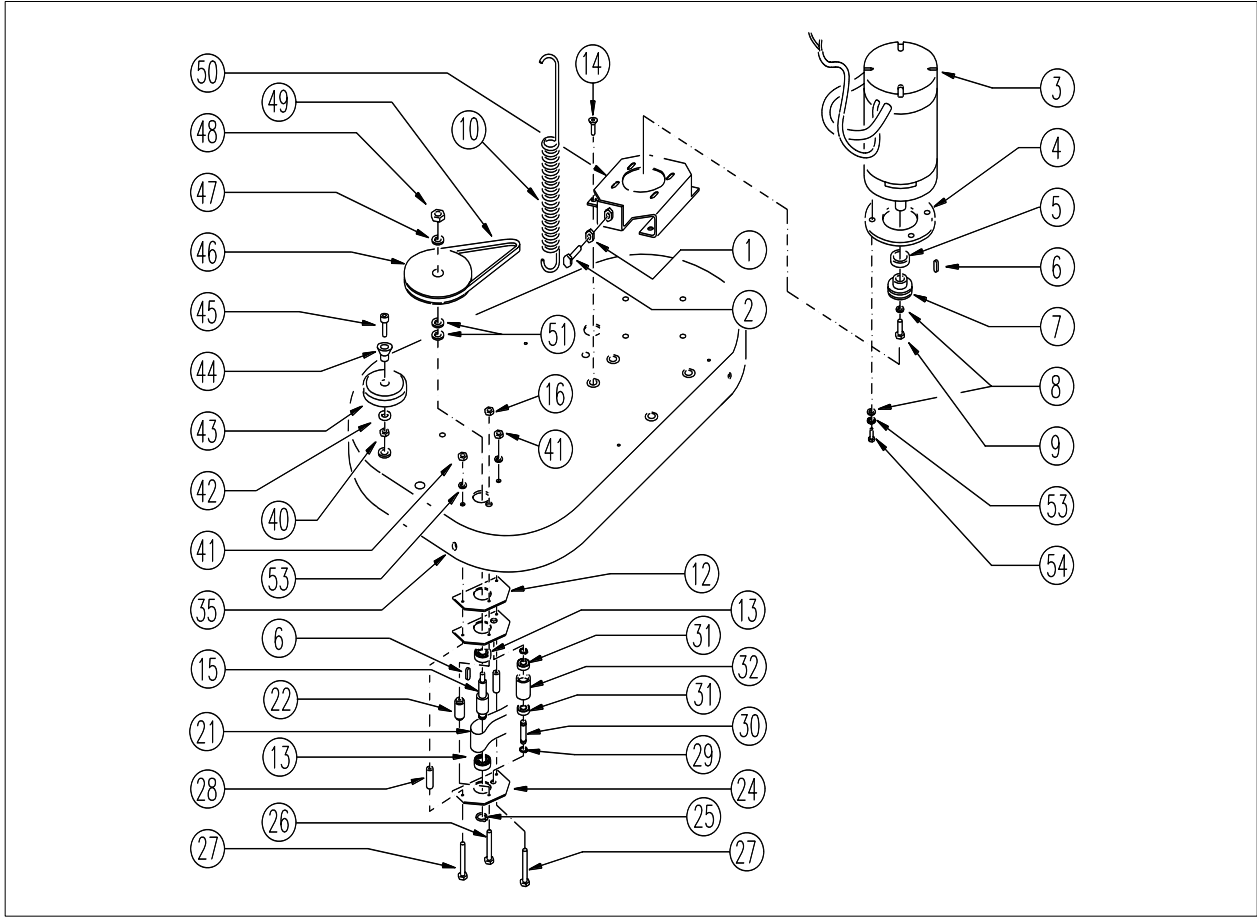


BATTERIES WIRING

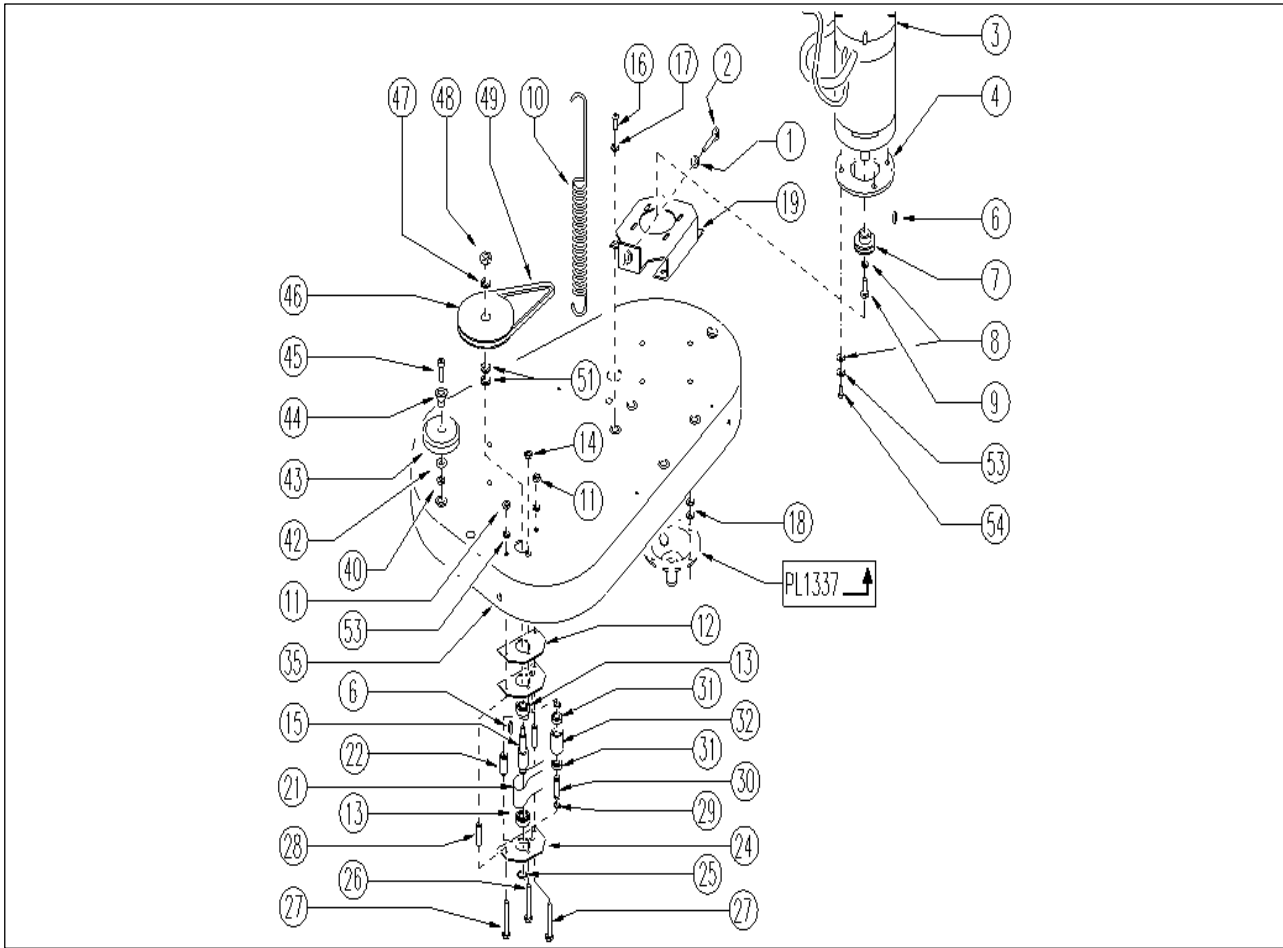
SN from 01B600



ITEM	SKU	DESCRIPTION	QTY
1	E86778	Wire WS20/24	1
2	E86597	screw	2
3	E87883	60 AMP Fuse for WS20/24	1
4	E86373	master fuse carrier WS20/24	1
5	E86370	wiring harness WS24	1
6	E86563	support	1
7	E86702	Cham Washer D8	5
8	E86703	Nut M8	5
9	SL04108	SCREW	2
10	E86448	AS20 Washer	2
11	E86420	Relay	1
12	E86565	washer	1
13	E86853	Self-locking nut M8	1
15	E87846	Battery Cable Harness w/50A Red Connector	1
16	AL03122	BATTERY	2
17	E86433	Cable, 6 AWG, Black, 17" L, 1R & 1L Bat Term	1
18	E86925	Battery tray	1
19	E86398	support WS20/24	1
20	SL04316	SCREW	2

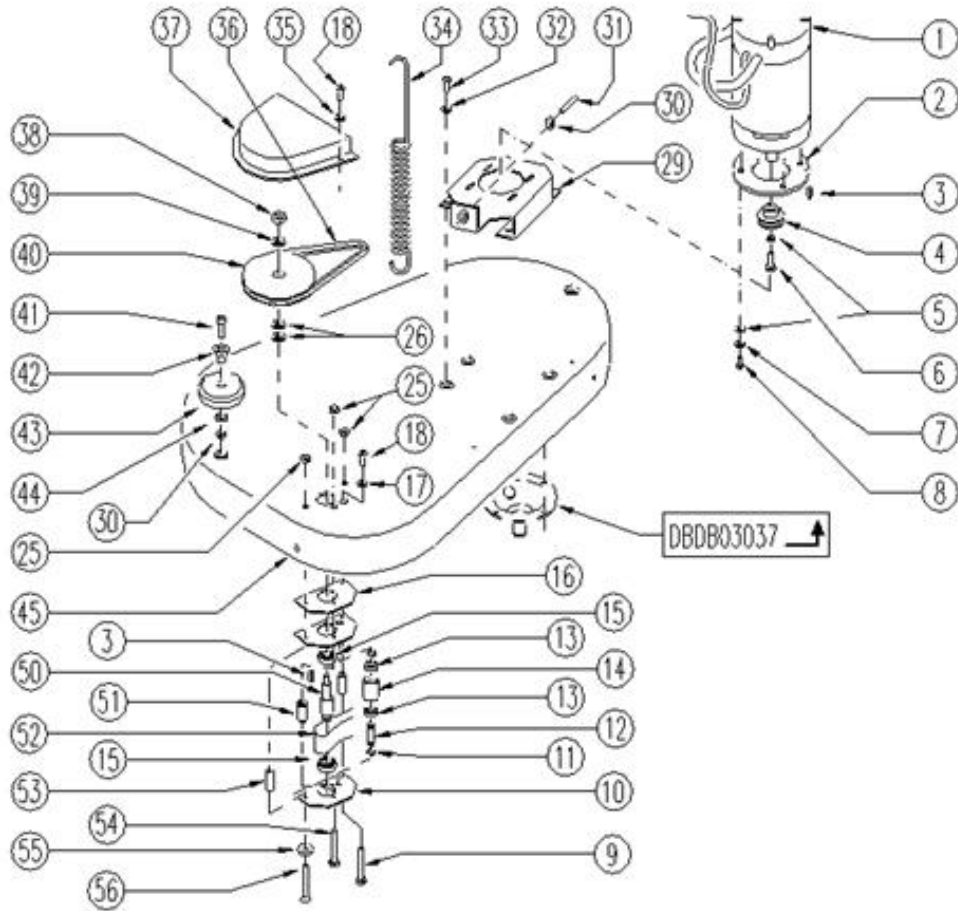


ITEM	SKU	DESCRIPTION	QTY	ITEM	SKU	DESCRIPTION	QTY
1	E86703	Nut M8	1	27	E87833	Screw WS20	2
2	E86542	Screw AS20	1	28	E89485	Spacer	2
3	E86608	Brush Motor	1	29	E89408	Stop Ring	2
4	E86374	flange WS20/24	1	30	E86666	AS28 Pin	1
5	E86375	spacer WS20/24	1	31	E86667	Bearing, 6001 2RS	2
6	E86536	Key	2	32	E86727	Neutral Pulley	1
7	E87871	Pulley, Brush Motor	1	35	SL39051	HEAD	1
8	E86758	Washer	5	40	E86876	Nut	3
9	E86737	Screw	1	41	E87868	Self Locking Nut	2
10	E86911	Spring	1	42	E86878	Washer	3
11	E86499	Hex Bolt M6x55 SS	1	43	E86451	AS20 Wheel	3
12	E86763	Gasket	1	44	E87862	Spacer WS20/24	3
13	E83310	Bearing, 6203 2RS	2	45	E86360	Screw for WS24	3
14	E87864	Screw WS20/24	4	46	E89139	Pulley WS24	1
15	E86535	Shaft B-4 serial# 04B004	1	47	E86565	washer	1
16	E86873	Nut	1	48	E86853	Self-locking nut M8	1
21	SL16041	BELT	1	49	E86516	Belt	1
22	E86995	Spacer WS20/24	1	50	E87933	Support	1
24	E86764	Plate	2	51	E86744	AS20 Washer	2
25	E86537	Ring	1	53	E86716	Cham Washer	8
26	E86499	Hex Bolt M6x55 SS	1	54	E86475	AS20 Screw TE M .6-20	4



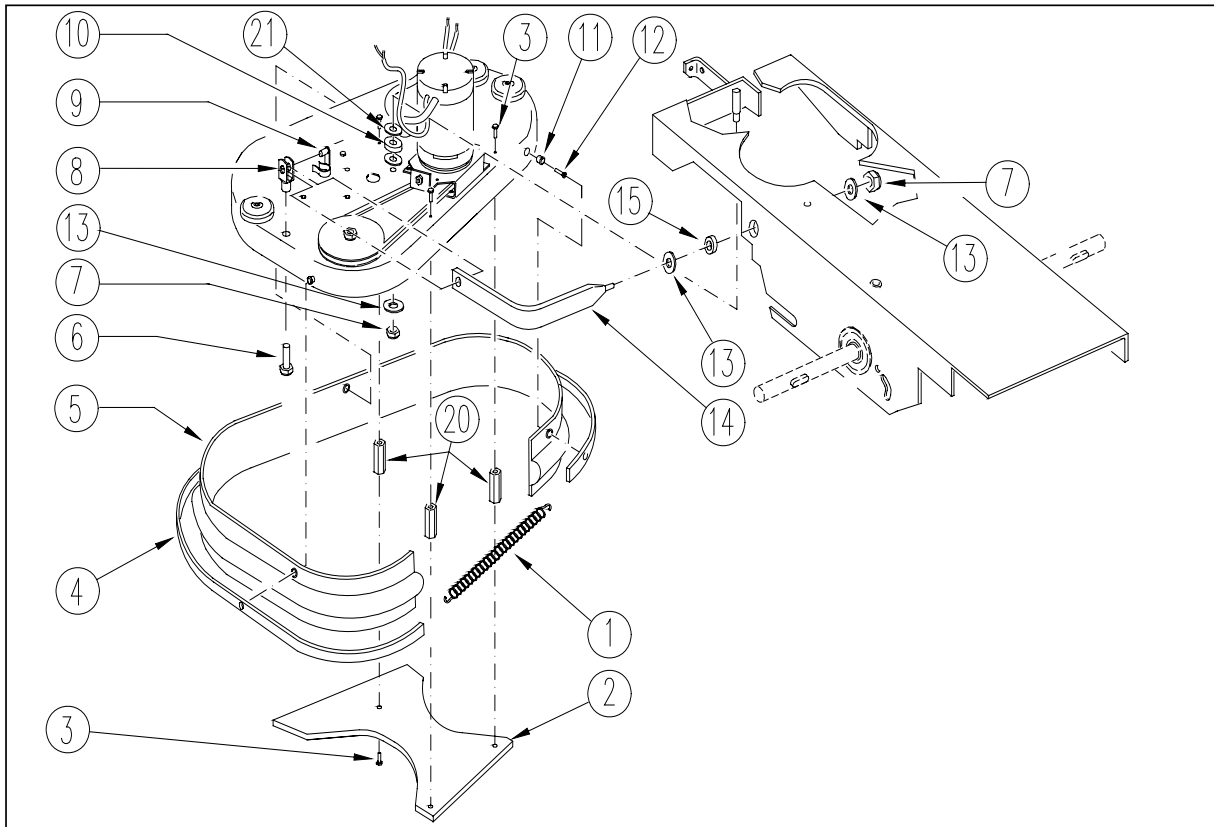
ITEM	SKU	DESCRIPTION	QTY	ITEM	SKU	DESCRIPTION	QTY
1	E86703	Nut M8	1	25	E86537	Ring	1
2	E86486	Screw TE M8-45	1	26	E86499	Hex Bolt M6x55 SS	1
3	E86608	Brush Motor	1	27	E87833	Screw WS20	2
4	E86374	flange WS20/24	1	28	E89485	Spacer	2
6	E86536	Key	2	29	E89408	Stop Ring	2
7	SL10098	PULLEY	1	30	E86666	AS28 Pin	1
8	E86758	Washer	5	31	E86667	Bearing, 6001 2RS	2
9	E86737	Screw	1	32	E86727	Neutral Pulley	1
10	E86911	AS30/36 Spring	1	35	E87937	Head WS24	1
11	E87868	Self Locking Nut	2	40	E86876	Nut	3
12	E86763	Gasket	1	42	E86878	Washer	3
13	E83310	Bearing, 6203 2RS	2	43	E86451	AS20 Wheel	3
14	E86873	Nut	1	44	E87862	Spacer WS20/24	3
15	E86535	Shaft B-4 serial# 04B004	1	45	E86360	Screw for WS24	3
16	E89251	Screw	4	46	E89139	Pulley WS24	1
17	E87921	Washer	4	47	E86565	washer	1
18	E86427	Washer for AS20	8	48	E86853	Self-locking nut M8	1
19	E87933	Support	1	49	E86516	Belt	1
21	E89463	Flat Belt, WS24	1	51	E86744	AS20 Washer	2
22	E86995	Spacer WS20/24	1	53	E86716	Cham Washer	8
24	E86764	Plate	2	54	E86475	AS20 Screw TE M .6-2	4

## BRUSH DRIVE, NEW STYLE



ITEM	SKU	DESCRIPTION	QTY	FROM
1	E86608	Brush Motor	1	10/2002
2	E86374	flange WS20/24	1	10/2002
3	E86536	Key	2	02/2004
4	MTPLO0151	PULLEY	1	04/2003
5	E86758	Washer	5	10/2002
6	E86737	Screw	1	10/2002
7	E86716	Cham Washer	4	10/2002
8	E86475	Screw M .6-20	4	10/2002
9	E87833	Screw WS20	1	02/2004
10	E86764	Plate	2	02/2004
11	E89408	Stop Ring	2	02/2004
12	E86666	AS28 Pin	1	02/2004
13	E86667	Bearing, 6001 2RS	2	
14	E86727	Neutral Pulley	1	02/2004
15	E83310	Bearing, 6203 2RS	2	02/2004
16	E86763	Gasket	1	02/2004
17	E89118	Washer	1	02/2004
18	E86336	M4 - 10 Screw	3	02/2004
25	E86738	Nut M6 w/ Nylon Ring	3	02/2004
26	E86744	AS20 Washer	2	
29	E87933	Support	1	10/2002
30	E86876	Nut	4	10/2002

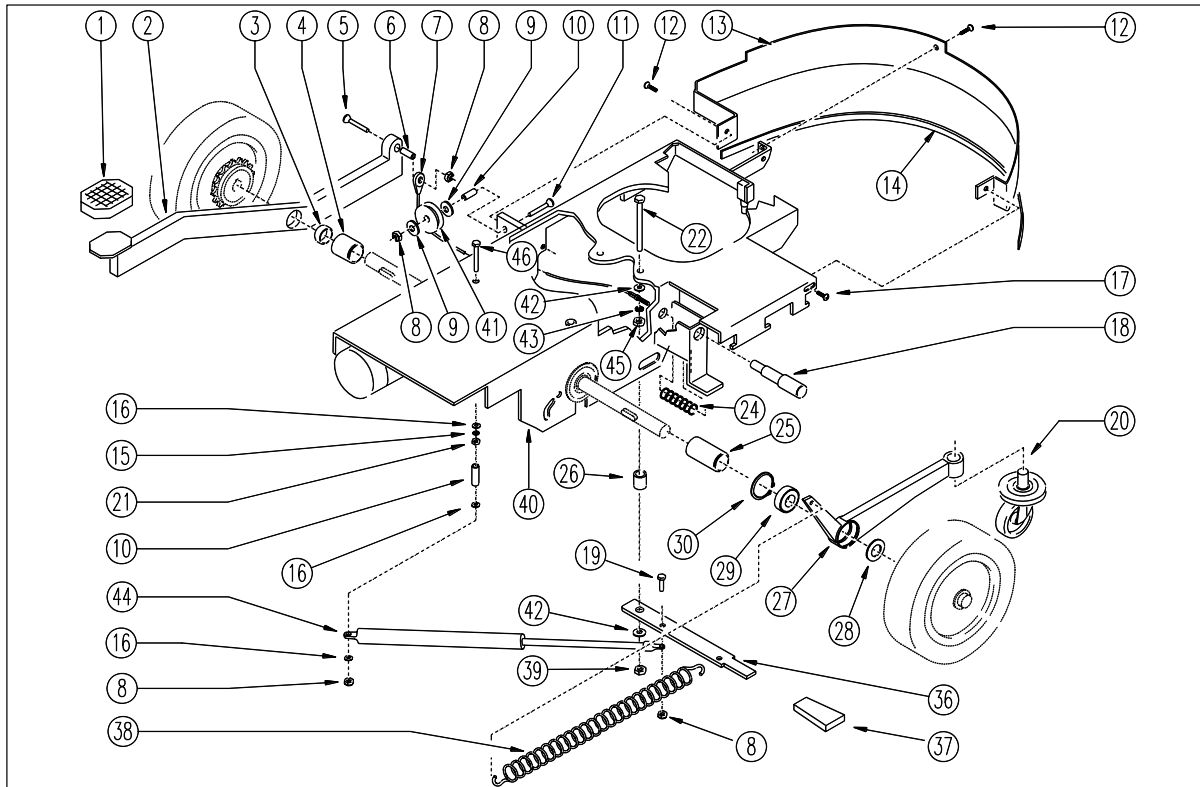
ITEM	SKU	DESCRIPTION	QTY	FROM
31	VTVT00897	SCREW M 8/35	1	10/2002
32	E87921	Washer	4	10/2002
33	E89251	Screw	4	10/2002
34	E86911	AS30/36 Spring	1	10/2002
35	E86768	Washer	2	02/2004
36	E86516	Belt	1	10/2002
37	E89179	Case	1	02/2004
38	E86853	Self-locking nut M8	1	10/2002
39	E86565	washer	1	10/2002
40	E89139	Pulley WS24	1	10/2002
41	E86360	Screw for WS24	3	10/2002
42	E87862	Spacer WS20/24	3	10/2002
43	E86451	AS20 Wheel	3	10/2002
44	E86878	Washer	3	10/2002
45	E87937	Head WS24	1	02/2004
50	E89253	Shaft after 04B004	1	02/2004
51	LAFN04056	SPACER	1	02/2004
52	E89463	Flat Belt, WS24	1	02/2004
53	E89485	Spacer	2	02/2004
54	E86499	Hex Bolt M6x55 SS	1	02/2004
55	LAFN04163	WASHER	1	02/2004
56	VTVT00869	SCREW M.6-60	1	02/2004



ITEM	SKU	DESCRIPTION	QTY
1	E86541	Spring	1
2	E86541	GUARD	1
3	SL03537	Screw - Self Thread M4, 2-13	6
4	E86970	Flap Press	1
5	E86507	Splash Guard	1
6	E86506	Screw	1
7	E89182	Self-locking nut M8	2
8	E86853	Fork for AS24/28	1
9	E86672	Bracket for Squeegee	1
10	E86673	Rubber Gasket D11.25 L=10	1
11	E86975	SPACER	3
12	SL07375	Screw	3
13	E87934	Washer	3
14	E86879	LEVER	1
15	SL39047	AS20 Bushing	1
20	E86453	SPACER	3
21	SL14339	Washer D13-24-2.5	2

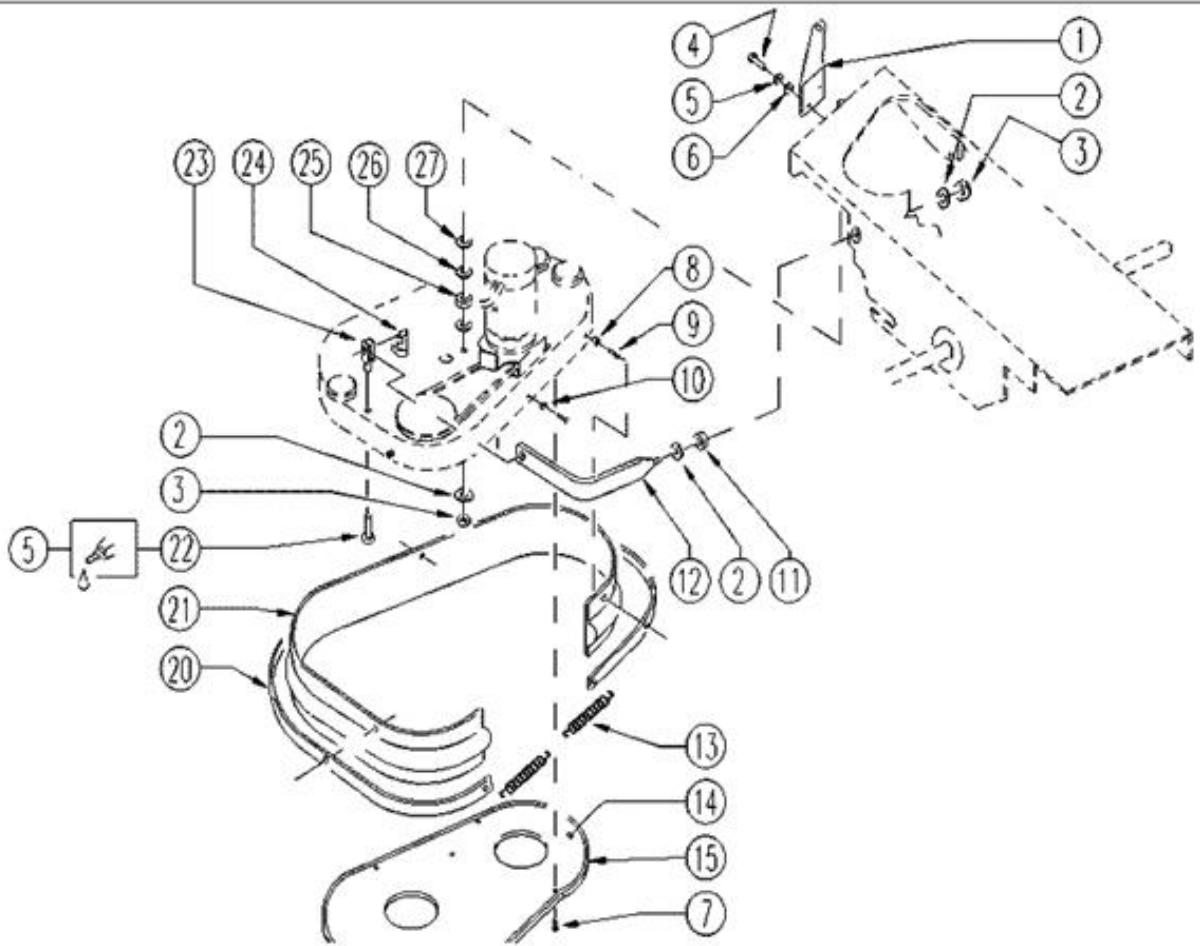
WS24 CHASSIS B OLD STYLE

SN FROM 018600

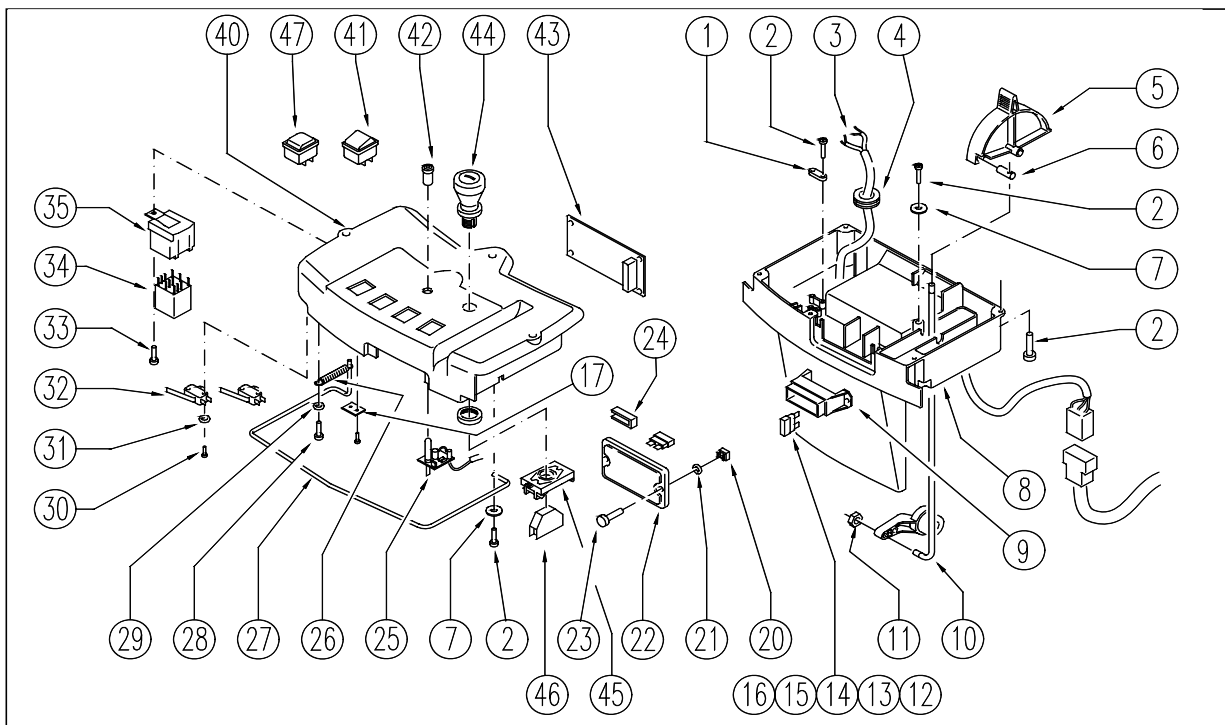


ITEM	SKU	DESCRIPTION	QTY
1	E87807	Foot Petal pad WS20/24	1
2	E89235	Pedal	1
3	E89186	Bearing	1
4	E89449	Spacer	1
5	E87768	Screw	1
6	E86766	Spacer WS24	1
7	E86501	Cable	1
8	E87868	Self Locking Nut WS20/24 FS28/32	4
9	E86881	Washer	2
10	E86561	spacer	1
11	E87758	Screw	1
12	E86336	M4 - 10 Phil Pan Head Screw	2
13	E87902	Bulk head WS24	1
14	E88127	Gasket-Edge Protector-Outline	1
15	E86716	Cham Washer	1
16	E86427	Washer for AS20	3
17	E89469	M4 - 15 Phil Pan Head Screw	1
18	E86562	pin	1
19	E86737	Screw	1
20	E86511	Wheel	1
21	E86873	Nut	5
22	E86869	Screw	1
24	E89092	Spring	1
25	E89187	Spacer	1
26	SL07112	SPACER	1
27	E86500	Small Wheel Arm	1
28	E86744	AS20 Washer	2
29	E89189	Bearing 6003-2RS	1
30	E89188	Seeger	1
36	SL39048	LEVER	1
37	SL20054	HANDGRIP	1
38	E86515	Spring	1
39	E86853	Self-locking nut M8	1
40	SL39050	FRAME	1
41	E86550	pulley WS24	1
42	E86879	Washer	2
43	E89183	Washer	1
44	E89465	Spring	1
45	E86876	Nut	1
46	E86465	AS20 Screw	1

CHASSIS NEW



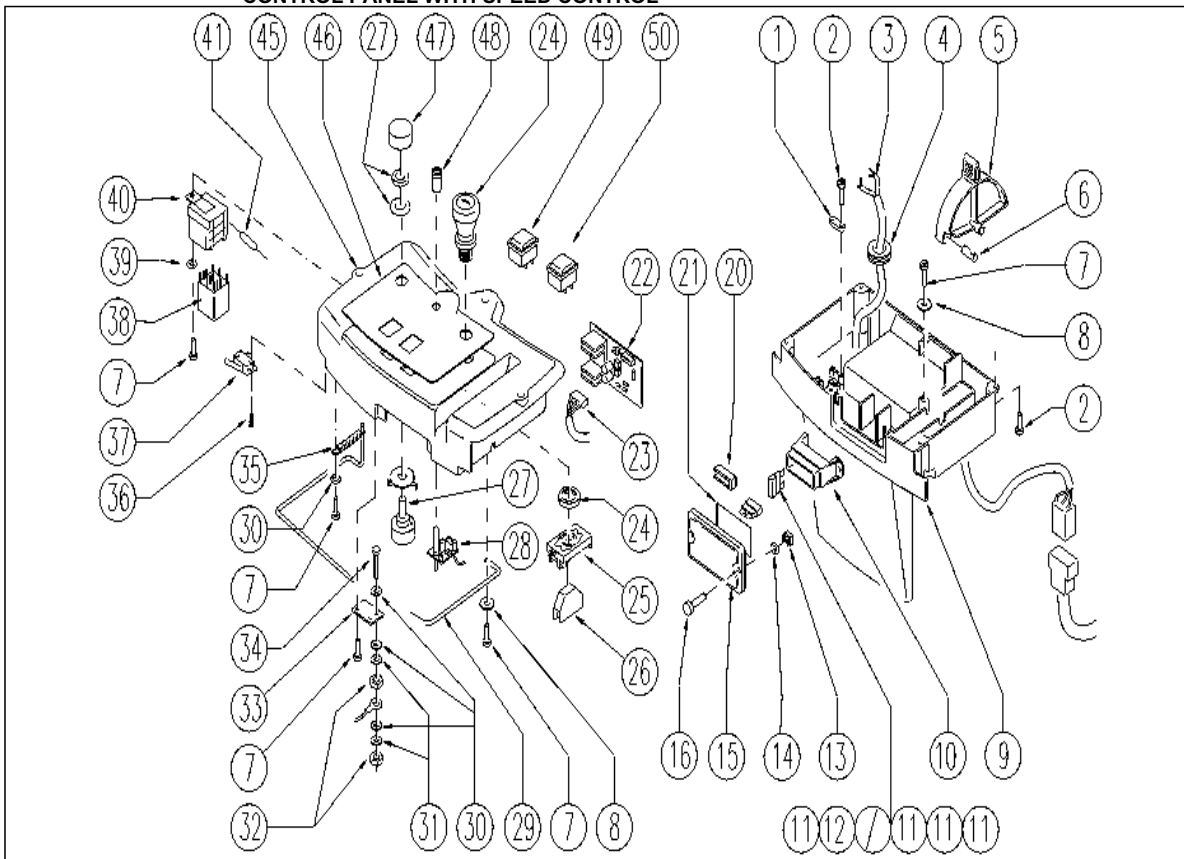
ITEM	SKU	DESCRIPTION	QTY	FROM
1	LAFN05896	BRACKET	1	02/2004
2	E86879	Washer	3	10/2002
3	E86853	Self-locking nut M8	2	10/2002
4	E86475	AS20 Screw TE M .6-20	2	02/2004
5	E87921	Washer	2	02/2004
6	E86427	Washer for AS20	2	02/2004
7	E86336	M4 - 10 Phil Pan Head Screw	7	04/2003
8	LAFN03901	BUSHING	3	10/2002
9	E87934	Screw	4	10/2002
10	VTDD07727	NUT M 5 INOX	1	10/2002
11	E86453	AS20 Bushing	1	10/2002
12	LAFN05670	LEVER	1	10/2002
13	E86541	Spring	2	10/2002
14	E89172	Guard	1	02/2004
15	E89173	Gasket	1	02/2004
20	E86507	Flap Press	1	10/2002
21	E86506	Splash Guard	1	10/2002
22	E89182	Screw	1	10/2002
23	CMCV35596	FORK M 8 X42 BT	1	10/2002
24	E86673	Bracket for Squeegee	1	10/2002
25	E86975	Rubber Gasket D11.25 L=10	1	10/2002
26	VTRS43258	WASHER D.13	2	10/2002
27	VTRS15523	WASHER D.10	1	10/2002



ITEM	SKU	DESCRIPTION	QTY
	<b>E86776</b>	<b>Control panel complete WS24</b>	<b>1</b>
1	SL09908	CABLE CLAMPING STAPLE	1
2	SL04187	SCREW	8
3	E88174	Wiring, Control Panel WS20 New Style	1
4	SL23695	FAIRLEAD	1
5	E86519	Lever	1
6	E89474	Solution Rod ADJ	1
7	E86448	AS20 Washer	2
8	E86798	Lower control panel WS20	1
9	E89468	Fuse Carrier	1
10	E87826	Solution Control Rod WS20	1
11	E86875	Self-Locking Nut	1
12	E86825	Fuse 5 amp	2
13	E89342	Fuse 30 Amp	2
14	E89342	Fuse 30 Amp	2
15	E86825	Fuse 5 amp	2
16	E89342	Fuse 30 Amp	1
17	SL09955	SUPPORT	1
20	E87830	Nut	2
21	E87876	Gasket WS20/24 FS28/32	2
22	E86543	Fuse Cover for AS20	1
23	E87877	Screw WS20/24 FS28/32	2
24	SL23209	FUSE TWEEZERS	1
25	E86496	Circuit Board	1
26	E89530	Spring WS20/24	1
27	E87923	Handle	1
28	SL04215	SCREW	3
29	E86797	Washer	1
30	E89154	Screw	6
31	SL06009	WASHER	4
32	E86527	Microswitch	2
33	SL04226	SCREW	1
34	E89471	Vac Motor Relay	1
35	E89529	Relay Support WS20/24	1
40	E86997	Upper Control Panel WS20/24	1
41	E86423	Bipolar Switch	2
42	E86421	Reflector	1
43	E86528	Gearcase Board	1
44	E86988	Operator D22 Mushroom complete	1
45	E86988	Operator D22 Mushroom complete	1
46	E86988	Operator D22 Mushroom complete	2
47	E89143	Black plug	2

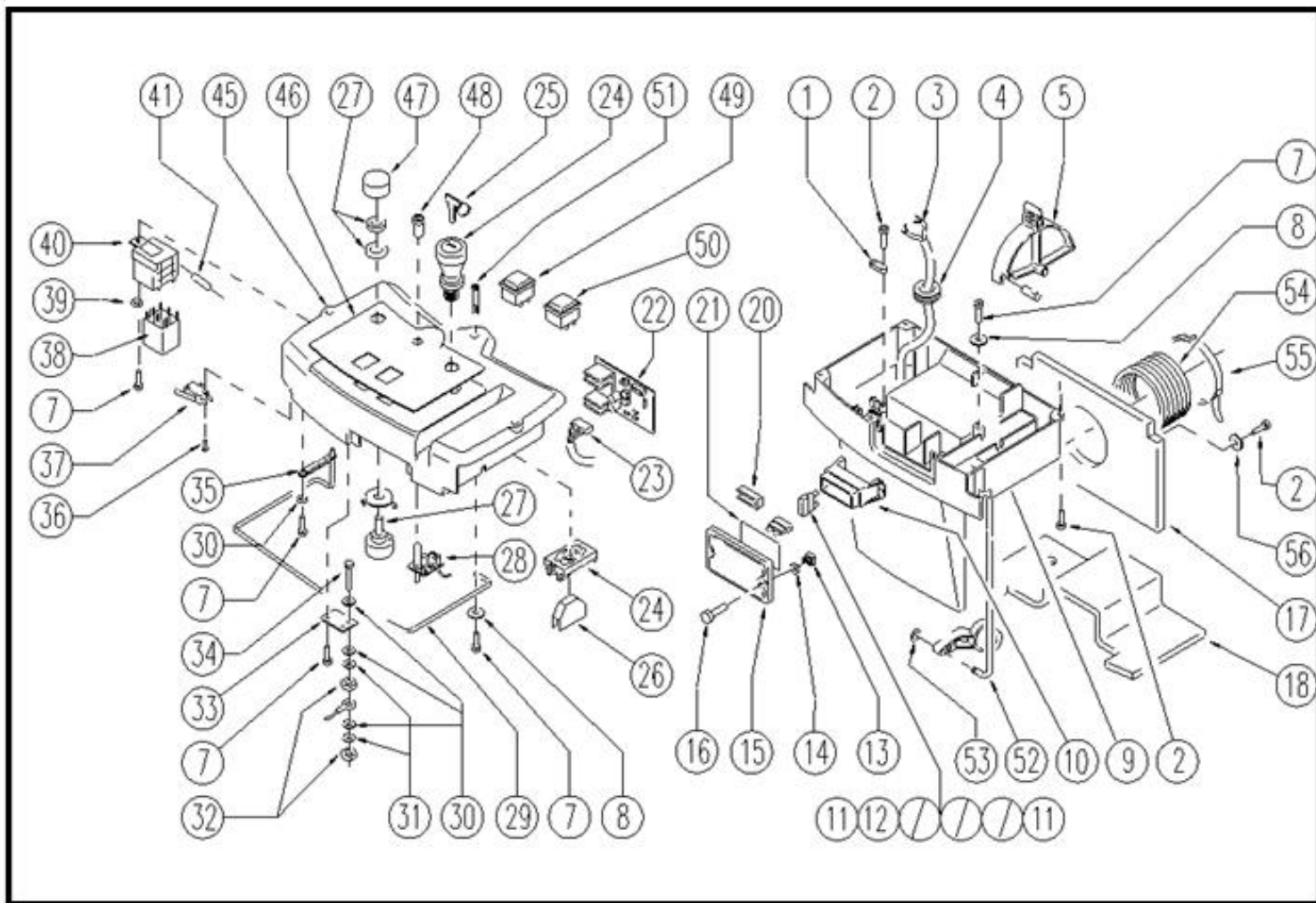


**CONTROL PANEL WITH SPEED CONTROL**



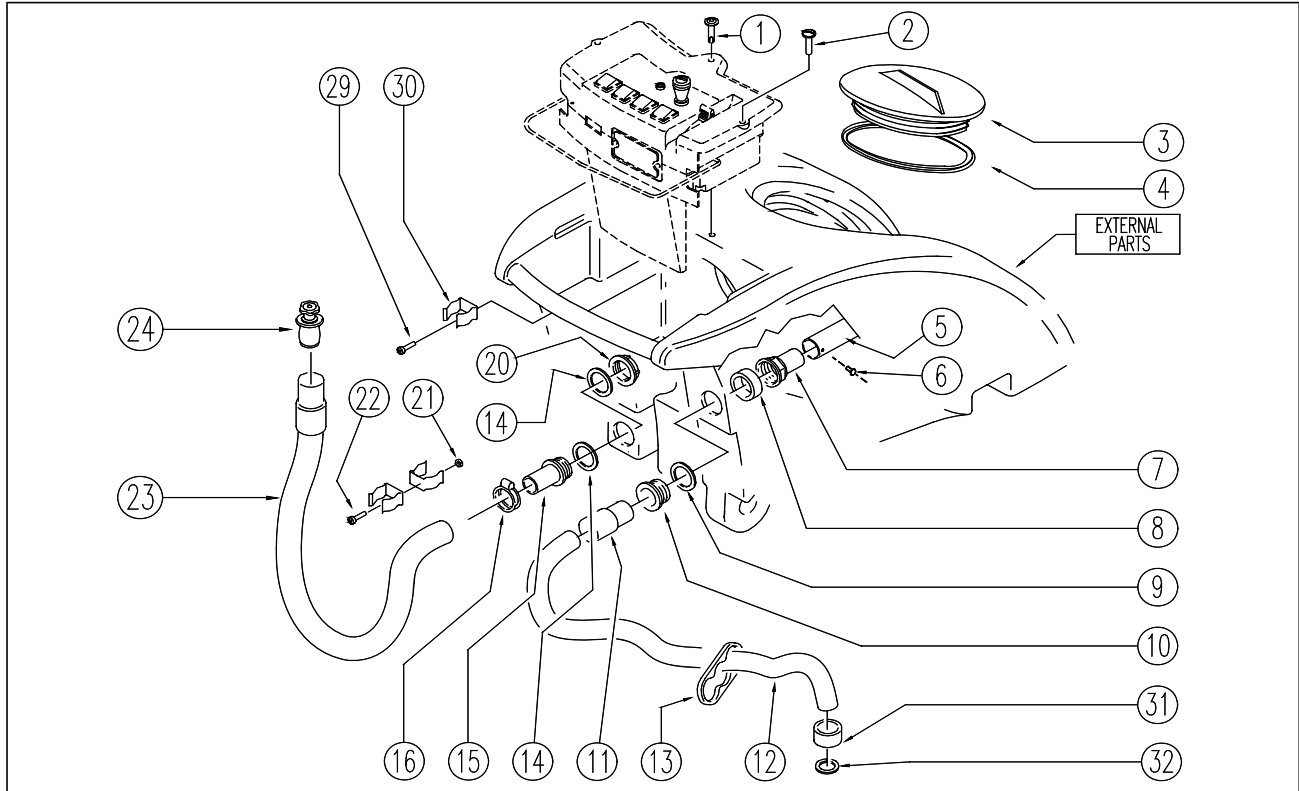
ITEM	SKU	DESCRIPTION	QTY
	<b>E86776</b>	<b>Control panel complete</b>	<b>1</b>
1	SL09908	CABLE	1
2	SL04187	SCREW	6
3	SL23733-1	WIRING	1
4	SL23695	FAIRLEAD	1
5	E86519	Lever	1
6	E89474	Solution Rod ADJ	1
7	SL04240	SCREW	6
8	E86448	AS20 Washer	2
9	E86798	Lower control panel WS20	1
10	E89468	Fuse Carrier	1
11	E89342	Fuse 30 Amp	6
12	E86647	Fuse 40A	2
13	E87830	Nut	2
14	E87876	Gasket WS20/24 FS28/32	2
15	E86543	Fuse Cover for AS20	1
16	E87877	Screw WS20/24 FS28/32	2
20	SL23209	FUSE TWEEZERS	1
21	SL55061	LABEL	1
22	E89234	Traction card WS24	1
23	SL23221	CONNECTOR	1
24	E86988	Main Key Switch	1
25	E86988	Main Key Switch	1
26	E86988	Main Key Switch	2
27	E89153	Potentiometer	1
28	E86496	Circuit Board	1
29	E87923	Handle	1
30	E86750	Washer D5	6
31	SL06094	WASHER	2
32	E86749	Nut M5 UNI 5588	2
33	SL03607	SUPPORT	1
34	SL04244	SCREW	1
35	E89530	Spring WS20/24	1
36	E89154	Screw	2
37	E89087	Microswitch	1
38	E89471	Vac Motor Relay	1
39	E86797	Washer	1
40	E89529	Relay Support WS20/24	1
41	E89223	Resistor	1
45	E86997	Upper Control Panel WS20/24	1
46	SL55039	LABEL	1
47	E86644	Knob for Potentiometer	1
48	E86421	Reflector	1
49	E89255	Brush rocker switch WS24	1
50	E86423	Bipolar Switch	1

## Control Panel New Style A



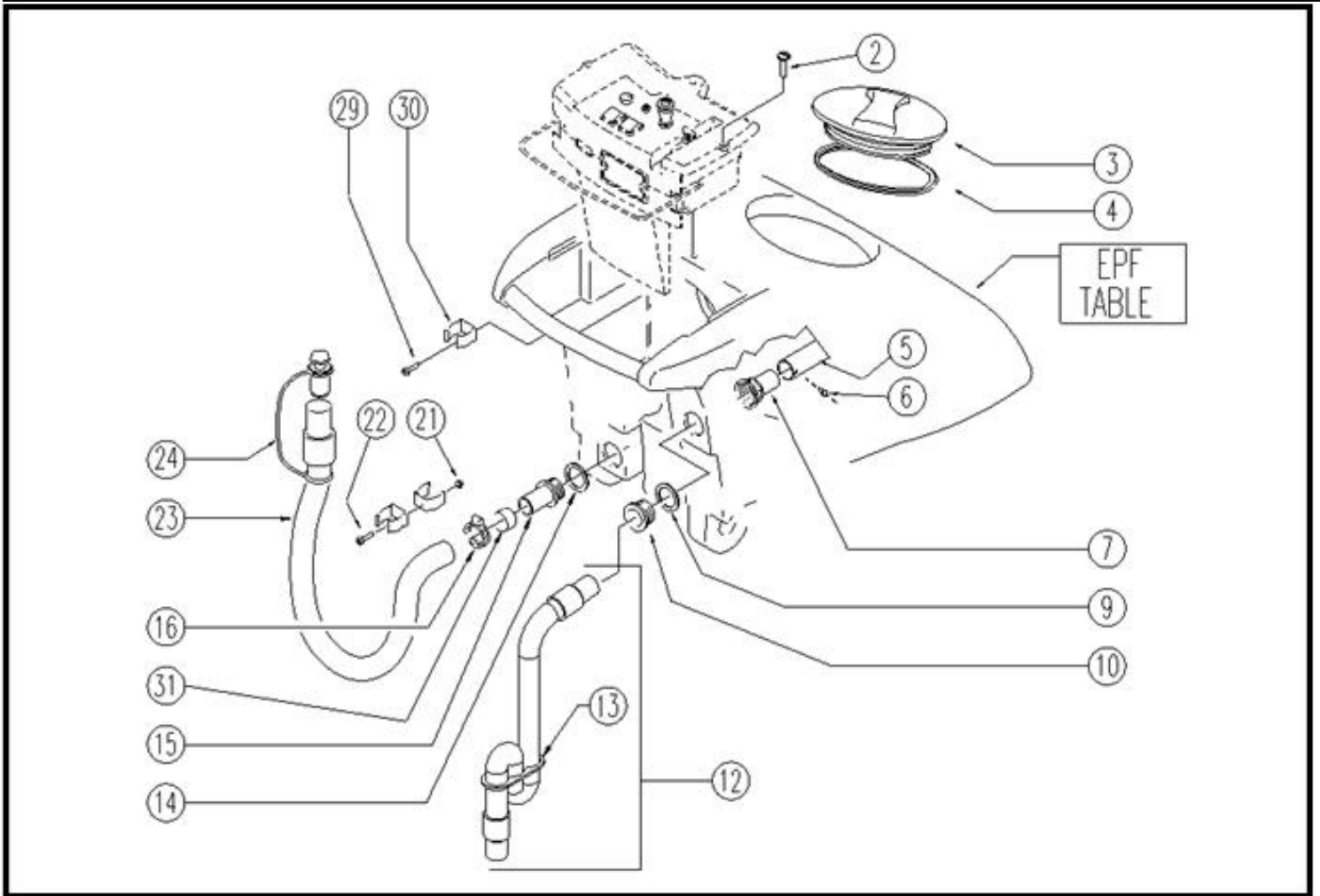
ITEM	SKU	DESCRIPTION	QTY	ITEM	SKU	DESCRIPTION	QTY
1	LAFN05201	CABLE CLAMPING	1	28	E86496	Circuit Board	1
2	VTVT28553	SCREW TCB-TC 3.5X16	8	29	E87923	Handle	1
3	MECB00772	WIRING PANNELLO	1	30	E86750	Washer D5	6
4	MEVR01331	FAIR-LEAD	1	31	VTRS15908	WASHER D. 5	2
5	MPVR03845	LEVER	1	32	VTDD07727	NUT M 5 INOX	2
6	LAFN05103	ARTICULATION	1	33	MPVR02820	SUPPORT	1
7	VTVT07859	SCREW 3.5X13	6	34	VTVT00766	SCREW TE M. 5-25	1
8	E86448	AS20 Washer	2	35	MLML00215	SPRING	1
9	MPVR03844	PANEL	1	36	E89154	Screw	2
10	E89468	Fuse Carrier	1	37	MEC 00310	MICROSWITCH	1
11	E89342	Fuse 30 Amp	6	38	E89471	Vac Motor Relay	1
12	E86647	Fuse 40A	2	39	E86797	Washer	1
13	E87830	Nut	2	40	E89529	Relay Support WS20/24	1
14	GUGO00150	NUT	2	41	E89223	Resistor	1
15	E86543	Fuse Cover for AS20	1	45	E86997	Upper Control Panel	1
16	E87877	Screw	2	46	ETET01342	LABELPANN.COMANDI100	1
17	ITSO00031	SOUND-PROOFING	1	47	E86644	Knob for Potentiometer	1
18	ITSO00032	SOUND-PROOFING	1	48	E86421	Reflector	1
20	MEVR01153	FUSE	1	49	MEC 00336	SWITCHBIPOL.LUMIN.100	1
21	ETET01352	LABEL	1	50	E86423	Bipolar Switch	1
22	E89234	Traction card WS24	1	51	MPVR02940	CLIP D. 6,5	1
23	MEC 00277	CONNECTOR	1	52	LAFN05758	ROD	1
24	MEC 00323	BUTTON	1	53	E89475	Snap Ring	1
25	E89243	Key(set of 2)	1	54	E88420	Hose, Motor Exhaust Vent	1
26	MEC 00403	CONTACT -	2	55	FSVR00083	CLAMP 62-82100	1
27	E89153	Potentiometer	1	56	E86577	washer WS20/24	2

### Recovery Tank/Hoses SN from 01D150



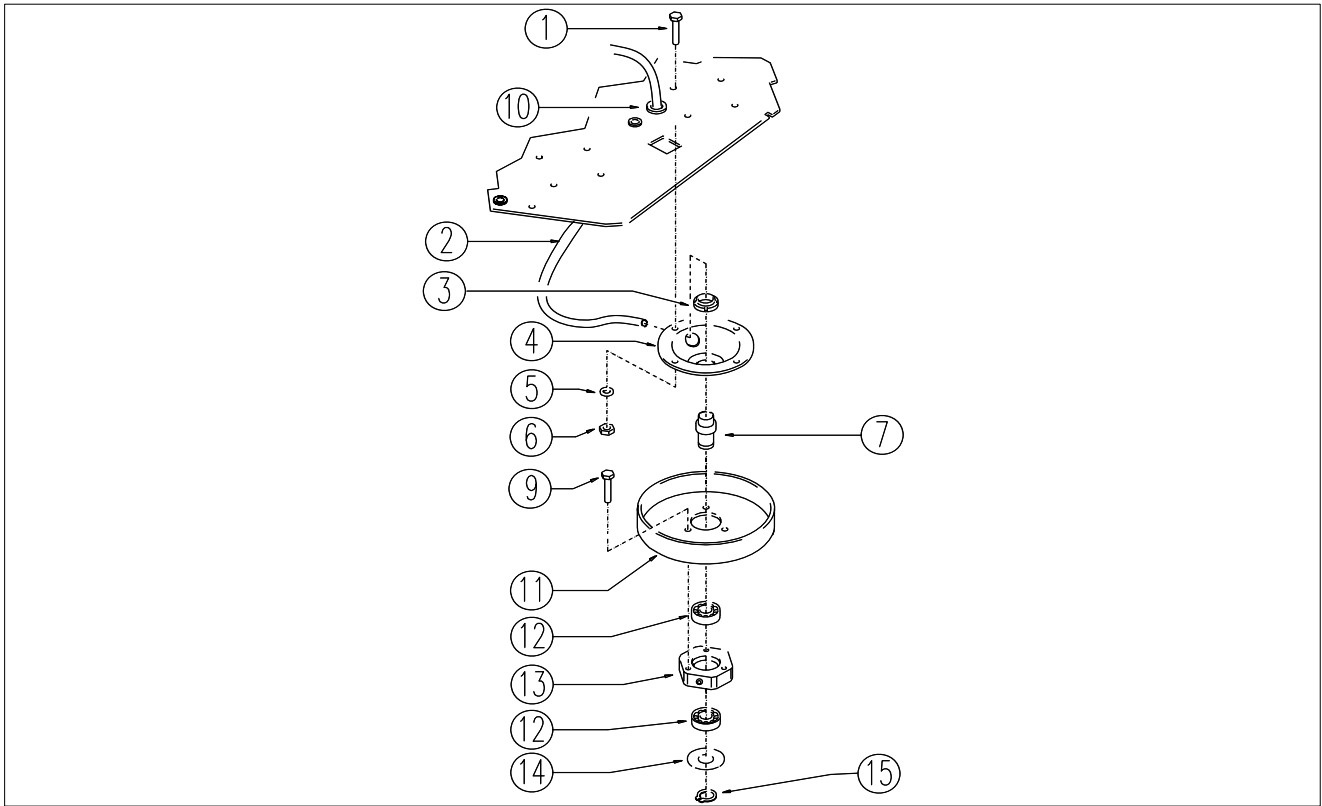
ITEM	SKU	DESCRIPTION	QTY
1	E86367	clip WS20	1
2	E87877	Screw WS20/24 FS28/32	2
3	E86518	Cover	1
4	E86503	Gasket	1
5	E87922	Hose	1
6	E86306	Screw	1
7	E89152	Connector WS20/24	1
8	E89280	Spacer	1
9	E87857	Gasket WS20/24	1
10	E87858	Suction Opening WS20/24	1
11	E86849	Sleeve	1
12	E86521	Hose	1
13	E86759	Plaque	1
14	E89089	Gasket	2
15	E87772	Connector for WS20	1
16	E86480	Double Wire Clamp	1
20	E89236	Nut	1
21	E86735	Nut	2
22	E86734	Screw	2
23	E86522	Hose	1
24	E86993	Drain hose plug with clamp	1
29	E89473	Screw	2
30	E86992	Hose Clips	3
31	E87785	Sleeve	1
32	E87786	Gasket	1

## RECOVERY TANK/HOSES NEW



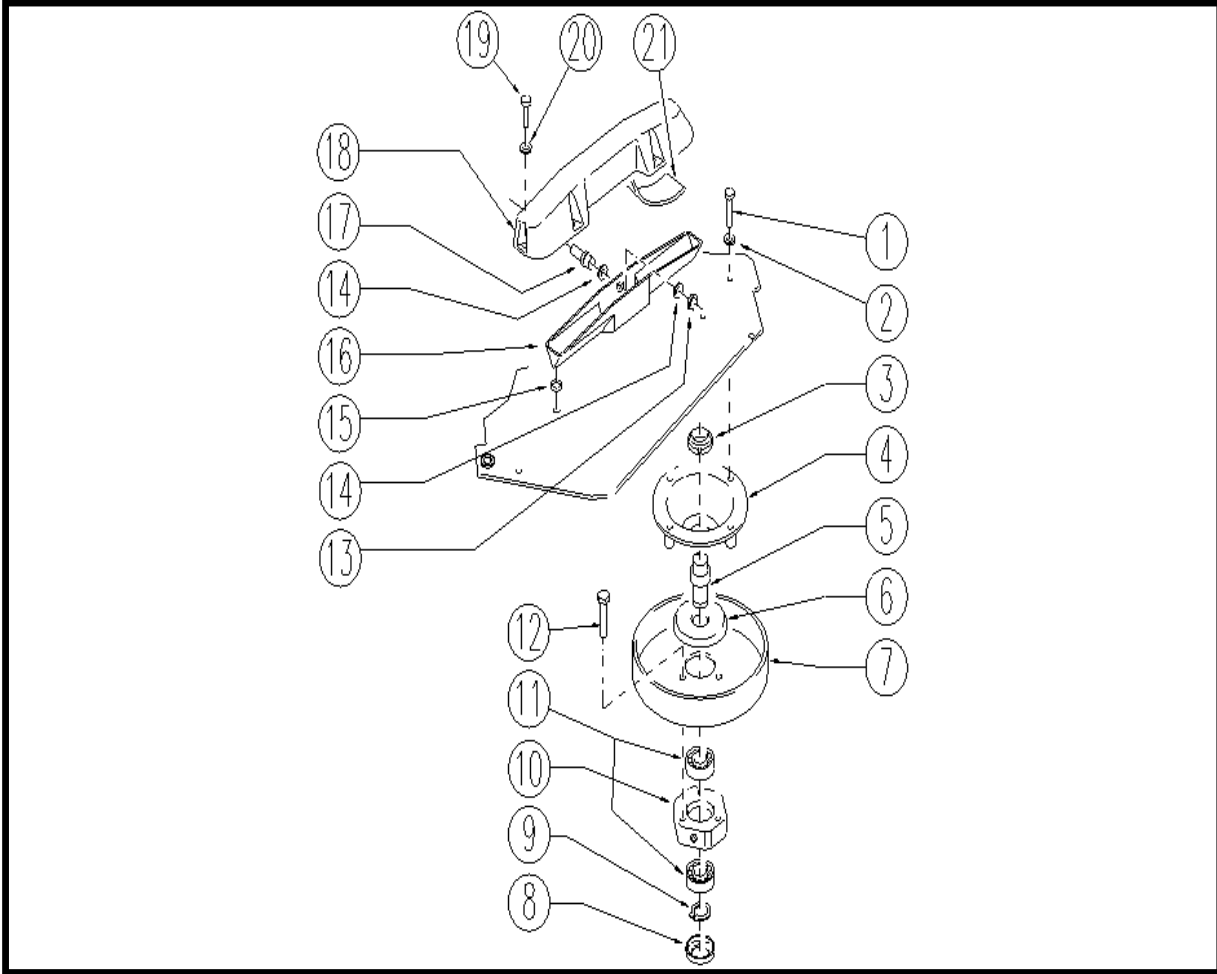
ITEM	SKU	DESCRIPTION	QTY
2	E87877	Screw WS20/24 FS28/32	2
3	E86518	Cover	1
4	E86503	Gasket	1
5	E87922	Hose	1
6	VTVT00881	SCREW M4x6	1
7	E89152	Connector WS20/24	1
9	E87857	Gasket WS20/24	1
10	E87858	Suction Opening WS20/24	1
12	E89237	Squeegee Hose ASM	1
13	E86759	Plaque	1
14	E89089	Gasket	1
15	E87772	Connector for WS20	1
16	E86480	Double Wire Clamp	1
21	VTDD00147	NUT M 4 INX U.5588	2
22	E86734	Screw	2
23	E86522	Hose	1
24	E86993	Drain hose plug with clamp	1
29	E89473	Screw	2
30	E86992	Hose Clips	3
31	E89506	Drain hose protector WS20	1

SCRUB DECK, OLD STYLE

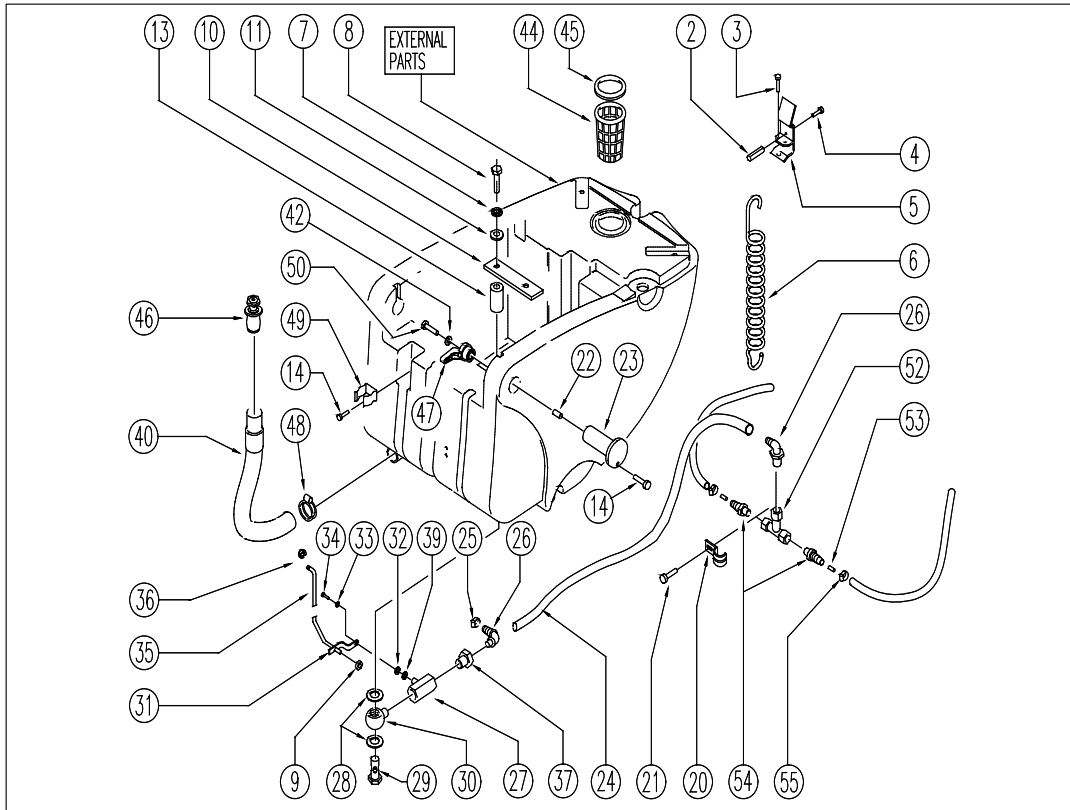


REF.	CODE	DESCRIPTION	QT
1	E86383	screw WS24	8
2	E86337	hose WS24	2
3	E86468	AS20 Nut	2
4	E86382	Flange, WS24 before 04B004	2
5	E86726	Washer	8
6	E86853	Self-locking nut M8	8
7	E86381	Pin, WS24 before 04B004	2
9	E86977	Screw M5-16 Zinc Plated	6
10	E87906	Fairlead	2
11	E86724	Pulley, pipe WS24 before 04B004	2
12	E86409	Bearing, 6005 2RS	4
13	E89431	Hexagon, WS24 before 04B004	2
14	E86617	Lower Protection	2
15	E86812	Seegeer	2

SCRUB DECK NEW STYLE



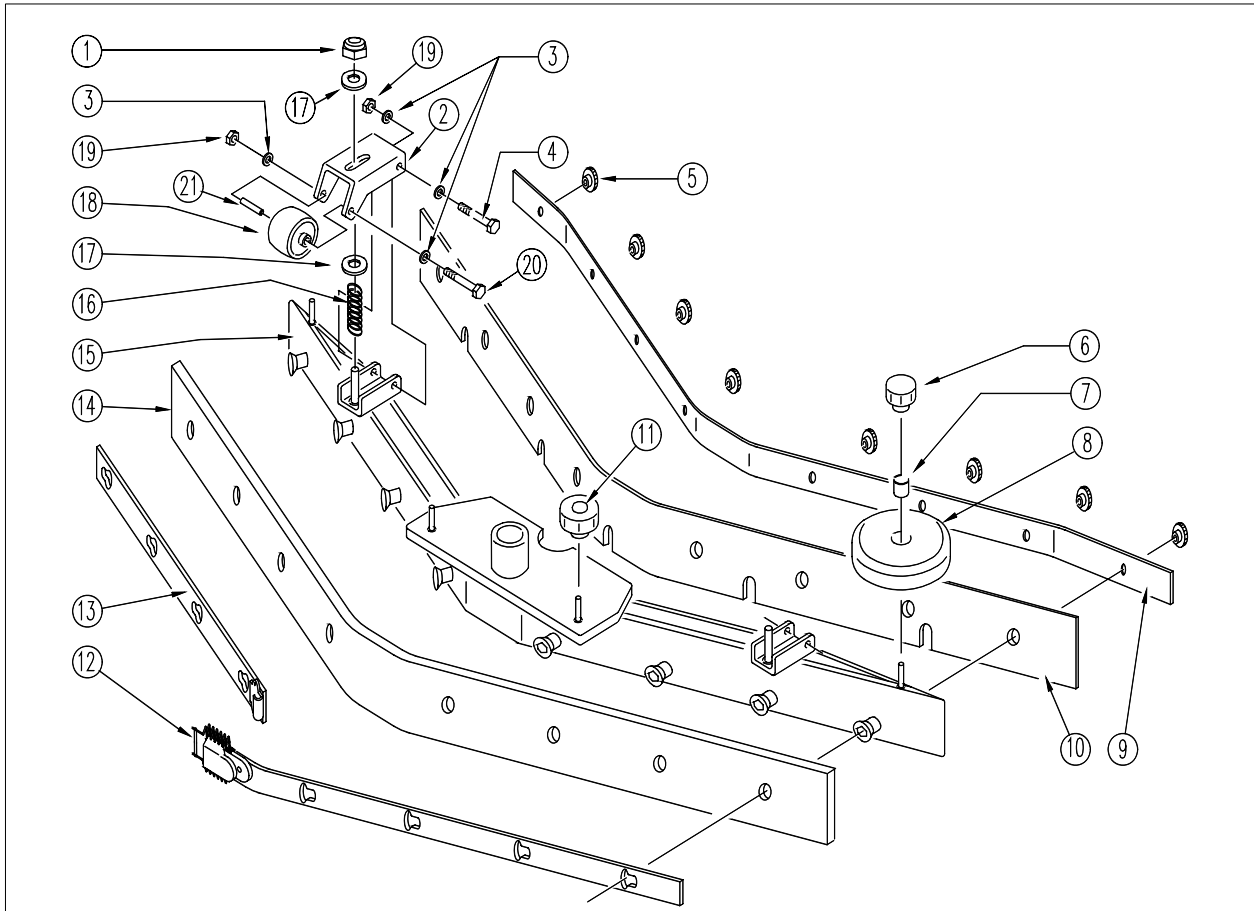
ITEM	SKU	DESCRIPTION	QTY
1	E89251	Screw	8
2	E86427	Washer for AS20	8
3	E86468	AS20 Nut	2
4	E89252	Flange, WS24 after 04B004	2
5	E89127	Pin, WS24 after 04B004	2
6	E86618	Upper Protection	2
7	E86724	Pulley, pipe WS24 before 04B004	2
8	E89128	Oil splash guard WS20/24	2
9	E86812	Seegeer	2
10	E89129	Hexagon, WS24 after 04B004	2
11	E86409	Bearing, 6005 2RS	4
12	E86977	Screw TCEI M5-16 Uni 5931 Zinc Plated	6
13	E87943	Nut	1
14	E86915	AS30/36 Gasket	2
15	E86744	AS20 Washer	2
16	E89246	Distributor	1
17	E89095	Union/connector	1
18	E89239	Cover	1
19	E89285	Screw	4
20	E89286	Washer	4
21	E89261	Gasket WS24	1



ITEM	SKU	DESCRIPTION	QTY	ITEM	SKU	DESCRIPTION	QTY
2	E86796	Spacer WS24	1	30	E87828	Connector	1
3	SL04222	SCREW	2	31	E87861	Lever	1
4	SL04278	SCREW	1	32	E89119	Washer	1
5	SL09829-4	HOOK	1	33	E89118	Washer	1
6	E86513	Spring	1	34	E89117	Screw	1
7	E86702	Cham Washer D8	2	35	E87860	Solution Rod WS20/24	1
8	E86542	Screw AS20	2	36	E89475	Snap Ring	1
9	E86875	Self-Locking Nut	3	37	E86377	reduction WS20/24	1
10	SL39098	BRACKET	1	39	E86879	Washer	1
11	E86726	Washer	2	40	E86523	Hose Foreman28	1
13	E86567	spacer	2	42	E86704	Washer D 6-18	3
14	E89473	Screw	4	44	E87799	Filter WS20/24	1
20	E87895	clamp	1	45	E89142	Gasket	1
21	E87864	Screw WS20/24	1	46	E86993	Drain hose plug with cla	1
22	E86372	insert	2	47	E87897	lever WS20/24 FS28/32	1
23	E86574	pin WS20/24	2	48	E86480	Double Wire Clamp	1
24	E86525	Hose	1	49	E86992	Hose Clips	1
25	SL14007	CLAMP	1	50	E86737	Screw	2
26	E86940	L Coupling, 3/8" D.15	2	52	E87894	Connector	1
27	E87936	TAP	1	53	E86927	Inserto	2
28	E87815	Washer WS24	2	54	E86752	Coupling 10 x 3-8 M	2
29	SL18257	SCREW	1	55	E86751	Clamp 10-16	2

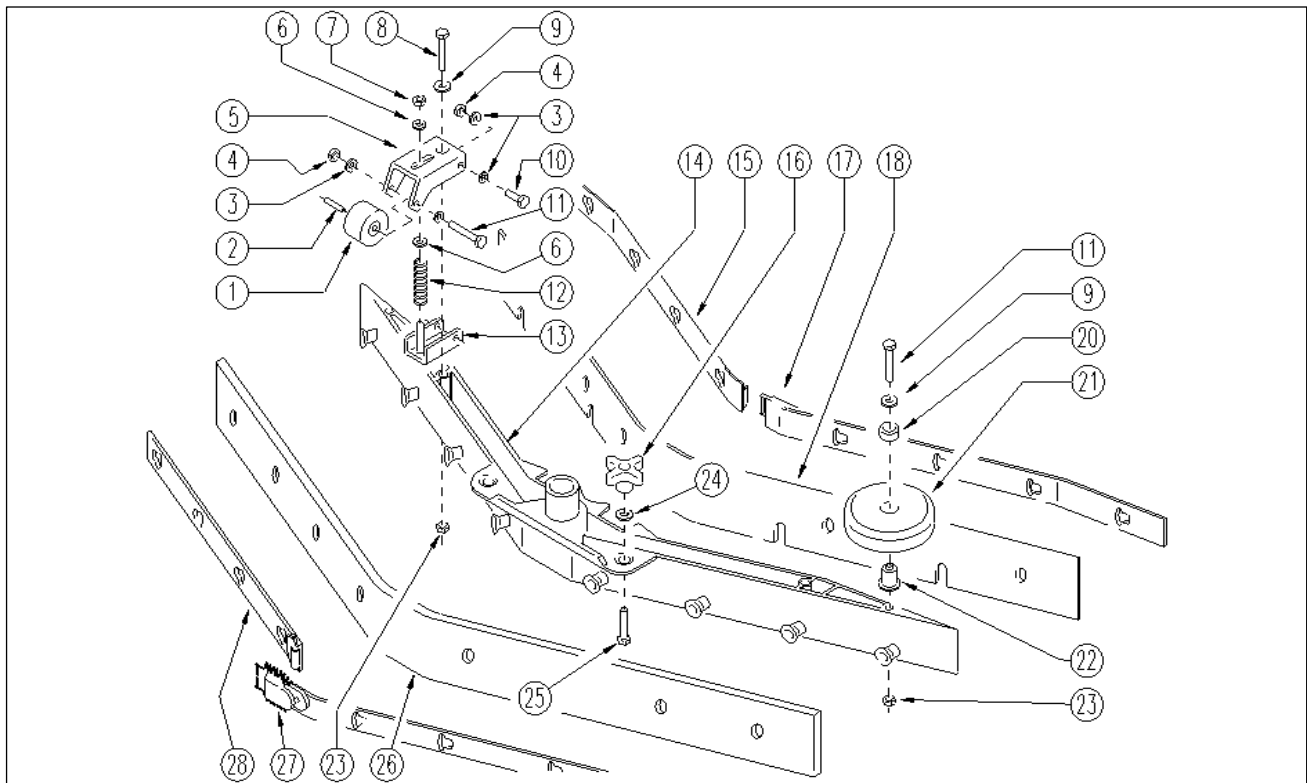
SQUEEGEE ASSEMBLY OLD STYLE

SN FROM 01B000

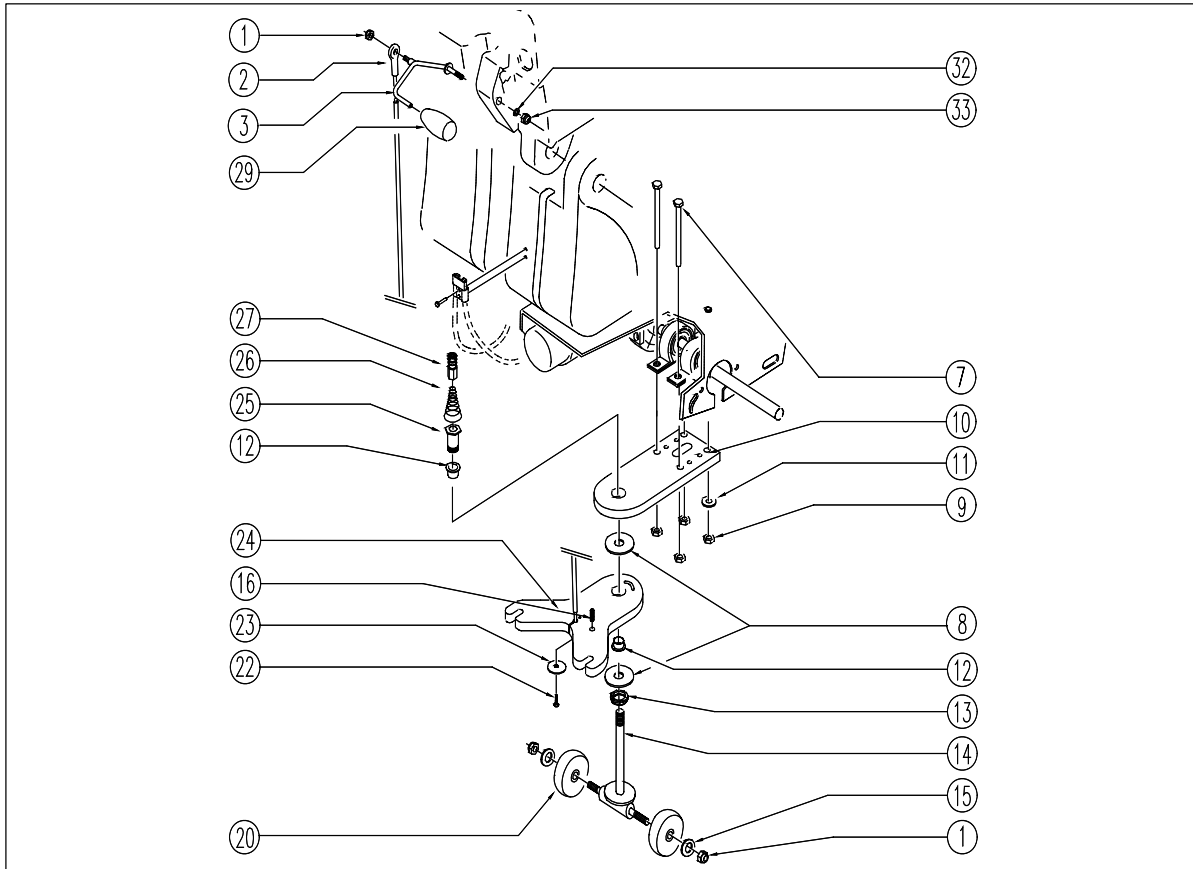


ITEM	SKU	DESCRIPTION	QTY
	E87800	Complete Squeegee for WS20/24	
1	E86853	Self-locking nut M8	2
2	E89218	Squeegee support	2
3	E86427	Washer	12
4	E86737	Screw	4
5	E86526	Handle	8
6	E86850	Knob	2
7	E86560	spacer	2
8	E86451	AS20 Wheel	2
9	E86529	Blade Holder	1
10	E86504	Front Curved Squeegee Blade WS20/24	1
11	E86867	Squeegee Knob	2
12	E86530	Blade Holder	1
13	E86531	Blade Holder	1
14	E86505	Rear Curved Squeegee Blade WS20/24	1
15	SL39027	BODY	1
16	E86514	Spring	2
17	E86879	Washer	4
18	E89520	Small Wheel	2
19	E87868	Self Locking Nut	6
20	E86499	Hex Bolt M6x55 SS	2
21	E89521	Spacer FS28/32	2



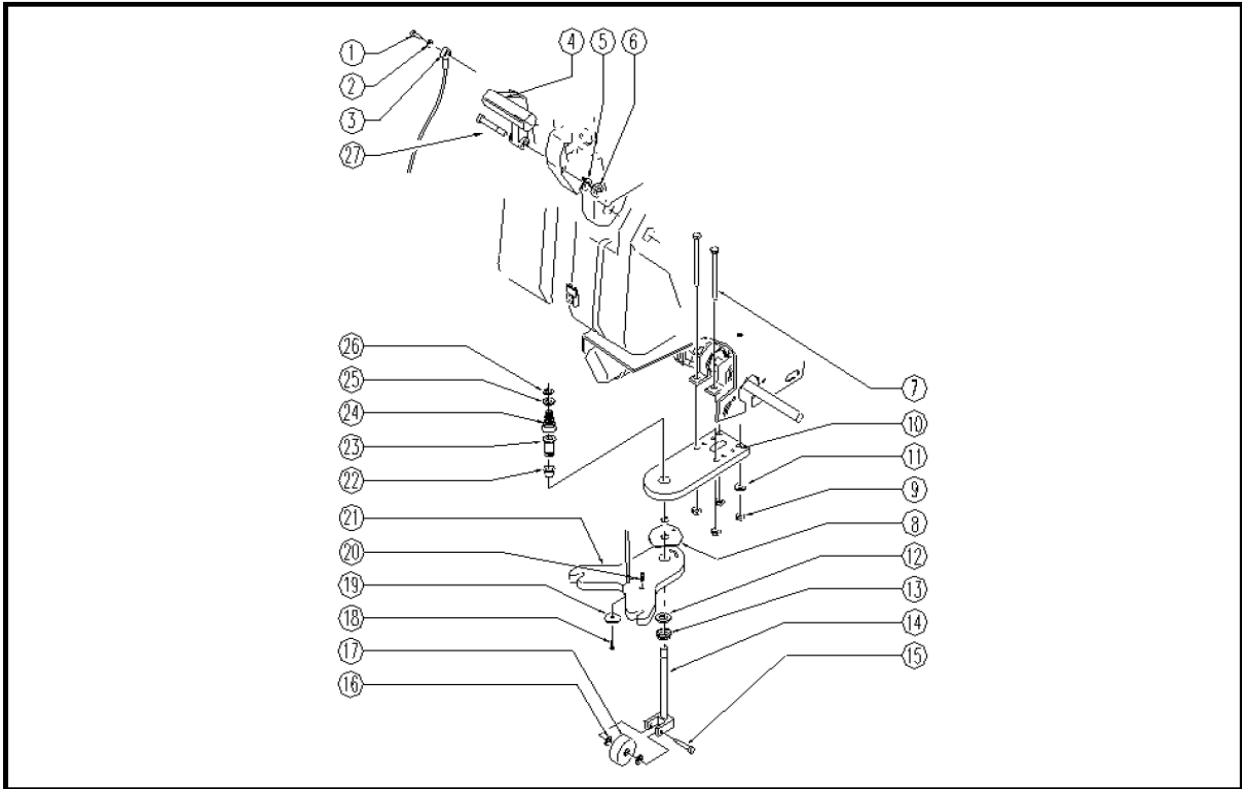


REF.	CODE	DESCRIPTION	QT
	E87800	Complete Squeegee for WS20/24	
1	E89520	Small wheel FS28/32	2
2	E89521	Spacer FS28/32	2
3	E86427	Washer for AS20	12
4	E86738	Nut M6 w/ Nylon Ring	6
5	E89218	Squeegee support	2
6	E86879	Washer	4
7	E86853	Self-locking nut M8	2
8	E89171	Screw	2
9	E87921	Washer	4
10	E86737	Screw	4
11	E86499	Hex Bolt M6x55 SS	4
12	E86514	Spring	2
13	E89287	Support	2
14	E89004	Squeegee body WS20/24	1
15	E89284	Squeegee holder with latch	1
16	E86867	Squeegee Knob WS20/24 FS28	2
17	E89283	Squeegee holder with hook	1
18	E86504	Front Curved Squeegee Blade WS20/24	1
20	E87834	Bushing WS20	2
21	E86451	AS20 Wheel	2
22	E86560	spacer	2
23	E86873	Nut	4
24	E89211	Washer	2
25	E89212	Screw	2
26	E86505	Rear Curved Squeegee Blade WS20/24	1
27	E86530	Blade Holder	1
28	E86531	Blade Holder	1

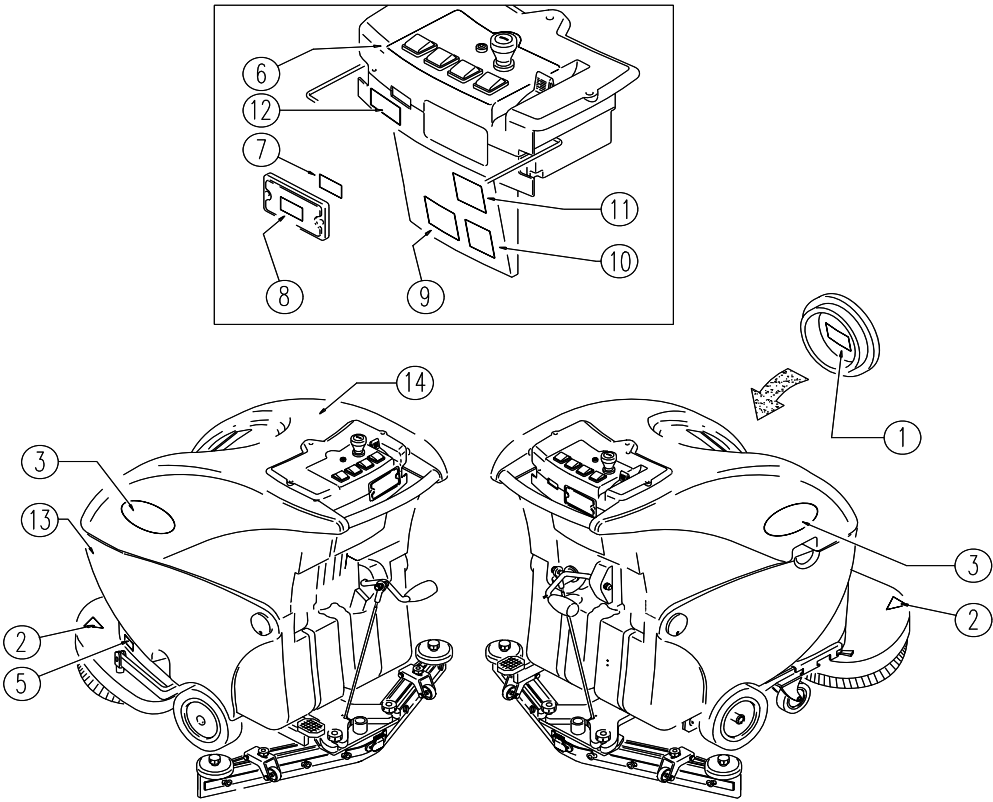


ITEM	SKU	DESCRIPTION	QTY
1	E86853	Self-locking nut M8	3
2	E89462	WS 24 Squeegee Cable	1
3	E89094	Lever, Metal Squeegee Lift	1
7	E89194	Screw	5
8	E89404	Washer	2
9	E86853	Self-locking nut M8	5
10	E89197	Support	1
11	E86726	Washer	4
12	E89403	Bushing	2
13	E87836	Nut WS 24	1
14	E87791	Rear Wheel Kit WS20/24	1
15	E86879	Washer	2
16	E89195	Screw	1
20	E86508	Small Wheel	2
22	E86578	screw WS20/24	1
23	E86577	washer WS20/24	1
24	E89196	Plate	1
25	E89405	Pin	1
26	E89406	Spring	1
27	SL07522	NUT	1
29	E86599	handgrip WS20/24	1
32	E89120	Washer	1
33	E86462	AS20 Nut	1

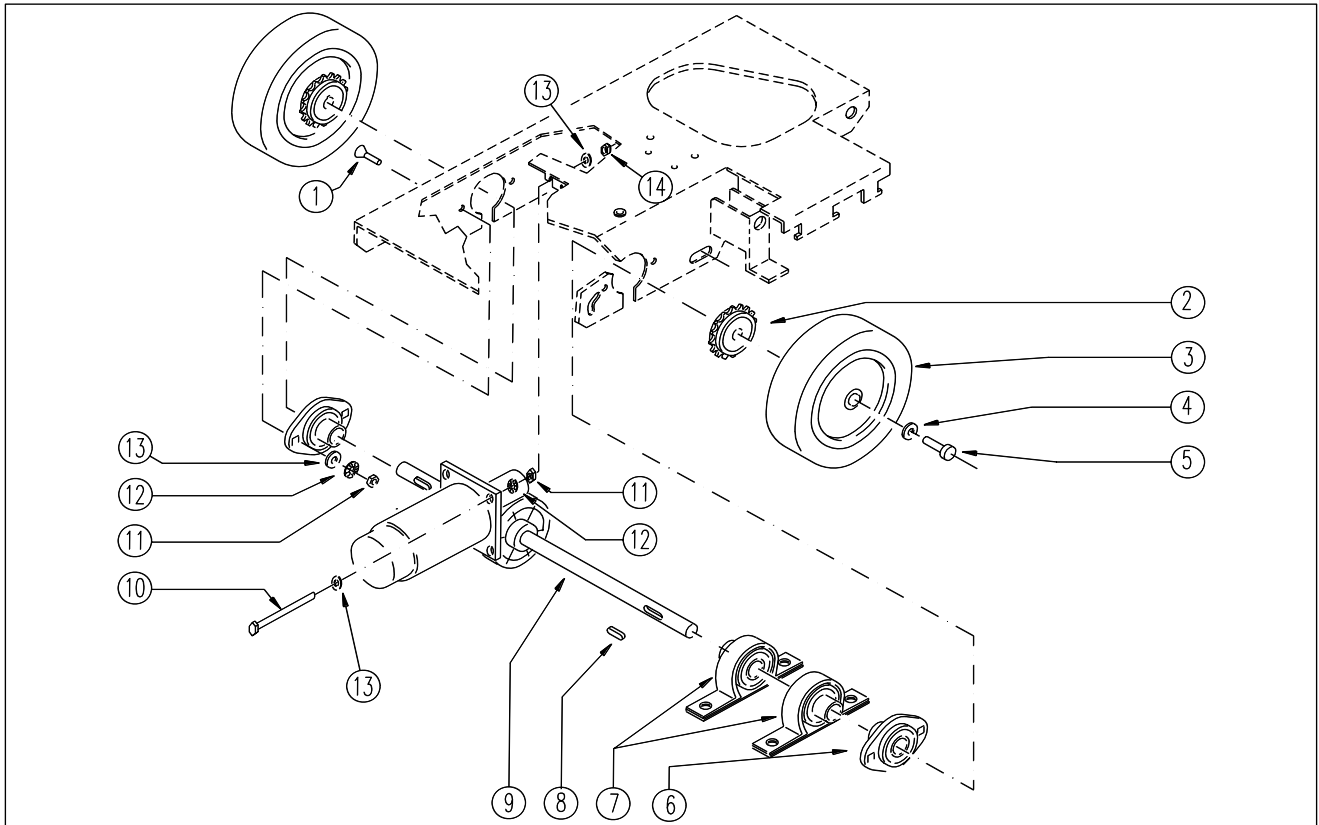
## Squeegee Support New Style



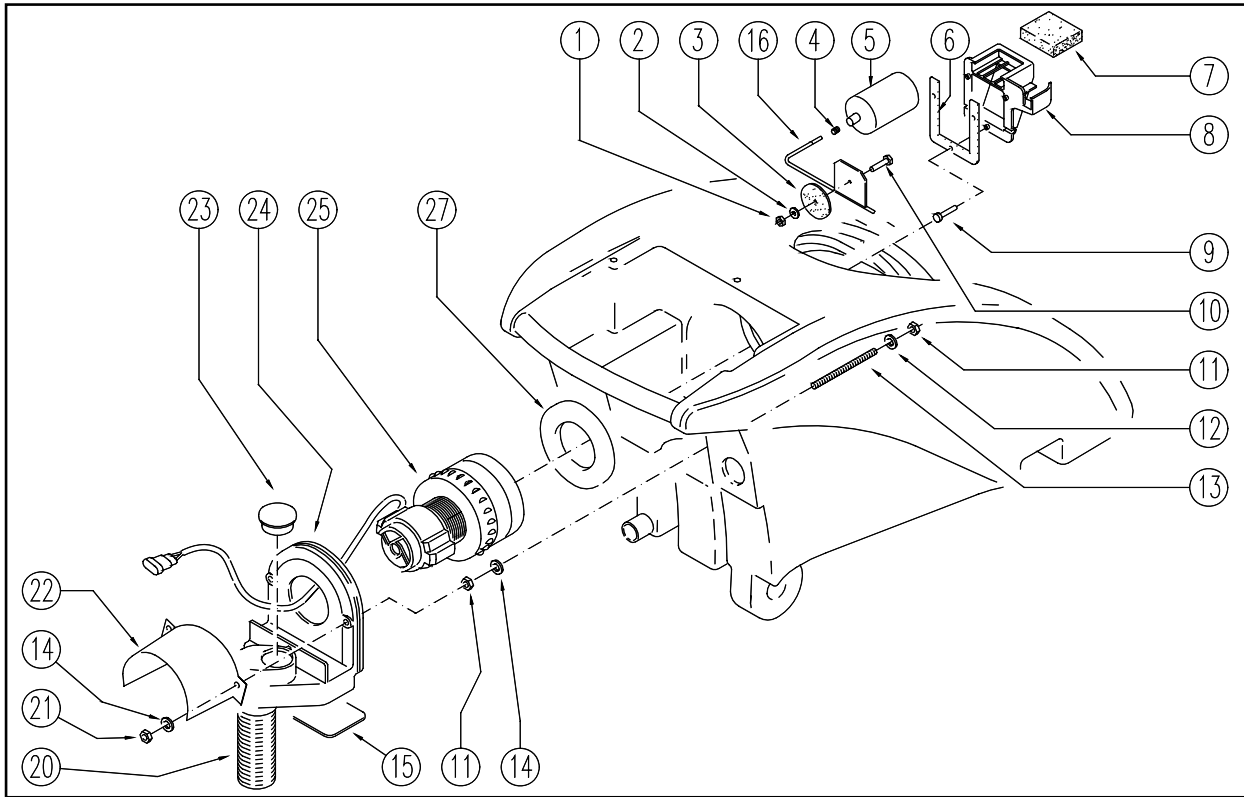
ITEM	SKU	DESCRIPTION	QTY	FROM
1	E88004	Screw, Machine M4 x 12	1	05/2003
2	E89118	Washer	1	05/2003
3	E89462	WS 24 Squeegee Cable	1	09/2003
4	E89108	Lever, Plastic Squeegee Lift	1	05/2003
5	E88091	Washer	1	05/2003
6	E86462	AS20 Nut	1	10/2002
7	E89194	Screw	4	10/2002
8	VTRS00363	WASHER D.6	1	03/2004
9	E86853	Self-locking nut M8	4	05/2003
10	LAFN51070	SQUEEGEE ARM	1	03/2004
11	E86726	Washer	4	10/2002
12	VTRS00259	RING	1	04/2004
13	E87836	Nut WS 24	1	
14	E87872	Support for WS20/24	1	10/2002
15	E87850	Screw Squeegee Support	1	04/2003
16	E86878	Washer	2	10/2002
17	E87845	Red Wheel	1	10/2002
18	E86578	screw	1	10/2002
19	E86577	washer	1	10/2002
20	E89195	Screw	1	07/2004
21	LAFN05555	PLATE	1	04/2004
22	E89403	Bushing	1	03/2004
23	E89405	Pin	1	03/2004
24	E89406	Spring	1	10/2002
25	E87873	Washer for WS20	1	10/2002
26	E89408	Stop Ring	1	10/2002
27	E89217	Squeegee handle bolt	1	05/2003



ITEM	SKU	DESCRIPTION	QTY
1	SL25056	LABEL	1
2	SL25364	LABEL	2
3	SL25744	LABEL	2
5	SL25369	LABEL	1
6	E86575	control panel label	1
7	SL25928	LABEL	1
8	E89162	Label for fuse FS28	1
9	SL25002	LABEL	1
10	SL25177	LABEL	1
11	SL25053	LABEL	1
12	SL25401-3	PART, SERIAL NUMBER LABEL	1
13	E87851	Solution Tank	1
14	E86401	Recovery tank, red	1



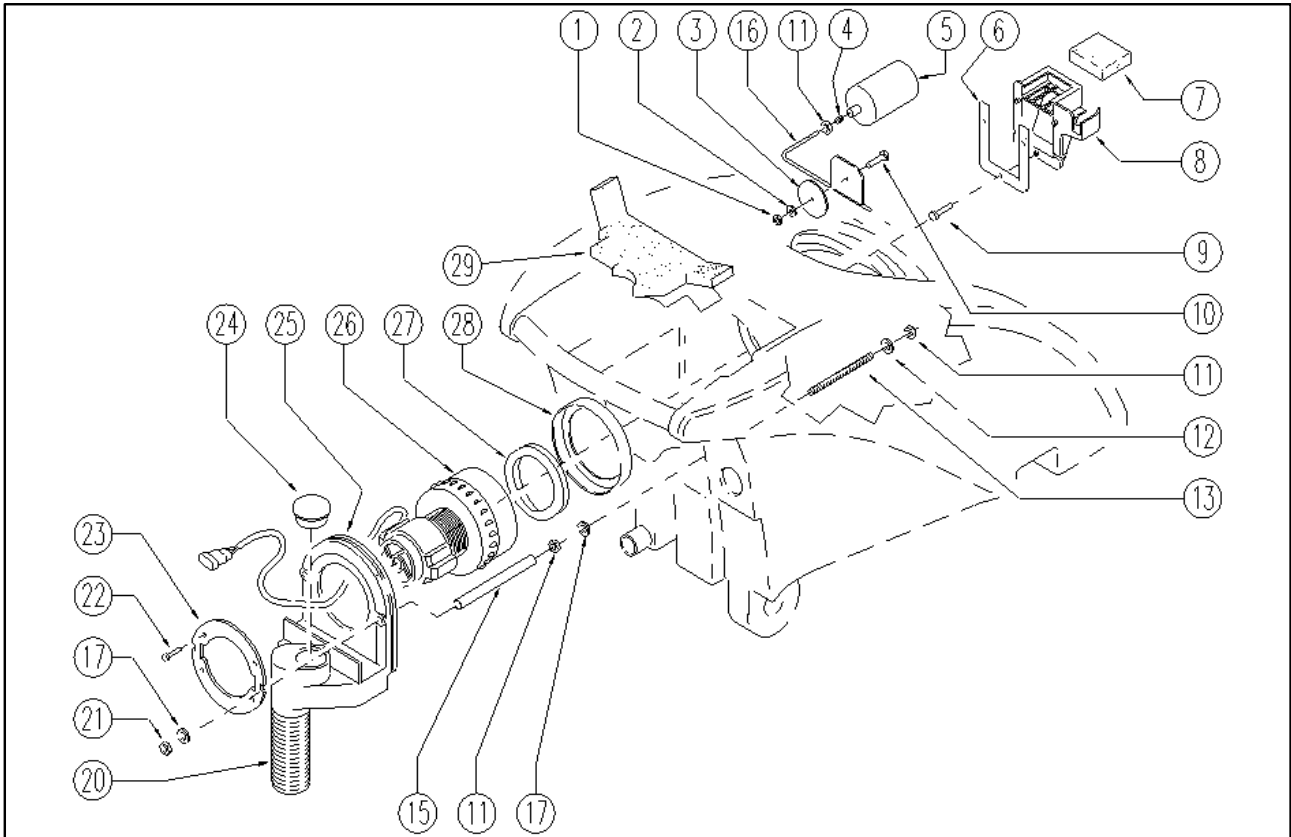
ITEM	SKU	DESCRIPTION	QTY
1	E87864	Screw	4
2	E86601	Bearing	2
3	E86625	Wheel	2
4	E86878	Washer	2
5	E86540	Screw M8x10	2
6	E86742	Support	2
7	E86359	Support	2
8	E89466	Square key	2
9	E89459	Drive Motor Shaft	1
10	E86871	Screw	1
11	E86873	Nut	5
12	E86716	Cham Washer	5
13	E86427	Washer	7
14	E86875	Self-Locking Nut	1



ITEM	SKU	DESCRIPTION	QTY
1	E86772	Nut	1
2	E86448	AS20 Washer	1
3	E86591	Gasket WS20/24-FS28/32	1
4	E89213	Insert FS28/32	1
5	E86593	Float WS20/24-FS28/32	1
6	E86365	filter gasket WS20	1
7	E86502	Filter	1
8	E86595	Support WS20/24-FS28/32	1
9	E89451	Screw	3
10	E86594	Screw WS20/24-FS28/32	1
11	E86873	Nut	4
12	E86719	AS20 Washer	2
13	E87910	Screw	2
14	E86427	Washer for AS20	4
15	SL17554	BULKHEAD	1
16	E86592	Rod WS20/24-FS28/32	1
20	E86524	Pipe	1
21	E86875	Self-Locking Nut	2
22	E89131	Suction conveyor	1
23	E89132	Cap	1
24	E89133	Cap / shell	1
25	E89478	Vac. Motor	1
27	E86403	Gasket for Vacuum Motor	1

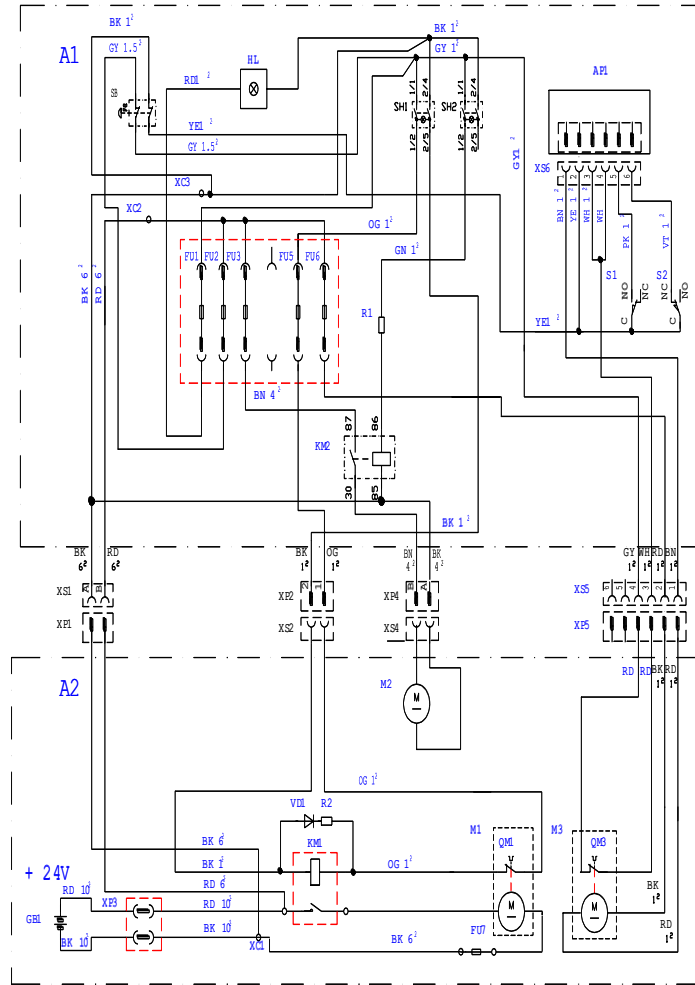
**Vacuum Motor Group**

**SN FROM 04C335**



ITEM	SKU	DESCRIPTION	QTY
1	E86772	Nut	1
2	E86448	AS20 Washer	1
3	E86591	Gasket WS20/24-FS28/32	1
4	E89213	Insert FS28/32	1
5	E86593	Float WS20/24-FS28/32	1
6	E86365	filter gasket WS20	1
7	E86502	Filter	1
8	E86595	Support WS20/24-FS28/32	1
9	SL04342	SCREW	3
10	E86594	Screw WS20/24-FS28/32	1
11	E86873	Nut	5
12	E86719	AS20 Washer	2
13	E87910	Screw	2
15	E89125	Spacer WS20/24	2
16	E86592	Rod WS20/24-FS28/32	1
17	E86758	Washer	4
20	E86524	Pipe	1
21	E86875	Self-Locking Nut	2
22	SL04421	SCREW	4
23	E89126	Flange vac plate WS20/24	1
24	E89132	Cap	1
25	E89133	Cap / shell	1
26	E89124	2 stage vac motor WS20/24 after 04B	1
27	E87832	O Ring for Gasket FS28	1
28	E86612	Gasket for vacuum motor	1
29	MPVR51075	GASKET	1

BK	BLACK	BU	BLUE
BN	BROWN	VT	VIOLET
RD	RED	GY	GREY
OG	ORANGE	WH	WHITE
YE	YELLOW	PK	PINK
GN	GREEN	TQ	TURQUOISE

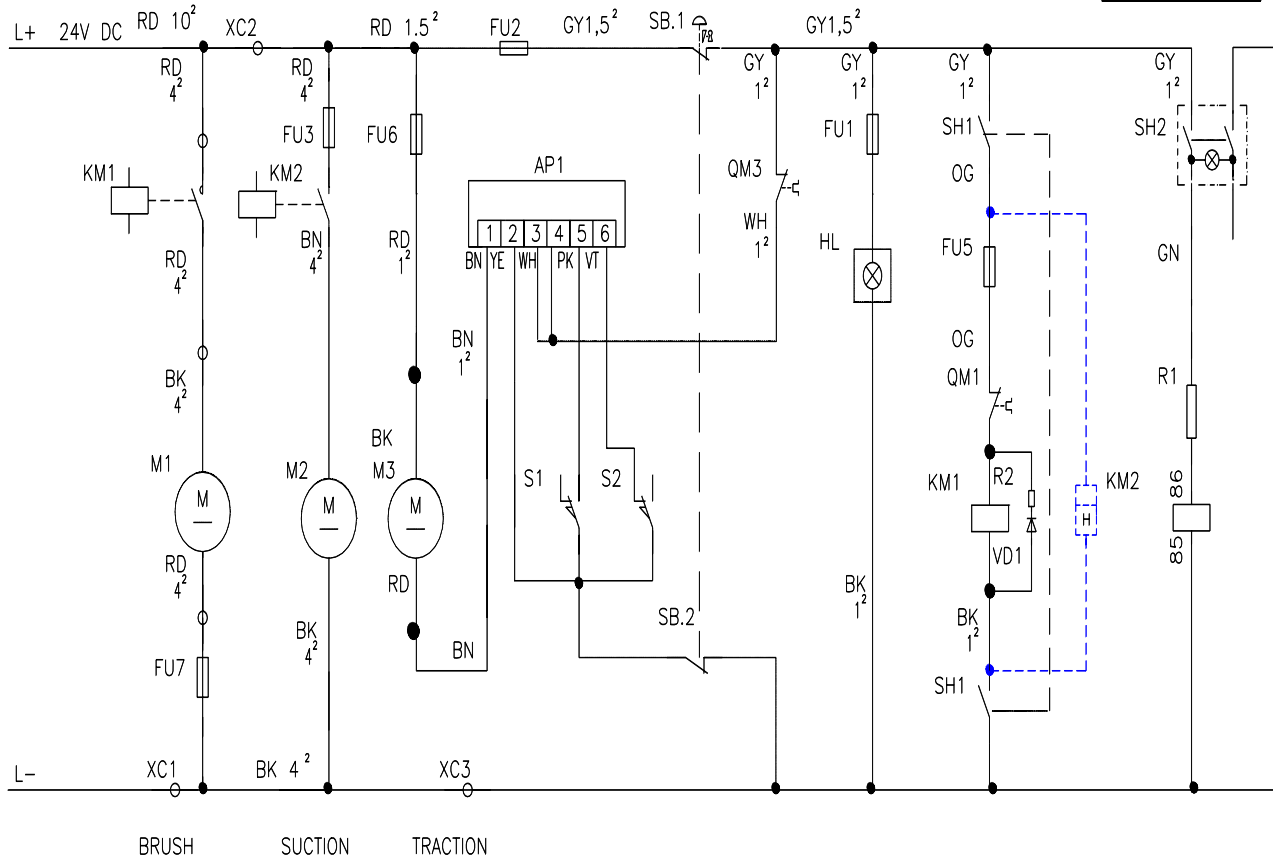


ITEM	SKU	DESCRIPTION
AP1	E86528	Gearcase Board
FU1	E86825	Fuse 5 amp
FU2	E89342	Fuse 30 Amp
FU3	E89342	Fuse 30 Amp
FU5	E86825	Fuse 5 amp
FU6	E89342	Fuse 30 Amp
FU7	E87883	60 AMP Fuse for WS20/24
GB1	E11767	BATTERY
HL	E86496	Circuit Board
KM1	E86420	Relay
KM2	E89471	Vac Motor Relay
M1	E86608	Brush Motor
M2	E89478	Vac. Motor
M3	E89459	Drive Motor Shaft
QM1	INTERNAL	THERMAL PROTECTION
QM3	INTERNAL	THERMAL PROTECTION
R1	E89223	Resistor
R2	SL23899	RESISTANCE
S1	E86527	Microswitch

ITEM	SKU	DESCRIPTION
S2	E86527	Microswitch
SB	INTERNAL	PUSH-BUTTON
SH1	E86423	Bipolar Switch
SH2	E86423	Bipolar Switch
VD1	E87965	Diode, 5 OHM Watchman 20
XC1	E86563	support
XC2	SL23414	CLAMP
XC3	SL23414	CLAMP
XP1	E89281	Female connector kit
XP2	E86307	CONNECTOR
XP3	SL23010K	CONNECTOR
XP4	E89281	Female connector kit
XP5	SL23558	CONNECTOR
XS1	E89282	Male connector kit
XS2	E86308	Connector
XS4	E89282	Male connector kit
XS5	SL23559	CONNECTOR
XS6	SL23902	CONNECTOR



BK	BLACK	BU	BLUE
BN	BROWN	VT	VIOLET
RD	RED	GY	GREY
OG	ORANGE	WH	WHITE
YE	YELLOW	PK	PINK
GN	GREEN	TQ	TURQUOISE

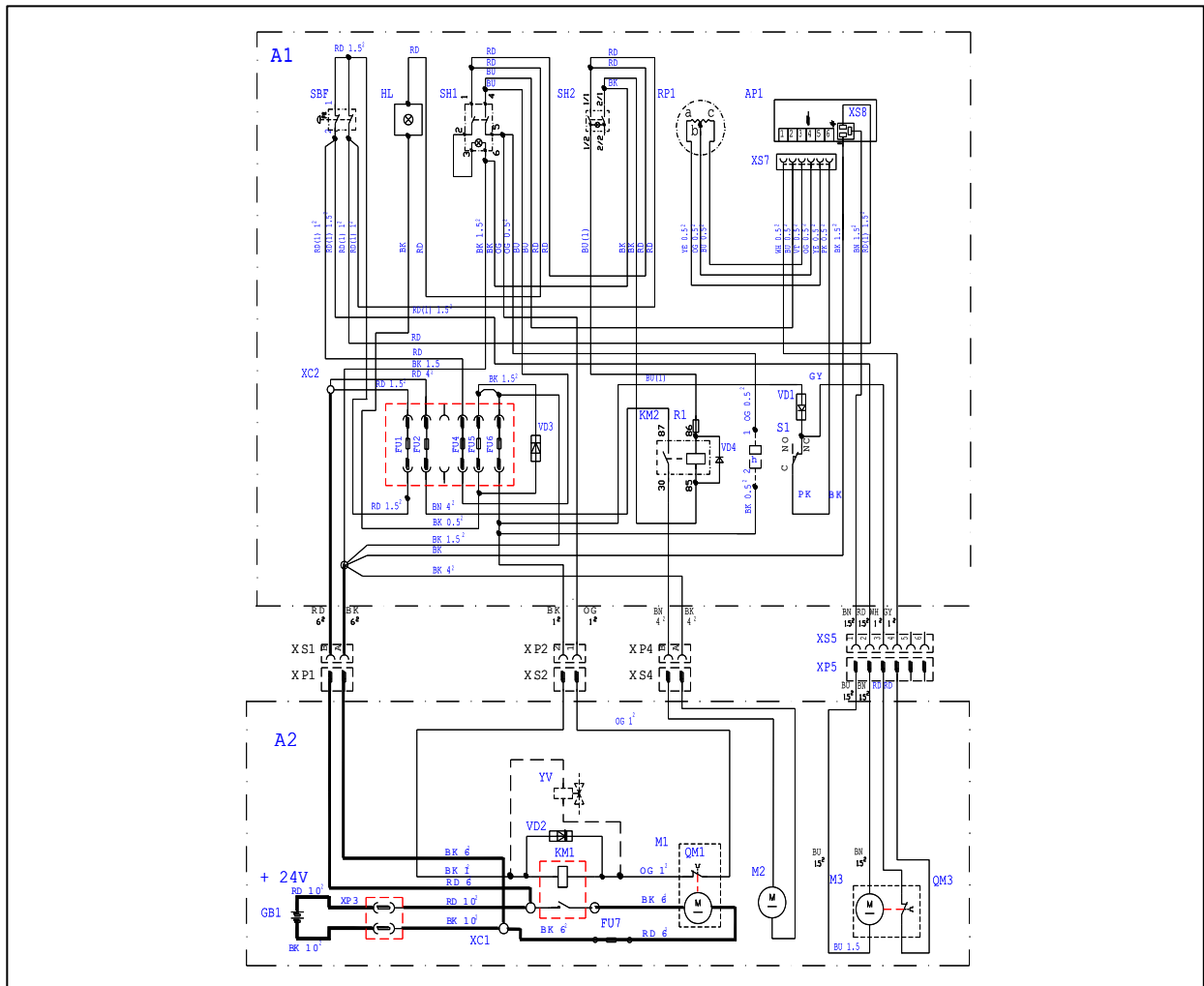


ITEM	SKU	DESCRIPTION
AP1	E86528	Gearcase Board
FU1	E86825	Fuse 5 amp
FU2	E89342	Fuse 30 Amp
FU3	E89342	Fuse 30 Amp
FU5	E86825	Fuse 5 amp
FU6	E89342	Fuse 30 Amp
FU7	E87883	60 AMP Fuse
GB1	E11767	BATERÍA
HL	E86496	Circuit Board
KM1	E86420	Relay
KM2	E89471	Vac Motor Relay
M1	E86608	Brush Motor
M2	E89478	Vac. Motor
M3	E89459	Drive Motor Shaft

ITEM	SKU	DESCRIPTION
QM1	INTERNAL	THERMAL PROTECTION
QM3	INTERNAL	THERMAL PROTECTION
R1	E89223	Resistor
R2	SL23899	RESISTANCE
S1	E86527	Microswitch
S2	E86527	Microswitch
SB	INTERNAL	PUSH-BUTTON
SH1	E86423	Bipolar Switch
SH2	E86423	Bipolar Switch
VD1	E87965	Diode, 5 OHM
XC1	E86563	support
XC2	SL23414	CLAMP
XC3	SL23414	CLAMP

# WIRING VARIABLE SPEED CONTROL

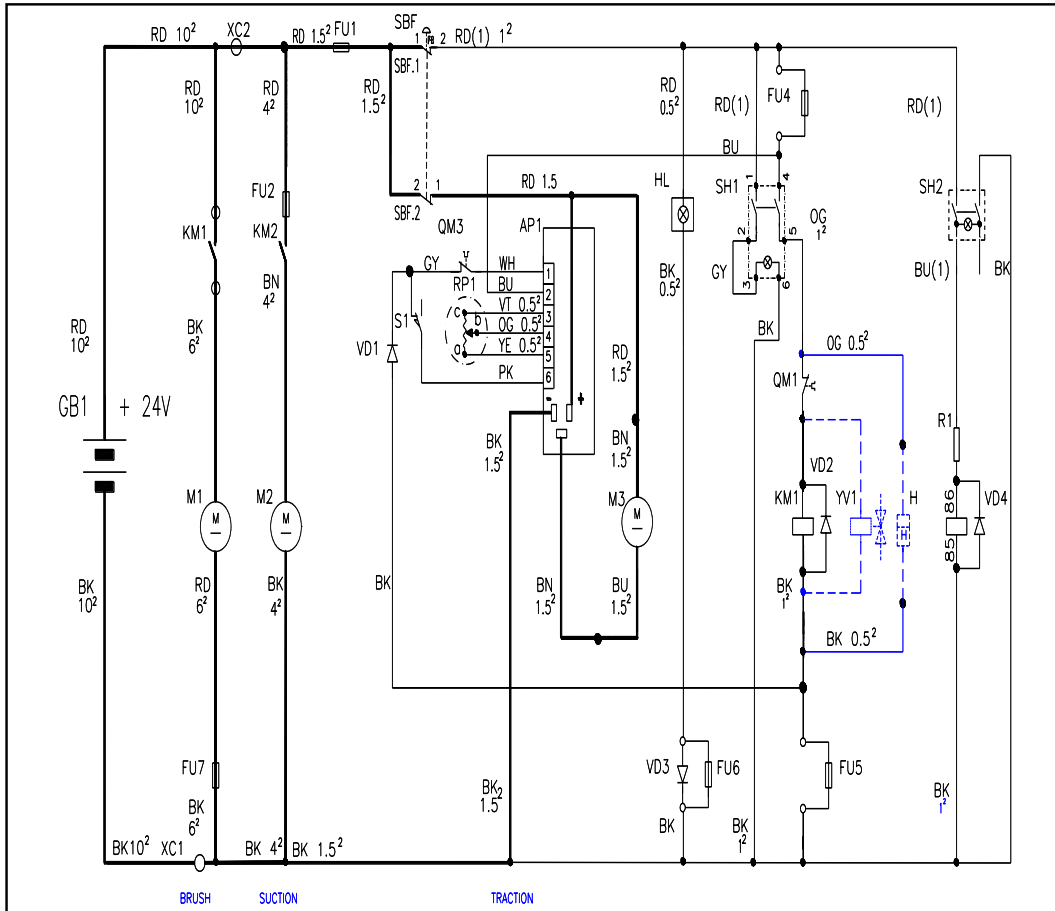
SN FROM 03A000



ITEM	SKU	DESCRIPTION	ITEM	SKU	DESCRIPTION
AP1	E89234	Traction card	SH1	E89255	Switch after ser# 03A000
FU1	E89342	Fuse 30 Amp	SH2	E86423	Bipolar Switch
FU2	E86647	Fuse 40A	VD1	E87965	Diode
FU4	E89342	Fuse 30 Amp	VD2	E87965	Diode
FU5	E89342	Fuse 30 Amp	VD3	E87965	Diode
FU6	E89342	Fuse 30 Amp	VD4	E87965	Diode
FU7	E87883	60 AMP Fuse	XC1	E86563	support
GB1	E11767	BATTERY	XC2	SL23428	CLAMP
HL	E86496	Circuit Board	XP1	E89281	Female connector kit
KM1	E86420	Relay	XP2	E86307	Connector
KM2	E89471	Vac Motor Relay	XP3	SL23010K	CONNECTOR
M1	E86608	Brush Motor	XP4	E89281	Female connector kit
M2	E89478	Vac. Motor	XP5	SL23558	CONNECTOR
M3	E89459	Drive Motor Shaft	XS1	E89282	Male connector kit
QM1	INTERNAL	TH OVERLOAD	XS2	E86308	Connector
QM3	INTERNAL	TH OVERLOAD	XS4	E89282	Male connector kit
R1	E89223	Resistor	XS5	SL23559	CONNECTOR
RP1	E89153	Potentiometer	XS6	SL23902	CONNECTOR
S1	E89087	Microswitch	H	SL23984J	HOUR METER (OPT)
SBF	E86988	MAIN KEY SWITCH	YV	SL18404	ELECTROVALVE (OPT)

WIRING, LADDER W/SPEED CONTROL

SN FROM 03A000



ITEM	SKU	DESCRIPTION
AP1	E89234	Traction card WS24
FU1	E89342	Fuse 30 Amp
FU2	E86647	Fuse 40A
FU4	E89342	Fuse 30 Amp
FU5	E89342	Fuse 30 Amp
FU6	E89342	Fuse 30 Amp
FU7	E87883	60 AMP Fuse
GB1	E11767	Battery
HL	E86496	Circuit Board
KM1	E86420	Relay
KM2	E89471	Vac Motor Relay
M1	E86608	Brush Motor
M2	E89478	Vac. Motor
M3	E89459	Drive Motor Shaft
QM1	INTERNAL	THERMAL PROTECTION
QM3	INTERNAL	THERMAL PROTECTION
R1	E89223	Resistor
RP1	E89153	Potentiometer
S1	E89087	Microswitch
SBF	E86988	Main Switch
SBF.1	E86988	Main Switch
SH1	E89255	Rocker Switch
SH2	E86423	Bipolar Switch
VD1	E87965	Diode
VD2	E87965	Diode
VD3	E87965	Diode
VD4	E87965	Diode
XC1	E86563	support
XC2	SL23428	CLAMP
H	SL23984J	HOUR METER (OPTIONAL)
YV	SL18404	ELECTROVALVE (OPTIONAL)

# BETCO US WARRANTY POLICY

## 10 year coverage

Subject to the conditions stated below, Betco warrants parts and labor on rotationally molded polyethylene tanks/housings and injection molded vacuum head assemblies to be free from defects in materials and workmanship for a period of ten years to the original purchaser.

## 3 Year Coverage

Subject to the conditions stated below, Betco warrants parts and labor on all other Betco components to be free from defects in materials and workmanship for a period of three years to the original purchaser.

## 1 Year Coverage

Subject to the conditions stated below, Betco offers a limited warranty on parts and labor on the following equipment: parts and accessories to be free from defects in materials and workmanship for a period of one year to the original purchaser.

- DM Series Vacuums: #85506-00, #85507-00
- Bac Pac Lite Vacuum: #85903-00
- FiberPRO® Floor Dryer: #85507-00
- WORKMAN™ Series Vacuums: #85024-00, #85025-00, #85026-00, #85027-00
- CV100T Vacuum: #85023-00
- All Tools and Accessories
- All Battery Chargers
- All Batteries are pro-rated for 1 year

### **Allowable Travel Time Warranty Reimbursement:**

Eligible equipment: All battery and propane powered equipment products. Warranty period: 90 days from date of sale to the original purchaser. A maximum 60 mile round trip at 44 cents per mile will be allowed for warranty consideration.

### **Propane Machine Warranty:**

Honda engines are warranted by Honda for a period of 2 years against manufacturer defects. Kawasaki engines are warranted by Kawasaki for a period of 2 years against manufacturer defects. All other components (except wear items)\* are warranted by Betco for a period of 3 years.

**\*Wear Items exempt from Warranty consideration include but may not be limited to: power cords, transport wheels, vacuum bags, belts, squeegee blades, pad drivers, clutch plates, handle grips, filters, screens, throttle cables, brushes and carbon brushes.**

Subject to the conditions and exceptions stated in this warranty, Betco warrants the Betco products to be free from defects in material and workmanship, under normal use and service, for the periods listed under the warranty policy to the original purchaser. At any time during the warranty period, Betco will furnish replacement parts for the Betco parts to the original purchaser. Such parts will be furnished and charged including transportation costs, to the original owner through any Betco authorized Service Distributor. If the original part is returned within the warranty policy period from date of delivery for inspection by Betco and is found to be defective the owner will be credited for the cost of replacement parts plus shipping and handling. Replacement parts that have become defective through wear or abuse are not included in this warranty.

This warranty does not apply to damage or defect caused by accident, misuse, negligence, fire, or to any Betco product which has been serviced or repaired by other than an authorized Betco Service Distributor or Betco factory personnel. This warranty is void if products are used for any purpose other than that which was intended. There are no other warranties expressed or implied. In no event shall Betco be liable for incidental or consequential damages or any damage to person or property. (Please note some states do not allow the exclusion or limitations for incidental and consequential damages)

