

# AS20

**ORDER #86000**

*20" Automatic Scrubber*

## FEATURES

- 8 Gallon Solution Capacity
- 9 Gallon Recovery Capacity
- Curved Squeegee Assembly
- "Quick Change" Squeegee Blades
- Float Shut-off
- Hands Free Pad Driver Installation

The Betco 20" Automatic Floor Scrubber offers an 8 Gallon Solution tank and a 9 Gallon Recovery tank. The brush pressure is 70 lbs. to give big machine performance in a compact unit. The 20" width will allow you to clean up to 17,000 sq. ft. per hour. A pad holder comes standard with the machine.

## WARRANTY

Tank: 10 Year

Other components: 3 Year\*

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



## SPECIFICATIONS

- Volts: 24 Volt System
- Solution Tank: 8 Gallon
- Recovery Tank: 9 Gallon
- Brush Pressure: 70 lbs.
- Run Time: Approx. 3.5 hrs.
- Waterlift: 56"
- Weight w/o Batteries: 139 lbs.
- Dimensions:  
Length: 48", Width: 20"  
Height: 33", Squeegee width: 35"

## APPLICATIONS

- General Cleaning
- Stripping
- Heavy Duty Scrubbing

## OPTIONS

Nylon Brush #86301

Grit Brush #86302

Charger #86201

Battery (2) #86276

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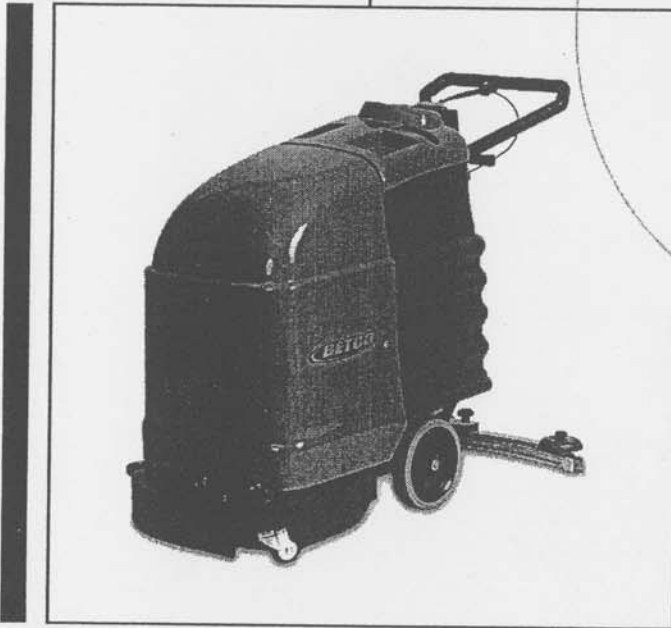
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# AS20 20" Automatic Scrubber

## Operator's Manual

Order #86000



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# DIMENSIONS

## AS 20 AUTOMATIC

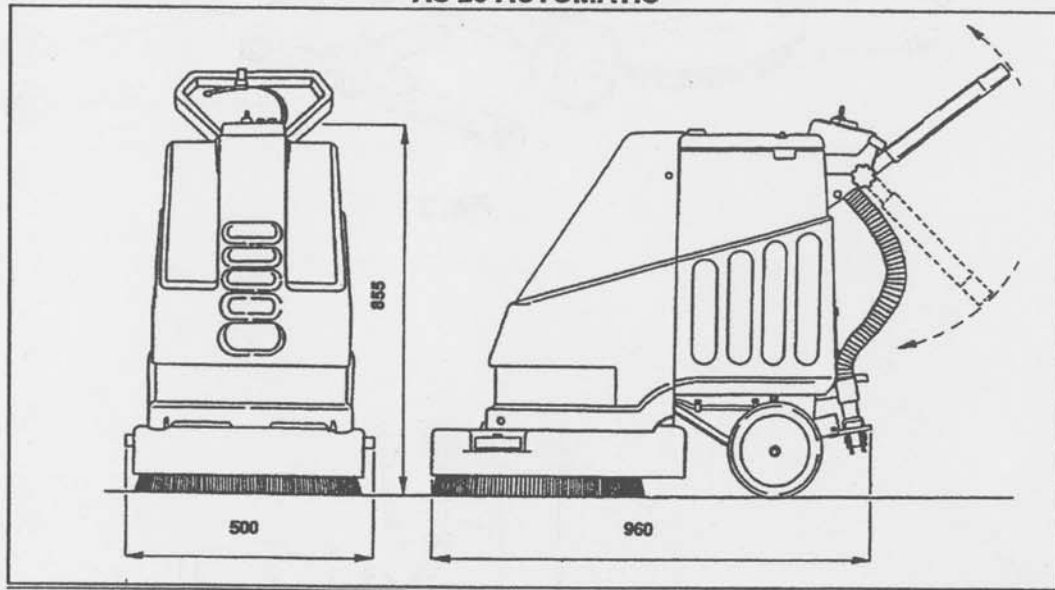


Fig. 1

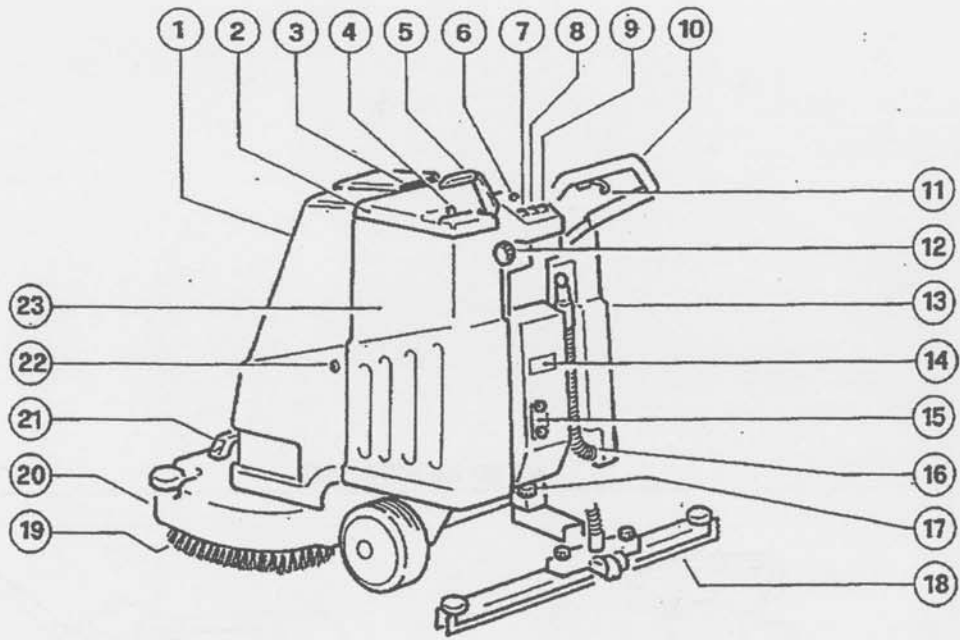


Fig. 2

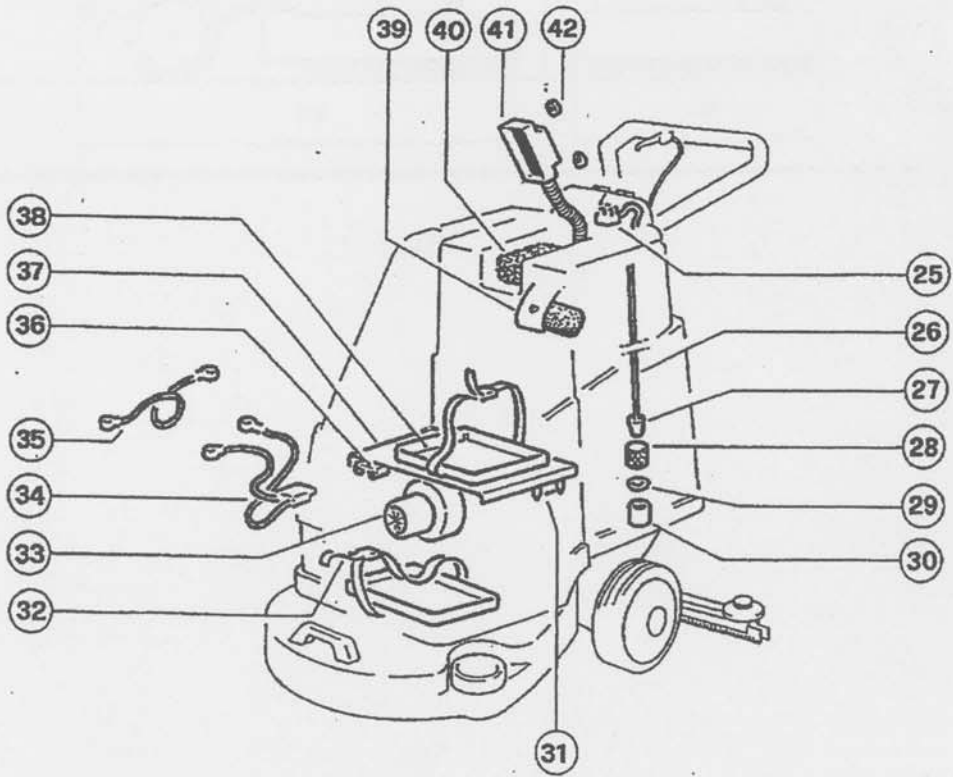


Fig. 3

## 2. SAFETY PRECAUTIONS

Read this manual carefully before using the floor cleaner. The machine must not be operated by untrained or unauthorized personnel.

Ensure that the sockets used to power the mains-operated models or battery chargers are suitably earthed and that they are protected by magnetothermal and differential switches.

This automatic scrubber shall be grounded while in use to protect the operator from electric shock. The cable machine is provided with a three-conductor cable and a three-contact grounding type attachment plug to fit the proper grounding type receptacle. The green and yellow conductor in the cord is the grounding wire. Never connect this wire to the other than the grounding pin of the attachment plug.

Look at the series plate to see the voltage for which the cable machine is built: if this machine is for use on a nominal 120-Volt circuit it has a grounding plug that resembles the plug illustrated in figure A. Make sure that the machine is connected to an outlet having the same configuration as the plug. No adapter should be used with this machine.

If this machine is provided with an attachment plug as shown in figure B, it is intended for use on a nominal 240 Volt circuit. No adapter is available for this plug.

Ensure that the electrical characteristics of the machine (voltage, frequency, power absorbed), shown on the rating plate, correspond to those of the power distribution system.

Move the machine carefully on slopes and ramps. Do not reverse on slopes. Never park the machine on a slope.

This machine must be used only on slopes with a gradient of less than 2%.

The cleaner must not be used on public highways.

The machine can cause explosions if used in the vicinity of inflammable materials or vapours (fuel, solvents etc.). It must therefore not be used to suck up inflammable liquids, even if diluted.

Do not use in the presence of harmful dust.

Repairs must be carried out by specialist personnel only.

All maintenance operations must be carried out only after disconnecting the machine from the mains (always unplug). In the battery-operated version, disconnect the battery connector.

When using, be careful of other people and in particular children in the area. Do not leave the machine unattended with the plug connected.

To ensure correct operation of the machine, use non-foaming detergents.

Maintenance operations on the electric plant and all operations not mentioned in the followings must be done only by specialized persons.

**Safety precautions for cable models**

During use, avoid squashing or ripping the mains cable.

Periodically check the mains cable to ensure that it has not been damaged. If damaged, the machine cannot be used.

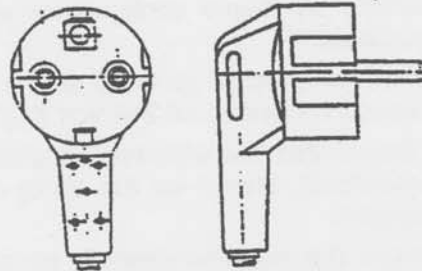
If you have to replace the cable, plug or terminals, secure the electrical connections and cable strap (fig. 3, N°. 25) so that the cable cannot be ripped. Carefully refit the electrical boxes to ensure operator safety.

**Safety precautions for battery models**

For battery maintenance and recharging, carefully follow the specific instructions given in this manual.



**Fig. A**



**Fig. B**

### 3. GENERAL INFORMATION

#### 3.3 Machine identification

This operating and service manual applies to models of single-brush floor cleaners. The machine identification plate is affixed to the electrical box in position N°. 14, fig. 2.

#### 3.2 General description

This floor cleaner has been designed to wash and dry smooth, even floors free from obstructions. It is available in battery or mains-operated versions to satisfy all requirements.

The cleaner distributes a suitable amount of detergent over the floor and brushes it to remove the dirt. By using specific detergents or by fitting brushes made of different fibres or abrasive disks, the machine can be adapted to a wide range of floor and dirt types.

A liquid suction system incorporated in the cleaner provides for perfect floor drying.

The main parts of the machine are as follows (reference fig. 2):

- the detergent solution tank (N°. 23) which contains and transports the mixture of clean water and detergent;
- the recovery tank (N°. 13), used to collect the dirty water sucked up from the floor during washing;
- the squeegee (N°. 18), which wipes and therefore dries the floor, sucking up the dirty water;
- the brush (N°. 19).

#### 3.3 Applications

Washing and drying of smooth and moderately rough floors.

Polishing.

#### 3.4 Detergents to be use

This machine has been studied to work with specific detergents for scrubbers.

It is particularly recommended:

- to always dissolve detergents following the instruction given by detergent supplier;
- to employ only no-foam detergents;
- to never use sodium-hypochlorite or other oxidizers specially in high concentration;
- to never use solvents and hydrocarbons.

## 4. PREPARING THE MACHINE

### 4.1 Lifting and transporting the machine in its packaging

The machine is packed on a wooden pallet and can be moved by fork lift. Handle carefully, avoiding knocks, and do not overturn.

### 4.2 Checks on delivery

When the transporter delivers the machine, carefully check the state of the packaging and ensure that the machine is intact. If it is damaged, inform the transporter but accept the delivery, reserving the right to submit a written claim for compensation for damages.

### 4.3 Unpacking

Remove the machine from its packing as follows:

- cut and remove the plastic straps using scissors or nippers;
- lift and remove the carton;
- remove the squeegee (fig. 2, N°. 18) and brush (fig. 2, N°. 19) from their packaging;
- operate the squeegee lifting lever (fig. 2, N°. 5) and remove the tank cover (fig. 2, N°. 2), eliminating the sheet protecting the control panel;
- take out the envelope inside the dirty water tank (fig. 2, N°. 13) and the one attached to the handgrip (fig. 2, N°. 10) and check the contents:

envelope 1 (in the dirty water tank):

- testing check-list;
- warranty form;
- operating and service manual;

envelope 2 (attached to the handgrip):

- 2 knobs (fig. 2, N°. 12) for fixing the handgrip (fig. 2, N°. 10);
- 1 battery charger connector (only battery-operated model);

- take the two knobs out of the second envelope, raise the handgrip (fig. 2, N°. 10) until the two threaded holes correspond to two of the four slots in the upright and secure, tightening the knobs from the outside;
- remove the bonnet (only for the battery-operated model, fig. 2, N°. 1), holding it by means of the grip (fig. 2, N°. 3) and lifting it up;
- remove the battery wiring and jumper with terminals (only for the battery-operated model, fig. 3 - N°. 34 e N°. 35);
- according to the model cut and remove the plastic straps fixing the machine to the pallet using scissors or nippers, otherwise using spanners for unscrew the bolts on the brackets connecting the machine chassis to the pallet;
- raise the machine by means of the front handle (fig. 2, N°. 21) and handgrip (fig. 2, N°. 10) and remove it from the pallet;
- dispose of the packing cartons, pallet, steel brackets, bracket retaining bolts and plastic sheet, using differentiated waste bins if available.



#### 4.4 Fitting the squeegee

The squeegee (fig. 2, N°. 18) is the prime drying agent. To fit it on the machine, stand behind the handgrip with the squeegee blades facing down and the wheel (fig. 4, N°. 50) in the position shown in figure 4. Check that the squeegee support (fig. 4, N°. 47) is raised (if not, raise it by pulling back the squeegee lever fig. 2, N°. 5), loosen the two knobs (fig. 4, N°. 48) in the middle of the squeegee and slide it into the support. Secure the squeegee by tightening the two knobs.

#### 4.5 Electrical and earth connection (mains-operated model)

The rating plate (fig. 2, N°. 14) gives the electrical characteristics of the machine. Ensure that the frequency and power correspond to those of the power distribution system. As regards voltage, the models with rating plate indicating 230 V can be used for voltages of 220, 230 or 240 V. The same applies to the models with 115 V rating: they can be used at 110, 115 and 120 V. The frequency specified on the plate must, however, always be identical to the mains frequency.

Check that the electrical system is provided with a suitable earth line and that the sockets (and any adapters used) do not interrupt the earth leads.

**FAILURE TO OBSERVE THESE DIRECTIONS CAN RESULT IN SERIOUS DAMAGE TO PERSONS AND THINGS AND LAPSE OF THE WARRANTY.**

#### 4.6 Preparing the battery charger (battery-operated model)

If you wish to use a battery charger not supplied with the machine, it must be fitted with the connector sent with the machine in envelope 2 (see "Unpacking" paragraph).

To fit the connector:

- remove approximately 13 mm of protective sheathing from the two red and black battery charger cables;
- crimp the connector pin terminals on the cables;
- following the instructions enclosed with the connector, fit the cables with pin terminals into the semi-circular connector housings observing the polarity: red cable +, black cable -.

#### 4.7 Installing the batteries (battery-operated model)

This machine has been designed to use two 12 V batteries with a maximum weight of 2x26 kg and a capacity of 120 Ah (20h). The use of heavier batteries can seriously affect manoeuvrability and overheat the brush motor. Lighter, lower capacity batteries, on the other hand, will require recharging more often.

If the machine is delivered with **dry batteries**, they must be charged as follows before installation:

- after removing the caps, fill all the elements with the correct sulphuric acid solution for batteries with specific gravity 1,240 (28° Bé), at a temperature of 30° C, until the plates are fully covered (fill each element in two stages at least);
- leave to rest for 3-4 hours to give the plates time to absorb the electrolyte;
- check that the level of the liquid is still above the plates and if not, top up with the sulphuric acid solution;
- close the caps;
- instal the batteries in the machine (following the procedure below for tubular armoured batteries);
- recharge for at least 2-3 hours with an automatic 24V 20A battery charger before using the machine.

If the machine is supplied with **tubular armoured batteries**, instal them following the instructions below:

- if the bonnet (fig. 2, N°. 1) is fitted on the machine, remove it by gripping and lifting at the point shown in figure 2, N°. 3;
- on the upper battery support (fig. 3, N°. 37), at the side of the upper battery plate (fig. 3, n° 38), there is a label showing the layout of the batteries and cables: the battery on the top plate must have the + and - poles facing the tanks, whereas the ones on the lower plate must face away from the tanks;
- open the fastening of the lower battery holder belt (fig. 3, N°. 32) and adjust so that its ends face the side opposite the suction motor (fig. 3, N°. 33) (i.e. the left side of the machine) to prevent them obstructing the battery plate;
- position the battery as shown on the label for the lower plate and fit it on the lower plate;
- wrap the belt around the battery, inserting the free end into the fastening, and tighten to lock;
- repeat the procedure for the upper battery making sure that you observe the position shown by the label;
- referring to the cable layout shown on the label, connect the terminals of the battery wiring (fig. 3, N°. 34) and of the jumper with terminals (fig. 3, N°. 35) to the battery poles (be careful only to fit terminals marked with the symbol + on the positive poles). Position the cables as shown in the label, tightening the terminal fixing bolts with a 10 mm spanner and coat the terminals with vaseline. Check that all the switches on the control panel are set to 0 (off) and connect the battery wiring connector to the one on the machine on the battery support over the vacuum motor;
- use the machine according to the instructions given below until the battery flat light starts to blink, indicating that the battery needs recharging.

## 5. USING THE MACHINE

### 5.1 Description of the controls

Electrical controls and indicator lights on the control panel:

- **POWER INDICATOR LIGHT** (fig. 2, N°. 6; only mains-operated model): light indicating that the machine cable is connected to the mains;
- **BATTERY CHARGE CONTROL LIGHT** (fig. 2, N°. 6; only battery-operated model) with three different modes:
  - off: the battery is disconnected or all the switches are set to 0 (off);
  - blinking: the batteries are flat and must be immediately recharged - if you continue working, the batteries may be permanently damaged;
  - on: battery charged;
- **BRUSH SWITCH** (fig. 2, N°. 7): enables (I) and disables (O) the brush motor;
- **SUCTION MOTOR SWITCH** (fig. 2, N°. 8): switches the suction motor on and off;

Other controls:

- **BRUSH CONTROL LEVER** (fig. 2, N°. 11): located on the handgrip, it drives the motor which rotates the brush and moves the machine forward; the cleaner is provided with a special mechanical traction device by means of which the friction between brush and floor is used to generate forward thrust;
- **SQUEEGEE LEVER** (fig. 2, N°. 5): located on the left side of the column and enables the operator to raise (if pulled back) and lower (if pushed forward) the squeegee;
- **TAP CONTROL SLIDER** (fig. 2, N°. 4): located above the tanks on the left side of the machine, it permits continuous regulation of the flow of detergent solution from 0 to approximately 3 l/min;
- **SQUEEGEE ANGLE ADJUSTMENT KNOB** (fig. 4, N°. 46): located on the squeegee arm, it permits vertical adjustment of the squeegee angle;
- **SQUEEGEE HANDLE** (fig. 4, N°. 45): located above the squeegee arm, it permits regulation of the pressure exerted by the squeegee on the floor;
- **SPEED REGULATION KNOB** (fig. 2, N°. 17): permits slight adjustments in forward speed and correction of any tendencies to deviate sideways.

### 5.2 Adjusting the squeegee

The squeegee is provided with two adjustments so that it can be adapted to all types of surface:

- angle: adjusted by rotating the appropriate knob (fig. 4, N°. 46);
- pressure: adjusted by moving the spring working point via the appropriate handle (fig. 4, N°. 45); minimum pressure corresponds to the highest working point.

Combined adjustment of angle and pressure will provide perfect drying. For effective adjustment, the rubber sheet at the rear must be bent back slightly when the machine is moved forwards.

### 5.3 Adjusting the handgrip

To suit all heights, the handgrip can be adjusted to two positions as follows:

- unscrew the two fixing knobs (fig. 2, N°. 12);
- raise (or lower) the handgrip (fig. 2, N°. 10) until the slots on the upright coincide with the threaded holes on the handgrip;
- fit and tighten the knobs.

### 5.4 Discharging the dirty water

To empty the tank:

- position the machine over a drain hole;
- remove the tank lid (fig. 2, N°. 2);
- pull out the discharge pipe (fig. 2, N°. 16);
- holding the end of the pipe as high as possible, remove the cap;
- gradually lower the end of the pipe, regulating the flow according to its height from the ground;
- check the amount of residual dirt in the tank and flush out if necessary;
- once the contents of the tank have been fully discharged, refit the cap and reposition the pipe;
- replace the tank lid, checking that it is perfectly closed.

### 5.5 Discharging the clean water

To empty the tank:

- position the machine over a drain hole;
- pull out the discharge pipe (fig. 2, N°. 16);
- holding the end of the pipe as high as possible, remove the cap;
- gradually lower the end of the pipe, regulating the flow according to its height from the ground;
- once the contents of the tank have been fully discharged, refit the cap and reposition the pipe.

### 5.6 Fitting and dismantling the bonnet

To remove the bonnet (battery-operated model fig. 2, N°. 1):

- grip at the point shown in fig. 2, N°. 3 and lift up to remove.

To fit the bonnet (battery-operated model):

- align the bonnet with the tanks;
- lower it and press down to click into place.

To remove and refit the bonnet (mains-operated model):

- unscrew the two fixing screws (fig. 2, N°. 22) using a 4 mm Allen key and remove the bonnet (fig. 2, N°. 1). Refit, tightening the screws.

### 5.7 Moving the machine

To move the machine:

- remove the brush (or pad drive) following the instructions in the paragraph below;
- raise the squeegee;
- raise the front part of the machine by pressing down on the handgrip;
- push forward.

## 5.8 Fitting and changing the brush/pad drive

To fit the brush (fig. 2, N°. 19), rest it on the floor in front of the machine, stand behind and press on the handgrip in order to raise the front part, push the machine forward (maintaining the pressure on the handgrip) and line up the brush hub (fig. 2, N°. 20) with the brush. Rest the machine on the brush. Rapidly operate the brush control lever a few times: the brush will automatically screw onto the hub.

If this operation is not successful, realign the brush and repeat the above operations.

To use an abrasive disk, fit it on the pad drive and carry out the above operations.

To **remove** the brush (or pad drive) follow one of the following procedures:

- a) raise the front part of the machine by pressing the handgrip down and repeatedly operate the brush control lever in rapid succession. This will release the brush (or pad drive) which will fall to the ground;
- b) push the machine forward, press down on the handgrip to slowly raise the front while continuing to push the cleaner forward. The brush (or pad drive) will come off as it grazes the floor.

## 5.9 Preparing the machine for work

- For the battery-operated model, recharge the batteries if necessary;
- lift and remove the tank cover (fig. 2, N°. 2);
- empty the recovery tank (fig. 2, N°. 13) if necessary, following the procedure already described;
- check that the tap control slider (fig. 2, N°. 4) is in the closed position (i.e. positioned at the extreme left of the machine);
- pour clean water and detergent in the right concentration into the solution tank (fig. 2, N°. 23) leaving a gap of at least 5 cm between the surface of the liquid and the tank inlet;
- refit the tank cover (fig. 2, N°. 2).

## 5.10 Work

Once you have prepared the machine with the mains cable connected to the power socket (or with the batteries charged and the battery wiring connector (fig. 3, N°. 34) connected to the cleaner (fig. 3, N°. 36)), with the detergent solution tank (fig. 2, N°. 23) full and with the brush fitted:

- set the brush switch (fig. 2, N°. 7) to position I;
- set the suction motor switch (fig. 2, N°. 4) to position I: the suction unit will start up;
- push the squeegee lever forward (fig. 2, N°. 8): the squeegee will touch the floor;
- move the tap control slider (fig. 2, N°. 4) to the right: the tap will open, allowing the detergent solution to flow to the brush;
- pull the brush control lever (fig. 2, N°. 11): the brush (or pad drive) will rotate, washing the floor and exerting a thrust that will move the machine forward;
- guide the machine over the floor to be washed;
- adjust the squeegee and the flow of detergent solution as required via the controls (fig. 4, N°. 45 and N°. 46; fig. 2, N°. 4);
- for the battery-operated version, monitor the battery charge control light (fig. 2, N°. 6) which must always be on during work. When the light begins to blink, the batteries are low and you must stop immediately to recharge them. Continuing to wash with the light blinking can lead to permanent battery damage;
- monitor washing performance and replace the detergent solution when it has run out;
- do not stand still with the suction unit on and the detergent solution tap (fig. 2, N°. 4) open;
- every time you fill the detergent tank (fig. 2, N°. 23), always empty the recovery tank (fig. 2, N°. 13).

**Note:** if the brush control lever (fig. 2, N°. 11) is operated intermittently for a prolonged period, the brush motor may overheat consequently damaging the motor. In addition, in the mains-operated version the motor needs 2-3 seconds' rest in order to start up again without straining.

You should therefore use the lever in this way only when necessary, for example when moving round obstacles:

### 5.11 End of work

- Let the vacuum motor work for 2 minutes with the tank cover open to be sure the vacuum motor itself is well dry;
- check that the tap control slider (fig. 2, N°. 4) is in the closed position (i.e. positioned at the extreme left of the machine);
- remove the brush (or pad drive) to avoid permanent deformation;
- lift the squeegee from the ground (control fig. 2, N°. 5) to avoid continuous pressure deforming the drying blades and therefore affecting performance;
- empty and clean the recovery tank;
- unplug, or recharge the batteries according to the model.

### 5.12 How to get the most out of your floor cleaner

When removing particularly stubborn dirt, washing and drying can be performed in two separate stages:

- **prewashing:** open the water tap and begin washing with the suction unit off and squeegee raised, going over the dirtiest points several times. This gives the detergent time to act and the brush time to perform efficiently;
- **drying:** lower the squeegee, start the suction unit motor and go over the same area again.

This ensures thorough washing and will considerably reduce subsequent routine cleaning.

For easy use and maximum efficiency, you are advised to work in straight lines as far as possible, going over any areas that cannot be reached with the cleaner at the end, using a mop or cloth.

## 6. ORDINARY MAINTENANCE

### 6.1 General

To avoid damage to persons and the cleaner itself, always disconnect the power supply cable (in the mains-operated model) or the battery connector before carrying out any maintenance operations. The power supply cable of the battery charger, if incorporated, must also be disconnected from the mains.

Maintenance operations on the electric plant and all operations not mentioned in the followings must be done only by specialized persons.

### 6.2 Servicing and recharging the batteries (only battery-operated model)

To charge the **lead batteries** with liquid electrolyte, proceed as follows:

- move the cleaner to a well ventilated area (the batteries release inflammable vapours: before opening the caps, always move to a well ventilated area away from fires, sparks, lit cigarettes etc.);
- remove the bonnet (fig. 2, N°. 1);
- remove the battery caps and check that the electrolyte covers the plates; if not, top up with distilled water;
- disconnect the battery wiring connector (fig. 3, N°. 34) from the one fixed to the cleaner chassis and connect it to the battery charger socket. (**Caution:** DO NOT connect the battery charger to the fixed connector on the cleaner chassis);
- recharge, regulating the battery charger according to the instructions;
- once the batteries are charged, check with a densimeter. If one or more elements are flat according to the densimeter (whereas the adjacent elements are perfectly charged) it is a sign that the battery is damaged and must therefore be replaced;
- close the caps again, reconnect the battery wiring to the machine and replace the bonnet.

If the machine requires **gelatine batteries**, follow the instructions below:

- remove the bonnet;
- disconnect the battery wiring connector from the one fixed to the cleaner chassis and connect it to the battery charger socket. (**Caution:** DO NOT connect the battery charger to the connector fixed to the cleaner chassis);
- only use a battery charger specifically designed for gelatine batteries; recharge, regulating it according to the instructions;
- reconnect the battery wiring to the machine and replace the bonnet.

### 6.3 Cleaning the suction unit filter

- Remove the tank cover (fig. 2, N°. 2);
- unscrew the knobs (fig. 3, N°. 42) and remove the filter box (fig. 3, N°. 41) and filter (fig. 3, N°. 40);
- clean the filter under running water, leave to dry and refit everything.

### 6.4 Cleaning the detergent solution tap

To eliminate any scale that may prevent perfect closure of the tap, follow the instructions below:

- remove the tank cover (fig. 2, N°. 2) and completely empty the detergent solution tank (fig. 2, N°. 23);
- slide your hand inside the detergent solution tank; grip the solution rod (fig. 3, N°. 26) and pull up to disengage it from the tap body (fig. 3, N°. 30);
- pull out the solution filter (fig. 3, N°. 28) and clean it;
- clean the tap body (fig. 3, N°. 30) and shutter (fig. 3, N°. 27) using a cloth soaked in detergent;
- refit the filter;
- replace the shutter, pulling the solution rod up again.

### 6.5 General cleaning

When cleaning the machine, always bear the following in mind:

- avoid using hydrocleaners: water could seep into the electrical boxes or motors consequently damaging them or causing a short circuit;
- do not use steam as the heat will deform the plastic parts (casings and tanks) and make the nylon wheel bearings unserviceable;
- do not use solvents or hydrocarbons: you could damage the casings or rubber parts.

### 6.6 Replacing the squeegee blades

The job of the squeegee blades is to scrape the film of water and detergent from the floor thus permitting perfect drying. With use, continuous friction will blunt and crack the sharp edge in contact with the floor, affecting drying efficiency and thus requiring replacement of the blade.

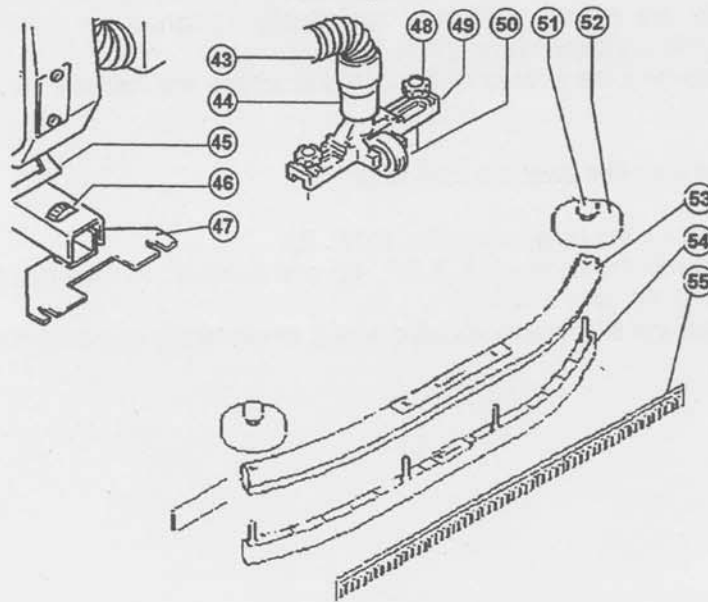


Fig. 4



Each squeegee is fitted with two blades, only one of which will be subject to wear. Initially therefore, when one blade is worn, simply swap them round and then when the second one is worn, replace them both.

Swapping the blades (for references see fig. 4):

- remove the squeegee from its support (N°. 47), sliding out the coupling (N°. 44) of the suction pipe and loosening the two knobs (N°. 48);
- completely unscrew the two knobs (N°. 48) and disconnect the squeegee inlet (N°. 49) from the squeegee profile (N°. 53); rotate the inlet by 180° with respect to the profile and refit on the profile;
- refit the squeegee on its support (N°. 47), ensuring that the wheel (N°. 50) is positioned at the back with respect to the cleaner. Tighten the two knobs (N°. 48) and connect the coupling (N°. 44).

Replacing the blades (for references see figure 4):

- remove the squeegee from its support (N°. 47), completely unscrewing the two knobs (N°. 48), slide out the coupling (N°. 44) of the suction pipe and disconnect the squeegee inlet (N°. 49) from the squeegee profile (N°. 53);
- unscrew the two knobs (N°. 51) and remove the wheels (N°. 52);
- turn the squeegee over and press the protruding threaded pins down to release the insert (N°. 54);
- remove the worn blades (N°. 55) and replace them with the new ones, inserting the protruding tooth into the profile housing (N°. 53); check that the teeth of both blades are perfectly positioned in the profile;
- refit the insert (N°. 54), the wheels (N°. 52), the inlet (N°. 49) and knobs (N°. 51);
- refit the squeegee on its support (N°. 47), ensuring that the wheel (N°. 50) is positioned at the back with respect to the cleaner. Tighten the two knobs (N°. 48) and connect the coupling (N°. 44).

### **6.7 Replacing the fuses (battery-operated model)**

To replace the fuses in the back of the machine:

- remove the fuse cover (fig. 2, N°. 15);
- using the tweezers provided with the machine, remove the blown fuses and replace them with new ones with the same amperage;
- close the fuse cover.

The 60 A (fig. 3, N°. 31) fuse that protects the brush motor is located at the front of the machine above the brush motor.

To remove it:

- raise the bonnet;
- remove the fuse by unscrewing the retaining screws;
- fit a new fuse and replace the bonnet.

If a fuse continues to blow, the fault in the wiring, in the electronic cards or in the motors must be identified and repaired; have the machine checked by qualified personnel.

### **6.8 Periodical lubrication**

This cleaner does not require any periodical lubrication.

**6.9 Routine maintenance: daily operations**

Every day, at the end of work, carry out the following operations:

- check that the overflow valve (fig. 3, N° 39) is working correctly;
- check that the recovery tank (fig. 2, N° 13) is not encrusted with dirt; if so, clean it;
- clean the suction motor filter (fig. 3, N° 40);
- check that the filter (fig. 3, N° 28) of the detergent solution tanks clean;
- clean the squeegee blades (fig. 2, N° 18) checking that they are not excessively worn and that they have not been torn;
- recharge the batteries following the procedure previously described (only battery-operated model).

**6.10 Routine maintenance: weekly operations**

- Check that the squeegee suction hole is not clogged; remove any encrusted dirt if necessary;
- clean the suction pipe (fig. 4, N° 43);
- check the level of electrolyte in the batteries and top up with distilled water if necessary (only battery-operated model).

**6.11 Routine maintenance: six-monthly operations**

- Have the electrical system checked by qualified personnel.

**6.12 Preparing for prolonged periods of inactivity**

If the machine is not going to be used for a long period, proceed as follows:

- dismantle the squeegee (fig. 2, N° 18), wash it and pack in a plastic envelope or sheet;
- remove the brush (or pad drive);
- empty and thoroughly clean both tanks (fig. 2, N° 13 and N° 23);
- completely recharge the batteries before storing them in the warehouse with the battery wiring connector (fig. 3, N° 34) disconnected from the connector on the machine. Recharge periodically (at least once every two months).

**7. HOW TO ORDER SPARE PARTS**

To enable our servicing department to correctly identify the spare parts required, and therefore to provide an efficient service at all times, the following information must ALWAYS be provided:

- machine model;
- serial number (see rating plate fig. 2, N° 14);
- spare parts table showing the part and reference number;
- part code;
- quantity required.

For replacement under warranty, a brief description of the fault must also be enclosed with the order.

## 8. TROUBLESHOOTING

Fault	Cause	Remedy
The solution does not flow out	* The solution tank (fig. 2, N° 23) is empty	* Fill it
	* The solution filter (fig. 3, N° 28) or pipes are obstructed	* Clean the filter and remove the obstruction in the pipes
	* The tap is damaged	* Repair or replace the tap
The flow of solution does not stop when the tap is closed	* The tap remains open because it is damaged or very dirty	* Clean or repair the tap, checking that it closes properly
The squeegee does not suck up the dirt	* The overflow valve (fig. 3, N° 39) is closed	* Free the overflow valve
	* The dirty water tank (fig. 2, N° 13) is full	* Empty the tank to release the overflow valve
	* There is an obstruction in the suction pipe (fig. 4, N° 43)	* Unclog the pipe
	* The suction pipe is not connected to the squeegee	* Connect the pipe
	* The suction motor does not work	* Check the fuse (battery-operated version) and motor connections. If necessary, replace the motor
The squeegee leaves traces of dirty liquid on the floor	* The squeegee angle and/or pressure are not correctly adjusted	* Adjust the squeegee following the instructions
	* The blade edge in contact with the floor is worn	* Replace the blade
	* The squeegee or pipe is clogged or damaged	* Unclog and repair the damage
The batteries run flat sooner than expected	* The poles and terminals of the batteries are dirty and oxidized	* Clean and grease the poles and terminals and recharge the batteries
	* The level of electrolyte is too low	* Add distilled water, topping up each element according to the instructions
	* The battery charger does not work	* See battery charger instructions
	* The densimeter test reveals significant differences between various elements in the same battery	* The battery is damaged and must be replaced

Fault	Cause	Remedy
The machine does not clean evenly	* The brush or abrasive disk is worn	* Replace
The machine runs too fast or does not move at all and tends to pull to one side	* The brush pressure must be adjusted	* Adjust the brush pressure via the speed regulation knob (fig. 2, N°. 17)
The brush motor has trouble starting (only mains-operated model)	* You are working with a dry brush on a very rough floor	* Open the detergent solution tap
	* You are working with extension leads with inadequate section or the voltage is significantly lower than the value specified on the machine rating plate (15% less)	* Avoid using inadequate extension leads, increase the section to minimum ..... mm, use sockets with higher voltage
	* One or both of the capacitors has developed a fault	* To be controlled by specialized persons
	* The centrifugal earth protection is faulty	* To be controlled by specialized persons
The brush motor does not work	* The brush switch (fig. 2, N°. 7) is set to 0 (off)	* Turn the brush switch on
	* The fuse F1 (services) has blown (only battery-operated model)	* Replace the fuse
	* The motor thermal protection has cut in (only for battery-operated model)	* Leave the machine to cool down for at least 45'
	* The F7 brush motor fuse has blown (only for battery-operated model)	* Replace the 60A fuse (fig. 4, N°. 31) above the brush motor
	* Both capacitors are faulty (only mains-operated model)	* To be controlled by specialized persons
	* The motor is faulty	* To be controlled by specialized persons

# AS20 20" Automatic Scrubber

## Parts Schematic

Item #86000

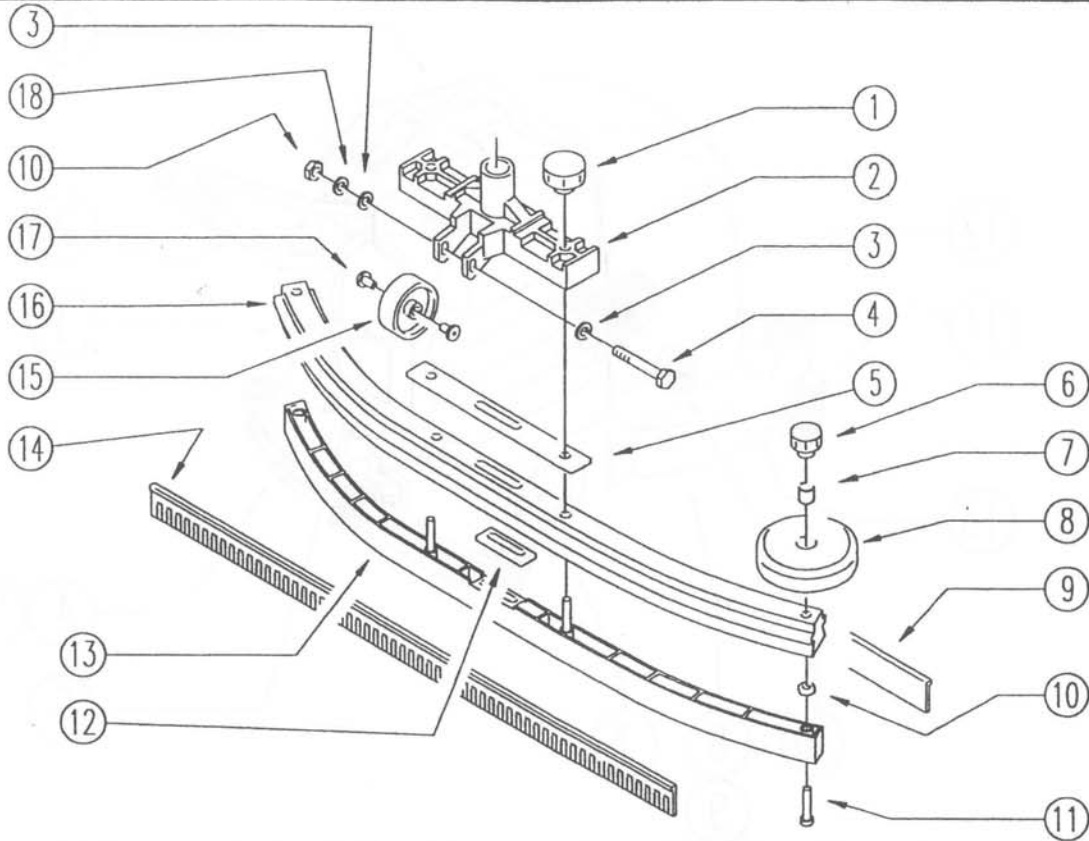




CODE:

pl1009 aa SN from 98F557

DESCRIPTION: SQUEEGEE 800

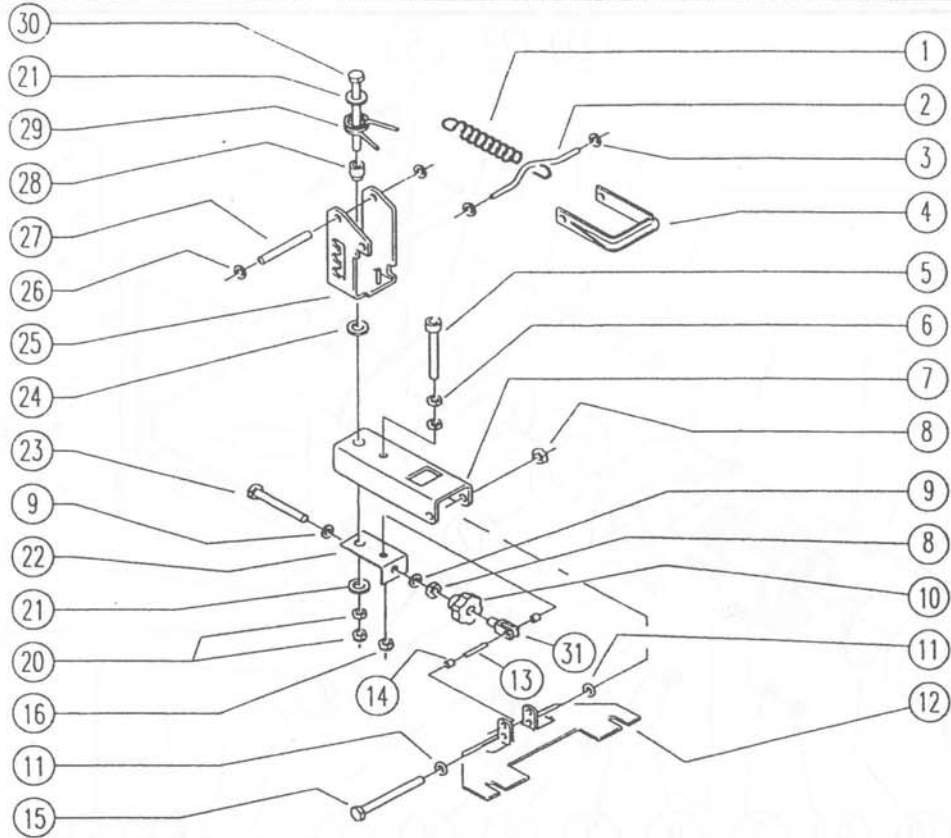


REF.	CODE	DESCRIPTION	QT
1	SL20002	HANDLE	2
2	SL01018	SUCTION POINT	1
3	SL06022	WASHER	2
4	SL04061	SCREW	1
5	SL03051	GASKET	1
6	SL20018	HANDLE	2
7	SL07082	SPACER	2
8	SL08040	WHEEL	2
9	SL03232	BLADE	1
10	SL05017	NUT	3
11	SL04331	SCREW	2
12	SL03052	GASKET	1
13	SL15036	INSERT	1
14	SL03435	BLADE	1
15	SL08015	WHEEL	1
16	SL15035	EXTRUDED	1
17	SL07077	BUSHING	2
18	SL06023	WASHER	1

CODE:

pl1114 ab SN from 98E906

DESCRIPTION: SQUEEGEE SUPPORT



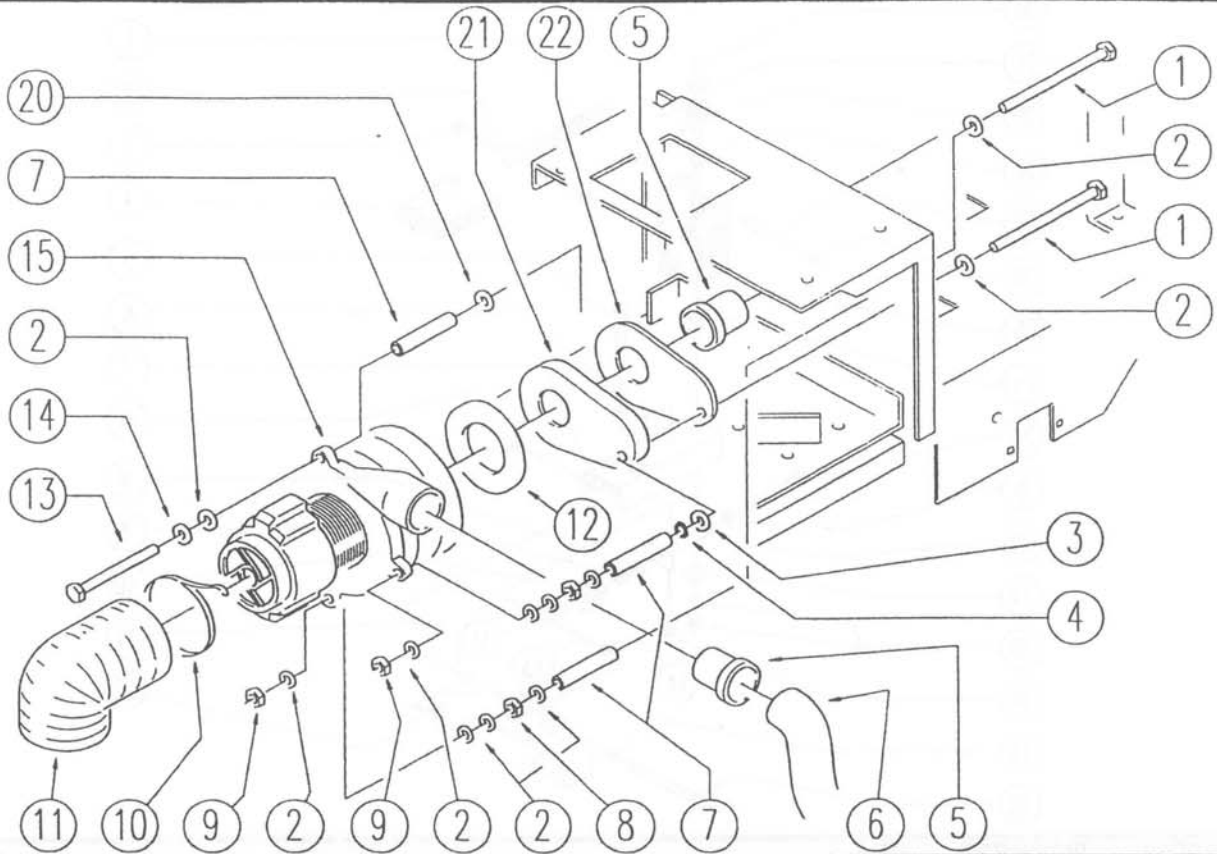
REF. CODE	DESCRIPTION	QT					
1 SL13029	SPRING	1					
2 SL09413	HOOKING	1					
3 SL06060	RING	2					
4 SL17180	HANDLE	1					
5 SL04194	SCREW	1					
6 SL05017	NUT	2					
7 SL09516	ARM	1					
8 SL05039	NUT	2					
9 SL06041	WASHER	2					
10 SL20020	HANDLE	1					
11 SL06064	WASHER	2					
12 SL09514	PLATE	1					
13 SL11039	PIN	1					
14 SL07141	SPACER	1					
15 SL04229	SCREW	1					
16 SL05041	NUT	1					
20 SL05048	NUT	2					
21 SL06025	WASHER	2					
22 SL09513	SUPPORT	1					
23 SL04156	SCREW	1					
24 SL07138	WASHER	1					
25 SL09515	BRACKET	1					
26 SL05041	NUT	2					
27 SL11050	PIN	1					
28 SL07134	BUSH	1					
29 SL13029	SPRING	1					
30 SL04164	SCREW	1					
31 SL22008	FORK	1					



CODE:

pl1154 aa SN from 98E905

DESCRIPTION: SUCTION



REF	CODE	DESCRIPTION	QT
1	SL04282	SCREW	2
2	SL06022	WASHER	11
3	SL06030	WASHER	1
4	SL11095	RING	1
5	SL07044	BUSHING / BUSH	2
6	SL19113	HOSE	1
7	SL07290	BEARING	3
8	SL05017	NUT	2
9	SL05041	NUT	2
10	SL14020	CLAMP	1
11	SL19157	HOSE	1
12	SL03033	GASKET	1
13	SL04247	SCREW	1
14	SL06023	WASHER	1
15	MP02302-J	MOTOR	1
20	SL06041	WASHER	1
21	SL17239	SUCTION CONVEYOR	1
22	SL03160	GASKET	1

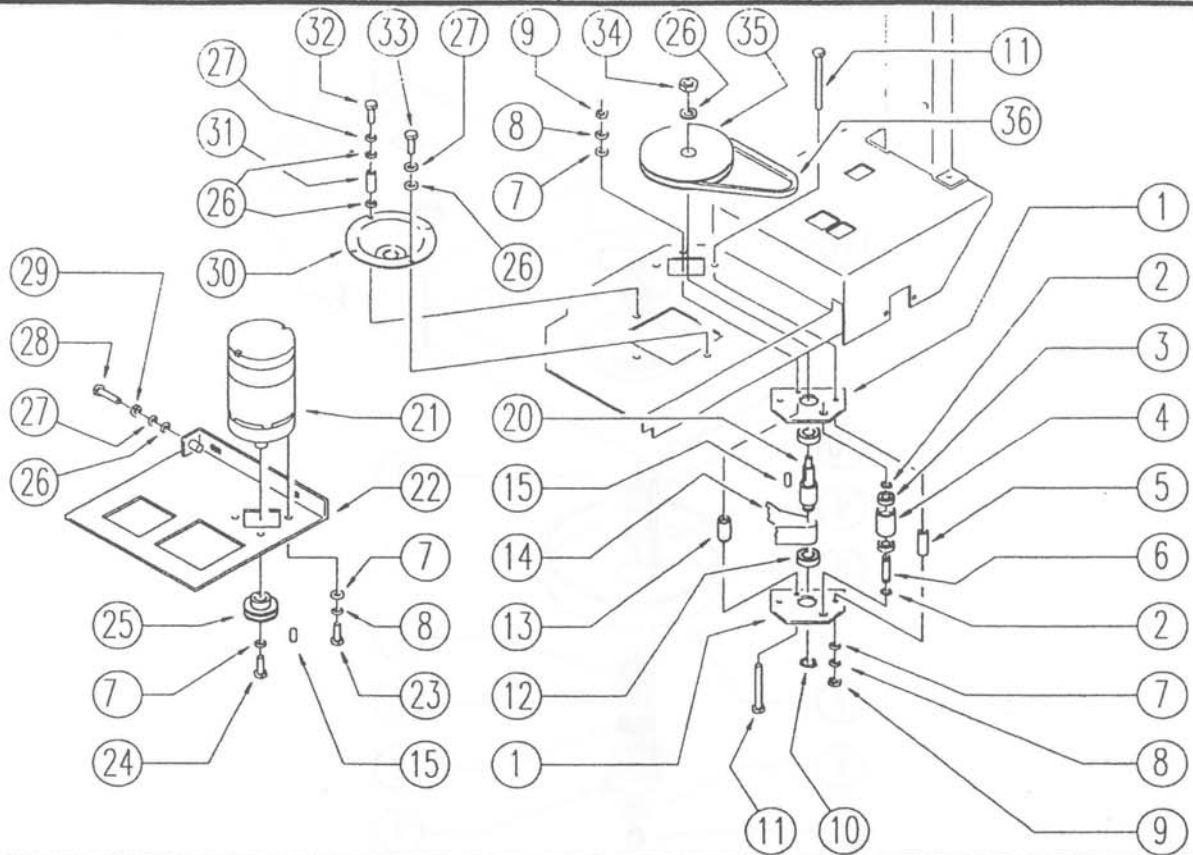


CODE:

pl1161K aa SN from 98E905

DESCRIPTION:

MOTOR

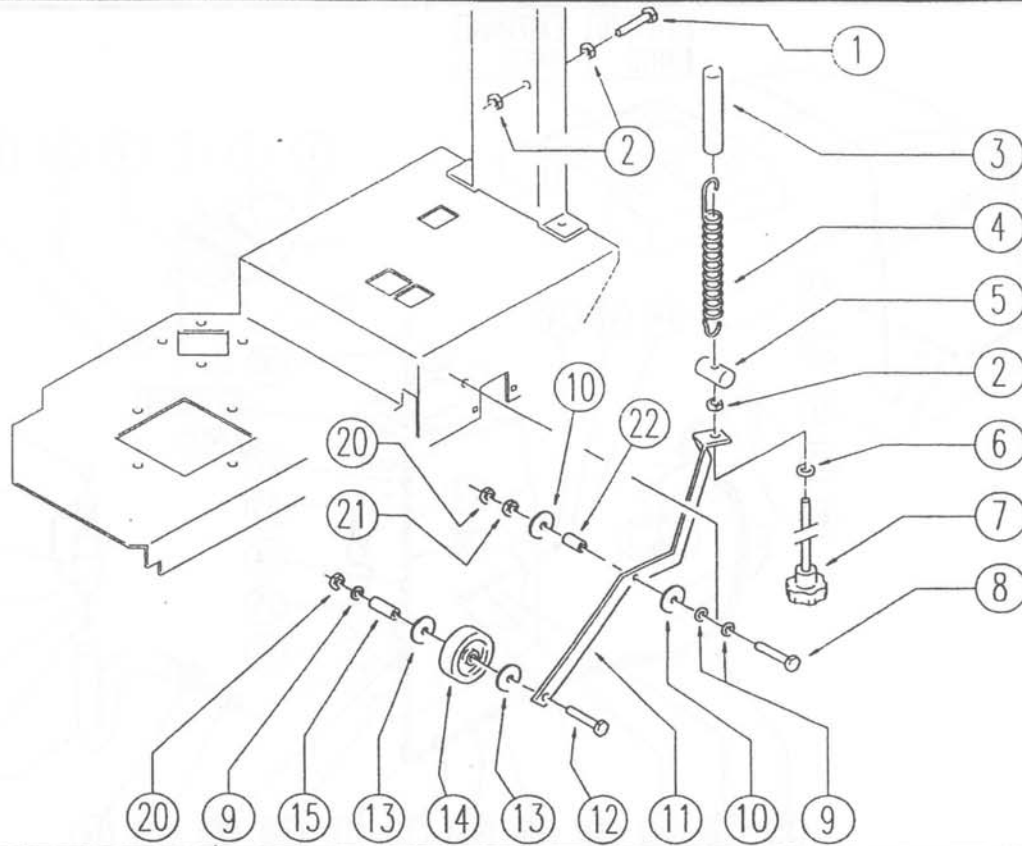


REF.	CODE	DESCRIPTION	QT
1	SL09592	PLAQUE	2
2	SL11095	RING	2
3	SL12003	BEARING	2
4	SL10045	PULLEY	1
5	SL07143	BEARING	2
6	SL11041	PIN / PLUG	1
7	SL06022	WASHER	8
8	SL06023	WASHER	7
9	SL05017	NUT	3
10	SL11100	RING	1
11	SL04061	SCREW	3
12	SL12029	BEARING	2
13	SL07191	BEARING	1
14	SL16016	BELT	1
15	SL11010	TANG / TONGUE	2
20	SL07190	SHAFT	1
21	SL02099	MOTOR	1
22	SL09588K	SUPPORT	1
23	SL04135	SCREW	4
24	SL04135	SCREW	1
25	SL10049	PULLEY	1
26	SL06041	WASHER	8
27	SL06057	WASHER	5
28	SL04156	SCREW	1
29	SL05048	NUT	1
30	SL15023	FLANGE	1
31	SL07196	BEARING	2
32	SL04143	SCREW	2
33	SL04134	SCREW	2
34	SL05039	NUT	1
35	SL10048	PULLEY	1
36	SL16018	BELT	1

CODE:

pl1163 aa SN from 98E905

DESCRIPTION: WHEEL / SMALL WHEEL

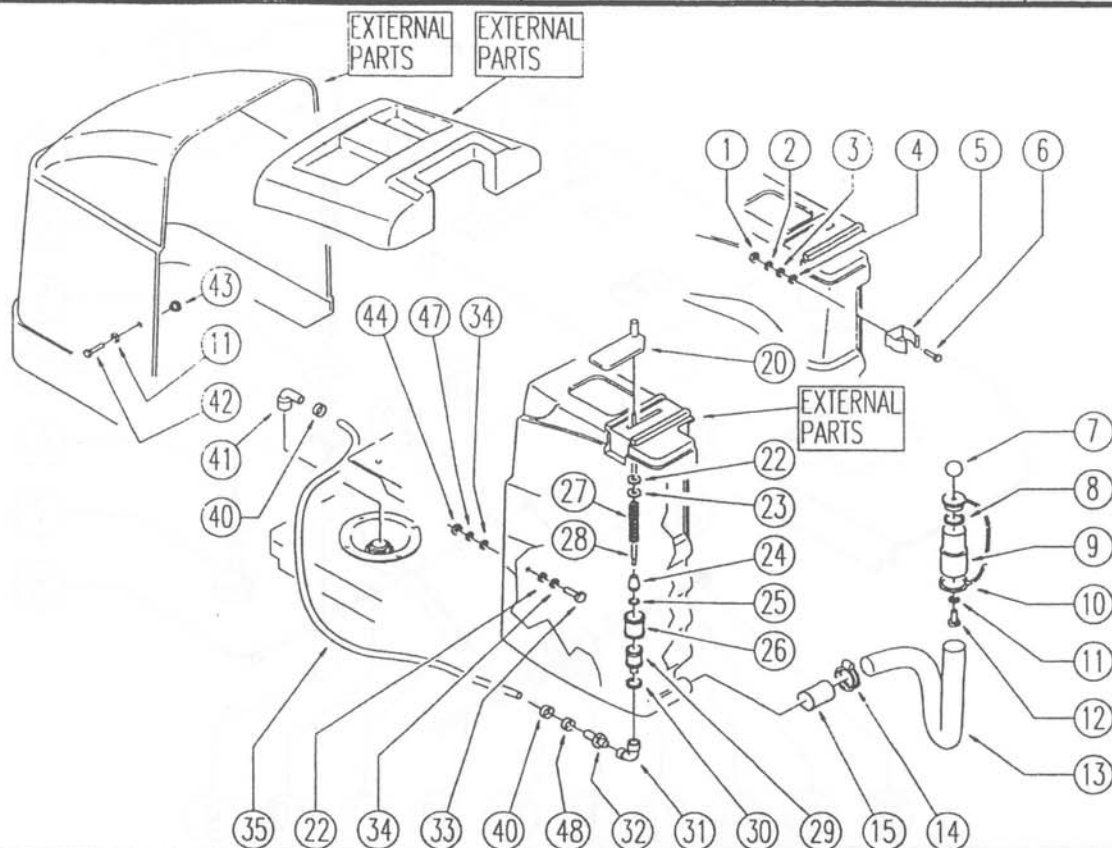


REF.	CODE	DESCRIPTION	QT
1	SL04048	SCREW	1
2	SL05017	NUT	3
3	MP19201	SHEATH	1
4	SL13037	SPRING	1
5	SL07199	SPRING COUPLING	1
6	SL06039	WASHER	1
7	SL20047	KNOB (o HANDWHEEL)	1
8	SL04127	SCREW	1
9	SL06041	WASHER	3
10	SL06053	WASHER	2
11	SL09589	LEVER	1
12	SL04156	SCREW	1
13	SL08024-1	WASHER	2
14	SL08024-3	WHEEL / SMALL WHEEL	1
15	SL08024-2	PIN	1
20	SL05039	NUT	2
21	SL05048	NUT	1
22	SL07063	BUSHING / BUSH	1

CODE:

pl1195WS aa SN from 98E905

DESCRIPTION: TANK-HOOD



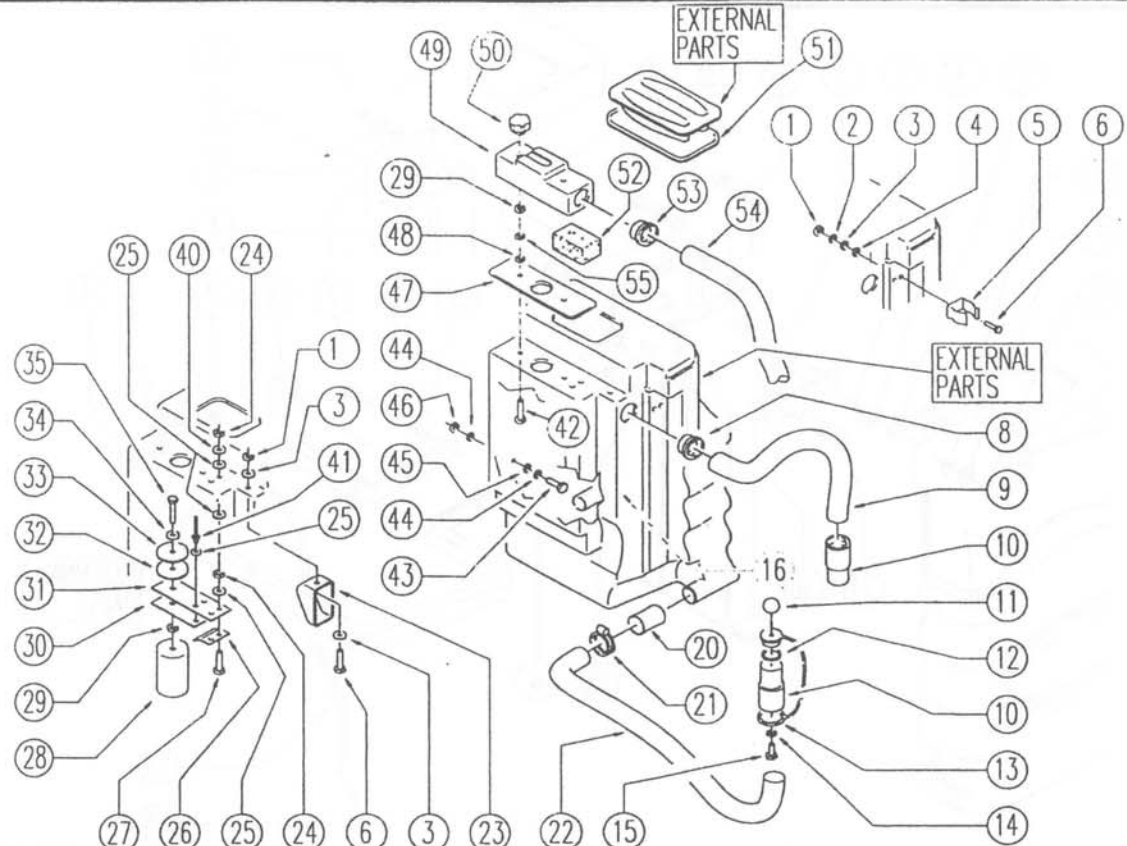
REF.	CODE	DESCRIPTION	QT
1	SL05016	NUT	2
2	SL06037	WASHER	2
3	SL06034	WASHER	2
4	SL03118	GASKET	2
5	SL13014	DUCT LOCK	1
6	SL04152	SCREW	2
7	SL20015	KNOB (c HANDWHEEL)	1
8	SL03315	GASKET	1
9	SL14003	SLEEVE	1
10	SL14237	CAP	1
11	SL06022	WASHER	3
12	SL04002	SCREW	1
13	SL19113	HOSE	1
14	SL14063	CLAMP	1
15	MP03196	SHEATH	1
20	SL17140-1K	LEVER / CURSOR	1
22	SL03122	WASHER	2
23	SL06039	WASHER	1
24	SL07250	SHUTTER	1
25	SL03149	GASKET	1
26	SL18137	FILTER	1
27	SL13032	SPRING	1
28	SL09381	TIE ROD	1
29	SL07249	BODY	1
30	SL03058	GASKET	1
31	SL18130	UNION / CONNECTOR	1
32	SL18150	UNION / CONNECTOR	1
33	SL04145	SCREW	1
34	SL06025	WASHER	1
35	SL19240	HOSE	1
40	SL14109	CLAMP	2
41	SL18232	UNION / CONNECTOR	1
42	SL04027	SCREW	2
43	SL07210	BUSHING / BUSH	2
44	SL05039	NUT	1
47	SL06057	WASHER	1
48	SL14150	CLAMP	1



CODE:

pl1199K aa SN from 98L000

DESCRIPTION: TANK

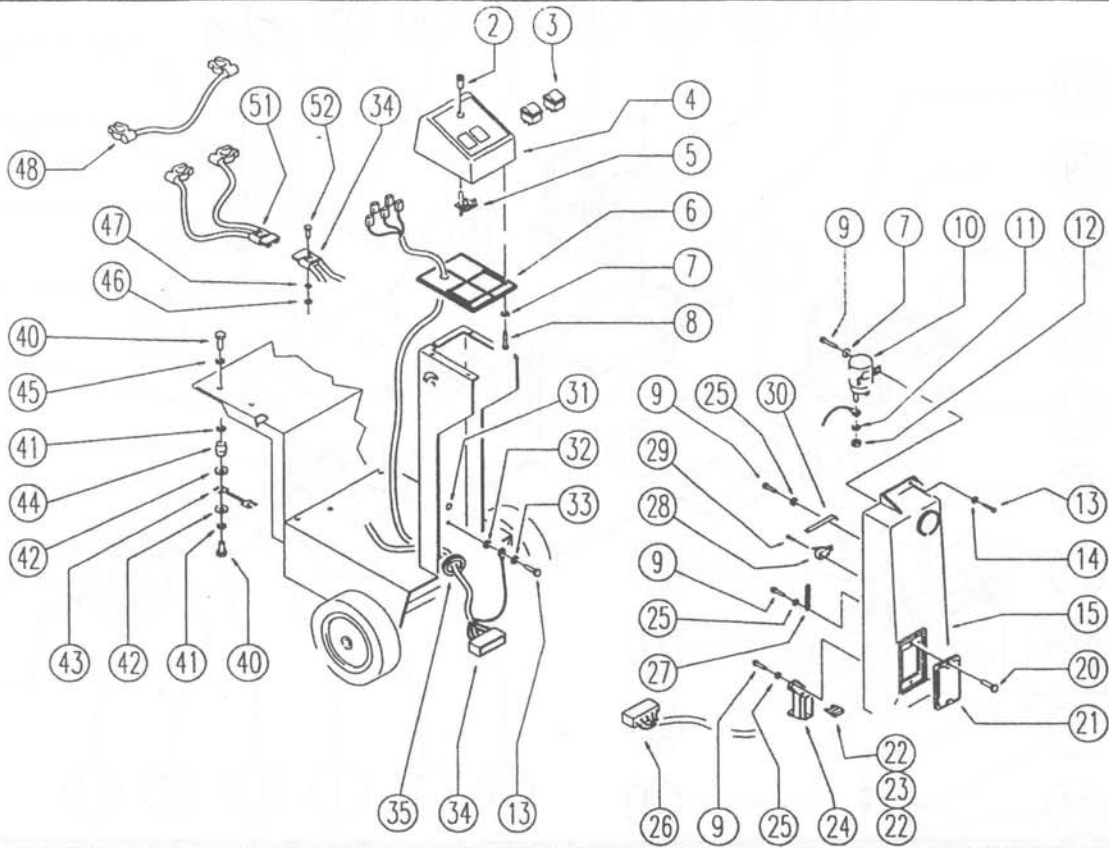


REF.	CODE	DESCRIPTION	QT
1	SL05016	NUT	3
2	SL06037	WASHER	2
3	SL06034	WASHER	4
4	SL03116	GASKET	2
5	SL13014	DUCT LOCK	1
6	SL04152	SCREW	3
8	SL07178	BUSHING / BUSH	1
9	SL19013	HOSE	1
10	SL14003	SLEEVE	2
11	SL20015	KNOB (ø HANDWHEEL)	1
12	SL03315	GASKET	1
13	SL14237	CAP	1
14	SL06022	WASHER	3
15	SL04002	SCREW	1
16	SL07120K	CROSS	1
20	MP03196	SHEATH	1
21	SL14063	CLAMP	1
22	SL19113	HOSE	1
23	SL17155-1	BAFFLE PLATE	1
24	SL05044	NUT	4
25	SL06031	WASHER	4
26	SL09675	SMALL BRACKET	1
27	SL04189	SCREW	2
28	SL18065	FLOAT	1
29	SL05017	NUT	3
30	SL09364	PLATE	1
31	SL03111	RUBBER SHIM	1
32	SL03110	CAP	1
33	SL03235	CAP	1
34	SL06071	WASHER	1
35	SL04087	SCREW	1
40	SL06033	WASHER	2
41	SL14006	RIVET	2
42	SL04140	SCREW	2
43	SL04145	SCREW	1
44	SL06025	WASHER	1
45	SL03122	WASHER	2
46	SL05039	NUT	2
47	SL03113	GASKET	1
48	SL06071	WASHER	2
49	SL17141-1	BOX	1
50	SL20006	KNOB (ø HANDWHEEL)	2
51	SL03470	GASKET	1
52	SL03109	FILTER	1
53	SL07044	BUSHING / BUSH	1
54	SL19100	HOSE	1
55	SL06023	WASHER	1

CODE:

pl1201 aa SN from 98E905

DESCRIPTION: ELECTRIC UNIT



REF. CODE	DESCRIPTION	QT					
2	SL23031-1	REFLECTOR	1				
3	SL23183	SWITCH	2				
4	SL17175	CONTROL PANEL	1				
5	SL23031	GEARCASE / BOARD	1				
6	SL17178	CONTROL PANEL BASE	1				
7	SL06031	WASHER	4				
8	SL04177	SCREW	4				
9	SL04176	SCREW	4				
10	SL23001	TELE-SWITCH	1				
11	SL06002	WASHER	2				
12	SL05004	NUT	2				
13	SL04079	SCREW	3				
14	SL06019	WASHER	2				
15	SL17166	COVER	1				
20	SL04027	SCREW	2				
21	SL17149-1	LID	1				
22	SL23144	FUSE	2				
23	SL23147	FUSE	1				
24	SL23894-1	CONNECTOR	1				
25	SL06014	WASHER	2				
26	SL23818	WIRING	1				
27	SL13026	SPRING	1				
28	SL23120	MICROSWITCH	1				
29	SL04178	SCREW	2				
30	SL09499	FOIL / LAMINA	1				
31	SL25185	LABEL	1				
32	SL06033	WASHER	3				
33	SL06032	WASHER	1				
34	SL23817K	WIRING	1				
35	SL23783	FAIRLEAD	1				
40	SL04092	SCREW	4				
41	SL06001	WASHER	4				
42	SL06015	WASHER	4				
43	SL23837	FUSE	1				
44	SL23842	FUSE	2				
45	SL06004	WASHER	2				
46	SL05009	NUT	2				
47	SL06024	WASHER	2				
48	SL23838	BRIDGE	1				
51	SL23839US	WIRING	1				
52	SL04122	SCREW	2				

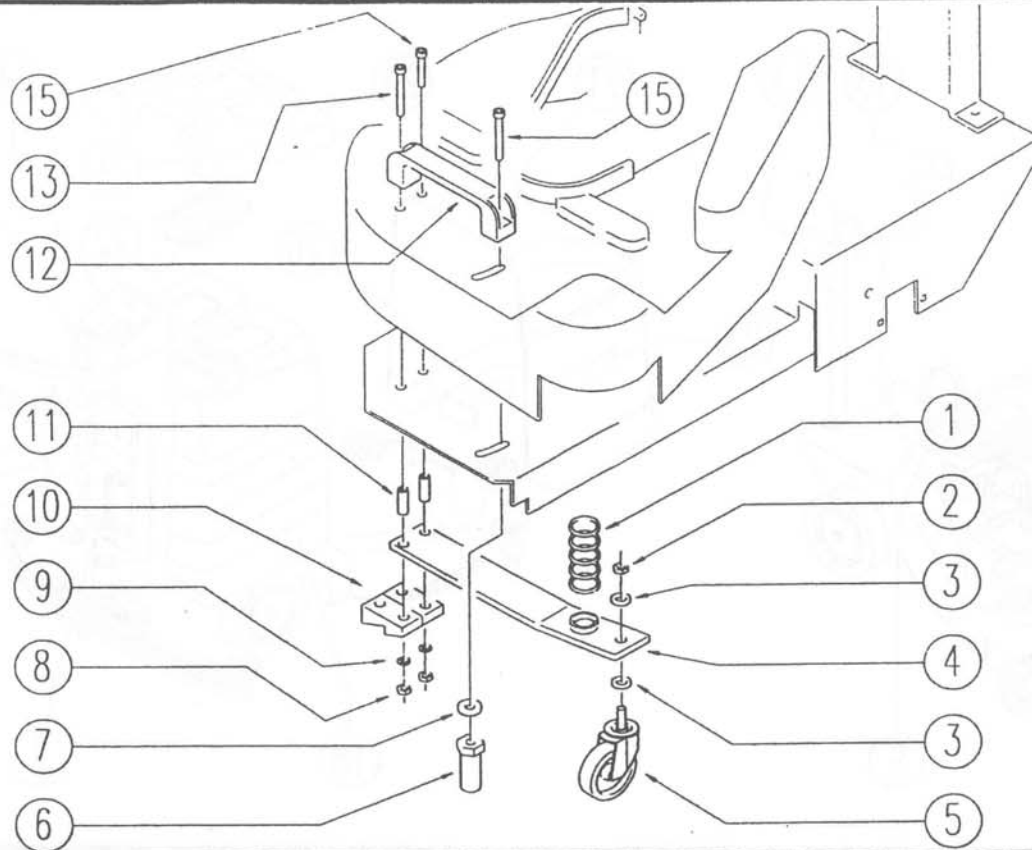




CODE:

pl1204BC aa SN from 98L000

DESCRIPTION: SMALL WHEEL



REF. CODE	DESCRIPTION	QT
1 SL13069	SPRING	1
2 SL05013	NUT	1
3 SL06005	WASHER	2
4 SL09953	LEVER	1
5 SL08029	WHEEL / SMALL WHEEL	1
6 SL07248	BEARING	1
7 SL06073	WASHER	1
8 SL05039	NUT	2
9 SL06025	WASHER	2
10 SL03121	SILENT BLOK	2
11 SL07241	BEARING	2
12 SL20029	HANDLE	1
13 SL04237	SCREW	2
15 SL04238	SCREW	2







