

WRANGLER 1708 AB / 2008 AB

IMPORTANT SAFETY INSTRUCTIONS



WARNING: Failure to observe these instructions can cause personal injury to machine operator or bystanders.



WARNING: Fire or explosion hazard. **NEVER** operate this machine in an explosive atmosphere (grain dust, flammable liquids or fumes, etc.).



WARNING: Fire or explosion hazard. **NEVER** attempt to pick up flammable or combustible materials or use such materials in tank.



WARNING: Orange Oil (D-limonene) is not compatible with the plastic used in NSS automatic scrubbers and the Sidekick Chemical Metering System. Use of D-limonene may result in damage to the machine.



WARNING: This product contains a chemical known to the state of California to cause cancer and birth defects or other reproductive harm.

INTENDED USE

This machine is designed for scrubbing floors in an indoor environment. NSS does not recommend using this machine for any other purpose.

FOR SAFETY:

- **ALWAYS** read and understand all instructions before operating or servicing machine.
- **ALWAYS** use this machine **ONLY** as described in this manual.
- **NEVER** attempt to operate this machine unless you have been trained in its operation.
- **NEVER** allow an untrained person to operate this machine.
- **NEVER** attempt to operate this machine if it is not working properly or has been damaged in any manner.
- **NEVER** disconnect or modify any switches or safety devices (circuit breaker).
- **NEVER** drop or insert any object into any machine opening.
- **NEVER** operate this machine with any air opening blocked. Keep all air openings free of dust, lint, hair, etc.
- **NEVER** pick up anything that is burning or smoking, such as cigarettes, matches or hot ashes.
- **NEVER** spray this machine with water or any liquids.
- **NEVER** allow the vacuum motor or battery-charging plug to get wet or a short may occur.
- **NEVER** operate this machine when the battery charger is plugged in.
- **NEVER** operate this machine with the side skirt removed.
- **NEVER** allow this machine to be used as a toy. Close attention is necessary when used by or near children.
- **ALWAYS** wear clean tennis shoes or "non-slip" shoes. Leather soled shoes will become extremely slippery when wet.
- **ALWAYS** keep face, fingers, hair or any other body part or loose clothing away from any machine opening or moving part (revolving brush, pad driver, or vacuum motor).
- **ALWAYS** turn the machine off when attaching pads or brushes.
- **ALWAYS** remove keys when this machine is left unattended.
- **ALWAYS** be sure that the ramp is secured to the vehicle before attempting to load / unload.
- **ALWAYS** use extreme caution when operating the machine on a ramp or loading / unloading this machine into or out of a truck / trailer. Use extreme caution if the ramp is wet, oily, or covered with cleaning chemicals.
- **NEVER** stop or turn the machine on a ramp or incline.
- **NEVER** attempt to climb a grade or operate this machine on a ramp or incline of more than 8 degrees.
- **NEVER** park or store the machine near a dock, on ramps, near a furnace, boiler, open flame, or other high heat source.
- **NEVER** allow this machine to freeze.
- **NEVER** expose the machine to rain, snow, or extreme temperatures.
- **NEVER** store any items on this machine.
- **ALWAYS** store this machine indoors in a dry, cool area.

ALL REPAIR SERVICE MUST BE PERFORMED BY AN NSS AUTHORIZED DISTRIBUTOR/ SERVICE STATION USING ONLY NSS ORIGINAL EQUIPMENT PARTS.

SAVE THESE INSTRUCTIONS

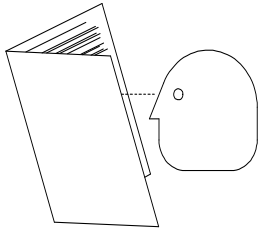


IMPORTANT SAFETY INSTRUCTIONS

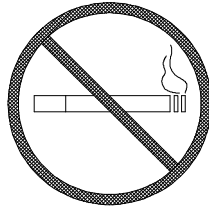


BATTERY POWERED EQUIPMENT WITH ON BOARD CHARGERS

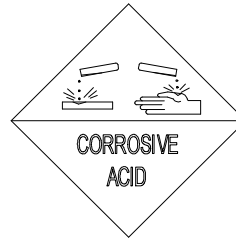
WARNING: Failure to observe these instructions can cause personal injury to machine operator or bystanders.



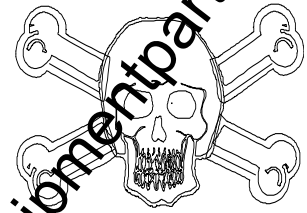
Read and understand all instructions before installing or charging batteries.



No smoking, open flames, or sparks while working with batteries.



Contains acid. Avoid contact



Poison. Causes severe burns. Avoid contact.



WARNING: Batteries emit hydrogen, which can cause fire or explosion. **NEVER** smoke, light a match, or cause a spark during operation or charging. **ALWAYS** charge in a well-ventilated area away from open flame.

GENERAL

- **ALWAYS** read and understand all instructions before installing or charging batteries.
- **NEVER** attempt to install or charge batteries unless you have been trained to do so.
- **NEVER** allow an untrained person to install or charge batteries.
- **ALWAYS** remove all jewelry when working on or near the batteries.
- **ALWAYS** turn off all switches during installation and service.
- **ALWAYS** disconnect the battery leads before performing any service or repair.
- **ALWAYS** wear eye protection and protective clothing to avoid contact with battery acid.
- **NEVER** lay anything on top of batteries as arcing may occur.
- **IF CONTACT WITH BATTERY ACID OCCURS**, follow these instructions:
 - SKIN – rinse area with water.
 - EYES – Flush with water for 15 minutes.
 - INTERNAL – Drink water or milk. Follow with Milk of Magnesia, beaten egg or vegetable oil. Call a physician immediately.

BATTERY INSTALLATION

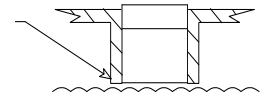
- **ALWAYS** use two people to install, as batteries are heavy.
- **ALWAYS** turn off all machine switches.
- **ALWAYS** position batteries as shown on the machine installation decal to maintain machine balance.
- **ALWAYS** connect batteries as shown on the machine installation decal to avoid shorting out the batteries and the electrical system.

BATTERY CHARGING

- **ALWAYS** read instructions on charger carefully.
- **ALWAYS** use the NSS supplied charger with proper voltage rating.

For lead acid batteries only, (does not apply to gel cell or maintenance free batteries).

- **ALWAYS** check to ensure the battery water level covers the battery plates before charging.
- **ALWAYS** check water level after charging and add water if necessary to bring level to the bottom of the fill hole.
- **NEVER** overfill batteries as battery and machine damage may result.
- **ALWAYS** wipe any acid from the top of batteries using a soap solution.
- **ALWAYS** study battery manufacturers' specific precautions such as recommended rates of charge.
- **ALWAYS** reattach caps to batteries. Do not charge with caps loose or removed.
- **ADD** only distilled or treated city water. Not well water.
- **NEVER** charge a frozen battery.
- **ALWAYS** plug the charger into an earthed socket outlet.
- **NEVER** touch uninsulated portion of output connector or uninsulated battery terminal.
- **ALWAYS** disconnect the AC supply before making or breaking the connections to the battery while charging.
- **NEVER** open or disassemble charger.
- **NEVER** operate charger if the AC supply cord is damaged or if the charger has received a sharp blow, been dropped, or otherwise damaged in any way.



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NOISE AND VIBRATION

NOISE

Sound pressure level at Operator position 66dB(A)

VIBRATION

Weighted RMS acceleration value (ISO 5349) .367 m/s²

MACHINE INSPECTION

- Now that the machine is unpacked remember to recycle all packing materials.
- Inspect the machine for damage or missing components. If damage is found, contact the local freight company to file a freight claim.

MACHINE COMPONENTS

Solution Tank

The solution tank is the lower part of the machine body. It has a capacity of **8 gallons (30 liters)**.

- The amount of water in the tank is measured by the sight hose, (clear plastic tube), at the rear of the machine.

Recovery Tank

The recovery tank is the upper part of the machine body. It has a capacity of **10 gallons (38 liters)**.

- A rectangular, clearview lid assembly closes the recovery tank.
- The recovery tank has a foam-sensitive float shut-off assembly. As the water or foam level rises, the float ball will rise and shut off the air-flow of the vacuum motor to the squeegee. It does **not** shut off the vacuum motor.

Control Panel

- The operator control panel is located at the rear area of the machine. This panel has components that control various machine functions.
- Starting from the *left* side:
- The circuit breaker is for both the brush motor and the vacuum motor.
- The first switch turns the brush motor on and off.
- The next switch turns the vacuum motor on and off.
- The red switch is the master power switch; it controls the power to all components

Battery Meter

The battery meter is located on the right side of the operator control panel and shows the state of charge of batteries during operation and recharge.

The battery meter is equipped with a relay that will open, turning off the machine, when the battery voltage has dropped to it's lowest permissible level.

- When the batteries are fully charged, all of the LED's are illuminated.
- As the batteries discharge, the LED's start to turn off, one at a time, from right to left.
- When the last yellow LED on the left starts blinking, there is only a few minutes of runtime left before the machine is automatically turned off.

Squeegee Assembly

The squeegee assembly has a wide, flat frame to help prevent damage, two (2) mounting knobs, and two (2)

small wheels to prevent "rollover" in reverse.

Brush Gear Motor

This machine has one (1) 24-volt brush motor located at the front of the machine. The motor is attached to a gearbox to turn the pad drivers or brushes.

- This motor has carbon brushes that must be serviced on a regular basis. The carbon brushes have an expected life of 2,000 operating hours. Refer to the maintenance section later in this book.

Vacuum Motor

This machine has a 24-volt vacuum motor.

- The vacuum motor is attached to the underside of the solution tank behind the rubber flap.
- This motor has carbon brushes that must be serviced on a regular basis. The carbon brushes have a maximum expected life of 700 operating hours. Refer to the maintenance section later in this book.

Battery Package

The Wrangler 106/2008 is a **24 volt system** with two (2) 12 volt, 15 amp hour batteries. Consult your local NSS authorized distributor for application recommendations.

PREPARING THE MACHINE

Installing the Batteries:

- Turn off all switches.
- Empty all liquids from recovery tank.
- Step on foot pedal at front of machine to release tanks. Lift tanks up and tilt back to rest on handles.
- Refer to the wiring diagram on bottom of tanks.
- Align batteries in the compartment as shown on the diagram.
- Install battery cables as shown on the wiring diagram.
- Tighten bolts and hex nuts with a wrench.
- **CAUTION:** Do not short across two terminals with a wrench.
- Loose or improper battery connections will cause battery or machine damage and possible personal injury.

Battery Charging

- To recharge the batteries plug the charger cord, located at the rear of the machine, into an electrical outlet.
- When the cord is plugged into an outlet the machine will become disabled.

See charging instructions for more details.

Preparing the Solution and Recovery Tanks:

- **Never** use water over **140°F (60°C)** degrees.
- Excessively hot water may damage components such as the tanks.
- Put 1 to 2 gallons of clean water into the solution tank first to help dilute the chemicals and prevent excess sudsing. Dilute the cleaning chemicals according to the manufacturer's instructions.
- Fill the tank by pouring the water and cleaning chemicals through the mesh filter that covers the opening at the front of the solution tank.

- Make sure the recovery tank drain hose is tight on the plug.
- **Always** use a defoamer to protect the vac motor.
- Consult your local distributor for complete chemical advice.

Install a Pad Driver and Pad:

- There is a wide range of pads or brushes available for the many cleaning applications. Consult your NSS authorized distributor for recommendations.
- Turn off all switches and empty all liquids from the recovery and solution tank.
- Raise the brush motor into the “up” position. The foot pedal is at the rear left of the machine. Step on the pedal and slide it to the right into the notch.
- Step on the foot pedal latch at the front of the machine chassis.
- Lift the machine body by the opening for the solution tank. Tilt the machine body backward until the handles rest on the floor.
- Remove pad driver assembly from drive casting on end of brush motor shaft by turning the driver counter-clockwise.
- Turn the pad drivers upside down on the floor and remove the pad holding cup.
- Remove the center cutout of the 17” (43cm) or 20” (51cm) pad if present and place pad on the face of the pad driver.
- The pad *must be centered* on the driver to prevent wobbling or bouncing.
- Install and secure the pad holding cup to the pad driver. Turn the pad driver over so that the pad faces the floor.
- Align the notches of the pad driver with the lugs of the drive casting.
- Turn the pad driver clockwise to lock onto the drive casting.
- Turn the pad driver counter-clockwise to remove.

Install a Brush:

- Align the notches of the brush with the lugs of the drive casting.
- Turn the brush clockwise to lock onto the drive casting.
- Turn the brush counter-clockwise to remove.

Install the Squeegee Assembly:

- Place the squeegee lift arm in the storage (up) position.
- The squeegee assembly mounts to a metal bracket at the bottom center of the machine, using two (2) mounting knobs. Loosen the mounting knobs and slide the squeegee assembly onto the mounting plate.
- The squeegee assembly has two (2) small wheels to prevent “rollover” while in reverse. The roller wheels must face the operator. Hand tighten the mounting knobs. **Do not** use pliers to tighten knobs, as this will defeat the “break-away” design. **Do not** add any weights or other pressure to the squeegee mechanism. This will not improve the performance and will shorten the life of the blades.

- It is recommended that, with new blades, the rear wheels be adjusted to their lowest position. Loosen the two screws on the bracket rotate the bracket downward as far as it will go, then tighten the screws. Perform this adjustment on both wheels/brackets.
- When the squeegee becomes worn, and the wiping edge no longer contacts the floor properly, further use may be possible by adjusting the rear wheels upward enough to restore proper engagement of the blades wiping edge with the floor. Be sure to adjust the wheels back down when a new blade is installed.

Operating the Machine

Do not operate the machine with the battery meter needle in the red zone.

The Wrangler 1708/2008 is very maneuverable and is designed for light to medium scrubbing as you operate the machine from behind. Follow these steps to prepare the machine for daily operation.

- Sweep and dust mop the floor to remove dirt and debris before scrubbing. Accumulations of dirt or debris on the floor will reduce cleaning performance.
- You may also need to **preclean** some types of spills or stains before scrubbing.
- Plan your work so that you make long, straight paths with the fewest amounts of turns as possible, overlapping each cleaning path about 2 in. (5cm) to prevent streaking and dirty areas.
- Remove as many obstacles as possible from the area to be scrubbed.
- Do not put strip solution in solution tank. Apply with mop and bucket and rinse with clean water in solution tank.

MACHINE MAINTENANCE

Routine maintenance is critical to ensure proper machine operation and cleaning performance. Perform all maintenance procedures as follows.

Always turn OFF all machine switches before performing any maintenance.

Adjusting the Squeegee Assembly:

As the machine is used, the squeegee blades will wear or need to be replaced due to damage. Some adjustment may be needed.

- Squeegee blades should lie over slightly (like a window squeegee) when the machine is moving forward or in reverse.
- Adjust the blade angle by turning the wing nut on the pivot arm clockwise/counterclockwise.

Daily Maintenance

Solution and Recovery Tanks

- Drain the solution tank through the solution valve or the sight hose at the rear of the machine.
- The recovery tank is emptied through the black hose at the rear of the machine. Remove the plug and drain the liquids according to your local EPA regulations.

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- **Every time** you empty the recovery tank, we recommend that you add at least 4 to 6 ounces of defoamer chemical into the recovery tank before resuming work. Vacuum the defoamer into the empty recovery tank through the squeegee vac hose.
- At the end of the day empty all liquids from both solution and recovery tanks. Rinse both tanks with clean water to prevent chemical residue build-up, allow to air - dry to prevent odors.
- Remove any residue from screen and float ball to ensure proper operation. Replace float assembly in recovery tank.
- Check clear lid for airtight seal.
- Check the drain hose for damage and / or restriction, to access the hose, remove the clean out cap from inside the Recovery tank, replace the cap before using the machine.

Battery Charging

- **The master power switch and all other switches must be turned OFF.**
- Recharge the batteries at the end of every shift or when indicated by the battery meter. Read the battery meter while the machine is in use. *115 AH batteries require 9-12 hours to fully charge.
- **NOTE:** If battery charger is unplugged before the charging cycle is completed, it may take up to five minutes before the machine to be able to be turned on.
- Consult your local authorized NSS distributor or service center for assistance.

Battery Electrolyte (Liquid) Level

Inspect the electrolyte level of at least one cell in each battery before daily charging. The liquid must be visible above the internal plates. Do not charge the batteries if the liquid is below the plates.

- Add only water to the cell of a battery to adjust the liquid level. Distilled water preferred, **Do Not** use well water. Before charging, add only enough water to cover the top of the internal plates. After charging add only enough water to bring the level to the bottom of the fill tube.
- **Do not** overfill the battery liquid level, this will cause electrolyte (acid) spill. Spilled electrolyte (acid) can cause machine damage and personal injury. Clean up and dispose of all spills immediately.
- **Every cell** of every battery must be checked and replenished once per week.
- See the battery-warning sheet (page 2) for more details.

Pad Drivers or Brushes

- Remove either pad drivers or brushes from machine after use.
- Rinse with clean water to prevent chemical residue build-up.
- Allow to air-dry, on a peg or upside down on a shelf.

- Inspect for wear or damage. Repair or replace as needed.

Squeegee Assembly

- Remove squeegee assembly from machine.
- Rinse with clean water to prevent chemical residue build-up.
- Allow to air dry, it can be stored on top of the machine for drying.
- Inspect the squeegee assembly, linkage, and vacuum hose, for wear, damage or obstruction. Repair or replace as needed.
- Remove debris from squeegee hose and entrance to recovery tank.

Weekly Maintenance (20 Hours)

- Verify all daily maintenance has been performed.
- Inspect all battery liquid levels. Adjust to proper level as needed. Add only water
- Check all battery terminal and cable connections. Tighten as needed. Loose connections are dangerous and can cause personal injury and machine damage.
- Clean any corrosion from battery terminals and cables.
- Drain all liquids from battery compartment. Dispose of according to local EPA regulations.
- Check solution flow to pad drivers / brushes. Flush clean solution tank and hoses with a mixture of 8 oz. (250ml.) white vinegar to one-gallon (4 liter) warm water.
- Repair or replace any worn or damaged components as needed.

****CAUTION****

Inspect and replenish battery water in every cell in every battery weekly. Failure to maintain proper electrolyte level in every cell of every battery will cause premature battery failure, and void the warrantee.

Monthly Maintenance (100 Hours)

- Verify all daily and weekly maintenance has been performed.
- Lubricate the axle bearings of the two large 8" (20cm) wheels. Use high-grade water-resistant grease.
- Lubricate the caster with moisture resistant foaming-type spray.

Mandatory Periodic Maintenance

It is important for you to read the hour meter for hours used in order to perform this machine maintenance.

It is **mandatory** that the following maintenance procedure be performed at the described interval. Failure to perform this procedure may result in poor machine performance, machine component damage and failure. This procedure should be performed by an NSS authorized distributor or service center. Repairs performed by an unauthorized company will void the machine warranty. If you require assistance finding an authorized service center, please contact NSS Enterprises, Inc.

After every **450-500 hours** of operation you must inspect vacuum motor carbon brushes for wear. Replace the vacuum motor carbon brushes when they are 7/16in. (11mm) in length.

After every **650-700 hours** of operation you must inspect brush motor carbon brushes for wear. Replace the brush motor carbon brushes when they are 1/2in. (13mm) in length.

BATTERY CHARGER OPERATING INSTRUCTIONS

GENERAL INFORMATION AND WARNINGS

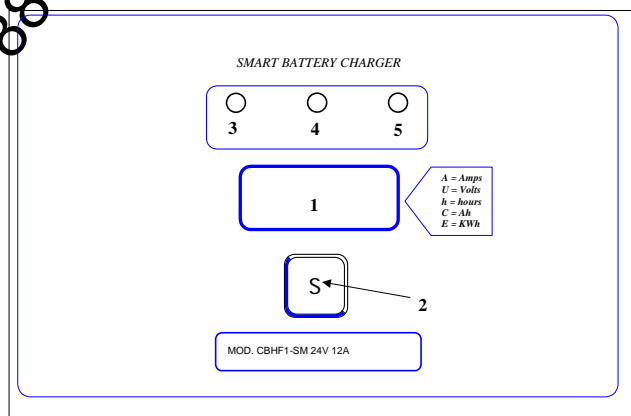
- NSS machines are delivered with the SPE charger set to Curve #1 for Crown batteries.
- Electronic automatic battery charger with microprocessor suitable for any battery type.
- Fully automatic charging cycle with electronic setting; protected against overload, short-circuit at clamps and reversed polarity.
- Before starting to charge, make sure the voltage of the equipment suits the voltage of the battery, that the charging current suits the capacity of the battery and that the selected charging curve (for lead-acid batteries or airtight gel batteries) is correct for the type of battery to be charged. In addition, make sure the rated input voltage of the charger suits the available supply voltage and the system is equipped with grounding.
- Pay attention to any remarks of the battery manufacturer.

CONTROLS (see figure below)

1. Three-digit display + symbol (1), to view **A** = the charging current, **U** = the battery voltage, **h** = the charging time, **C** = the charging ampere-hour [Ah], **E** = the energy used [KWh].
2. Button for the Selection of the display mode (2): **A, U, h, C, E**. After about 10 seconds the display returns to the visualization of the charging current.
3. Red control indicator (3): when it is on, the charging cycle has started.
4. Yellow control indicator (4): when it is on, the final phase of the charging cycle has started.
5. Green control indicator (5): when it is on, the charging cycle has finished.

OPERATION

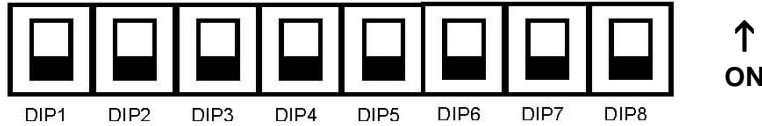
- Plug the cord into a socket.
- Now, the battery charger's display will show a sequence of details on the charger's internal programming: after the name "SPE", it will show the software release installed in the equipment, then, in sequence, the following parameters: battery voltage, charging current, charging curve number and, finally, the words "**GEL**" or "**Acd**" depending on the set up charging curve being suitable for airtight gel batteries or lead-acid batteries. Now, a test is run on the battery voltage to decide if the charging process should be started or not. If the battery is not connected to the battery charger, the display will show the word "**bat**". The word will stay on, even if the test is failed (for instance, reversed polarities or incorrect battery connection). If the test is passed, the display will show the battery voltage for approximately 5 seconds and the battery will begin to be charged. The charging cycle progress will be shown by red (3), yellow (4) and green (5) LED indicators. At the end of the charge, when the green indicator (5) is on, unplug the cord from the socket and operate the machine.



FRONT PANEL OF BATTERY CHARGER MODEL
CBHF1-SM

CBHF1-SM DIP SWITCH CONFIGURATION

Through the set of 8 dipswitches it is possible to change the charging curve (15 charging curves are available for Wet and Gel batteries and it is possible to customize the charging profile under the specifications of battery manufacturers), the battery voltage (12V or 24V) and the charging current (4A or 8A or 10A or 12A). The set of 8 dip switch is easy to find (is located under the front label of the charger, lifting the corner on the bottom-left) without opening the charger.



DIP1 DIP2 DIP3 DIP4 for the selection of the CHARGING CURVE

DIP1	DIP2	DIP3	DIP4	CHARGING CURVE
ON	ON	ON	ON	0 – Special Curve for charging CROWN Lead-Acid (Wet) batteries. SETTING FOR NSS 2392111 - BATTERY, WET, 12V, 115 AMP/HR 6393651 - BATTERY WET, 12V, 145 AMP/HR
OFF	ON	ON	ON	1 – Curve for charging AGM SEALED LEAD-ACID batteries w/float charge. SETTING FOR NSS 2392731 AGM BATTERY, 12V, 100AMP/HR
ON	OFF	ON	ON	2 - Curve for charging typical GEL sealed lead acid batteries.
OFF	OFF	ON	ON	3 – Wet batteries with float, 3.5A finish, formerly curve #4.

***For batteries from manufacturers other than crown, contact NSS customer service for a recommended algorithm. Not all other manufacturer's batteries are compatible with the chargers supplied on NSS equipment.**

DIP5 DIP6 DIP7 for the selection of the CURRENT

DIP5	DIP6	DIP7	CURRENT
ON	ON	ON	4A
OFF	ON	ON	8A
ON	OFF	ON	10A
OFF	OFF	ON	12A

DIP8 for the selection of the battery voltage

DIP8	VOLTS
ON	12
OFF	24

PROBLEMS	SOLUTIONS AND CHECKS
The battery charger does not switch on	Check that the plug is connected to the supply mains and that the circuit breaker is efficient.
The charging cycle does not start and the message ' bat ' is displayed.	Check the connection to the battery and the polarity.
The yellow indicator (4) will not light up even 15 hours from the starting of the charging cycle, and the display shows E03 .	Check the battery for possible faulty components.
The message E01 is displayed	This means that the maximum voltage admissible by the battery has been exceeded. The charging is interrupted.
The message E02 is displayed.	This means that the maximum temperature has been exceeded. The charging is interrupted.
The message SCt is displayed	SCt is a fault code indicating time out before charge cycle completed..
The message SR is displayed	This signals a possible internal short circuit.
The message EdU is displayed	The batteries are damaged and need replaced.
The message EdI is displayed	The batteries are damaged and need replaced.

TROUBLE-SHOOTING

PROBLEM	CAUSE	SOLUTION
No Solution Flow.	Solution tank is empty. Low battery charge. Clogged filter. The solution valve is closed. Obstruction in the solution hose. Solution valve or linkage damaged. Solution hose kinked.	Fill the tank. Charge the batteries. Clean filter. Open the solution valve. Remove the obstruction. Repair / replace the valve linkage. Check for kinks and remove.
Solution Flow Does Not Stop.	The solution valve is open. Solution valve or linkage damage. The solution valve is dirty. Damaged seat and washer in valve. The valve stem is dirty. Hose disconnected or damaged between sol. tank & valve.	Close the solution valve. Repair / replace the valve linkage. Clean the solution valve. Replace valve. Clean and lubricate valve stem. Reinstall or replace hose.
Will Not Pick Up Any Water From Floor.	Squeegee is up. Squeegee hose is off or plugged. Vac motor switch is off. Recovery tank is full. Vacuum shut-off float is stuck. Obstruction / damage in the squeegee, squeegee hose or standpipe. Leaking over gasket. Vac motor is not running. Recovery drain hose not plugged properly.	Lower squeegee. Reinstall hose. Remove cap inside the Recovery tank to clean hose restriction. Turn vac motor switch "on". Empty tank. Open float valve/remove obstruction. Remove obstruction / repair damage. Remove old gasket / replace. Have an authorized serviceman repair. Install drain hose plug properly.
Will Not Pick Up All Of The Water From The Floor.	Debris on squeegee blades. Squeegee blade is worn / damaged. Obstruction / damage in the squeegee, squeegee hose, or standpipe. Squeegee angle needs adjustment. Vacuum motor worn out. Recovery tank drain hose damaged.	Clean squeegee. Reverse / replace squeegee blade. Remove obstruction / repair damage. Adjust angle. Repair / replace vac motor. Repair / replace recovery drain hose.
Batteries Do Not Seem To Run Long Enough.	Over charging batteries. (Charging too frequently). Tops of batteries are dirty / wet. Battery terminals are dirty / damaged, or loose. Electrolyte level is too low. Batteries are not fully charged. Charger is damaged. Battery is defective or worn out.	Monitor run time, and adjust charging frequency accordingly. Clean / dry, charge batteries. Clean terminals, and connectors, replace damaged cables. Charge. Add distilled water and charge. Charge batteries for 8 hours. Have an authorized serviceman repair. Check cell voltage while discharging.
Cleaning Is Not Even.	Brush / pad is worn. Damage to brush assembly; casters or solution valve.	Replace brush / pads. Have an authorized serviceman repair.
Machine does not run.	Circuit breaker tripped. Battery cables loose or not connected. Batteries not charged. Battery charger was unplugged before the charge cycle was completed.	Reset circuit breaker. Check and connect or tighten. Charge batteries. Wait (up to five minutes) and try again.

NOTE: If any problems remain after taking the above steps, contact your local authorized distributor / service station for further evaluation and repair.



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