

OPERATION MANUAL

CHAMP ZS 29

IMPORTANT SAFETY INSTRUCTIONS



WARNING: Failure to observe these instructions can cause personal injury to machine operator or by-standers.



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 tanks.

INTENDED USE

This machine is intended for commercial use, 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.
- **NEVER** turn on machine unless sitting in the operators seat.
- **NEVER** climb on machine when it is turned on.
- **NEVER** use machine to transport passengers other than the operator.
- **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

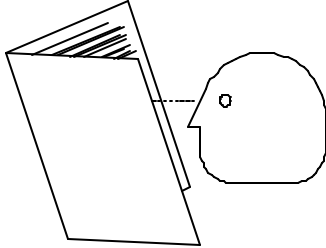


IMPORTANT SAFETY INSTRUCTIONS

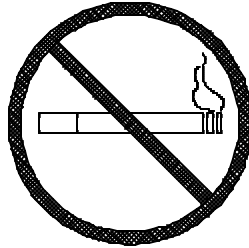
BATTERY POWERED EQUIPMENT



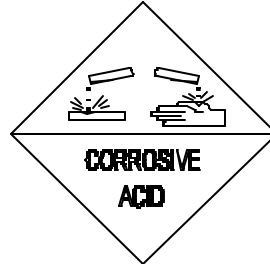
WARNING: Failure to observe these instructions can cause personal injury to machine operator or by-standers.



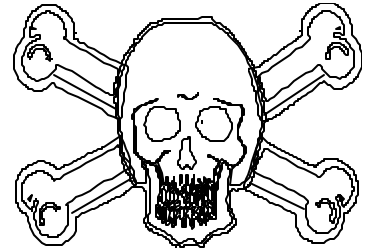
Read and understand all instructions before installing or charging batteries.



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

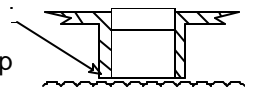
- **ALWAYS** read and understand all instructions before installing or charging batteries.
- **NEVER** attempt to install or charge batteries unless you have been trained to do so.
- **NEVER** allow an untrained person to install or charge batteries.
- **ALWAYS** remove all jewelry when working on or 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.
- **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** reattach caps to batteries. Do not charge with caps loose or removed.
- **ADD** only distilled or treated city water. Not well water.



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

SAVE THESE INSTRUCTIONS



MACHINE INSPECTION

- Carefully unpack the CHAMP ZS 29 and 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.
- Inspect squeegee assembly for concealed damage.

MACHINE UNPACKING INSTRUCTIONS

- Remove staples and lift off carton.
- Disconnect pallet anchors.
- Remove skirts, squeegee and pad drivers.
- Plug in battery connector (under seat).
- Put ramp in place.
- Slowly back machine off of pallet.

MACHINE COMPONENTS

BATTERY PACKAGE

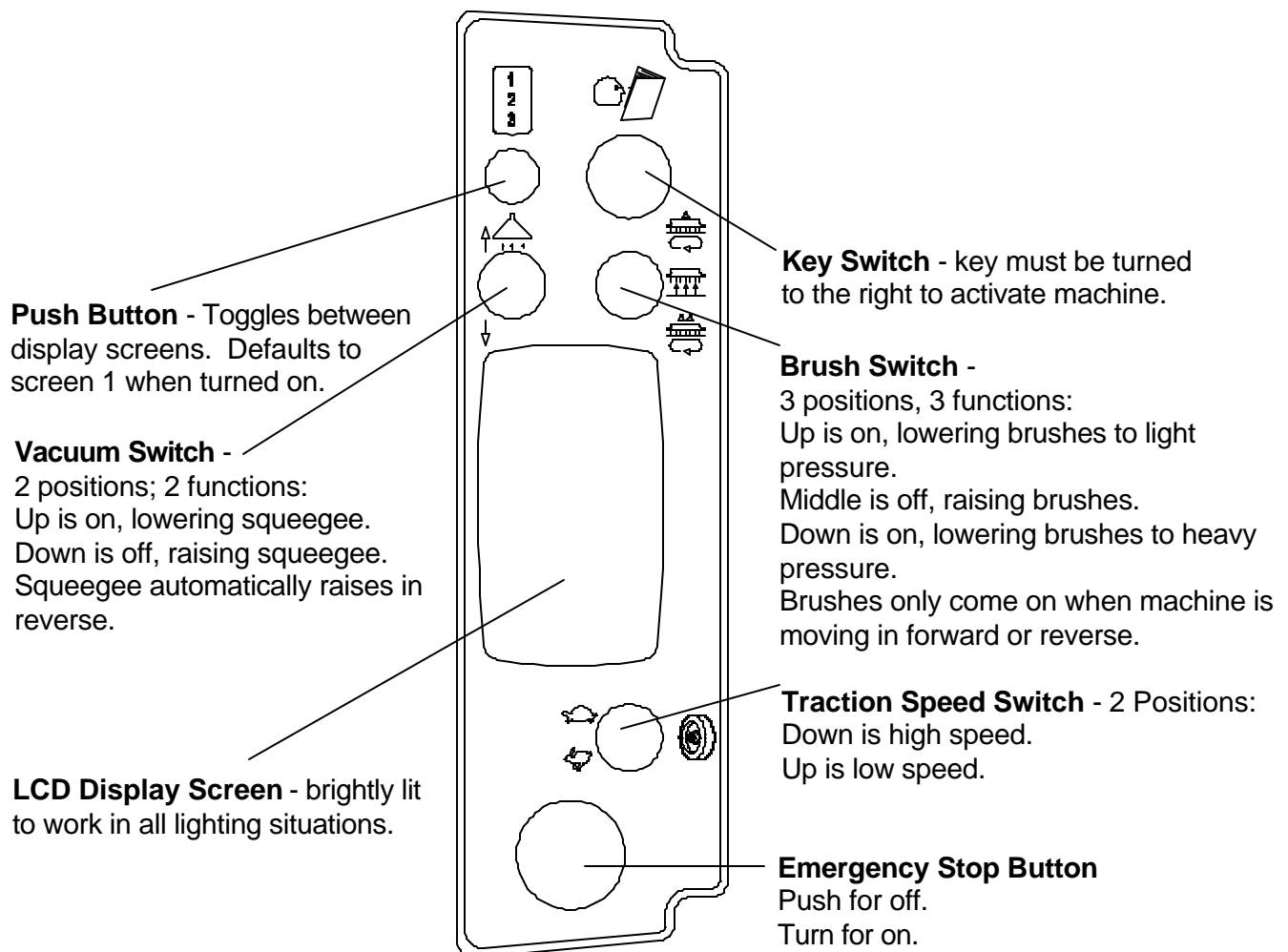
The CHAMP ZS 29 is a **36 volt system**.

- Six (6) volt batteries.

Consult your local NSS authorized distributor for application recommendations.

CONTROL PANEL

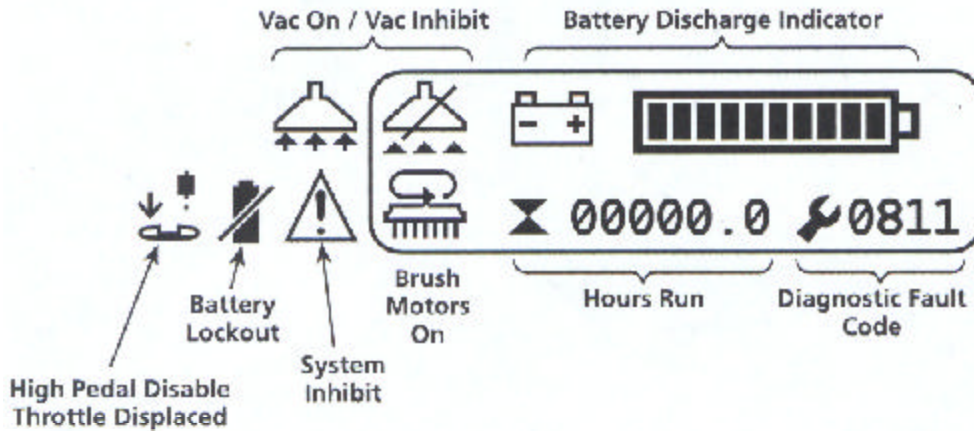
The operator control panel is located to the left of the operator's seat. This panel has components that control various machine functions. See diagram below.



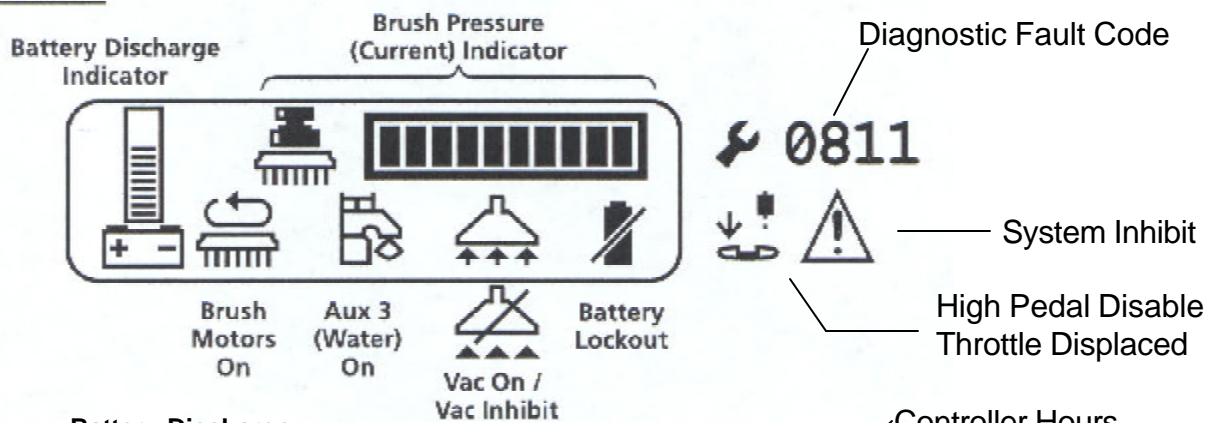
THE DISPLAY SCREENS

- There are many symbols that can be displayed on the LCD. Therefore, the LCD Mode switch can be used to toggle between pre-defined screens (see Control Panel for Details).

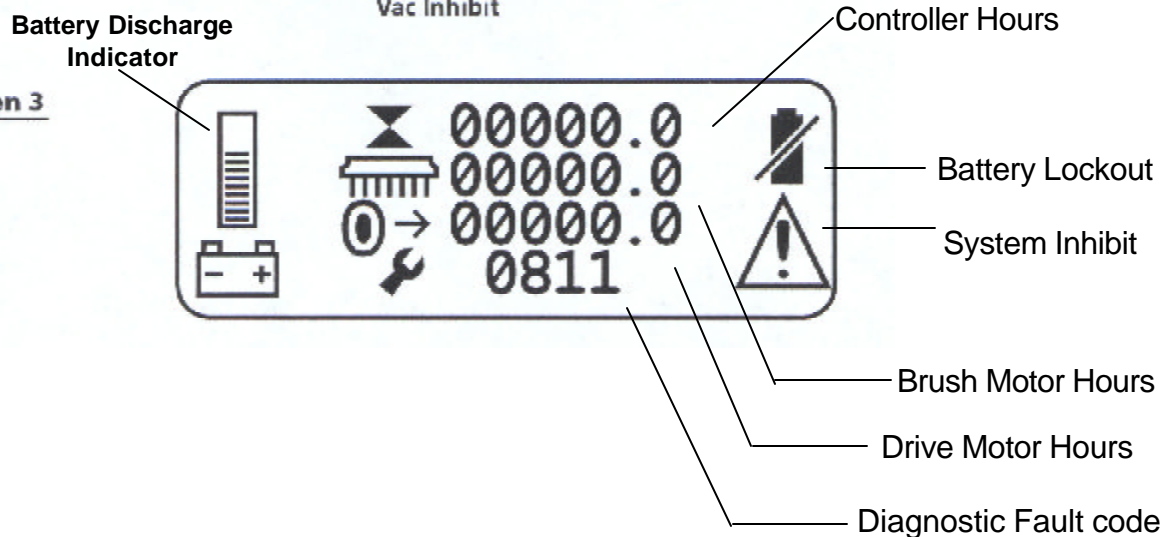
Screen 1



Screen 2



Screen 3



MACHINE OPERATION

General Information

The CHAMP ZS 29 is very maneuverable and is designed to clean as you drive the machine. Follow these steps to prepare the machine for daily operation.

Always sweep or dust mop the floor of debris before scrubbing. 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 amount of turns as possible. Remove as many obstacles as possible from the area to be cleaned. Place "Wet Floor" warning signs in area being cleaned. Consult your local NSS distributor for more complete procedures and chemical advice.

DAILY USE

To Prepare the Solution Tank:

- **Never** use water over 140° F (60° C).
- Pour all liquids through the mesh filter at the left side of the solution tank.
- Fill with clean water, up to 29 gallons.
- Add the cleaning chemicals to the solution tank.

To Prepare the Recovery Tank:

- **Always** use a defoamer to protect the vacuum motor of this machine, we recommend that you add at least 4 to 6 ounces of defoamer chemical. Vacuum the defoamer into the recovery tank through the vac hose.
- Make sure that the drain plug of the recovery tank hose is closed tightly.

To Install a Pad Driver and Pad:

- Pull pin and open skirt.
- There are a wide range of pads or brushes available for the many cleaning applications of this machine. See the "Accessories" page in the Parts List manual.
- Turn the pad driver upside down on the floor and remove the pad holding cup.
- Remove the center cutout of the 15" pad and place the 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.
- Raise the brush motor into the transport position (center position of switch).
- Align the lugs of the pad driver with notches of the drive casting.
- Turn the pad driver to lock onto the drive casting.
- Close the locking latch.
- Close the skirt.

To Install a Brush:

- Pull pin and open skirt.
- Raise the brush motor into the transport position.
- Align the lugs of the brush with the notches of the drive casting.
- Turn the brush to lock onto the drive casting.
- Close the locking latch.
- Close the skirt.

NOTE: Remove squeegee, brushes or pad drivers, and side skirts if transporting to different places or loading / unloading into a truck or trailer.

SQUEEGEE ASSEMBLY

To Install the Squeegee Assembly:

- Loosen the two mounting knobs and slide the squeegee assembly onto the mounting plate.
- Hand tighten the mounting knobs. Do **not** use pliers to tighten the knobs as this will defeat the “breakaway” design.
- As the machine is used, the squeegee blades wear out, and need to be replaced due to damage.
- Squeegee blades should lay over (like a window squeegee) whenever the machine is moving forward.
- Do not add any weights or other pressure to the squeegee mechanism, it will not improve the performance or service life.
- The squeegee rises automatically when the machine is in reverse.
- Squeegee springs add pressure to floor. There are 3 adjustments available by moving the end at the frame from hole to hole. Always move both sides the same.

MACHINE MAINTENANCE

Daily Maintenance

- Recharge the batteries when indicated by the Battery Discharge Indicator.
- Empty and rinse clean the recovery tank.
- Remove and rinse clean the squeegee assembly.
- Remove and rinse clean the pad driver and / or brush.
- Inspect the machine components for wear or damage. Call authorized service center for repairs.
- Wipe machine down, **NEVER** spray this machine with water or any liquids.

Weekly Maintenance

- Verify that all daily maintenance has been performed.
- Inspect the battery liquid level, adjust to the proper level as needed, using only water.
NOTE: If optional autofill system is installed, follow the directions that come with this system.
- Check all battery terminal and cable connections. Tighten as deemed necessary.
- Clean any corrosion from the battery terminals and cables.
- Check the solution flow to the pad driver and/or brush. Flush clean the solution tank and hose with a mixture of 8 oz. (250ml.) of white vinegar to 1 gallon (4 liter) of warm water.
- Inspect filters.

Monthly Maintenance

- Verify that all daily and weekly maintenance has been performed.
- Clean filters by rinsing with cool, clear water. Dry Completely.

After every 750 Hours of Operation:

- Inspect the drive motor carbon brushes for wear.
Replace the brushes when they are 3/8 in. (9mm.) in length.
- Inspect the brush drive motor carbon brushes for wear.
Replace the brushes when they are 1/2 in. (13mm.) in length.
- Inspect the vacuum motor carbon brushes for wear.
Replace the brushes when they are 7/16 in. (11mm.) in length.

NSS X-IQ ELECTRONIC CONTROL DIAGNOSTIC CODES

CODE #	Description of Code	Possible Cause/Solution
070X	Switch Reference Codes.	Check for incorrectly wired input switches.
081X	Throttle codes.	Check for incorrectly wired or faulty potentiometer.
OAO1	Power down error.	Power down error.
131O	Supply over current.	Check Motors and Batteries for Excessive Current.
160O	High battery voltage.	Check for Proper Battery Voltage and Installation.
180X	Watchdog Tripped.	Internal control fault-reset controller/consult factory.
1DO2	Throttle Specification Modified.	Happens when throttle program is changed.
1EO3	Inhibit Active.	Inhibit Active/Reset Controller.
2COX	Low Battery Voltage.	Check Batteries/Charge as necessary.
2FO1	Throttle Input Displaced.	Check for incorrectly wired or faulty potentiometer.
310X	Low Bridge Fault.	May indicate problem with motor connections.
750X	LCD Module Communications Out.	Check Wiring From Controller to LCD Module.
760O	Brush Motor Disconnected.	Check Brush Motor Wiring for Proper Connections.
76O1	Brush Motor Running at Current Limit.	Check Brush Motor for Obstructions / Reset Controller.
76O2	Brush Motor Current Overload.	Check Brush Motor for Obstructions / Reset Controller.
76O3	Possible Short Circuit on Brush Output.	Check Brush Motor Wiring for Frayed or Faulty Condition.
77O0	Vacuum Motor Disconnected.	Check Vacuum Motor Wiring for Proper Connections.
77O1	Vacuum Motor at Current Limit.	Check Vacuum Motor for Obstructions.
77O2	Vacuum Current Overload.	Check Vacuum Motor for Obstructions.
77O3	Possible Short Circuit on Vacuum Output.	Check Vacuum Motor Wiring for Frayed or Faulty Condition.
78O0	Drive Motor Disconnected.	Check Drive Motor Wiring for Proper Connections.
78O1	Drive Motor Overcurrent Error.	Check Drive Motor / Brake System for Damage.
78O2	Drive Current Overload.	Check Drive Motor / Brake System for Damage.
790X	Emergency Stop.	Check "STOP" switch and wires.

The **X** after the first 3 numbers will appear as a number. If a code appears, make a note of the code #. Turn machine off, wait 10 seconds. Turn machine on, controller will automatically reset. If code appears again, call your authorized service center reference the code # for service / repair.

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
No Solution Flow.	The solution valve is closed. Water solenoid valve not open. Obstruction in the solution hose. Solution valve or cable damaged. Solution tank is empty. Solution valve is dirty. Damaged seat and washer in valve.	Open the solution valve. Charge the battery. Remove the obstruction. Repair / replace the valve cable. Fill the tank. Clean the solution valve. Replace valve.
Will Not Pick Up Any Water From The Floor.	Squeegee is up. Vac motor switch is "off". Recovery tank is full. Vacuum shut-off float is stuck. Hole in squeegee hose. Vac motor is not running. Drain plug not in tight. Port-hole cover is missing. Squeegee blade is worn / damaged. Obstruction / damage in the squeegee, squeegee hose or standpipe.	Lower squeegee. Turn vac motor switch "on". Empty tank. Remove obstruction. Replace hose. Have an authorized serviceman repair. Tighten drain plug. Replace port-hole cover. Reverse / replace squeegee blade. Remove obstruction / repair damage.
Batteries Do Not Seem To Run Long Enough.	Tops of batteries are dirty / wet. Battery terminals are dirty / damaged. Electrolyte level is too low. Batteries are not fully charged. Charger is damaged. Battery is defective. Wrong size battery. Batteries have memory — recharging prematurely will result in a loss of battery capacity. Battery tray full.	Clean / dry, charge batteries. Clean terminals and connectors, replace damaged cables. Add water and charge. Charge batteries for 8 hours. Have an authorized serviceman repair. Check cell voltage while discharging. Replace with larger batteries. Don't recharge batteries until "Battery Recharger" indicator is displayed.
Cleaning Is Not Even.	Brush / pads are worn. Damage to brush assembly or solution valve. Motor is not running. Not enough or uneven water.	Replace. Have an authorized serviceman repair. Check circuit breakers. reset if necessary, replace carbon brushes, repair wiring, replace switch. Check solution hose for blockage.
Machine Does Not Run.	Check circuit breaker. Code on control panel.	Reset circuit breaker. Check battery connections. Contact authorized repair service center.

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



NSS® Enterprises, Inc.

3115 Frenchmens Road, Toledo, Ohio 43607
 PHONE (419) 531-2121 FAX (419) 531-3761

NSS® Enterprises, Inc. European Distribution Centre
 Unit II, Pinfold Trading Estate * 55 Nottingham Road
 STAPLEFORD, NOTTINGHAM NG9 8AD ENGLAND U.K.
 PHONE: (44) 0115 939 1568 * FAX: (44) 0115 949 0615