

OPERATION MANUAL  
**WRANGLER 2016 E**

**IMPORTANT SAFETY INSTRUCTIONS**



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



**WARNING:** Shock or electrocution hazard. **ALWAYS** unplug machine before performing any maintenance or service.



**WARNING:** Shock or electrocution hazard. **NEVER** connect this machine to an electrical outlet that is not properly grounded.



**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.

**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** leave the machine plugged in to the electrical outlet when not in use.
- **NEVER** unplug the machine from an electrical outlet until after the machine is turned off.
- **NEVER** operate this machine if the cord and/or plug has been damaged, broken, cut, abraded or taped.
- **NEVER** handle the machine, cord or plug with wet hands.
- **ALWAYS** replace the entire cord when the cord or plug is damaged in any way.
- **NEVER** pull machine by the cord.
- **NEVER** operate this machine with any air opening blocked. Keep all air openings free of dust, lint, hair, etc.
- **NEVER** drop or insert any object into any machine opening.

- **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 to get wet.
- **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 be extremely slippery.
- **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** unplug the machine when attaching pads or brushes.
- **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**





## MACHINE INSPECTION

- Carefully unpack the Wrangler 2016 and recycle all packing materials.
- Inspect machine for damaged 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 and has a capacity of 16 gal (60.5 l).
- The tank is filled by pouring the water and cleaning chemicals through the opening and filter at the front of the tank.
- The amount of water in the tank is measured in the plastic tube at the right rear of the tank.
- The solution tank is emptied through the clear plastic tube at the right rear of the tank.

### Recovery Tank

- The recovery tank is the upper part of the machine body and has a capacity of 17 gal (64.3 l).
- The recovery tank is closed by a round, clearview lid assembly.
- The recovery tank has a foam sensitive float shut-off assembly. As the water level rises, the float ball will rise into the tube and shut of the air flow of the vacuum.
- The float shut-off assembly does **not** shut off the vacuum motor.
- The recovery tank is emptied through a large rubber hose at the front of the machine. Remove the plug and drain the liquids according to your local EPA regulations.

### Operator Control Panel

- The operator control panel is located at the upper rear area of the machine. This panel has components that control various machine functions.
- The toggle switch on the left controls the brush motor.
- The toggle switch on the right controls the vacuum motor.

### Circuit Breaker

- The circuit breakers are located to the left of the handle grips.
- The right circuit breaker is for the vacuum motor.
- The left circuit breaker is for the brush motor.

### Solution Control (Valve) Lever

- The solution control lever is located in middle rear of the machine. This lever controls the solution valve and the amounts of liquid put on the floor when cleaning.
- Pull **up** on the handle to **open** the valve, push **down** on the handle to **close** the valve.
- Solution is controlled by the solenoid valve and will not flow until the brush is in operation.

### Solution Filter Assembly

- Attached to the bottom of the tank is a filter assembly designed to stop debris from entering the solution valve.
- If the solution stops flowing to the brush, empty the tank and open the filter fitting (by hand), remove and clean the screen.

### Brush Gear Motor

- The brush motor is located on the front of the machine. The motor is attached to a gearbox to turn the pad driver or brush.
- The right lift arm is used to raise or lower the brush motor to and from transport, float, or heavy scrub positions.
- 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.

### Vacuum Motor

- The vacuum motor is mounted to the underside of the recovery (top) tank.
- This motor has carbon brushes that must be serviced on a regular basis. The carbon brushes have an expected life of 700 operating hours.

### Squeegee Assembly

- The squeegee assembly may use a dual (2) urethane blade system to recover liquids from the floor. Also available is a curved assembly with a gum rubber rear blade and neoprene front blade.
- 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.
- The squeegee assembly mounts to a metal bracket at the rear center of the machine.
- Raise and lower the squeegee assembly with the handle at the center rear of the machine.

# MACHINE OPERATION

## General Information

The Wrangler 2016 is very maneuverable and is designed to clean as you drive the machine from behind.

- Always sweep the floor before scrubbing. You may also need to preclean some spills or stains before scrubbing. Consult your local NSS Authorized Distributor for procedures and more complete chemical advice.
- Always wear clean “tennis shoes” or “non-slip” shoes when working with an automatic scrubber. Leather soled shoes of any type will be extremely slippery when wet.
- Make sure you wipe your shoes dry before walking onto other areas of bare floor or carpet. Some floor cleaning chemicals may cause great damage to carpet or other floor surfaces.

## Daily Use

Follow these steps to prepare the machine for daily operation.

### Prepare the solution tank:

- Never use water over 140F (60C) degrees. Excessively hot water **may** damage components such as the tanks.
- Pour all liquids through the mesh filter at the front of the solution tank.
- Put 1 to 2 gallons of clean water into the solution tank first to help dilute the chemicals and prevent excess sudsing.
- Consult your local distributor for complete chemical advice. Dilute the cleaning chemicals according to the manufacturer’s instructions.
- Add the cleaning chemicals to the solution tank and fill with water as needed.

### Prepare the recovery tank:

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

### To install a brush or pad driver and pad:

- There are a wide range of pads or brushes available for the many cleaning applications of this machine. Consult your local NSS distributor for application recommendations.
- Turn the pad drivers upside down on the floor and remove the pad holding cup.
- Remove the center cutout of the pad. 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.
- Align the notches on the pad driver or brush with the lugs on the drive casting and rotate to lock or unlock.

### To install the squeegee assembly:

- Place the squeegee lift handle in the storage position.
- Loosen the two mounting knobs and slide the squeegee assembly onto the mounting plate. The roller wheels must face the operator.
- Hand tighten the mounting knobs. Do not use pliers to tighten knobs as this will defeat the “breakaway” design.

### To adjust 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.

- Turn the vacuum motor ON and open the water valve slightly.
- Squeegee blades should lay over slightly (like a window squeegee) when the machine is moving forward or reverse.
- Adjust the blade angle by turning the wing nut (or knob) on the pivot arm clockwise or counterclockwise.
- Do not add any weights or other pressure to the squeegee mechanism, it will not improve the performance and will shorten service life.

## Operating the Machine

### Cleaning path

- The Wrangler 2016 has the brush motor offset to the right side of the machine. This offset allows you to clean the edge of a floor or an obstructed area (walls or shelving) with the right side of the machine.
- 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.
- Overlap each cleaning path about 2 in. (5 cm) to prevent streaking and dirty areas.

### **Normal Cleaning**

- Fill solution tank as directed.
- Put defoamer chemical in recovery tank.
- Install pad driver/pad or brush.
- Move machine to area to be cleaned.
- Sweep and dust mop the area to be cleaned.
- Place "Wet Floor" warning signs in area.
- Turn on brush and vacuum motor switches.
- Place brush motor and squeegee assembly in operating position on the floor.
- Lift solution valve handle to start liquid flow to floor. Adjust amount of flow as needed.
- Close the solution valve completely 10 ft (3 m) before you turn at the end of your cleaning path. This will reduce the amount of liquid on the floor when you make your turn. Open the solution valve when starting the next pass. Repeat this procedure for each pass.
- Watch the level of liquid in the recovery tank and listen for the float shut-off to change the sound of the vac motor. The air flow will stop and you must empty the recovery tank.
- Take the machine to an approved disposal drain and turn off all switches.
- Pull the flexible rubber drain hose out from behind the brush motor. Raise the end of the hose above the level of the recovery tank, loosen and remove the hose drain plug. Carefully direct the drain hose into the drain.
- When tank is empty, replace and tighten the drain plug. Place the drain hose back behind the brush motor. Do not obstruct the lift mechanism or brush motor.
- Resume cleaning operation. Refill solution tank and empty recovery tank as needed.
- When cleaning is complete, return machine to storage area to perform daily maintenance.

### **Special Cleaning**

- Double scrubbing - This procedure provides deeper cleaning on heavily soiled floors. One or more cleaning passes are made before picking up the chemicals with the squeegee. Best results are achieved by placing the brush motor in the heavy scrub position.
- Stripping - This procedure is used to remove moderate build-up of floor finish from the floor. The most aggressive pads or brushes are used in this procedure. The stripper solution is applied to the floor with a mop and bucket and then double scrubbed as described above. Stripper should not be put into the solution tank. Clean water from the solution tank is applied to the floor to keep the chemicals and finish in a "liquid" condition.
- The floor will become extremely slippery in these operations. The Wrangler should be operated slowly and great care should be taken when walking on this surface.

# 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.**

## Daily Maintenance

### Solution and Recovery Tanks

- Empty all liquids from both solution and recovery tank.
- Rinse both tanks with clean water to prevent chemical residue build-up. Empty both tanks.
- Leave recovery tank clear lid open to allow tank to air dry and prevent odors.

### Pad driver or brush

- Remove pad driver or brush from machine.
- Rinse with clean water to prevent chemical build-up. Allow to air dry on shelf or rack.
- Inspect for wear or damage. Repair or replace as needed.

## Weekly Maintenance

- Verify all daily maintenance has been performed.
- Inspect battery liquid level, adjust to proper level as needed.
- Inspect and clean float screen and small vac filter above float.
- Check solution flow to pad driver/brush head. Inspect and clean solution filter assembly.
- Flush solution tank and hoses with a mixture of 8 oz/250 ml white vinegar to 1 gal/4 l water.
- Repair or replace any worn or damaged components as needed.

## Monthly Maintenance

- Verify all daily and weekly maintenance has been performed.
- Grease the caster axle and swivel bearing. Use only water resistant lithium-based grease.
- Inspect all mechanical linkages, pivot points and ball joints for freedom of movement. Use a penetrating spray lubricant that is water resistant. Do **not** use WD-40 lubricant.
- Inspect all fasteners (bolts, screws, nuts) at mechanical linkages, pivot points and ball joints for tightness. Tighten as needed.

## Mandatory Periodic Maintenance

It is important for you to maintain a record of the amount of machine operating hours in order to perform this machine maintenance. It is mandatory that the following maintenance procedure be performed at the described interval. This procedure should be performed by an NSS service center. Failure to perform this procedure may result in poor machine performance, machine component damage and failure.

- After every 450-500 hours of operation: inspect vac motor carbon brushes for wear
- After every 650-700 hours of operation: inspect drive motor (transaxle) carbon brushes for wear. Inspect brush drive motor carbon brushes for wear.
- Replace the drive motor (transaxle) carbon brushes when they are 3/8 in. (9 mm) in length.
- Replace the brush motor carbon brushes when they are 1/2 in. (13 mm) in length.
- Replace the vacuum motor carbon brushes when they are 7/16 in. (11 mm) in length.

### Authorized Repair Service

Repair service for this machine must be performed by an NSS authorized service center. Repairs not performed by an unauthorized company will void the machine warranty. If you require assistance finding an authorized service center, contact NSS Enterprises.

## TROUBLE-SHOOTING

<u>PROBLEM</u>	<u>CAUSE</u>	<u>SOLUTION</u>
No solution flow.	Clogged filter. The solution valve is closed. Obstruction in the solution hose. Solution valve or linkage damaged. Solution hose kinked. Solution tank is empty.	Clean filter. Open the solution valve. Remove the obstruction. Repair/replace the valve linkage. Check for kinks at valve. Fill the tank.
Solution flow does not stop.	The solution valve is open. Solution valve or linkage damage. 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 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. 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.
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.	Reset circuit breaker.

**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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