

# **Powr-Flite**<sup>®</sup>

## **OPERATOR'S MANUAL**

### **Crossover Automatic Scrubber Model PAS26R**



**WARNING: OPERATOR MUST READ AND UNDERSTAND THIS MANUAL COMPLETELY BEFORE OPERATING THIS EQUIPMENT.**

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**Save These Instructions**

PAS26R 03/2020

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## 1. PRESENTATION

Dear Customer,

Powr-Flite would like to thank you for choosing to purchase this new ride-on automatic scrubber which thanks, to its features - described in this manual -, we are confident will satisfy your needs.

This machine has been entirely designed and constructed with top-quality materials and devoting a special effort to reducing the risk of accidents as much as possible.

We have prepared this manual in order to provide you with adequate instructions on the correct use and maintenance, which are essential for the operator's safety.

Please carefully read this manual in its entirety, strictly comply with the instructions it contains and above all - for safety reasons - do not perform any type of procedure that is not specifically mentioned herein.

## SYMBOLS

The following symbols are used in the guide for the purposes outlined by the following descriptions:

### WARNING

Hazardous or unsafe procedures that might cause severe personal injury or even be fatal.

### CAUTION

Hazardous or unsafe procedures that might cause non-severe personal injury or damage to the machine or surrounding objects.

### FOR SAFETY

Used to identify actions to be undertaken for safe machine operation.



Before using the device for the first time, read these original instructions, follow them and store them for future use or in case of resale of the device.

## 2. MACHINE DESCRIPTION

This battery powered, automatic scrubber is driven by an operator seated on board, to wash and dry hard floors and is intended for commercial use.

The main components of the machine are as follows:

- The detergent solution tank and relevant system
- The brush deck
- The dirty water recovery tank and relevant system
- The electrical system and relevant control panel, the steering and speed device.

The function of the detergent solution tank is to store water (with dilution of any detergent); supplying it to the washing system. The relevant system includes the tank, filter, proportional valve to adjust flow rate and controls.

The tank contains the detergent solution (water and detergent) and supplies it to the washing system when required. The filter protects the solenoid valve from debris in the water. The proportional solenoid valve controls detergent solution supply to the washing system. The valve automatically prevents the flow of the detergent solution. The control selector of the solution flow - by controlling opening duration and section of the solenoid valve - regulates the amount of detergent solution conveyed to the washing system.

The brush deck includes: two counter-rotating brushes, the electric motor, the actuator to lift the entire brush unit, the manual cam for lifting the squeegee assembly only and the controls. The brushes wash the floor while the motor and the pair of gears, solidly attached to the brushes, actuate their motion. The side band, in bristles, lets the detergent solution remain in the brushes' working area. The squeegee assembly is the water collecting device. The water flow is regulated by a proportional solenoid valve.

The function of the squeegee assembly is to suck the dirty water and convey it to the recovery tank.

The recovery system includes: the squeegee, the vacuum motor, the filter, the recovery tank and the controls. The squeegee collects the dirty solution from the floor as the machine moves forward. The vacuum motor assures the necessary vacuum to suck the dirty solution from the floor and convey it to the recovery tank. The filter protects the vacuum motor from the debris and foam. The recovery tank stores the dirty solution.

The maximum recovery water level is controlled by a level sensor connected to the control unit and acting on the suction motor; therefore, the turbine will stop sucking water as it reaches the max level in the collection tank.

The function of the control devices and steering wheel (steering and speed devices) is to control the direction and speed of the machine. The steering control system includes: the speed pedal, the steering wheel, the brake pedal. The speed pedal is unidirectional. Depending on the setting of the running direction via the suitable panel selector, the machine moves forwards or backwards. With the steering wheel the operator steers the driving wheel in the desired direction.

The automatic scrubber equipped with a brake that will stop the machine while moving both forward and backward. Furthermore, this brake also acts as parking brake, stopping the rotation of the wheels of the rear axle, each time the machine is turned off or left by the operator.



Large space for operator



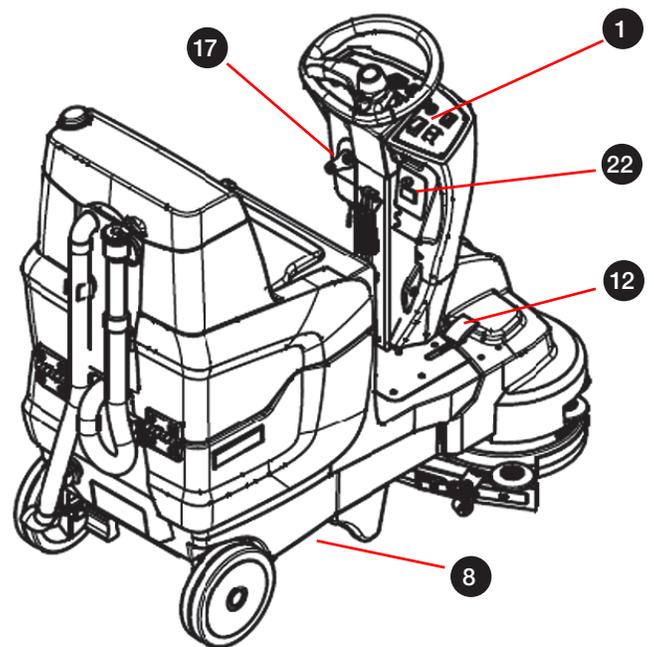
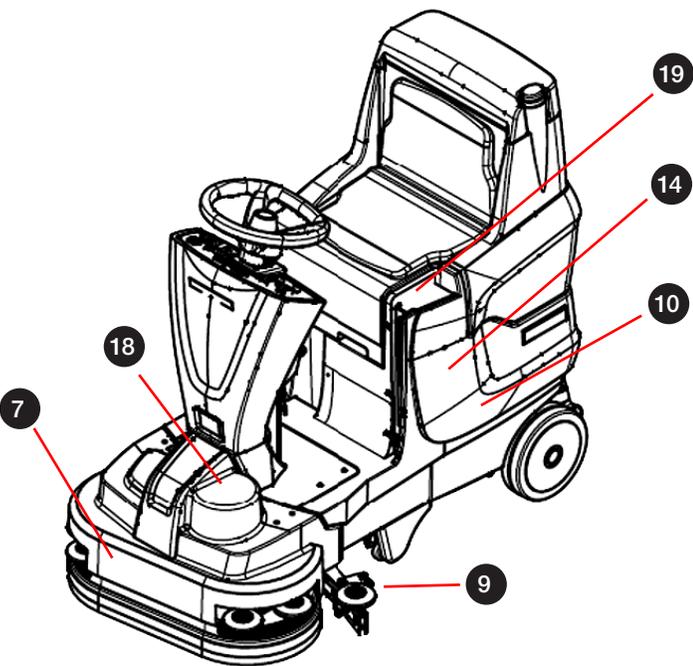
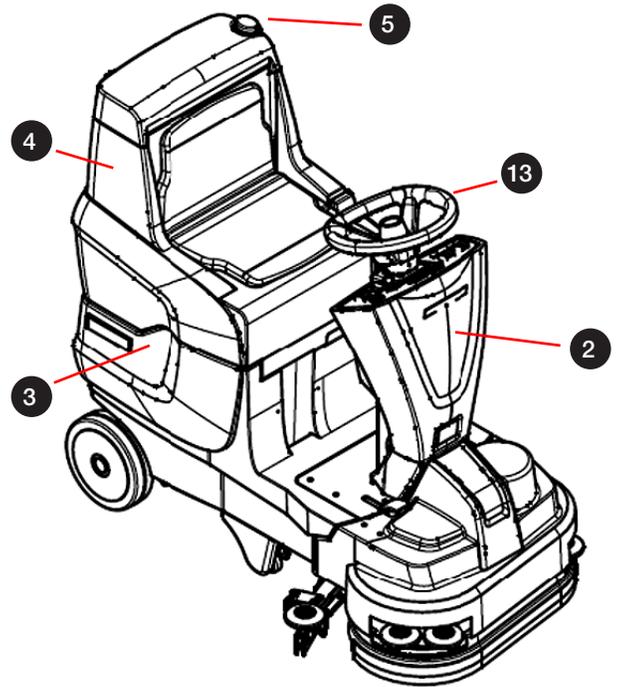
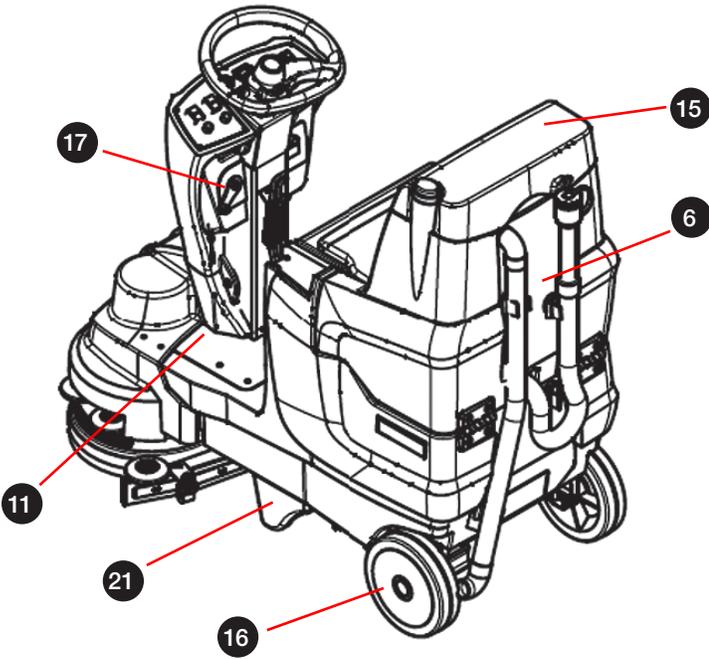
Squeegee



Brake pedal

### 3. TECHNICAL FEATURES

#### 3.1 Unit functions

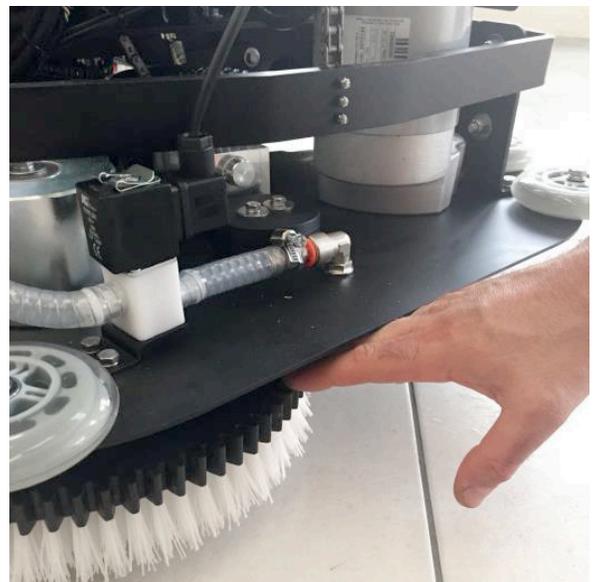


### 3.2 Unit functions

1. Control panel
2. Front nose
3. Solution tank
4. Recovery tank
5. Flashing lamp
6. Recovery tank discharge flexible hose
7. Brush head
8. Solution discharge flexible hose
9. Squeegee assembly
10. Vacuum motor
11. Brake pedal
12. Speed adjustment pedal
13. Steering wheel
14. Battery compartment
15. Recovery tank lid
16. Motor/drive with electric brake
17. Squeegee lifting manual lever
18. Brush rotation motor
19. Water-loading spout
20. Speed stabilizer during operation (not enabled during transfer)
21. Anti-tip device
22. Resettable thermal cut-off switches



Resettable thermal cut-off switches



Brush plate

### 3.2 Specifications

Features		Technical Data
<b>Washing Function</b>		
Washed lane width		26"
Solution tank		18 gal.
Brushes motor		0.04 hp
Brush rotation speed		200 RPM
Weight on brushes		0-101 lbs.
Pressure on brushes		0.43 psi
Brushes		2 x 13"
<b>Recovery Function</b>		
Recovery tank		21 gal.
Silenced vacuum motor	3 stages	0.7 hp
Suction vacuum		64" of lift
<b>Power drive</b>		
Type of drive		rear-wheel with differential
Max climbing ability		16% (Ramp) - 7% (scrubbing)
<b>Power supply</b>		
Power supply		24 V
Number of Batteries		2
Recommended batteries (optional)		105 Ah – 140 Ah
Battery compartment size (lxwxh)		14.7" x 14.7" x 12.4"
<b>Overall power and operative life</b>		
Range		up to 4 hrs.
<b>Dimensions / Weights and Noise level</b>		
Machine dimensions	Inclined Squeegee	58" x 26" x 48"
Machine packaging dimensions	Inclined Squeegee	61" x 31" x 54"
Unladen weight (without batteries)/ with package		352 lbs.
Unladen weight/with package		540 lbs.
Noise level		66.3 dB(A)

## 4. SAFETY FEATURES

### WARNING

To reduce the risk of fire, electrical shocks or personal injury, comply with the following instructions

- Only use the machine indoors. Do not use the machine outdoors and do not expose it to rain.
- Only use the machine complying with the instructions described in this manual.
- Only use the components and accessories recommended by the manufacturer.
- If the machine does not work correctly, or it has been dropped, has been damaged, has been left outside or has fallen in water, bring it to an authorized service center.
- Do not use the machine if one of the openings is obstructed. Keep the openings clear from debris, which might reduce the air flow.
- The machine has not been designed to collect hazardous powders.
- If it is operated near flammable vapors or materials, the machine may cause fires.
- Do not operate the machine near flammable liquids, powders or vapors.
- The machine is designed for commercial use.
- The use of the machine must be entrusted only to personnel trained and informed on correct use.
- Maintenance and repair operations must be performed only by qualified personnel.
- Should any foam or liquids escape the machine, turn it off immediately.
- Before performing cleaning or maintenance operations, disconnect the battery.
- Before handing the machine to a waste collection center, the battery must be removed and correctly disposed of.
- Ensure all warning labels are legible and correctly applied to the machine.
- During operation, pay the utmost attention to other people, especially children.
- Before using the machine, ensure all covers and doors are in the specified positions per the instructions.
- When the machine is left unattended, disable or lock the power supply switch to prevent unauthorized use.
- The machine is designed to be used with the brushes specified by the manufacturer. The use of other types of brushes may affect the machine's safety.

### WARNING

- Lead batteries emit hydrogen. These emissions give rise to fire or explosion hazard.
- Do not use the machine near sparks or naked flames.
- Keep the solution tank lifted during recharge.
- Keep the batteries away from sparks or naked flames.
- Do not smoke near the batteries.

## WARNING

- Disconnect the batteries before performing any kind of procedure on the machine.
- Every procedure on the machine must be performed by skilled personnel only. Always wear protective clothing and glasses when operating on or near the batteries.
- Avoid skin contact with the acid contained in the batteries.

## WARNING

- Never place any metal objects on the top part of the batteries.
- Never wash the floor scrubber dryer with pressure washers or electrical parts with water.

## FOR SAFETY

- Immediately report any machine damage or malfunctioning.
- Do not use the machine unless it is in perfect operating condition.
- Identify all the machine's safety devices.
- Assure adequate training of the personnel in charge of operating the machine.
- **DO NOT OPERATE THE MACHINE IN THE FOLLOWING CASES:**
  - You have not been trained and authorized.
  - The operating Guide has not been read.
  - You are in an area under risk of fire or explosions.
  - You are in an area where there is a falling objects hazard.
- **DURING MAINTENANCE OPERATIONS:**
  - Avoid moving parts. Do not wear wide clothing, such as jackets, shirts in general, necklaces or hanging objects or clothes with wide sleeves when using the machine.
- Use approved spare parts.

### 4.1. Safety devices of fixed closing guards

The components protecting some areas that contain moving parts or live equipment are considered fixed closing guards.

The brush plate is fitted with a fixed closing guard, consisting in the plastic material protection casing.

The steering column contains moving parts (levers for lifting the brush plate) and live equipment (electrical panel, motors wiring). This column is protected by a plastic material nose, which entirely encloses the head; assembled with screws.

## WARNING

Do not remove the fixed closing guards. In the event of maintenance, ensure the same are reassembled before turning on the machine and starting to work.

### 4.2. Safety devices relevant to mobile guards

There are no mobile guards on the machine.

The battery compartment is housed under the upper dirty water recovery tank. In order to access it the tank, which is hinged at the top, it must be tilted over.

## 5. TECHNICAL SPECIFICATIONS LABEL POSITION

The technical specifications label, which includes your unit's serial number, is attached to the steering upright and should not be removed for any reason.



## 6. MACHINE TRANSPORT AND LIFTING

Lift the brush plate before proceeding with transport. Place the machine on a pallet, taking care to lock the wheels to prevent the machine from moving.

Transport and any lifting must be done with the machine on a pallet. It is recommended to empty the solution recovery tanks.

If the automatic scrubber is loaded on a vehicle via a ramp, or in any situation where it is required to drive it on a steep ramp, it is recommended to lift the brush plate and take down the splash-guards and brushes.

## 7. INTENDED USE OF THE MACHINE (washing and drying phase)

This automatic scrubber is a Scrubber-Dryer machine, driven by an operator seated on board, to wash and dry hard floors and is battery powered; intended for commercial use.

The machinery applies a detergent solution to the hard floor, a solution that is collected in the solution tank and is conveyed through suitable piping to the brush plate. With solenoid valve adjustable flow, it scrubs the floor by the combined action of two counter-rotating brushes and then draws the dirty water into the recovery tank.

It is also possible to spray the floor with water, actuating the brushes only for scrubbing and cleaning, without drying.

## 8. INTENDED USE OF THE MACHINE (machine being moved without washing or drying)

The automatic scrubber can be handled without the brush plate lowered and the brushes being in contact with the floor, or with the vacuum motor turned off. This can happen during transfer from one room to another, at the end of the cleaning or for other reasons. It is required to set the appropriate controls to raise the brush plate and drive the machine with brake and accelerator. At this stage; the **maximum speed adjustment system is not activated**, but the speed is controlled solely by the accelerator pedal. When moving the machine when the operator is not on board or needing to push or pull the washer-dryer, with traction motor turned off, turn the red lever on the axle of the rear gear reducer by pulling it towards the rear of the machine.

Thus, the gears of the motor reducers are at idle and the machine can be moved easily. Remember to rotate the red lever toward the front of the machine if you want to activate the motor-reducer the drive system of the machine.

## 9. INCORRECT USE OF THE MACHINE

### WARNING

The machine is not intended for outdoors use.

Do not wash and extract corrosive, flammable, explosive liquids, even if diluted.

Do not use the machine in environments with explosion hazard or where there are flammable and explosive gases, vapors, liquids and powders.

### WARNING

Do not wash the floors with water hotter than 50°C/122°F.

Do not use diesel fuel/benzene or corrosive detergents for washing floors.

## 10. SUPPLIED KIT

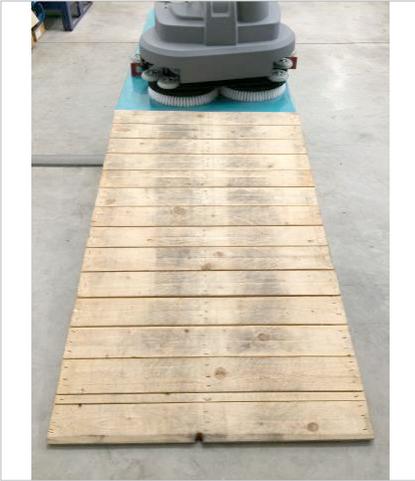
In addition to this instruction manual, the machine is supplied with a kit containing: 1 clean-water tank filling hose

## 11. INSTALLATION

### 11.1 Preliminary operations

The machine is shipped on a pallet.

Unload the machine from the pallet. It is recommended not to push the machine from the pallet without the use of a ramp. It is recommended to remove the batteries (if installed) and unload it by hand; 4 people required (approx. 66 lbs).



Before use, perform the following operations:

1. Perform a preliminary inspection to identify any problems that might cause malfunctioning or breakdowns. Visually ensure there is no external damage, leaks and the wheels are not damaged.
2. Ensure the squeegeewiper is correctly adjusted.
3. Check that the drain hose, the cap and the hose from the wiper are installed properly, taking care to insert the hose into a sharp bend with a suitable curve as shown in figure above.
4. Check battery conditions and if necessary recharge.
5. Ensure the brakes and steering wheel operate correctly.

Should any damage, fault or missing parts be detected, do not commission the machine and contact your Dealer or Powr-Flite.

## 12. MACHINE PREPARATION AND COMMISSIONING

### 12.1. MACHINE START UP

**NOTE:** Before operating the machine, perform preliminary inspection.

#### FOR SAFETY

Before starting the machine, ensure all safety devices work correctly.

1. The operator must be on the drive seat and keep his left foot on the brake pedal. To avoid any unintentional movement, the accelerator pedal must not be pressed.

**NOTE:** To move the machine in the desired direction, the operator must be seated in the driving seat because a safety device that detects the seated operator is installed under the seat.

2. Turn the ignition key clockwise into the “ON” position.
3. Check the Set Travel direction, and select it on the Forward or Backward selector.
4. With the operator seated and key “ON”, the parking brake is automatically released. Now, slightly press the accelerator pedal and move the vehicle into the filling area by turning the steering wheel.

## 12.2. MACHINE FILLING

### FOR SAFETY

Before leaving the machine unattended or performing any maintenance operation, ensure it is on a flat surface, turn off the machine and remove the key.

1. Lift the entire brush plate and turn the start key counter-clockwise to “OFF” to turn off the machine.
2. Rotate the solution tank cover.
3. Paying attention to the level shown in the small gauge pipe located on the side of the tank under the filling spout the solution tank may be filled to maximum filling capacity (20 gallons),

To avoid damaging the tank, the water temperature must not exceed 120°F (49°C).

Measure the amount of chemical in the solution tank after filling it with water. Before adding powder detergent into the tank of the solution, dissolve the powder detergent completely.



## 13. USE OF THE MACHINE

### 13.1. FLOOR WASHING AND DRYING

Plan the washing and drying route in advance. The longest route follows the perimeter of the area to be treated. The ideal route has the least turns, stops or brush plate lifting and lowering (to maneuver).

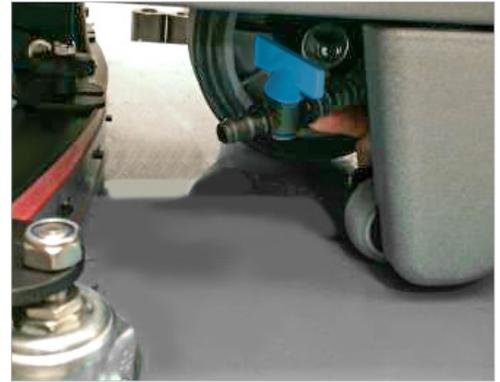
To obtain the best results, the area to be cleaned must be accurately swept prior to washing. Remove large debris, ropes and cables to prevent them from coming into contact with the brushes or wiper.

If the machine is left “ON” but not moving, with lowered working brushes, the flow of solution and the brush rotation stop. The machine is equipped with a solenoid valve mounted directly on the brush plate, so that when it is turned off, water feeding is stopped, eliminating unwanted dripping.

The machine is also equipped with a manual valve that stops the flow of water thus emptying the tank of the solution, if necessary operate under maintenance to manually close the water flow.



Water flow adjustment solenoid valve



Fresh water or solution tank manual drain valve

### 13.2. START OF SCRUBBING AND DRYING

When the machine is used around people, pay the utmost attention to unexpected movement. Pay extra attention when using around children.

1. The parking brake is always engaged automatically, with machine off, with selector “OFF” and no operator on the driving seat.
2. Ensure the accelerator pedal is not pressed and turn the ignition key “ON”; the parking brake is automatically released.
3. Select the desired travelling direction (forward or backward).
4. Operate the switch (progressive) to adjust the load of brushes on the ground; if necessary, possibly adjusting (+/- loaded) the position with respect to the floor.
5. Press the Brush Start switch on the control panel. The brush motor is ready to be started. The brushes will only start turning when the operator starts pressing the accelerator pedal.
6. Turn the knob on the panel to adjust solution water opening.
7. Press the Vacuum switch on to start the extraction system.
8. Adjust the machine speed with the speed control knob, located on the fuse panel.

NOTE: Brush rotation and solution flow are automatically interrupted when the operator decides to stop the machine and no longer presses on the accelerator pedal. Brush motion and flow automatically resume when the accelerator pedal is pressed again.

### 13.3. INTERRUPTION OF BRUSH MOTION AND WASHING

1. Press the switch that controls brush rotation on the control panel. The brush motor is de-activated.
2. Lifting one’s foot off the accelerator is also enough to stop brush rotation; the machine stops and the brushes stop.
3. Press the switch that controls complete brush plate lifting; it is lifted in parking position. After 5 seconds the extraction motor is stopped. This delay is to allow for complete emptying of the recovered solution, which is still present in the extraction pipe.
4. Brake until the machine stops.
5. Turn the ignition key “OFF” or get off the machine.
6. The parking brake is automatically engaged.

#### 13.4. DOUBLE SCRUBBING and SINGLE DRYING

Particularly dirty floors may not be sufficiently cleaned with one pass. In these cases, double scrubbing must be performed.

To perform double scrubbing, carry out a first pass with the wiper lifted by acting on the manual cam located on the side of the steering column; solution flow activated and brushes lowered. In this way, the solution is in contact with the floor while the brushes work to reduce the layer of dirt. Leave a reasonable amount of time so the solution is allowed to soak on the floor. The length of time elapsed between the first and second pass depends on the amount of dirt and type of chemical used.

A second pass with squeegee and brushes lowered and activated solution further reduces the layer of dirt. A further application of solution contributes to making a hard cleaning operation easier.

When double washing passes are performed, it is recommended to maintain a low driving speed due to the wet floor and to allow the detergent to chemically act on the dirt.



In the case of a double pass move the lever to “UP”.

#### 13.5. EMPTYING AND CLEANING THE RECOVERY TANK

1. Press the switch on the control panel to lift the brush plate, stop the motor and flow of solution and de-activate the vacuum motor.
2. Place the vehicle near a floor drain. The discharge pipe is at the rear of the machine.
3. Turn the ignition key to “OFF”, the parking brake is engaged.
4. Remove the drain hose from the hook. Unscrew the cap and lower the discharge pipe towards the floor drain.
5. Remove the upper tank cover.
6. Wash the recovery tank with clean water. Repeat washing until clean water comes out of the discharge pipe. Do not use water at a temperature higher than 120°F (49°C) as it might damage the tank.
7. Replace the cap and the discharge pipe.
8. If the machine must be left inactive for a long period of time, do not replace the recovery tank cover and the drain hose cap, this will allow air to circulate inside it.

### 13.6. EMPTYING AND CLEANING THE SOLUTION TANK

1. Place the vehicle near a floor drain. The discharge pipe is in the left front corner of the machine, under the tank.
2. Turn the ignition key to “OFF”, the parking brake is engaged.
3. Remove the clip from the small discharge pipe connected to the solution tank. The pipe is underneath the machine, on the left side. Lower the pipe toward the drain, turn on the valve.
4. Wash the tank with clean water and run clean water into the system, until reaching tank capacity (20 gal). Do not use water at a temperature higher than 120°F (49°C) to clean the tank as it might cause damage.

NOTE: Never leave the solution inside the tank as it might damage the tank, the seal gaskets and the solenoid valves.

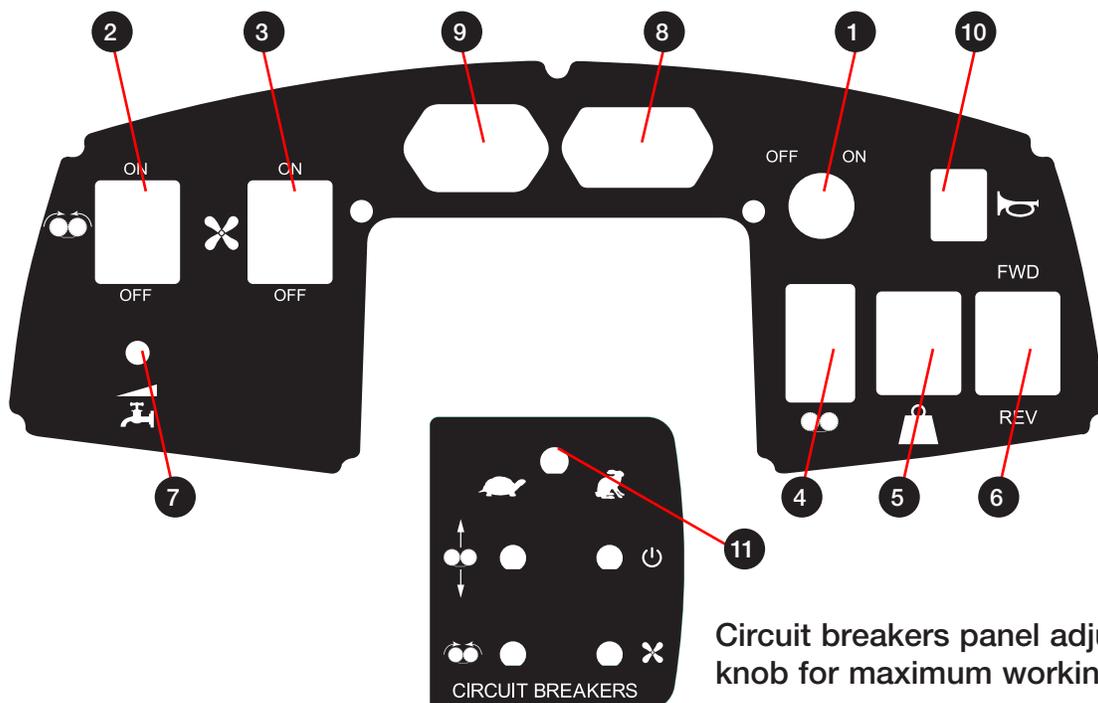
6. Replace the discharge pipe.



Dirty water drain hose

## 14. CONTROLS

### 14. CONTROL STATION



Circuit breakers panel adjustment knob for maximum working speed

### **14.3. DESCRIPTION OF CONTROLS**

#### **14.3.1 ON/OFF KEY SWITCH (1)**

It controls electrical power supply to the machine's functions. To switch on the machine, turn the key to the ON symbol. When it is switched on with the key, the machine's electrical system is energized, the flashing light on and the possibility to lift and lower the brush plate.

#### **14.3.2. BRUSH ROTATION ACTIVATION SWITCH (2)**

This switch controls brush rotation.

To start rotation, press the switch. The brush motor is powered and to start rotation, just press the accelerator pedal.

If the speed control pedal is at idle, the brushes and solution flow are stopped.

#### **14.3.3. VACUUM MOTOR SWITCH (3)**

This switch controls activation of the vacuum motor. To start suction, press the switch.

If the brush plate is lifted, or the machine stops, the solution flow is interrupted and the vacuum is automatically disabled with a 5 second delay. This delay is to allow the water recovered from the floor, contained in the vacuum hose, to be eliminated.

#### **14.3.4. BRUSH PLATE LIFTING SWITCH (4)**

The switch controls the ascent or the descent of the whole brushes plate, including the wiper, in a variety of different positions, thus offering the possibility to adjust the brush pressure on the floor according to the position chosen.

#### **14.3.5. BRUSH PRESSURE INDICATOR (5)**

The brush pressure indicator switch, described in the previous point, checks the brush pressure exerted on the floor. To decrease pressure, press the top of the switch. To increase pressure, press the bottom of the switch.

The indicator beside the switch indicates the pressure value of the brushes. Once the brushes plate is lowered on the floor, at the end stroke and while operating, this indicator will signal with a red color (more pressure) to green (less pressure); the force exerted on the floor by the brushes. It is recommended, depending on the state of dirt of the floor or on the floor type, to lift the brush plate until the machine is operated with green light on, to achieve a longer battery service life. In case of a very dirty floor, where it is necessary to have a high brush pressure, the machine should be operated with the indicator turned red.

The flashing red indicator means the maximum pressure allowed for brushes has been reached.

#### **14.3.6. TRAVEL DIRECTION SELECTOR (6)**

The selector lets you choose the travel direction. Setting it to FW (FORWARD), the machine moves FORWARD when the speed pedal is pressed. Setting it to BW (BACKWARD), motion will be in reverse as soon as the pedal is pressed. If the brush motor is de-activated or if the speed control pedal is in the idle position, the solution flow is automatically interrupted until the brush motor and machine motion are resumed. This function prevents unintentional discharging of the solution tank and allows the operator to adjust the solution flow without needing to adjust it each time.

### 14.3.7. WATER-DETERGENT SOLUTION FLOW CONTROL KNOB (7)

To increase flow, turn the solution control knob clockwise.

To decrease flow, turn counter-clockwise.

If the brush motor is de-activated or if the speed control pedal is in the idle position, the solution flow is automatically interrupted until the brush motor and machine motion are resumed. This function prevents unintentional discharging of the solution tank and allows the operator to adjust the solution flow without needing to adjust it each time.

### 14.3.8. BATTERY CHARGE STATUS INDICATOR (8)

The LED display signals the battery charge status.

#### FOR SAFETY

Do not charge the batteries before using the machine for at least 60 minutes, in order to not damage charging cycles.

### 14.3.9. HOUR COUNTER (9)

The display indicates the machine's operation hours since control unit activation when the automatic scrubber was constructed. The hour counter activates at the start of brush rotation and de-activates when they stop. Therefore, machine movement hours are actually measured.

### 14.3.10. ACOUSTIC SIGNAL (10)

Horn or audible signal. Push button to activate.

### 14.3.11. SPEED CONTROL KNOB FOR MAXIMUM WORKING SPEED (11)

The knob controls the maximum forward speed of the machine. The speed can be changed by the operator by turning the rotating knob (12) counter-clockwise to decrease and clockwise to increase. The speed is the same; adjustable through the accelerator pedal itself.

## 14.4. CONTROLS

### 14.4.1. SPEED CONTROL PEDAL

It is located to the right of the steering column. It controls the machine's speed. The motion speed is increased by lightly pressing the pedal.

The motion direction (forward gear or reverse) is controlled by the panel selector.

The maximum speed is still settable, only during operation and when the brushes are working, through the knob on the control panel, next to the steering column.



#### 14.4.2. CONTROL AND PARKING BRAKE

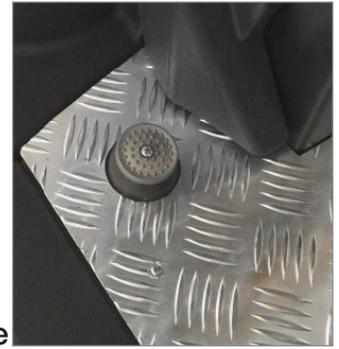
The machine is equipped with a parking and control brake, of the electric brake type, built into the motor axle.

The brake is always engaged every time the machine selector is OFF and the operator is not seated on the driving seat.

The brake is automatically disengaged with selector ON and operator seated (there is a safety micro-switch under the seat).

Operators can activate the brake to reduce the speed or stop the machine while in motion.

Engaging the parking brake is necessary in special conditions, such as on slightly sloping paths or the operator needs to temporarily stop the machine.



#### 14.4.3. SQUEEGEE LIFT LEVER

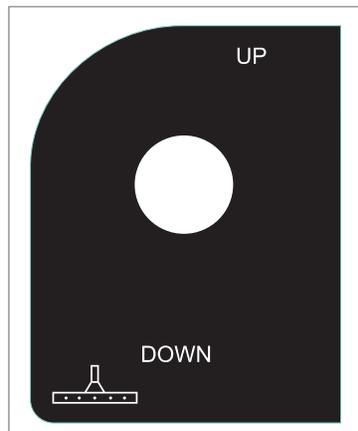
The brush plate is built into the wiper and it lifts jointly with the brush plate.

The wiper may also be lifted independently by means of the manual lever located to the left of the steering column.

Turn the hand lever clockwise to place squeegee in the UP position.

To return squeegee to DOWN position, turn the hand lever to the opposite direction until it is on the DOWN symbol.

The use of this lever is indicated only in case of double cleaning processing. See below:



#### 14.4.4. STEERING WHEEL

It is used to turn the front wheel to change the direction of travel of the machine.

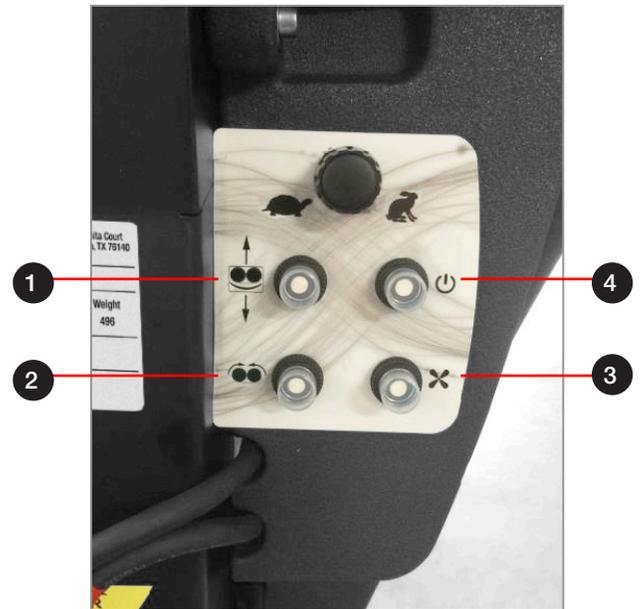
## 14.5. ELECTRICAL CONTROL DEVICES

### 14.5.1. PLATE OF RESETTABLE THERMAL CIRCUIT BREAKERS OF THE MOTOR

It is located to the right of the steering column.

There are buttons to release the circuit breakers of the motors, which trigger following overheating as a result of an increase in electricity consumption.

The picture to the right shows the functions that are protected by these devices.



**Position 1 = brush lifting motor thermal protection (5 Ampere)**

**Position 2 = brush rotation motor thermal protection (30 Ampere)**

**Position 3 = extraction motor thermal protection (30 Ampere)**

**Position 4 = main thermal protection (5 Ampere)**

### 14.5.2. ANDERSON BATTERY CHARGER SOCKET

It is located directly on the steering column.

When the machine is powered by its own batteries, the socket must be engaged.

In the event of recharging the batteries, the top socket must be detached and the battery charger plug must be inserted into the lower socket.

The sticker shown in the picture to the right indicates the direction of insertion of the battery charger plug.



## 15. MAINTENANCE

### 15.1. BATTERIES

The batteries supply the power to operate the machine. For the batteries to always achieve peak performance, some maintenance operations must be regularly carried out.

For the batteries to last as long as possible, recharge them every time the charge indicator reaches the first red mark, shown by the display on the control panel.

Do not let the batteries run completely down. Never expose spent batteries to temperatures lower than freezing point 32°F (0°C); the liquid inside them freezing might lead to cracking of the outer plastic casing (lead acid battery versions).

Do not start the machine unless the batteries are in good condition or if the charge status is lower than 25%.

Never place metal objects on top of the battery, as they might cause a short circuit. Replace damaged or worn cables or terminals.

Check the electrolyte level in each battery element before and after charging. Never add acid to the batteries; only use distilled water.

Never let the water level go below the battery plates; the parts of the plates exposed to air would be damaged. Do not excessively fill the battery. Always securely insert all caps.

**When performing maintenance operations, avoid contact with the acid. The batteries emit hydrogen. Risk of fire and explosions.**

**Keep the batteries away from sparks and naked flames. Remove all caps before charging the batteries.**

**Charge Pb batteries only in dedicated areas.**

**Always wear protective gloves and glasses to perform battery maintenance. Charge the batteries in a well-ventilated area.**

**When charging the batteries, lift the recovery tank as shown in the photo to the right.**



## 15.2. CHARGING THE BATTERIES

1. Place the machine in a clean and well-ventilated area, near a battery charger.

2. Lift the upper tank to access the battery compartment.

### FOR SAFETY

Before leaving the machine unattended or performing any maintenance operation, ensure it is on a flat surface, engage the parking brake, turn off the machine and remove the key.

3. After ensuring it does not contain any water, tilt the upper tank.

4. Check electrolyte level in every battery element. Before charging the battery, add a sufficient amount of water to cover the plates. After completing recharge, add a sufficient amount of water to bring the water level to the gauge level. If the water level is too high before charging, the normal electrolyte expansion may cause it to leak, which causes loss of acid balancing and machine damage.

5. Replace battery caps.

6. Disconnect the battery connector from the machine. Disconnect the battery charger from the power outlet.



## FOR SAFETY

When charging the batteries, connect the battery charger to the batteries before connecting it to the power outlet. Never connect the battery charger to the power outlet first as sparks might be generated.

7. To charge the battery pack, use a DC 24 V battery charger that automatically switches off as soon as the batteries are completely charged.

8. Connect the battery charger to the battery connector. Connect the battery charger cable to the power outlet. The charge indicator shows that the batteries are charging.

9. When the batteries are completely charged, disconnect the battery charger from the batteries.

10. Connect the batteries to the machine connector.

11. Check electrolyte level. The level must reach the gauge. If necessary, add distilled water.

12. Lower the upper recovery tank into its position.

### 15.3. BRUSH PLATE ADJUSTMENT

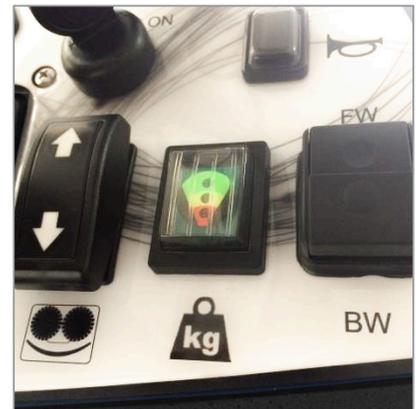
The brush plate is pre-shaped for optimal adherence to the floor. There is the option of adjusting the brush plate pressure on the ground, to have a lighter or heavier scrubbing action.

The switch controls the pressure exerted on the floor by the brushes. To decrease pressure, press the top of the switch. To increase the pressure, press the bottom part of the switch and check the LED display that indicates the pressure exerted by the brushes on the floor.

Green means: Light Brush Pressure

Yellow means: Medium Brush Pressure

Red means: Heavy Brush Pressure



### 15.4. BRUSH REPLACEMENT

This is done as follows:

1. With the brush plate lifted, turn the ignition key to OFF; the parking brake is engaged.

2. Press on the top of the brush to remove it from its rim hub and let it drop on the floor.

3. To insert the new brush, place it under the brush plate, roughly aligned with the hub, then lift it with your hands and push it against the hub until it engages the closing tabs (you should hear several snaps).

In order to avoid brush or pad warping in case of no use, it is recommended to always lift the brush deck when the machine is idle.



## 15.5. SQUEEGEE ASSEMBLY

The machine is packed, shipped and delivered with the squeegee assembly.

We recommend that you mount the squeegee providing its rotation to the right, to have the most amount of clear hose that facilitates assembly.

To do this, turn the mounting arm to the right, move the wiper closer and fix it with the suitable screws. Connect the hose to the wiper connection itself.



## 15.6. SQUEEGEE ADJUSTMENT

Two squeegee adjustments are possible:

1. Longitudinal tilt: the squeegee may be tilted more forward or backward by tightening or loosening the threaded adjusting screw.



2. Height from ground: using the clamping nut of the support wheel to move vertically the wheel itself, by screwing or unscrewing it from its mounting plate.



The ride height adjustment and tilt are needed when you work on different floors.

It is recommended to lower the squeegee evenly, raising or lowering both wheels to the same value.

## 15.7. SQUEEGEE DRYING BLADE REPLACEMENT

Two blades are assembled: one on the front and one on the rear. They are built so as to avoid installation errors.

The squeegee picks up the water from the floor through a vacuum chamber that generates inside it.

In order to achieve maximum vacuum, plastic material drying blades (various types) are fitted that allow it to perfectly adhere to the floor with no vacuum losses. Blade replacement is therefore required to prevent decrease of water extraction properties by the squeegee.

To replace the blades:

1. Loosen the two knobs, on the right and left, that lock the squeegee and aim it outward in order to make access easy. Remove the squeegee and place it on a work bench.

2. Loosen and remove the hand wheels that fasten the blade.

3. Remove the fastening strap and the blade, then rotate upside down or completely replace the blade.
4. The same blade can be used 4 times; each time causing it to work on a different edge (you should turn them every 20 working hours).
5. Fit the blade and fastening strap on the reference pins, then screw the hand-wheels on again.
6. Replace the squeegee.

#### 15.8. CLEAN WATER FILTER CLEANING

The clean water filter is fitted under the machine's floor, on the right side. Its position is also indicated by the wording on the right side of the solution tank. The filter has the purpose of preserving the solenoid valve controlling solution flow rate from any debris or sediment there might be in the solution tank.

It is recommended to clean the filter **weekly**.

In order to clean it, unscrew the cup, remove the filter inside it and wash it under running water. Replace it and fit the cup back in.

The filter also acts as a shut-off valve on the solution tank, that is by unscrewing the cup the flow automatically stops.



#### 15.9. EXTRACTION FILTER CLEANING

The mesh filter is fitted inside the recovery tank, directly fitted onto the end of the vacuum motor cone. The purpose of the filter is to protect the vacuum motor from foreign matter which might enter through the extraction cone during dry extraction.

It is recommended to clean the filter **daily**.

To clean the filter, remove it and wash it under running water. Fit it back onto the cone, taking care to fit it securely onto the cone.



## 15.10. MAINTENANCE SCHEDULE

Maintenance Action	Daily	Every 50 Hours	Every 200 Hours
Check the battery water level when charged; if necessary, add distilled water (only for version with lead acid battery). Gel batteries are maintenance-free.	x		
Check seal of recovery tank cover.	x		
Visually check integrity (damage or wear) of the tires.		x	
Ensure the brushes are correctly mounted.		x	
Check connections of flexible vacuum hoses.	x		
Check correct operation of brakes and steering wheel.		x	
Inspect the vacuum filter for any debris.	x		
Clean the detergent solution filter and tank. Check flow.	x		
Clean brushes and check them for wear.		x	
Clean wiper rubbers and check them for wear. It is recommended to turn them every 20 working hours.	x		
Clean the recovery tank and vacuum filter.	x		
Clean the outer part of the tank. Check integrity.	x		
Charge batteries.	x		
Clean the top of batteries.		x	
Clean detergent solution filters.	x		
Check effectiveness of parking brake.		x	
Check all motors to ensure the carbon brushes are not worn.			x

## 15.11. SUMMARY FOR GOOD MAINTENANCE OF THE MACHINE

1. Unloading from pallet: always use a ramp to move the machine.
2. On loading or unloading from truck: lift the head, always remove brushes, squeegee and splash guard. Rest the hose of the squeegee on the support bracket.
3. End cleaning: always lift the head.
4. End cleaning: it is recommended to always turn off the switches of brushes and vacuum motor before turning the key.
5. End cleaning: always clean the recovery tank/dirty water.
6. End cleaning: always clean the drying blades.
7. Squeegee lever: you must operate only in the case of washing without drying. In all other situations, never use it.
8. Squeegee blades: it is recommended to turn them when necessary, bearing in mind that there are 4 useful positions.
9. Brushes: check for wear and replace them when required and at least once a year.
10. Stainless steel air intake filter: inspect it regularly and clean when dirty (dry suction).
11. Water filter: inspect it and wash it regularly.
12. Batteries: charge them for at least 8 hours.

## 15.12. TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Unit not powering on	Disconnected batteries	Check connections of all battery cables.
	Corroded battery cables	Clean connections.
	Main thermal cut-out tripped	Reset the thermal cut-out.
	Faulty key switch	Replace the switch.
Unit not moving forward or backward	Dead battery	Charge batteries.
	Machinery on with pedal not activated	Press accelerator pedal.
	Loosened motor connection	Check wires and connections from circuit board to motor.
	Loosened accelerator connections or faulty accelerator potentiometer	Check wires and connections that go from accelerator to panel and to potentiometer resistor.
	Loosened seat switch connection or faulty seat switch	Check connections and continuity of the switch.
Unit not recovering water	Wiper not adjusted	Adjust the wiper.
	Wiper clogged by debris	Remove debris.
	Worn wiper blades	Rotate or replace the blades.
	Flexible water collection hose clogged	Release the vacuum flexible hose.
	Flexible water collection hose not correctly inserted in the recovery tank	Reconnect the vacuum flexible hose.
	Flexible water collection hose damaged	Replace the flexible hose.
	Vacuum motor inlet filter dirty	Clean or replace the inlet filter.
	Recovery tank full of foam	Empty the recovery tank, use less detergent or a different detergent. Use an anti-foaming agent.
Brush plate not raising/lowering	Faulty actuator	Repair or replace the actuator.
The vacuum motor does not work or works slowly.	Recovery tank full	Discharge the recovery tank.
	Loosened motor connection	Check motor wires and connections.
	Vacuum fan motor brushes worn	Replace brushes.
Poor washing performance	Washing brushes clogged by debris, worn brushes	Remove debris. Replace brushes.
	Unsuitable detergent, worn brush or worn pad.	Contact the experts of the application or fitting.
	Insufficient washing pressure	Increase the washing pressure.
	Flat batteries	Charge batteries.
Detergent solution flow to the floor is poor or absent	Detergent solution tank empty	Fill the detergent solution tank.
	Detergent solution flow de-activated or adjusted too low	Activate detergent solution flow or increase the flow adjustment.
	Detergent solution filter obstructed	Clean the detergent solution filter.
	Obstructed piping of the detergent solution system	Clear the piping.
	Detergent solution solenoid valve obstructed or jammed	Clean or replace the solenoid valve.

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