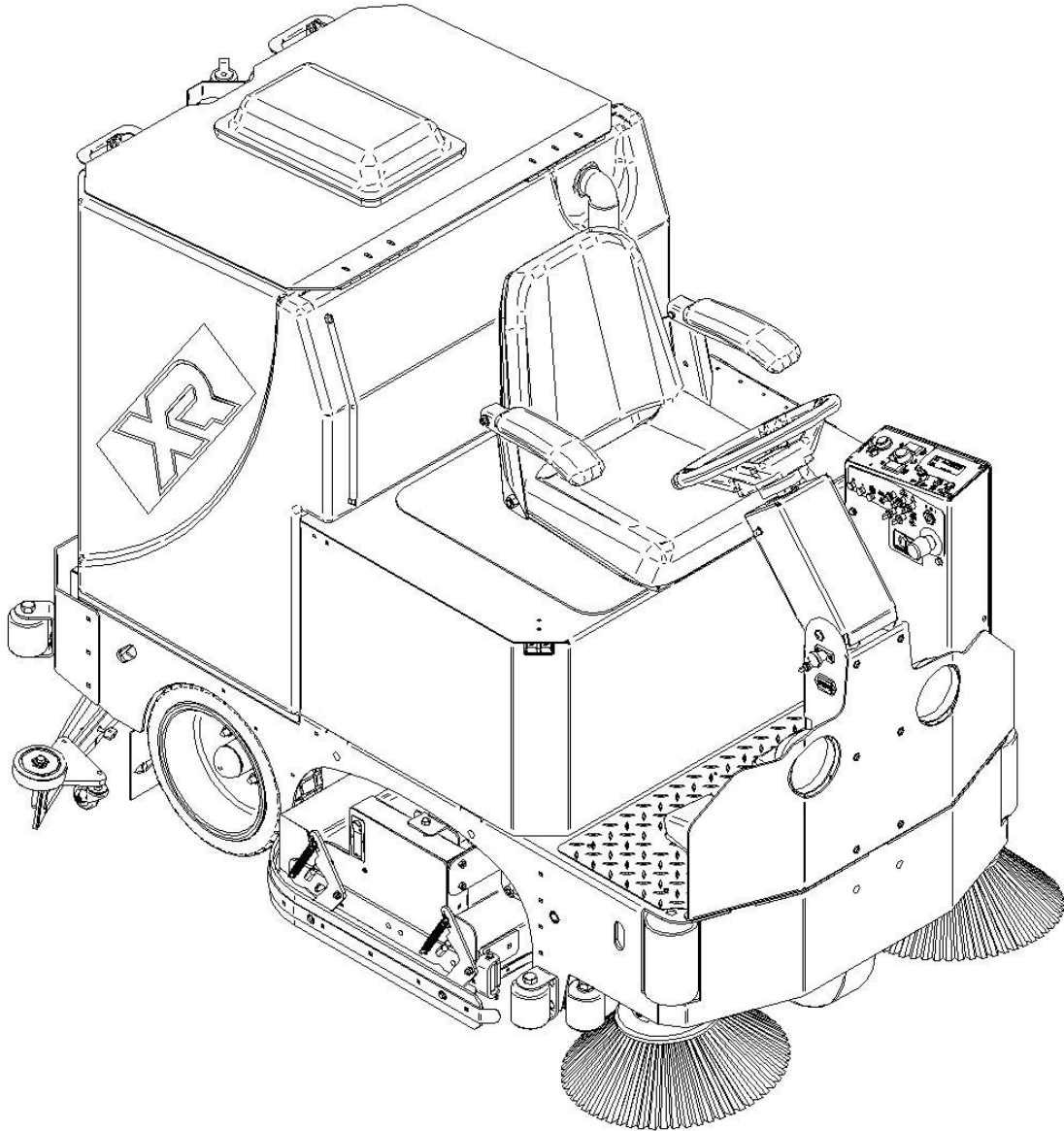


XR SERIES

OPERATORS MANUAL



RPS Corporation

Mailing: P.O. Box 368
Racine, WI. 53401
Shipping: 1711 South Street
Racine, WI. 53404

Phone: 1-800-634-4060
Fax: 1-866-901-3335

This Manual Contains the Following Sections:

Table of Contents: Tells you where to look in the manual.

Machine Delivery Form: Should be filled out upon machine installation and faxed to 1-866-632-6961 or online at www.rpscoperation.com.

Warranty Policy: Tells you coverage, exclusions and limitations to warranty.

Safety: Section contains important information regarding hazard or unsafe practices of the machine. Levels of hazards are identified that could result in product or personal injury, or severe injury resulting in death.

Machine Controls: Shows you the different machine controls and features.

Machine Setup: Tells you how to setup machine from uncrating to installing squeegee and brushes.

Operations: Section is to familiarize the operator with the operation and function of the machine.

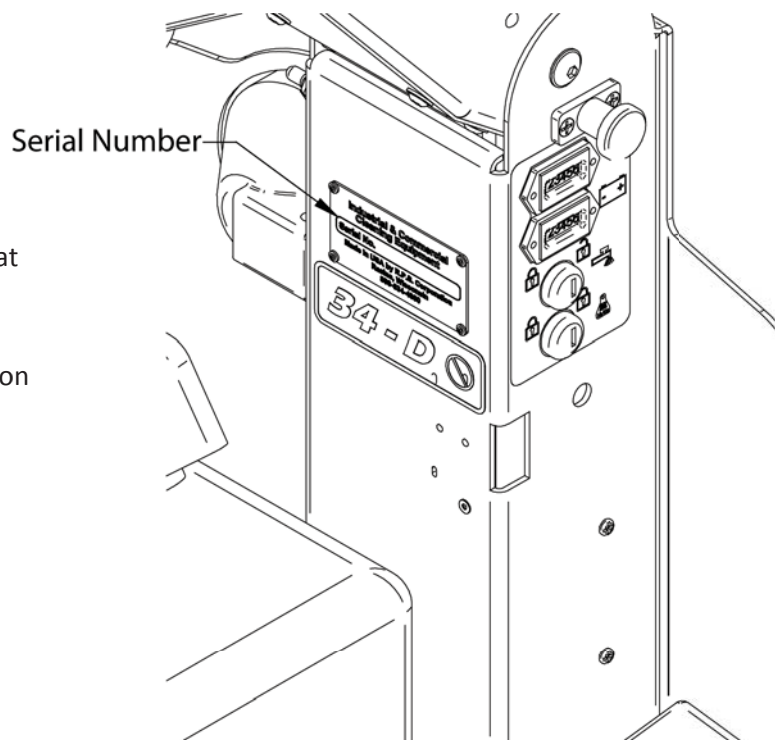
Battery Charging: Shows you how to charge the batteries (on-board and off board charging).

Maintenance: This section contains preventative maintenance to keep the machine and it's components in good working condition. They are listed in this general order:

- Batteries
- Scrub Brushes
- Adjusting Squeegee
- Service Schedule
- Machine Trouble Shooting

Trouble Shooting: A list of common problems that may occur.

Note: The serial number of your machine is located on the lower half of the steering column on the machine (see picture to your right).



*** As Our Policy Is One Of Constant Improvement, All Information And***

Specifications Are Subject To Change Without Notice

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Installing Dealer: _____ Installed By: _____

Location: (City, State): _____ Install Date: _____

End-User Company Name _____ End-User Contact: _____

Address: _____ City/State: _____ Zip _____

Phone: _____ Fax: _____ Email: _____

Model: _____ Serial #: _____ Hour Meter: _____

BUYER'S REPRESENTATIVE HAS RECEIVED INSTRUCTION IN PROPER OPERATION OF THE FOLLOWING CONTROLS AND FEATURES:

SCRUBBERS

- Filling solution tank, Solution tank sight tube, Solution drain hose or valve for flushing and freezing conditions
- Adjusting controls & operation, Double scrubbing, Squeegee lift delay, vacuum switch (horn honking) and vacuum timer
- Recovery tank draining & cleaning, vacuum screen removal and cleaning, drain saver basket emptied.
- Shroud and pad/brush removal and installation
- Side Wiper and Curtain adjustment and maintenance for water control
- Solution valve and filter operation (removal and cleaning)
- LCD display operation, 4 hour meters (key switch, brush, traction drive, vacuum)
- Tank tilt back feature, only when both tanks are fully drained
- Squeegee hose removal and checking for clogs

BURNISHERS

- Train and have customer demonstrate proper removal and replacement of burnishing pad
- Pad pressure gauge and proper operating range to avoid tripping the circuit breaker

SWEEPERS

- Demonstrate proper removal and replacement of main broom and side brooms
- Method for cleaning the dust filter, emptying out the debris hopper and correct installation
- Correct operation of the main broom and side broom levers, and understands to park with brushes in UP position
- Trained on the "Wet-Sweep" bypass door and not to operate through standing water

EDGE MACHINES

- EDGE scrubbers must have their isolators & deck hour meter replaced every 250 hours of use.
- Customer understands the Grip Face is not warranted against damage from improper use or direct contact with the floor

ALL MACHINES

- Checking battery electrolyte level and confirm monthly check that battery terminals are tight
- Parking brake override
- Charging operation and customer understands batteries have limited "cycles" and recharging = 1 cycle
- Seat and steering wheel adjustment
- Customer has read and understands the list of WARNINGS in the Operator manual
- Battery and Machine Maintenance Guide posters hung up and reviewed
- Manufacturer's website is a good source of information and sign up for quarterly newsletters

In addition to the above items the buyers representative has received the operator's manual and been advised to read the manual before operating the machine.

Installed By (print) _____ Signature _____

Buyers Representative (print) _____ Signature _____

Buyer agrees to pay for any repairs, adjustments, or secondary training that manufacturer determines is excluded from the warranty.

STANDARD WARRANTY POLICY (RPS Corporation)

RPS Corporation warrants its machines, parts and accessories to be free of manufacturer's defects for the periods specified below. Warranty will be granted at the sole discretion of RPS Corporation and is subject to final claim and parts review by R.P.S. Corporation and its vendors. This policy is effective January 1, 2010 and is subject to change on production units at a future date.

COVERAGE, EXCLUSIONS AND LIMITATIONS:

Coverage:	All (non-floor machines) Models sold (Sweepers, Scrubbers, Burnishers)
Parts:	36 months / 1,500 hours on "Power On" hour meter
Labor:	12 months
Travel:	3 months (150 mile maximum)
Poly Tanks:	7 Years (Water must not exceed 135°F/57°C)
OEM Parts:	3 months
Validity:	Fully completed Machine Delivery Form (online or fax) is on record at RPS.
Limitation:	Warranty will begin on date of machine installation to end-user or 6 months after shipment from RPS Corp to the distributor if unsold at that time.

This warranty includes all parts on the machine except normal wear parts. Some of these exceptions are:

- ❖ Edge isolators (250 hours on average)
- ❖ Squeegee Blades, Wiper Blades, Skirts and Curtains.
- ❖ Caster Wheels, Squeegee Wheels and Bumpers.
- ❖ Lights (Strobe, Headlights, or Bulbs).
- ❖ Chains and Belts.
- ❖ Filters, Screens, and Vacuum Bags.
- ❖ Motor Brushes and commutator wear.
- ❖ Brooms, Brushes, Pads and Pad Retainers.
- ❖ Hoses and Tubing.
- ❖ Drive Tires, Pneumatic Wheels and Tubes.
- ❖ Rubber Floor Seals and Gaskets.
- ❖ Vacuum motors with evidence of moisture or debris intrusion or > 400 hours.
- ❖ The Batteries (see below).
- ❖ **NOT COVERED:** Routine maintenance, adjustments or parts damaged from abuse, neglect, improper use of the machine, or lack of scheduled "daily, weekly, monthly" maintenance in accordance with our published PM Sheets.

POLY TANKS: 7 Years Coverage against leakage due to manufacturer's defect in materials or workmanship. Tank warranty void if water used exceeds 135°F/57°C

NOTE: Freight coverage for 3-Years under the parts section of warranty.

BATTERIES: Warranted through battery manufacturer for **One (1) Year** (prorated) from the date of delivery. The battery manufacturer approves or denies the warranty coverage after analysis. We rely on solely on their review.

NOTE NOT COVERED: Damage from lack of water, failure to use OEM charger, or non-distilled water.

Battery terminals – Battery terminals and cable connections are covered for 30 days from the shipment of the machine. (Battery terminals tightness should be inspected every 30 days.)

Safety Messages:

Your safety, and the safety of others, is very important, and operating this unit safely is an important responsibility.

To help you make informed decisions about safety, we have provided operating procedures and other safety information in the manual. This information informs you of potential hazards that could hurt you or others.

It is not practical or possible to warn you of all the hazards associated with operating this unit. You must use your own good judgment.

This machine is intended for commercial use. It is designed to be used on hard floor in an indoor environment with the recommended pads or brushes.

1. DO NOT OPERATE UNIT:

- Unless trained and authorized
- Unless operator manual is read and understood
- If unit is not in proper operating condition
- With water that exceeds 135°F/57°C
- With high percentage bleach mixture
- Outdoors or exposed to rain
- For picking up hazardous materials/dust
- On surfaces having a gradient exceeding 2%
- Parking brake is functioning on the machine

2. WHEN OPERATING UNIT:

- Remove loose objects from the floor that may be projected from the revolving brushes
- Keeps hands and feet away from the revolving brushes
- Do not operate machine where flammable liquids are present
- Use extreme caution when maneuvering

3. BEFORE LEAVING:

- Drain Tanks
- Make sure machine is turned off
- Stop on level surfaces
- Disconnect batteries

4. BEFORE SERVICING:

- Stop on level surface and secure machine
- Disconnect batteries

5. BEFORE DISCARDING MACHINE:

- The batteries must be removed and properly disposed of

!! Safety Precautions !!

WARNING! Hazardous voltage. Shock, burns or electrocution can result. Always disconnect the batteries before servicing machine.

WARNING! Batteries emit hydrogen gases. Explosion or fire can result. Keep sparks and open flames away.

WARNING! Charge unit in a well ventilated area, and keep battery compartment open when charging. Explosion or fire could result.

WARNING! Battery acid can cause burns. Wear protective eye wear and gloves when servicing batteries.

WARNING! Do not store outdoor or pressure wash. Prevent electronic components from getting wet.

WARNING! The use of parts and solutions other than that recommended by the manufacturer may cause damage or endanger people.

WARNING! Dress safely. Do not wear rings or metal wrist watches while working on this machine. They can cause an electrical short, which can cause serious burns. Do not work on this machine while wearing a tie, scarf or other loose, dangling neckwear or clothing. These loose items can tangle in the rotating parts and cause serious injury or even death.

WARNING! Do not use the machine as a step ladder or chair.

WARNING! Only operate this machine from the operators position. It was not designed to carry passengers.

WARNING! Do not operate this machine on ramps or uneven surfaces. When climbing a ramp, always drive the machine forward, straight up or down the ramp. Never drive across the incline. Do not back down or turn on ramps!

WARNING! Do not use a high percentage bleach mixture.

WARNING! Always use the charger provided by the manufacturer to charge the machine. It is an automatic charger, specifically designed to charge at the appropriate rate. If you must use a different charger, disconnect the batteries before charging. This will prevent damage to the electronic speed controller.

WARNING! Understand the dynamic braking system before you operate the machine on ramps. Machine may coast.

WARNING! Do not park the machine on ramps or slopes.

WARNING! Do not operate the machine if any parts have been removed or damaged.

WARNING! Do not remove, paint over, or destroy warning decals. If warning decals become damaged, they must be replaced.

WARNING! Do not operate machine in unsafe conditions. If the machine is in need of repair or is in anyway unsafe to operate, the matter should be reported immediately to the shift supervisor. Do not operate the machine until it is returned to proper operating condition.

WARNING! This machine must only be operated by a trained operator. As part of his or her training, they must read this manual thoroughly. If extra copies are needed, contact your local dealer.

WARNING! Always turn off the machine before leaving it unattended.

WARNING! Do not operate over electrical floor outlets. May result in serious injury.

WARNING! Do not use water that exceeds 135°F/57°C, may result in damage to tanks.

Brushes	Model 34" Disk	Model 40" Disk	Model 46" Disk
Super Grit	17-421 SS	20-421 SS	23-421 SS
Tough Grit	17-421 S	20-421 S	23-421 SS
Midi Grit	17-421 C	20-421 C	23-421 C
Light Grit	17-421 PS	20-421 PS	23-421 PS
Poly (.028)	17-421 P	20-421 P	23-421 P
Nylon (.016)	17-421 N	20-421 N	23-421 N
Tampico	17-421 T	20-421 T	23-421 T
Pad Driver	17-421 D	20-421 D	23-421 D
Diamond Driver	17-421 DD	20-421 DD	23-421 DD

Brush Repair Kit: 40-423 Replacement locating clip for all brushes

NOTE: # In Disk column denotes pad size: 17, 20, 23

Pads	Disk	Level	Color
Super Black	##-422 BB	Very High	Black
Black	##-422 B	High	Black
Brown	##-422 BR	High	Brown
Green	##-422 G	Medium	Green
Blue	##-422 BL	Moderate	Blue
Red	##-422 R	Moderate	Red
White	##-422 W	Light	White

Extra pad driver retaining clip: 40-433

Brushes	Model 34" Cyl	Model 40" Cyl	Model 46" Cyl
Super Grit	N/A	N/A	N/A
Tough Grit	327-821 S	387-821 S	447-821 S
Midi Grit	327-821 C	387-821 C	447-821 C
Light Grit	327-821 PS	387-821 PS	447-821 PS
Poly (.028)	N/A	N/A	N/A
Nylon (.016)	327-821 N	387-821 N	447-821 N

Squeegee Size	34" Disk 34" Cyl	40" Disk 40" Cyl	46" Disk 46" Cyl	Gum Rubber Blade Kit	Linatex Blade Kit	Urethane Blade Kit	Complete Squeegee Assemblies
46" Squeegee	Standard	N/A	N/A	360-770G	360-770L	360-770U	360-7180
53" Squeegee	Optional	Standard	Optional	370-770G	370-770L	370-770U	370-7180
60" Squeegee	Optional	Optional	Standard	380-770G	380-770L	380-770U	380-7180

NOTE: Squeegee blade kits include (1) Rear blade, (1) Front blade, and (2) Backup wheels with hardware.

NOTE: Squeegee assemblies (complete) listed above all come with Linatex blades.

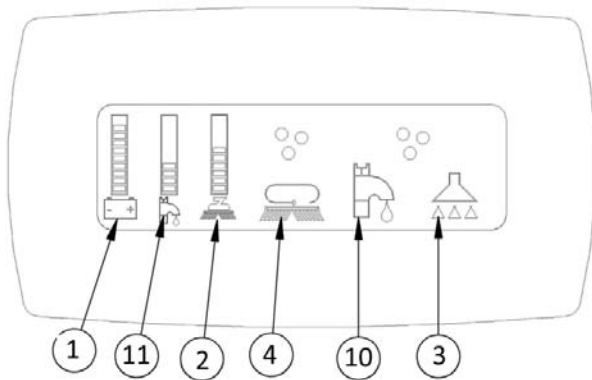
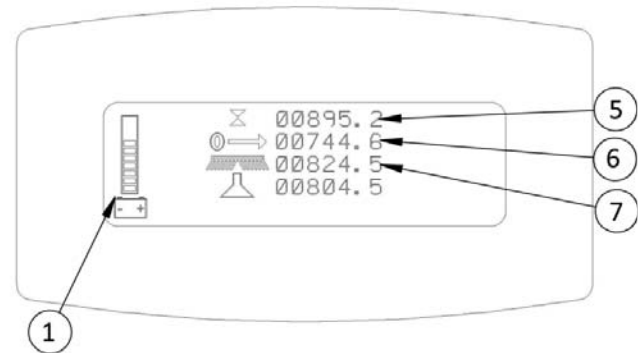
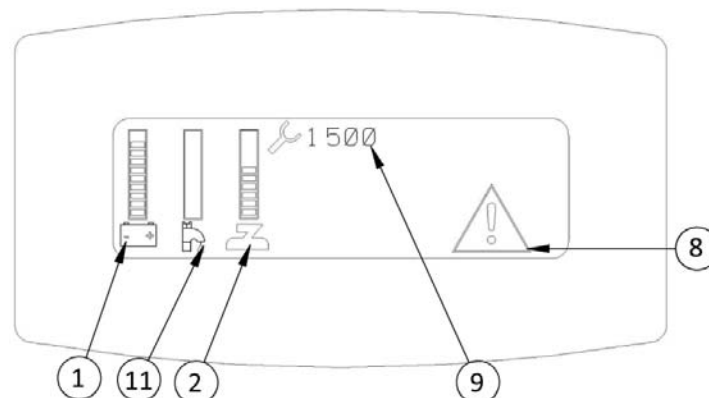
NOTE: Size is stamped into the top of the painted steel squeegee body on all squeegee's.

NOTE: The squeegee is designed for narrow aisles and may not have the same water control around tight turns as the larger squeegees.

SOAP:

Citrus Green
 Low pH Degreaser
 Eco Neutral Cleaner
 High Power Degreaser
 Gloss
 HD Degreaser

**For More SOAP Information call PowerCat
 (414) 745-9337
www.powercatsolutions.com**

LCD Screen Menu Displays:**Screen #1 (Operator)****Screen #2 (Maintenance)****Screen #3 (W/ Error Code)**

*** Use Green Menu Selection Button on Control Panel to Change Screens ***

1. Battery Level Indicator - Indicates the energy level remaining in the batteries. *(Shown on all menu displays)*

2. Scrubdeck Down Pressure Gauge - Sets the down pressure on the brushes.

3. Vacuum On - Indicates the vacuum is "on".

4. Scrub Motors On - Indicates the brush motors are "running".

5. Key Switch Hour Meter - Indicates the total number of hours that the machine has been on.

6. Scrub Brush Hour Meter - Indicates the total number of hours that the brush motors have been used.

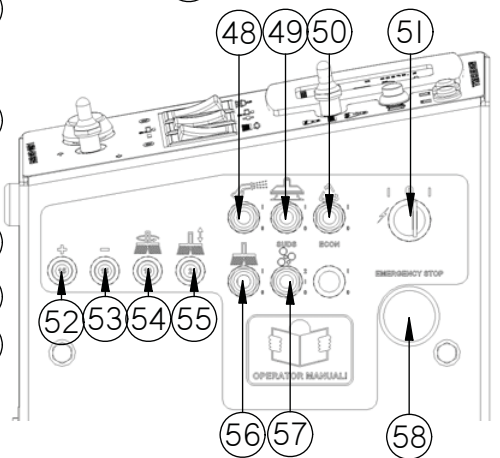
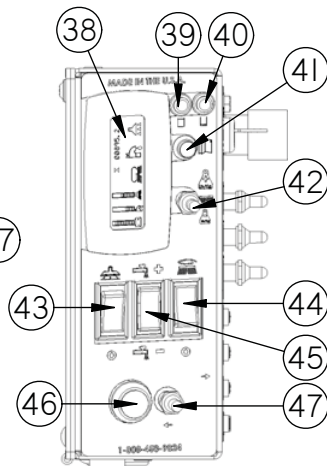
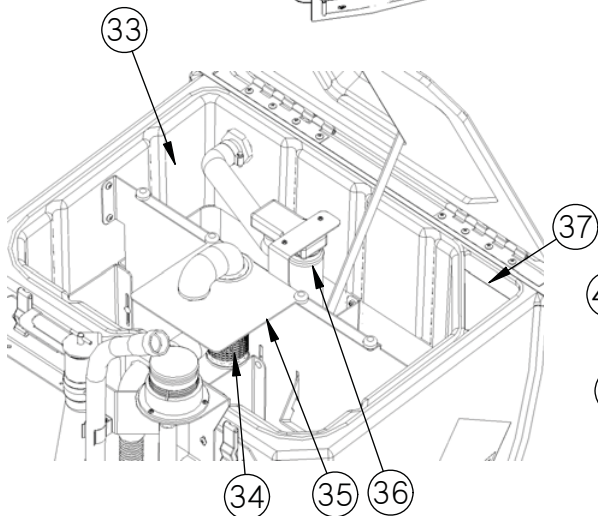
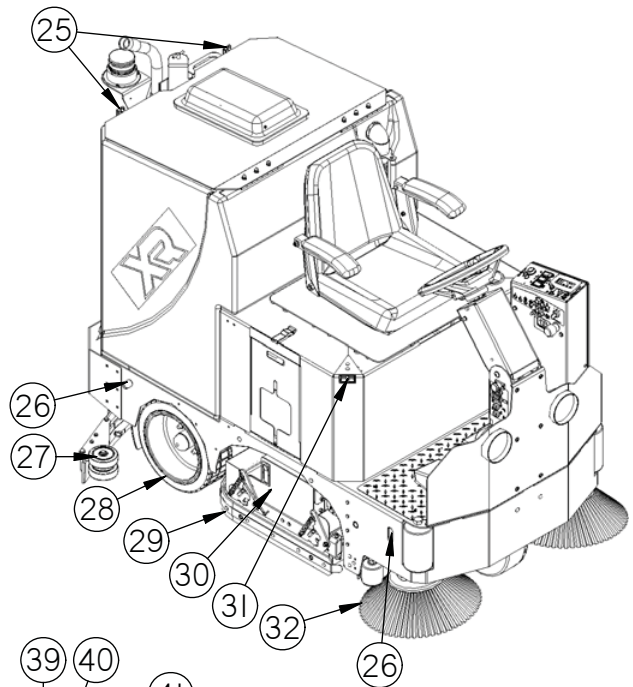
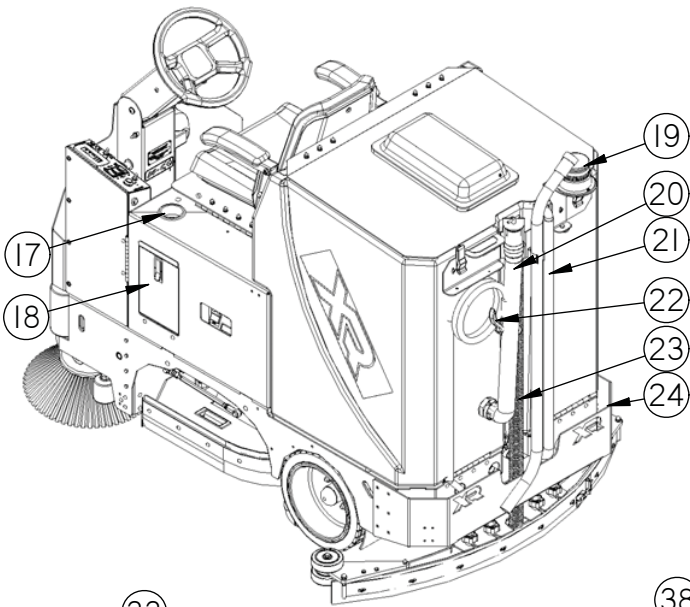
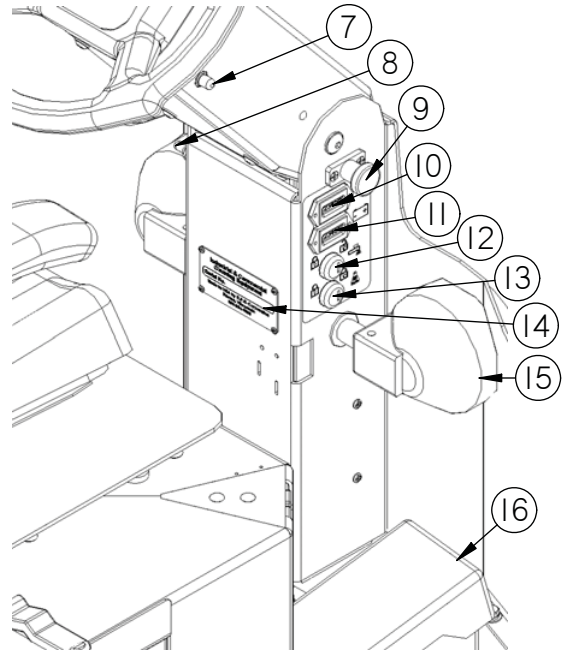
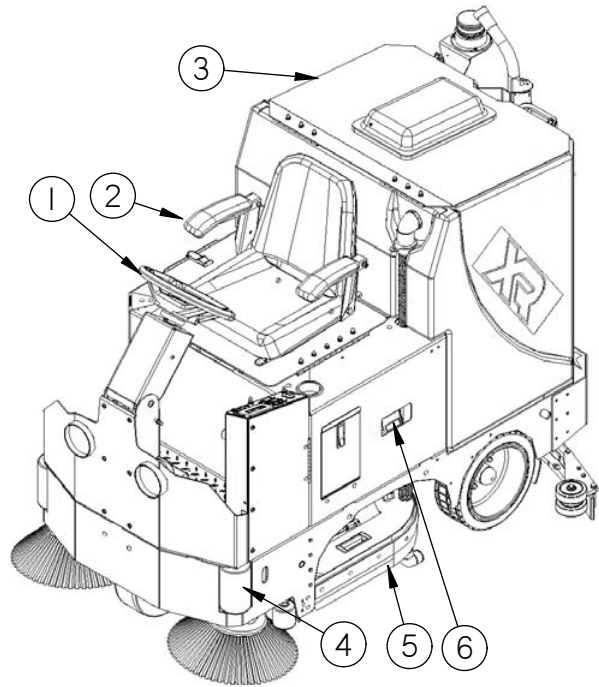
7. Transport Hour Meter - Indicates the total number of hours the drive system has been used.

8. Error Warning Symbol - Indicates when there has been a diagnostic code error.

9. Diagnostic Code - When the machine has detected an error, it will display the warning symbol and a diagnostic code which tells you what's wrong.

10. Water On - Indicates the solution flow is "on".

11. Solution Level - Indicates the gallons per minute (GPM) 0 - 1.0.



1. **Steering wheel:** Steers the machine.
2. **Adjustable seat with arm rests:** Your machine is equipped with an adjustable seat with arm rests.
3. **Recovery tank lid:** Latch must be secured for recovery tank to seal properly.
4. **Polyurethane rollers:** Helps prevent damage to machine and objects you may drive close to.
5. **Adjustable disk deck side wipers:** Controls water on turns by directing it to the squeegee.
6. **On board charger (optional):** Plugs into any three pronged 20 amp dedicated outlet to charge machine
7. **Horn button:** Sounds the horn for warning oncoming traffic.
8. **Headlight switch:** Turns headlight on and off.
9. **Adjustable steering:** Four settings for operator comfort and ease of entry.
10. **Hour meter:** Keeps track of total hours of use on the machine.
11. **Battery hour meter:** keeps track of total hours of use on the batteries.
12. **Water control lockout:** locks out the solution flow control so it cannot be changed.
13. **Down pressure lockout:** locks out the scrub deck down pressure so it cannot be changed.
14. **Serial # plate:** Have machines individual serial number stamped on it.
15. **Headlight:** helps you see in low light areas and to warn oncoming traffic.
16. **Foot pedal:** Controls the acceleration and deceleration of the machine.
17. **Cup holder:** Holds beverage container.
18. **Pre-Treat soap door:** Holds (2) pre-treat soap jugs.
19. **Strobe light (optional):** Warns people that the machine is in operation.
20. **Recovery drain hose:** Allows for controlled draining of recovery tank dirty water.
21. **Site tube/ sol. drain hose:** Shows how much solution is in the tank and drains the solution tank.
22. **Spray hose (optional):** Permits cleaning in remote areas.
23. **Squeegee/vacuum hose:** Adds Vacuum to squeegee. Note: keep free and clear of blockage.
24. **Rear bumper:** Offers squeegee system protection from damage.
25. **Tank latch:** Permits access to tank.
26. **Tie down points:** Location for tie down straps during transport.
27. **Squeegee rollers:** Help protect the squeegee.
28. **Rear Tire:** Solid Tire.
29. **Adjustable cylindrical deck side Wipers:** Controls water on turns by directing it to the squeegee.
30. **Cylindrical Deck Access Door:** Provides easy access to the decks belts & pulleys.
31. **Charger Port (Grey 175):** Receives charger input. (Only use OEM charger provided)
32. **Side Brooms:** Extends the cleaning path up to walls.
33. **Recovery tank:** Holds approximately 68-gallons of dirty "recovery" water.
34. **Drain saver:** Prevents debris from clogging drain.
35. **Foam protection screen:** Used to protect vacuum motor from debris.
36. **Vacuum screen box:** Houses the stainless vac screen & shutoff ball.
37. **Solution fill port:** Holds approximately 68-gallons of clean water.
38. **LCD screen:** Lists functions and setting of the machine. (See page #)
39. **High water recovery light (red):** Indicates when the recovery tank is nearly full.
40. **Low solution light (yellow):** Indicates when the solution tank is nearly empty.
41. **Menu control:** Scrolls through different options on the LCD display.
42. **Scrub deck down pressure switch:** Controls the pressure put on the scrub deck.
43. **Squeegee switch:** Raises and lowers the squeegee.
44. **Scrub deck switch:** Raises and lowers the scrub deck.
45. **Solution control:** (-) to reduce & (+) to increase flow of solution.
46. **"Uni-touch" button:** Activates brushes, squeegee, and solution flow simultaneously.
47. **Forward/reverse switch (red):** Controls the direction of the traction motor.
48. **Spray jet (blue)(optional):** Activates spray pump for remote spray wand.
49. **Vacuum switch (white)(optional):** For use with remote vacuum wand.
50. **Econ Switch:**
51. **Key switch:** Turns the main power on and off.
52. **Circuit breaker (15 amp):** Positive bus bar.
53. **Circuit breaker (15 amp):** Negative bus bar.
54. **Circuit breaker (10 amp):** Side broom motors.
55. **Circuit breaker (2 amp):** Side broom lift actuator.
56. **Side broom (yellow):** Lifts and lowers side brooms which turn on automatically.
57. **SUDS switch:**
58. **Emergency stop:** shuts machine down in a emergency

Uncrating Machine & Connecting Batteries:

1. Carefully check the crate for any signs of damage. Batteries are in the unit.

2. To uncrate the machine, remove banding from around the crate. Take off the top and sides and dispose of properly.

3. Remove banding from machine. Remove the chocks around the drive wheels.

4. Turn all switches to the off position and remove key.

5. Tip back seat to expose the battery compartment and check to see that the battery cables are connected.

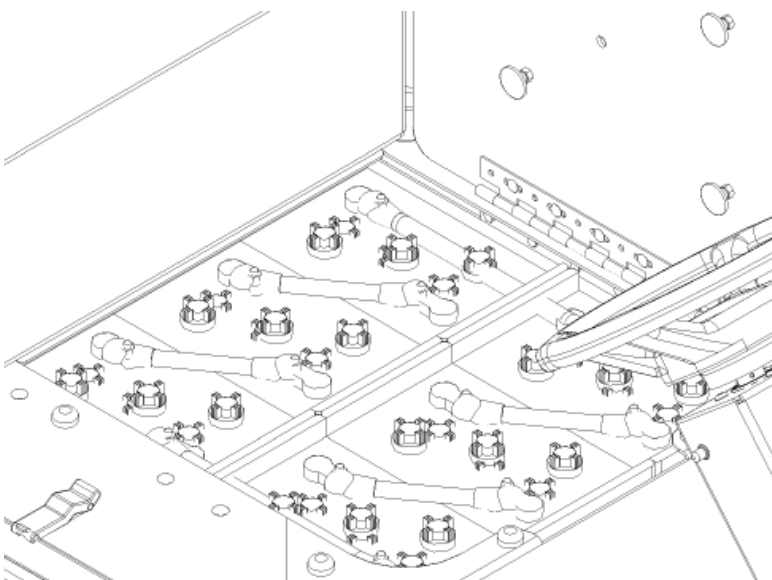
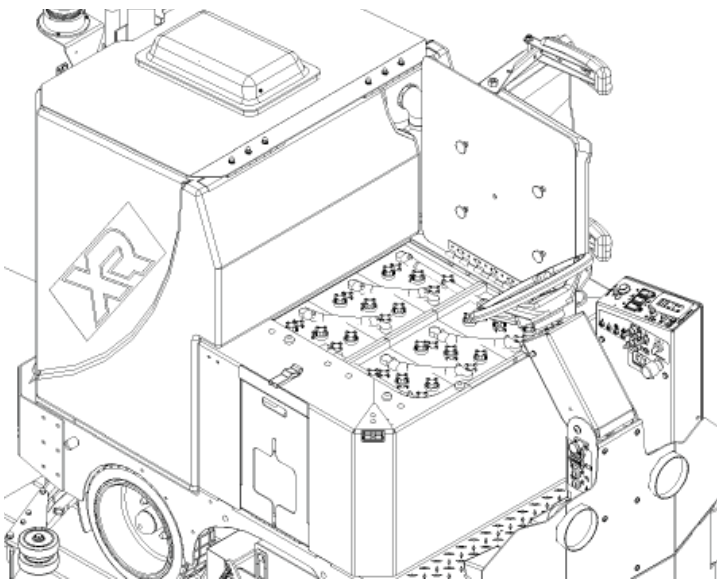
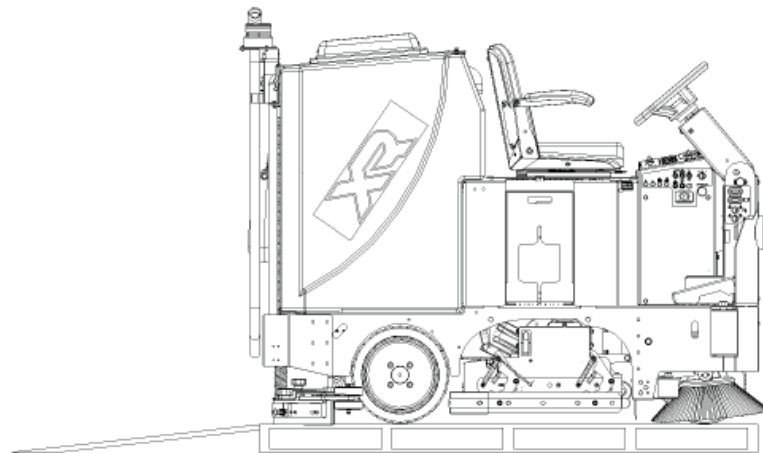
A standard machine is equipped with (6) 6-volt, deep cycle, 325 ah batteries, which form a 36 volt system. Maximum battery dimensions are 7-1/8"W x 12-1/4"L x 13-1/4"H.

6. Verify that all of the battery cables are connected to the batteries tightly. Locate any loose ones and connect to the open terminal. Tighten with 9/16" wrench. **(DO NOT OVER TIGHTEN!)** Batteries are heavy but easily damaged. Put covers in place. **(See picture to the left)**

7. Turn on main power switch and check the battery condition meter to ensure correct installation.

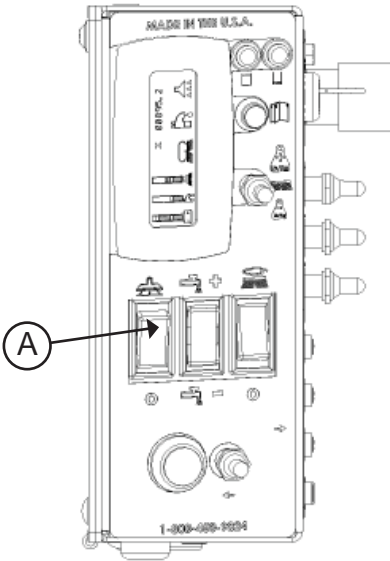
8. Fold down ramp, and drive machine off of the base.

Notify the carrier immediately if concealed damage is discovered.

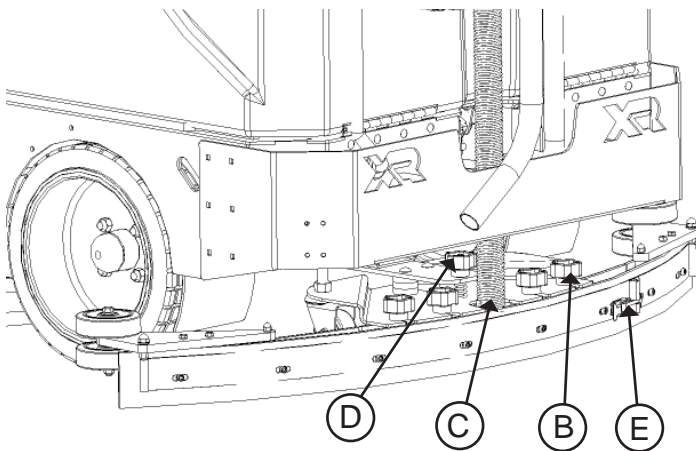


Attaching Squeegee:

1. Lower the squeegee mounting plate by depressing the squeegee switch (A) to the down position. *(See picture below)*



2. Loosen the four knobs (B) on the squeegee and slide them into the slots in the squeegee mounting plate. *(See picture below)*
3. Tighten the four knobs (B) and connect vacuum hose (C) from the machine to the squeegee. *(See picture below)*
4. You may have to adjust the squeegee pitch by turning the pitch adjustment knob (D). *(See picture below)*



5. Note vac exhaust, dual vac out *assists in drying *(See picture above)*

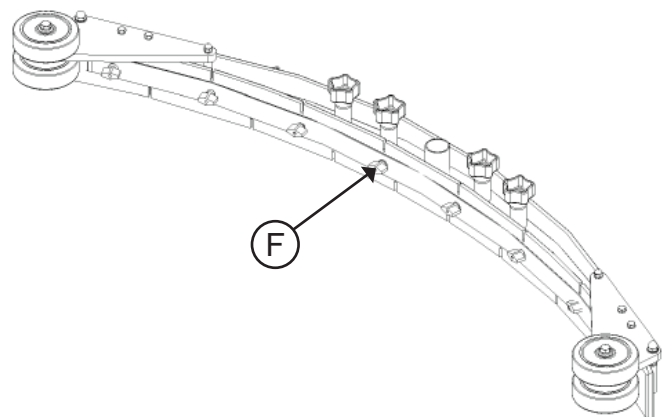
Removing Squeegee:

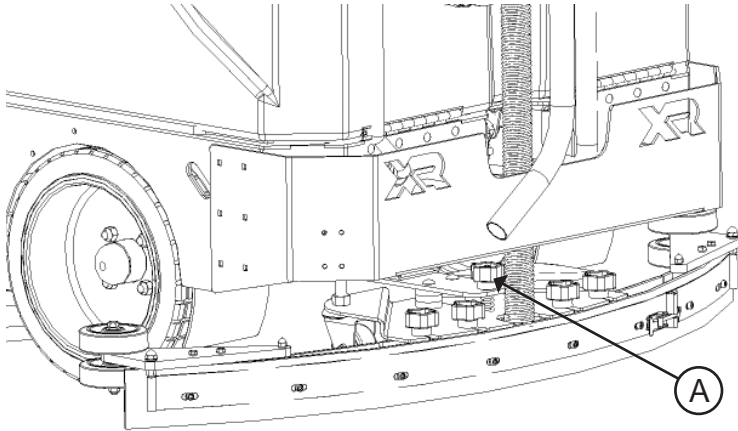
1. With the squeegee in the down position, turn key switch off & remove key.
2. Disconnect vacuum hose from squeegee and loosen the (4) knobs.
3. Pull squeegee assembly rearward from the lifting carrier.
4. Inspect or repair as necessary and reinstall.

Replacing or Rotate Squeegee Blades:

For Safety: Before leaving or servicing the machine, stop on a level surface, turn off machine, and remove key.

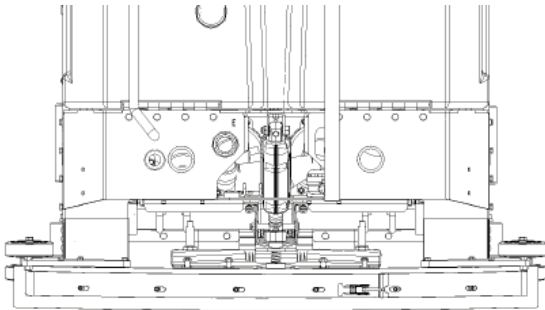
1. Remove the squeegee assembly from the machine.
2. Loosen latch (E) and swing both retaining straps away from squeegee to remove the rear squeegee blade. *(See picture at lower left)*
3. To remove the front squeegee blade, remove all the knobs (F) on the front of the squeegee assembly, then remove the retaining strap that secures the blade in place. *(See picture below)*
4. Rotate the squeegee blades to new edge position or replace as required.
5. Install blades on the locating pins of squeegee assembly.
6. Reinstall squeegee retainer straps.
7. Retighten front knobs & rear latch.



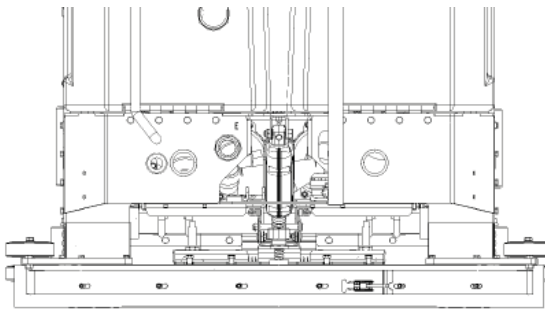


Adjusting The Squeegee:

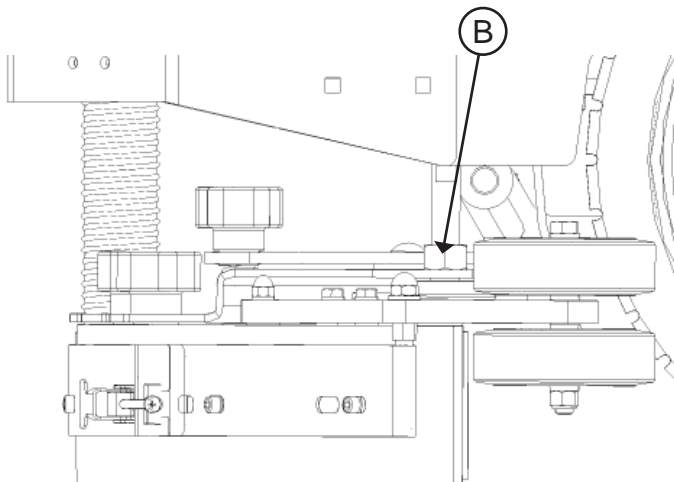
1. Turning adjustment knob **(A)** clock-wise (**Tightening**) will raise tips & lower center. (**See picture to the left**)



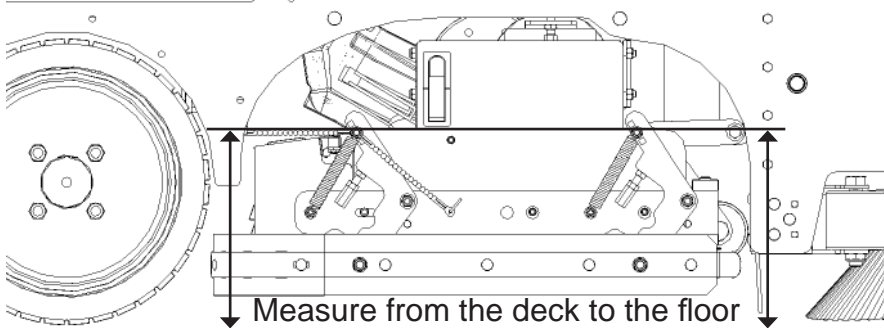
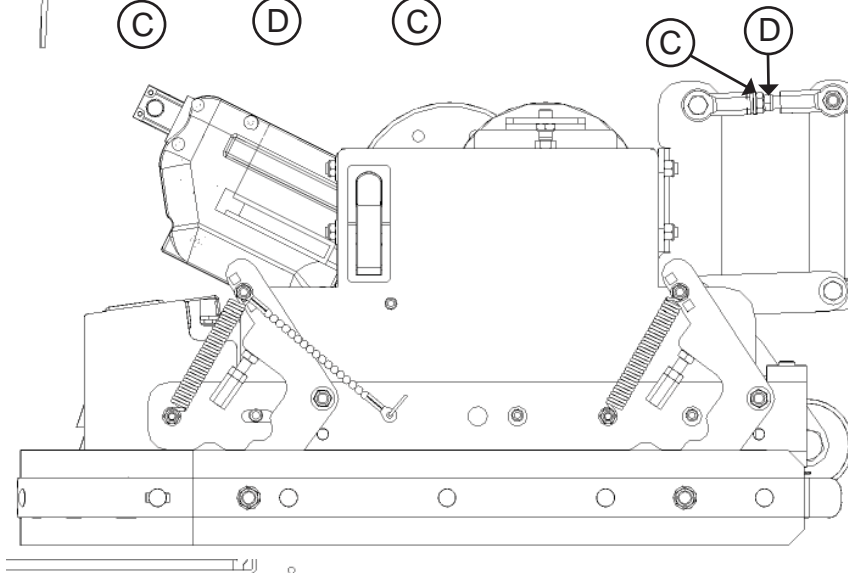
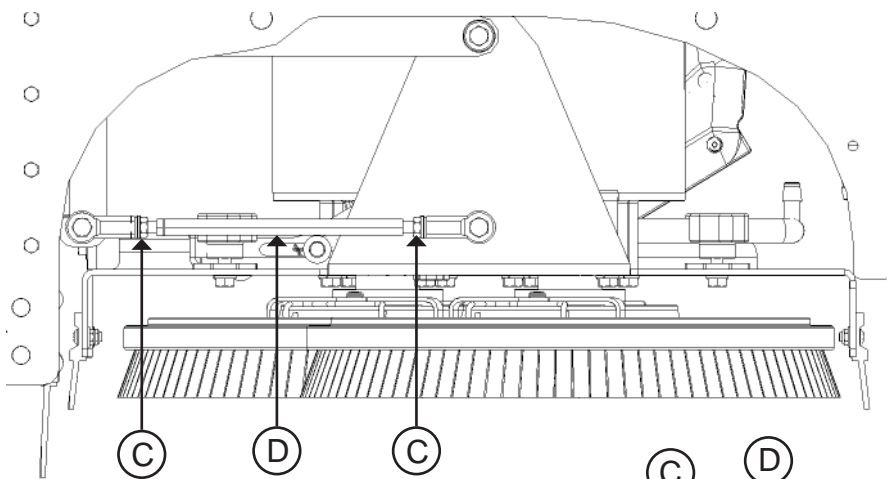
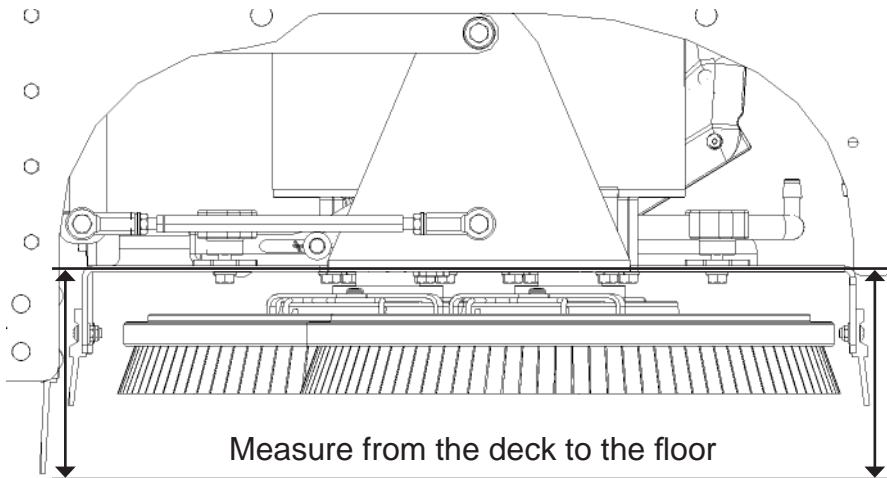
2. This squeegee is adjusted too far back and will not pick up on the corners. NOTE: Tips of the blades are off the floor. (**See picture to the left**)



3. This squeegee is adjusted just right with good deflection across the entire rear blade. (**See picture to the left**)



4. To adjust the squeegee trail wheels, first loosen locking nut **(B)**. Then turn the wheel assembly clock-wise until it bottoms out against the mounting plate and back it off **(3)** full turns. This is a starting point for adjustment. Raise or lower as needed. Retighten locking nut.

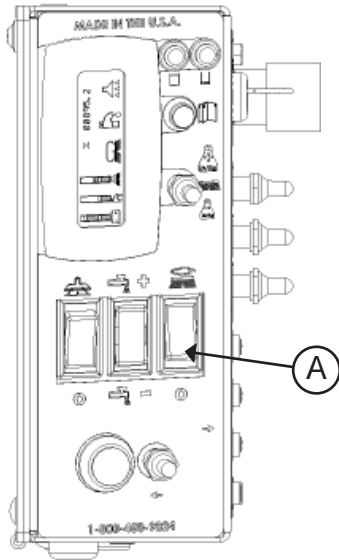


Leveling Disk Decks:

1. Drive machine to a flat level surface and turn machine off.
2. Deck should be raised off the floor.
3. With the shrouds off, measure from the ground to a parallel surface on all four corners of the scrubdeck. *(See picture to the left)*
4. If the measurements are not the same the deck is not level and needs to be adjusted.
5. Loosen the (2) locking nuts **(C)** and adjust the hexagonal arm **(D)**. *(See picture to the left)*
6. Extending the adjustable arms raises the front and lowers the rear of the scrubdeck. Measure & Retighten. *(See picture to the left)*

Leveling Cylindrical Decks:

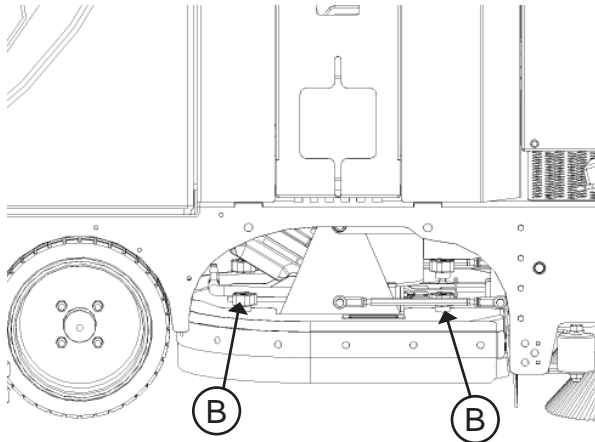
1. Drive machine to a flat level surface and turn machine off.
2. Raise the deck off the floor.
3. Measure from the ground to a parallel edge on all four corners of the scrubdeck.
4. If the measurements are not the same the deck is not level and needs to be adjusted.
5. Loosen the locking nut **(C)** and turn the hexagonal arm **(D)** on each side of the scrubdeck to level it. *(See picture to the left)*
6. Extending the adjustable arm raises the front and lowers the rear of the scrubdeck. Measure & Retighten. *(See picture to the left)*



Attaching Disk Brushes/Pad Drivers:

1. Turn "on" machine power.

2. Raise the scrub deck by depressing the brush switch **(A)** to the ("**0**") position and turn machine power "off". Disconnect batteries. (See picture to the left)

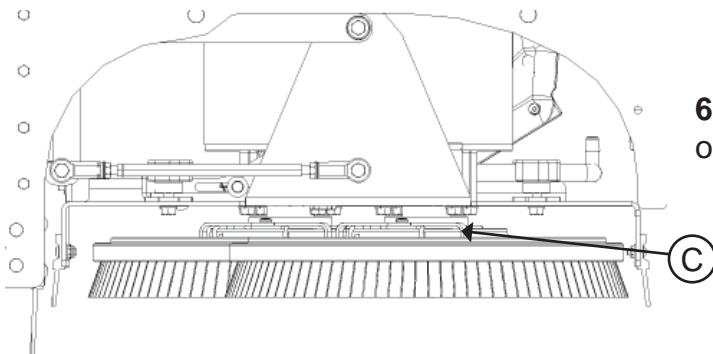


3. Loosen knobs **(B)** and remove shrouds to access scrub deck (See picture to the left)

4. Attach pads to pad drivers before connecting pad drivers to motor hub. (See picture to the left)

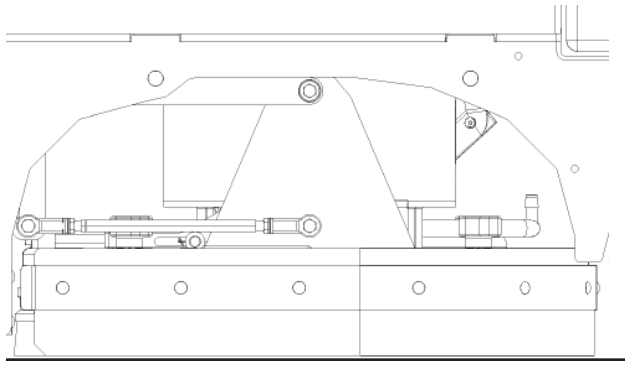


5. Attach brushes or pads to motor hubs. squeeze the scissor locking device **(C)** and lift brush up on to the motor drive hub. Make sure the scissors close and lock once the brushes are on. (See picture to the left)



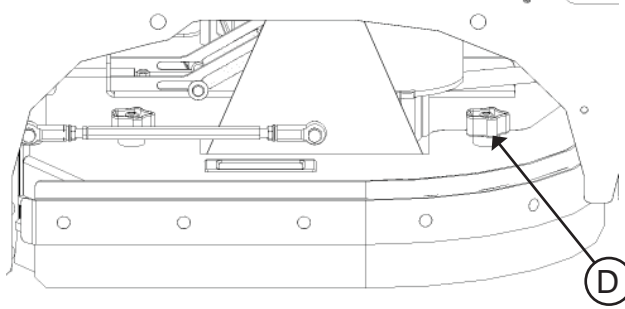
6. When brushes are attached put shrouds back on machine and tighten knobs.

For Correct Pad Application, Call Your Local Dealer

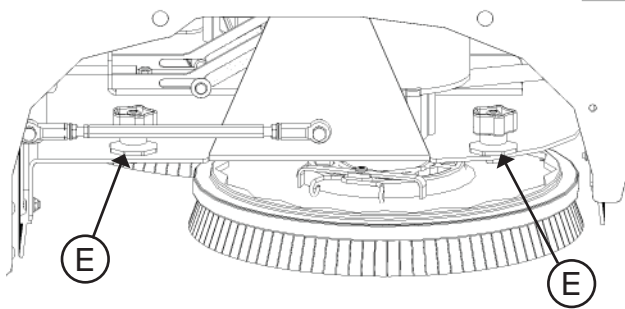
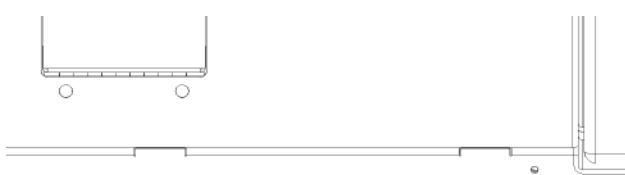


Adjusting Shrouds:

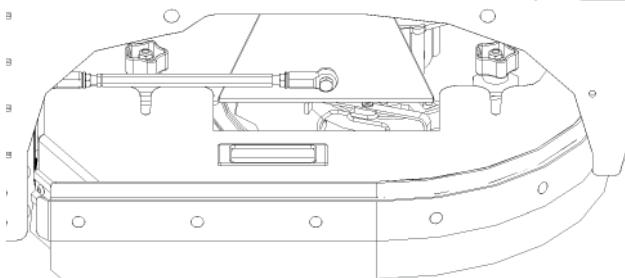
1. The shroud must be adjusted correctly in order to have proper water control during turns. The front of the shroud should be slightly higher than the rear. **(See picture to the left)**



2. To adjust shrouds loosen knobs **(D)** and remove shroud. **(See picture to the left)**

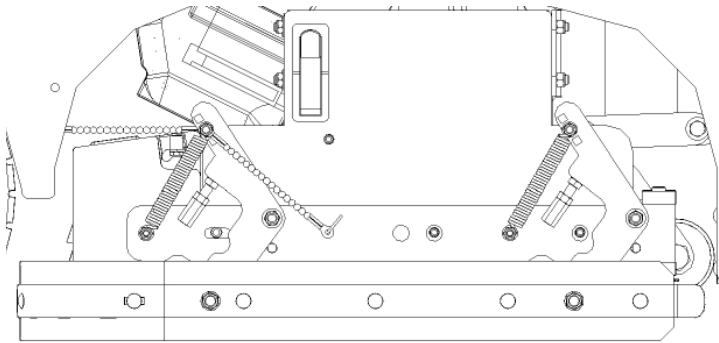


3. Spin the RED shroud support **(E)** up or down to get adjustments. **(See picture to the left)**

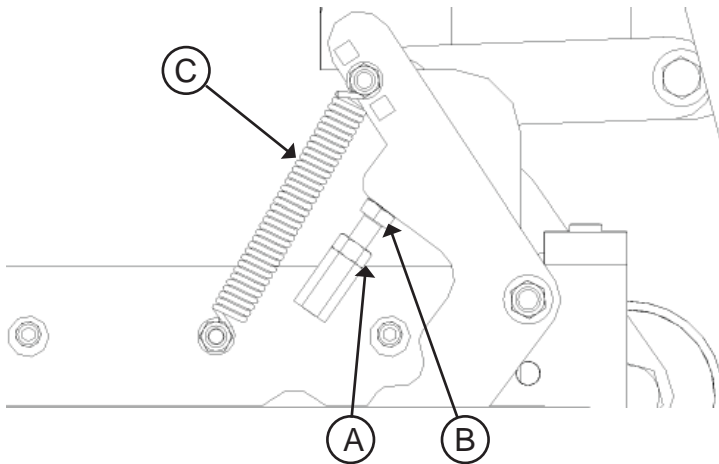


4. Once adjusted to the proper height put the shrouds back on top of adjustment supports and tighten knobs back down. **(See picture to the left)**

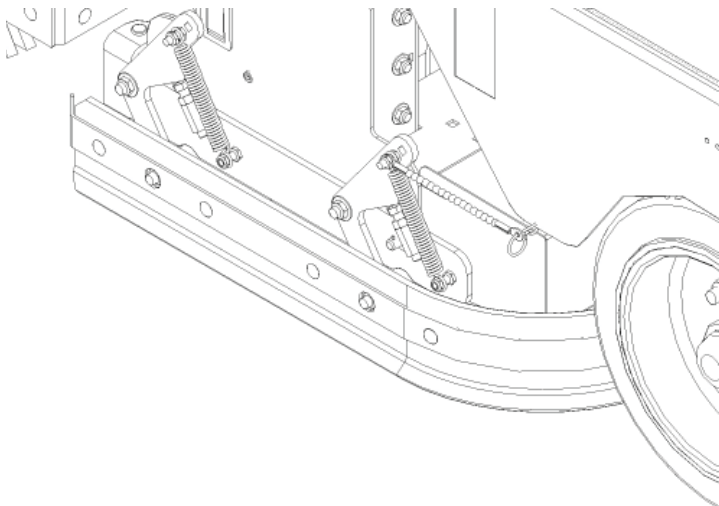
Adjusting Cylindrical Side Wipers:



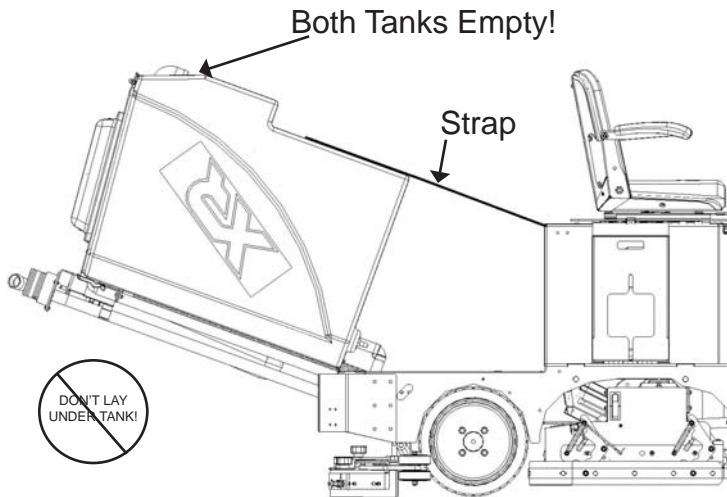
1. The cylindrical deck comes equipped with side wipers for increased water control when turning. **(See picture to the left)**



2. To adjust the side wipers, first loosen the locking nut **(A)**, then turn the adjusting screw **(B)** in to raise or out to lower the height of the side wiper blade. The spring **(C)** provides tension during adjustment. **(See picture to the left)**

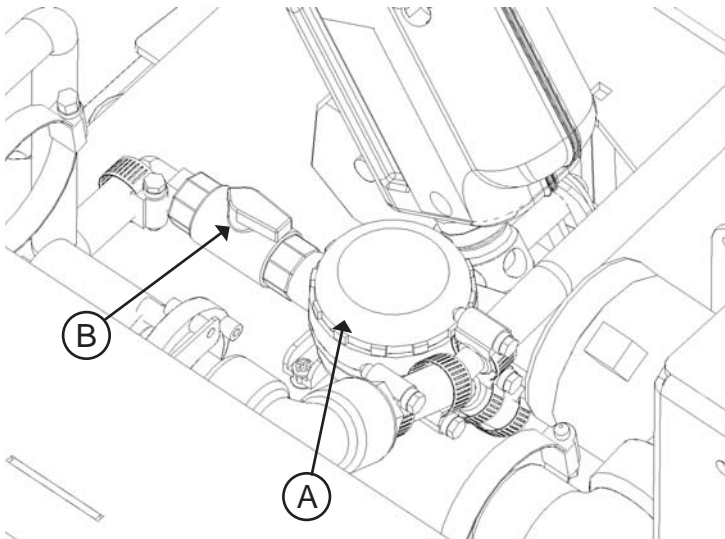


3. A properly adjusted side wiper will have slight blade deflection on the floor when turning. **(See picture to the left)**



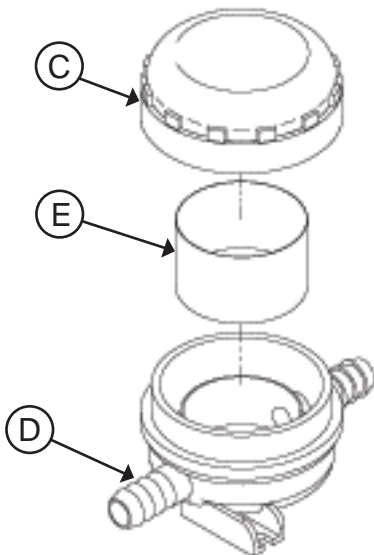
Tip Back Tank:

1. Fully drain solution tank.
2. Fully drain recovery tank.
3. Tip tank back carefully until supported by tank strap. *(See picture to the left)*



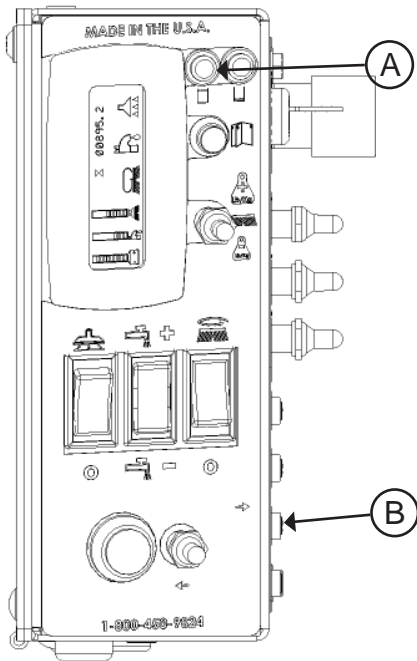
Solution Filter:

The solution system has an “Inline Filter” **(A)** to filter out cleaning solution prior to scrubbing and a “Gate Valve” **(B)** to shut off the solution to clean out the filter. *(See picture to the left)*



Cleaning Solution Filter:

1. To clean the “Solution Filter”, unscrew the clear cap **(C)** from the housing **(D)** and remove the “Stainless Steel” screen **(E)**. *(See picture to the left)*
2. Rinse any debris from the screen with clean water.
3. Reinstall screen and screw cap back on tightly.

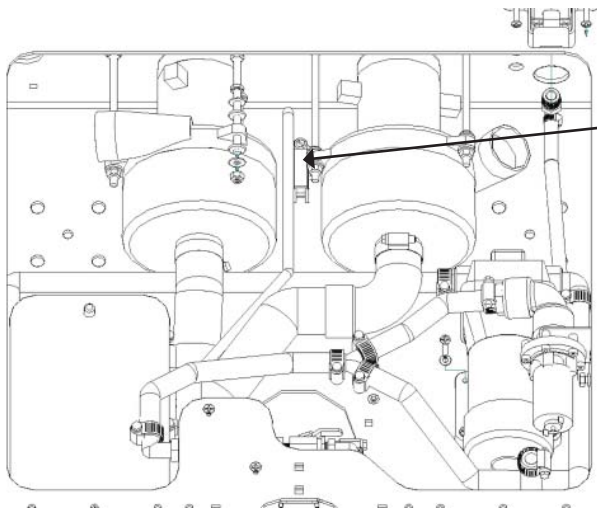


Vacuum System:

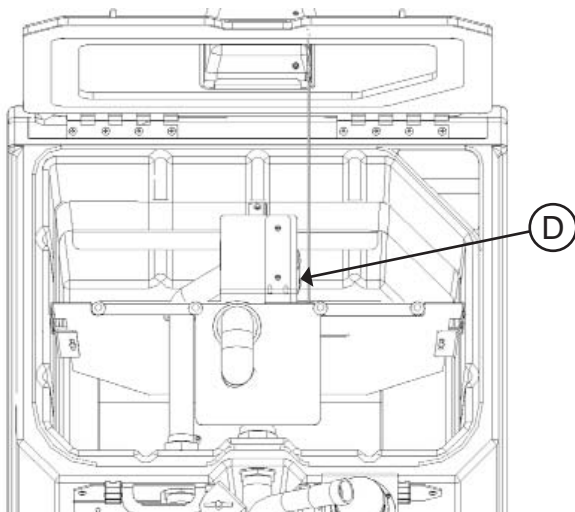
1. The “high recovery” light **(A) (red)** will illuminate and the horn will sound when the recovery tank is full. Stop immediately and drain the recovery tank. **(See picture to the left)**

2. If the red light is ignored the vac motor will overheat.

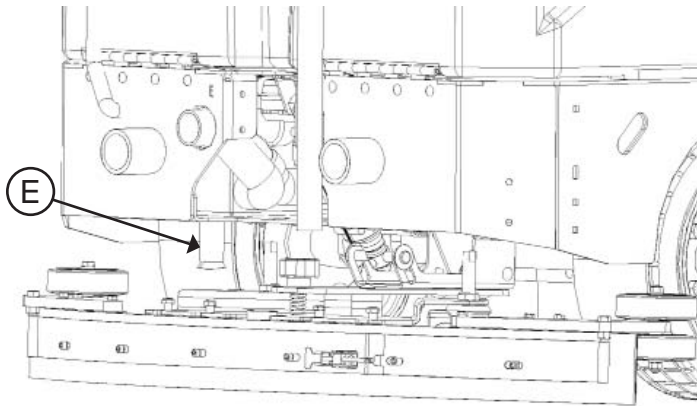
3. If the vac motor is pulling excessive current, circuit breaker **(B) (50 amps)** may blow to prevent damage. If this occurs contact your service agent.



4. Vac switch **(C)** is set to engage at 45-50” of lift.

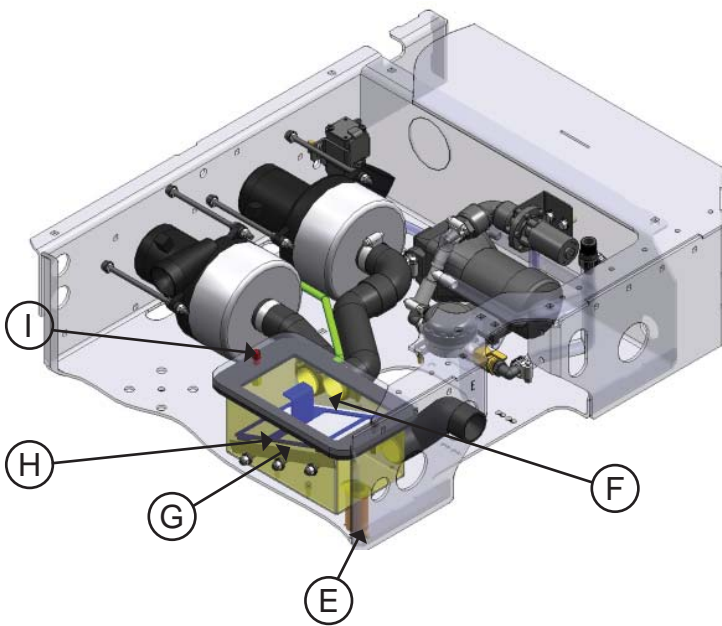


5. If foam or water gets past the recovery tank “vac screen/ball system” **(D)** the “unloader valve” **(E)** will drain it from the vac box. **(See picture to the left and next page top)**



6. “Unloader valve” (**E**) is located on the bottom of the vacuum box in the back of the machine.
(See picture to the left)

Vacuum Filter Box: Serial Number 63205 and Newer



7. The “Vac Filter Box” (**F**) is located in the back of the machine underneath the tank. To access this you need to tip the tank back. This filter box captures potential dust and soap and prevents it from getting to the Vac Motors.

8. The Filters (**G**) inside of the “Vac Filter Box” are placed inside of the box. These disposable white filters capture dust and soap from reaching the vac motors and need to be replaced when they become restricted or clogged, OR every 6 months.

9. The “Metal Filter Plate” (**H**) must be installed with tab facing the “Indexing Pin” (**I**). The filter plate holds the filters in place, while the pin holds the cover of the Vac Filter Box on securely to prevent depressurization.

Pre-Cleaning Check List:

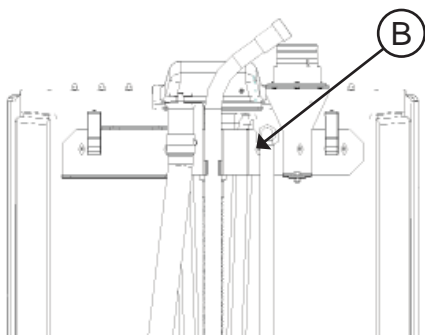
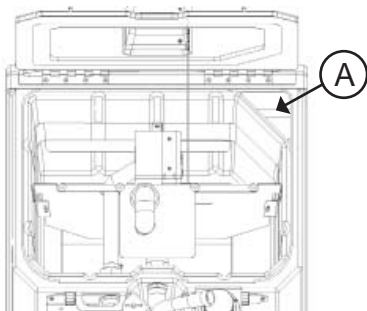
Read and understand the safety section on pages 6 and 7 before operating this machine.

1. Check battery condition gauge on the control panel. Make sure batteries are fully charged before using.
2. Check conditions of the pads or brushes.
3. Check the condition of the squeegee blades.
4. Transport the machine to the filling station. Raise the scrub head and squeegee when transporting.
5. Turn machine off.
6. Open solution fill lid on the top of the tank and fill the tank up **(A)** with clean water or “approved” detergent. For help call PowerCat Solutions at 414-745-9337. Foam in the recovery tank is usually an indication of excessive soap. **NOTE: Water temperature must not exceed 135°F/57°C and do not use high percentage bleach mixture.**

The clear tube **(B)** at the rear of the machine indicates the amount of water in the tank.

7. Add “approved” cleaning chemical. Use the proper dilution ratio indicated on the bottle. Call if unsure.

NOTE: Use only non-flammable commercial cleaning chemicals. Your authorized distributor can assist you in selecting a proper chemical.

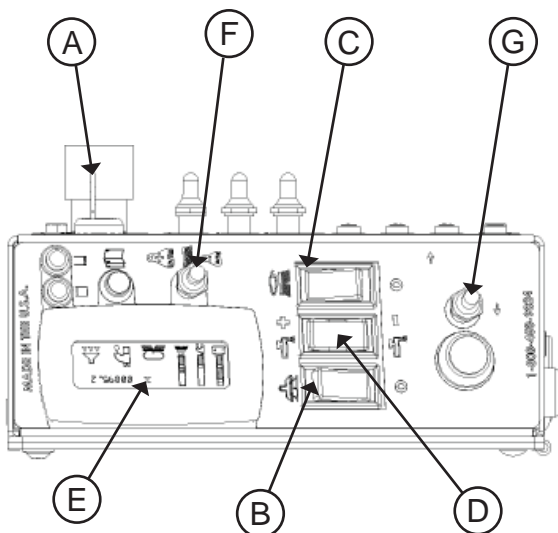


Operating Hints:

1. Observe the amount of solution the machine is dispensing on the floor and adjust to the desired flow. To increase the solution flow rate, push the “+” on the solution switch. To shut the solution off completely, push the “-”.
2. Keep an eye on the clear vacuum cover to make sure there is not any foamy buildup in the recovery tank. If excess foam begins to develop, pour a recommended foam control solution into the recovery tank. Foam is usually an indication of excessive soap.
3. Always operate at lower speeds when scrubbing around walls and objects. The operator should reduce the speed, to maintain control when turning.
4. If squeegee starts to streak, raise and wipe the blades with a clean cloth. If the problem continues, check the blades for wear or damage, and rotate if needed. You may need to pre-sweep before scrubbing.
5. Change or turn over pads when dirty. Rotate scrub brushes every week from left to right.
6. Stay clear of objects protruding from the floor, such as sockets, grates, for they will damage the pads and squeegee blades.
7. During brief stops you do not have to turn anything off. The brushes and solution will automatically stop when the foot pedal is released.
8. Always keep an eye on your gauges. They let you know the status of a particular system at a glance. If your battery gauge is reading low, you must stop immediately and recharge. Running the batteries dead will result in damage to the batteries.
9. When you run out of solution, raise the brushes and continue to vacuum the remaining water until it is consumed. The solution sight hose is used to indicate the level of detergent remaining in the tank.
10. When you are ready to stop, pick up the brushes, turn off the solution switch, lift the squeegee, and drive the machine back to the charging area. Be sure to drain both tanks before storing the machine.

One Pass Scrubbing:

1. Turn machine on with the key switch **(A)**.
2. Lower squeegee by pressing the switch **(B)**.
3. Lower scrub head to the floor, use the top half of the brush switch **(C)**.
4. Adjust the solution “+”/”-” to the desired setting **(D)**. **(Start at half way)**
5. Begin scrubbing by depressing the foot pedal slowly and then to the speed required. **(Not Shown)**
6. Once the machine begins to move, check the down pressure on the LCD screen **(E)**. To adjust the down pressure, push the toggle switch **(F)** forward to increase the pressure and backwards to decrease the pressure. Start scrubbing at the #1 or #2 marks. *Do not use the #4 or #5 marks without management’s approval.*
7. To operate machine in reverse, simply switch the reverse switch **(G)** to the reverse position, back up alarm will sound *(optional)* and your reverse speed is set to roughly 70% of forward.
8. To stop the machine, let off the foot pedal and the machine will stop automatically. **(Not Shown)**



Scrub Only:

1. Turn machine on with the key switch **(A)**.
2. Lower scrub head to the floor, use the top half of the brush switch **(C)**.
3. Adjust the solution “+”/”-” to the desired setting **(D)**. **(Start at half way)**
4. Begin scrubbing by depressing the foot pedal slowly and then to the speed required. **(Not Shown)**
5. Once the machine begins to move, check the down pressure on the LCD screen **(E)**. To adjust the down pressure, push toggle switch **(F)** forward to increase pressure backward to decrease pressure. Start scrubbing at the #1 or #2 marks. Do not use the #4 or #5 marks without management’s approval.
6. To operate machine in reverse simple switch the reverse switch **(G)** to the reverse position, back up alarm will sound *(optional)* and your reverse speed is set to roughly 70% of forward.
7. To stop the machine, let off the foot pedal and the machine will stop automatically. **(Not Shown)**

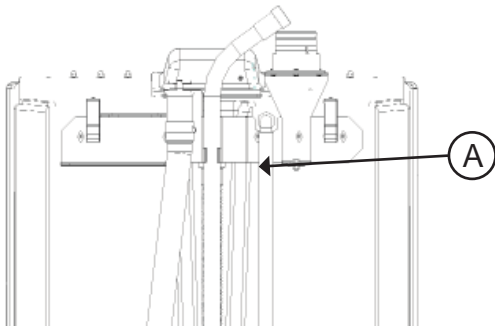
Vacuum Only:

1. Turn machine on with the key switch **(A)**.
2. Lower squeegee by pressing the switch **(B)**.
3. Begin vacuuming by depressing the foot pedal slowly and then to the speed required. **(Not Shown)**
4. To operate machines in reverse, simply switch the reverse switch **(G)** to the reverse position, back up alarm will sound *(optional)* and your reverse speed is set to roughly 70% of forward.
5. To stop the machine, let off of the foot pedal and the machine will stop automatically. **(Not Shown)**

Drain Solution Tank:

To drain left over cleaning solution from the solution tank, perform the following steps.

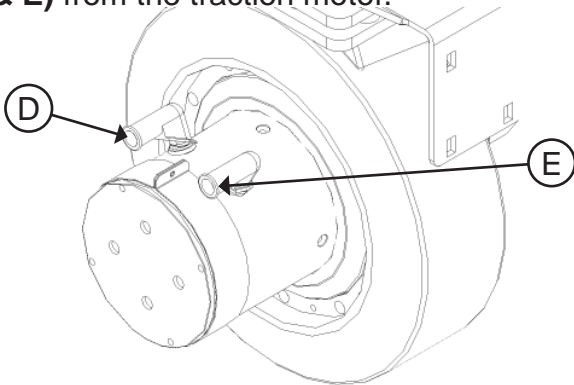
1. Pull the clear sight tube/drain hose (A) off barbed fitting. **(See picture below)**
2. Rinse out tank and solution flow system with clean water.



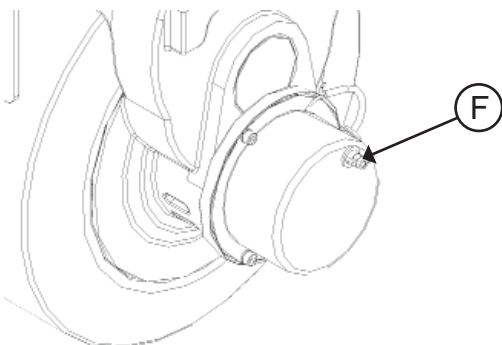
Override Parking Brake:

The parking brake must be released prior to attempting to “pull/push” the machine manually. Perform the following steps in any order.

1. Disconnect both positive and negative leads (D & E) from the traction motor.



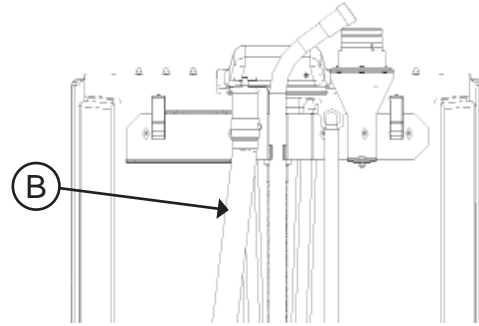
2. Turn wingnut (F) clockwise to release the parking brake.



Drain Recovery Tank:

Always empty recovery tank when refilling the solution tank. To drain the recovery tank, perform the following steps.

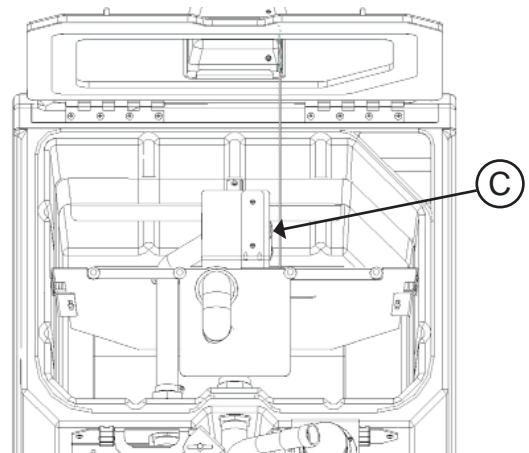
1. Remove drain hose (B) and unscrew cap. Open the top “recovery access lid” and flush out with fresh water to keep tank clean.



2. Remove cap and begin draining.

NOTE: It is the customers responsibility to verify that discarded water is in compliance with local, state, and federal laws. DO NOT DRAIN INTO “STORM DRAINS” !

3. Open the top “recovery tank lid” and flush out with fresh water to keep tank clean. Rinse the recovery tank after every use. This will prevent heavy build up on the bottom of the tank, foul odors and clogging of the drain hose. Empty “Drain Saver” (C).

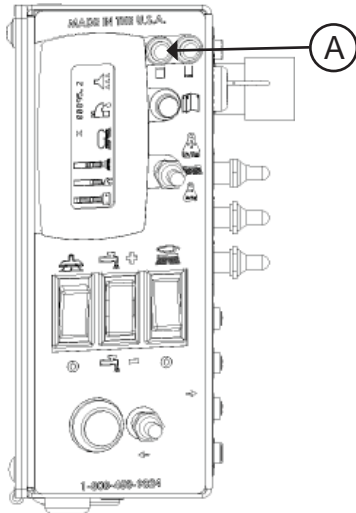


4. Once tank is empty, put the cap back on and place hose back on hook.

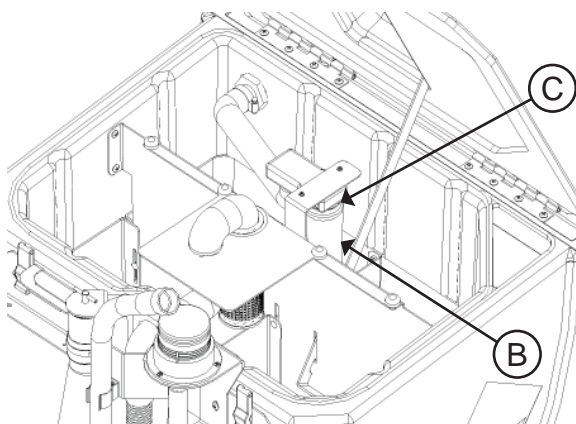
Recovery Tank Float Shut Off:

When water is no longer being vacuumed from the floor and the vacuum fan is operating, the ball float has engaged the red high recovery light **(A)** will come on.

The vacuum motor will not vacuum water with recovery tank full. The recovery tank must be drained.



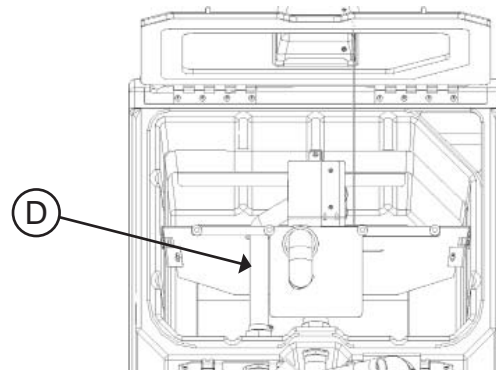
1. The float shut off **(B)** screen can be cleaned in or out of the machine.
2. To clean the float shut off while it is inside the machine, wipe material off screen, then rinse. Check that the ball is also clean and moves freely.
3. To remove the float shut off, remove the white clamp **(C)**, grasp the screen with one hand, and pull down to remove.
4. Screens, gaskets, and shut off balls must be in place.



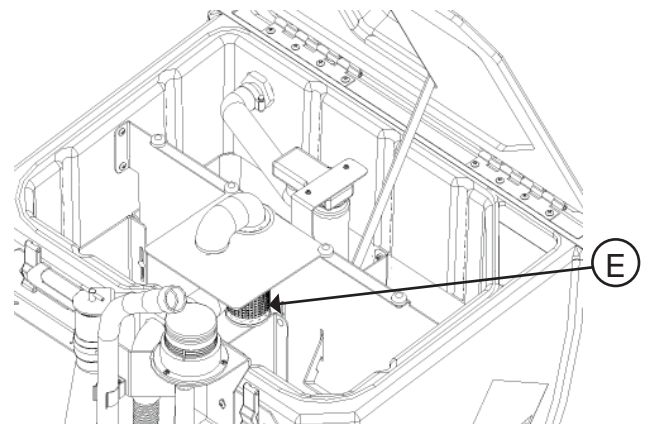
Recovery Tank Drain Saver:

The recovery tank drain saver will help prevent the drain from being clogged with debris.

1. The drain saver screen should be emptied and cleaned after you drain the tank.
2. To clean, pull hose **(D)** out of drain saver and remove screen. Empty screen into trash, wipe material off screen and then rinse.



3. When finished, place screen back into the recovery tank and re-insert hose into screen **(E)**

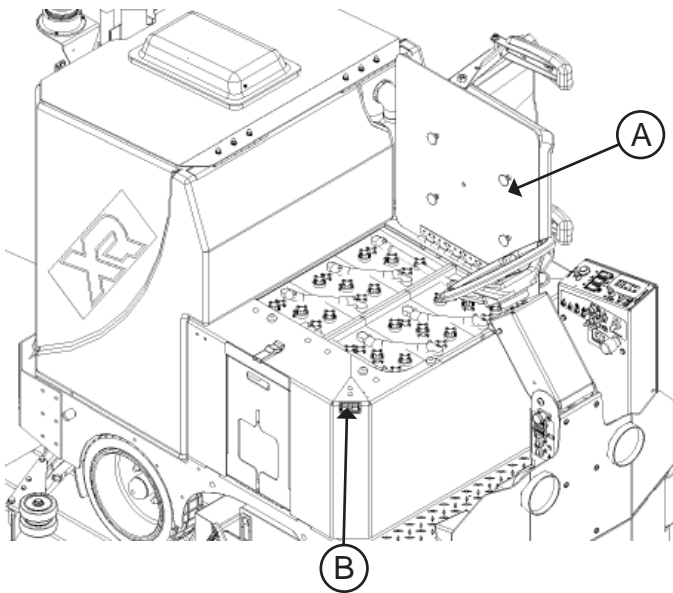


4. The screen saver must always be in place when the machine is in use to prevent clogging of drain.

Charger Specifications:

Output voltage of 36 volts. (Standard)
 Output current of 36 amps max. (Standard)
 Input voltage of 110 volts/60 Hz. (standard)
 Automatic shut off circuit.
 Made for deep cycle batteries.

Danger: Always charge batteries in a well ventilated area. Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and flame away. Shield eyes when servicing batteries and avoid contact with battery acid. Leave access panel (A) open when charging!



Standard Charger:

Caution: The following instructions are intended for the 36v charger supplied with the machine. Do not use any non OEM charger with this machine.

1. Transport machine to a well ventilated area for charging.
2. Turn the machine off.
3. Access Panel opens (A) the tank to expose the batteries. (See picture to the left)

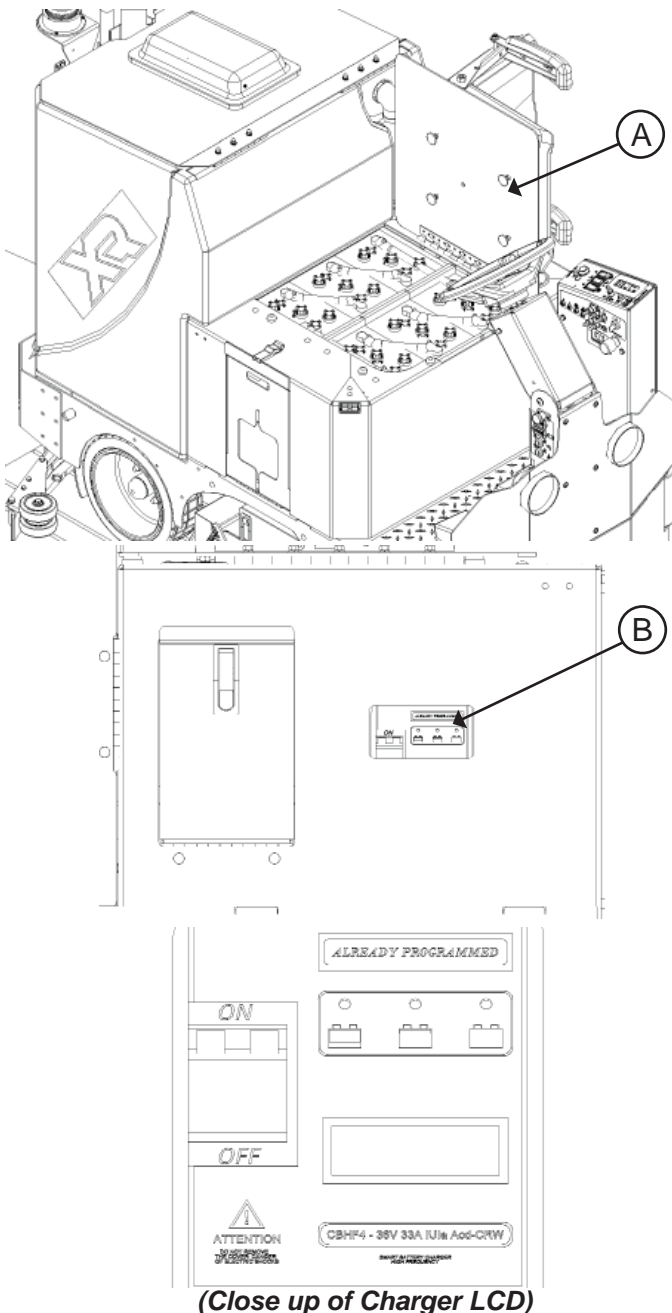
Caution: Always wear eye protection when batteries are exposed.

4. Check the water level in each battery. Do not charge the machine unless the water is slightly higher than the plates. If needed, add enough **distilled** water to 1/2" above the plates. Do not over fill. Batteries can overflow during charging. Replace caps before charging.
5. With the grey (175) charger plug disconnected from the machine, plug the charger power cord into a grounded 110 volt standard wall outlet.
6. Connect the grey charger plug into the battery charging port (B) located on the seat pedestal.
7. The charger will automatically begin charging, and automatically shut off when fully charged. (**Check gauge**)
8. After the charger has turned off, unplug the grey charger plug from the machine and disconnect the charger from the wall outlet.
9. Recheck the cell level after charging. If needed, add distilled water up to the correct level. Be certain to replace the caps securely and to wipe off the top of the batteries.

Charger Specifications:

Output voltage of 36 volts. (optional)
 Output current of 30 amps max.
 Input voltage of 110 volts/60 Hz.
 Automatic shut off circuit.
 Made for deep cycle batteries, wet or sealed.

Danger: Always charge batteries in a well ventilated area. Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and flame away. Shield eyes when servicing batteries and avoid contact with battery acid. Leave access panel (A) open when charging!



(Close up of Charger LCD)

Onboard Charger:

Caution: The following instructions are intended for the 36v "optional" Onboard Charger (B). (See left middle picture)

1. Transport machine to a well ventilated area for charging.
2. Turn the machine off.
3. Access Panel opens (A) the tank to expose the batteries. (See picture to the left)
4. Check the water level in each battery. Do not charge the machine unless the water is slightly higher than the plates. If needed, add enough **distilled** water to 1/2" above the plates. Do not over fill. Batteries can overflow during charging. Replace caps before charging.
5. Plug the extension cord into a grounded 110 volt/60 Hz standard wall outlet & flip switch. (See picture to the left) **NOTE: MUST HAVE 20 AMP SERVICE.**
6. The charger will automatically begin charging, and automatically shut off when fully charged. (Check gauge)
7. After the charger has turned off, unplug the extension cord from the machine and disconnect from the wall outlet. (See picture to the left)
8. Recheck the cell level after charging. If needed, add distilled water up to the correct level. Be certain to replace the caps securely and to wipe off the top of the batteries.

Description of LED:

Red LED - Battery level low.
 Yellow LED - Battery at 1/2 charge.
 Green LED - Battery is fully charged.

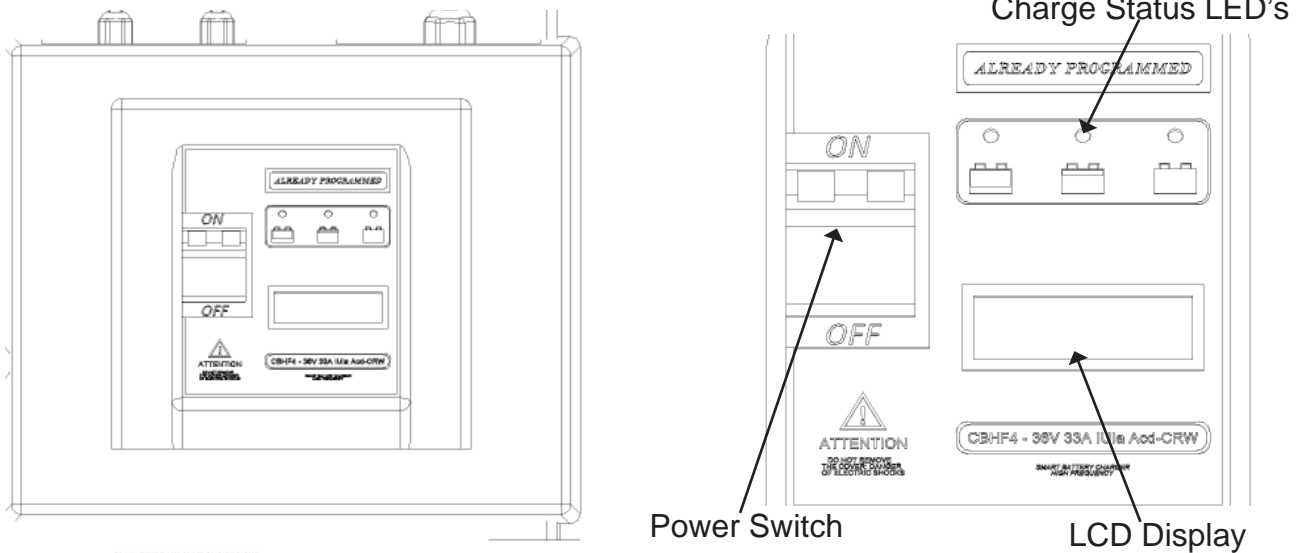
Power Cat 36 Volt 30 Amp High Frequency charger



The Power Cat 3630A is a high frequency electronic battery charger with an on board microprocessor that can be programmed for any type of battery. The charger features a fully automatic charging cycle and has built in protection against short circuits and reverse polarity.

THE CHARGER UNIT

The charger is equipped with a main power switch/ circuit breaker, 3 LED charge state indicators and an LCD display for observing charge cycle information.

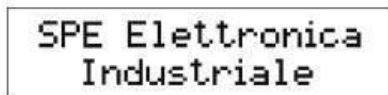


OPERATION

When the 3630A is initially switched on using the main power switch the model and the charging curve are displayed.

The charger will then scroll through a series of screens while the charger initializes and prepares to charge.

SCREEN 1 - Greeting



Power Cat 36 Volt 30 Amp High Frequency charger



When the charger reaches "Screen 8" the battery is then being charged. In "Screen 8" there are 4 parameters that are monitored.

"I" = Charger output in amps

"U" = Battery voltage

"C" = Charger output in amp hours for current charge cycle

"t" = Elapsed time of the charge cycle.

While the charge cycle is in progress the 3 LED charge state indicators show what portion of the charge the unit is in.

RED = Bulk charge

YELLOW = Finish Charge

GREEN = Charge cycle complete.

TROUBLE SHOOTING

In the event that there is a problem with charger here is a simple trouble shooting guide.

If the unit does not power on, assure that the plug for the charger is placed firmly in the wall receptacle and that that the circuit breaker for that receptacle is not blown. Make sure you have moved the ON/OFF switch to the ON position on the charger. If the circuit breaker on the wall circuit is good and the charger is plugged in and turned on call a factory authorized service center.

```
UBattery = 37.5V
Version: 100Ufs
```

If the unit powers on but stalls at this screen it is an indication that there is a problem with the battery or the connections to it. Call a factory authorized repair facility for service.

Power Cat 36 Volt 30 Amp High Frequency charger

SCREEN 2 – Firmware Listing

```
Firmwear FLASH  
Version:HF4 1.3
```

SCREEN 3 – Charger Settings

```
CBHF4: 36V 33A  
Curve: IUIa CRW
```

SCREEN 4 – Power Module Check

```
Power Modules:2
```

SCREEN 5 – Battery voltage check

```
UBattery = 37.5V  
Version: 100Ufs
```

SCREEN 6 – Master relay verification

```
Relay Master:ON
```

SCREEN 7 – Slave relay verification

```
Relay Master:ON  
Relay Slave :ON
```

SCREEN 8 – Charge status screen

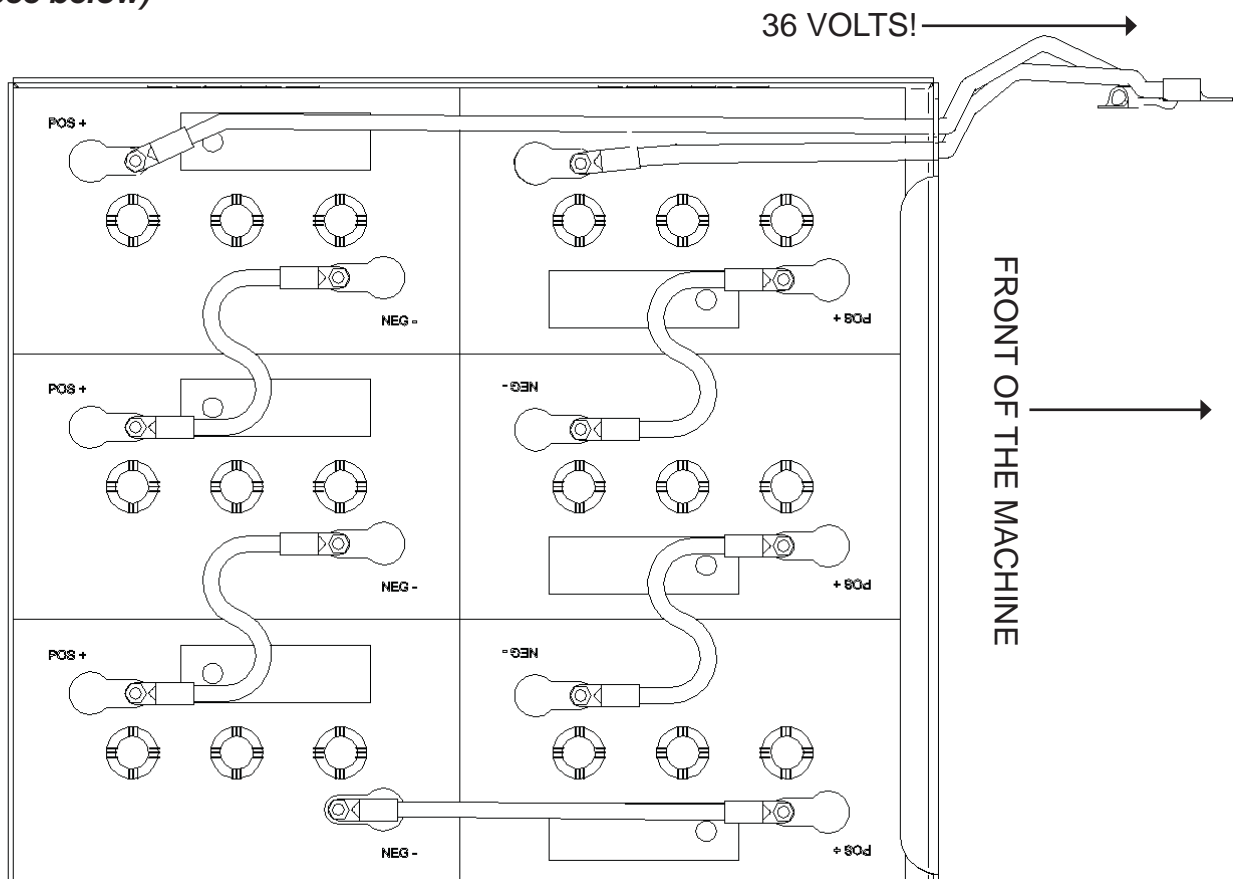
```
I=00.0A U=37.5V  
C=0000Ah t=00.0
```

Changing Batteries:

Stop machine in a clean area next to the charger. Turn off machine. **For safety: Before leaving or servicing the machine; stop on level surface, turn off machine and remove key. Use eye protection.**

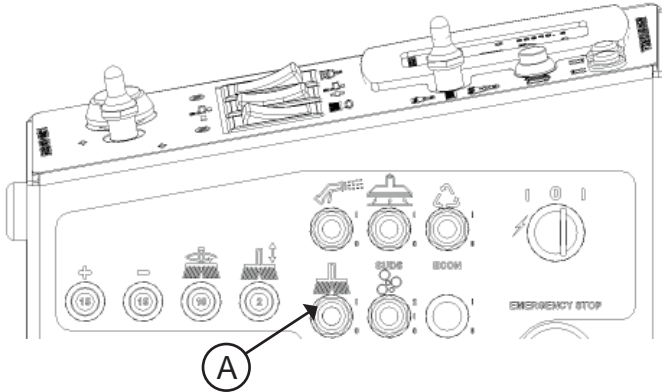
1. Tip back tank to expose batteries.
2. Disconnect main battery cables from machine.
3. Use the proper size wrench to disconnect main ground wire first and secure cable terminal away from batteries.
4. Disconnect main positive lead and secure cable and remove one at a time.
5. Loosen both terminals on each jumper cable and remove one at a time, and place away from machine.
6. Prepare a suitable site to place the batteries, store on a wood pallet, not on concrete.
7. Attach suitable battery lifting device and lift batteries from the machine

Warning! Batteries are a possible environmental hazard & extremely heavy. Consult your battery supplier for safe removal & disposal methods. Note orientation of the positive and negative posts is critical for cables to reach. Do not lift from battery posts, which cannot support the weight. (See below)



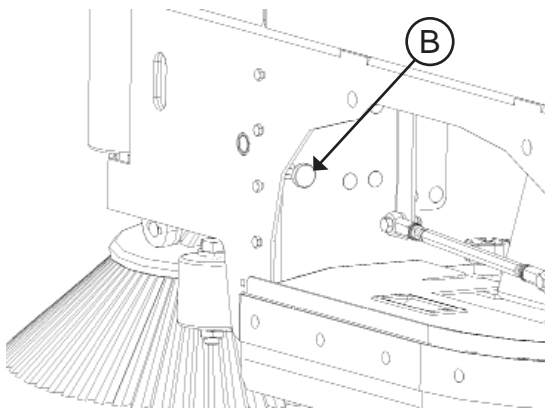
Side Broom System:

1. Flip side broom switch (A) up to lower and engage broom. (See picture below)

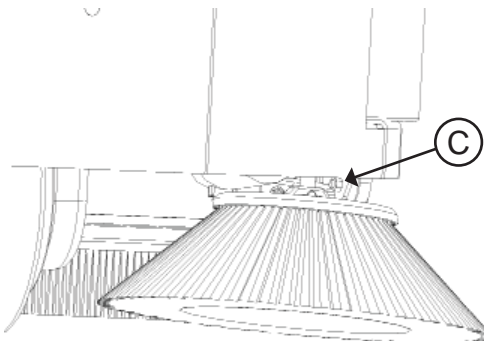


2. To adjust side broom height, loosen locking nut located behind screwhead (B) of screw that is in front of scrubdeck just inside the side wall of frame on each side of the machine. Use 1/2" wrench to loosen locking nut. (See picture below)

3. Turn adjustment screw (B) counter-clockwise (loosens) to lower side brooms. Turn screw clock-wise (tightens) to raise side brooms.



4. Side broom pitch adjustment slot (C). (See picture below)



5. Picture below shows brooms too high.



6. Picture below shows brooms too low.

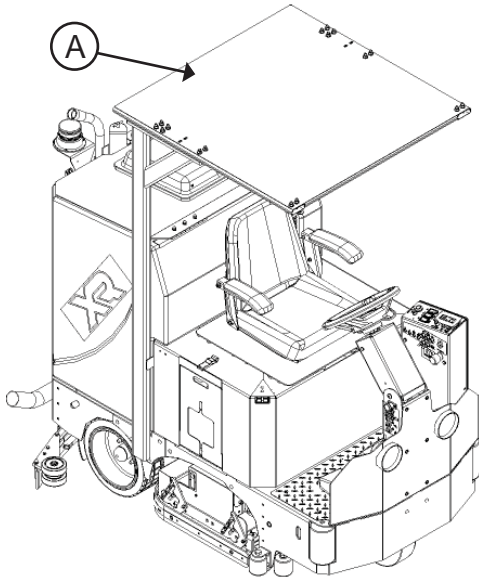


7. Picture below shows brooms just right.



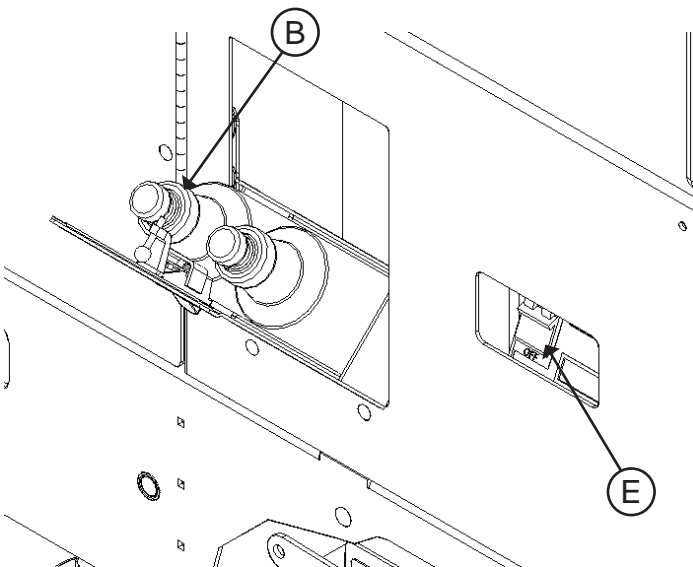
Overhead Guard:

1. Your machine may be equipped with an "optional" "Overhead Guard" (A) that helps protect the operator from falling objects that are above the operators head. (See picture below)



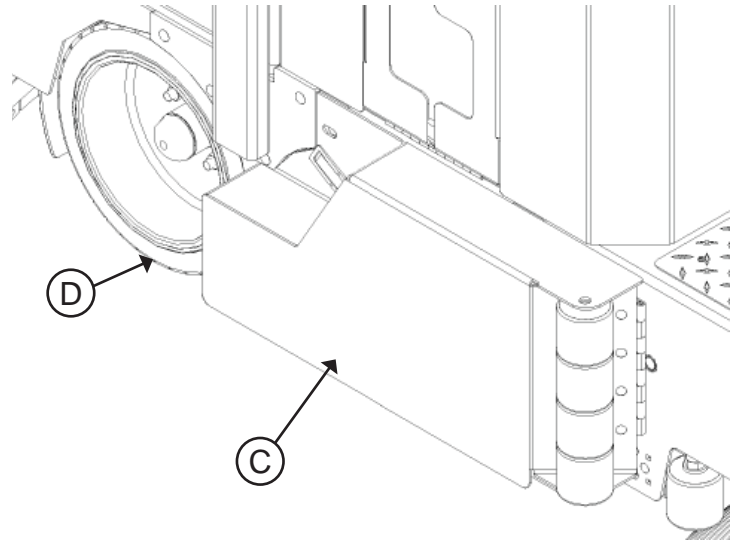
Pre Treat Soap:

1. Your machine is may be with "optional" "Pre-treat Soap" (B).
2. It helps remove stains that a normal detergent can not get out of floor. (See picture below)



HD Side Doors:

1. Your machine may be equipped with "optional" "Heavy Duty Side Doors" (C) that helps protect the machine's scrubdeck from collision damage. (See picture below)

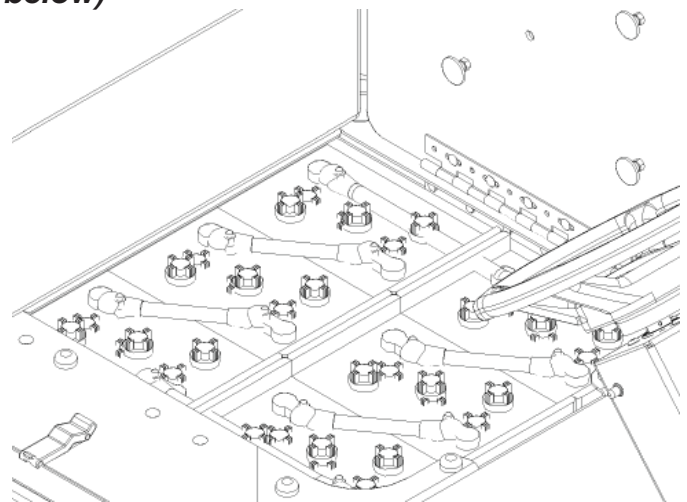


Non Marking Tires:

1. Your machine may be equipped with non marking (D) tires, which may have reduced traction on some floors. (See picture above)

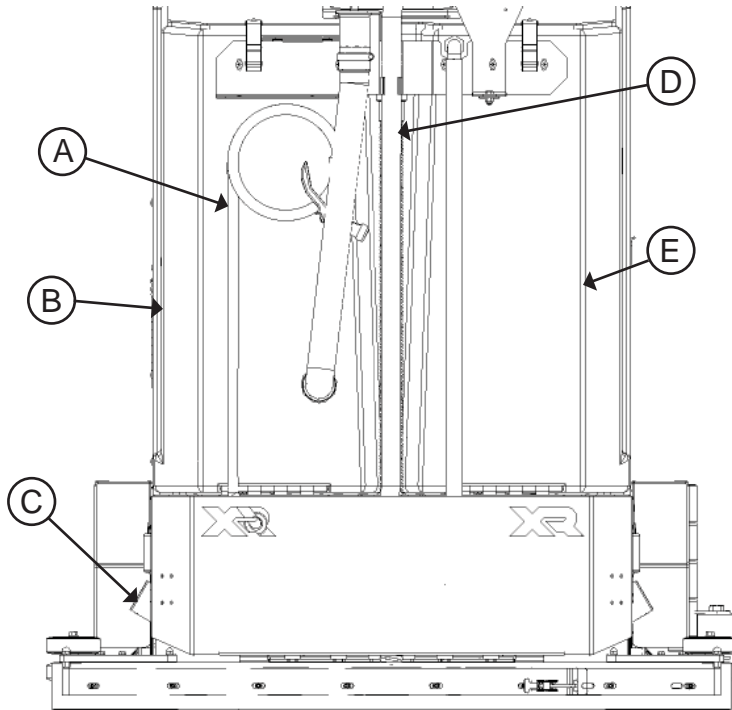
Industrial Battery:

1. Your machine may be equipped with "optional" "Heavy Duty Industrial Battery" and charger that provides longer machine run time. (See picture below)



Onboard Charger:

1. Your machine may be equipped with "optional" "On-board charger (E) that will charge your machine. (See picture to the left)

Machine Options:**Spray Hose:**

(A) Your machine may be equipped with “optional” Spray hose. Permits cleaning in remote areas.

Stainless Recovery Tank:

(B) Your machine may be equipped with “optional” stainless steel recovery tank.

Diffuser Exhaust:

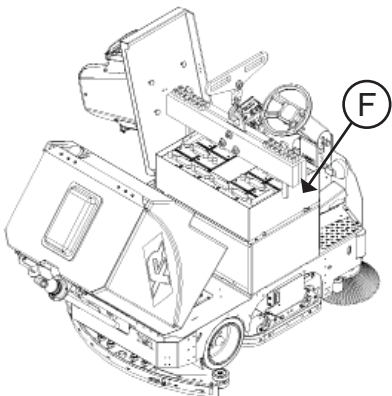
(C) Your machine may be equipped with “optional” diffuser exhaust which helps reduce noise and assist in drying the floor by dispersing air evenly to the floor.

Vac Wand:

(D) Your machine may be equipped with “optional” Vacuum wand which allows you to vacuum up water in hard to reach places.

Industrial Removeable Batteries:

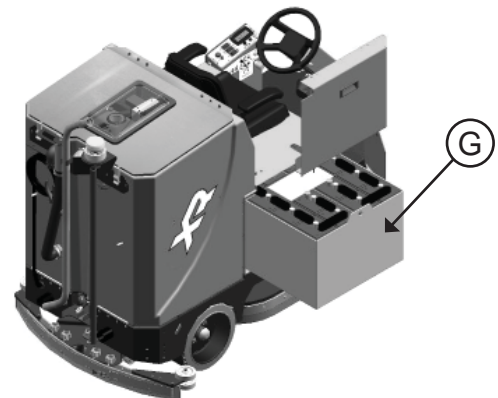
(F) The Industrial Battery we sell is one whole unit that requires and specific lift out too for a forklift. This allows to have a fully charged back-up ready for a quick switch with a fork lift.

**Stainless Solution Tank:**

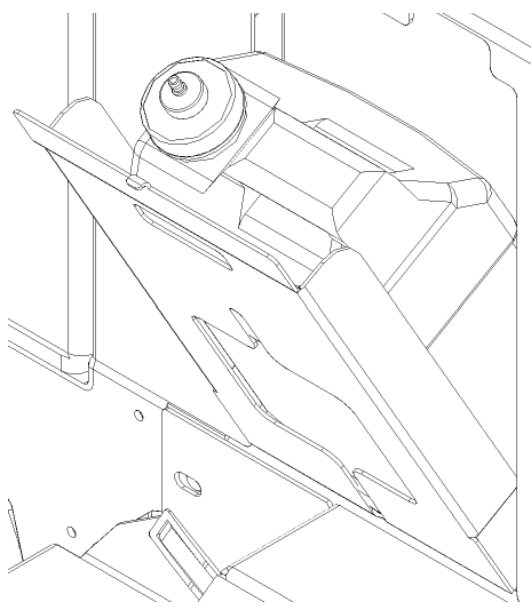
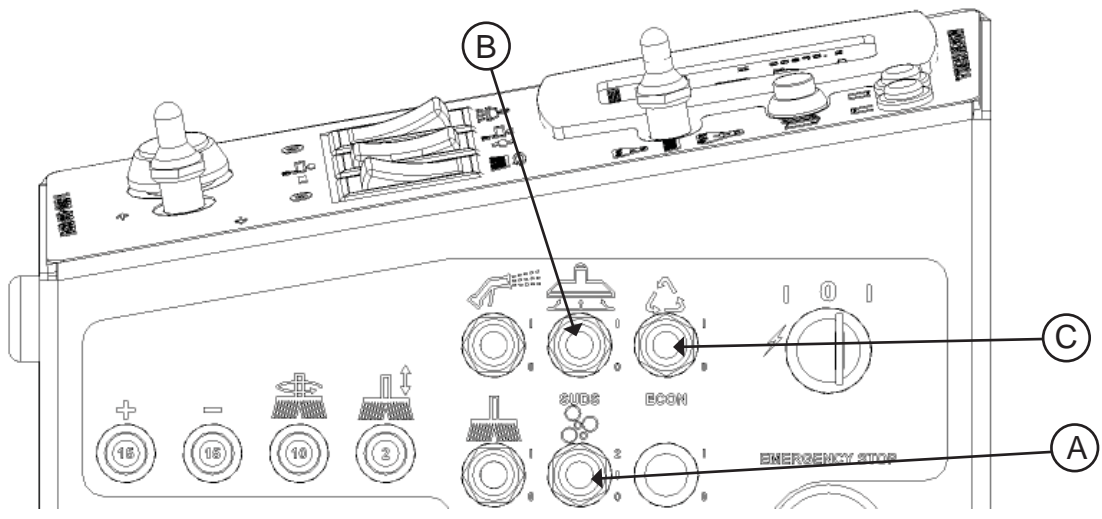
(E) Your machine may be equipped with “optional” Stainless steel Solution tank.

Roll Out Battery Box:

(G) The Roll Out Battery Box has the same functionality as the Industrial Removeable Battery Unit, but with the ability to do so without a forklift. This provides for easy switching between full sets of batteries.

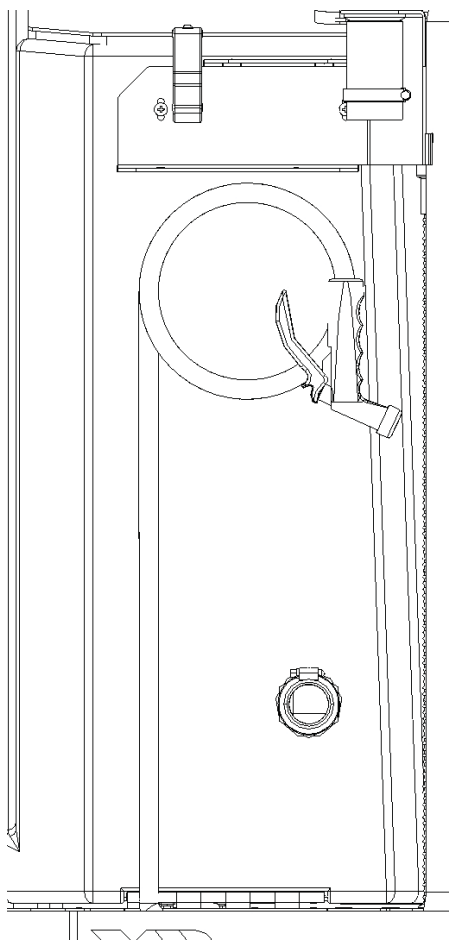
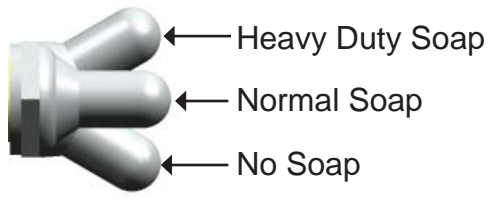


Machine Options:



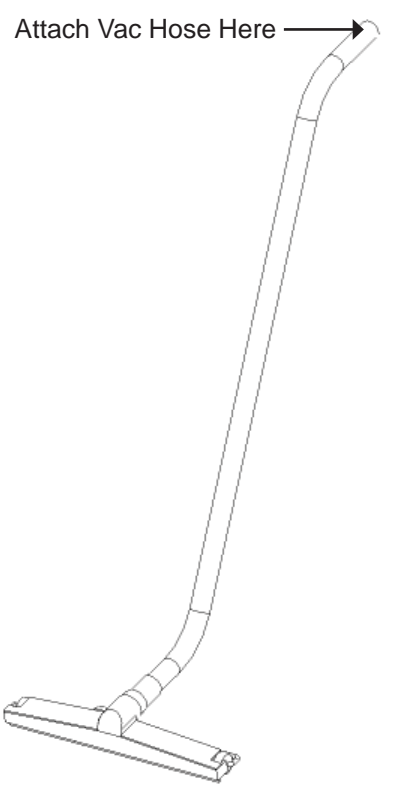
Onboard Soap:

1. Switch toggle switch up once for normal soap distribution and up twice for heavy duty soap distribution. **(A)**



Spray Hose:

1. Turn on spray jet pump using the toggle switch on the central command. **(B)**
2. Detach spray hose from back of machine and squeeze handle.



Vac Wand:

1. Detach vac hose from squeegee and attach it to the vac wand. **(See picture above)**
2. Turn on vac motors using the toggle switch on the central command. **(C)**

Daily Maintenance:

1. Remove and clean pads or brushes. Never use soiled pads when cleaning. Replace pads when they become packed with residue.
2. Remove and clean debris from the float shut-off screen and drain saver located inside the recovery tank.
3. Drain and rinse tanks thoroughly.
4. Inspect vacuum hose for any objects obstructing the air flow.
5. Raise squeegee and wiper blades with a clean cloth. Store squeegee in the raised position to prevent damage or setting of the blades.
6. Wipe down machine if needed. Use a non-abrasive, non solvent cleaner, or a clean damp cloth.
7. Recharge the batteries if needed.

Weekly Maintenance:

1. Check battery water level in each cell of the batteries, and fill as needed. Always use distilled water to refill batteries. Batteries should be filled approximately 3/4" to 1" above the plates. Overfilling will cause the batteries to leak during charging. The charging process creates gas bubbles inside the battery, which effectively increases the volume of the electrolyte.
2. Clean battery tops to prevent corrosion.
3. Rotate brushes. Rotate the left to the right and right to left. On cylindrical models from front to back, or end to end if using different materials.
4. Drain and rinse tanks thoroughly. To thoroughly flush out any solution chemicals in solution line and valves, refill solution tank with a few gallons of warm clean water and run machine until tank is empty.

Monthly Maintenance:

1. Check scrub head and squeegee lifting cables for wear and spring tension.
2. Check machine for water leaks and loose nuts and bolts.
3. Check to see if battery cables are tightened (Tighten if needed)
4. Check parking brake.

Yearly Maintenance:

Call your local dealer for yearly maintenance.

Storing Machine:

1. Be sure to flush the tanks out completely. To thoroughly flush out any solution chemicals in solution line and valves, refill solution tank with a few gallons of warm clean water and run machine until tank is empty.
2. Open the recovery tank lid to promote air circulation.
3. Raise brushes and squeegee.

Checking Battery Specific Gravity:

Use a hydrometer to check the battery specific gravity.

Checking Gravity:

A. Hydrometer

B. Battery

NOTE: Do not take readings immediately after adding distilled water, if water and acid are not thoroughly mixed, the reading may not be accurate.

Check the hydrometer against this chart:

Specific Gravity @ 80°F/27°C	Battery Condition
1.265	100% Charged
1.225	75% Charged
1.190	50% Charged
1.155	25% Charged
1.120	DISCHARGED

NOTE: If the readings are taken when the battery electrolyte is any temperature other than 80vF (27vC), the reading must be temperature corrected.

To find the corrected specific gravity reading when the temperature of the battery electrolyte is other than 80vF (27vC): add (+) to the specific gravity reading 0.004 (4 points), for each 10vF (6vC) above 80v (27vC) subtract (-) from the specific reading 0.004 (4 points), for each 10vF (6vC) below 80vF (27vC).

Maintenance Service Schedule					
Maintenance	Before Each Work Period	After Each Work Period	50 Hrs	100 Hrs	200 Hrs
Check water level of batteries after charging. Add distilled water if necessary.	X				
Check that recovery tank cover seals tightly.	X				
Visually check for damaged or worn tires.	X				
Check brushes or pads for proper installation.	X				
Check vacuum hose connections.	X				
Check that squeegee is securely attached and properly adjusted.	X				
Check that side squeegees are properly adjusted.	X				
Check for attached drain hose, plug and caps.	X				
Check parking brake and terring for proper operation.	X				
Inspect vacuum filter for debris.		X			
Clean out solution tank and filter, check flow valve.		X			
Run vacuum motors to dry.		X			
Clean brushes or pads and check for wear.		X			
Clean main and side squeegee blades and check for wear.		X			
Clean out recovery tank and vacuum filter.		X			
Clean and inspect flow shut off.		X			
Clean outside of tanks and check for damages.		X			
Store with tank covers open.		X			
Charge batteries.		X			
Check side squeegee for wear.			X		
Clean off top of batteries.			X		
Check battery cells with hydrometer.			X		
Inspect scrub deck skirt.			X		
Clean solution strainer.			X		
Check battery connections are tight.			X		
Check parking brake adjustment.				X	
Check battery case and battery compartment.					X
Check brake for damage or wear.					X
Clean pivot points on squeegee and scrub deck.					X
Check all motors for carbon brush wear.					X
Check motor commutators.					X
Check steering chain tensioner.					X
NOTE: Traction drive, wheels and batteries should be serviced based on traction drive hour meter. The scrub brush hour meter should be used for all other service schedule items.					

XR Preventive Maintenance

CUSTOMER INFORMATION			
CUSTOMER		EMAIL	
ADDRESS		PHONE	
CITY	ST	ZIP	CONTACT

MACHINE INFORMATION	
MODEL #	SERIAL #
WORK ORDER #	HOUR METER (KEY)
CHASSIS HOUR METER	HOUR METER (TRACTION)
RECHARGE NUMBER	HOUR METER (SCRUB)
	HOUR METER (VACUUM)

BATTERY CONDITION	Cell #1	Cell #2	Cell #3
Battery # 1 Hydrometer Reading			
Battery # 1 Water Condition			
Battery # 2 Hydrometer Reading			
Battery # 2 Water condition			
Battery # 3 Hydrometer Reading			
Battery # 3 Water Condition			
Battery # 4 Hydrometer Reading			
Battery # 4 Water condition			
Battery # 5 Hydrometer Reading			
Battery # 5 Water condition			
Battery # 6 Hydrometer Reading			
Battery # 6 Water condition			

Clean Battery Tops. Check Battery Cable and Terminal Condition
NOTES

BRUSH CONDITION				
Scrub Brush Fiber Length	Rotated Brushes			
Broom Driver Sockets (4)	Good	Worn	Needs Replacement	
Driver Idler Hubs	Good	Worn	Needs Replacement	
Side Broom Condition	Good	Worn	Needs Replacement	Rotated Side to Side

CHECK OPERATION AND CONDITION OF:	IN SPEC	REPAIR	PROBLEM
Steering wheel Tilt Mechanism			
Key Switch			
Horn			
Head Lights			
LCD Display			
Page Button			
Brush Pressure Toggle			
Managers Lock Out			
Foot Pedal			
Reverse Switch			
Back Up Alarm (Reverse Only)			
One Touch Switch			
Brush Switch			
Solution +/- Switch			
Solution Solenoid			
Low Solution Light			

XR Preventive Maintenance

Brush Deck Lift System			
Brush Motors			
Vacuum Switch			
Vacuum Motor Performance			
Off-Board Vac Switch			
Squeegee Lift System			
Squeegee Adjustment Pitch and Height			
Squeegee Blades			
Drain Hose and Plug			
Side Broom Operation			
Spray Jet Pump, Hose & Nozzle			
Strobe Light			
Battery Charger Connectors & Function			

CLEAN AND/OR LUBRICATE	IN SPEC	REPAIR	PROBLEM
Solution Tank Condition			
Squeegee Pivot Points & Knobs			
Scrub Deck Linkage			
Solution Filter Cleaning			
Steering Chain			

VISUALLY INSPECT	IN SPEC	REPAIR	PROBLEM
Solution Tank Condition			
Recovery Tank & Gasket Condition			
Drain Saver			
Vacuum Floats & Screen			
Vacuum Hoses			
Solution Hoses			
Blade Retainers & Hardware			
Squeegee Wheels			
Brush Skirts			
Drive & Rear Wheel Condition			

COMMENTS

Servicing Distributor _____

Technician's Name _____ Date _____ Signature _____

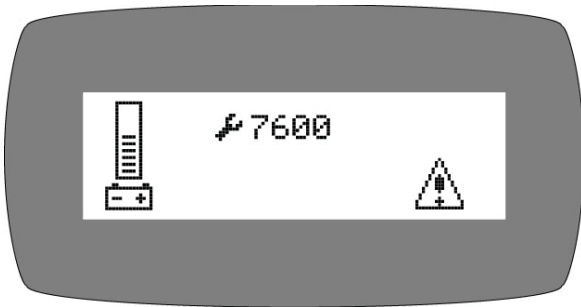
Customer's Name: _____ Date _____ Signature _____

Troubleshooting Central Command:

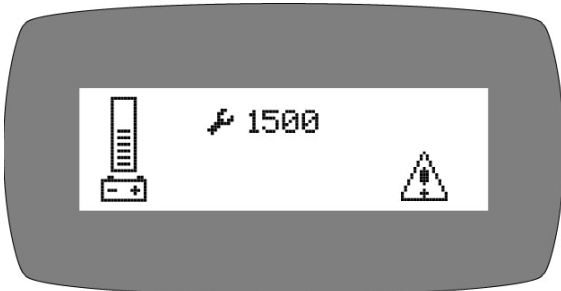
Note: This machine is operated by a sophisticated electronic “controller” that has many fail-safes within it. It self-analyzes problems and flashes a four-digit alpha-numeric code of what is wrong in the LCD window.

Most of these codes require a technician attention. You should not attempt repairs you are unfamiliar with, especially if you are not authorized to work on this equipment.

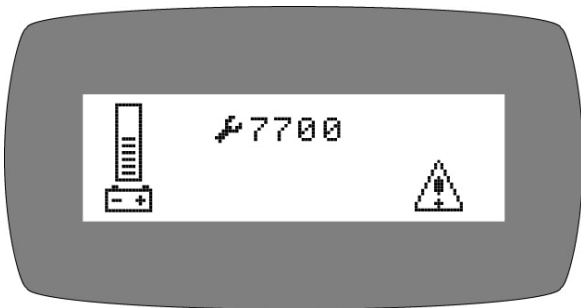
The complete list of codes is published in the simplified electronic troubleshooting manual, which is available to authorized and certified distribution technicians. However, we have included the basic codes that you can usually resolve yourself.



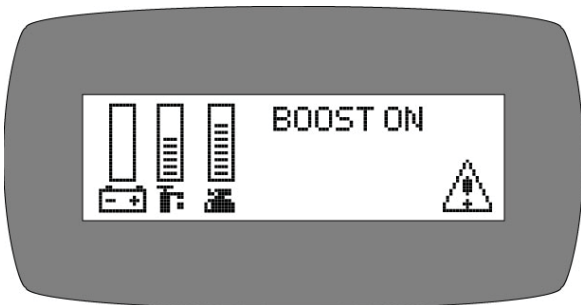
1. 7601 and 7602 ERROR: Scrub deck current over load. This can occur when driving over a bump in the floor. To restart, turn off the key and turn it on again. To avoid this error, either slow down on bumpy parts of the floor, or reduce down pressure on the pads.



2. 1500 ERROR: There is an open in the parking brake circuit. Check the parking brake wiring and the parking brake coil to find the open circuit.

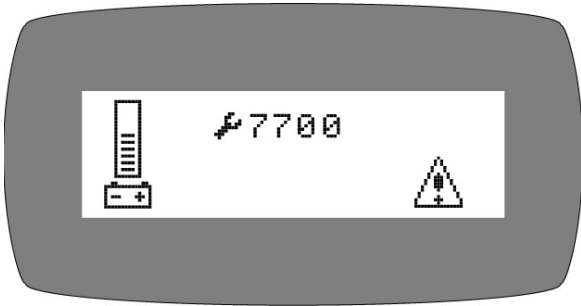


3. 770, 7701, 7702, and 7703 ERROR: The vacuum motor has exceeded their authorized power limits. Turn off key and turn on again to clear.

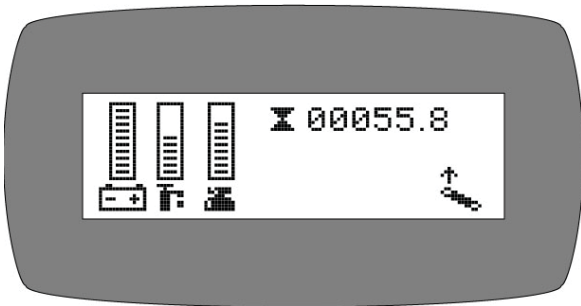


4. BOOST ON: Allows front wheel drive to draw more power when needed to climb ramps for 30 seconds.

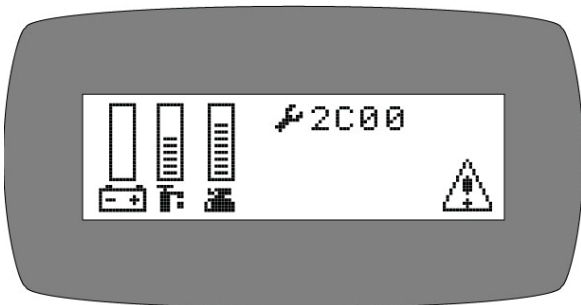
Troubleshooting Central Command:



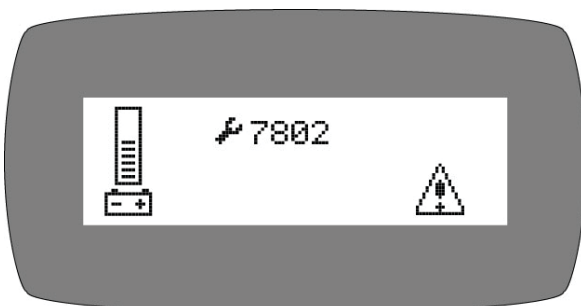
5. **7700:** Vacuum motor circuit is open.



6. **Throttle ERROR:** You pressed the foot pedal before turning on the key. Turn off the key and try again, leaving foot off of the pedal.



7. **2C00 and 2C01 ERROR:** Low voltage warning. Voltage has dropped down below the minimum required to operate the machine. If you wait a few minutes, the batteries may come up in voltage, allowing you to drive very slowly to the recharge station. If not, you will have to release the parking brake (on the front wheel, pull lever toward the front of the machine to release) and push the machine to recharging station. You must disconnect the traction motor! (+ cable first)



8. **7802 ERROR:** The traction motor pulled excessive current perhaps running a ramp for more than the 60 seconds allowing for this. Turn off the key, turn on again, and continue. You should not use this machine to climb ramps so steep and so long that this code comes up repeatedly, or you could overheat the traction motor.

9. **All other ERROR codes:** Turn off the key, and disconnect the positive battery cable from the batteries for more than one minute (the time is needed to drain the controller on-board capacitor). Reconnect cables, being sure that it is tight. ***Too loose and you will burn battery. If you over tighten the cables you can damage the battery lead terminal. Try again.***

10. If the problems cannot be solved by any of this solution, call your local dealer service department.



CENTRAL COMMAND II SYSTEM DIAGNOSTIC CODES



Code	Fault Description	Course of correction
0204	Controller Memory Corrupt	Disconnect battery for 2 minutes. Reconnect. If code is still present replace the control.
0700	Bias Voltage Error	High reference signal is grounded
0701	Mid Rail Voltage High	
0702	Mid rail bias voltage high	
0704	12V supply failure	
0705	2.5 V reference error	
0706	High reference ground fault	5 Volt reference is Contacting 0 Volt Reference
0810	Throttle High reference error	For all Throttle Diagnostic Codes
0811	Throttle Max Wiper Difference Error	Check throttle wiring for shorts or opens. Repair or replace as necessary.
0812	Throttle Max Pull Down Difference Error	If diagnostic code is not cleared, then replace the throttle potentiometer
0813	Throttle Max Pull Safe Difference Error	
0814	Throttle Reference Error	
0815	Throttle Lo Reference Error	
0816	Throttle Hi Reference ISO Error	
0817	Throttle Lo Reference ISO Error	
0818	Throttle Error: Both have Readings	
0A01	Power down error	Check the wiring to the main power switch. This code indicates rapid power cycling
1310	Excessive Current Trip	Current Draw on Control exceeds maximum limit of 250 amps Resistance in the machine's Main Breaker and/or battery cable to control Gives a false reading to the control.
1311	Brush head actuator, excessive current	Device connected to the brush head actuator has exceeded maximum limit of 21 amps surge value and 7 amps continuous. Check that the arms are not too tight (torque = 25 inch lbs, almost finger loose). Check that actuator system is not binding.
1312	Squeegee actuator, excessive current	Device connected to squeegee actuator (on riders) has exceeded max limit of 21 amps surge value and 7 amps continuous load. Check that the arms are not too tight (torque = 25 inch lbs, almost finger loose). Check that actuator system is not binding.
1313	Solution valve circuit output(Aux 3), excessive current	Current exceeded seven amps max. Check valve operation. Coil may be corroded, or short in wires.
1314	Soft Aux 4 Over current Occurred	Aux 4 is one of the following: High Vac Horn, Under Seat Fan, Suds Valve
1318	Soft Brake light Over current Occurred	Brake light circuit not used by us at this time.
131C	Backup Alarm Over current occurred	Backup alarm drew more than 2 amps max allowed. Check inline resistor on some models. If resistor is bad, remove it, and put piece of duct tape over speaker of alarm. (Reverse EMF from the echo is causing the problem)
1321	Aux 1 (Brush Actuator) Over current 2 Occurred	Brush actuator exceeded 12 amps for less than 0.1 sec. See notes for 1311
1322	Aux 2 (Squeegee Actuator) Over current 2 Occurred	Squeegee actuator exceeded 12 amps for less than 0.1 sec. See notes for 1312
1331	Relay #1 failure. Traction Drive relay	Relay current limit exceeded or contacts are may be damaged.
1332	Relay #2 failure. Output (brush, vac all others) relay.	Relay current limit exceeded or contacts are may be damaged.
1400	Bridge Fault 1 - Brush or traction motor not in correct voltage range.	Possible short between B+ and the high amperage outputs
1401	Bridge Fault 2 - Voltage difference on traction bridge too great	
1402	Brush Bridge Fault - Battery/Brush bridge voltage difference too great	
1411	Brush actuator positive wire is shorting	Find appropriate wire and remove short.
1412	Brush actuator negative wire is shorting	Find appropriate wire and remove short.
1413	Squeegee actuator positive wire is shorting	Find appropriate wire and remove short.
1414	Squeegee actuator negative wire is shorting	Find appropriate wire and remove short.
1500	Brake Fault - Solenoid brake circuit is open	Parking Brake is disconnected or coil of brake is open.
1501	Brake Fault - Solenoid brake circuit is shorted	Parking Brake coil or wiring is shorted.
1502	Brake Fault - Brake Over Current Error	Parking brake coil is shorted internally or wiring too it is shorted
1503	Solenoid brake driver fault	
1504	Solenoid brake interlock fault	
1507	Brake Over current	Parking Brake is drawing too much power. Check wiring and brake.
1600	High Battery Error	Battery voltage is too high. Batteries hooked up wrong, or still on charger.
1704	Internal Power up error	Disconnect battery for 2 minutes. Reconnect. If code is still present replace the control.
1705	Short to B+ on Traction or Brake output	Either the traction or brake output is shorted to B+
1706	Short to B+ on Brush, Vac or Aux outputs	Either the Brush, Vacuum or an Aux output is shorted to B+
1800	Controller Internal Timer Failure	Disconnect battery for 2 minutes. Reconnect. If code is still present replace the control.
1D02	Spec Change Trip	This is normal--comes up when you reprogram the control. Turn key off and on to reset the program.
1E03	Inhibit activated	Interlock switch closed or wiring to it is damaged. Charger interlock switch.
1E04	Inhibit Activated 2	Interlock switch closed or wiring to it is damaged.
1E06	Inhibit Input Out of Range	Interlock switch closed or wiring to it is damaged.
2C00	Low Battery Error	Voltage in battery dropped too low (18 volts on 24V system; 28V on 36V system)
2C01	Low Battery Error--2	Recharge the battery in either case. check voltage under load to see if a bad cell is pulling down voltage.
2C02	Battery lockout occurred	
2C03	Battery Lockout occurred--2	



CENTRAL COMMAND II
SYSTEM DIAGNOSTIC CODES



Code	Fault Description	Course of correction
2F01	Throttle Displaced Error	Throttle was activated when key was turned on. Release throttle. Restart machine.
3A00	Bad Program Settings	You reprogrammed the control with settings that are not authorized.
3100	Low bridge voltage	Probable short circuit of output device or wiring
3101	Traction bridge fault	
3102	Brush/Vac bridge fault	
3103	Waiting for bridge to charge	
3603	Micro Processor Error	Check to make sure there are no outputs shorted to battery. Disconnect the battery for 2 minutes and reconnect. If the code is still present replace controller.
7000	Startup With Push Selected	Freewheel input signal selected at startup. Disconnect freewheel switch.
7001	Push Activated in Drive Mode	Freewheel input signal activated while driving. Disconnect freewheel switch. <i>NOTE: As of this writing, we do not use Freewheel. This permits pushing machine more easily by disconnecting traction motor from control.</i>
7500	Throttle Comms Time Out	Problem with LCD dash module or with wiring to it. Check and replace as necessary.
7501	LCD Module settings corrupt	Disconnect batteries and wait 2 minutes to reconnect. If code does not clear replace LCD.
7600	Brush motor not connected	Check for open circuit to brush motors.
7601	Soft Brush Current Fold back	Too much load on brush motor. May be from hitting a bump or wire tangled in brush drive mechanism. Possible wiring or brush motor short.
7602	Soft Brush Current Fold back--2	Same as above.
7603	Soft Brush Current Fold back--3	Same as above.
7604	Brush Inhibit is on	We do not use Brush Inhibit at this time.
7605	Brush startup over current detection	You may have started brushes on carpet or rubber or other high resistance material. This may have stalled motor before actuator could react to lift brush head up. If chronic problem, call Factory to discuss reprogramming machine for application.
7700	Soft Vacuum Motor Disconnected Error	Check wiring to vac motor. On 390, check wiring to Hella relay for vac motor
7701	Vac Motor Current Fold back	Too much amp load on vac circuit. Check wiring. May come from picking up large column of water.
7702	Soft Vacuum Current Fold back--2	Same as above
7703	Soft Vacuum Current Fold back--3	Same as above
7800	Traction Motor Circuit Open	Check traction motor wiring and connectors. Include connector at steering pivot under floor cover!
7801	Traction Motor Over current Error	Too much current due to bad motor or wiring to motor.
7802	Soft Traction Motor in Fold back State	Traction motor being overloaded, or ramp climbing that took longer than 60 seconds. (Fold back means normal low amp setting to motor. There is one minute ramp climbing surge that may be 4 times as high as the fold back rate).
7803	Motor Line Voltages Instability Timeout	May be loose wire at motor or at control. Possible motor problem
7804	Traction Drive in BOOST mode	The traction Drive is in the boost mode. This is normal on heavy acceleration or on ramps.
7880	Traction Speed Input Out of Range	Throttle setting wrong for motor speed. Check throttle pot. and wiring.
7900	Emergency Stop Error	Emergency Stop Button is Actuated when you tried to move. Optional button.
7901	Soft Belly Button Actuated	Belly Button Switch activated. We don't use this.
8000	Service Mode	Service Timer Limits have been reached. We don't normally use them; they are dealer option.
9000	Brushes not fitted	Check brush deck to make sure brushes are on, and on securely.
0003	Possible terminal short in system	For all of these Diagnostic Codes:
0100		1. Turn off key switch and disconnect battery for two minutes, using your watch to measure time.
0B02		
1802		2. When you reconnect battery, you must see a spark. This shows the control's on-board capacitor has been discharged and has been refilled.
1B20		
1B21		3. Restore the battery connection. Make sure battery cable is on tight before trying machine or you could burn battery posts and cable.
2102		
2103		4. Turn on machine. If diagnostic code still shows, then replace the control.
2D01		
3104		
3105		
3200		
3201		
3210		
3211		
3212		
3213		
3214		
3601		
3602		
3608		
3609		
360a		
360b		
360d		
360e		

Troubleshooting Machine Operations:

Problem:	Cause:	Solution:
No power, nothing operates	Faulty key switch Batteries need charging Faulty battery Loose battery cable Main circuit breaker tripped	Contact local servicing dealer See charging batteries Replace battery Tighten loose cable Wait 5 minutes for auto reset Determine cause and correct
Brush motor(s) do not operate	Brush deck is not down Foot pedal is not depressed Brush circuit breaker tripped Carbon brushes worn Faulty brush motor or wires	Put brush deck down Engage foot pedal Wait 5 minutes for auto reset Determine cause and correct Contact local servicing dealer Contact local servicing dealer
Drive motor does not operate	Recharge switch misadjusted Faulty speed controller or wires Faulty drive motor Faulty wiring Carbon brushes worn	Contact local servicing dealer Contact local servicing dealer Contact local servicing dealer Contact local servicing dealer Contact local servicing dealer
Vacuum motor does not operate	Squeegee is in the up position Faulty vacuum switch Vacuum circuit breaker tripped Faulty vacuum motor	Rotate squeegee lift level down Try operating "white" toggle Wait 5 minutes for auto reset Determine cause and correct Contact local servicing dealer
Drive motor runs incorrectly	Faulty speed controller or wires Faulty potentiometer Loose wires	Contact local servicing dealer Contact local servicing dealer Contact local servicing dealer
Insufficient solution flow	Solution tank low Flow knob turned down Solution filter clogged Solution line clogged Solution valve clogged	Refill solution tank, drain recovery tank Move lever to "On" Remove cover and clean Remove and blow out with compressed air Remove cover and clean

Troubleshooting Machine Operations:

Problem:	Cause:	Solution:
No solution flow	No solution in tank Solution valve off Solution switch off Solution screen clogged Faulty solution solenoid Faulty solution switch	Fill solution tank Rotate lever to on Turn solution switch on Remove and clean screen Contact local servicing dealer Contact local servicing dealer
Poor water recovery	Recovery tank is full Ball/screen in recovery Tank is clogged Vacuum hose is clogged Squeegee is clogged Squeegee blade is worn Faulty vacuum hose Vacuum motor gasket torn Tank gasket faulty Drain plug loose Vac motor faulty Battery charge low	Empty recovery tank Remove screen and clean Remove debris Remove debris Rotate or replace blades Contact local servicing dealer Contact local servicing dealer Contact local servicing dealer Tighten lid Contact local servicing dealer Charge batteries overnight
Poor water recovery on turns	Wipers worn Wipers chatter Squeegee swing is binding Incorrect squeegee size	Replace wiper material Tighten pivot points Contact local servicing dealer Contact local servicing dealer
Rear tires noisy	Bearing dry Faulty hubs	Grease bearings Contact local servicing dealer
Poor traction	Excessive brush pressure Worn drive tire Heavy soap concentration	Reduce pressure with switch Contact local servicing dealer
Short run time	Batteries run down Batteries still down Batteries low on water Batteries over cycled	Charge batteries twice Contact local servicing dealer Fill with distilled water to 3/4" above the lead plates Contact local servicing dealer

Battery Maintenance Guide

SAFETY:

- Always wear protective clothing, gloves and goggles when handling batteries
- If acid contacts your skin or eyes, flush with water immediately
- Keep flames, sparks and metal objects away from batteries
- Charge batteries in a well-ventilated area
- To avoid short circuits do not lay objects on top of battery
- Check that all cable connections to the terminal are properly tightened; connections that are too tight or too loose could result in post breakage, meltdown or fire

INSPECTION & CLEANING:

- Keep batteries clean and dry from residue
- Check that all vent caps are tight
- Use a solution of baking soda and water to clean if there is acid residue on batteries or corrosion on the terminals
- Protective spray or petroleum jelly should be applied to terminals to reduce corrosion

STORAGE:

- Batteries should be fully charged prior to and during storage
- Never store discharged batteries
- Store batteries in a cool, dry place
- Recharge batteries before putting them back into service

WATERING:

- **ADD WATER, NEVER ACID, TO CELLS** (distilled water recommended)
- **DO NOT OVERWATER**
- Before charging the batteries, **only add water if the plates are exposed..** Add just enough water to cover the plates, then charge the batteries. Once fully charged, add water to the proper level as indicated below
- For fully charged **standard deep cycle batteries**, add water to level of 1/8" (3 mm) below bottom of vent well (see diagram A)
- For fully charged **Plus Series** batteries, add water to the maximum water level indicator (see diagram B)
- After watering, secure vent caps back on batteries



Diagram A



Add water to 1/8" (3 mm) below bottom of the vent well.

Diagram B



Add water to the maximum water level indicator.

Maximum Battery Size for Replacement

Standard 325ah Batteries

Dimensions Inches (mm)		
Length	Width	Height
12 1/4"	7"	14 3/8"
(311)	(178)	(365)

Upgraded 420ah Batteries

Dimensions Inches (mm)		
Length	Width	Height
11 5/8"	7"	16 3/4"
(295)	(178)	(424)



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DEMO / RENTAL QUARTS



WALL-MOUNTED SUPERCON



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Onboard
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Approved

707 Citrus Green An environmentally cleaner that works! It is a solvent free degreaser that works on oil, carbon, even rubber marks. Incorporates the latest technology in "Green Cleaning".

SUDS
Approved

733 Low pH Safe on most surfaces not harmed by water alone. Low scale formula to prevent alkali buildup in cleaning equipment, while offer detergent to emulsify oil.

SUDS
Approved

755 High Power Ideal solvent fortified degreaser. This butyl based detergent is penetrating, fast acting, and deep cleaning with built-in corrosion inhibitors. It is our most effective degreaser.

SUDS
Approved

757 Gloss A high gloss detergent designed to dry to a bright shine. It is ideal for use on finished surfaces, tile, epoxy, or enamel. The special formula removes salt residue, scuff marks and dirt, while leaving no residue behind. The result is a clean, non-slip surface, ready for immediate use.

SUDS
Approved

797 HD The Heavy Duty concentrate is a Super alkaline detergent, formulated for heavy soil, grease, and thick buildup. Popular in machine shops, auto and truck repair, and other facilities with oil, hydraulic fluids and cutting oils.

***Below Sold in bulk concentrate only. Not available as a SuperCon, PowerDose or SUDS product.*

727 Pretreat** Designed to quickly remove tire marks, oil stains and buildup that has accumulated. This pretreat uses the powerful cleaning of natural citrus extract and is intended to be used directly on the floor at 100% concentrate.

744 Tough Stuff** Ideal for applications with Hard Water problems. It is safe to use in pressure washers and automatic scrubbers. The formulation enhances soil suspension, digests oil and grease, while supporting extra water conditioner.

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PowerCat, LLC, 2008.

