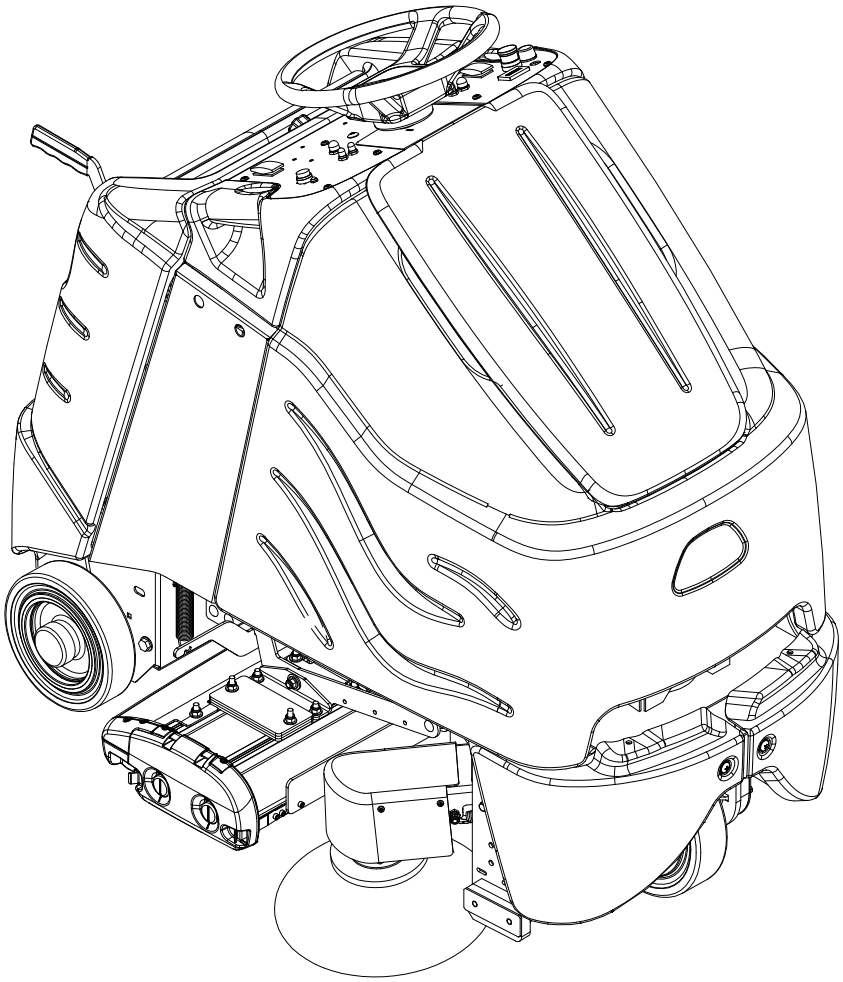
WINDSOR

chariot

iVacuum 34™

Operating instructions (ENG)



MODELS: **CV34**
10125650

CV34X
10125790

Read these instructions before using the machine.

86347810-T
02/09/12

Model: _____

Date of Purchase: _____

Serial Number: _____

Dealer: _____

Address: _____

Phone Number: _____

Sales Representative: _____

OVERVIEW

The Chariot® iVacuum 34™ is a battery powered, stand-on, wide area vacuum intended for commercial use. The Chariot® iVacuum 34™ brushes and vacuums debris from the floor and stores it in the debris tray and vacuum bags.

Warranty Registration

Thank you for purchasing a Windsor product. Warranty registration is quick and easy. Your registration will allow us to serve you better over the lifetime of the product.

To register your product go to :
www.windsorind.com/WarrantyRegistration.aspx
For customer assistance:
1-800-444-7654

WINDSOR®

This manual contains the following sections:

- HOW TO USE THIS MANUAL
- SAFETY
- OPERATIONS
- MAINTENANCE
- PARTS LIST

The HOW TO USE THIS MANUAL section will tell you how to find important information for ordering correct repair parts.

Model: _____

Date of Purchase: _____

Serial Number: _____

Dealer: _____

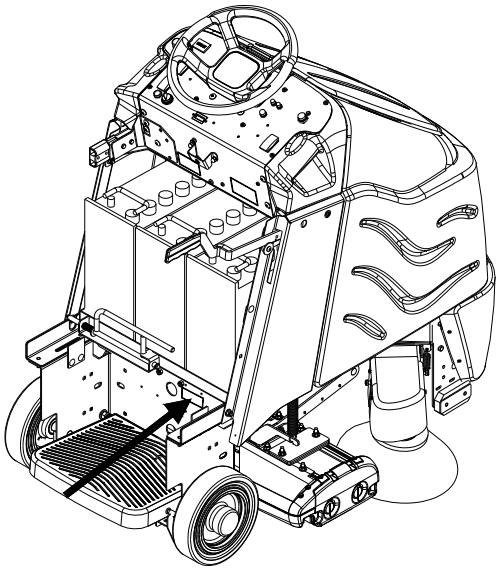
Address: _____

Phone Number: _____

Sales Representative: _____

Parts may be ordered from authorized Windsor dealers. When placing an order for parts, the machine model and machine serial number are important. Refer to the MACHINE DATA box which is filled out during the installation of your machine. The MACHINE DATA box is located on the inside of the front cover of this manual.

The model and serial number of your machine are located below the battery compartment of the machine.



The 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.

The OPERATIONS section is to familiarize the operator with the operation and function of the machine.

The MAINTENANCE section contains preventive maintenance to keep the machine and its components in good working condition. They are listed in this general order:

- Service Schedule
- Batteries
- Brush Deck
- Circuit Protection
- Vacuum Motor
- Drive Motor & Brake

The PARTS LIST section contains assembled parts illustrations and corresponding parts list. The parts lists include a number of columns of information:

REF - column refers to the reference number on the parts illustration.

PART NO. - column lists the part number for the part.

PRV NO. - reference number.

QTY - column lists the quantity of the part used in that area of the machine.

DESCRIPTION - column is a brief description of the part.

SERIAL NO. FROM - If this column has an (*) and a Reference number, see the SERIAL NUMBERS page in the back of your manual. If column has two asterisk (**), call manufacturer for serial number. The serial number indicates the first machine the part number is applicable to. The main illustration shows the most current design of the machine. When a boxed illustration is shown, it displays the older design.

NOTES - column for information not noted by the other columns.

NOTE: If a service or option kit is installed on your machine, be sure to keep the KIT INSTRUCTIONS which came with the kit. It contains replacement parts numbers needed for ordering future parts

IMPORTANT SAFETY INSTRUCTIONS

When using an electrical appliance, basic precaution must always be followed, including the following:

READ ALL INSTRUCTIONS BEFORE USING THIS MACHINE.

⚠WARNING: To reduce the risk of fire, electric shock, or injury:

Use only indoors. Do not use outdoors or expose to rain.

Use only as described in this manual. Use only manufacturer's recommended components and attachments.

If the machine is not working properly, has been dropped, damaged, left outdoors, or dropped into water, return it to an authorized service center.

Do not operate the machine with any openings blocked. Keep openings free of debris that may reduce airflow.

This machine is not suitable for picking up hazardous dust.

Machine can cause a fire when operating near flammable vapors or materials. Do not operate this machine near flammable fluids, dust or vapors.

This machine is suitable for commercial use, for example in hotels, schools, hospitals, factories, shops and offices for more than normal housekeeping purposes.

Maintenance and repairs must be done by qualified personnel.

Disconnect battery before cleaning or servicing.

Before the machine is discarded, the batteries must be removed and properly disposed of.

Make sure all warning and caution labels are legible and properly attached to the machine.

During operation, attention shall be paid to other persons, especially children.

Before use all covers and doors shall be put in the positions specified in the instructions.

When leaving unattended, secure against unintentional movement.

The machine shall only be operated by instructed and authorized persons.

When leaving unattended, switch off or lock the main power switch to prevent unauthorized use.

This appliance has been designed for use with the brushes specified by the manufacturer. The fitting of other brushes may affect its safety.

Do not use on surfaces having a gradient of over 10% (6 degrees).

SAVE THESE INSTRUCTIONS

The following symbols are used throughout this guide as indicated in their descriptions:

HAZARD INTENSITY LEVEL

There are three levels of hazard intensity identified by signal words -**WARNING** and **CAUTION** and ***FOR SAFETY***. The level of hazard intensity is determined by the following definitions:

⚠WARNING:

WARNING - Hazards or unsafe practices which COULD result in severe personal injury or death.

⚠CAUTION:

CAUTION - Hazards or unsafe practices which could result in minor personal injury or product or property damage.

FOR SAFETY: To Identify actions which must be followed for safe operation of equipment.

Report machine damage or faulty operation immediately. Do not use the machine if it is not in proper operating condition. Following is information that signals some potentially dangerous conditions to the operator or the equipment. Read this information carefully. Know when these conditions can exist. Locate all safety devices on the machine. Please take the necessary steps to train the machine operating personnel.

FOR SAFETY:

DO NOT OPERATE MACHINE:
Unless Trained and Authorized.
Unless Operation Guide is Read and understood.
In Flammable or Explosive areas.
In areas with possible falling objects.

WHEN SERVICING MACHINE:

Avoid moving parts. Do not wear loose clothing; jackets, shirts, or sleeves when working on the machine. Use Windsor approved replacement parts.

⚠WARNING:

Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and open flame away. Keep solution tank in raised position when charging. Keep sparks and flames away from the batteries. Do not smoke around batteries.

⚠WARNING:

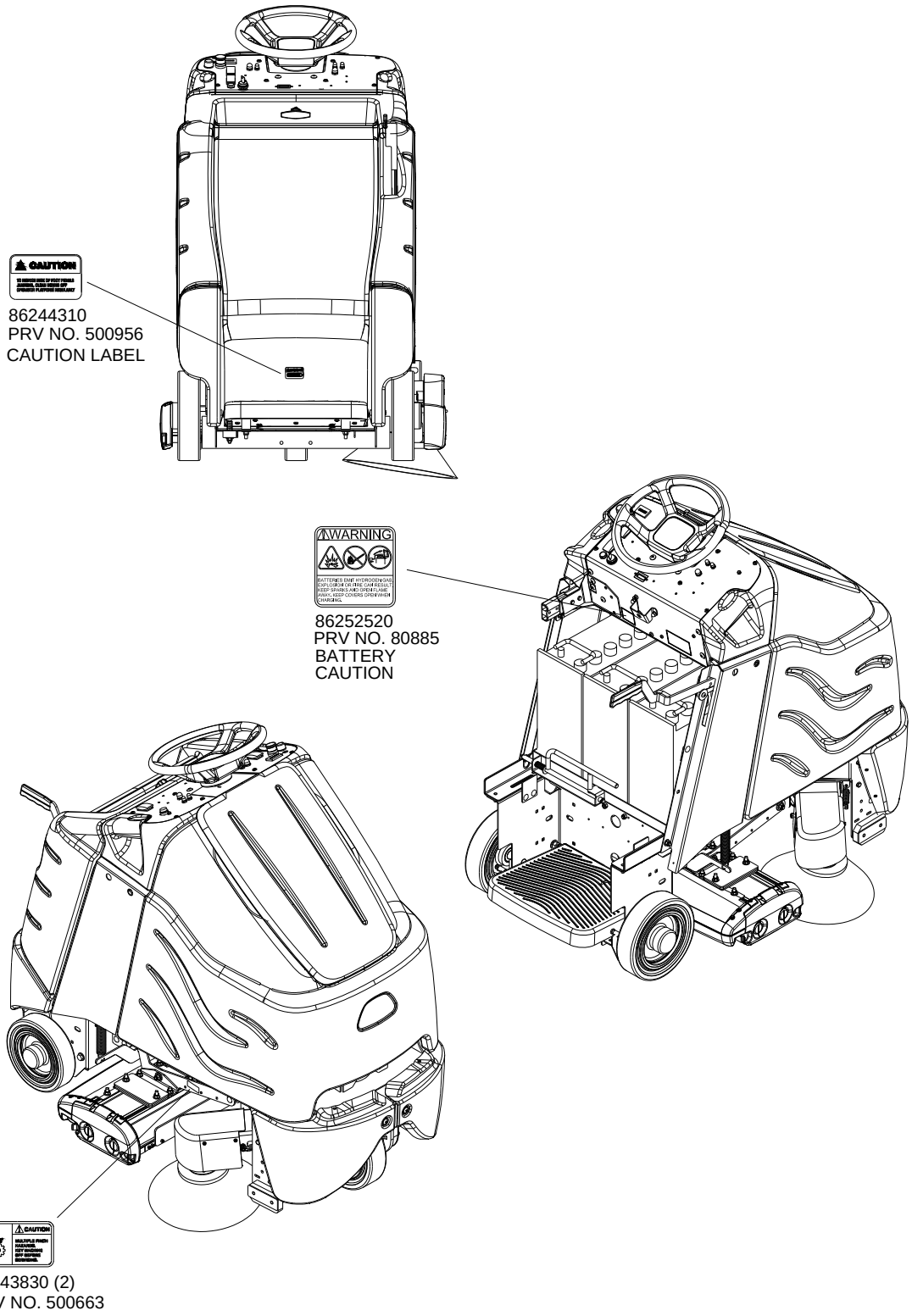
Disconnect batteries before working on machine. Only qualified personnel should work inside machine. Always wear eye protection and protective clothing when working on or near batteries. Avoid skin contact with the acid contained in the batteries.

⚠WARNING:

Never allow metal to lie across battery tops.

Safety Label Location

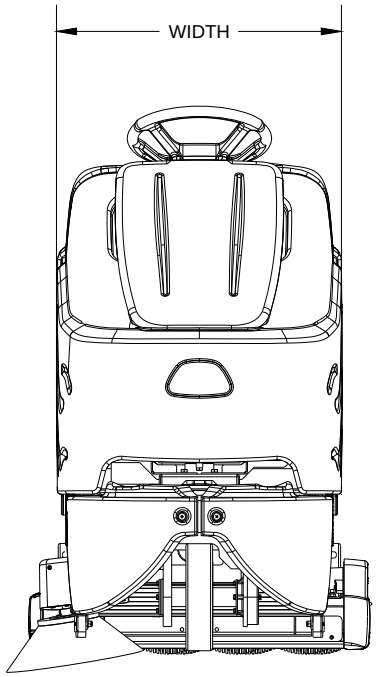
These drawings indicate the location of safety labels on the machine. If at any time the labels become illegible, promptly replace them.

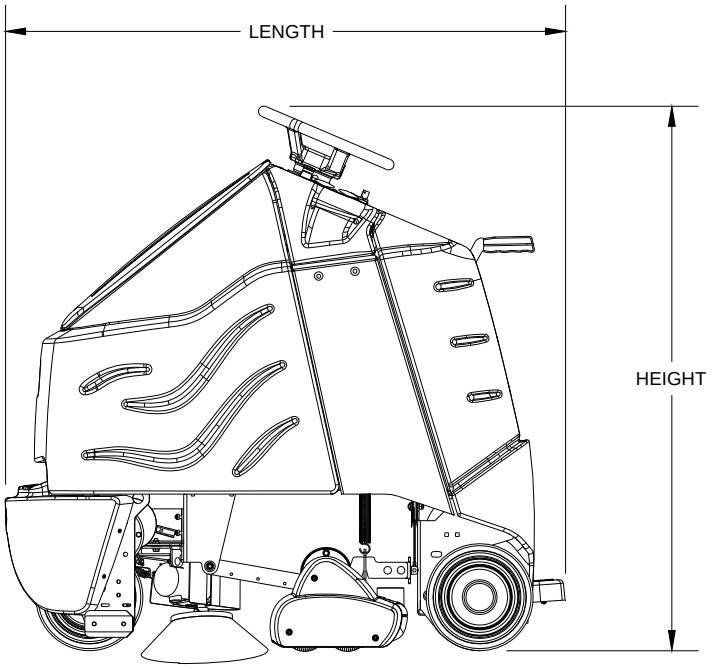


Technical Specifications

ITEM	DIMENSION/CAPACITY
Nominal Power	1548 W
Rated Voltage	36 Volts DC
Rated Amperage	43 amps
Batteries	3 X12 Volt 195-215 AH @ 20 hr. rate
Battery Compartment Dimensions	21 in. x 16 in. x 17 in. tall (533mm x 406mm x 432mm)
Propelling Motor	0.75 HP (560 W)
Brush Motor	0.5 HP (373 W)
Side Broom Motor	0.06 HP (47W)
Bag Capacity (HEPA)	1019 in^3 (16.7 L)
Hopper Capacity	54.9in^3 (0.93 Liters)
Brushes	Two 28 in. (71 cm) by 4 in. (10 cm) diameter
Side Broom	13 in (33 cm)
Brush Speed	1125 RPM
Side Broom Speed	90 RPM
Vacuum Motor	0.75 HP (560 W)
Maximum flow rate of vacuum motor	200 cfm (95 liters per second)
Suction of vacuum motor with new HEPA bag.	4.8 inches of water (1.19 kPa)
Vacuum bag full shut off	14-16 inches of water (3.5-4.0 kPa)
Maximim suction of vacuum motor	23-26 inches of water (5.7-6.5 kPa)
Weight (GVW) Gross Weight Batteries	1035 lbs (470 kg)
Weight Empty Without Batteries	467 lbs (212 kg)
Tires	10 in. (254mm) Solid Gray non-marking
Foundation Pressure	79 psi (544 kPa)
Maximum Speed	3.5 miles/hour (5.7 Km/hour)
Frame Construction	Powder coated steel
Brake	Electrical parking brake, sets automatically whenever operator steps off platform or engages emergency stop.
Minimum Aisle	U-Turn Width 61 in. (1550 mm)
Maximum Rated Climb And Descent Angle	10.0 degrees
Sound Pressure level at operator's ear (IEC 60704-1)	69.7 dBA Uncertainty 3.0 dBA
Sound Power (IEC 60704-1)	84.3 dBA Uncertainty 3.0 dBA
Vibration Hands (ISO 5349)	1.32 m/sec^2 Uncertainty 0.5 m/sec^2
Vibration Feet (ISO 5349)	0.52 m/sec^2 Uncertainty 0.5 m/sec^2

ITEM	MEASURE
Height	50.6 inches (1285 mm)
Length	52.5 inches (1330 mm)
Width without deck	26.5 inches (670 mm)
Width of deck	32.0 inches (813 mm)
Width with side broom	34.5 inches (876 mm)





⚠CAUTION:

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

How This machine Works

The Chariot® iVacuum 34™ is a battery powered, self-propelled, vacuum intended for commercial use. The appliance vacuums debris and dirt from the floor and collects it in a hopper, pdebris tray and disposable bag.

The machine's primary systems are the brush system, vacuum system, and operator control system.

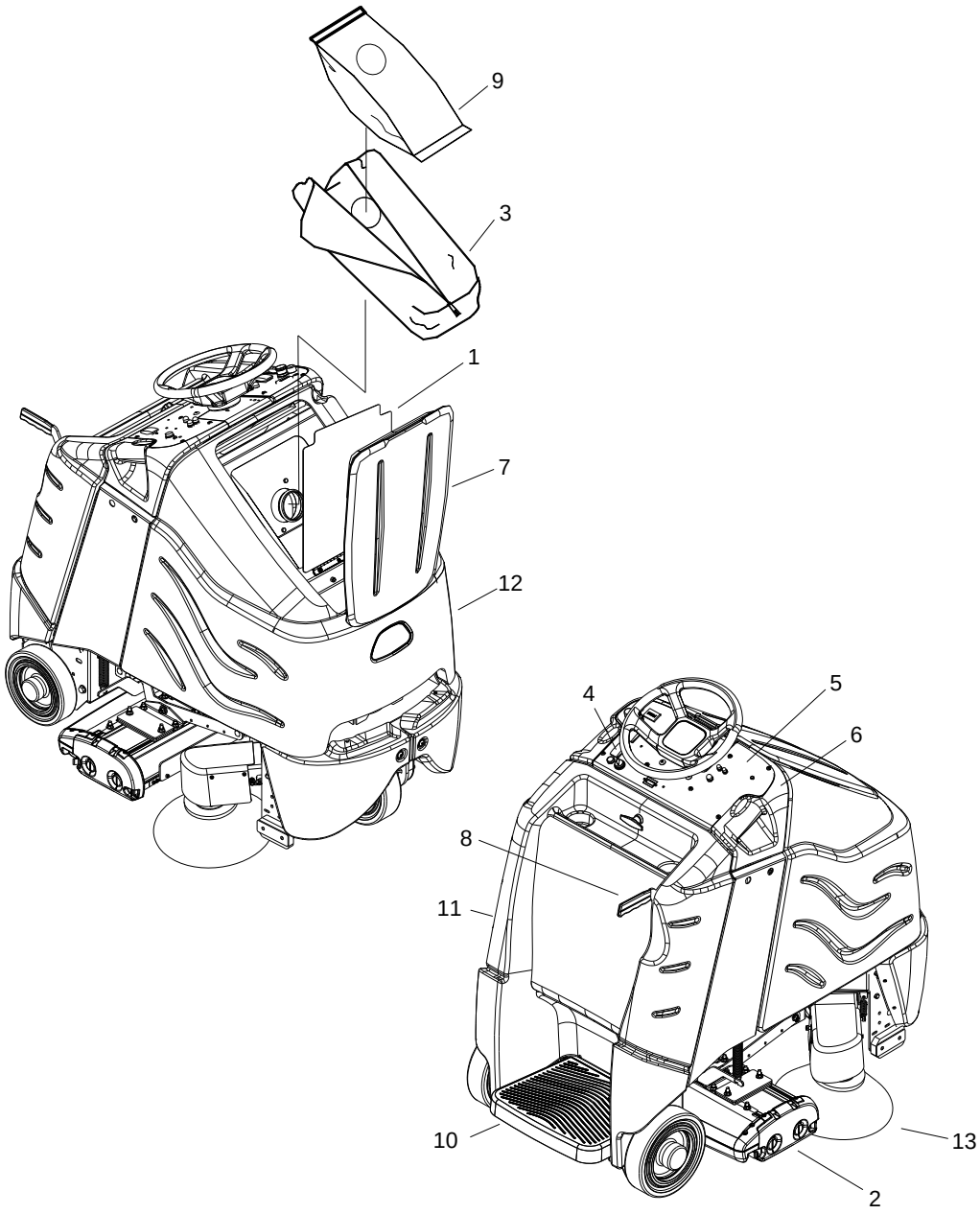
The function of the brush system is to brush the floor.

The brush system consists of two cylindrical type brushes, motor, brush deck, and controls.

The front brush turns clockwise when viewed from the right side of the machine. The rear brush turns counterclockwise. Both brushes work to agitate the floor and to route the debris up into the brush deck.

The function of the vacuum system is to vacuum fine dirt and debris into the vacuum bag, and large debris into the debris tray. The recovery system consists of the vacuum deck, debris tray, vacuum motor, cloth vacuum bag and paper vacuum bag. The vacuum deck captures the dirt off the floor as the machine moves forward. The vacuum motor provides suction to draw the fine dirt into the vacuum bag, and the debris tray stores large debris. The vacuum bag stores the fine dirt.

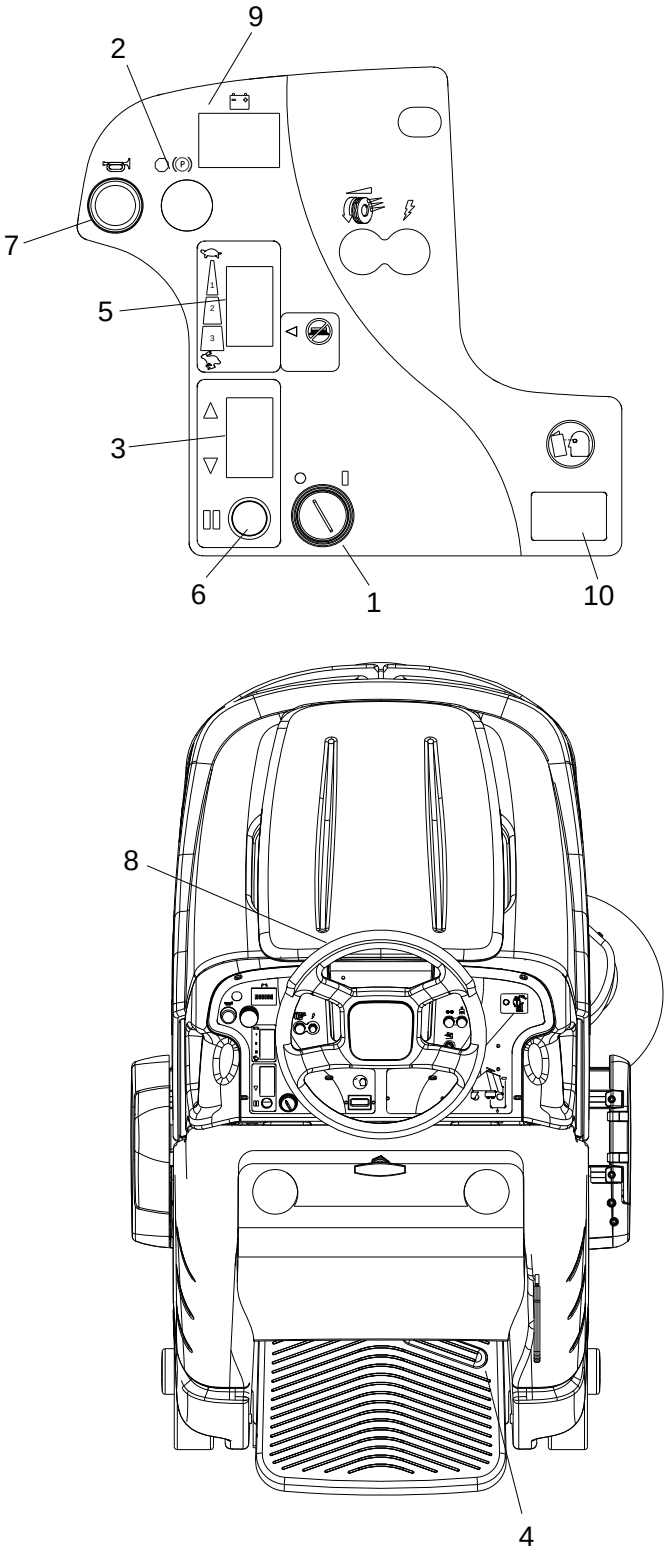
The function of the operator control system is to control the direction and speed of the machine. The directional control system consists of the direction control switch, throttle pedal, speed control switch, drive reset switch, emergency stop/brake switch, steering wheel, propel controller and drive wheel. The directional control switch signals forward or reverse direction. The controller interprets signals from the throttle pedal to command the drive wheel to propel or slow the machine. The drive reset switch is to make sure the operator is on platform before machine will propel. The steering wheel points the drive wheel in the direction desired by the operator. The parking brake automatically engages when the operator steps off the platform. The emergency stop/brake can be used to hold the machine on slopes.



Components

1. Bag Access Lid
2. Brush Deck
3. Cloth Bag
4. Control Panel-Drive
5. Control Panel-Vacuum
6. Control Housing
7. Cover Lid
8. Deck Lift
9. Paper Bag
10. Pedal Platform
11. Rear Cover
12. Cover
13. Side Broom

Drive Controls



1. Key Switch
2. Emergency Stop/Brake Switch
3. Directional Control Switch
4. Throttle Pedal
5. Speed Control Switch
6. Drive Reset Button
7. Horn Button
8. Steering Wheel
9. Battery Discharge Indicator
10. Hour Meter

1. KEY SWITCH

   Controls the power for machine functions.
   To turn the machine power on, rotate key clockwise.
   To turn the machine off, rotate key counterclockwise.

2. EMERGENCY STOP/BRAKE SWITCH

   This safety feature is designed to cut all power to the machine at any time and apply parking brake.
   To shut the machine power off, push the Emergency Stop Switch, this will also engage the parking brake and cause the machine to stop immediately.
   To reset the machine, rotate the switch clockwise.

3. DIRECTIONAL CONTROL SWITCH

   Controls the direction of travel of the vehicle. The position of the switch indicates direction of travel.
   To travel forward, press the top of the switch.
   To travel in reverse, press the bottom of the switch.

4. THROTTLE PEDAL

   Controls the speed of the vehicle within the speed control setting selected. Pressing the pedal causes the machine to travel in the direction selected by the Directional Control Switch.
   To increase speed, increase pressure on the pedal.
   To decrease speed, decrease pressure on the pedal.

5. SPEED CONTROL SWITCH

   Controls the maximum speed of the machine. Speed 1 is intended for vacuuming. Speeds 2 and 3 are recommended for transport only, not vacuuming.
   To increase speed, press the top of the switch.
   To decrease speed, press bottom of the switch. Speeds can be adjusted at any time, whether machine is moving or not.

6. DRIVE RESET SWITCH

   This safety feature is designed to ensure safe engagement of propel drive. Each time the machine power is turned on, and each time an operator steps on to the platform, the Drive Reset Switch must be pushed before machine will propel.

7. HORN BUTTON

   The horn is activated by pressing the horn button.

8. STEERING WHEEL

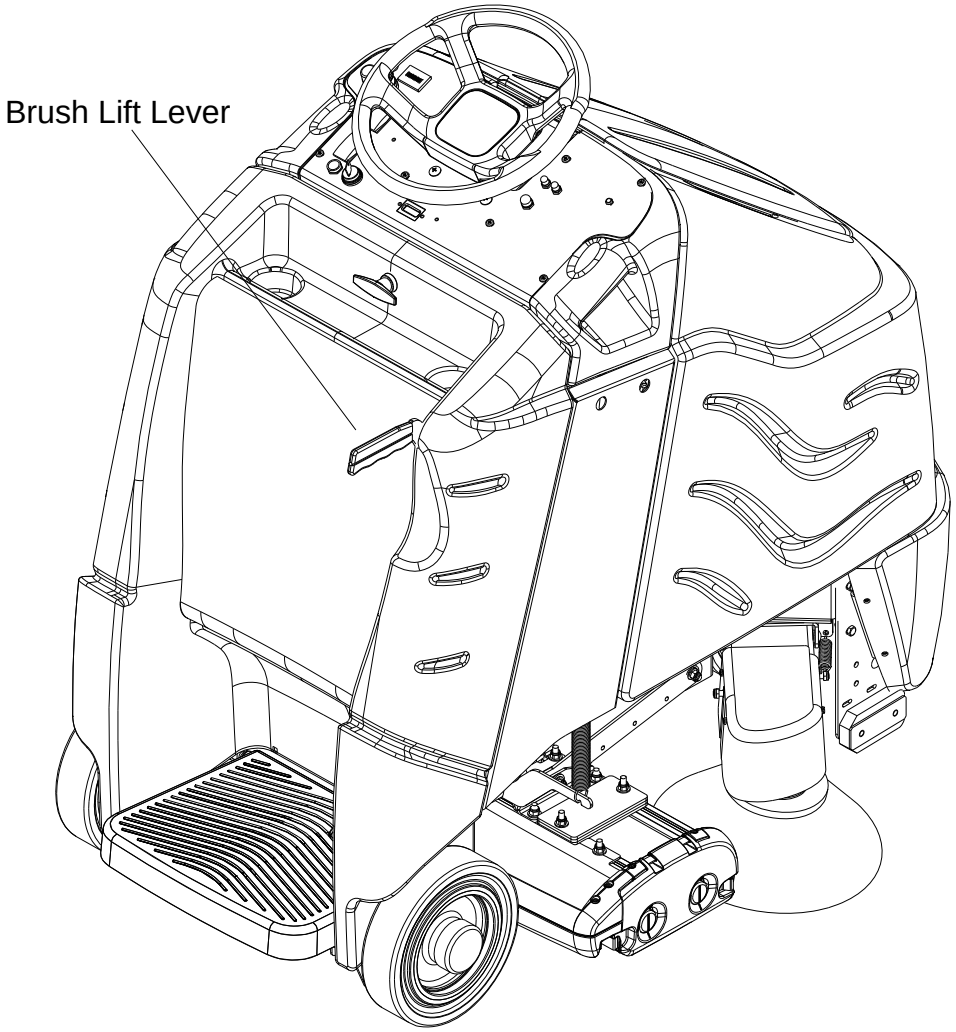
   The steering wheel turns the front wheel causing the machine to change direction.

9. BATTERY DISCHARGE INDICATOR

   Indicates the charge level of the batteries.
   The meter display is divided into 10 vertical bars. Bars illuminated on the far right indicate full charge. Bars flashing near the left side indicate the batteries should be recharged. Further operation of the machine could damage the machine or the batteries. Bars flashing near left side also indicate that machine has been left unattended with key on for more that 15 minutes. Turn key off then on to reset.
   When the machine is left overnight with less than a full charge, the display may initially indicate a full charge. It will also indicate a full charge if the batteries are disconnected, then reconnected. After a few minutes of operation the meter will give the correct charge level.

10. HOUR METER

    Records the number of hours the machine has been in operation. This information is useful in determining when to service the machine.



Deck Controls

Brush Lift Lever

Raises and lowers the brush deck, side broom and turns the vacuum motor on and off.

To lower brush deck and start vacuum motor and brushes, lift the lever from its raised position.

To raise brush deck and stop vacuum motor and brushes, lift the lever from its lowered position.

Pre-run Machine Inspection

Do a pre-run inspection to find possible problems that could cause poor performance or lost time from break-down. Follow the same procedure each time to avoid missing steps.

NOTE: See maintenance section for pre-run machine inspection checklist items.

STARTING MACHINE

NOTE: Perform pre-run machine check before operating machine.

FOR SAFETY: Before starting machine, make sure that all safety devices are in place and operating properly.

1. Stand on the operator platform. Throttle pedal must be in neutral position.
2. Turn the machine power on by turning key switch clockwise to the "ON" position.
3. Check the position of the Directional Control Switch to make sure the machine will travel in the direction intended.
4. Press the Drive Reset Switch.
5. Press lightly on the throttle pedal with right foot.

Emergency Stop Procedures

1. Release the throttle pedal by lifting right foot.
2. Turn machine power off with key switch by turning key switch counterclockwise.
3. If an electrical problem is suspected, push in emergency stop button. This will also engage the parking brake and cause the machine to stop immediately.

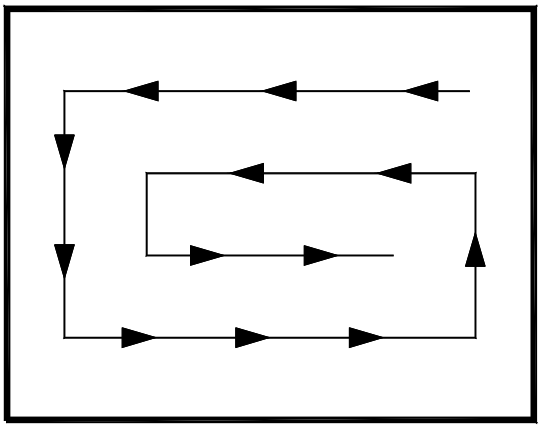
Normal Vacuuming

Plan the vacuuming pattern in advance. The longest track is around the perimeter of the area to be cleaned. For efficient operation, the runs should be the longest possible without turning or stopping.

In order to achieve the best possible results, the area which is to be cleaned should be picked up before vacuuming. Large debris, strings and wire must be removed to prevent being caught in brushes.

If machine is allowed to stand in neutral with the vacuum deck down for more than 2 seconds, the brush motor stops. If either forward or reverse travel is selected, the brush motor will continue once movement of machine begins. Overlap the brush path and avoid transporting over previously cleaned areas.

Recommended Path



To Begin Vacuuming

⚠ CAUTION:

When operating the machine around people, pay close attention for unexpected movement. Use extra caution around children.

1. Stand on the operator platform. Throttle pedal must be in neutral position.
2. Turn machine power on.
3. Check position of Directional Control Switch to ensure that machine is set to travel in direction intended.
4. Press the Drive Reset Switch.
5. Lower the Brush Deck.
6. Drive machine forward to begin vacuuming.
7. Adjust the speed of the machine as necessary.

To Stop Vacuuming

1. Raise the brush deck, which turns off brushes and vacuum.
2. Allow the throttle pedal to return to neutral.
3. Turn machine power off.

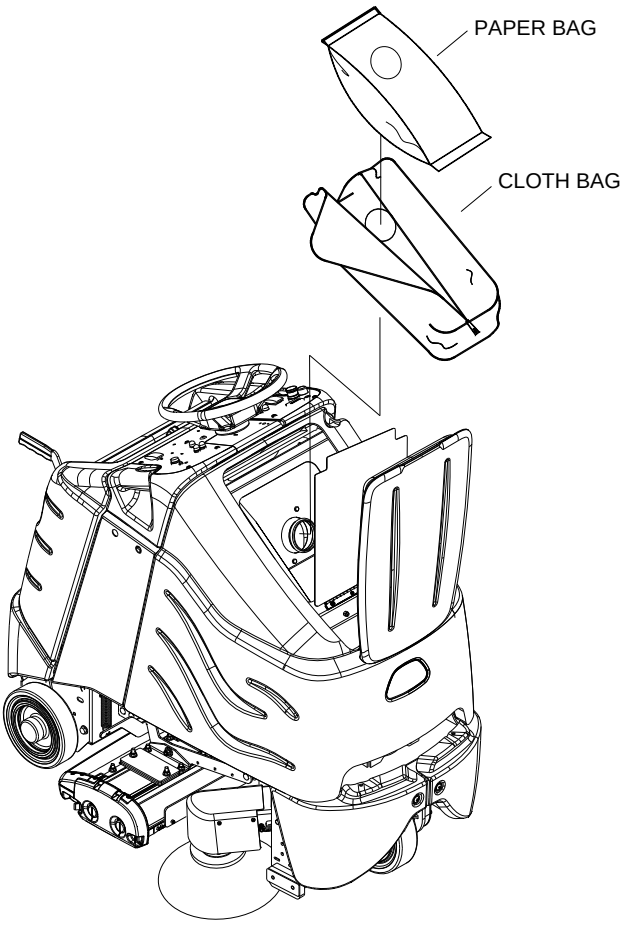
FOR SAFETY: Before leaving or servicing machine: stop on level surface, turn off machine and remove key.

FOR SAFETY: When using machine, go slow on inclines.

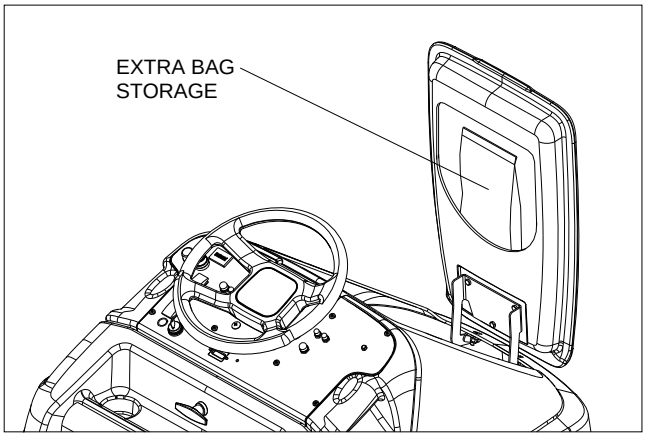
Changing Vacuum Bag

A convenient bag storage is built into the lid.

1. Park machine on level area.
2. Turn the machine power off.
3. Open cover lid and vacuum box lid.
4. Unzip cloth bag.
5. Remove paper bag lip from nozzle.



6. Remove cloth bag lip from nozzle.
7. Remove cloth band and paper bag together from vacuum box.
8. Remove paper bag from cloth bag and dispose of properly.
9. Clean vacuum box and remove any debris from inside screen.
10. Shake cloth bag to remove any extra debris.
11. Place cloth bag back into vacuum box and push the rubber collar over the nozzle.
12. Retrieve a new clean paper bag from the storage compartment in the cover lid.

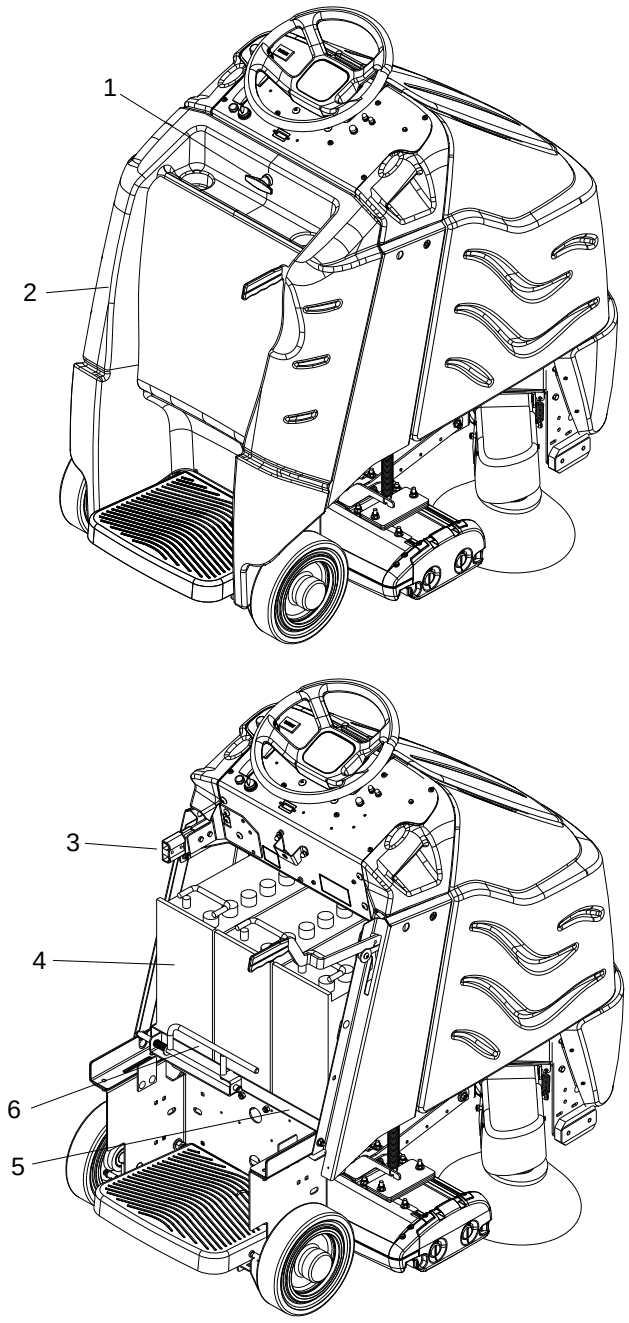


13. Place a new paper bag into the cloth bag and push the rubber collar over the nozzle.
14. Close all lids and covers.

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	*				
Check that the vacuum box lid seal tightly	*				
Visually check for damaged or worn tires.	*				
Check vacuum hose connections.	*				
Check hoses for debris buildup.	*				
Check pedal(s), brake and steering for proper operation	*				
Check vacuum bag fullness and change if necessary.	*				
Clean brushes and check wear.		*			
Empty debris tray		*			
Charge batteries.		*			
Clean off top of batteries.			*		
Check battery cells with hydrometer. (Wet cell only)			*		
Check battery connections are tight.			*		
Clean battery cases and compartment.				*	
Clean and check drive tension chain for wear and tension.				*	
Check parking brake.					*
Clean chains, cables and pulleys for brush deck lift.					*
Check all motors for carbon brush wear.					*
Check motor commutators.					*
Check steering chain tensioner.					*

NOTE: A Vacuum hose cleaning brush is included with your vacuum. If debris is caught in the vacuum hose, use brush to clear the vacuum hose. Remove vacuum bag and clear hose of debris with the brush. It may be necessary to clear the hose at vacuum shoe connection. Disconnect vacuum hose and clear hose. Check vacuum shoe for debris also.



Batteries

1. Rear Cover Retainer Knob
2. Rear Cover
3. Battery Connector-Machine
4. Batteries
5. Battery Tray
6. Battery Tray Latch

Batteries (Wet Cell Only)

The batteries provide the power to operate the machine. The batteries require regular maintenance to keep them operating at peak efficiency.

The machine batteries will hold their charge for long periods of time, but they can only be charged a certain number of times. To get the greatest life from the batteries, charge them when their charge level reaches 25% of a full charge. Use a hydrometer to check the charge level.

Do not allow the batteries to remain in a discharged condition for any length of time. Never expose a discharged battery to temperatures below freezing. Discharged batteries will freeze causing cracked cases. Do not operate the machine if the batteries are in poor condition or if they have a charge level below 25% (specific gravity below 1.155).

Keep all metallic objects off the top of the batteries, as they may cause a short circuit. Replace worn or damaged cables and terminals.

Check the electrolyte level in each battery cell before and after charging the batteries. Never add acid to the batteries, use distilled water. Do not allow water level to fall below the battery plates. Portions of plates exposed to air will be destroyed. Do not overfill. Keep plugs firmly in place at all times.

⚠CAUTION:

When servicing machine, avoid contact with battery acid.

⚠WARNING:

Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and open flame away. Keep covers open when charging.

⚠WARNING:

Wear eye protection and protective clothing when working with batteries.

⚠WARNING:

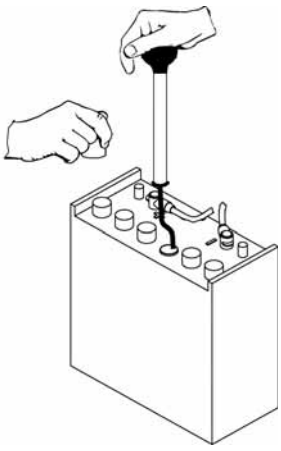
Charge batteries in a well ventilated area.

Battery Maintenance

1. When cleaning the batteries, use a solution of baking soda and water. Do not allow the cleaning fluid to enter the battery cells, electrolyte will be neutralized.
2. Maintain the proper electrolyte level in each battery cell. If a cell should accidentally overflow, clean immediately.
3. Wipe off the top of the batteries at least once a week.
4. Test battery condition with a hydrometer at least once a week.
5. Ensure that all connections are tight and all corrosion removed.
6. Every 4 to 6 months, remove that batteries from the machine and clean the battery cases and battery compartment.

Checking Battery Specific Gravity

Use a hydrometer to check the battery specific gravity.



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

Check the hydrometer readings 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 80°F (27°C), the reading must be temperature corrected.

To find the corrected specific gravity reading when the temperature of the battery electrolyte is other than 80°F (27°): Add (+) to the specific gravity reading 0.004 (4 points), for each 10°F (6°C) above 80° (27°C).

Subtract (-) from the specific reading 0.004 (4 points), for each 10°F (6°C) below 80°F (27°C).

Charging Batteries

⚠WARNING:

When servicing machine, avoid contact with battery acid.

⚠WARNING:

Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and open flame away. Keep covers open when charging.

⚠WARNING:

Wear eye protection and protective clothing when working with batteries.

⚠WARNING:

Charge batteries in a well ventilated area.

Use a 36 volt, 20 amp maximum output DC charger which will automatically shut off when the batteries are fully charged.

1. Empty recovery tank.
2. Stop the machine in a clean, well ventilated area next to the charger.
3. Turn "OFF" machine.

FOR SAFETY: **Before leaving or servicing machine; stop on level surface, turn off machine and remove key.**

4. 3.Remove rear cover, unplug batteries from machine, unlatch battery tray and pull out to expose batteries.

⚠WARNING:

Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and open flame away. Keep covers open when charging.

5. Check the electrolyte level in each battery cell. Before charging, add just enough distilled water to cover the plates. After charging is complete, add just enough distilled water to bring up the level to the indicator ring. If the water level is too high before charging, normal expansion rate of the electrolyte may cause an overflow resulting in a loss of battery acid balance and damage the machine.

NOTE: Battery Charger must be approved to 60335-2-29 standard.

5. Replace the battery caps, and leave them in place while charging.
6. Unplug the battery connector from the machine.

SAFTEY: When charging, connect the charger to the batteries before connecting the charger to the AC wall outlet. Never connect the charger to the AC wall outlet first. Hazardous sparks may result.

7. Plug the charger connector into the battery connector. Connect the charger AC plug to a wall outlet. The charger gauge should indicate that the batteries are charging.
8. When the batteries are fully charged, disconnect the charger from the AC wall outlet, then disconnect the charger from the batteries.
9. Connect the batteries to the machine connector.
10. Check the electrolyte level. It should be up to the indicator ring. If necessary, add distilled water.
11. Install the rear cover.

Changing Batteries

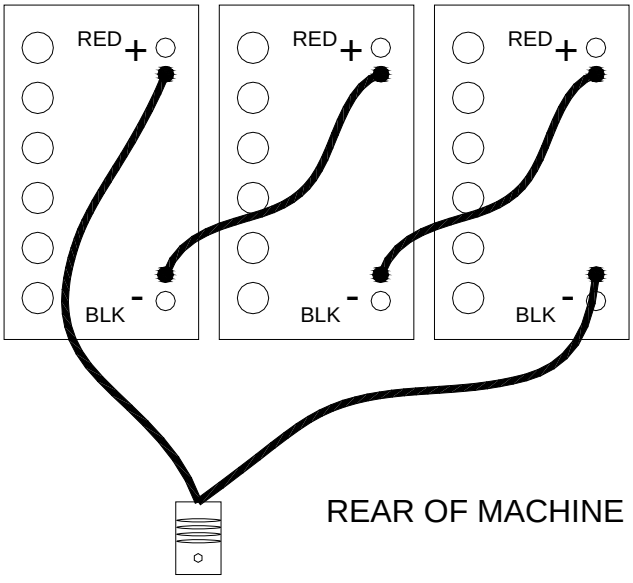
Stop the machine in a clean area next to the charger. Turn off machine.

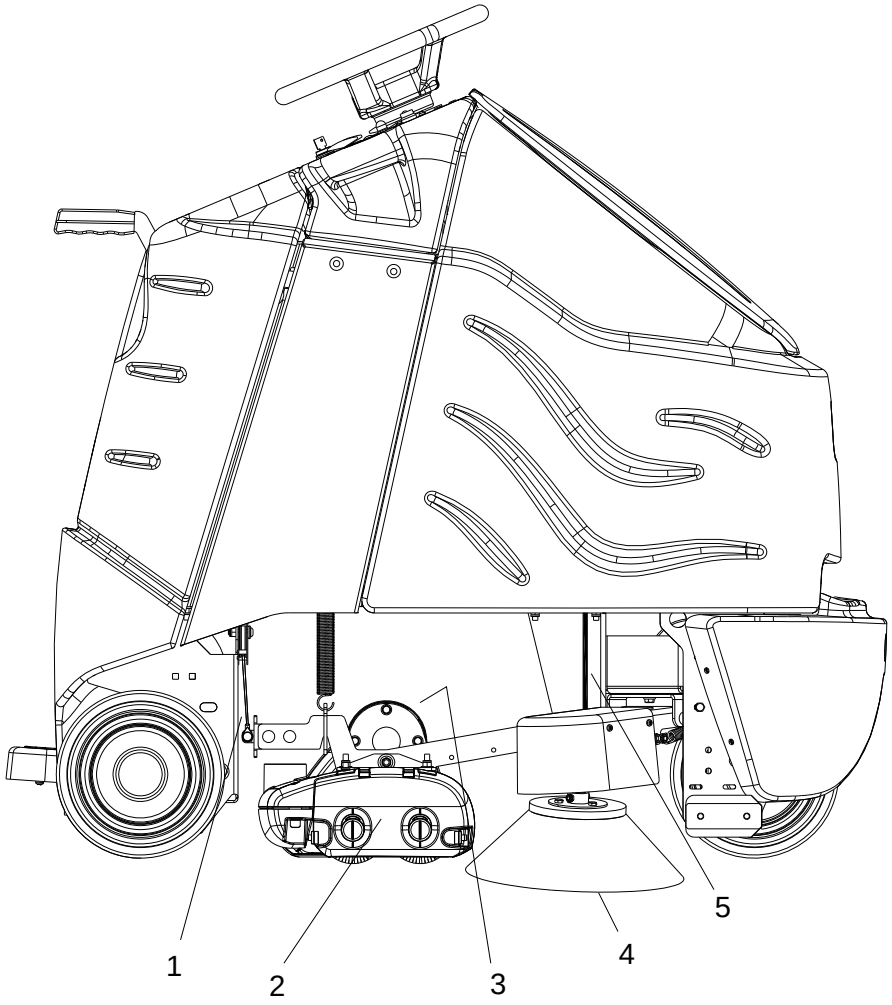
SAFETY: Before leaving or servicing the machine; stop on level surface, turn off machine and remove key.

1. Remove the rear cover.
2. Disconnect battery pack from machine.
3. Unlatch battery tray from machine and pull out to expose batteries.
4. Use the proper size open end wrench to disconnect main ground wire first and secure cable terminal away from batteries.
5. Disconnect main positive lead and secure cable terminals away from batteries.
6. Loosen both terminals on each jumper cable and remove one at a time.
7. Prepare a suitable site to place the batteries.
8. Attach suitable battery lifting device and lift batteries from the machine.

⚠WARNING:

Batteries are a potential environmental hazard. Consult your battery supplier for safe disposal methods.





Brush Deck

1. Brush Deck Lift Cable
2. Brush Door
3. Brush Motor
4. Side Broom
5. Side Broom Lift Cable

Brush Deck

The dual cylindrical head is designed to agitate the carpet while vacuuming. The first scrubbing brush turns in a clockwise rotation when viewed from the right of operator's side of machine. The first brush scrubs dirt and debris between the brushes. The second brush, turns in a counter clockwise rotation, picks up debris and throws it into the debris tray.

NOTE: The brushes should wear evenly side to side. Brushes should be replaced as a set when bristle length wears to height of yellow PerformAlert™ bristles.

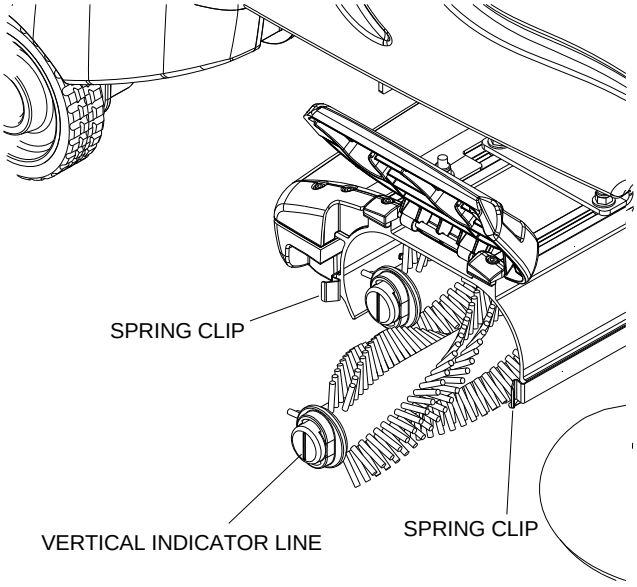
Brush Removal

The brushes are removed from the right side of the machine.

1. Release door spring clips and rotate the brush door up.
2. Slide the brushes out the side opening.

Brush Installation

1. Slide brush through door opening and onto drive shaft. Make sure it is fully seated and is driven by the deck system.
2. Rotate the brushes until the indicator lines on the ends are vertical.
3. Rotate the brush door down and secure with spring clips.

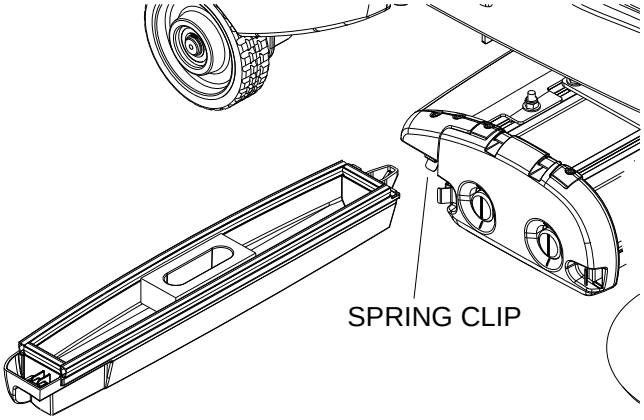


Debris Tray Removal

1. Release the debris tray spring clip.
2. Slide the debris tray away from machine.

Debris Tray Installation

1. Slide the debris tray into the debris tray mount notch.
2. Secure with debris tray spring clip.



⚠CAUTION:

Do not use a pressure washer to clean around the brush motors. Use tap pressure only.

To Replace Brush Motor

3. With the scrub deck in the lowered position, disconnect brush motor wiring connector from harness.
4. Remove the drive housing
5. Remove six (6) motor mount screws.
6. Remove motor with attached coupler, leaving front motor mounting bracket still attached to deck.
7. Remove coupler from old motor for reuse.
8. Inspect spider coupler for wear replace as needed.
9. Reverse process to reassemble with new motor.

Brush Motor Carbon Brush Replacement

1. Scribe alignment mark on motor barrel to motor cap. Remove two bolts.
2. Remove end cap from motor.

NOTE: Motors contain two wave washers in cap. Do not lose these.

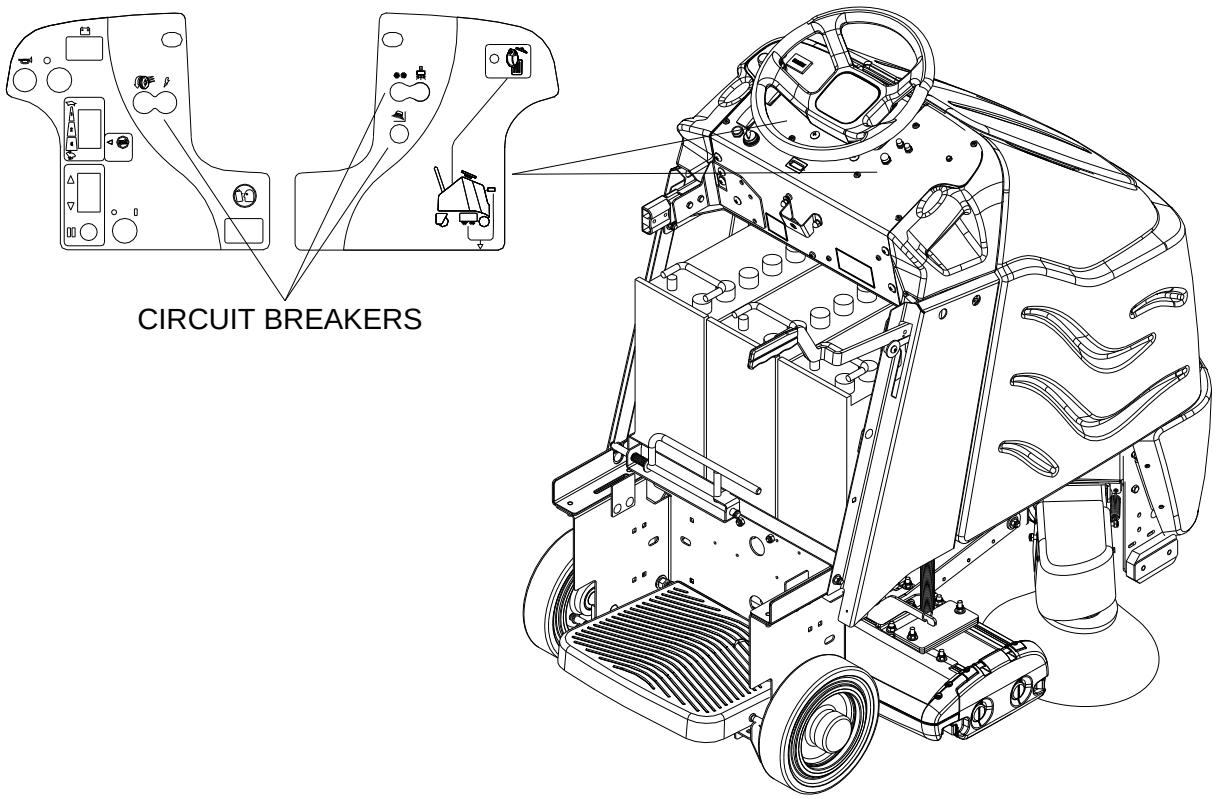
3. Release brush from spring tension. Remove screw connecting brush wire lead to brush holder. Clean brush holder to insure free movement.
4. Retract spring and install new brush. Install connector screw and lead.
5. When all new brushes are installed. Place all in retracted position, held into brush holder by spring tension.
6. Carefully place end cap onto bearing on motor shaft.

NOTE: Use care to assure wave washer alignment.

7. With end cap in partially installed position, release all brushes to contact position with motor commutator.

NOTE: Failure to insure all brushes are released will result in motor failure.

8. Reset end cap and realign with scribe marks on motor barrel. Reinstall the two attach bolts from cap into base.
9. Maintain alignment between motor barrel base and cap.



Circuit Breakers

Circuit breakers interrupt the flow of power in the event of an electrical overload. When a circuit breaker is tripped, reset it by pressing the exposed button. If a circuit breaker continues to trip, the cause of the electrical overload should be found and corrected.

22 Amp. Protects the brush motor.

30 Amp. Protects the propel motor.

3 Amp. Protects the machine controls.

3 Amp. Protects the side broom.

22 Amp. Protects the vacuum motor.

⚠WARNING:

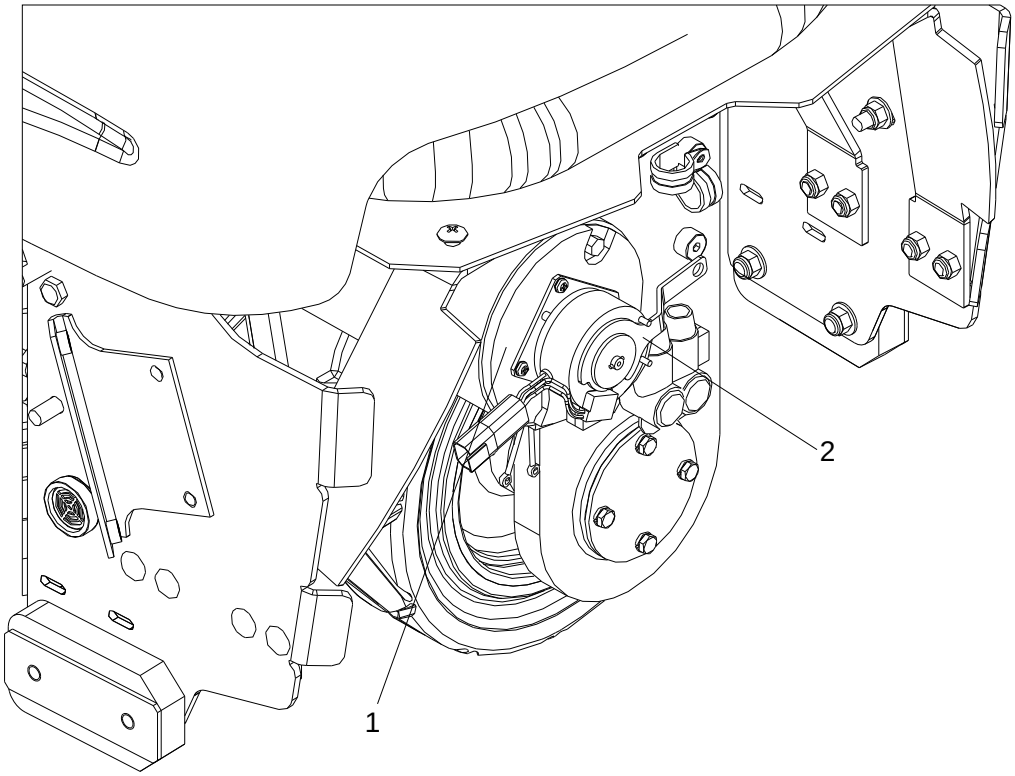
Disconnect batteries before working on machine. Only qualified personnel should work inside machine. Always wear eye protection and protective clothing when working on or near batteries. Avoid skin contact with the acid contained in the batteries.

Vacuum Motor Carbon Brush Replacement

1. Remove rear cover from machine.
2. Remove batteries from machine.
3. Remove 4 bolts holding access cover in place and remove cover.
4. Pull top clips from vacuum motor top brush retainers.
5. Remove and inspect brushes.
6. Replace both if either is less than 3/8" (9.5 mm) long.
7. Reverse steps to assemble.

To Remove Vacuum Motor

1. Remove rear cover.
2. Remove two screws from top of control panel and four screws from side of control panel housing.
3. Slide control housing back from tank to expose main cover bolts.
4. Remove four bolts in front of console from cover, and 2 bolts from the bottom front of main cover, and two inside, next to batteries.
5. Remove main cover.
6. Remove four bolts from vacuum motor and disconnect plug.
7. Reverse steps to assemble



Drive Motor & Brake

1. Drive motor
2. Parking brake

Electric Parking Brake Engagement

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

Electric Brake Engagement

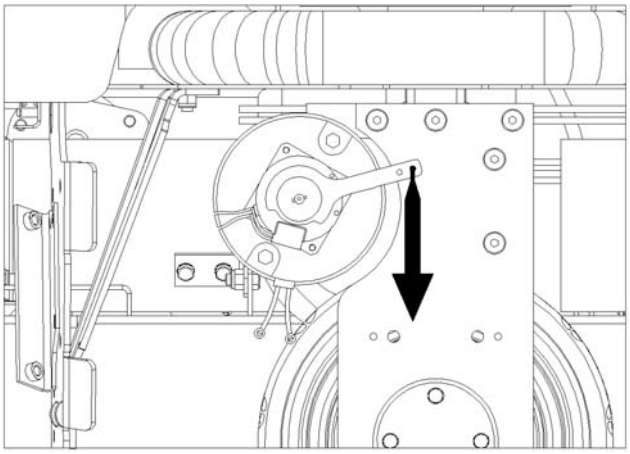
This machine is equipped with an electric parking brake.

The brake automatically engages and keeps the machine from moving whenever the operator steps off the platform or when emergency stop is engaged.

The brake has a mechanical over-ride that can be engaged so machine can be pushed or towed (slowly).

When the mechanical over-ride is engaged the machine cannot be driven.

To engage brake:

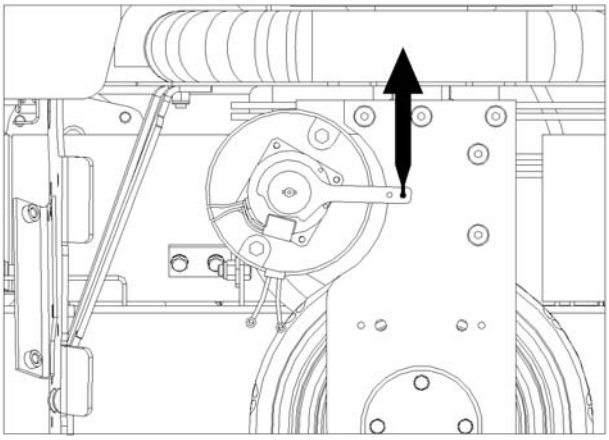


1. Mechanical over-ride engaged.
2. Machine can be pushed or towed (slowly).

Push lever firmly in direction of arrow

NOTE: There is an intermediate stop. Make sure lever is fully in the down position.

To disengage brake:



1. Mechanical over-ride disengaged
2. Machine can be driven.
3. Push lever firmly in direction of arrow.

Drive Motor Carbon Brush Replacement

⚠WARNING:

Do not use a pressure washer to clean around the motors. Use tap pressure only.

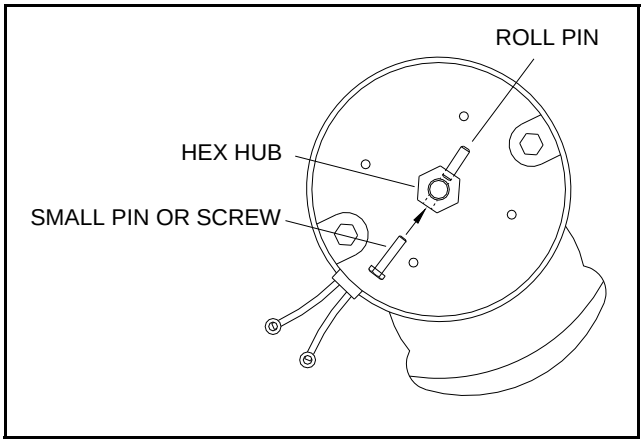
SAFETY: Before leaving or servicing machine, stop on a level surface, turn off machine and remove key.

1. Disconnect batteries from machine.
2. Disconnect the electrical connection to the traction motor.

Brake Removal

(Must be done to access carbon brushes)

3. Remove 4 mounting screws and remove brake.
4. Drive roll pin out of the hex hub enough to allow hex hub to slide off shaft. It is recommended that the roll pin be left partially in the hex hub.



5. Remove brush cap.
6. Release brush from spring tension. Remove screw connecting brush wire lead to brush holder. Clean brush holder to insure free movement.
7. Install new brush and reinstall connecting screw and lead.
8. When all new brushes are installed. Place all in retracted position, held into brush holder by spring tension.
9. Carefully replace brush cap.

Reinstalling:

10. When replacing the hex hub, use a small pin or screw to help align the holes.
11. Drive the pin into the hub and make sure it is flush to the hex surface. The brake will not fit on the hub if the roll pin is protruding from the hub.
12. Replace the hub and use Lock-Tite on the screws.

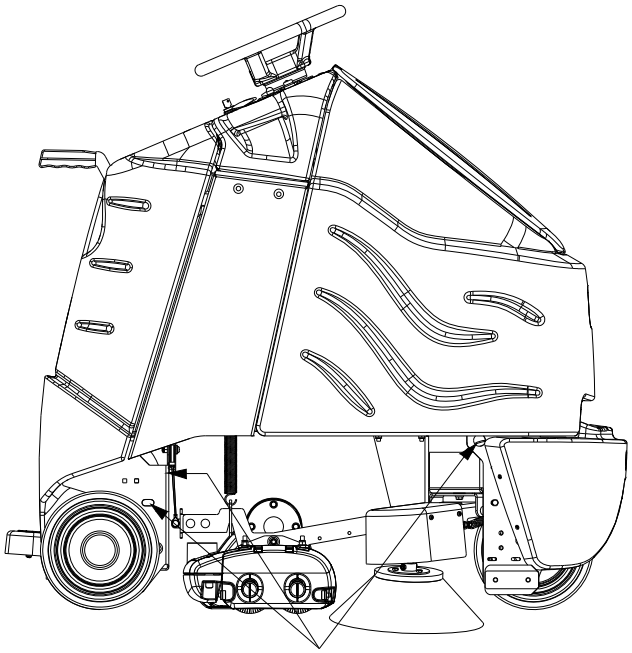
Pushing Machine

The machine may be pushed for short distances at speeds not to exceed 5 mph. Be careful to avoid damaging machine. The machine may be pushed by hand from the rear.

NOTE: To avoid damage caused by regenerative voltage, disconnect traction motor before towing or pushing machine.

Machine Tie-downs

There are two tie points located at front and each side of foot box frame and two at the front side of frame. Tie-down devices must be of the proper type and strength. The combined strength of all tie-downs must be strong enough to lift two times the weight of the machine. Tie-downs must be positioned to prevent the machine from moving forward, backward, or either side to side. Use all four corners of the machine with the tie-downs running out opposite directions. Tie-downs must be attached to the transporting vehicle securely.



TIE DOWN POINTS

Preparation for Loading/Unloading Trailer

Before loading or unloading machine from trailer, brush head must be in the up position before loading.

NOTE: When transporting the machine on a trailer or in a truck, in addition to using tie-downs, be sure to set the parking brake, and block the tires to prevent the machine from rolling

Troubleshooting

PROBLEM	CAUSE	SOLUTION
No power to machine	Battery disconnected	Check all battery cable connections
	Emergency shut-off activated	Reset
	Faulty key switch	Replace switch
Little or no propel	Low battery charge	Charge batteries
	Machine turned on with pedal not in neutral position	Allow pedal to return to neutral. Restart
	Tripped circuit breaker	Reset circuit breaker and check brush
	Controller overheated	Allow cool down period
	Loose motor connection	Check wires and connections from controller to motor
	Faulty throttle circuit or potentiometer	Check wires and connections from throttle to controller and potentiometer resistance
	Faulty drive reset circuit or switch	Check wires, connection and switch
	Faulty platform circuit or switch	Check wires, connections and switch
	Brake over-ride engaged	Disengage brake over-ride
	Faulty brake circuit or over-ride switch	Check wires, connections and switch
Machine does not change speeds	Faulty speed control circuit or switch	Check wires, connections and switch
Forward speed only Reverse speed only	Faulty forward/reverse switch	Replace Switch
Vacuum and brush do not turn on	Circuit breaker tripped	Reset
	Full bag or clog in system (bag full light on)	Replace bag, check for and remove debris
Poor vacuums performance	Debris caught in system	Remove debris
	Low battery charge	Charge batteries
Brush motors do no run, or run slowly	Bag full light on	Replace bag or remove clog
	Circuit breaker(s) tripped	Reset circuit breaker(s)
	Low battery charge	Charge battery
	Fault brush circuit or motor	Check wires, connections and motor

Propel Circuit Board Troubleshooting

Curtis 1228 LED DIAGNOSTICS

During normal operation, with no faults present, the status LED is steadily on.

If the controller detects a fault, the status LED provides two types of information.

First, it displays a slow flash (2 Hz) or a fast flash (4 Hz) to indicate the severity of the fault. Slow-flash faults are self-clearing; as soon as the fault is corrected, the vehicle will operate normally. Fast-flash faults ("." in Table 2) are considered to be more serious in nature and require that the key switch be cycled to resume operation after the fault is corrected.

After the severity indication has been active for 10 seconds, the status LED flashes a 2-digit fault identification code continuously until the fault is corrected. For example, code "1,4"-low battery voltage-appears as: one LED flash, followed by a pause, then 4 LED flashes, and then repeats.

LED CODE	PROGRAMMER LCD DISPLAY	EXPLANATION	POSSIBLE CAUSE
1,1	THERMAL CUTBACK	over-/under-temperature cutback	1. Temperature >92°C or < -25°C. 2. Excessive load on vehicle. 3. Operation in extreme environments. 4. Electromagnetic brake not releasing.
1,2	THROTTLE FAULT 1	throttle fault	1. Throttle input wire open or shorted. 2. Throttle pot defective. 3. Wrong throttle type selected
1,3	SPD LIMIT POT FAULT	speed limit pot fault	1. Speed limit pot wire(s) broken or shorted. 2. Broken speed limit pot.
1,4	LOW BATTERY VOLTAGE	battery voltage too low	1. Battery voltage <17 volts. 2. Bad connection at battery or controller.
1,5	OVERVOLTAGE	battery voltage too high	1. Battery voltage >36 volts. 2. Vehicle operating with charger attached. 3. Intermittent battery connection.
2,1	MAIN OFF FAULT	main contactor driver Off fault	1. Main contactor driver failed open.
2,3	MAIN CONT FLTS	main contactor fault	1. Main contactor welded or stuck open. 2. Main contactor driver fault. 3. Brake coil resistance too high.
2,4	MAIN ON FAULT	main contactor driver On fault	1. Main contactor driver failed closed.

LED CODE	PROGRAMMER LCD DISPLAY	EXPLANATION	POSSIBLE CAUSE
3,1	PROC/WIRING FAULT	HPD fault present for >10 sec.	1. Misadjusted throttle. 2. Broken throttle pot or throttle mechanism.
3,2	BRAKE ON FAULT	brake On fault	1. Electromagnetic brake driver shorted. 2. Electromagnetic brake coil open.
3,3	PRECHARGE FAULT	precharge fault	1. Low battery voltage. 2. KSI and throttle turned on at same time.
3,4	BRAKE OFF FAULT	brake Off fault	1. Electromagnetic brake driver open. 2. Electromagnetic brake coil shorted.
3,5	HPD	HPD (High Pedal Disable) fault	1. Improper sequence of throttle and KSI, push, or inhibit inputs. 2. Misadjusted throttle pot.
4,1	CURRENT SENSE FAULT	current sense fault	1. Short in motor or in motor wiring. 2. Controller failure.
4,2	HW FAILSAFE	motor voltage fault (hardware)	1. Motor voltage does not correspond to throttle request. 2. Short in motor or in motor wiring. 3. Controller failure.
4,3	EEPROM FAULT	EEPROM fault	1. EEPROM failure or fault.
4,4	POWER SECTION FAULT	power section fault	1. EEPROM failure or fault. 2. Short in motor or in motor wiring. 3. Controller failure.