

PowerBoss®
The Power of Clean

User Manual Atlas Sweeper

Models: Diesel, Gasoline, & LPG

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Bortek®
WE KNOW CLEAN®



PowerBoss®, Minuteman International, Inc.
A Member of the Hako Group

PB# 4100053 Rev. B 05/15

PREFACE

Thank you for your purchase of the new industry standard for scrubber/sweepers. PowerBoss® takes great pride in offering the most dependable, reliable and best value in industrial power scrubbers and sweepers. We set the standard.

Our Customer Service Department would like to hear from you. If you see any errors, omissions or something that needs clarification in this User Manual, please let us know. We are working hard towards continually improving our processes to benefit you, our valued customer.

Please copy the form on the next page. Fill out and comment on how you found our manual.

Thank you!

The PowerBoss Team

Name: _____

Title: _____

Company Name: _____

Address: _____

Country: _____

Type of equipment or model number: _____

Comments: _____

Please return to:

Customer Service Manager

PowerBoss®, Minuteman International, Inc.

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Pingree Grove, Illinois 60140 USA

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This is the User Manual for the PowerBoss® Atlas Rider Sweeper.

This manual covers all Standard Atlas machine variations beginning May 2015.

We believe this machine will provide excellent service for many years.

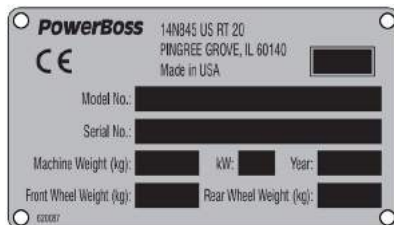
However, the best results will be obtained if:

- The machine is operated with reasonable care.
- The machine is maintained regularly per the maintenance schedule provided in this User Manual.
- The machine is maintained with PowerBoss® supplied or equivalent parts.

All right side and left side references to the machine (except for engine) are determined by facing the direction of forward travel. The front of the engine or engine fan faces the left side of the machine. Some hardware considered to be common or locally available has been omitted from the parts section to make this manual clear. Be sure to use equivalent hardware when replacement becomes necessary.

The Model and Serial Number of your machine is shown on the I.D. name plate. This information is needed when contacting Technical Support or when ordering parts. The I.D. plate is mounted on the left side wall of the operator seating area.

Example I.D. Plate:



Parts may be ordered by phone, fax or e-mail from your local PowerBoss® parts and service center. Before ordering parts or supplies, be sure to have your machine Model Number and Serial Number handy. For your convenience Fill out the Machine Data block for future reference.

MACHINE DATA Fill out at installation	
Model Number:	_____
Serial Number:	_____
Engine Serial Number:	_____
Sales Rep.:	_____ Date of Install: _____

All information contained in this catalog is current at the time of printing.
Minuteman International, Inc. reserves the right to make changes at any time without notice.

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TECHNICAL SPECIFICATIONS

Model: Atlas Sweeper

Model No.: PB620DSL, PB620GAS, PB620LP

Atlas Sweeper w/Dual Side Broom

PB620DSL-DSB, PB620GAS-DSB, PB620LP-DSB

GENERAL MACHINE SPECIFICATIONS

Length: 99.75 in
Width without side broom 63.38 in
Rear frame width: 60.00 in
Height w/ overhead guard 82.88 in
Height w/ overhead guard 58.88 in
Wheelbase: 47.75 in
Aisle width U-turn: 10.0 ft (120 in)
(contact clearance = 113 in)
Empty vehicle weight 3460 lbs
Gross vehicle weight 4660 lbs
Sound level: 83 dBA
Maximum forward speed: 9.8 mph
Maximum reverse speed: 3 mph
Maximum climb angle
empty hopper: 14 degrees (24.9 % grade)
Maximum climb angle full hopper . . 10 degrees (17.6% grade)

SWEEPING SYSTEM

Productivity 184,800 sq. ft. per hour
Main broom diameter: 14.0 in
Main broom length: 48.0 in
Side broom diameter: 26.0 in
Sweeping path w/ side broom 63 in
Optimum main broom
pattern width: 2.0 in – 2.5 in
Hopper weight capacity: 1200 lbs.
Hopper volumetric capacity
(less filter box): 16.0 cu ft
Hopper dump height: variable to clear 60 in
Min. ceiling height
for 60" hopper dump: 8 ft – 6 in
Filter type: Treated synthetic panel filter
Filter area: 95 sq ft

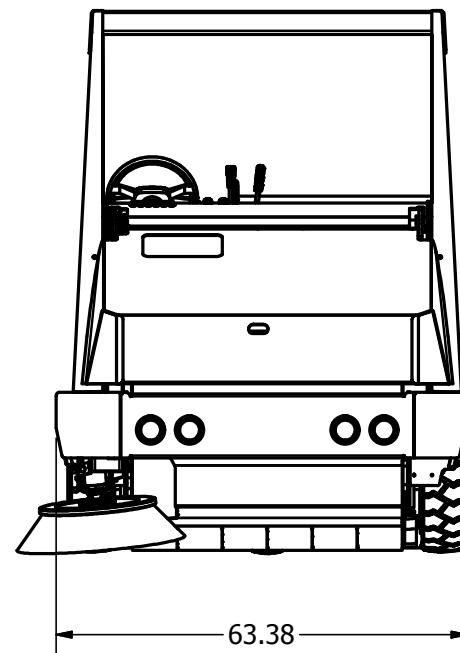
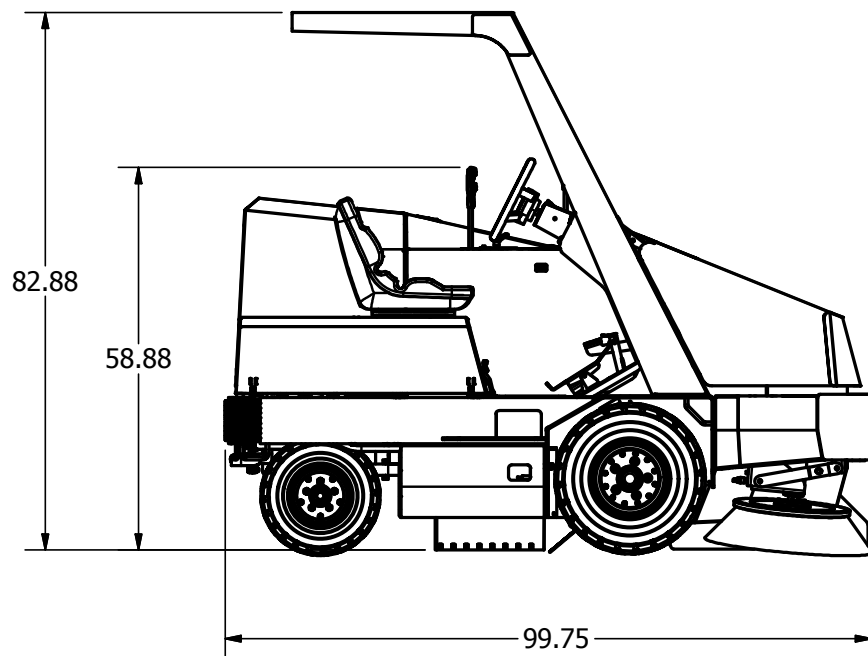


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FEATURES

AIR-MOVING SYSTEM

- Four-stage dust filtration
 - Vacuumized main broom chamber
 - Removable pre-filtering for large particle removal
 - 95 Sq. Ft. synthetic dust control filter panel
 - Advanced electric filter shakers design that shakes filter element
- User friendly filtration system design no need to remove shaker motor to remove filter element
- Double layered mounting of hydraulic impeller for reduced noise
- Engine area shielded from exhaust air, which is vented at the rear of the machine
- Fire-in-hopper Indicator will automatically shut off impeller fan
- Optional clogged Filter Indicator

DEBRIS-HANDLING SYSTEM

- High wear rubber skirts equipped with indicators for wear, adjustment and replacement
- Shock mounted side broom, employs trailing arm design to prevent accidental damage
- Quick change 26" side broom
- Direct throw sweeping method
- Oversized hopper
- Innovative main broom adjustment system
 - Fully adjustable from operator compartment
 - Full float feature
 - Visual broom wear indicator from operator compartment
 - Lever position for quick and simplified broom replacement
- Impeller shut off for wet sweeping from operator compartment
- Dual-performance sweep mode
- Multi-Level Hopper Dumping

SAFETY INNOVATIONS

- Vehicle speed restriction when hopper is raised
- Hopper safety arm accessible without need to reach under raised hopper
- Safety vision feature allows forward visibility with hopper raised

ERGONOMICS SYSTEM

- Roomy, open operator compartment for extra comfort
- Toe operated parking brake
- Adjustable, high-back seat
- Power steering and tilt steering wheel
- Comfortable pedal/controls placement
- Unparalleled maintenance accessibility, cover removal requires no tools
- Simplified color coded operator controls for sweep and dump functions.

HYDRAULIC SYSTEM

- Hydraulic filter built into reservoir for ease of maintenance
- Protection for both auxiliary and propulsion pumps using separate 100 mesh filters
- Hydraulic reservoir equipped with site gauge and dip stick for fluid level check and replacement
- Hydraulic filter equipped with color coded pressure gauge to indicate filter replacement

DRIVE-TRAIN SYSTEM

- Industrial liquid-cooled engine
- Heavy-duty radiator & Tri-phase air cleaner
- Hydraulics protection package
- 4-Core Radiator
- PowerClimb™ All-Terrain Access
(Two 23-1/4" OD Pneumatic Front Tires & single 18 1/2" OD Pneumatic Rear Tire)

CHASSIS SYSTEM

- Massive One-Piece, unitized 1/4 thick steel frame
- Oversized, soft-ride tires

POWERBOSS INNOVATIONS

- PowerClimb™ - with oversized tires and extra ground clearance you can easily negotiate rough terrain and speed bumps; even climb most sidewalk curbs

ENVIRONMENTAL FRIENDLY FEATURES

CLEAN AIR

High-performance filter system dramatically reduces the release of dust and debris back into the air, dust vacuum ensures that dust is put directly into the hopper, bristle pattern on main broom increases dust control

LOWER EMISSIONS

All gas and LP engines meet Tier 3 specifications, catalyst mufflers, diesel operated available, bio-diesel fuel can be used in Kubota® engine

SAFER WORK ENVIRONMENT

Orange machines are highly visible to others in the workplace, simple controls reduce operator error. Machine equipped with horn, fire in hopper indicator, effective braking system, also available: overhead guard, back-up alarm, seat belt, warning beacon and others

SAFETY INFORMATION

IMPORTANT SAFETY INSTRUCTIONS

Operators must read and understand this manual before operating or maintaining this machine.

Do not operate this machine in flammable or explosive areas.

This machine is designed solely for removing dirt, dust and debris in an outdoor or indoor environment. PowerBoss does not recommend using this machine in any other capacity.

The following information indicate a potential hazard to the operator and equipment. Read this manual carefully and be aware when these conditions can exist. Take necessary steps to locate all safety devices on the machine and train the personnel operating the machine. Report any machine damage or faulty operation immediately. Do not use machine if it is not in proper operating condition.

FOR SAFETY DURING OPERATION

Keep hands and feet clear of moving parts while machine is in operation.

Make sure all safety devices are in place and operate properly. All covers, doors and latches must be in place, closed and fastened before use.

During operation, attention should be paid to other persons in the work area and especially if small children are present.

Components can cause an explosion when operated near explosive materials or vapor. Do not operate this machine near flammable materials such as solvents, thinners, fuels, grain dust, etc.

Store or park this machine on a level surface only. To prevent unauthorized use, machine should be stored or parked with the parking brake set and the key removed.

This machine is designed for level operation only. Do not operate on ramps or inclines greater than 14 degrees (24.9% grade).

This machine is not suitable for picking up hazardous dusts.

Use caution when moving this machine into areas that are below freezing temperatures.

FOR SAFETY WHEN SERVICING & MAINTAINING MACHINE

Stop on level surface, set parking brake and turn off machine.

Disconnect the power to the machine when servicing.

Avoid moving parts. Do not wear loose jackets, shirts, or sleeves when working on machine.

Avoid contact with battery acid. Battery acid can cause burns. When working on or around batteries, wear protective clothing and safety glasses. Remove metal jewelry. Do not lay tools or metal objects on top of battery.

Authorized personnel must perform repairs and maintenance. Use PowerBoss supplied replacement parts.

SAFETY SYMBOLS

Five symbols are used throughout this manual to emphasize various levels of safety information. These symbols and the meaning of each are listed below.



To warn of immediate hazards which will result in severe personal injury or death



To warn of hazards or unsafe practices which could result in severe personal injury or death.



To warn of hazards or unsafe practices which could result in minor personal injury.



To warn of practices which could result in extensive equipment damage.

NOTE: To direct your attention to important equipment information or special instructions for preventing damage to equipment

Symbols at the top of the list are the strongest warnings. However, all symbols represent important information which should be observed to protect you and others from harm and injury, and to prevent damage to the equipment.

SAFETY DECALS

Decals directly attached to various parts of the unit are highly visible safety reminders which should be read and observed. Make sure the decals are replaced if they become illegible or damaged.

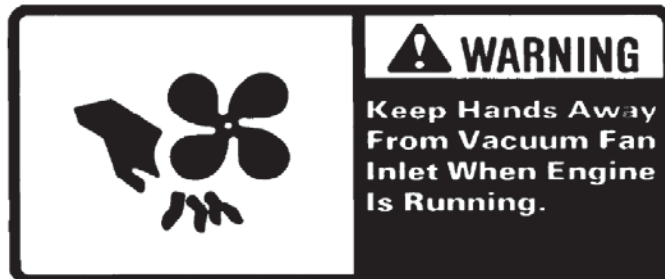
Located in the operator compartment:

Part Number 3301854



Located near the Impeller inlet:

Part Number 3301729



Located on the hopper and hopper lift arms:

Part Number 3301732



SAFETY INFORMATION

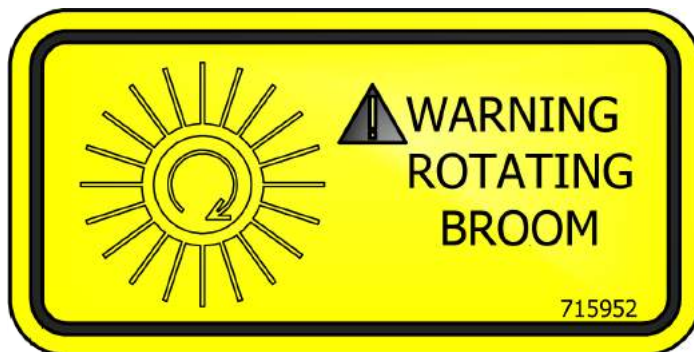
Located on the shroud of the radiator:
Part Number 3301733



Located on the engine mount:
Part Number 3301730



Located behind the main broom doors:
Part number 715952



Located on the rear bumper:
Part number 3342978



Located in the operator compartment:
Part number 3342264



Located on the safety arm:
Part number 715951



Located on the seat mount:
Part number 715954



BASIC POWERBOSS® SAFETY

PowerBoss® sweepers should never be operated unless:

1. The operator is trained and authorized to operate the equipment and,
2. The equipment is functioning correctly.
Malfunctioning equipment should be removed from service.

DANGER

Keep cigarettes, matches and all other flame sources away from the sweeper. Gasoline, LP gas and diesel fuel are highly flammable. Lead acid batteries are equally dangerous due to the highly explosive hydrogen gas they emit.

WARNING

Do not operate an LPG powered sweeper when any component in the fuel system is malfunctioning or leaking.

WARNING

Before starting the engine, make sure that:

- * You have read and understand the User Manual.
- * You are securely seated in the operator's seat.
- * The parking brake is engaged.
- * The directional control pedal is in neutral.
- * The throttle is in idle.
- * Hydraulic controls are in the OFF position.

WARNING

During operation:

- * Keep your hands and body clear of moving parts, especially when the hopper or lift arms are partially or fully raised.
- * Make sure others in the area stay clear of the equipment and moving parts.
- * Never attempt to dump debris from a dock or mezzanine. Dump from ground level only.

 WARNING

When leaving the sweeper unattended:

- * Place the controls in the OFF position.
- * Set the parking brake.
- * Shut off the engine.
- * Remove the key.

 WARNING

When servicing or repairing the fuel system:

- * Work in a properly ventilated area, do not smoke or allow an open flame near the fuel system.
- * Never bypass safety components unless you are testing them.
- * Never bypass the fuel filter lock, except when testing them (and always reconnect them after testing).
- * Wear gloves to disconnect the tank coupling.

 WARNING

During cleaning and maintenance:

- * Always stop the engine and set the parking brake before servicing.
- * Never use detergents or cleansers that are flammable or combustible.
- * Never inflate a pneumatic tire without using a safety cage.
- * Do not attempt any impeller adjustment unless you have shut off the engine. Never place your hands near the intake hoses or inlet when the engine is running.
- * Always engage the safety arm before servicing the hopper. Do not rely on the hydraulic cylinder to keep the hopper raised.
- * Never test for hydraulic hose leaks using your hand or any other part of your body. High pressure leaks can be very dangerous and should only be checked using a piece of paper.

WARNING

Replace any defective safety components before operating the sweeper.

CAUTION

Do not drive with the hopper in the raised position except the few feet necessary to position the hopper over the dumpster or receptacle. Driving with the hopper raised reduces visibility and creates conditions for striking over-head objects, throwing the machine off-balance and other hazards.

CAUTION

Travel slowly on grades.

CAUTION

Place a block or chock behind the wheels when parking on inclines.

CAUTION

Use special care when traveling on wet surfaces.

CAUTION

Observe all proper procedures for operation and maintenance of the unit, as outlined in this manual.

CAUTION

Remain alert at all times to people and equipment in and around your area of operation.

ATTENTION!

Never push or tow a machine faster than 6 mph.

ATTENTION!

Engage tow valve before towing or pushing.

MACHINE OPERATION

BASIC OPERATING CONTROLS & INDICATORS

IGNITION SWITCH

The ignition switch located to the right of the steering column and is used to start and stop the engine.

THROTTLE / GLOW PLUG SWITCH

The LPG and gasoline machines have a three speed throttle switch with idle, operating and fast selections. The diesel machine has three position throttle with, glow plug, idle and operating selections. The throttle is located to the right of the steering column and adjusts the engine speed.

- The glow plug selection activates the glow plugs.
- The throttle should be in the IDLE position when starting the engine and immediately before shutdown.
- The operating position should be used during operation to ensure proper broom speed and dust control.
- The fast selection is not recommended for sweeping due to excessive broom wear. The fast selection is for traveling from location to location.

LIGHT SWITCH

The light switch, located to the left of the steering column operates the head lights, tail lights and optional side broom light.

HORN BUTTON

The horn is activated by pressing the horn button which is located to the right of the steering column below the throttle switch.

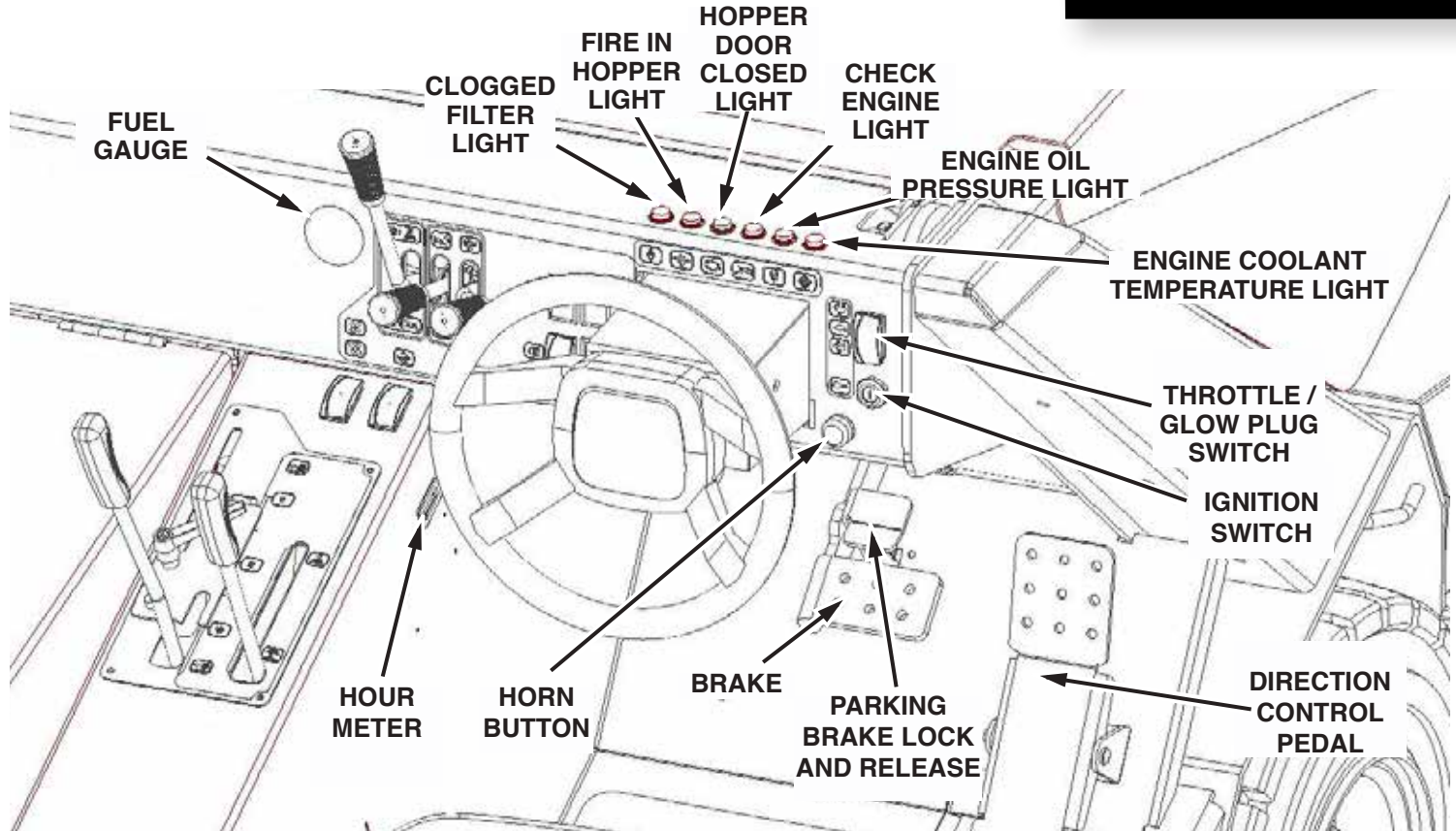
FUEL LEVEL GAUGE

The gasoline and diesel models are equipped with a fuel gauge, located to the far left of the steering column and indicates the amount of fuel remaining in the tank.

HOURLY METER

The hour meter, located on the left side of the operator compartment, records the number of hours the machine has been operated. The hour meter provides a helpful guide for performing routine maintenance tasks.

MACHINE OPERATION



INDICATOR LIGHTS

Clogged filter light (optional)

The clogged filter indicator will illuminate when it is necessary to clean or replace the filter element.

Fire in the hopper light

The fire in the hopper indicator will illuminate when a fire is detected in the hopper.

Hopper Door Closed light

The hopper door closed indicator will illuminate anytime the hopper door is not fully opened. The hopper door must be fully open when sweeping with the unit. The main broom and the impeller are prevented from operating if the hopper door is not fully open.

Check Engine light

The check engine light will illuminate if a problem is detected. The engine will be automatically shut off.

Engine oil pressure light

The engine oil pressure light will illuminate if the oil pressure drops below 7 psi indicating a problem which may result in damage to the engine. The engine will be automatically shut off.

Engine Coolant Temperature light

The engine coolant temperature light will illuminate if the engine coolant temperature raises above 220°F indicate an overheating engine. The engine will be automatically shut off.

DIRECTIONAL CONTROL PEDAL

The directional control pedal controls the speed and direction of the machine. It is also used for slowing the machine or stopping.

- To propel the machine forward, apply pressure to the front of the pedal, increasing pressure to increase speed.
- To propel the machine backward, apply pressure to the rear of the pedal.
- To slow or stop the machine, move the foot pedal into neutral.
- For emergency stops, move the foot pedal past neutral and into the opposite position.

BRAKE / PARKING BRAKE

The mechanical drum brakes on the two front wheels are operated by pressing on the brake pedal. To engage the parking brake push the upper brake lock to set the parking brake. To release the parking brake depress the brake pedal.

TILT STEERING LEVER

The steering wheel can be adjusted to provide the most comfortable position for the operator. To adjust the steering wheel loosen lever knob on the left side of the steering column, position the steering wheel and tighten the lever knob.

SEAT ADJUSTMENT

The drivers seat is adjustable to provide the most comfortable position for the operator. The adjustment lever is at the bottom front of the seat. While sitting in the seat, push the lever to the right and pull forward or push back on the seat. Release the lever when the seat is in the proper location.

SWEEPING CONTROLS

The sweeping controls are color coded in green for easy operator identification.

BROOM CONTROL LEVER

The broom control lever activates the brooms. Pushing the broom control lever forward activates the main and side brooms. Positioning the broom control lever in the middle turns off all brooms. Pulling the broom control lever activates the main broom only.

NOTE: The main broom and side broom may be lowered independently.

NOTE: The “OFF” position is achieved by placing the broom control lever in the center of the slot. Both broom motors (main & side) are deactivated by taking this action.

MAIN BROOM LEVER

The main broom lever, located to the far left of the driver raises and lowers the main broom.

- For normal sweeping, move the lever forward to the normal sweeping slot position.
- For sweeping low spots or uneven surfaces move the lever forward into the full float slot.

NOTE: Extensive use of the float position reduces broom life.

- When not sweeping, move the lever back and lock in the RAISE position.

MAIN BROOM ADJUSTMENT

The main broom adjustment plate controls the broom height.

MAIN BROOM WEAR INDICATOR

The main broom wear indicator shows broom wear and indicates when broom should be turned end for end or replaced.

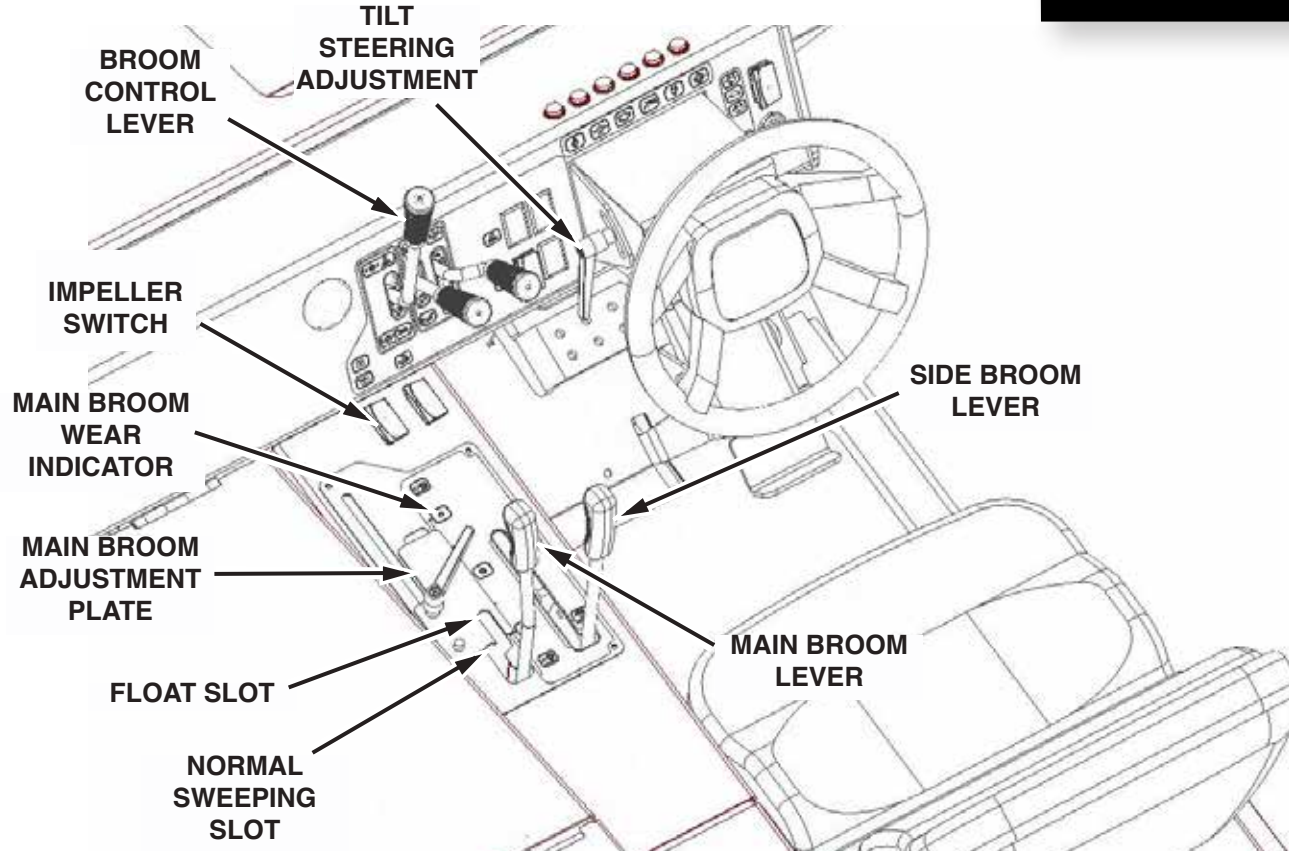
SIDE BROOM LEVER

The side broom lever, located to the immediate left of the driver raises and lowers the side broom.

- To lower the side broom, move the lever forward to the LOWER position.
- When not sweeping, move the lever back and lock in the RAISE position.

IMPELLER SWITCH

The impeller switch turns the impeller motor on and off. The impeller can be turned off for wet sweeping applications. The impeller will be turned off automatically if a fire is detected in the hopper.



DEBRIS HOPPER DUMP CONTROLS

The dump controls are color coded in orange for easy operator identification.

HOPPER FILTER SHAKER BUTTON

This button is used to activate the filter shaker prior to dumping or as needed during sweeping operation. It is located to the left hand side of the instrument panel. The optional filter clogged light will illuminate when the filter needs cleaning or replacement.

To shake the filter:

1. Bring the machine to a complete stop.
2. Place the broom control lever in the OFF position.
3. Press and hold the filter shaker button for 20 to 30 seconds.
4. Place the broom control lever in the ON position and resume sweeping.

HOPPER RAISE / LOWER LEVER

The far right lever on the front of the control panel is used to raise and lower the hopper to any height up to 60" (1.52 mm). Push the lever up to raise the hopper, pull the lever down to lower the hopper.

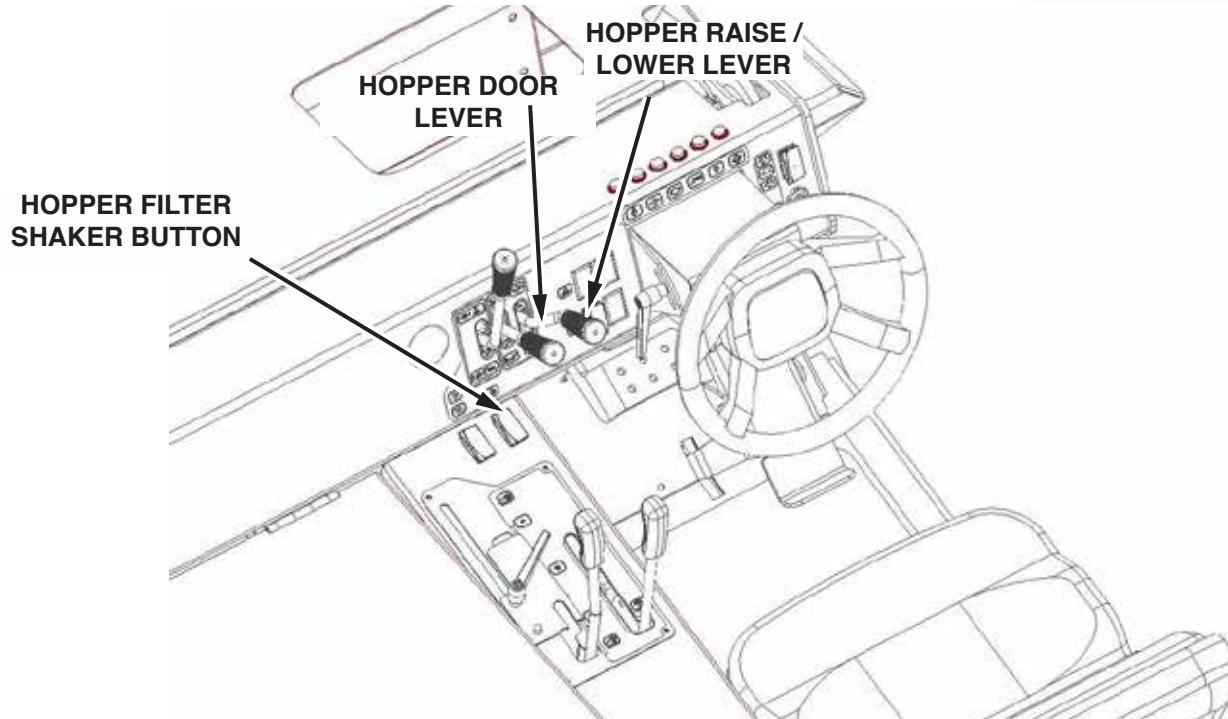


CAUTION

Do not leave the hopper in the RAISE position without engaging the hopper safety arm.

HOPPER DOOR LEVER

The hopper door lever is the center lever left of the control panel, opens and closes the hopper door. Push the lever up to open and pull down to close the hopper door. The hopper door must be open when sweeping with the unit. The hopper closed light on the control panel above the steering wheel will be illuminated when the hopper door is closed.



OPERATING PROCEDURES

PRE-OPERATION CHECKS

Prior to starting the engine, check the following:

1. Engine oil level
2. Engine coolant level
3. Fuel level
4. Hydraulic fluid level
5. Brakes, steering and directional controls
6. The floor beneath the machine for signs of fluid leaks
7. Check the condition of sweeping brooms, remove any strings and debris wrapped around them.

Fluid levels should be correct. Brakes, steering and directional controls should be functioning properly. Hoses, lines and tanks should be free of damage and leaks.

STARTING

WARNING

Before starting the engine, sit in the operator's seat and make sure the parking brake is engaged.

1. Make sure the directional control pedal is in the neutral position.
2. Engage the parking brake.
3. Make sure the throttle is in the idle position.
4. LP and Gasoline-powered: Turn the ignition key to the start position (clockwise). When the engine starts, release the key.

Diesel-powered: Press the Glow-plug switch for 15 to 20 seconds, then turn the ignition key to the start position (clockwise). When the engine starts, release the key.

CAUTION

If the engine fails to start, do not continue cranking for more than ten seconds. Allow the starter motor to cool between attempts.

DRIVING

The direction control pedal moves the machine forward and backward. To move the machine forward or backward release the parking brake.

- Forward: Apply pressure to the front of the directional control pedal, increasing pressure to increase speed.
- Reverse: Apply pressure to the rear of the pedal, increasing pressure to increase speed.

SLOWING AND STOPPING

Allow the directional control pedal to move into neutral. Step on the brake pedal.

OPERATING INCLINES/SLIPPERY SURFACES

Always travel slowly when operating on inclines or slippery surfaces.



WARNING

Do not travel across or turn on inclines, to maintain stability of the machine.

Always travel straight up or down on inclines.

SWEEPING

Make sure main and side broom are adjusted correctly, refer to “Main Broom Height Adjustment” and “Side Broom Height (Wear) Adjustment”.

Make sure the impeller switch is turned on.

Make sure the hopper door is open, check if the hopper door closed light is illuminated. If it is push the lever forward to close the hopper door.

Drive to the location to be cleaned.

1. To activate both brooms move the broom control lever forward or to activate just the main broom move the broom control lever backward.
2. Unlock and move the main broom lever forward to lower the main broom.
3. If using the side broom unlock the side broom lever and move forward to lower the side broom.
4. Sweep area as needed.

STOP SWEEPING

Stop machine after sweeping is complete.

1. To deactivate both brooms move the broom control lever to the center position.
2. Move the main broom lever backward to raise the main broom and lock in position.
3. If using the side broom, move backward to raise the side broom and lock in position.

EMPTYING THE HOPPER

1. Pull the hopper door lever back to close the hopper door, make sure the hopper door close light illuminates.
2. Drive the machine to the dumping area.
3. Reduce the engine speed by toggling the throttle switch to idle speed.
4. Press the filter shaker switch for 20-30 seconds.
5. Push the hopper lever up to raise the hopper until the bottom of the hopper is high enough to clear the top of the container.



WARNING

Stay clear of the hopper when operating.

6. Slowly and carefully move the machine forward until the hopper is positioned over the container.



WARNING

It is unsafe to travel an extended distance with the hopper raised. Travel only the distance necessary to position the hopper.

7. Push the hopper door lever up to open the hopper door and empty the debris.
8. After the hopper empties, pull the hopper door lever down until the hopper door closes. The hopper door closed light should illuminate.
9. Slowly back the machine away from the container to provide adequate clearance to lower the hopper.
10. Pull the hopper lever down to lower the hopper.
11. Push the hopper door lever down to open the hopper door.

STOPPING THE MACHINE

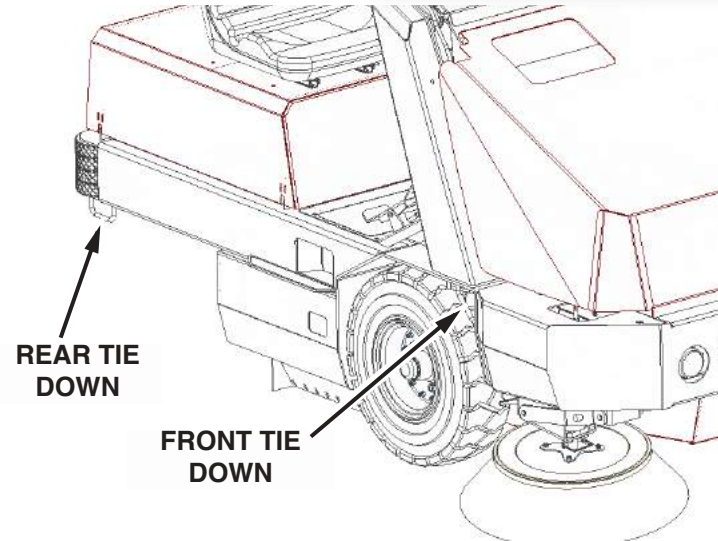
1. Make sure the directional control pedal is in the neutral position.
2. Engage the parking brake.
3. Make sure the throttle is in the idle position.
4. Turn the ignition key to the stop position (counterclockwise) and remove key.

TRANSPORTING THE MACHINE

Using a Trailer or Transport Vehicle

1. Position the machine on the transport vehicle or trailer and apply the parking brake.
2. Tie the machine down using the tie down bars in the wheel wells ahead of both front tires and in the rear corners of the frame.

NOTE: Attach the tie downs to the tie down bars only.



Pushing or towing the Machine

Before towing or pushing the machine, turn the bypass valve located on the top of the propulsion pump 90 degrees as shown in the illustration.

Push the machine from the front or rear using the bumpers only. Tow the machine using the front or rear tie down bars.

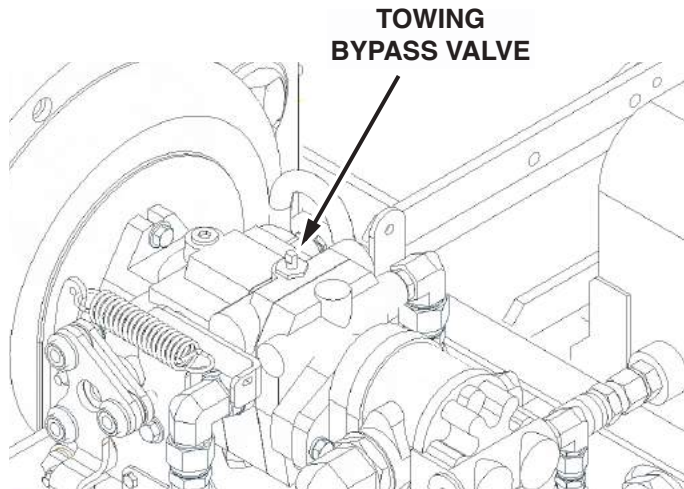
CAUTION

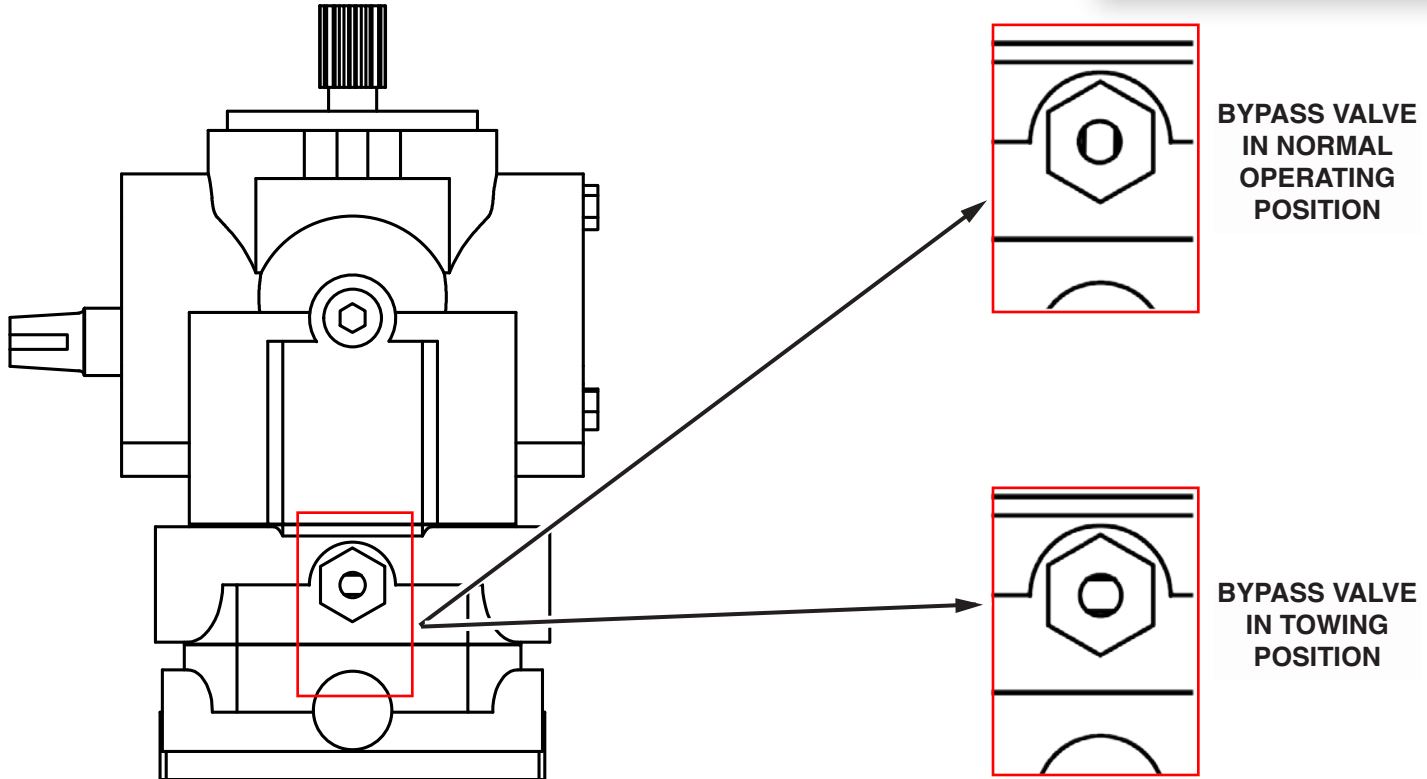
The tow control valve must be turned 90 degrees from the operating position.

Not turning the tow control valve will cause damage to the pump.

ATTENTION!

Do not tow or push the machine a distance of more than .5 miles (.80 kilometers) or faster than one mile per hour (1.61 km). Exceeding these restrictions may cause damage to the hydraulic system. If towing will exceed the above restrictions, the rear wheel must be raised or supported by a dolly.





PREVENTATIVE MAINTENANCE

INTRODUCTION

Regular maintenance on your sweeper results in better cleaning, faster cleaning and a prolonged service life for the equipment and components. This section contains the following information to help you give your sweeper the maintenance attention it requires:

- A Scheduled Maintenance Chart
- Preventative Maintenance Instructions for Required Scheduled Maintenance Tasks

Because it is extremely important to your safety, you will see the following **WARNING** repeated throughout this section:

 WARNING

Never attempt to perform any service on the equipment or components until the engine is OFF, the parking brake is LOCKED, and the wheels are CHOCKED.

SCHEDULED MAINTENANCE CHART

FREQUENCY (IN HOURS)					SERVICE (BY MAINTENANCE AREA)
DAILY	50	100	200	500	
ENGINE					
		X			Pressure wash engine <i>NOTE: For additional maintenance requirements, refer to the engine manual.</i>
AIR INTAKE SYSTEM					
X					Empty rubber dust cup of air filter element.
X					Check air filter indicator
	X				Clean air filter. <i>NOTE: Clean more often in dusty conditions.</i>
			X		Replace air filter.
ELECTRICAL SYSTEM					
			X		Clean battery top.
COOLANT SYSTEM					
X					Check coolant level and fill as needed.
	X				Inspect radiator fins and clean as needed.
		X			Blow out radiator fins.

SCHEDULED MAINTENANCE CHART

FREQUENCY (IN HOURS)					SERVICE (BY MAINTENANCE AREA)
DAILY	50	100	200	500	
LUBRICATION POINTS					
				X	Lubricate steering cylinder rod end.
				X	Lubricate steering pivot thrust bearing
				X	Lubricate broom lift cable pulleys
			X		Lubricate hopper lift bearings
				X	Hood Latches & Hinges Lubricate type - oil
IMPELLER					
X					Check for hydraulic fluid leaks from hoses and motor.
HYDRAULIC SYSTEM					
X					Check hydraulic reservoir gauge and fill as needed.
				X	Replace breather cap filter element.
				X¹	Replace hydraulic fluid and filter
X					Check functioning of directional control pedal (hydrostatic transmission) and adjust as needed.
				X	Clean hydraulic fluid strainer in reservoir.
	X				Inspect hydraulic oil cooler fins and clean as needed (if so equipped).
		X			Blow out hydraulic oil cooler fins with compressed air (if so equipped).

Notes:1. Replace as indicated by hydraulic filter gauge.

SCHEDULED MAINTENANCE CHART

FREQUENCY (IN HOURS)					SERVICE (BY MAINTENANCE AREA)
DAILY	50	100	200	500	
SWEEPING COMPONENTS					
X					Inspect brooms for wear and remove strings and debris from bristles and drive assembly.
X					Inspect main broom door skirts for wear and damage, adjust or replace as needed.
	X				Inspect main broom rear skirt for wear and damage, adjust or replace as needed.
	X				Inspect main broom recirculating flap for wear or damage, replace as needed.
X					Adjust main broom height.
	X				Rotate main broom end-to-end.
				X	Preform main broom taper and sweep pattern test and adjust if needed.
X					Inspect the side broom for wear and adjust as needed.
					Replace main and side brooms as needed: Main Broom needs to be replace if bristles are 1” in length or less. Side Broom needs to be replaced if bristles are 3” in length.
HOPPER					
X					Check hopper filters and clean or replace as needed.
X					Inspect the hopper skirts for wear or damage and replace as needed.
		X			Inspect hopper wheel well and top frame skirts for wear or damage. Adjust or replace as needed.

SCHEDULED MAINTENANCE CHART

FREQUENCY (IN HOURS)					SERVICE (BY MAINTENANCE AREA)
DAILY	50	100	200	500	
STEERING					
	X				Check for leaks.
PARKING BRAKE					
			X		Check for proper functioning and adjust as needed.
WHEELS AND TIRES					
X					Visually inspect for wear and damage. Repair or replace as needed.
			X		Check pneumatic tires for proper air pressure (95 psi).
	X				Check and tighten lug nuts. (torque to 100 ft.-lbs)
MISCELLANEOUS					
				X	Inspect latches and hinges. Tighten and lubricate as needed.
			X		Check anti-static drag chain on rear wall of broom chamber for damage or excessive wear. Replace as needed.
				X	Check side broom lift cable and lift cable for wear.

PREVENTATIVE MAINTENANCE INSTRUCTIONS

ENGINE

Maintenance requirements and service instructions for your sweeper engine are outlined in the following parts of this Maintenance Section:

- Air Intake System
- Electrical System
- Fuel System
- Coolant System
- Lubrication System

All basic maintenance tasks are listed with their recommended frequencies on the Planned Maintenance Chart in this manual. Important additional maintenance requirements and instructions are explained in the engine manual which comes with your machine.



WARNING

Never attempt to perform any service on the equipment or components until the engine is OFF, the parking brake is LOCKED, and the wheels are CHOCKED.

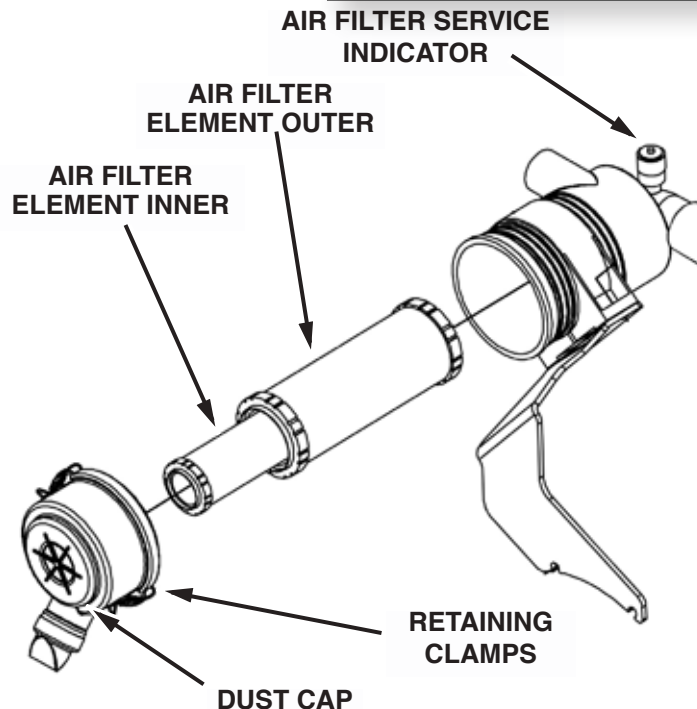
Air Intake System

Check Air Filter Service Indicator

The air filter service indicator shows when to change the air filter element. Check the indicator on a daily basis. The red indicator gradually becomes visible as the air filter elements load with dirt. It is not necessary to change the air filter elements until the red indicator reaches the top of the service indicator and locks into position.

1. Lift engine cover.
2. Inspect air filter service indicator

NOTE: The indicator may return to the nonvisible position when the engine is shut off. To check, reset indicator and turn on the engine, if it locks in visible position again clean or change element.



Air Filter Element Removal

1. Turn off the engine and set the parking brake.
2. Lift the engine cover.
3. Locate the air filter and loosen the retaining clamp.
4. Remove the dust cup.
5. Pull the rubber plug out of the dust cup and empty the contents.
6. Pull the air filter elements out of its housing.

Air Filter Cleaning

1. Once you have removed the air filter elements, empty the dust cup and clean the interior of the air filter housing.
2. Use an air hose to blow out the air filter elements. Air pressure should be 100 psi or less.

Air Filter Inspection

1. After you clean the air filter elements, check the elements for holes by passing a light bulb inside it.

Air Filter Installation

1. Wipe out the air cleaner housing with a damp cloth. Be sure all dirt is removed.
2. Install the cleaned replacement filter elements so that the fins are at the far end of the housing. Be careful not to damage the fins.
3. Replace the rubber plug in the dust cup.
4. Replace dust cup, being sure embossed word "top" on cup is positioned correctly (up).
5. Tighten the retaining clips.
6. Check the condition of intake hoses and clamps. Close engine cover.

ELECTRICAL SYSTEM

Battery Cleaning

1. Combine baking soda and water in a strong solution.
2. Brush the solution over the battery top, including terminals and cable clamps. Make sure the solution does not enter the battery.
3. Using a wire brush, clean the terminal posts and cable clamps.
4. Apply a thin coating of petroleum jelly to the terminals and cable clamps.

Battery Replacement



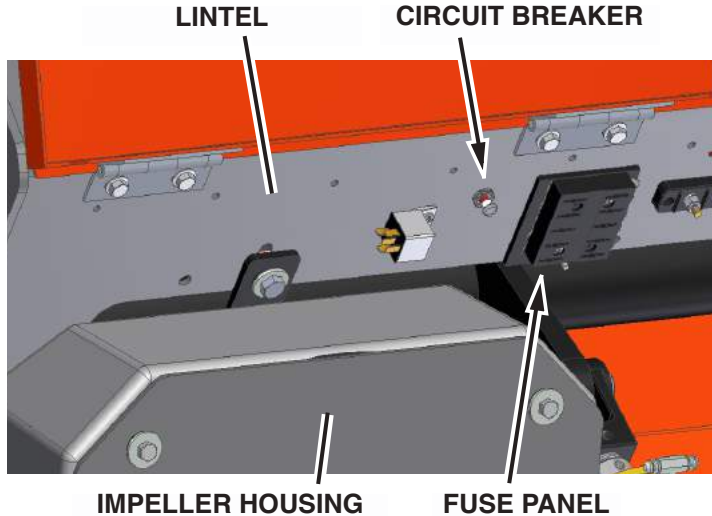
CAUTION

Remove the negative battery cable before you remove the positive battery cable. This is done to prevent accidental electrical shorting which can result in personal injury.

1. Disconnect the negative (-) cable and then the positive (+) cable.
2. Remove the battery.
3. Install the new battery.
4. Connect the positive (+) battery cable first, then the negative (-) cable.

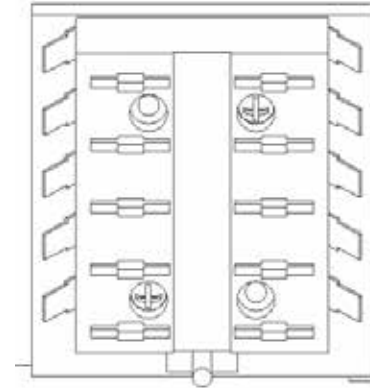
Circuit Breakers

If a circuit breaker trips, it can be reset by pressing the reset button in the center of the breaker. The breaker is located on the lintel next to the fuse box. Open/lift the top panel to the left side of the driver compartment. Locate the breaker, between the impeller housing and the fuse panel on the lintel. Press the reset button to reset the breaker.



Fuses

The fuse panel is located on the lintel panel left of the impeller housing and the broom control levers, under the top cover. Lift the top cover to access the fuse panel.



FUEL SYSTEM

WARNING

Never attempt to perform any service on the equipment or components until the engine is OFF, the parking brake is LOCKED, and the wheels are CHOCKED.

WARNING

Never operate an LPG powered sweeper when any component in the fuel system is malfunctioning or leaking.

WARNING

Replace any defective safety components before operation the sweeper.

WARNING

During repair or servicing of the fuel system, work in a properly ventilated area and do not smoke or allow an open flame near the fuel system.

WARNING

When disconnecting the tank coupling, always wear gloves. LPG fuel can freeze bare hands.

WARNING

Under no circumstances should the fuel filter lock be bypassed, except when testing. After testing, always reconnect lock. Bypassing the fuel filter lock after testing creates a potential fire hazard.

Tier III compliant fuel system Refer to P.S.I Service Manual

COOLANT SYSTEM

Blowing Out Radiator Fins

NOTE: Make sure radiator is cool before blowing out the radiator fins with compressed air.

Reverse Flow Flushing

1. At the engine, disconnect the hoses.
2. Make sure the radiator cap is on tight.
3. Using a hose clamp, attach a flushing gun onto the lower hose.
4. Turn on the water and fill the radiator.
5. To keep from damaging the radiator, apply air pressure slowly and carefully.
6. Shut off the air pressure, refill the radiator with water, and reapply the air pressure. You will need to repeat these steps until water flushed from the radiator runs out clear.

7. Inspect and clean the radiator cap.
8. Inspect and reconnect the hoses.
9. Refill the radiator with coolant.

NOTE: Use a 50/50 mixture of water and an anti-freeze with an ethylene glycol base.

LUBRICATION

Gasoline and LPG Engines: Use any SF or SG rated oil meeting API specifications and suited to seasonal temperatures.

Refer to the Engine Manufacturer's Operator Manual for these specifications.

Changing Engine Oil

1. Place a drain pan under the lowest end of the engine.
2. Remove the drain plug and allow the oil to drain into the pan.
3. Remove the used oil filter and replace with a new one.
4. Dispose of the oil and oil filter in an approved manner.
5. Remove the engine oil cap, add oil in the amounts listed in the engine manual, then secure the cap.

LUBRICATION POINTS

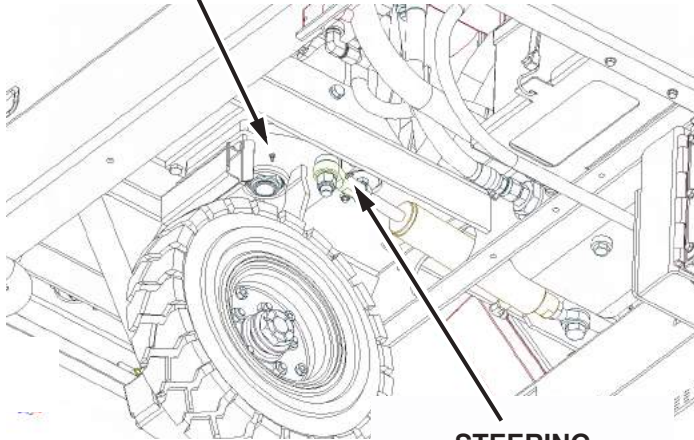
Steering Cylinder Rod End

The steering cylinder rod end must be lubricated every 500 hours with grease.

Steering Pivot Thrust Bearing

The steering pivot thrust bearing must be lubricated every 500 hours with grease.

**STEERING PIVOT
THRUST BEARING
LUBRICATION POINT**



**STEERING
CYLINDER ROD END
LUBRICATION POINT**

Main and Side Broom Lift Pulleys

Lubricate the main and side broom lift pulleys every 500 hours with light oil.

Hopper Lift Bearing

Lubricate the hopper lift bearings every 500 hours with light oil.

Latches & Hinges

The hinges and latches and all doors and covers should be lubricated with oil every 500 hours. There are numerous hinges and latches, make sure to lubricate all of the following:

- Engine cover, hinges and latches
- Side Door, hinges and latches
- Top cover, hinges and latches
- Hopper cover, latch
- Hopper dump door, hinge
- Main Broom Doors, hinges and latches

HYDRAULICS SYSTEM

Filling The Fluid Reservoir

NOTE: The reservoir is located under the operator seat and is accessible by removing the latch and tilting the operator's seat / pump cover outward.

1. When the machine is cool and the hopper is in the lowered position, remove the breather cap and dipstick. Fluid level should be between the high and low marks on the dipstick.

NOTE: The reservoir also has a site gauge on the front side of the tank that can be used to check the fluid level.

⚠ CAUTION

**DO NOT OVERFILL HYDRAULIC RESERVOIR TANK!
DO NOT USE TRANSMISSION FLUID!**

⚠ CAUTION

**PowerBoss® recommends using:
Mobil DTE 10 Excel 32 Hydraulic Oil or equivalent.**

2. If the fluid level is not between the marks, add or remove hydraulic fluid as needed.

Hydraulic Fluid Viscosity Specifications

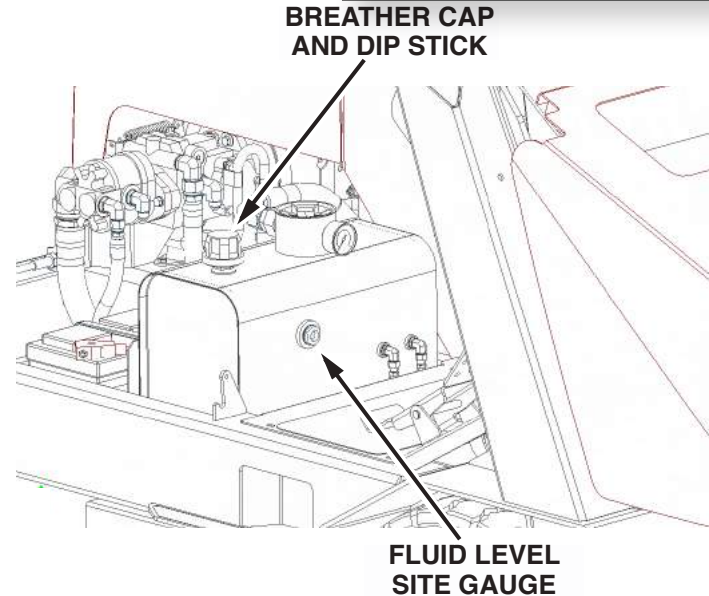
Mobil DTE 10 Excel 32 - Viscosity, ASTM D 445

cSt @ 40°C (104°F): 32.7

cSt @ 100°C (212°F): 6.63

Decal located on Hydraulic Reservoir tank:

#715023



Maintaining Hydraulic Oil Cooler Efficiency

Your machine is equipped with a hydraulic oil cooler, it is integrated with the radiator and utilizes exhausted radiator air from the engine fan to cool the hydraulic fluid. To maintain its efficiency, periodically blow out the radiator & oil cooler fins with compressed air 100 p.s.i. is maximum.

Changing The Hydraulic Fluid

1. Turn off the engine and engage the parking brake.
2. Place a drain pan on the floor below the reservoir.
3. Remove the drain plug located on the bottom of the reservoir and allow the fluid to drain.
4. Discard the fluid in an approved manner, then replace and retighten the drain plug.
5. Remove the filler / breather cap located on top of the reservoir and fill the reservoir with approved hydraulic fluid.

NOTE: Eight gallons (US) of fluid are required.

6. Install the filler cap assembly.
7. Check the drain plug for leakage.

Changing The Hydraulic Fluid Filter

The reservoir has pressure gauge used to indicate when the fluid filter needs to be changed. The gauge indicates a green, yellow and red pressure range. When the needle reaches the red pressure range filter needs to be changed.

NOTE: The fluid filter is integrated with the reservoir, located under the operator seat. The filter can be removed from the top of the reservoir and can be accessed by removing the latch and tilting the operator seat / pump cover outwards.

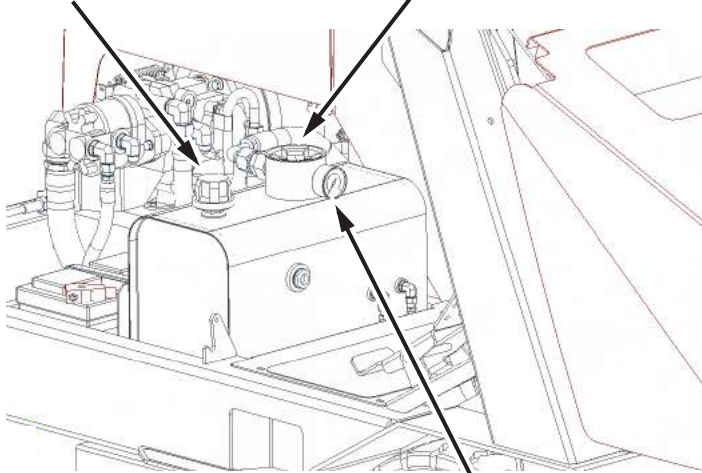
1. Turn off the engine and engage the parking brake.
2. Unscrew and remove the fluid filter from the top of the reservoir.
3. Screw the new filter to the top of the reservoir hand tight.

NOTE: Do not over tighten.

4. Start the machine, shut it off, then check for leakage.

**BREATHER CAP
AND DIP STICK**

FLUID FILTER



**PRESSURE
GAUGE**

Hydroback Pump Centering Unit

If the machine does not remain in neutral when the foot pedal is released, it may indicate that the Hydroback Pump Centering Unit needs adjustment.

WARNING

**Do not use a jack alone to support the machine!
Always support the machine using jack stands or
similar type of device that can support the weight of
the machine.**

Testing Hydroback Pump Centering Unit

1. Raise the rear of the machine with a suitable floor jack so that drive wheel is off of the floor.
2. Start the engine and position the throttle switch to the high speed position.
3. Press the directional control pedal into the maximum forward position and release. The drive wheel should stop turning.
4. Press the directional control pedal into the maximum reverse position and release. The drive wheel should stop turning.

If during the above tests the drive wheel comes to a complete stop then the neutral setting is correct and the pump centering unit installation is complete.

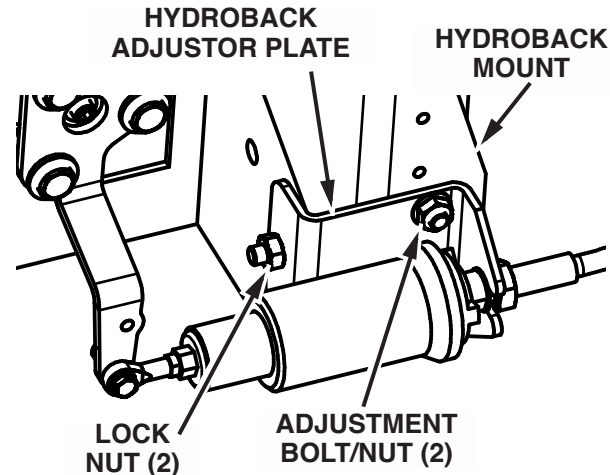
If during the above tests the drive wheel remains in motion after releasing the directional control pedal, even if it turns very slowly, the neutral setting is incorrect and must be adjusted as described below.

Adjusting Propulsion Pump Neutral Setting

Note: This adjustment is only required if, during the above test, the drive wheel continues to rotate after releasing the directional control pedal.

1. Raise the rear of the machine with a suitable floor jack so that drive wheel is off the floor.
2. Slightly loosen the two adjustment bolts holding the Hydroback adjuster plate to the Hydroback mount so that the plates remain in contact but allow the adjuster plate to move.
3. Start the engine and position the throttle switch to the high speed position.
4. Note the direction that the drive wheel is rotating when the directional control pedal released.

5. **If the drive wheel turns in the forward direction**, slowly turn the lock nuts located on either side of the Hydroback adjuster plate so that the adjuster plate slides to the right when viewed from the back of the machine.
6. **If the drive wheel turns in the reverse direction**, slowly turn the lock nuts located on either side of the Hydroback adjuster plate so that the adjuster plate slides to the left when viewed from the back of the machine.
7. When the drive wheel comes to a complete stop tighten the two lock nuts.
8. Tighten the two bolts holding the Hydroback adjuster plate to the Hydroback mount.
9. Go to *"Testing the Hydroback pump centering unit"* above to verify that the neutral position is correctly adjusted.
10. If not, repeat steps 1 through 9 above.
11. Turn off the engine and lower the machine to the floor.
12. This concludes the propulsion pump neutral adjustment.



SWEEP COMPONENTS

Inspecting Drive Assemblies/brooms for Debris

Inspect the main and side brooms for wear and remove debris that may be caught in bristles. Remove any strings or debris from the drive assemblies.

ATTENTION!

Strings and other debris may become wrapped or stuck in bristles and broom drive assemblies and cause damage or premature wear of components.

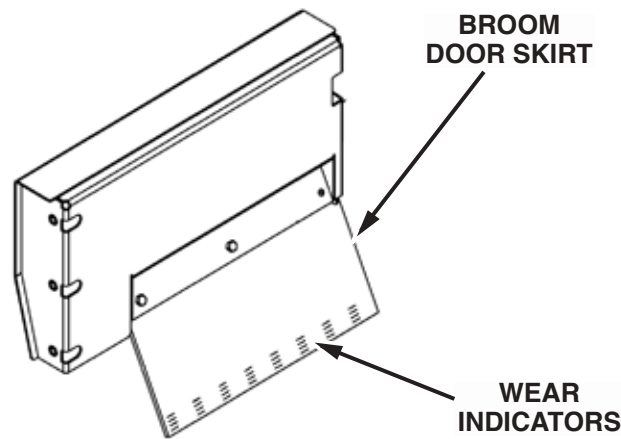
Broom Door and Rear Skirts Inspection

The rear and door broom skirts are equipped with wear indicators to show when the skirts need adjustment. The skirts have wear indicators 1/4" apart along the bottom edge of the skirt. When the bottom edge of the skirt wears to the line it is time to adjust the skirt.

NOTE: Perform this inspection when the machine is parked on a level surface.

1. Turn the machine off and lock the parking brake.
2. Open the broom both broom doors.

3. Inspect broom door and rear skirts for wear and damage. Skirt clearance should be 0" to 1/8" (3.18 mm) above the floor.
4. If skirt is worn to an indicator line or more than 1/4" (6.35 mm) above the floor adjust skirt height. If the skirt is damaged or worn beyond the last indicator mark and can not be adjusted to the proper height, replace skirt immediately to maintain proper dust control.



Broom Door Skirt Replacement and Adjustment

The skirts are attached to the broom doors by a retainer bar, and hex bolts.

Remove and Replace Door Skirts

To remove the skirts, remove the bolts, retainer bar and skirt. To install new skirt, align skirt and retaining bar and attach to door with hex bolts hand tight. Adjust skirt height and tighten bolts.

Adjust Door Skirts

To adjust the skirt, loosen the bolts, slide the skirt up or down as needed. Tighten the bolts.

Broom Rear Skirt Replacement and Adjustment

The skirts are attached to the frame by a retainer bar, hex nuts located on the rear of the main broom compartment.

NOTE: The retaining bar also attaches the recirculating flap and will be removed with the retaining bar.

Remove and Replace Rear Skirt

Remove the main broom, remove the hex nuts, retainer bar and skirt. To install new skirt, align skirt and retaining bar and attach to frame with hex nuts hand tight. Adjust skirt height and tighten nuts. Replace the main broom.

Adjust Rear Skirt

To adjust the skirt, loosen the hex nuts, slide the skirt up or down as needed. Tighten the nuts.

Broom Recirculating Flap Inspection

1. Turn the machine off and lock the parking brake.
2. Open the operator side broom door.
3. Inspect the recirculating flap for wear and damage.
4. If flap is worn or is damaged replace flap immediately to maintain proper dust control.

Broom Recirculating Flap Replacement

Remove the main broom. Remove the hex bolts and nuts securing the flap to the retainer bar. Remove the flap and install new flap, align flap and retaining bar with the hex bolts and attach to the retaining bar with hex nuts. Replace the main broom.

Main Broom Height Adjustment

The main broom height adjustment can be quickly and easily performed with no tools from the operator cockpit. Performing the main broom height adjustment on a daily basis improves sweeping performance maintains proper broom height.

NOTE: Perform this adjustment on a flat, smooth test surface.

1. Drive the machine onto the test surface with the main broom in the RAISE position.
2. Set the parking brake and from the operator cockpit loosen the main broom adjustment plate and push it all the way forward.
3. Release the main broom handle and move it forward and let it go. It will stop when the broom rests on the ground.
4. Pull back on the handle with your finger tips putting very little pressure on the handle.
5. Slide the main broom adjustment plate back to the handle and lock it into position.
6. This will set the main broom to the proper height.

Main Broom Rotation or Replacement

NOTE: Broom should be replaced if bristles worn to a length of 1 inch (2.54 cm) or less. The main broom handle has a wear indicator, when the broom reaches the end of it's adjustment the broom needs to be replaced.

1. Turn the engine off and lock the parking brake.
2. Pull the main broom handle all the way back and lock it in the raised position.
3. If you are installing a new broom. Slide the main broom adjustment plate all the way back and lock it in position. If you are rotating the broom end to end leave the adjustment plate where it is.

NOTE: This will locate the broom drive hub to the proper height to install a new broom.

4. Open the operator's side broom chamber door
5. Loosen the knob and pull the idler arm assembly straight out and set aside.
6. Grasp the main broom by the plastic drive hub, pull the main broom straight out and clear of the broom chamber.

7. Depending on broom condition, you can either rotate the old broom end-to-end and re-install it or you can install a new broom. Slide the main broom into the broom chamber and align the broom with the metal drive hub located at the far side of the broom chamber.
8. Once the broom is started onto the drive hubs, rotate the broom counter-clockwise while pushing lightly against the broom.
9. Once the broom is fully engaged, replace the idler arm assembly, while aligning the seats in the idler hub with the broom's drive hub ears.
10. Install the retaining knob into position and tighten.
11. Close and latch the operator side broom door.
12. Perform a main broom taper and sweep pattern test as needed.

Main Broom Taper and Sweep Pattern Test

This test should be performed every 500 hours or when installing a new main broom. This test should also be performed if you notice a reduced sweeping performance.

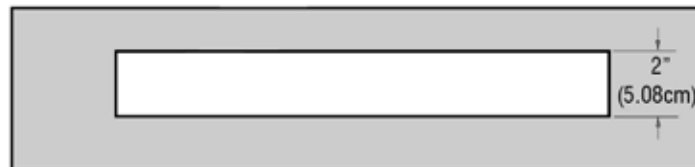
NOTE: Perform this test on a flat, smooth surface.

1. Drive the machine onto the test surface with the main broom in the RAISE position.
2. Push the main broom handle forward to lower the main broom.
3. Pull the broom control lever back to activate the main broom only and open the throttle to full RPM.
4. Allow about 45 seconds for the broom to operate, then deactivate the broom motor and raise the broom.

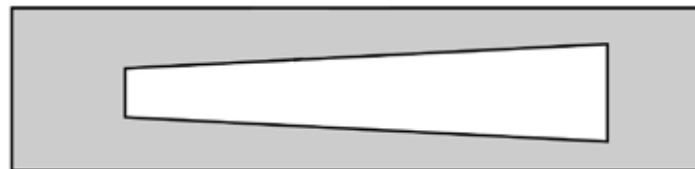
NOTE: Test time will vary according to the test surface used.

5. Drive the machine clear of the test site.
6. Examine the polished pattern made by the broom on the test area.

Correct Main Broom Test Pattern



Incorrect Main Broom Test Pattern Showing Taper



A rectangular shape the length of the main broom, 2" (5.08 cm) wide, indicates the main broom is properly adjusted.

A pattern smaller than 2" (5.08 cm) indicates need for lower adjustment. When adjusting the main broom pull back on the main broom handle with less pressure before locking the adjustment plate in place.

A pattern wider than 2" (5.08 cm) indicates a need for higher adjustment. When adjusting the main broom pull back on the main broom handle with more pressure before locking the adjustment plate in place.

If pattern is tapered from end to end instead of rectangular, perform a main broom taper adjustment.

Main Broom Taper Adjustment

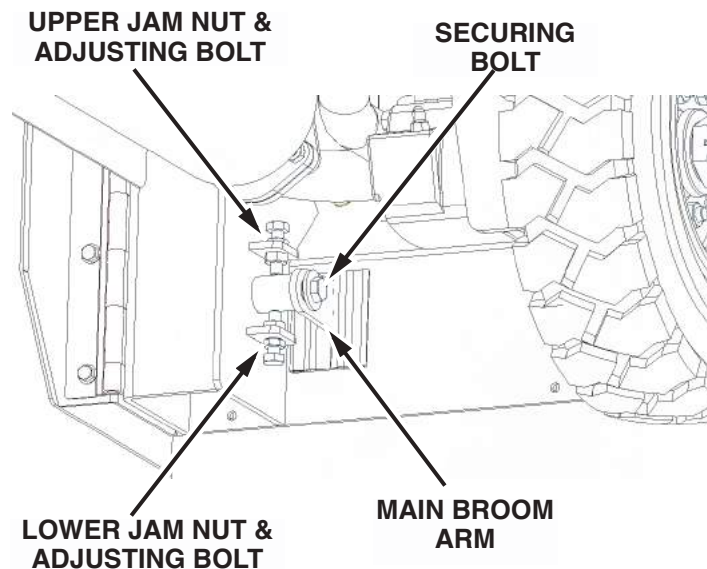
NOTE: It is not usually necessary to perform this adjustment. However, if the main broom adjustment test shows a pattern that is tapered in length (one end is wider than the other), perform the procedures which follow.

1. Locate and loosen the lock nut and bolt securing the main broom arm. They are located on the left side of the machine to the rear of the left side main broom door.
2. Loosen the lower and upper jam nuts securing the taper adjustment bolts to the frame.
3. Use the adjusting screws to raise or lower the left end of the main broom arm.

NOTE: The right end of the broom remains fixed. All adjustments affect the left end of the broom.

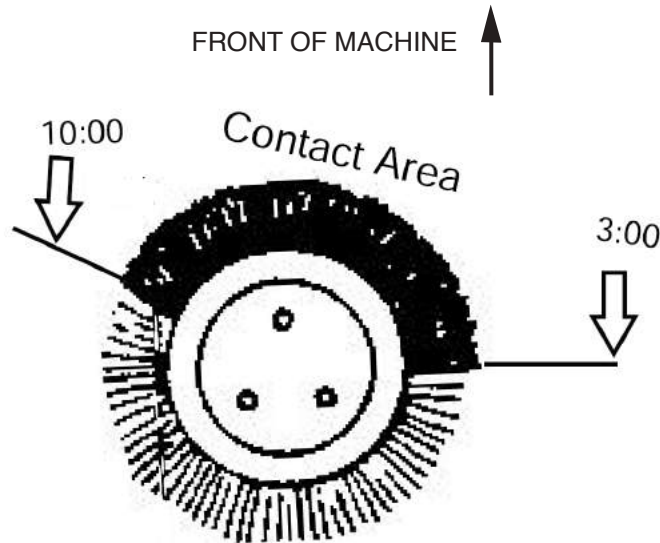
4. After adjustment, tighten upper and lower jam nuts for the adjusting bolts.
5. Tighten the lock nut and bolt to secure the main broom arm.

6. Repeat the main broom taper and sweep pattern test to see that the broom is properly adjusted.



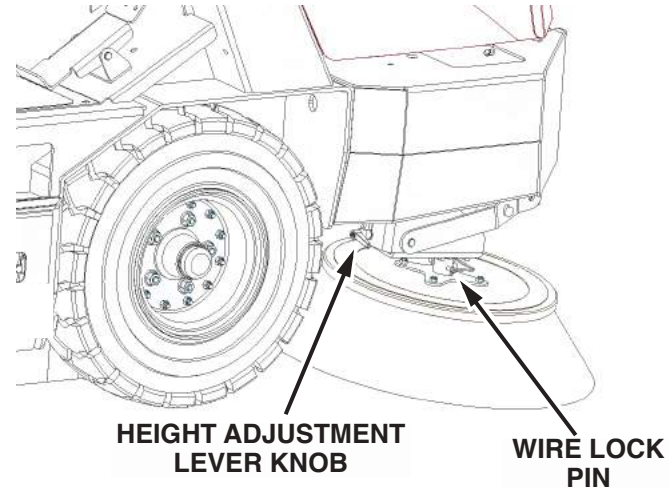
Side Broom Height (Wear) Adjustment

The height of the side broom is adjusted with the use of a lever knob on the rear side of the side broom. As the side broom wears, it will be necessary to lower the side broom assembly.



To Adjust The Side Broom Height

Lower the hopper, push the side broom handle forward to lower the side broom. Check to see if the side broom makes correct contact with the floor. If not loosen the lever knob and slide the broom up or down until the broom makes good contact with the floor. Tighten the lever knob.



Side Broom Shock Mount Stop Adjustment

This adjustment is set at the factory and is not normally necessary. In case side broom components are replaced or damaged you may have to adjust the side broom stop.



WARNING

Do not rely upon the hydraulic cylinders to keep the hopper raised for maintenance. Always engage the safety arm before servicing the hopper.

1. Raise the hopper.
2. Set the safety arm under the hopper.
3. Look up at the side broom the trailing arm should be parallel to the bumper.
4. If not loosen the jam nut and adjust the stop bolt until the trailing arm is parallel with the bumper.
5. Tighten the jam nut, and remove the safety ram.
6. Lower the hopper.

Side Broom Replacement

NOTE: Broom should be replaced if bristles worn to a length of 3 inches (7.62 cm) or less.

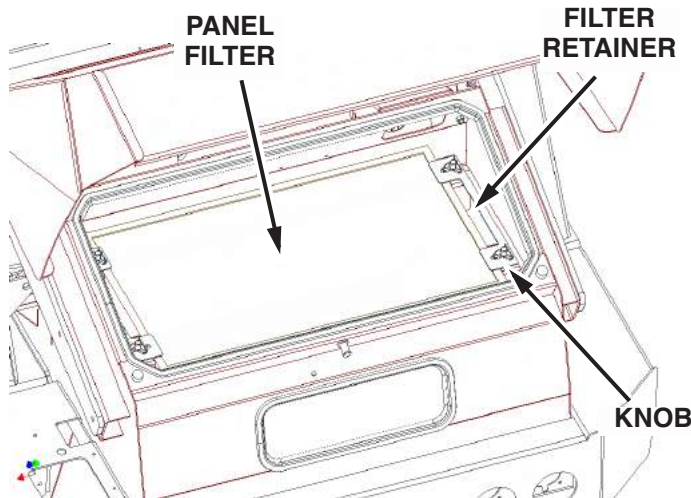
NOTE: The side broom features a quick release mechanism which enables the operator to remove the brush in seconds.

1. Pull back on the side broom handle to raise the side broom.
2. Hold the Side broom and remove the wire lock pin.
3. Remove the side broom and detach from the side broom flange.
4. Attach new side broom to flange and install on machine
5. Inset the wire lock pin.
6. Loosen the side broom height adjustment lever knob and move all the way down.
7. Push the side broom handle forward to lower the side broom.
8. If adjustment is required, loosen the side broom height adjustment lever knob and adjust the broom up or down until it makes good contact with the floor.
9. Lock the lever knob.

HOPPER

Filter Removal

1. Release the latch on the hopper cover and raise the cover.
2. Loosen the four knobs and slide the two filter retainers out of the way.
3. Lift out the panel filter.



Filter Cleaning

The dust control filter is a polyester type element filter. It may be vacuumed, blown out with compressed air, tapped against the floor or washed with soap and water.

1. If blown out with compressed air, use 100 psi or less.
2. If washed with soap and water, use 40 psi water pressure or less.

NOTE: Make sure the filters are thoroughly dried while standing on their side before installing in the hopper. Do not install or use a wet filter.

Filter Replacement

1. Insert the panel filter.
2. Slide the filter retainers over the filter.
3. Push down on the filter retainer to make it easier to tighten the knobs.
4. Tighten the four knobs.

Hopper Frame Skirt Replacement

WARNING

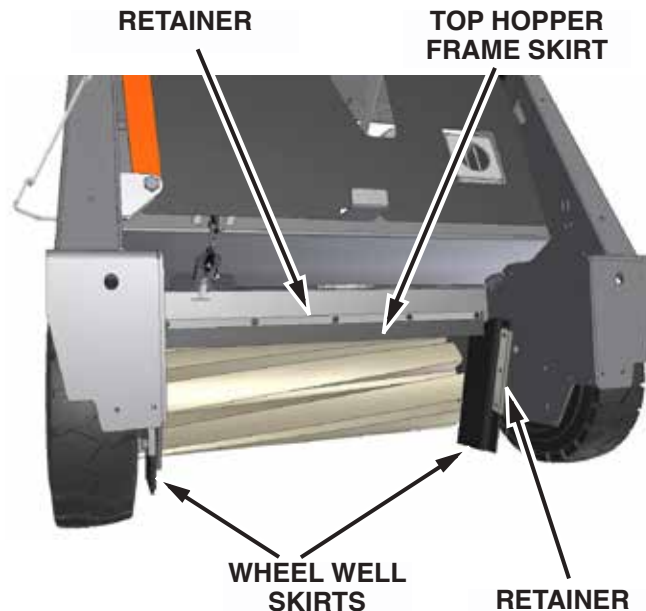
Do not rely upon the hydraulic cylinders to keep the hopper raised for maintenance. Always engage the safety arm before servicing in the area of the hopper.

Top Hopper Frame Skirt

The top hopper frame skirt attaches to the front edge of the frame above the broom chamber using press-in fasteners and a retainer. Replace the press-in fasteners when replacing the top hopper frame skirt. Always engage the safety arm before removing the top hopper frame skirt.

Wheel Well Skirts

The wheel well skirts are adjustable by loosening the screw and sliding skirt to make a seal between the hopper and the frame. If the skirt is worn out or does not make a seal replace. Remove the screws securing the retainer, skirt and support to the wheel well. Install the new skirt and adjust to create a seal between the frame and hopper. Always engage the safety arm before removing the wheel well skirts.



PARKING BRAKE

The parking brake adjustment is located under the hopper just above the broom chamber.

Adjusting The Parking Brake Cable Length

1. Park the machine on a level surface and chock the wheels.
2. Release the parking brake.
3. Lift the hopper and set the safety arm.



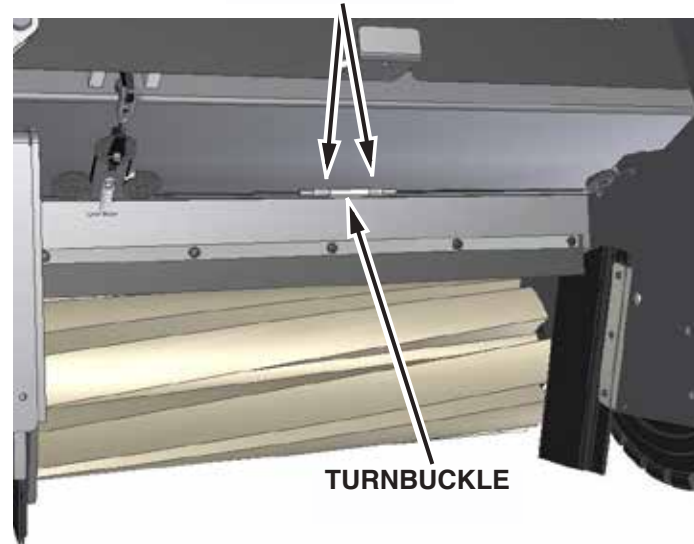
WARNING

Do not rely upon the hydraulic cylinders to keep the hopper raised for maintenance. Always engage the safety arm before servicing in the area of the hopper.

4. Loosen the nuts on either side of the turnbuckle.
5. Adjust the turnbuckle to lengthen or shorten the brake cable.
6. Tighten the nut on either side of the turn buckle.
7. Release the safety arm and lower the hopper.

8. Set the parking brake and remove the wheel chocks.
9. Check operation of the parking brake to ensure it holds machine in place.

LOCKING NUTS



TURNBUCKLE

TIRES

Changing Solid Tires

NOTE: The procedures which follow apply to **SOLID TIRES ONLY**.

1. Remove the tire from the vehicle by removing the five inner lug nuts.
2. Remove the ten hex head bolts and nuts.
3. Press the tire from the rim.
4. Press the large rim half into the new tire.
5. Mount the small rim half and secure with hex head bolts.
6. Reinstall the tire on the machine

Changing Pneumatic Tires



CAUTION

Changing pneumatic tires must be performed in a safety cage and require special tools, PowerBoss® recommends that you have these tires changed by a professional tire dealer. (They are to be inflated to 110 psi.)

MISCELLANEOUS ADJUSTMENTS

Anti-Static Chain Adjustment

Each machine is equipped with an anti-static chain bolted to the left side of the frame behind the broom chamber. This should remain in contact with the floor at all times. Inspect the chain every 200 operating hours. Replace if at least one link does not drag the surface of the floor.

Latch and Hinge Maintenance

Latches and hinges should be inspected after every 500 hours of use. Retighten and oil if necessary.

Cables

Inspect all cables for wear every 500 hours.

TROUBLESHOOTING

This section provides information to assist in identifying maintenance trouble and provides possible causes and actions to correct the problem.

TROUBLESHOOTING CHART		
PROBLEM	POSSIBLE CAUSE(S)	SOLUTION(S)
Engine will not start or runs roughly after start. NOTE: On machines with LPG fuel, also check the following:	Battery dead.	Recharge or replace battery.
	Machine out of fuel.	Refuel
	Fuel filter plugged.	Clean or replace filter.
	Fuel line broken or obstructed.	Blow fuel line out with compressed air.
	Dirty air filter. Problems with spark plugs, ignition points, ignition coil ignition switch, carburetor, regulator, wiring harness.	Clean or replace air filter. Review engine manual at back of this manual for maintenance and troubleshooting procedures.
	Tank valve not fully opened.	Open the valve slowly.
	Fuel tank type does not match fuel supply.	Use the correct tank type for the fuel supply.
	Fuel tank and lines are covered with frost.	Open shut-off valve slowly to ¼ open, start.
	Defective vacuum lock-off.	Replace or repair.

TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE(S)	SOLUTION(S)
Engine overheats. NOTE: If coolant loss has not occurred, check for malfunction of the temperature sending unit.	Low coolant level.	Supply coolant.
	Clogged radiator.	Flush radiator.
	Loose fan belt.	Tighten belt.
	Defective thermostat.	Replace thermostat.
PowerBoss® moves slowly or does not move.	Parking brake is on.	Release brake.
	Directional control pedal jammed, damaged, or not adjusted properly.	Clear jam or adjust linkage.
	Tires skidding from contact with oil or grease.	Clean tires or drive through a solvent absorbing substance.
	Wheels jammed.	Clear jam.
	Low hydraulic fluid level.	Add hydraulic fluid.
	Hydraulic fluid temperature too high and too thin caused by excessive load, climbing, high environment temperatures, worn pump, or improper fluid.	Use the proper weight oil or the operation conditions; check pump.
	Damaged or worn pump drive coupling.	Replace damaged item.
	Other problems with the hydraulics system: pump failure, motor failure, relief valve leaking or stuck open.	See Hydraulics System Problems in this section.

TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE(S)	SOLUTION(S)
PowerBoss® creeps in neutral.	Directional control pedal return spring is out of adjustment.	Perform the adjustment procedures.
Brushes do not turn or turn very slowly.	Hydraulic system problem:	See Hydraulics System Problems in this section.
	Motor	
	Control valve	
	Gear pump	
	Relief valve	
Little or no vacuum in brush compartment.	Filters clogged.	Clean filters.
	Leak or clog in hose from impeller.	Repair leaks; clear obstructions or replace hose.
	Impeller failure.	Check and repair.
Loss of dust control.	Debris in hose or impeller inlet.	Clean.
	Broom skirts or seal worn.	Replace.
	Skirt clearance from floor exceeds 1/8".	Adjust clearance.
	Dust control filters clogged.	Clean filters.
	Filter seals worn or missing.	Replace.
	Poor seal with vacuum gasket.	Visually check and adjust, if necessary.

TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE(S)	SOLUTION(S)
Sweeper unit leaving debris.	Hopper full.	Dump hopper.
	Broom(s) out of adjustment.	Adjust.
	Broom bristles worn.	Check broom for wear and adjustment.
	Poor performance of broom drive mechanism.	Check for jam in broom chamber.
	Broom lift arms hung up with debris.	Clear out debris.
	Hopper flaps damaged or missing.	Replace or adjust clearance.
	Hopper out of adjustment.	Check hopper clearance.
	Dust control filters clogged.	Clean filters.
Hopper does not raise or lower.	Hydraulics system problem:	See Hydraulics Systems Problems in this section.
	Control valve	
	Gear pump	
	Lift cylinder	
	Relief valve	
	Hopper arms binding.	Lubricate or adjust arm linkage.
Hopper lift cylinder failure.	Line to cylinder leaking.	Tighten fittings or replace hose.
	Piston seals leaking.	Replace seals.
	Bent piston rod.	Replace rod.

TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE(S)	SOLUTION(S)
Hopper does not rotate or rotates too slowly.	Hopper load too heavy.	Dump more frequently.
	Hydraulics system problem:	See Hydraulics System Problems in this section.
	Control valve	
	Gear pump	
	Lift cylinder	
	Relief valve	
Hydraulic control valve failure	Misaligned control linkage.	Align.
	Foreign matter in spool bore.	Remove spool and clean bore.
	Valve seals Leaking.	Replace seals.
	O-rings leaking.	Replace O-rings
	Relief valve stuck open.	Clean or replace relief valve.
Hydraulic motor failure.	Motor leaking.	Replace seals.
	Drive link malfunction.	Replace drive link.
	Output shaft malfunction.	Replace output shaft and bearings.

TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE(S)	SOLUTION(S)
Hydraulic gear pump failure.	Pump leaking.	Replace seals or RR Pump
	Gears worn or scored.	Rebuild pump or RR Pump
	Relief valve stuck.	Clean or replace (at control valve).
	Oil supply low.	Check and fill.
	Oil strainer clogged.	Replace strainer (inside reservoir).
	Incorrect oil.	Use recommended viscosity oil.
	Damage due to entry of air into hydraulic system.	Maintain correct hydraulic fluid level in reservoir. Keep suction hose fittings tight..
Hydraulic variable displacement pump failure.	Pump leaking.	Replace seals.
	Relief valve(s) stuck.	Clean or replace relief valve(s) at the pump.
	Drive coupling malfunction.	Replace defective gears.
	Control linkage out of adjustment.	Check to see if linkage is binding unfastened.
	Charge pump gears worn or scored.	Replace defective gears.
	Damage due to entry of air into hydraulic system.	Maintain correct hydraulic fluid level in reservoir. Keep suction hose fittings tight.

TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE(S)	SOLUTION(S)
Hydraulic system noisy.	Air in system.	Check fluid level in reservoir; check for loose connections or leaks.
	Relief valve dirty or damaged.	Clean or replace.
	Loose suction line.	Tighten fittings.
	Clogged section filter or pump inlet line.	Replace filter, clear line; change fluid in reservoir if dirty and flush system.
	Internal pump or motor damage.	Inspect and repair.

WARRANTY

Revision J**Effective January 2014****PowerBoss Made Simple Industrial Limited Warranty**

Minuteman International owner of PowerBoss warrants to the original purchaser/user that the product is free from defects in workmanship and materials under normal use. PowerBoss will, at its option, repair or replace without charge, parts that fail under normal use and service when operated and maintained in accordance with the applicable operation and instruction manuals. All warranty claims must be submitted through and approved by factory authorized repair stations.

This warranty does not apply to normal wear, or to items whose life is dependent on their use and care. Parts not manufactured by PowerBoss are covered by and subject to the warranties and/or guarantees of their manufacturers. Please contact Minuteman International for procedures in warranty claims against these manufacturers.

Special warning to purchaser -- Use of replacement parts not manufactured by PowerBoss or its designated licensees, will void all warranties expressed or implied. A potential health hazard exists without original equipment replacement.

All warranted items become the sole property of Minuteman International or PowerBoss or its original manufacturer, whichever the case may be.

PowerBoss disclaims any implied warranty, including the warranty of merchantability and the warranty of fitness for a particular purpose. PowerBoss assumes no responsibility for any special, incidental or consequential damages.

This limited warranty is applicable only in the U.S.A. and Canada, and is extended only to the original user/purchaser of this product. Customers outside the U.S.A. and Canada should contact their local distributor for export warranty policies. PowerBoss is not responsible for costs or repairs performed by persons other than those specifically authorized by PowerBoss. This warranty does not apply to damage from transportation, alterations by unauthorized persons, misuse or abuse of the equipment, use of non-compatible chemicals, or damage to property, or loss of income due to malfunctions of the product. If a difficulty develops with this machine, you should contact the dealer from whom it was purchased.

This warranty gives you specific legal rights, and you may have other rights, which vary from state to state. Some states do not allow the exclusion or limitation of special, incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you.

WARRANTY

	Travel *	Labor	Parts	Engine	Extended Warranty	Costs
Walk Behind						****
Battery Sweepers	90 Days	12 months	12 months	N/A	N/A	-
IC Sweepers	90 Days	12 months	12 months	Through Eng. Mfg.	N/A	-
Battery Scrubbers	90 Days	24 months	36 months	N/A	N/A	-
Riders						
Battery Scrubbers	90 Days	24 months	36 months or 2000 hr.	N/A	36 months parts + 24 labor (or 3000 Hours)	5%
IC Sweeper/Scrubbers 82 & 90	90 Days	6 months	24 months or 2000 hr.	24 months or 3000 hrs**	36 months parts + 24 months labor (or 3000 Hours) + 180 days travel	5%
I.C. Sweepers 9X, 10X	90 days	6 months	48 months or 3000 hrs.	60 months or 3000 hrs**	48 months parts + 24 months labor (or 3000 Hours) + 180 days travel	5%
NAUTILUS Scrubber	180 Days	24 months	36 months or 2000 hr.	36 months or 2000 hrs**	48 months parts + 24 months labor (or 3000 Hours) + 180 days travel	3%
All Rider, I.C. (excluding APEX series)					<u>Bumper to Bumper</u> 5000 hr max. 48 months parts, 48 months labor, 180 days travel	8%
Exceptions						
Apex Series Sweeper	90 Days	12 months	12 months or 1000 hr.	12 months or 1000 hrs**	24 months parts + 24 months labor (or 2000 Hours)	5%
6X Sweeper	90 Days	6 months	24 months or 2000 hr.	24 months or 2000 hours**	36 months parts + 24 months labor (or 3000 Hours) + 180 day travel	5%

Tank Bladders

Eight years/ no additional labor

Polyethylene plastic tanks

Ten years/ no additional labor

Batteries

0-3 months full replacement, 4-12 prorated credit

Chargers

One-year replacement

Aftermarket Replacement parts

Ninety days from date of purchase

***Two-Hour Cap Per Service Call**

****Through Engine Manufacturer. See Section 3 of Warranty Manual for Engine Warranty Exceptions**

***** Based Upon Dealer's Certification Status:**

**Extended Warranty MUST Be Signed Up Within 30 Days of Delivery to End User
(Dealer Has 1 Year From Receiving Machine To Sign Up For Extended Warranty)**

****All above labor and travel reimbursed at 65% or 75% of the published shop rate.*



Bortek Industries, Inc. - Authorized Dealer

4713 Gettysburg Road, Mechanicsburg, PA

800.626.7835

www.sweeperland.com

The logo for PowerBoss features the word "PowerBoss" in a bold, red, sans-serif font. Below it, the tagline "The Power of Clean" is written in a smaller, red, sans-serif font. The logo is framed by two thick, red, curved lines that sweep upwards from the sides.

PowerBoss®
The Power of Clean

“The Power of Clean”

**PowerBoss® is a Full Line Manufacturer of Sweepers and Scrubbers,
for Industrial Facilities.**

PowerBoss®, Minuteman International, Inc. • 14N845 U.S. Route 20 • Pingree Grove, Illinois • 60140

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