PowerBoss®

The Power of Clean

5550 Sweeper Scrubber

Owner's Manual

PowerBoss, Inc.
175 Anderson Street
Aberdeen, North Carolina 28315 USA
(910) 944-2167 / FAX (910) 944-7409

PB # 3334316 / Rev. 00A05

The Model and Serial Numbers of your machine are shown on the nameplate mounted on the machine. This information is needed when contacting Technical Support or ordering parts. For your convenience, use the space below to record the Model and Serial Numbers of your machine and the date it was placed into service.

MODEL NUMBER: _____

SERIAL NUMBER: _____

DATE PLACED INTO SERVICE: _____

All information contained in this manual is current at the time of printing. However, due to constant updates and improvements, we reserve the right to make changes at any time without notice.

PowerBoss®

The Power of Clean

OWNER'S MANUAL

5550 Sweeper Scrubber

TABLE OF CONTENTS

PB # 3334316 / Rev. 00A05

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

5550 Sweeper Scrubber
(LIMITED) PRODUCT WARRANTY

PowerBoss, Inc. (hereafter known as PowerBoss) warrants that these PowerBoss machines will be free from defects in material and workmanship for a period of 24 months or 2,000 operating hours from date of installation, whichever comes first. Poly components are warranted for five (5) years unless used with a cleaning solution in excess of 130°F (54°C), which would void the solution and recovery tank warranty. Written notice of any claimed defect must be given to PowerBoss within the warranty period and within thirty (30) days after such defect is discovered. Liability under this warranty is limited to either replacing or repairing, at PowerBoss's election, any part or parts deemed defective after examination by PowerBoss or an Authorized Service Representative.

For one hundred eighty (180) days from date of installation, PowerBoss will provide repair labor, at no charge, solely through an Authorized Service Representative. Thereafter, labor will be charged. Labor coverage is extended only to those items on which service was performed, and which failed as a result of defects in materials or workmanship. Normal preventative maintenance or adjustments, wearable parts, such as but not limited to flaps, filters, seals, points, plugs or similar items are not eligible for warranty coverage; parts or labor. Brushes are prorated against defects in materials or workmanship for twelve (12) months; hoses are warranted for six (6) months.

Travel is eligible for warranty consideration the first thirty (30) days after installation. The same provisions and exclusions apply to travel coverage as to labor and part eligibility.

This warranty does not extend to the PowerBoss machine, or its parts, that have been subject to misuse, accident or improper handling, installation, maintenance or application, nor does it extend to PowerBoss machine and/or parts which have been repaired or altered outside PowerBoss's plant or the facility of Authorized Service Representative.

Only authorized PowerBoss replacement parts purchased from PowerBoss are eligible for warranty consideration and are warranted against defects in materials and workmanship for the duration of the unit's warranty or thirty (30) days, whichever is longer. (Exception being wearable parts, such as but not limited to flaps, filters, seals, points, plugs or similar items. These items are to be free of defects in materials and workmanship when received and are not eligible for additional warranty consideration.) Damage to the unit, or that incurred as a result of utilization of parts not authorized by or purchased from PowerBoss, is not eligible for warranty reimbursement; parts or labor.

THE WARRANTY SET FORTH HEREIN IS IN LIEU OF AND EXCLUDES ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND CUSTOMER WAIVES ANY OBLIGATION OR LIABILITY OR POWERBOSS ARISING IN TORT OR STRICT LIABILITY IN TORT, OR FOR LOSS OR USE, REVENUE OR PROFIT WITH RESPECT TO POWERBOSS MACHINE AND/OR PARTS FOR ANY LIABILITY OF CUSTOMER TO ANY THIRD PARTY, OR FOR OTHER DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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.

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

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

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

ATTENTION!: 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 sweeper are highly visible safety reminders which should be read and observed. Make sure the decals are replaced if they become illegible or damaged. The decal below is located in the drive compartment. Other safety decals on you machine appear on the next page.

Part Number 301854

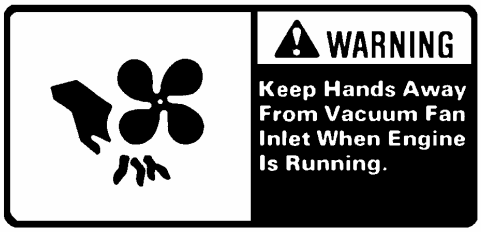
Follow manufacturers recommendations for safe handling of cleaning materials.

SAFETY DECALS (Continued)

Shroud of Radiator

Part Number 301729

Impeller



Part Number 301733

Impeller

Part Number 301730

High Dump & Low Dump Hopper

Part Number 301731

High Dump Hopper

Part Number 301732

Shroud of Radiator

Part Number 301728

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 free of malfuntions. 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

1. ***Before starting the engine, make sure that:***

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

2. ***During operation:***

   - ***Keep your hands and body clear of moving parts, expecially 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.***

3. ***When leaving the sweeper unattended:***

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

BASIC PowerBoss® SAFETY (Continued)

4. *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.*

5. *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 LPG tank coupling.*

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

7. *Replace any defective safety components before operating the sweeper.*

⚠CAUTION

1. *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.*

BASIC PowerBoss® SAFETY (Continued)

2. *Travel slowly on grades.*
3. *Place a block or chock behind the wheels when parking on inclines.*
4. *Use special care when traveling on wet surfaces.*
5. *Observe all proper procedures for operation and maintenance of the sweeper, as outlined in this manual.*
6. *Remain alert at all times to people and equipment in and around your area of operation.*

ATTENTION! *Turn the tow valve before pushing or towing. Never push or tow a machine faster than specified.*

BASIC OPERATION CONTROLS

IGNITION SWITCH

The ignition switch turns electrical power on for the machine. in addition, the switch cranks the engine. To start the engine, turn the key all the way clockwise to engage the starter motor. After the engine starts, release the key.

NOTE

The engine swing frame must be completely closed and latched to start the engine.

To stop the engine turn the key all the way counterclockwise to the "OFF" position.

HORN

The horn is activated by pressing the horn button located on the left side of the instrument panel.

FUEL LEVEL GAUGE

The fuel gauge indicates the amount of fuel remaining in the tank for gasoline and diesel models only. The fuel gauge for LPG models does not function. The gauge on the LPG tank must be used to determine the remaining fuel.

AMMETER

The ammeter indicates the charging current which is being sent to the battery by the alternator. It also indicates a discharge of current being used by the sweeper / scrubber when the alternator is not charging.

OIL PRESSURE

The Oil Pressure indicates the amount of engine oil pressure while the engine is running.

HOUR METER

The hour meter records the number of hours the machine has been operated, providing a helpful guide for performing routine maintenance tasks.

ENGINE COOLANT TEMPERATURE GAUGE

The engine coolant temperature gauge registers the temperature of the engine coolant. Temperatures above 230°F indicate an overheating engine.

THROTTLE

The throttle adjusts the engine speed from idle to the operating speed.

* The throttle should be in the **IDLE** position when starting the engine and immediately before shutdown.
* There are two positions for sweeping and scrubbing. The higher speed gives the best performance, while the medium speed gives a more quiet operation.

BASIC OPERATING CONTROLS (Continued)

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.

⚠CAUTION

Use for emergency stops only! Constant use of this braking method may result in damage to the drive components.

This machine is equipped with an adjustable pitch foot pedal for operator comfort.

BRAKE/ PARKING BRAKE

The brake operates the mechanical drum brakes on the front two wheels and is engaged by the brake pedal. Use this brake for slowing the machine. When descending ramps, use this brake only to slow the machine. For parking brake, apply brakes with right foot and engage lock with left foot. To unlock, press brake pedal with right foot.

HEADLIGHT SWITCH

Headlights and tail lights are illuminated when the switch is activated.

SOLUTION TANK EMPTY LAMP

Illuminates when the solution tank is empty.

RECOVERY TANK FULL LAMP

Illuminates to signal operator that the recovery tank is full and requires emptying.

SWEEPING CONTROLS

SIDE BROOM SWITCH

When activated the switch lowers the side broom to the floor and turns the broom on. This function only works when the main broom is also activated.

MAIN BROOM SWITCH

When activated this switch:
* Opens the hopper dump door
* Lowers the main broom to the floor.
* Activates the broom motor.
* Activates the impeller motor.

The main broom function can be used alone or with the side broom function.

By disengaging this switch, the following will occur:
* The hopper dump door closes.
* The main broom is raised.
* The main broom motor stops.
* The impeller motor stops.

FLOAT

The hand lever beside the operator's left leg my be lowered to provide a float position for the main broom. The float position may be used on extremely uneven floors.

NOTE

Extreme use of the float position reduces the broom life. For normal sweepeing, the float lever should be raised and locked in the upper position.

DUMP DOOR/ SHAKER SWITCH

This switch is located on the left side of the control panel. It is used to open the hopper dump door after the hopper is raised. (See "Debris Hopper Controls"). The other side of the switch is used to activate the filter shaker motor.

SCRUBBING CONTROLS

FILLING THE SOLUTION TANK

To fill the solution tank follow these steps:

1. Park the machine on a level area and lock the parking brake.
2. Open the top door of the tanks. Fill the tank with cleaning water solution.

SCRUBBING CONTROLS (Continued)

⚠CAUTION ***Never use detergents or cleaners that are flammable or combustible. Always wear safety glasses when using chemicals of any kind.***

NOTE *This machine is designed so that the scrub brushes will not turn and solution will not be delivered to the brushes while the machine is not moving.*

MAIN SCRUB BRUSHES

To operate the scrub brushes, follow these steps:

1. Lower the scrubheads to the floor with the scrubhead switch. This will lower the scrubhead and turn the brushes on when the machine begins to move.
2. The scrubhead will apply the selected pressure to the brushes.
3. To select the proper brush pressure for conditions, locate the brush pressure selection knob on the left console. There are four (4) selections. The lightest pressure is applied with the knob turned to the left, the heaviest to the right. Once set, it is not necessary to change this knob as the scrubhead is raised and lowered. Each time the brushes are activated, the scrubhead will return to the setting selected.

NOTE *For normal scrubbing, the main broom and side broom remain off.*

NOTE *To sweep simultaneously, lower the brooms at this time.*

4. When the scrubhead is lowered and the machine is moved forward or reversed, solution will automatically begin to flow. To select the rate of solution flow, locate the solution control knob on the left console. If turned completely to the left, no solution will flow. Rotating the knob to the right will increase the flow through three (3) more settings. It is not necessary to change this knob as the scrubhead is raised or lowered. When the scrubhead is raised, solution flow automatically stops. When the scrubhead is lowered and the machine is moved, solution flow resumes at the selected rate.

SCRUBBING CONTROLS

MAIN SCRUB BRUSHES (Continued)

5. Lower the squeegee with the squeegee switch. The squeegee can also be raised with the same switch. Lowering the squeegee activates the scrubbing impeller automatically. When the squeegee is raised, the impeller will continue to run for ten (10) seconds before shutting off.

NOTE

When machine travel stops, the scrub brushes stop rotating and solution flow is interrupted until travel resumes. This prevents flooding the floor and prevents excessive brush wear and floor damage.

6. Drive forward slowly.

⚠CAUTION ***Use care when driving on wet surfaces.***

⚠CAUTION ***Always travel slowly on grades.***

For double scrubbing, proceed as follows:

DOUBLE SCRUBBING

1. Follow the procedures on the previous page for scrubbing *without* lowering the squeegee to the floor and with the sweeping brooms off.
2. Make multiple passes over the same area of the floor as conditions dictate.
3. Lower the squeegee with the squeegee switch for the final pass. The squeegee can be raised with the same switch.

SCRUBBING CONTROLS (Continued)

DRAINING THE RECOVERY TANK

Follow these steps to drain the recovery tank:

1. Park the machine on a level surface at an approved drainage site with the left rear of the machine beside the drain access.
2. Engage the parking brake.
3. Turn the machine **OFF**.
4. Locate the drain hose on the left side of the machine beneath the engine access side door.
5. Remove the flexible drain hose from its storage tray. Pull out the drain hose for the required reach to the access.
6. Place the end of the drain hose on or in the approved drain access.
7. Loosen and remove the drain plug.
8. Drain the tank completely and reinstall the plug.
9. Reposition the drain hose on its storage tray.

CLEANING THE RECOVERY TANK

To clean the recovery tank after draining, proceed as follows:

NOTE *The recovery tank should be cleaned after every shift.*

1. Position the machine at an approved drain area.
2. Engage the parking brake.
3. Shut off the machine.
4. Remove the two 9" access caps at the sides of the unit.
5. Remove the drain hose and position it over the approved drain opening.
6. Loosen and remove the drain plug.
7. Spray the tank with clean water, flushing all sludge out of the access ports.
8. Remove the foam cap on top of the exit tube. Rinse and reinstall.
9. Drain the tank completely and reinstall the drain plug.
10. Return the drain hose to the storage tray at the left side of the machine beneath the engine.
11. Replace the 9" access caps removed in step four.

SCRUBBING CONTROLS (Continued)

CLEANING THE SOLUTION FILTER

The Cleaning solution passes through a filter canister on its way to the scrub brushes. This filter can be inspected and cleaned even if the solution tank is full. This filter is located on the right side of the machine beneath the foot pedal just inside of the frame rail.

1. Locate the valve on the forward side of the filter canister (the valve closest to the broom chamber). Turn the valve ninety degrees (90°) to close.
2. Grasp the filter canister housing and unscrew. Remove the housing. The element is inside of the housing and can be removed for cleaning and inspection.
3. Reinstall the element and housing.
4. Open the valve.

DRAINING THE SOLUTION TANK

A valve to the rear of the solution filter in the right frame rail may be opened ninety degrees (90°) to drain the solution tank.

HOPPER FILTER SHAKER BUTTON

This button is used to activate the filter shakers prior to dumping or as needed during sweeping operation. It is located to the left side of the instrument panel.

To shake the filter:

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

⚠CAUTION

Do not leave the hopper in the RAISE position for an extended period of time.

DEBRIS HOPPER DUMP CONTROLS

HIGH DUMP MODELS

The lever on the front control panel is used to raise the hopper to a height up to 60" (1.52 m) and dump it.

NOTE

*The lever is spring loaded to a center **OFF** position.*

- To raise the hopper, pull back the lever to the **RAISE** position and hold until the hopper raises to the proper height for the dumpster or container.
- To empty debris, locate the dump door/filter shaker switch at the left side of the instrument panel.
- Press and hold the left side of the switch until the dump door has opened.
- To lower the hopper, push the lever forward to the **LOWER** position until the hopper stops.

NOTE

The dump door will remain open until the hopper has been completely lowered.

ROTARY TRASH RELOCATOR (RTR™)

Rotary Trash Relocator (RTR™) is a standard feature on this machine. Its purpose is to increase the holding capacity of the debris hopper to make dumping the hopper less frequently required. Each time the main broom is turned off, the dump door closes automatically. This action relocates the debris to the front of the hopper.

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

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 locked.

1. Make sure the directional control pedal is in the neutral position.
2. Make sure the throttle is in the idle position.
3. **LP and Gasoline-powered**: Turn the ignition switch to the **START** position, then release.
   Diesel-powered: Turn the ignition switch to the first position, then press the glow plug switch for approximately 15 to 20 seconds. Turn the ignition switch to the **START** position and release.

NOTE

If the engine fails to start, do not continue cranking for more than ten (10) seconds. Allow the starter motor to cool between attempts.

4. Allow the engine to warm for approximately two minutes.

SLOWING AND STOPPING

1. Allow the directional control pedal to move into the neutral position. The machine will slow and coast to a stop.

OPERATING ON GRADES

1. Always travel slowly.
2. Exercise extreme caution when traveling across or turning on grades
3. Use the brake pedal only for slowing the machine on grades.

SWEEPING

1. Lower the Brooms
   * Lower the side broom by pressing the right side of the side broom switch.
   * Lower the main broom by pressing the right side of the main broom switch.
   * When sweeping extremely uneven floors, position the **FLOAT** lever in the lowered position.
2. Drive the machine over the area to be swept.

EMPTYING THE HOPPER

1. Drive the machine to an approved dumping area.
2. Shake the filters for 20 to 30 seconds.
3. Use the directional control pedal to position the machine so that the space between the machine and the container or dumpster is adequate to raise the hopper.
4. Reduce the engine speed.
5. Pull back the lever to the **RAISE** position and hold until the bottom of the hopper is high enough to clear the top of the container.

⚠WARNING ***Never place your hands or other body parts near the lift arms when the hopper is operating.***

6. Use the directional control pedal to slowly and carefully move the machine forward until the hopper is properly positioned to dump debris into the container.

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

7. Press and hold the left side of the Dump Door Open switch.
8. After the hopper empties, slowly back the machine away from the dumpster approximately five (5) feet.
9. Push the lever forward to the LOWER position until the hopper stops.

USING THE ROTARY TRASH RELOCATOR (RTR™)

During sweeping, if the need arises, the RTR functions can be accomplished as described below.

1. Use the directional control pedal to stop the machine on a level surface.
2. Turn the main broom **OFF** by placing the switch in the center **"OFF"** position.

NOTE *This rotates the dump door, causing debris to move from the rear entrance to the front wall of the hopper.*

TRANSPORTING THE MACHINE

Loading

1. Position the machine on the transport vehicle or trailer and apply the parking brake.
2. Tie the machine down using the tie down holes in the frame behind both the front wheels and in the rear center of the frame.

ATTENTION! **Attach the tie downs to the frame only. Do not attach tie-downs to the swing-able engine frame.**

Towing

To operate the tow valve:

1. Swing the engine open.
2. Locate the yellow lever under the forward wall of the hydraulic reservoir.
3. Rotate the lever ninety degrees (90°) clockwise.
4. Push or tow the machine.

Pushing

1. Push the machine from the rear using bumpers only.

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.***

JACK POINTS

⚠WARNING **Use jack stands to hold the machine. Do not rely on the jack alone.**

To jack the machine, place the jack under the front edge of the wheel well on the frame. To jack the rear of the machine, place the jack under the main frame beneath the tail lights.

TIE DOWN

Each of the front walls of the wheel wells have an opening for securing the machine in the front. In the right rear roller mount, two holes are supplied for attaching a clevis or eyebolt for securing the rear.

ATTENTION! **Do not attach tie downs to the swinging engine frame as permanent machine damage may result.**

REMOVING LP TANK

1. To remove the LP tank, loosen the knob to the left of the tank.
2. Rotate the locking bracket down.
3. Remove the knurled quick disconnect fitting at the tank.
4. Slide the tank out.

Hakomatic 1800

1. Release the latch on the retaining door for the LP tank and open the door.
2. Remove the hose fitting from the tank and slide the tank out.

INSTALLING LP TANK

1. Place the tank, base first into the tank cavity below the operator's seat.
2. Slide the tank toward the engine until the tank is flush with the outside of the machine frame. The locating hole should be on the bottom.
3. Attach the quick disconnect hose to the tank and tighten.
4. Rotate the locking bracket upward so that the pin engages the hole in the tank. Make sure that the locking tab on the back of the locking bracket rests on the inside lip of the tank collar.
5. While holding the bracket in place, tighten the knob.

Hakomatic 1800

1. Same as above.
2. Same as above.
3. Same as above.
4. Rotate the tank so that the locating opening is facing downward.
5. Close the access door and secure the latch.

CHECK ENGINE LIGHT

If the yellow "Check Engine Light" illuminates, this indicates that the engine has experienced a fault. Contact your service provider and advise them of the indicator light.

HYDRAULIC MANIFOLDS

Most hydraulic functions are controlled by three hydraulic manifold blocks containing electronically controlled valves. These manifold blocks are located behind the hopper and can be accessed by raising the hopper and engaging the safety arm.

⚠CAUTION

Do not leave the hopper in the RAISE position for an extended period of time.

The manifold blocks can also be unbolted from the frame and tilted forward for easier servicing.

SIDE SQUEEGEE ADJUSTMENT

There are two adjustments for the side squeegee. The first is the pitch adjustment which controls making the rubber edger parallel to the floor surface. This is controlled by the knob on the leading (forward on machine) end of squeegee tool. By rotating clockwise the front (forward) end of the rubber will be raised. Turning the knob counterclockwise will lower the front edge. The second adjustment is the spring alignment. By adjusting the spring anchor pin to stretch the spring tighten, more pressure will be applied to the rubber producing a more aggressive contact with the floor. Greater force may be modified for rough, pitted floor. Smooth floor requires less pressure.

REMOVING SIDE SQUEEGEE

To replace the rubber parts, simply remove the side squeegee assemblies from the machine by attaching the handle on top of the scrubhead. When sweeping only along the edge, walls or shelving, remove the side squeegees and right side brush to make side broom use easier.

REPLACING THE SIDE SQUEEGEE RUBBER

The long rubber components are 4-sided squeegees. Two edges may be used on the right side of the machine and then transferred to the left side of the machine for using the other two edges. Both sides use the same rubber components. Because of its unique shape, the short rubber parts are 2 sided. When one edge is worn, it may be transferred to the opposite side of the machine to use the other edge. The longest edge must always make contact with the floor.

PLANNED MAINTENANCE CHART
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 Planned Maintenance Chart
- Service Instructions for Required 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.***

PLANNED MAINTENANCE CHART

FREQUENCY (IN HOURS)					SERVICE (BY MAINTENANCE AREA)
DAILY	50	100	200	500	
					ENGINE
				X	Pressure wash engine
					For additional maintenance requirements, refer to the engine manual furnished with this manual.
					AIR INTAKE SYSTEM
X					Empty rubber dust cup of air filter element.
		X			Clean air filter. *NOTE: Clean more often in dusty conditions.*
			X		Replace air filter.
					ELECTRICAL SYSTEM
		X			Check electrolyte level in battery cells and fill as needed.
			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.

PLANNED MAINTENANCE CHART (Continued)

FREQUENCY (IN HOURS)					SERVICE (BY MAINTENANCE AREA)
DAILY	50	100	200	500	
					HYDRAULIC SYSTEM
X					Check hydraulic reservoir dipstick and fill as needed.
				X	Replace breather cap filter element.
				X	Replace hydraulic fluid and filter
X					Check functioning of directional control pedal 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).
					SWEEPING COMPONENTS
X					Inspect brooms for wear and remove strings and debris from bristles and drive assembly.
	X				Inspect broom skirts for wear and adjust or replace as needed.
	X				Rotate main broom end-to-end.
X					Perform main broom adjustment test and adjust as needed.
X					Inspect the side broom for wear and adjust as needed.
					Replace main and side brooms as needed. *Main Broom—Bristles are 1" in length.* *Side Broom—Bristles are 3" in length.*

PLANNED MAINTENANCE CHART (Continued)

FREQUENCY (IN HOURS)					SERVICE (BY MAINTENANCE AREA)
DAILY	50	100	200	500	
					HOPPER
X					Check hopper filters and clean or replace as needed.
X					Inspect the hopper flaps for wear or damage and replace as needed.
		X			Inspect hopper side and frame seals for wear or damage. Adjust or replace as needed.
					STEERING
	X				Check for leaks.
					PARKING BRAKE
			X		Check for proper functioning and adjust as needed.
					TANKS
X					Check squeegee tool and vacuum hose for clogs.
					TIRES
X					Visually inspect for wear and damage. Repair or replace as needed.

PLANNED MAINTENANCE CHART (Continued)

FREQUENCY (IN HOURS)					SERVICE (BY MAINTENANCE AREA)
DAILY	50	100	200	500	
					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 brake cable for wear.
					IMPELLER
X					Check for hydraulic fluid leaks.
					SCRUB AND WATER PICK-UP COMPONENTS
	X				Inspect scrub brushes and replace as needed.
X					Inspect squeegee flare and adjust as needed.
	X				Check the main squeegee for wear. (Turn or replace as needed.)

SERVICE INSTRUCTIONS
INTRODUCTION

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 if OFF, the parking brake is LOCKED, and the wheels are CHOCKED.

SERVICE INSTRUCTIONS (CONTINUED)
AIR INTAKE SYSTEM

AIR FILTER REMOVAL

1. Turn off the engine and set the parking brake.

⚠WARNING ***Do NOT swing the engine frame open while the engine is running.***

2. Open the engine access doors and lid.
3. Unlatch the engine and swing open the engine frame.
4. Locate the air filter and unclamp the dust cup retaining clamps.
5. Remove the dust cup.
6. Pull the air filter out of its housing.

NOTE ***The blue safety element should not be removed.***

AIR FILTER CLEANING

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

AIR FILTER INSPECTION

1. After you clean the air filter, check it for holes by passing a light bulb in side 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. Be careful not to damage the seals.
3. Replace dust cup, being sure the air valve on cup is positioned correctly. (Pointing toward rear drive wheel when the engine frame is closed)
4. Tighten the clamps.
5. Check the condition of intake hoses and clamps.
6. Close engine frame and securely latch.
7. Close the engine access cover.

SERVICE INSTRUCTIONS (CONTINUED)
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 the circuit breaker trips, it can be reset by pressing the reset button in the center of the breaker. (The circuit breaker is located on the instrument panel beside the ignition switch).

FUSES

The individual circuits are protected by automotive style fuses in a fuse panel. This panel is located beneath the large plastic cover beside the battery. The engine compartment. To access the fuses, remove the wingnut in the center of the plastic cover. Then remove the cover.

AUTO RESET CIRCUIT BREAKERS

The headlights, tail lights, and horn circuits are protected by automatically resetting circuit breakers. The left headlights are on a separate circuit than the right headlights. Should these circuits experience an overload condition, the circuit breaker will stop current flow and reset itself after a brief time. If current interruption persists, turn off this circuit and report fault to technician.

SERVICE INSTRUCTIONS (CONTINUED)
FUEL SYSTEM

⚠ WARNING

1. ***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.***

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

3. ***Never bypass safety components.***

4. ***Replace any defective safety components before operating the sweeper.***

5. ***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.***

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

7. ***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.***

CHECKING THE LPG FUEL LOCK

1. Start the engine. Then unplug the wire going to the fuel filter lock. The solenoid should close, shutting off the fuel supply and stopping the engine.
   - If the engine continues to operate, the fuel filter lock should be replaced.
   - If the engine stops, the fuel filter lock is operating properly.

2. With the engine stopped, let the machine stand with the fuel solenoid unplugged. After 10 minutes, try the starter motor.
   - If the engine starts or fires, this indicates a fuel leak has occurred. Replace the fuel filter lock immediately.
   - If the engine simply turns over, this indicates the fuel filter lock is operating correctly.

SERVICE INSTRUCTIONS (CONTINUED)
COOLANT SYSTEM

BLOWING OUT RADIATOR FINS

NOTE **Make sure radiator is cool before blowing out the radiator fins with compressed air. Be careful that the radiator fins are not bent by the compressed air. Any fins that are bent should be straightened.**

REVERSE FLOW FLUSHING

1. At the engine, disconnect the hoses.
2. Make sure the radiator cap is on tight.
3. Using a hose clamp, clamp 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 **In GM engines, use only long life engine coolant that meets GM specification number GM6277M or equivalent. This coolant is orange in color and is readily available under various trade names such as Dexcool™.**

ATTENTION! **Never add green colored ethylene glycol coolant in a cooling system that use orange colored coolant. Engine damage may occur. These two coolants are not compatible.**

SERVICE INSTRUCTIONS (CONTINUED)
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. Stop the engine and lock the parking brake.
2. Unlatch and swing the engine frame open and secure with the locking pin.
3. Place a drain pan under the engine drain hose located on the engine pan.
4. Remove the drain plug and allow the oil to drain into the pan.

NOTE ***Oil exiting the engine pan may contact exhaust components.***

5. Remove the used oil filter and replace with a new one.
6. Dispose of the oil and oil filter in an approved manner.
7. Remove the engine oil cap, add oil in the amounts listed in the engine manual, then secure the cap.
8. Clean all oil from surfaces of the exhaust components.

⚠WARNING **Exhaust components must be free of oil before starting the engine. Fire could result from operating the engine with oil on the surface of the exhaust components.**

9. Close the engine frame and latch securely.

NOTE **The engine may be operated prior to the oil change to warm the oil before draining. The engine must be stopped long enough to allow the exhaust components to cool before proceeding.**

⚠WARNING **The exhaust components must be cool enough to touch with bare hands before draining the oil. Fire could result from draining the oil when the exhaust components are hot.**

LUBRICATION POINTS

Lubrication	Type of Lubrication	Frequency (In Hours)
Dump Arm Mounts	Grease	100

SERVICE INSTRUCTIONS (CONTINUED)
HYDRAULICS SYSTEM

FILLING THE FLUID RESERVOIR

NOTE **The reservoir is located inside the machine and is accessible through the top side door.**

1. When the machine is cool and the hopper is in the lowered position, remove the fill cap located in the top of the fluid reservoir. Fluid level should be to the grove on the dipstick attached to the fill cap.

⚠CAUTION **DO NOT OVERFILL! DO NOT USE TRANSMISSION FLUID INSTEAD OF HYDRAULIC FLUID. HYDRAULIC OIL MUST MEET THE SPECIFICATIONS LISTED TO ENSURE PROPER PERFORMANCE.**

2. If the fluid level is not acceptable, add hydraulic fluid.

HYDRAULIC FLUID VISCOSITY SPECIFICATIONS

SUS @100° F 510-560
SUS @ 210° F 78-84

CHANGING THE HYDRAULIC FLUID

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

NOTE **Fourteen (14) gallons (US) (53 liters) of fluid are required.**

7. Check the dipstick to ensure the proper level is achieved.
8. Remove the dipstick from the old cap and attach to a new fill cap / breather.
9. Install the new filler / breather cap assembly.
10. Check the drain plug for leakage.

SERVICE INSTRUCTIONS (CONTINUED)
HYDRAULICS SYSTEM (CONTINUED)

CHANGING THE HYDRAULIC FLUID FILTER

1. Raise the hopper and engage the safety arm.
2. Turn off the engine and engage the parking brake.
3. Unscrew the oil filter cartridge from the mount and discard in an approved manner. The filter is located on the firewall behind the hopper.
4. Apply a thin coating of fluid to the seal of a new filter element.
5. Thread onto the mount and hand tighten.
6. Tighten an additional one-half turn beyond hand tight.

NOTE **Do not over tighten.**

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

ADJUSTING THE DIRECTIONAL CONTROL RETURN SPRING

You may encounter "creeping" problems from time to time. Creeping means the machine moves backward or forward when the forward/reverse pedal is in neutral. A grinding noise when the engine is shut down is also an indicator that the directional control return spring needs adjusting. If this occurs, perform the procedure which follows:

1. Turn off the engine, engage the parking brake and chock both wheels.
2. Swing the engine frame open and secure with the locking pin.
3. Jack the rear of the machine so that the rear tire just clears the floor. Use two jack stands to support the machine.

⚠WARNING **DO NOT USE A JACK ALONE TO HOLD THE MACHINE!**

⚠WARNING **DO NOT JACK THE MACHINE ON THE ENGINE FRAME! JACK ONLY AT THE MAIN MACHINE FRAME.**

4. Locate the forward / reverse cable adjustment bracket mounted on the inside edge of the engine frame.
5. Slightly loosen the bolts.
6. From the operator's seat, start the engine and run at the half throttle.

SERVICE INSTRUCTIONS (CONTINUED)
HYDRAULICS SYSTEM (CONTINUED)

ADJUSTING THE DIRECTIONAL CONTROL RETURN SPRING (CONTINUED)

⚠CAUTION **The engine lockout switch located on the inside of the main frame must be bypassed to perform this operation. Only qualified technician should perform this adjustment or tamper with this switch.**

8. Slide the bracket while watching the rear wheel. Continue to adjust until the rear wheel does not turn in either direction.
9. Fine tuning may be done by loosening the locking nuts on this bracket where the cable attaches. Adjust the cable anchoring to lengthen/ shorten the cable.

⚠WARNING **STAY CLEAR OF THE FAN AND OTHER MOVING PARTS OF THE ENGINE.**

9. Fully open the throttle. Push the directional control pedal forward and backward to be sure the pump stays in neutral. Check the wheel again and adjust as needed until the wheel remains motionless.
10. Retighten all the locking nuts and bolts.
11. Turn the engine off and lower the machine to the floor.
12. Reattach wires properly to lockout switch. Test switch by closing and securely latching engine frame. From operator's seat, start engine. Engine should start. Now stop engine. Release engine frame latch. From operator's seat, try to start engine. Engine should not start when latch is released. If engine starts, the safety switch is not operating properly and must be replaced before using machine. If switch operates correctly, relatch engine frame and close engine doors and lid.

SERVICE INSTRUCTIONS (CONTINUED)
SWEEP COMPONENTS

BROOM DOOR FLAP INSPECTION

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

1. Turn the machine off and lock the parking brake.
2. Inspect broom door flaps for wear and damage. Flap clearance should be ⅛" (3.18 mm) above the floor.
3. Worn and damaged flaps should be replaced immediately to maintain proper dust control.

BROOM DOOR FLAP REPLACEMENT AND ADJUSTMENT

The flaps are attached to the broom doors by a retainer bar, hex bolts and nuts. To remove the flaps, remove the nuts, bolts and retainer bar. To adjust the flaps, loosen the nuts and bolts, slide the flap up or down as needed. Retighten the nuts and bolts.

MAIN BROOM ADJUSTMENT

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

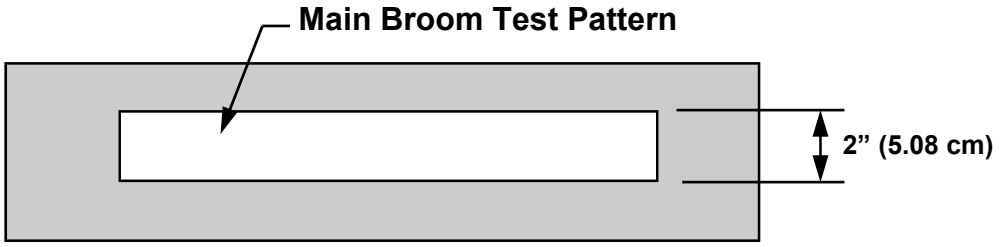
1. Drive the machine onto the test surface with the main broom in the **RAISED** position.
2. Set the parking brake and position the main broom float handle in the **NORMAL** (UP) position.
3. Push the broom control switch to the **ON** position to activate the broom motor and open the throttle to the 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.
7. If visibility of the polished pattern is difficult, draw a rectangle on the floor surface using chalk. Fill this area with chalk shading. Position the machine so that the main broom is above this shaded rectangle and repeat the test.

SERVICE INSTRUCTIONS (CONTINUED)
SWEEP COMPONENTS (CONTINUED)

NOTE **A rectangular shape the length of the main broom, 2" (5.08 cm) wide, indicates the main broom is properly adjusted. A pattern smaller then 2" (5.08 cm) indicates need for lower adjustment. A pattern wider than 2" (5.08 cm) indicates a need for higher adjustment. If pattern is tapered from end to end instead of rectangular, see Taper Adjustment on the next page.**



MAIN BROOM HEIGHT ADJUSTMENT

1. Start the machine and lock the parking brake.
2. Position the main broom float lever in the **FLOAT (DOWN)** position.
3. Remove the access cover behind the broom float lever.

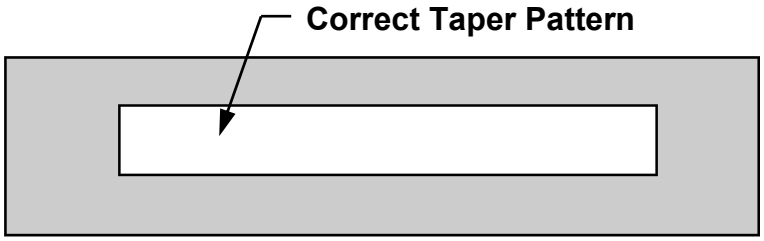
NOTE **The adjustment knob is located in the engine compartment behind the access cover.**

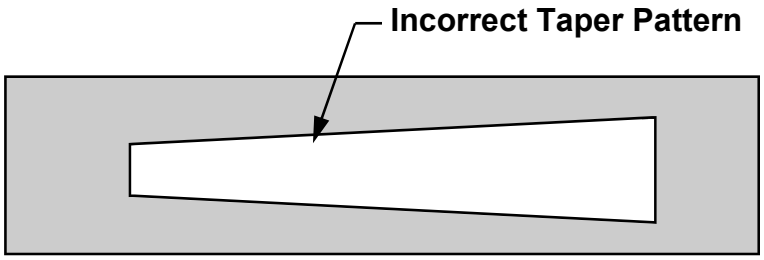
4. Turn the main broom on by pressing the switch to the "ON" position.
5. Turn the broom adjusting knob clockwise one-eighth turn to free the wing nut.
6. Turn the wingnut counter-clockwise to allow space for adjustment.
7. Make a lower or higher adjustment with the knob as required.
8. Retighten the wingnut.
9. Raise the main broom float lever to **NORMAL (UP)** position.
10. Repeat the main broom adjustment test to see that the broom is properly adjusted.

SERVICE INSTRUCTIONS (CONTINUED)
SWEEP COMPONENTS (CONTINUED)

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.**





Main Broom Taper Patterns

1. Locate the hex-shaped adjustment bar on the left rear wall of the broom chamber underneath the machine.
2. Loosen the retaining bolt on the right side of the hex bar.
3. Grasp the hex bar with a wrench and rotate it to raise or lower the left end of the main broom. (The right end of the broom remains fixed. All adjustments affect the left end of the broom.)
4. After adjustment, re-tighten the bolt.
5. Repeat the main broom adjustment test to see that the broom is properly adjusted.

SERVICE INSTRUCTIONS (CONTINUED)
SWEEP COMPONENTS (CONTINUED)

MAIN BROOM REPLACEMENT (Bristles worn to a length of 1 inch; 2.54 cm or less)

1. Turn the engine off and lock the parking brake.
2. Push the main broom float lever to the **FLOAT (DOWN)** position
3. Open the left broom chamber door (the door opposite the driver's seat).
4. Remove the knob on the main broom idler mount.
5. Pull the main broom idler mount straight out to remove.
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. It will be necessary to slightly raise the motor end of the broom to align with the drive hub. If a worn broom is being replaced, install the new broom by first adjusting the broom arms up to better match the position of the drive hub with the hub on the new broom.
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 hub 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 left broom door.
12. Perform a main broom adjustment test and adjust as needed.

SERVICE INSTRUCTIONS (CONTINUED)
SWEEP COMPONENTS (CONTINUED)

SIDE BROOM HEIGHT (WEAR) ADJUSTMENT

The side broom wear adjustment is controlled in ½" steps. These steps are accomplished using the two pins in the side broom adjusting block.

1. Lift the hopper cover to the open position.
2. Set the parking brake.
3. Start the engine and lift the hopper.
4. Stop the engine and engage the hopper safety arm.

⚠CAUTION **DO NOT RELY UPON THE HYDRAULIC CYLINDER TO KEEP THE HOPPER RAISED FOR MAINTENANCE. ALWAYS ENGAGE THE SAFETY ARM BEFORE GETTING UNDER THE HOPPER.**

5. Locate the side broom side block on the side of the hopper. Remove the pin closest to the actuator and insert on the side of the hopper. Remove the pin closest to the actuator and insert it into the hole on the opposite side of the remaining pin while putting tension on the cable. Make sure the repositioned pin goes through the loop in the cable (inside of the plastic block). Repositioning the pin places the cable closer to the floor when the lopper is lowered.
6. Make sure the pins are securely seated.
7. Start the machine and lower the hopper.
8. Close the hopper cover.

SIDE BROOM ANGLE ADJUSTMENT

The side broom can be adjusted to raise or lower the front leading edge of the broom. To adjust:

1. Locate the two ½" hex nuts on the plate behind the side broom motor. This plate is located between the motor and the hopper.
2. Loosen both nuts using a ½" wrench.
3. Move the broom to the desired angle.
4. Retighten both nuts.

SERVICE INSTRUCTIONS (CONTINUED)
SWEEP COMPONENTS (CONTINUED)

SIDE BROOM REPLACEMENT (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. Stop the machine and set the parking brake.
2. Turn the side broom by hand until the brush retainer bar is accessible.
3. Lift the bar and turn the broom clockwise (about one eighth of a turn) until the lock pins in the broom disengage from the drive plate.
4. Install the new broom by positioning the three drive pins into the pilot holes of the drive plate.
5. Lift and rotate the broom until the broom retainer bar springs into the locked position.
6. Check to make sure all three drive pins are properly engaged.

SERVICE INSTRUCTIONS (CONTINUED)
SCRUB & WATER PICK-UP COMPONENTS

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

SCRUB BRUSH REPLACEMENT

The scrub brush features a quick release mechanism which enables the operator to remove the brush in seconds.

NOTE **Brushes should be replaced when the bristles are less than ½" (12.77 mm) long.**

1. Turn the scrub brush by hand until the brush retainer clip is accessible.
2. Squeeze together the two handles of the brush retainer clip to disengage the brush from the driver.
3. Install the new brush by positioning the drive hub into the pilot hole of the brush.
4. Lift and rotate the brush until the brush retainer clip springs into the locked position.
5. Check to make sure that the brush is properly engaged.
6. For best access to the left brush, unlatch the engine frame and swing it open completely. Secure with the locking pin. Access to the left brush is now easier.

CHECKING THE MAIN SQUEEGEE ADJUSTMENT

1. On a level floor, lower the squeegee and drive forward several feet.
2. Observe the rubber contact with the floor. The rubber should have a consistent flare through its entire width. If the ends are flared more than the center, or if the center is flared more than the ends, a pitch adjustment is needed. (see below)
3. If the flare is consistent but too little or too much flare is present, a caster adjustment is needed.

SERVICE INSTRUCTIONS (CONTINUED)
SCRUB & WATER PICK-UP COMPONENTS

CASTER ADJUSTMENT

1. If only caster adjustment is required, stop the engine and set the parking brake.
2. Loosen the wing nuts on top of the caster stems. Turn the caster stems to raise or lower the casters. If too much flare was experienced, lower the caster. If too little flare was observed, raise the casters. Adjust the casters so that both are equal in adjustment.
3. Tighten the wing nuts without disturbing the adjustment.
4. Retest the squeegee.

PITCH ADJUSTMENT

If the pitch adjustment is required, it is usually easiest to adjust both pitch and casters at the same time.

1. Park the machine on a level floor and set the parking brake. Turn the engine off.
2. Loosen the wing nuts on top of the caster stems and adjust the casters up several turns. Leave loose.
3. Locate the pitch adjusting screws on the squeegee support arm. There are two adjusting screws. Loosen all four locking nuts (2 per screw) and back the nuts away from the bracket several turns.
4. At the forward end of each adjusting screw, locate and loosen the pivot bolts and nut. Do not remove the nuts.

NOTE **Only the pivot bolts attached to the ends of the adjusting bolts need to be loose. Do not loosen other pivot bolts.**

5. With the hardware loosened, crank the engine, set the throttle to medium speed. Turn the steering wheel completely to the right. Be sure that the parking brake is locked. Lower the squeegee.
6. With the squeegee rubber resting on the floor, check that the rear rubber is standing on the floor and making contact throughout its width. If not, lift and drop by hand until contact is made across.
7. With the squeegee in this position, turn all four locking nuts by hand until they are snug against the bracket. Do not wrench tighten yet.
8. Using a ¼" drill bit as a gage, lower both casters until the ¼" drill bit can pass between the wheel and the floor.

SERVICE INSTRUCTIONS (CONTINUED)
SCRUB & WATER PICK-UP COMPONENTS

PITCH ADJUSTMENT (Continued)

9. Turn the steering wheel straight, unlock the brake and pull the machine forward several feet. Set the brake and observe the flare.
10. Fine tune the pitch at the adjusting screws if required.
11. Fine tune the casters if required.
12. Retighten all four adjusting nuts and the two pivot bolts.
13. Tighten the wing nuts on the casters.

TURNING OR REPLACING THE MAIN SQUEEGEE RUBBER

The primary rubber on the main squeegee frame has four different edges that may be used: the front and back lower edge and the front and back upper edge. When the edge in use becomes worn to the midpoint of thickness, turn the rubber to an unused edge in the order indicated: 1. Front Lower Edge, 2. Opposite Lower Edge, 3. Front upper Edge and 4. Opposite Upper Edge. Removal and replacement instructions follow. This procedure can be performed with the squeegee tool on or off the machine.

NOTE **Removal and replacement of the main squeegee elements is easier if the squeegee frame is removed from the machine.**

1. Remove the hand knobs from the rear of the squeegee frame.
2. Remove the metal straps, the back-up strip and the outer squeegee rubber.
3. Turn the side ends of the squeegee rubber 180°, or turn the rubber upside down to expose an unused edge. Reposition the rubber on the pins of the squeegee frame.
4. Reposition the back-up strip.
5. Reposition the right metal strap on the right stud.
6. Repeat with the left strap and knob.

NOTE **Replace the back-up strip only if they lose their elasticity.**

SERVICE INSTRUCTIONS (CONTINUED)
SCRUB & WATER PICK-UP COMPONENTS

MAIN SQUEEGEE TOOL REMOVAL

All machines are equipped with auto-squeegee lift. To remove the squeegee tool, proceed as follows:

1. Engage the parking brake and chock the wheels.
2. Disconnect the squeegee suction hose from the squeegee tool.
3. Loosen the two large aluminum hand knobs on top of the squeegee retaining plate.

⚠CAUTION **The tool will fall to the floor if unsupported. Do not drop the tool on hands or feet.**

4. Grab tool with both hands and slide or pull back the tool away from the unit retaining and mounting plate.

MAIN SQUEEGEE TOOL INSTALL

NOTE **This is most easily done with an assistant, but can be done by one.**

1. Make sure the aluminum hand knobs are loose enough for the washer below the hand knobs to have clearance to slide up onto the retaining and mounting plate. ***Approximately ¾ of an inch of threads will be showing on aluminum knob.***
2. Using both hands, lift the squeegee tool up and onto the mounting plate.
3. Secure the squeegee tool assembly by tightening the aluminum hand knobs completely.

INNER SQUEEGEE REPLACEMENT

The inner squeegee is a component of the rear squeegee. When the squeegee is down and the rear squeegee rubber is flared, if the inner squeegee has become too worn to make proper contact with the floor, it should be replaced.

1. Remove the main squeegee tool (see removal instructions).
2. Remove the nuts on the front of the inner squeegee frame.
3. Remove the strap and the inner squeegee rubber.
4. Install the new inner squeegee rubber.
5. Position the strap and secure with the nuts.

AUTO SQUEEGEE LIFT MECHANISM

Bearing Replacement: If any binding occurs in the lift apparatus, replace the bushings, spacers and dry bearings located on the squeegee lift assembly as necessary.

SERVICE INSTRUCTIONS (CONTINUED)
HOPPER

FILTER REMOVAL

1. Raise the hopper cover.
2. Pull out both levers stored on the front of the filter retaining bracket.
3. Push down on both levers at the same time to open and lock the filter retaining bracket.
4. Slide the filter forward to remove.

FILTER CLEANING

The dust control filter is a permanent type paper 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 filter is thoroughly dried while standing on its side before installing in the hopper. Do not install or use a wet filter.**

FILTER REPLACEMENT

1. If the retainer bracket is closed, push down both handles until the bracket opens and locks.
2. Install the panel filter. Make sure the filter is positioned all of the way in the bracket. Gasket should be on the bottom.
3. Unlock the retainer bracket and close by lifting up on the retainer bracket handles.
4. Pivot the handles in against the filter to their stored position.
5. Close the hopper cover.

SERVICE INSTRUCTIONS (CONTINUED)
HOPPER (CONTINUED)

VACUUM GASKET MOUNT ADJUSTMENT

1. With the hopper in the normal position, observe contact between the back of the hopper and gasket. If complete seal is not maintained, raise the high dump hopper.

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

2. Loosen the mounting bolts in the impeller mount. Move the assembly toward the hopper. Tighten the bolts. Test and repeat if necessary.

FLAP REPLACEMENT

Flaps located at the entrance lip of the hopper must be replaced when worn or damaged. The flap panels may be replaced separately.

1. Park the machine on a level surface and engage the parking brake.
2. Raise the hopper.

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

3. Turn off the engine.
4. Remove the flap retaining angle and worn or damaged flaps.
5. Install new flaps.
6. Replace the retaining angle.

SERVICE INSTRUCTIONS (CONTINUED)
HOPPER (CONTINUED)

FRAME SEAL REPLACEMENT

FRONT FRAME SEAL

The hopper frame seal bolts to the front edge of the frame. Install a new seal by wrapping around foam strip and folding half to align holes. Doubled edge with holes goes on the bottom. Support the seal straight up while bolting the retainer bar in place. The seal should extend in front of the retainer bar after installation. Be certain that the seal edges are aligned to prevent twisting of the seal.

SIDE FRAME SEAL

The side frame seals should clear the floor by at least ⅛" (3.18 cm). If the bottom of a side seal measures ½" (1.27 cm) or more above the floor, readjust it or replace it by removing the bolts on the inside of the wheel wells, installing a new seal, and securing it with the bolts. Be sure to place the foam strip into the new seal during installation. The double edge with the holes goes toward the front.

SERVICE INSTRUCTIONS (CONTINUED)
BRAKES & TIRES

BRAKE ADJUSTMENT

1. Park the machine on a level surface and turn on the scrubdeck to lower the brushes to the floor. Turn off the engine.
2. Chock both sides of the right front tire.
3. Adjust the brakes for wear by locating the brake adjustment turnbuckle. This is located beneath the frame to the rear of the brake equalizing bar and directly below the brake pedal.
4. Using a 9/16" open end wrench loosen the locking nut positioned against the rear clevis. Back the nut away from the clevis several turns.
5. Using the 9/16" wrench, turn the threaded bar by grabbing the hex section at the center. If view from the rear of the machine, turning the bar counterclockwise will tighten the brakes. Rotate the turnbuckle bar two full turns.
6. Retighten the locking nut against the rear clevis.
7. Test the brakes. Readjust if required.

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 five flathead 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 flathead bolts.
6. Reinstall the tire on the machine.

SERVICE INSTRUCTIONS (CONTINUED)
MISCELLANEOUS

MISCELLANEOUS ADJUSTMENTS

- Each machine is equipped with an anti-static chain bolted to the back wall of 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.
- Latches and hinges should be inspected after every 500 hours of use. Retighten and oil if necessary.
- Inspect cables for wear every 500 hours.

TROUBLESHOOTING

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

TROUBLESHOOTING (CONTINUED)

PROBLEM	CAUSE	SOLUTION
Engine overheats.	Low coolant level.	Supply coolant.
	Clogged radiator.	Flush radiator.
	Loose fan belt.	Tighten belt.
	Defective thermostat.	Replace thermostat.
	NOTE: If coolant loss has not occurred, check for malfunction of the temperature sending unit.	
Machine moves slowly or does not move.	Parking brake is on.	Release brake.
	Tow valve open.	Close tow valve.
	Directional control pedal jammed, damaged, or not adjusted properly.	Clear jam or adjust linkage.
	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 for the operation conditions; check pump.
	Damaged or worn pump drive coupling.	Replace damaged item.

TROUBLESHOOTING (CONTINUED)

PROBLEM	CAUSE	SOLUTION
Machine moves slowly or does not move (continued).	Other problems with the hydraulics system: pump failure, motor failure, relief valve leaking or stuck open.	See Hydraulics System Problems in this section.
	Tow Valve improperly set.	Turn to correct position.
Machine 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: • Motor • Control Valve • Gear Pump • Relief Valve	See Hydraulics System Problems in this section.
Little or no vacuum in brush compartment.	Filters clogged.	Clean filters.
	Leak or clog in connection to impeller.	Repair leaks; clear obstructions or replace hose.
	Wet-sweep bypass engaged.	Turn off.
	Electrical fault at solenoid.	Check and repair.
	Impeller failure.	Check and repair.

TROUBLESHOOTING (CONTINUED)

PROBLEM	CAUSE	SOLUTION
Loss of dust control.	Broom skirts or seal worn.	Replace.
	Skirt clearance from floor exceeds ⅛".	Adjust clearance.
	Dust control filters clogged.	Clean filters.
	Filter seals worn or missing.	Replace.
	Poor seal contact at hopper lid or impeller inlet.	Visually check and adjust, if necessary.
Sweeper unit leaving debris.	Hopper full.	Dump hopper.
	Broom(s) out of adjustment.	Adjust.
	Hopper flaps damaged or missing.	Replace or adjust clearance.
	Dust control filters clogged.	Clean filters.

TROUBLESHOOTING (CONTINUED)

PROBLEM	CAUSE	SOLUTION
Hopper does not raise or lower.	Hydraulics system problem: • Control Valve • Gear Pump • Relief Valve	See Hydraulics Systems Problems in this section.
Scrubhead will not lower.	Fuse blown.	Replace fuse.
	Loose scrubhead switch wires.	Connect wires.
	Loose connection of plug at coil.	Connect.
	Defective coil.	Replace
	Defective scrubhead switch	Replace.

TROUBLESHOOTING (CONTINUED)

PROBLEM	CAUSE	SOLUTION
Scrubhead motors will not turn.	Fuse blown.	Replace fuse.
	Machine is stopped. (Machine must be moving for brushes to turn.)	Drive machine forward.
	Loose scrubhead switch wires.	Connect wires.
	Loose connection of plug at coil.	Connect.
	Defective coil.	Replace
	Defective scrubhead switch.	Replace.
Poor water pick-up	Recovery tank is full.	Empty the tank; if foaming badly, change detergent.
	Squeegee worn.	Replace squeegee.
	Debris caught in squeegee or pick-up tube.	Remove debris.
	Leak or clog in hose from Impeller or from squeegee.	Repair leak, clear obstruction or replace hose.
	Squeegee out of adjustment.	Adjust squeegee.
	Engine not operating at governed speed.	Re-adjust governor.
	Impeller failure.	Check and repair.

TROUBLESHOOTING (CONTINUED)

PROBLEM	CAUSE	SOLUTION
Detergent solution not being delivered.	Solution tank is empty.	Fill tank.
	Solution tank outlet filter clogged.	Clean screen.
	Machine is stopped. (Machine must be moving for solution to flow.)	Drive machine forward.
	Delivery lines clogged.	Clear lines.
	Pump not operating.	Inspect connections.
	Solution valve not opening.	Check and replace.
Scrubber unit not cleaning the floor.	Brushes worn.	Replace.
	Need different type of brush or detergent.	Use manufacturer's recommended brushes / detergent.
	Debris caught in brush drive mechanism.	Clear obstruction.
	Brushes out of adjustment.	Adjust.
	Brush motor failure.	See Hydraulics System Problems.

TROUBLESHOOTING (CONTINUED)

PROBLEM	CAUSE	SOLUTION
Squeegee will not lower.	Fuse blown.	Replace the fuse.
	Loose or defective squeegee switch (on console).	Reconnect wiring or replace switch.
	Loose wire(s) at forward relay.	Check connections and function.
	Loose or defective connection at coil.	Check coil and wiring.
Squeegee will not raise in reverse.	Poor connection at reverse solenoid.	Check connections and function.
Hopper lift cylinder failure.	Line to cylinder leaking.	Tighten fittings or replace hose.
	Priority flow valve failure.	Inspect or replace.
	Piston seals leaking.	Replace seals.
	Bent piston rod.	Replace rod.

TROUBLESHOOTING (CONTINUED)

PROBLEM	CAUSE	SOLUTION
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.
Hydraulic gear pump failure.	Pump leaking.	Replace seals.
	Gears worn or scored.	Rebuild pump.
	Relief valve stuck.	Clean or replace (at control valve).
	Oil supply low.	Check and fill.

TROUBLESHOOTING (CONTINUED)

PROBLEM	CAUSE	SOLUTION
Hydraulic gear pump failure (Continued).	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 (CONTINUED)

PROBLEM	CAUSE	SOLUTION
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 suction 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.

Notes:

Notes:

R

S

S (Continued)

T

U, V, W, X, Y, Z

Feedback?

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

Our Publishing Department, International would like to hear from you. If you see any errors, omissions or something that just needs clarification in this manual and/or the parts section, please let us know. We are working hard toward perfection in our little corner of the process of bringing you the best you can buy. Please fill out the form below and comment on how you found our manuals.
Thank you.

*Name_____

*Title: _____

*Company Name: _____

*Address: _____

*Country: _____

Type of equipment or model number: _____

Comments:

*Information is optional.
Please return to:

Manager, Publishing Department, International
PowerBoss, Inc.
175 Anderson Street
Aberdeen, North Carolina 28315 USA

Notes:

Notes: