



POWERBOSS[®]

ARMADILLO[®] SWEEPER

SW/8XV SW/9XV DELUXE SW/10XV DELUXE

OPERATION, MAINTENANCE, & TROUBLESHOOTING



AAR POWERBOSS, INC.

ANDERSON & TAYLOR STREETS / P.O. BOX 1227
ABERDEEN, NORTH CAROLINA 28315 U.S.A.
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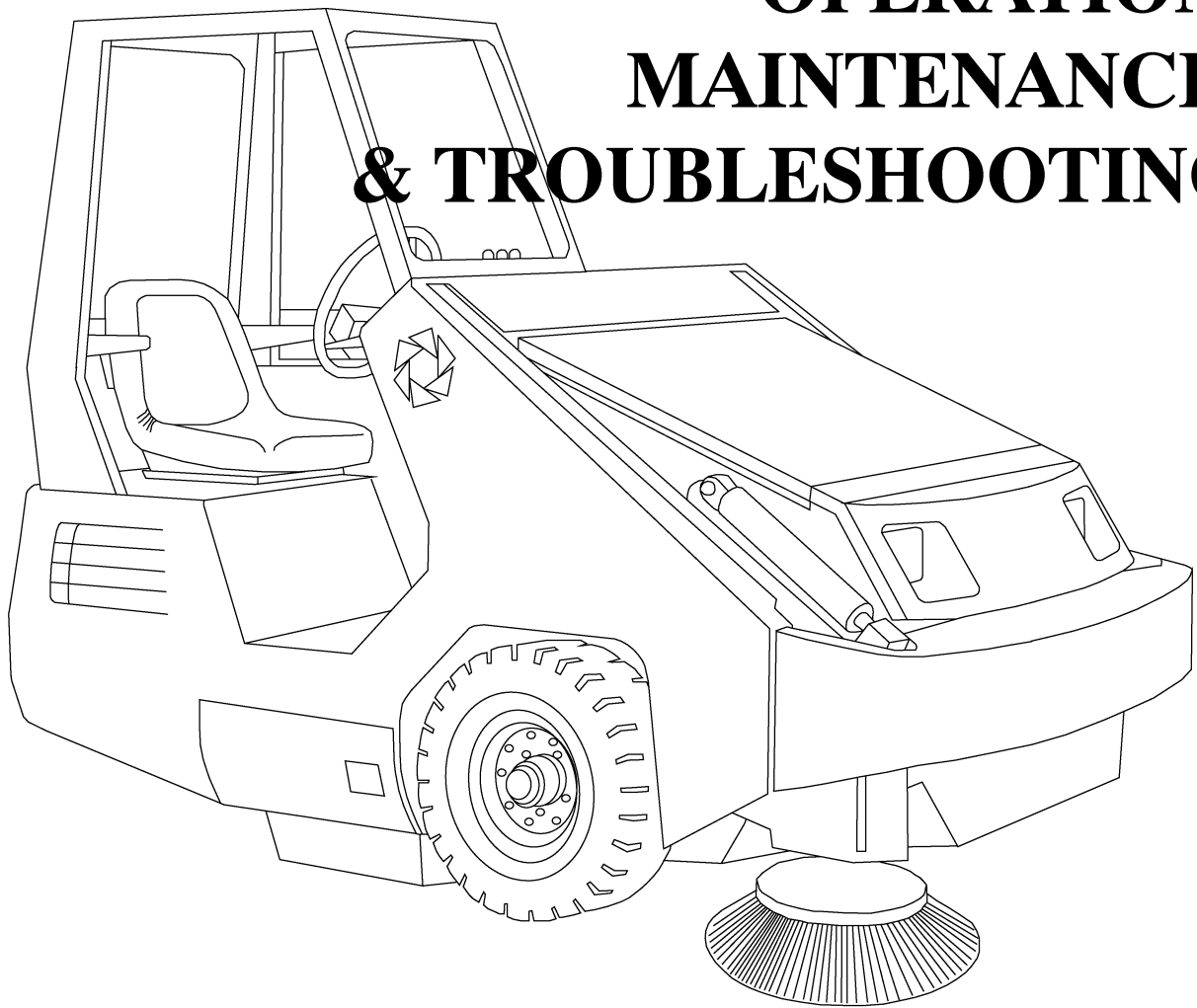
FEBRUARY '95

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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.

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SW/8XV , SW9XV DELUXE, SW/10XV DELUXE

FEATURES

1. Dual Dust Control Filters - 180 Sq. Ft. total (One Dust Control Filter - 110 Sq. Ft. in 8XV)
2. Dual Electric Filter Shakers (One Electric Filter Shaker in 8XV)
3. Shock-mounted Hydraulic Impeller
4. Power Steering with Tilt Steering Wheel
5. Adjustable Seat
6. Exhaust Air Expelled Outside Engine Compartment
7. Industrial Liquid-Cooled Engine
8. 4-Core Radiator
9. Tri-Phase Air Cleaner
10. PowerSwing™ engine access (Manual in 8XV)
11. One-Piece Unitized Steel Frame
12. Cast Steel Rear Body (Heavy Duty Rear Bumper in 8XV)
13. Hydraulics Protection Package
14. Dual Performance Sweep Mode
15. Quick-Change Floating 48" Main Broom (42" in 8XV)
16. PowerClimb™ All-Terrain Access
(Two 23" OD Pneumatic Front Tires & One 21" OD Pneumatic Rear Tire)
17. Oversized Hopper with RTR™
18. Retractable Quick-Change Side Broom
19. Multi-Level Hopper Dumping
20. Built-In Dust PreFiltering

ARMADILLO (LIMITED) PRODUCT WARRANTY

AAR POWERBOSS, INC. warrants that the **PowerBoss** Armadillo will be free from defects in material and workmanship for a period of 48 months or 2,800 operating hours from date of installation, whichever comes first. Written notice of any claimed defect must be given to AAR 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 AAR's election, any part or parts deemed defective after examination by AAR or an Authorized Service Representative. The **PowerBoss** machine or any of its parts returned by customer to AAR or an Authorized Service Representative via prepaid transportation and which is found to be defective, will be repaired or replaced and returned to customer via prepaid surface transportation within the Continental U.S. On the other hand, should a part be found not defective, inspection and handling charges may be charged to the customer by AAR or an Authorized Service Representative.

For one hundred eighty (180) days from date of installation, AAR will provide repair labor, at no charge, solely through an Authorized Service Representative. Thereafter, labor will be charged.

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 AAR's plant or the facility of Authorized Service Representative.

This warranty does not apply to routine wearable parts of the **PowerBoss** machine such as brushes, flaps, filters, seals, points, plugs, hoses or similar items. Moreover, this warranty does not extend to the **PowerBoss** machine or part replaced or repaired under this warranty.

Only replacement parts supplied by AAR are warranted for 30 days after installation.

The warranty for optional engines shall be limited to the warranty extended to AAR by the supplier.

ENGINE WARRANTY LIMITATION

For the 25th through 60th month, or from 2,000 hours through 3,000 hours, whichever comes first, only the following engine components shall be covered under the parts warranty:

- Cylinder Block
- Intake Manifold
- Cylinder Head
- Connecting Rods
- Camshaft

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 OF AAR 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.

(October 1992)

SAFETY SYMBOLS

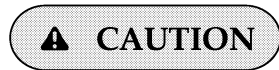
Five symbols are used throughout this manual to emphasize various levels of safety information. These symbols and the meaning of each are listed below.



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



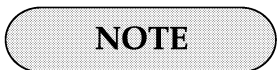
WARNING: To warn of hazards or unsafe practices which could result in severe personal injury or death.



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.

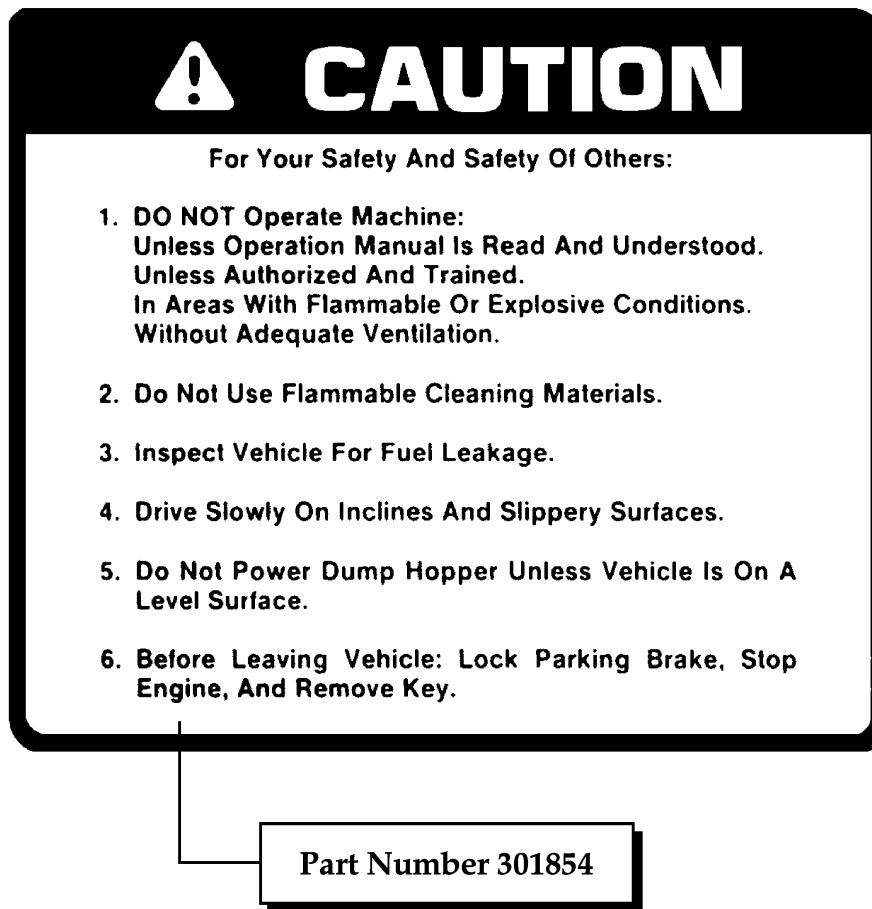


NOTE: To direct your attention to important equipment information or special instructions for preventing damage to equipment.

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 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 your machine appear on the next page.



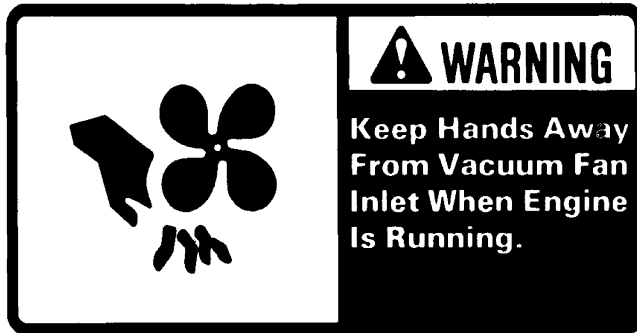
! CAUTION

For Your Safety And Safety Of Others:

- 1. DO NOT Operate Machine:
Unless Operation Manual Is Read And Understood.
Unless Authorized And Trained.
In Areas With Flammable Or Explosive Conditions.
Without Adequate Ventilation.**
- 2. Do Not Use Flammable Cleaning Materials.**
- 3. Inspect Vehicle For Fuel Leakage.**
- 4. Drive Slowly On Inclines And Slippery Surfaces.**
- 5. Do Not Power Dump Hopper Unless Vehicle Is On A
Level Surface.**
- 6. Before Leaving Vehicle: Lock Parking Brake, Stop
Engine, And Remove Key.**

Part Number 301854

Located at the Impeller:



Part Number 301729

Located on the high dump hopper:



Part Number 301732

Located on the shroud of the radiator:



Part Number 301733

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 malfunctions. Malfunctioning equipment should be removed from service.

DANGER

1. 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 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 OFF position.
2. 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.
3. When leaving the sweeper unattended:
 - Place the controls in OFF position.
 - Set the parking brake.
 - Shut off the engine.

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 getting under 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 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 overhead objects, throwing the machine off-balance, and other hazards.

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!

1. Do not operate the #2 RTR lever before the #1 light illuminates.
2. Never push or tow a machine faster than specified.

SW/8XV

Engine	47.5 H.P. 4 Cylinder Liquid-Cooled
PowerSwing™	360° Engine Accessibility. Engine swings (manually) outside frame for inspection.
Optional Power Source	LPG, 4 Cylinder Liquid-Cooled Diesel
Frame	Unitized Construction 3/16" (4.8 mm) Steel Plate, Side Rails are Double Walled Construction (3/8" ; 9.5 mm)
Drives	Hydraulic Driven Rear Wheel. Variable Speeds to 10 MPH (16.1 kmh), Main Broom, Side Broom, Hopper Dump and Vacuum Fan are Hydraulic Driven.
Steering	Manual, Automotive Recirculating Ball and Lever Controls Rear Wheel.
Sweep Path	56" (1422 mm) Sweep Path Including Side Brush
Sweep Coverage	165,000 Ft ² Per Hour (15,328 m ²) Based on a 56" (1422 mm) Path at 7 1/2 MPH with 6" (152.4 mm) Overlap
Sweeping Brushes	Main Broom: 14-inch (356 mm) diameter, 42-inch (1067 mm) length. Cylindrical, one-piece plastic core disposable runs at constant RPM. Five minute broom change. Raised and lowered from operator compartment. Floats for uneven surfaces. Adjustment for pressure, wear. Side Brush: 24-inch dia. (610 mm) rotary, one-piece disposable. Quick-change in seconds. No tools required. Bumper protected. Features retractable housing that swings away from obstructions. Adjustment for angle, pressure and wear.

SW/8XV (CONT.)

Vacuum System	Two-Stage Filter System with built-in Pre-Filtering of large dirt particles and Quick-Change Panel Filter. High volume 9-inch (229 mm) impeller provides constant air flow. Air is expelled outside engine compartment. Filter cleaned with one electric shaker.
Debris Hopper	17 ft ³ (.49 m ³), holds up to 1250 lbs.(567 kg) and multi-level high dump up to 60 inches (1524 mm). Features RTR rotary trash relocater system. 1/8 inch (3.18 mm) steel construction and optional stainless steel construction.
Controls	Operator controls all functions of sweeping and debris disposal while seated. Instant forward, reverse and braking using one pedal. Hand lever activated parking brake.
Instruments	Ammeter, hour meter, electric fuel gauge, oil pressure, water temperature, RTR (Rotary Trash Relocator) lights.
Tires	Front - Two 23" (584 mm) Solid, Pneumatic, Soft Shoe. Rear - One 21" (533 mm) Solid, Pneumatic, Soft Shoe.
PowerFlex™	Rear Wheel Suspension System (Optional)
Weight	3,200 Lbs. (1451.5 kg)
Dimensions	Length -100.69" (2,557.5 mm) Width - 54.00" (1,371.6 mm) Height - 56.00" (1,422 mm) 81.00" (2,057 mm) with overhead guard or cab

SW/9XV DELUXE

Engine	Ford 47.5 HP (35.4 kw), 4 Cyl Liquid-Cooled Gasoline (Standard) Ford 47.5 HP (35.4 kw), 4 Cyl Liquid-Cooled LPG (Optional) Kubota 46.0 H.P., 4 Cylinder Liquid-Cooled Diesel (Optional) 8-gallon (30 liter) Gas Tank. Electric Start
PowerSwing™	360° Engine Accessibility. Engine swings outside frame for inspection.
Frame	Unitized Construction 3/16" (4.8 mm) Steel Plate. 3/8" (9.5 mm) double-walled side rails. Rear end is steel casting.
Drives	Hydraulically-driven Rear Wheel. Variable Speeds to 10 MPH (16.1 kmh). Main Broom, Side Broom, Hopper Dump and Vacuum Impeller are Hydraulically Driven. Variable speed side broom.
Steering	Standard Power Steering through rear tire. Features Tilt Steering Wheel.
Turning Radius	Left Hand - 70.09 inches (1779 mm) Right Hand - 119.54 inches (3034 mm) "U" Turn - 115.00 inches (2919 mm)
Sweep Path	62" (1575 mm) Sweep Path Including Side Brush
Sweep Coverage	184,800 Ft ² (17,168 m ²) Per Hour Based on a 62" (1575 mm) Path at 7 1/2 MPH (12.07 kmh) with 6" (152 mm) Overlap.
Sweeping Brooms	Main Broom: 14-inch (356 mm) diameter, 48-inch (1219 mm) length. Cylindrical, one-piece plastic core disposable runs at constant RPM. Five minute broom change. Raised and lowered from operator compartment. Floats for uneven surfaces. Adjustable for pressure and wear. Side Broom: 24-inch dia. (610 mm) rotary, one-piece disposable. Quick-change in seconds. No tools required. Bumper protected. Features retractable housing that swings away from obstructions. Adjustment for angle, pressure and wear.

SW/9XV DELUXE (CONT.)

Vacuum System	Two-Stage Filter System with built-in Pre-Filtering of large dirt particles and dual Quick-Change Panel Filters for fine dust. 120 Ft ² (11.15 m ²) of filtering area. High volume 9-inch (229 mm) impeller provides constant air flow. Air is expelled behind engine compartment. Filter cleaned with two electric shakers.
Debris Hopper	22 Ft ³ (0.62 m ³) holds up to 1500 lbs. (680 kg) multi-level high dump up to 60-inches (1524 mm). Features RTR™ rotary trash relocater system. 1/8-inch (3.18 mm) steel construction with optional stainless steel.
Controls	Operator controls all functions of sweeping and debris disposal while seated. Instant forward, reverse and braking using one pedal. Front brakes hydraulically activated. Hand lever activated parking/emergency brake.
Instruments	Voltmeter, hour meter, electric fuel gauge, oil pressure, water temperature, RTR™ (Rotary Trash Relocator) lights.
Tires	Front - Two 23" (584 mm) OD Pneumatic (650 X 10). Rear - One 21" (533 mm) OD Pneumatic (650 X 9). Optional Soft Shoe and Solid Tires Available.
PowerFlex™	Rear Wheel Suspension System (Optional)
Weight	Net - 3,600 Lbs. (1633 kg). Shipping - 4,000 Lbs. (1814 kg). All approximate.
Dimensions	Length - 105.88" (2689.4 mm) Width - 60.00" (1524 mm) Height - 55.38" (1406.7 mm) 81.00" (2057 mm) with overhead guard or cab
Other	Tri-phase Air Cleaner with Four-core Radiator, Headlights, Taillights, Instrument Lights, Wet-Sweep By-Pass & Adjustable Hi-Back Seat are Standard Equipment.

SW/10XV DELUXE

Engine	Nissan 2.5 liter, 4 Cyl Liquid-Cooled Gasoline (<i>Standard</i>) Kubota 2.2 liter, 49.5 H.P., 4 Cylinder Liquid-Cooled Diesel (<i>Optional</i>) 8-gallon (30 liter) Gas Tank. Electric Start / 12-volt battery
PowerSwing™	360° Engine Accessibility. Engine swings outside frame for inspection.
Frame	Unitized Construction 3/16" (4.8 mm) Steel Plate. 3/8" (9.5 mm) double-walled side rails. Rear end is steel casting.
Drives	Hydraulically-driven Rear Wheel. Variable Speeds to 10 MPH. Main Broom, Side Broom, Hopper Dump and Vacuum Impeller are Hydraulically Driven. Powerflex™.
Steering	Standard Power Steering through rear tire. Features Tilt Steering Wheel.
Turning Radius	Left Hand - 72 inches (1,828 mm) Right Hand - 125 inches (3,175 mm)
Sweep Path	72" (1,828 mm) Sweep Path Including Side Broom
Sweep Coverage	214,502.5 Sq. Ft. (19,928 m ²) Per Hour *Based on a 72" Path at 7 1/2 MPH (12.07 kmh) with 6" (152 mm) Overlap.
Sweeping Brooms	Main Broom: 14-inch (356 mm) diameter, 56-inch (1,422 mm) length. Cylindrical, one-piece plastic core disposable runs at constant RPM. Five minute broom change. Raised and lowered from operator compartment. Floats for uneven surfaces. Adjustable for pressure and wear. Side Broom: 26-inch dia. (610 mm) rotary, one-piece disposable. Quick-change in seconds. No tools required. Bumper protected. Features retractable housing that swings away from obstructions. Adjustment for angle, pressure and wear.

SW/10XV DELUXE (CONT.)

Vacuum System	Two-Stage Filter System with built-in Pre-Filtering of large dirt particles and dual Quick-Change Panel Filters for fine dust. 180 Sq. Ft. (16.72 m ²) of filtering area. High volume 9-inch (229 mm) impeller provides constant air flow. Air is expelled behind engine compartment. Filter cleaned with two electric shakers.
Debris Hopper	30 Cu. Ft. (.89 m ³) holds up to 2000 lbs. (907.18 kg) multi-level high dump up to 60-inches (1524 mm). Features RTR™ rotary trash relocater system. 1/8-inch (3.18 mm) steel construction with optional stainless steel.
Controls	Operator controls all functions of sweeping and debris disposal while seated. Instant forward, reverse and braking using one pedal. Front brakes hydraulically activated. Hand lever activated parking/emergency brake.
Instruments	Voltmeter, hour meter, electric fuel gauge, oil pressure, water temperature, RTR™ (Rotary Trash Relocator) lights.
Tires	Front - Two 23" (584 mm) OD Pneumatic (650 X 10). Rear - One 21" (533 mm) OD Pneumatic (650 X 9). Optional Soft Shoe and Solid Tires Available.
PowerFlex™	Pre-loaded coil spring with mounted gas shock absorber on rear tire. (Standard)
Weight	Net - 4,575 Lbs. (2,075.17 kg). Shipping - 4,975 Lbs. (2,256.6 kg). All approximate.
Dimensions	Length - 105.88" (2689.4 mm) Width - 68.00" (1,727.2 mm) Height - 55.38" (1406.7 mm) 81.00" (2057 mm) with overhead guard or cab
Other	Tangential Air Cleaner with Four-core Radiator, Headlights, Taillights, Instrument Lights, Wet-Sweep By-Pass & Adjustable Hi-Back Seat are Standard Equipment.



COMPONENTS

THE AIR INTAKE SYSTEM

Engines are equipped with a dry cartridge type air filter with a rubber dust cup in the housing. The filters are accessible for easy removal and cleaning.

All engines have tangential inlet air filters.

THE ELECTRICAL SYSTEM

Circuit Breakers

There are four circuit breakers located just below the steering wheel.

1. Main
2. PowerSwing™ Interlock Switch
3. Headlights, hour meter, RTR™ lights
4. Water temperature gauge, oil pressure gauge, voltmeter, fuel gauge, horn, filter shakers

THE FUEL SYSTEM

Gasoline

Major fuel system components for gasoline-fueled engines are:

- fuel tank
- fuel filter
- mechanical fuel pump
- carburetor
- manually operated carburetor choke

Liquid Propane Gas (LPG)

Major fuel system components for LPG-fueled engines are:

- fuel tank
- pressure relief valve/fuel filter
- vacuum lock-off valve
- combination water heated vaporizer and primary regulator
- combination carburetor and secondary regulator

Diesel

Major fuel system components for diesel-fueled engines are:

- fuel tank
- fuel water trap
- fuel filter
- fuel lift pump
- fuel injection pump
- fuel injectors

THE COOLANT SYSTEM

Radiator Capacity: 3.75 qts, US ; Total System Capacity: 6.75 qts. US circulates through hoses and engine block which bring the total system capacity to 6.75 quarts.

A spring-loaded valve in the radiator pressure cap, designed to open at 14 psi, closes the outlet to the overflow pipe.

THE LUBRICATION SYSTEM

Grease fittings supply lubrication to:

- steering cylinder pivot points
- steering fork assembly
- pillow blocks supporting dump arms

THE HYDRAULICS SYSTEM

Hydraulic fluid is pumped from an eight-gallon capacity reservoir. The fluid passes through a 100 mesh suction strainer into supply lines which circulate fluid through two systems: the propulsion system and the accessory system.

Fluid returns through a heat exchanger and a filter equipped with a condition gauge.

Propelling System

The major component of the propelling system is a variable displacement piston pump protected by relief valves.

Accessories System

The major component of the accessories system is a gear pump. The gear pump, protected by a relief valve, sends fluid through a control valve to raise and lower hopper to rotate hopper, and to drive brooms, brushes, and other accessories.

Brooms are driven by hydraulic, high torque, low speed motors.

THE VACUUM SYSTEM

The vacuum system consists of a hydraulically driven impeller connected to a damper type hopper vacuum shut-off.

Filters and Shakers

SW models have two fully enclosed, positive sealed, quick-change filters providing 120 sq. ft. (11.15 m²) of filtering area and two electric shakers for cleaning the filters. Note: The SW/8XV has one filter providing 110 sq. ft. (10.22 m²).

HOPPERS

Rotary Trash Relocator™

The rotary trash relocater (RTR™) on high dump models increases the debris-holding capacity of the hopper, extending the sweeping time before dumping. By rotating the hopper about halfway through the dump rotation, the debris at the lip of the hopper moves to the front wall, leaving the entrance area clear to receive and hold more debris.

BRAKES AND TIRES

Brakes

All models have hydraulic drum brakes with a hand lever activated mechanical parking brake.

Tires

Front - Two 23" pneumatic, solid, or soft shoe
Rear - One 21" pneumatic, solid, or soft shoe

BASIC OPERATING CONTROLS

IGNITION SWITCH The two position keyswitch is used to turn the machine's electric power on and off.

STARTER To start gasoline powered machines, turn the key to ON position and press START button. When engine starts, release button. To stop engine, turn key to OFF.

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

FUEL LEVEL GAUGE The fuel gauge indicates the amount of fuel remaining in the tank.

VOLTMETER The voltmeter indicates the charging current which is being sent to the battery by the alternator. It also indicates a drop in voltage when the alternator is not charging.

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 CHOKE KNOB The choke knob on gasoline-powered machines is connected to a cable which controls the engine choke.

- Pull the knob out for aid in cold-starting the engine.
- Push the knob in after the engine starts.

STOP CABLE (DIESEL) When the stop cable knob is pulled out, the fuel pump is disconnected. The stop cable knob should be pulled out only after turning off the key switch, to prevent running down the battery.

ENGINE OIL PRESSURE The engine oil pressure gauge ranges from 0 psi to 60 psi. A reading below 7 psi indicates problems which may result in damage to the engine.

ENGINE COOLANT TEMPERATURE GAUGE The engine coolant temperature gauge registers the temperature of engine coolant. Temperatures above 210° 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.
- Full throttle position should be used during operation to ensure proper broom speed and dust control.

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 foot pedal into neutral.
- For emergency stops move foot pedal past neutral into opposite position. *(Use for emergency stops only! Constant use of this braking method may result in damage to drive components.)*

CAUTION

The sweeper is equipped with a speed limiter, a stop under the pedal which can be raised to reduce maximum speed.

PARKING BRAKE The hydraulic drum brakes on the two front wheels are operated by pressing on the brake pedal. The parking brake is cable activated. To engage the parking brake pull upward on the hand brake lever located on the left side of the front wall of the operator's compartment.

SWEEPING CONTROLS

BROOM CONTROL LEVER The broom control lever activates the brooms. ("Side Broom OFF" position activates main broom only.)

NOTE

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

NOTE

Note: The "OFF" position is achieved by placing the broom control lever in the center of the slot. Both broom motors (main & side) are de-activated by taking this action.

MAIN BROOM HANDLE The main broom handle to the immediate left of the driver raises and lowers the main broom. For normal sweeping, position the handle at LOWER on the handle slot.

NOTE

- For extremely uneven floors, position the handle at FLOAT position on the handle slot. **Note:** Extensive use of FLOAT position reduces broom life.
- When not sweeping, position and lock handle at RAISE position on the handle slot.

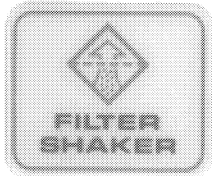
SIDE BROOM HANDLE The side broom handle to the immediate left of the driver raises and lowers the side broom.

- When not sweeping, the side broom should remain in the RAISE position.
- To lower the side broom, position the handle at LOWER in the handle slot.



DEBRIS HOPPER CONTROLS

HOPPER FILTER SHAKER BUTTON



(On the Left Side of the Instrument Panel)

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

To shake 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.

⚠ CAUTION

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

HIGH DUMP MODELS

NOTE

The two far left levers on the front control panel are used to raise the hopper to any height up to 60" (1.52 m) and dump it.

Note: Levers are spring loaded to a center off position.

- To raise the hopper, pull back Lever 1 to the RAISE position and hold until the hopper raises to the proper height for the dumpster or container.
- To empty debris, pull back Lever 2 to the DUMP position to rotate the hopper forward and empty the debris.
- To rotate the hopper back, push Lever 2 forward to the RETURN position until the hopper rotates and stops.
- To lower the hopper, push Lever 1 forward to the LOWER position until the hopper stops.

ROTARY TRASH RELOCATOR (RTR™)

Rotary Trash Relocator (RTR™) is a standard feature on high-dump models. Its purpose is to increase the holding capacity of the debris hopper to make dumping the hopper necessary less frequently.

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 cranking the engine, seat yourself in the operator's seat and make sure the parking brake is locked.

1. Make sure the directional control pedal is in neutral position.
2. Make sure the throttle is in idle position.
3. **Gasoline-powered:** Turn ignition key to ON position, push button located just below key. When engine starts, release button. If the engine is cold, pull out the choke knob and repeat procedure. When engine is running smoothly, push choke knob in.

NOTE

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

4. Move the machine forward or backward as follows:
 - **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.



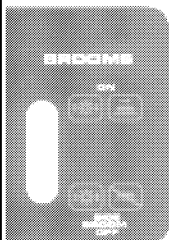
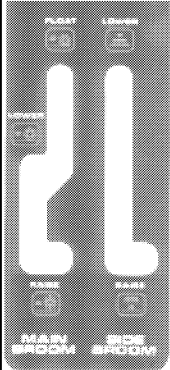
SLOWING AND STOPPING

1. Allow the directional control pedal to move into neutral. 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.

SWEEPING

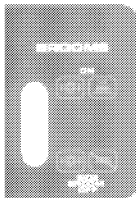


1. Lower the brooms.
 - When sweeping extremely uneven floors, position the main broom handle at FLOAT on the handle slot.
 - Lower the side broom by positioning the side broom handle at LOWER in the handle slot.
 - Lower the main broom by positioning the main broom handle at LOWER on the handle slot.
2. Activate the broom motors.
 - Activate both main and side broom motors by pushing the broom and brush control lever to the ON position.
 - Activate the main broom motor by pulling the broom and brush control lever to the SIDE BROOM OFF position.
3. Drive the machine over the area to be swept.

EMPTYING THE HOPPER

High Dump Models

NOTE



1. Drive the machine to the dumping area.
2. 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.
Note: Broom control lever must be in center OFF position.
3. Reduce the engine speed.
4. Pull back Lever 1 to 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.

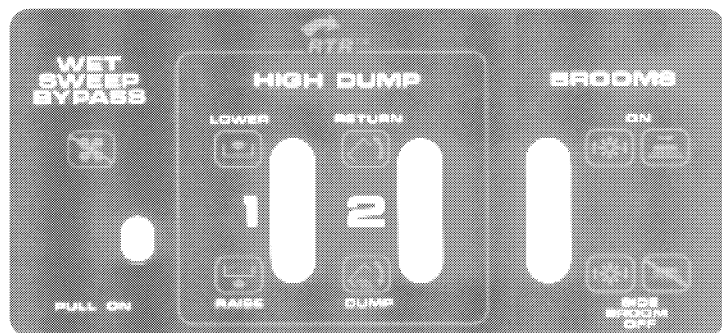
CAUTION

5. 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.

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

6. At this point, shake filters for 20 - 30 seconds. Pull back Lever 2 to DUMP position to rotate the hopper forward and empty the debris.
7. After hopper empties, push Lever 2 forward to RETURN position until the hopper rotates and stops.
8. Slowly back machine away from dumpster approximately 5 feet.
9. Push Lever 1 forward to the LOWER position until the hopper stops.

Controls That Are Located On The Lintel (the control panel in front of the steering wheel)

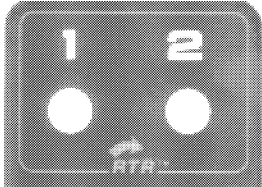




USING THE ROTARY TRASH RELOCATOR (RTR™)

1. Use the directional control pedal to stop the machine on a level surface.
2. Move the throttle to IDLE position.

NOTE



(On the Console)

Note: As you complete Steps three and four, observe the two red lights labeled 1 and 2 in the upper left corner of the control panel.

- Light 1 illuminates when the hopper reaches the minimum height required to use the RTR feature.
- Light 2 illuminates when the hopper reaches the rotation stop point.

3. Pull back Lever 1 to the RAISE position and hold until Light 1 illuminates, then release.

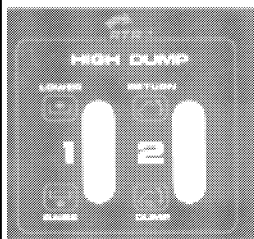
⚠ WARNING

Make sure no one is in the area under or around the hopper.

4. Pull back Lever 2 to DUMP position and hold until Light 2 illuminates, then release.

NOTE

Note: This rotates the hopper, causing debris to move from the rear entrance to the front wall of the hopper. Rotating beyond this point will cause debris to be dumped from the hopper.



(On the Lintel)

5. Push Lever 2 forward to RETURN position until the hopper rotates back and stops.
6. Push Lever 1 forward to the LOWER position until the hopper returns to the normal operating position.
7. Move the throttle back to RUN and resume sweeping.

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 front wheels and in the rear center of the frame.

NOTE

Note: Attach the tie downs to the frame only.

Pushing

1. Push the machine from the front or 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.

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:



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	
X		X			<p>ENGINE</p> <p>Pressure wash engine</p> <p><i>For additional maintenance requirements, refer to the engine manual furnished with this manual.</i></p>
X		X			<p>AIR INTAKE AND EXHAUST SYSTEMS</p> <p>Empty rubber dust cup of air filter element.</p> <p>Clean air filter. <i>NOTE: Clean more often in dusty conditions.</i></p> <p>Replace air filter.</p>
		X			<p>ELECTRICAL SYSTEM</p> <p>Check electrolyte level in battery cells and fill as needed.</p> <p>Clean battery top.</p>
X	X	X			<p>COOLANT SYSTEM</p> <p>Check coolant level and fill as needed.</p> <p>Inspect radiator fins and clean as needed.</p> <p>Blow out radiator fins.</p>

PLANNED MAINTENANCE CHART

FREQUENCY (IN HOURS)					SERVICE (BY MAINTENANCE AREA)
DAILY	50	100	200	500	
X				X	<p>HYDRAULIC SYSTEM</p> <p>Check hydraulic reservoir gauge and fill as needed.</p>
				X	<p>Replace breather cap filter element.</p>
X				X	<p>Replace hydraulic fluid and filter.</p>
				X	<p>Check functioning of directional control pedal and adjust as needed.</p>
	X			X	<p>Clean hydraulic fluid strainer in reservoir.</p>
		X			<p>Inspect hydraulic oil cooler fins & clean as needed (if so equipped).</p>
					<p>Blow out hydraulic oil cooler fins with compressed air (if so equipped).</p>
X					<p>SWEEPING COMPONENTS</p> <p>Inspect brooms for wear and remove strings and debris from bristles and drive assembly.</p>
	X				<p>Inspect broom skirts for wear and adjust or replace as needed.</p>
	X				<p>Rotate main broom end-to-end.</p>
	X				<p>Perform main broom adjustment test and adjust as needed.</p>
X					<p>Inspect the side broom for wear and adjust as needed.</p>
					<p><i>Replace main and side brooms as needed.</i></p> <p style="padding-left: 40px;"><i>Main Broom - Bristles are 1" in length.</i></p> <p style="padding-left: 40px;"><i>Side Broom - Bristles are 3" in length.</i></p>

PLANNED MAINTENANCE CHART

FREQUENCY (IN HOURS)					SERVICE (BY MAINTENANCE AREA)
DAILY	50	100	200	500	
X					HOPPER Check hopper filters and clean or replace as needed. Check hopper clearance from floor and adjust as needed.
	X				
X					Inspect the hopper flaps for wear or damage and replace as needed. Inspect hopper side and frame seals for wear or damage. Adjust or replace as needed.
		X			
				X	Lubricate the pillow blocks supporting the dump mechanism.
					STEERING
				X	Lubricate steering cylinder rod ends.
				X	Lubricate steering fork assembly.
	X				Check for leaks.
					PARKING BRAKE
			X		Check for proper functioning and adjust as needed.

PLANNED MAINTENANCE CHART

FREQUENCY (IN HOURS)					SERVICE (BY MAINTENANCE AREA)
DAILY	50	100	200	500	
X			X		<p>TIRES</p> <p>Visually inspect for wear and damage. Repair or replace as needed.</p> <p>Check pneumatic tires for proper air pressure (95 psi).</p>
				X	<p>MISCELLANEOUS</p> <p>Inspect latches and hinges. Tighten and lubricate as needed.</p>
			X		<p>Check anti-static drag chain on rear wall of broom chamber for damage or excessive wear. Replace as needed.</p>
				X	<p>Check side broom lift cable, and brake cable for wear.</p>
X					<p>IMPELLER</p> <p>Check for hydraulic fluid leaks.</p>

ENGINE

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

- Air Intake and Exhaust Systems
- 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 AND EXHAUST SYSTEMS SERVICE INSTRUCTIONS

AIR FILTER REMOVAL

1. Turn off the engine and set the parking brake.
2. Lift the engine cover.
3. Locate the air filter and unclamp 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 out of its housing.

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 inside it.

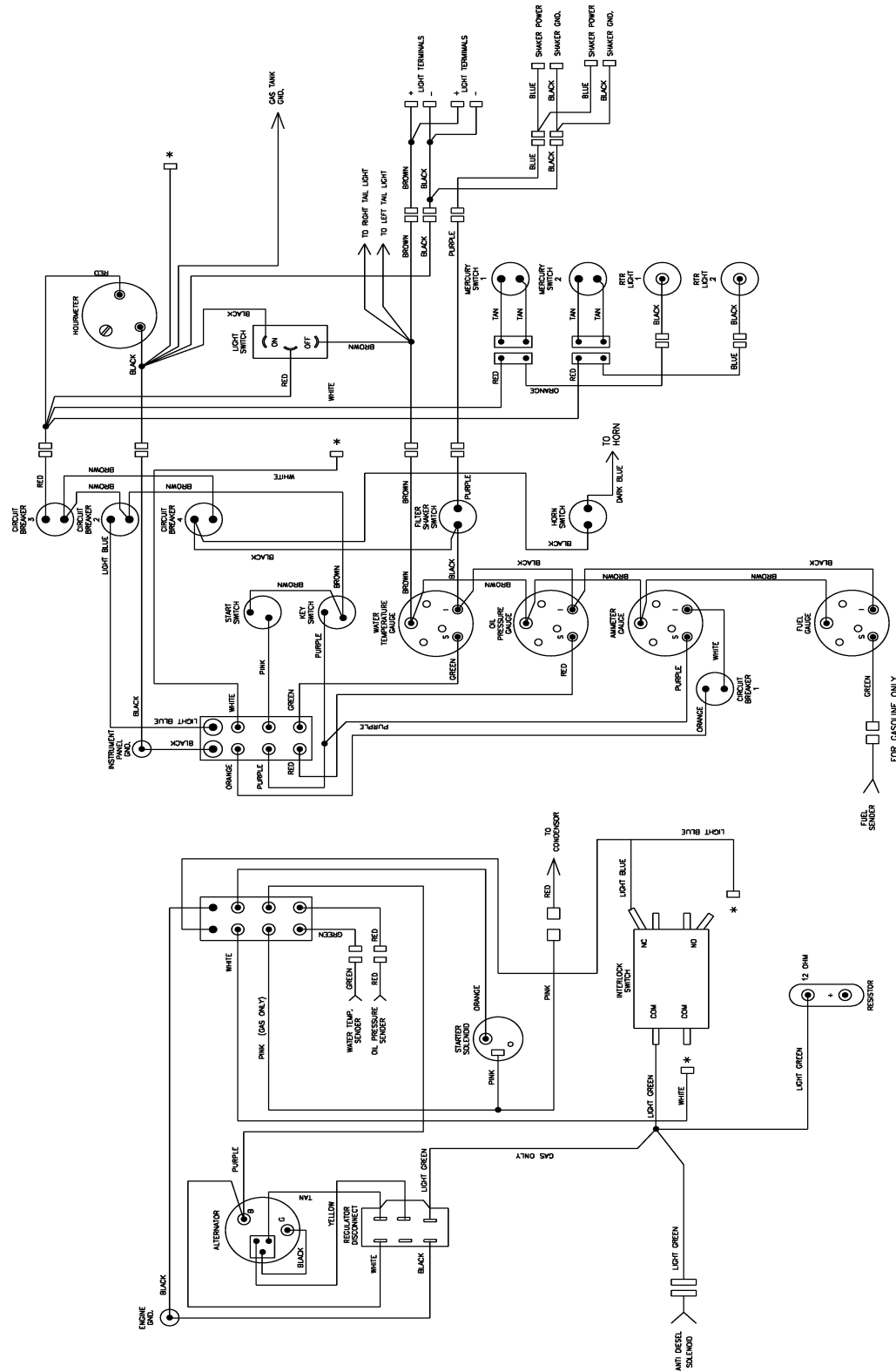
AIR FILTER INSTALLATION

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

ELECTRICAL SCHEMATIC

SW/8XV

- GASOLINE & LP GAS -



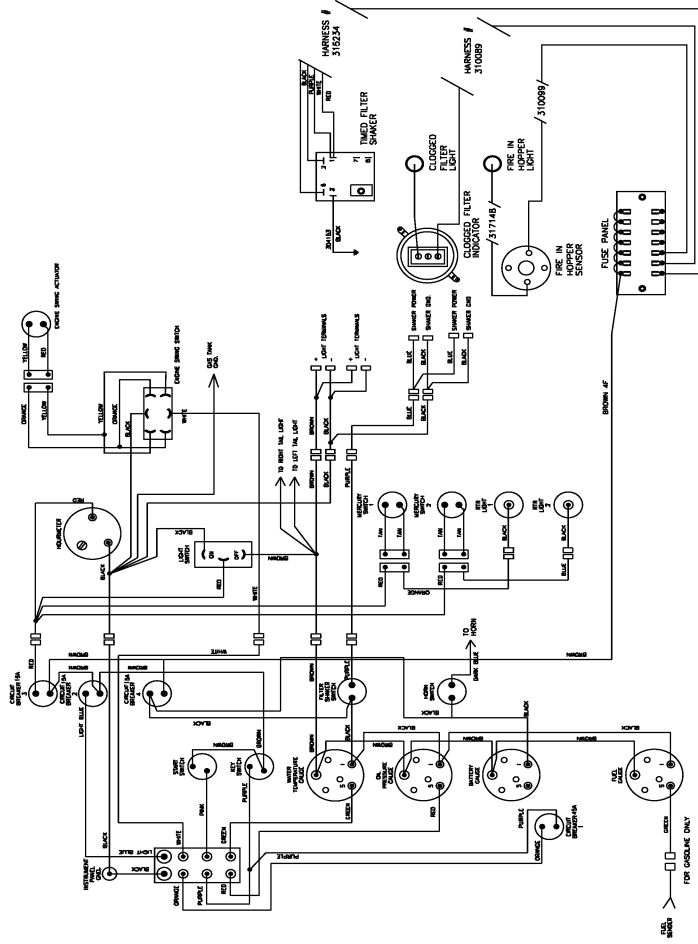
Notes:
 1. View for wiring all parts is the terminal side of part.
 2. Wires marked * not used on SW/8X models.

PowerBoss™ SW/8X ARMADILLO
 ELECTRICAL SCHEMATIC (GAS AND LP)

ELECTRICAL SCHEMATIC

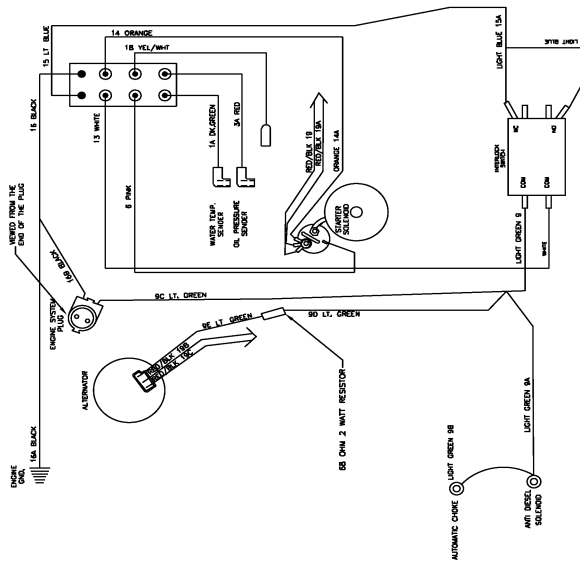
SW/9XV DELUXE

- GASOLINE & LP GAS -



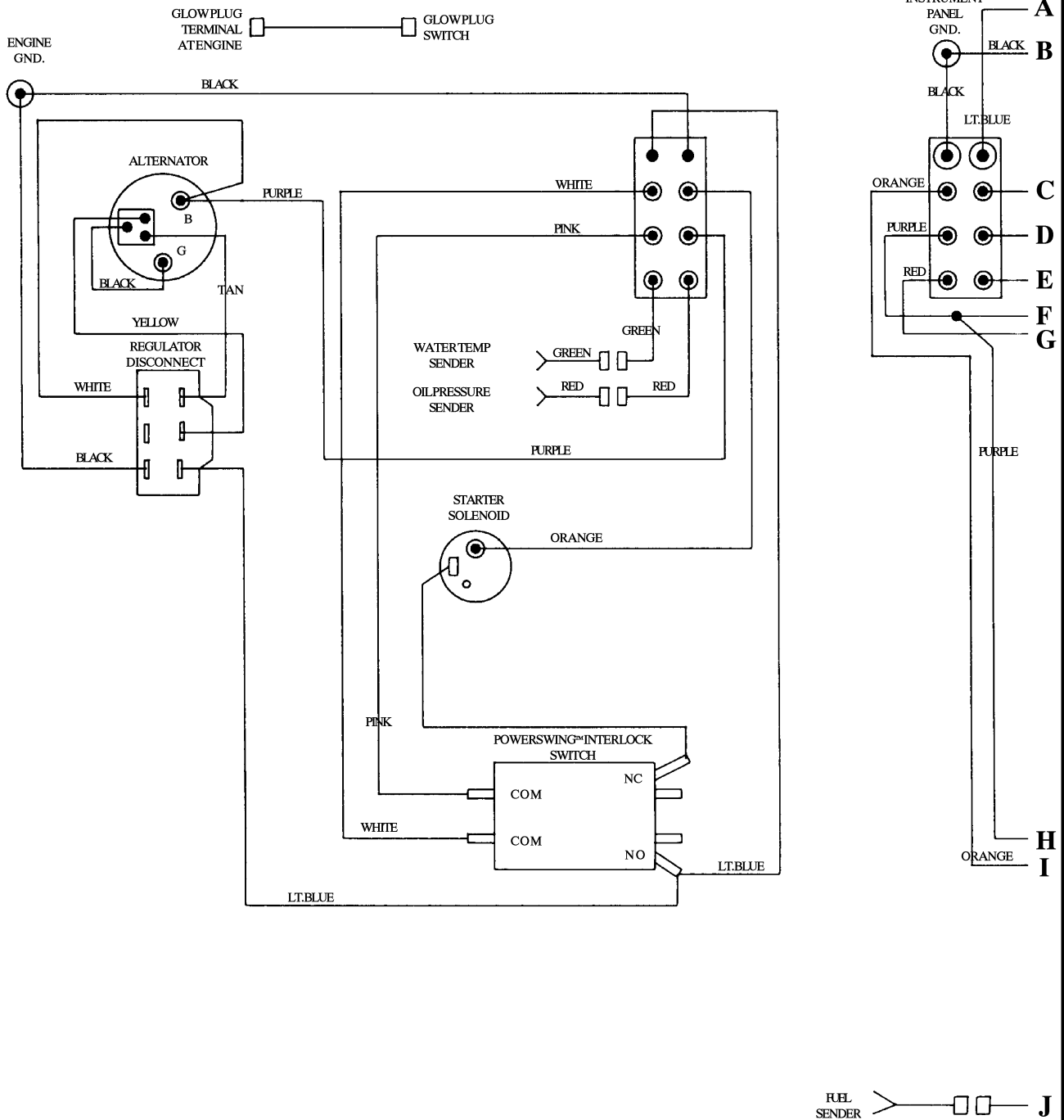
Notes: 1. Wire for wiring as shown in the terminal side of part.

PowerBoss™ SW/9X ARMADILLO
ELECTRICAL SCHEMATIC (GAS AND LP)

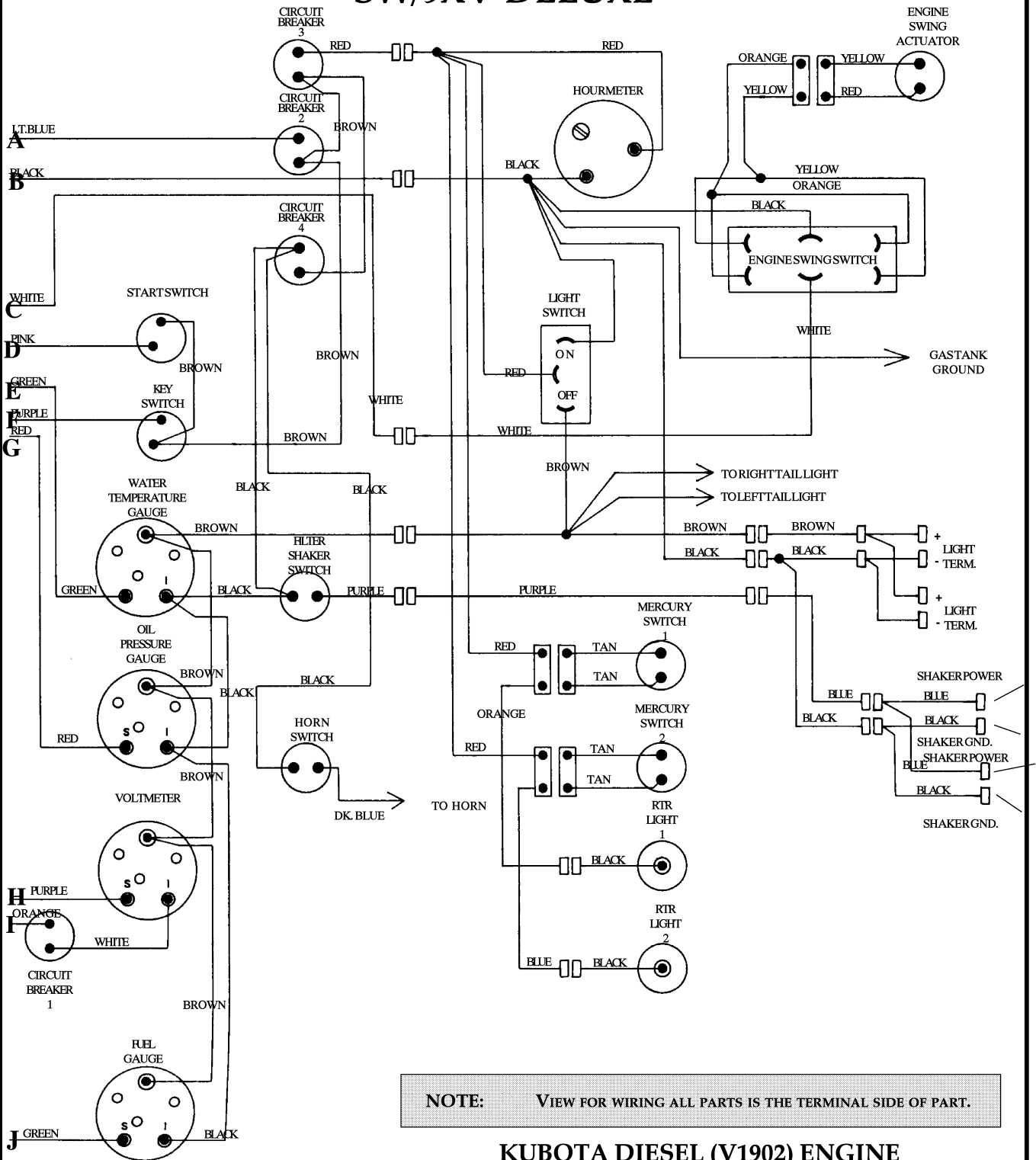


ELECTRICAL SCHEMATIC SW/9XV DELUXE

- DIESEL (KUBOTA) -



ELECTRICAL SCHEMATIC SW/9XV DELUXE



KUBOTA DIESEL (V1902) ENGINE

**ELECTRICAL SCHEMATIC
SW/10XV DELUXE**

TO BE SUPPLIED LATER

**ELECTRICAL SCHEMATIC
SW/10XV DELUXE
TO BE SUPPLIED LATER**

ELECTRICAL SCHEMATIC SW/10XV DELUXE

ELECTRICAL SYSTEMS

SERVICE INSTRUCTIONS

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 vaseline 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 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 circuit breakers are located on the instrument panel below the steering wheel.)

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 unless you are testing them.
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 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 FILTER LOCK

1. Start the engine. Then remove the vacuum hose 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 while the LPG tank valve is open (the hose is removed from the fuel filter lock). 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.

COOLANT SYSTEM SERVICE INSTRUCTIONS

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, 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: 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.

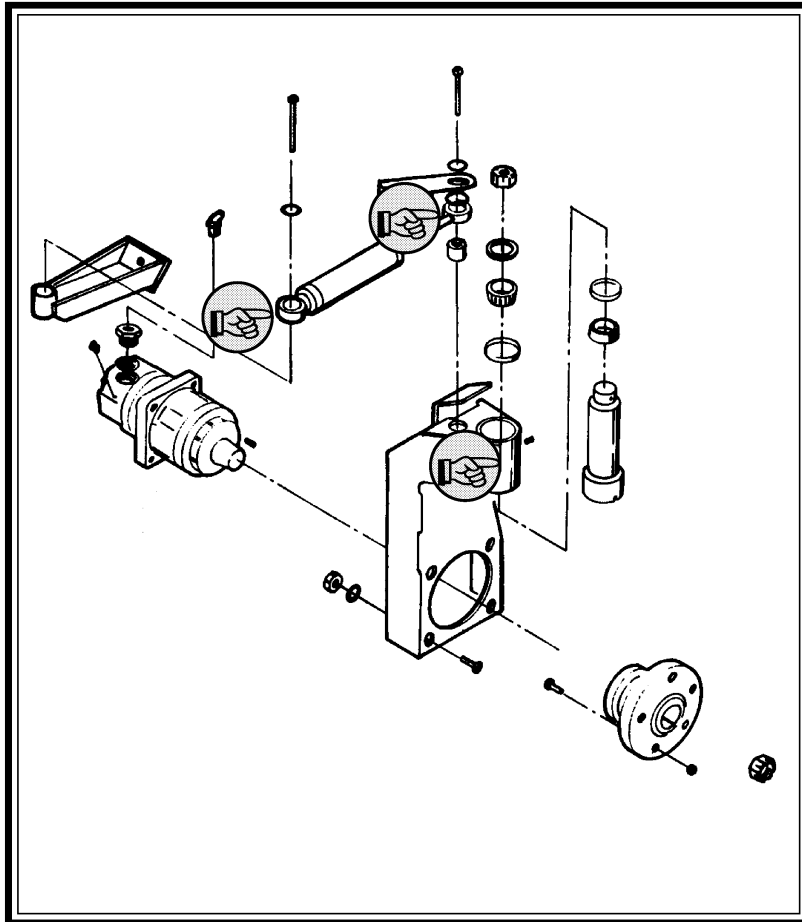
CHANGING ENGINE OIL

NOTE: The engine oil pan is equipped with a drain hose.

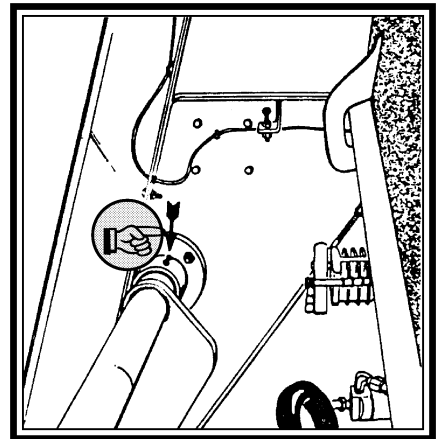
1. Pull the drain hose from beneath the engine and place a drain pan under the end of the hose.
2. Remove the drain plug and allow oil to drain into the pan.
3. Remove the used oil filter and replace with a new one.
4. Dispose of oil and oil filter in an approved manner.
5. Remove the engine oil cap,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

LUBRICATION POINTS

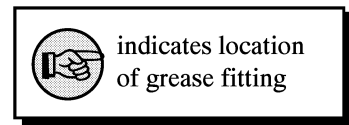
Lubrication	Type of Lubrication	Frequency (In Hours)
Steering Cylinder (2 fittings)	Grease	500
Steering Fork Assembly	Grease	500
Pillow Block Supporting Dump Mechanism (2 fittings)	Lithium Grease	500
Hood Latches & Hinges	Oil	500



Steering Lubrication Points



Dump Arm Pillow Block Lubrication Points



HYDRAULICS SYSTEM SERVICE INSTRUCTIONS

FILLING THE FLUID RESERVOIR

NOTE: The reservoir is located inside the machine and is accessible by tilting operator's seat forward.

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

NOTE: DO NOT OVERFILL! DO NOT USE TRANSMISSION FLUID INSTEAD OF HYDRAULIC FLUID. AAR PowerBoss recommends Chevron Dello 400.

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

MAINTAINING HYDRAULIC OIL COOLER EFFICIENCY

If your machine is equipped with a hydraulic oil cooler, it is located behind the radiator and utilizes exhausted radiator air to cool the hydraulic fluid.

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 rear of the reservoir and allow the fluid to drain.
4. Discard the fluid, 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: Six (6) gallons (US) of fluid required.

6. Check the dipstick to ensure the proper two-thirds level is achieved.
7. Install a new filler/breather cap assembly.
8. Check the drain plug for leakage.

CHANGING THE HYDRAULIC FLUID FILTER

1. Turn off the engine and engage the parking brake.
2. Unscrew the oil filter cartridge from the mount and discard.
3. Apply a thin coating of fluid to the seal of a new filter element.
4. Thread onto the mount and hand tighten.
5. Tighten an additional one-half turn beyond hand tight.

NOTE: Do not overtighten.

6. 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:

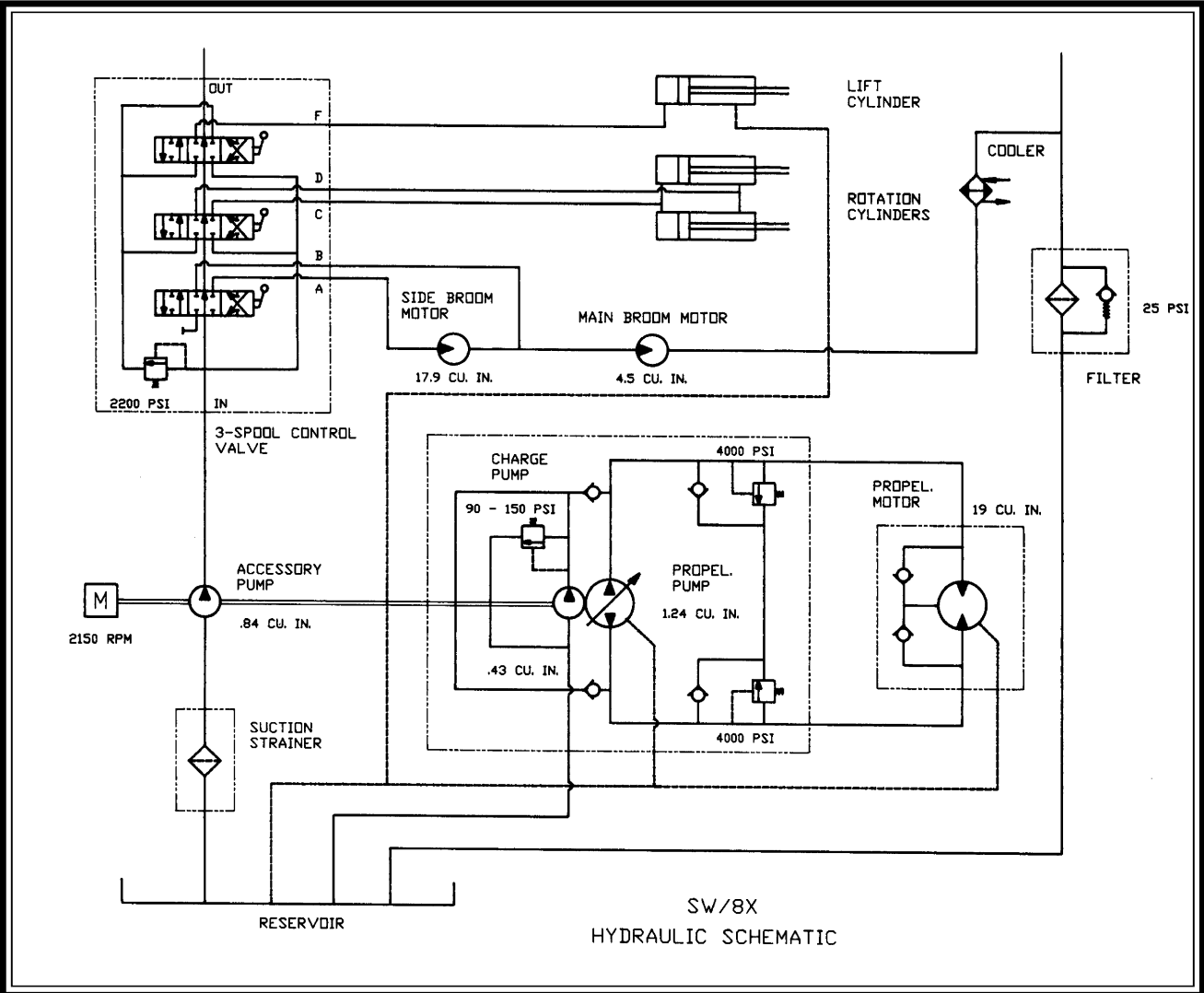
1. Turn off the engine, engage the parking brake, and chock both wheels.
2. Jack the rear of the machine so that the rear tire just clears the floor. Use two jack stands to support the machine. **DO NOT USE A JACK ALONE TO HOLD THE MACHINE !!**
3. Locate the forward/reverse adjustment bracket mounted beneath the pump on the pump mounting plate.
4. Slightly loosen the bolt on the center of the bracket.
5. Now loosen the locking nut on each of the adjusting bolts on the side of the bracket closest to the pump mounting plate.
6. From the operator's seat, start the engine and run at half throttle.
7. Turn the adjusting bolts while watching the rear wheel. Continue to adjust until the rear wheel does not turn in either direction.

8. Fully open throttle. Push the directional control pedal forward and backward to be sure pump stays in neutral. Check wheel again and adjust as needed until the wheel remains motionless.
9. Retighten all the locking nuts and the bolts.
10. Turn the engine off and lower the machine to the floor.

ADJUSTING MACHINE SPEED

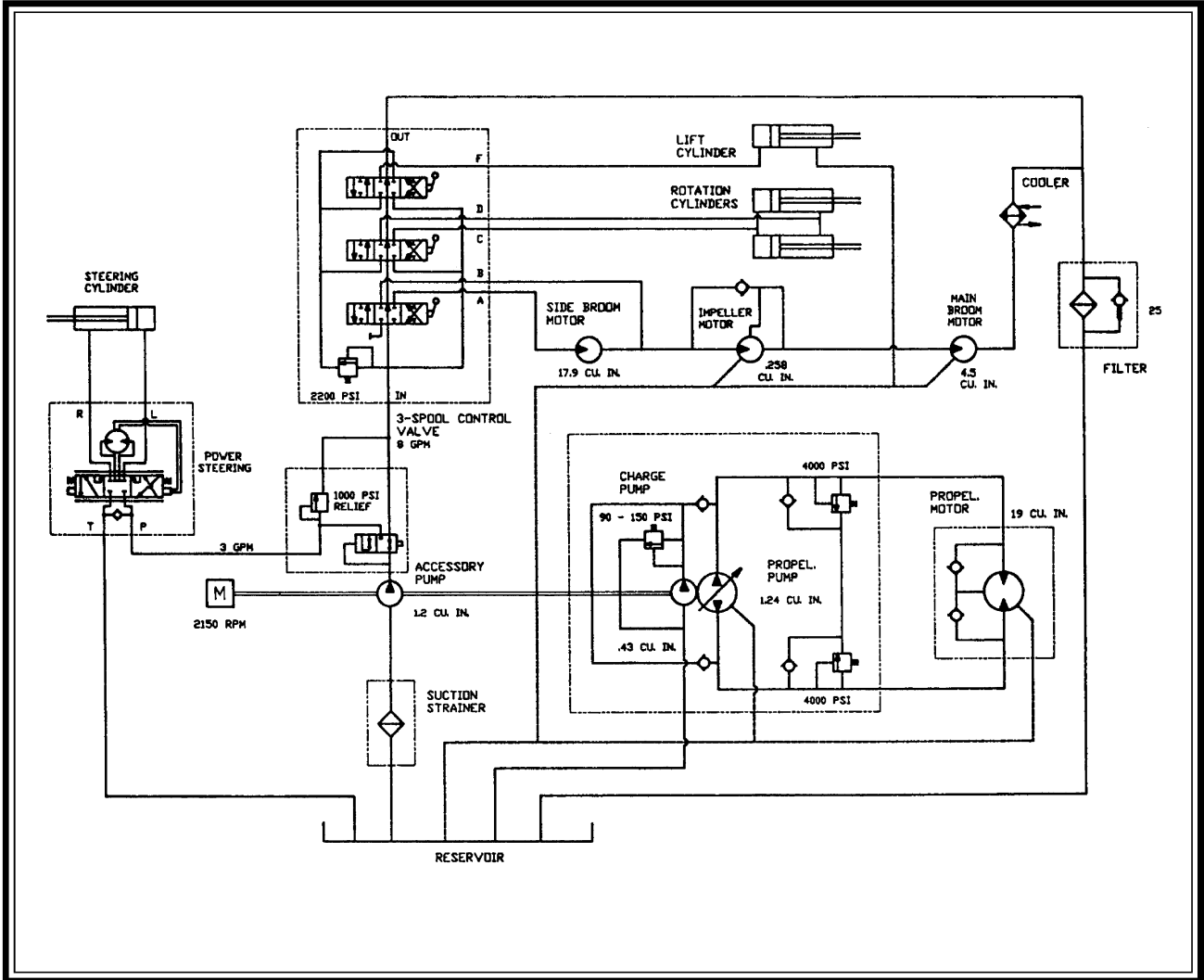
To limit the speed of the machine, simply reposition the speed limiter, a bolt underneath the directional control pedal which can be moved in or out. Be sure that the directional control pedal contacts the speed limiter bolt before the pump control arm hits the pump stop.

HYDRAULIC SCHEMATIC SW/8XV



SW/8X
HYDRAULIC SCHEMATIC

HYDRAULIC SCHEMATIC SW/9XV DELUXE



**HYDRAULIC SCHEMATIC
SW/10XV DELUXE
TO BE SUPPLIED LATER**

**HYDRAULIC SCHEMATIC
SW/10XV DELUXE
TO BE SUPPLIED LATER**

SWEEP COMPONENTS SERVICE INSTRUCTIONS

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 1/8" (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 and hex bolts and nuts. To remove the flaps, remove nuts, bolts, and retainer bar. To adjust flaps, loosen nuts and bolts, slide flap up or down as needed. Retighten nuts and bolts.

MAIN BROOM ADJUSTMENT TEST

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

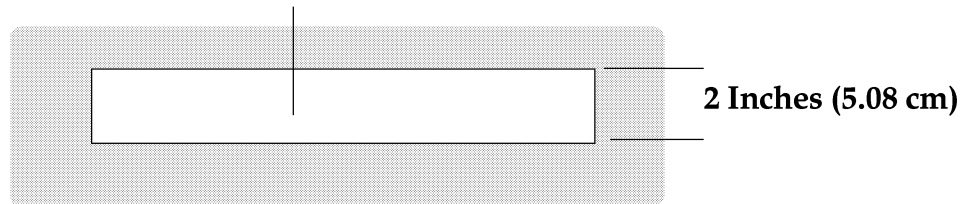
1. Drive the machine onto the test surface with the main broom in the RAISED position.
2. Set the parking brake and position the main broom handle in NORMAL position.
3. Push the broom control lever to ON position to activate the broom motor and open throttle to full RPM.
4. Allow about 45 seconds for 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.

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 than 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 Test Pattern



MAIN BROOM HEIGHT ADJUSTMENT

1. Turn the machine off and lock the parking brake.
2. Position the main broom lever in the LOWER position.

NOTE: The adjustment knob is located in the engine compartment on the broom control handle pivot.

3. Turn the broom adjusting knob clockwise one-eighth turn to free wingnut.
4. Turn the wingnut counter-clockwise to allow space for adjustment.
5. Make a lower or higher adjustment with the knob as required.
6. Retighten the wingnut.
7. Repeat the main broom adjustment test to see that the broom is properly adjusted.

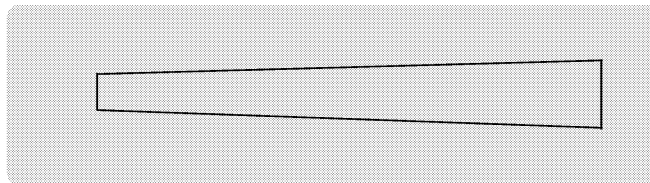
MAIN BROOM TAPER ADJUSTMENT

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.

Correct Taper Pattern



Incorrect Taper Pattern



Main Broom Taper Patterns

1. Locate the adjusting screws directly beneath the hydraulic pump.
2. Loosen the jam nuts on adjusting screws, and loosen the retaining bolt on the inside of the mounting bracket.
3. Use adjusting screws 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, tighten retainer bolt and adjusting screws.
5. Repeat the main broom adjustment test to see that the broom is properly adjusted.

SIDE BROOM ANGLE ADJUSTMENT

The angle adjustment is controlled with a stop bolt. This stop bolt is located at the top front of the side broom arm (under the spring). To increase the angle of the side broom, loosen jam nut and turn stop bolt counter-clockwise. Be sure to retighten the jam nut back down once the adjustment is made.

SIDE BROOM HEIGHT (WEAR) ADJUSTMENT

The height of the side broom is adjusted with the use of a stop bolt located at the lower rear of the curb broom arm. As the side broom wears it will be necessary to lower the arm. To lower the side broom, loosen the jam nut on stop bolt. Turn the stop bolt in a counter-clockwise direction, check side broom for proper contact and re-tighten the jam nut.

SIDE BROOM LIFT CABLE ADJUSTMENT

This adjustment is made at the cable clevis attached to the side broom assembly. It controls the height of the side broom in the RAISED position. This adjustment must be made with the hopper fully lowered.

1. Pull the side broom lever into the RAISED position.
2. Loosen the locknut on the threaded rod at the clevis.
3. Turn the threaded rod in or out to set the side broom in the maximum raised position.
4. Secure the cable adjustment by tightening the locknut.

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

1. Turn the engine off and lock the parking brake.
2. Push the main broom control lever to the LOWER position.
3. Open the left broom chamber door (the door opposite the driver's seat).
4. Using a 3/4" wrench, remove the hex bolt 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.

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 bolt into position and tighten with the wrench.
11. Close and latch the left broom door.
12. Perform a main broom adjustment test and adjust as needed.

SIDE BROOM REPLACEMENT (Bristles worn to length of 3 inches ; 7.62 cm)

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

1. Raise the side broom and lock in RAISE position.
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.

HOPPERS

SERVICE INSTRUCTIONS

HIGH DUMP HOPPER REMOVAL AND REPLACEMENT

It is not usually necessary to remove or replace the hopper on high dump models. However, if it becomes necessary for maintenance or to install an option, use the following procedure to remove:

1. Park the machine on a level surface and engage the parking brake.
2. Raise the hopper and position the high dump hopper dolly, a platform truck or similar four wheeled cart under the hopper.
3. Set the hopper down on the truck and turn the engine off.
4. Cycle the rotation control handle (#2) in both positions to relieve any residual hydraulic pressure.
5. Remove three bolts, washers, nuts, and backing plate.
6. Disconnect the wire connections at the right side of the hopper.
7. While spreading dump arms slightly, roll the hopper away from the machine.

TO REPLACE:

1. Position the hopper on the dolly so as to align the mounting holes in the sides of the hopper with the rotation mounts on the arms. Lift arms should be positioned about 1/3 of way up.
2. Engage lift arm rotation plates with three mounting bolts on each side of the hopper.
3. Start the machine and lift hopper.
4. Drive the truck away from the hopper dolly or cart.
5. Lower hopper.
6. Engage wire connections at right side of hopper.

FILTER REMOVAL:

1. Release the latch on the hopper cover and raise cover.
2. Disconnect the wire harness leading to the filter shaker motor.
3. Unscrew the four screws (each attached using one conical washer and an isolator) securing the filter retainer bars to the hopper.
4. Remove the shaker motor assembly and filter retainer bars.
5. Lift out the panel filter.

FILTER CLEANING

The dust control filters are permanent type paper element filters. They 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 sides before installing in the hopper. Do not install or use a wet filter.*

FILTER REPLACEMENT

1. Insert the panel filters.
2. Install the shaker motor assemblies.
3. Install and tighten the eight filter retaining screws & isolators.
4. Hook the wire harness to the filter shaker motors.
5. Close the hopper cover and secure the latch.

HOPPER FLOOR CLEARANCE & DUMP ADJUSTMENTS

In order to perform properly, the hopper must maintain a distance of 3-1/2" (8.89 cm) from the floor to the rear hopper entrance lip. The front of the hopper should be adjusted so that the front bumper aligns with the hopper frame where the two meet. When properly adjusted, the front edge of the hopper will be 5" (12.7 cm) to 6" (15.24 cm) from the floor.

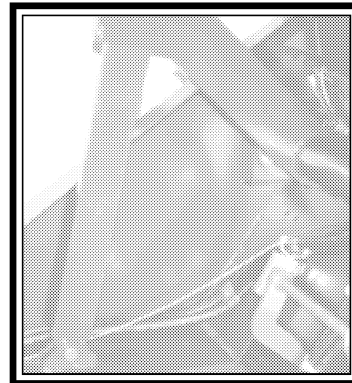
ADJUSTING MAXIMUM HOPPER DUMP ANGLE

1. Park the machine on a level surface, shut off the engine, and engage the parking brake.

▲ CAUTION

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

**SAFETY ARM
ENGAGED**



2. Adjust the lift arm stop bolts located on top of the wheel wells as low as possible while still allowing the side broom assembly to clear the lift arms when the hopper is in normal position. Be sure that both lift arms contact the stop bolts at the same time.

NOTE: This may involve raising and lowering the hopper several times.

3. After adjustment, with the hopper down, use the two adjustable stops located on the rotation plates on both sides of the hopper to establish 3-1/2" (8.89 cm) clearance between the rear hopper entrance lip and the floor.

NOTE: The stop on the driver's side is located immediately below the cylinder rod end and is threaded into the cylinder mount arm. The stop on the left side is located directly above the arm rotation plate.

ADJUSTING MAXIMUM HOPPER DUMP ANGLE (CONT.)

4. After the 3-1/2" (8.89 cm) clearance is established, make sure both stops make contact simultaneously. The lower front edge of the hopper should be 5" (12.7 cm) -6" (15.24 cm) from the floor. A balanced adjustment of both sets of adjustment bolts is required to correctly adjust the hopper in the lowered position. If the bumper is lower than the frame, after the hopper is correctly adjusted, loosen the bumper attachment bolts and reposition the front bumper.
5. Next, raise the hopper and rotate fully.
6. Turn the engine off.

▲ CAUTION

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

7. Adjust the stops on the hopper mounts on each side of hopper so that clearance between the lift arms and the cut outs in bumper is 1/4" (6.35 mm) maximum.
8. Loosen the locking set screw in the bottom side of the rotation cylinder rod end.
9. Using the hole in the cylinder rod, turn the rod to adjust cylinder extended length to match hopper rotation stops.
10. Tighten the set screw.
11. Rotate the hopper back, remove the safety arm, and lower the hopper.

HOPPER VACUUM GASKET MOUNT ADJUSTMENT

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

▲ CAUTION

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

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

HOPPER FLAP REPLACEMENT

Flaps located at the entrance lip of the hopper, and on the sides 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 hydraulic cylinders to keep hopper raised for maintenance. Always engage the safety arm before getting under 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.

HOPPER / FRAME SEAL REPLACEMENT

FRONT FRAME SEAL

The hopper frame seal bolts to the front edge of the engine pan. Install a new seal by folding it in 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 fall over 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 1/8" (3.18 mm).

If the bottom of a side seal measures 1/2" (1.27 cm) or more above the floor, readjust it or replace it by removing the bolts on the inside of the frame wheel wells, installing a new seal, and securing it with the bolts. The double edge with the holes goes toward the front.

PARKING BRAKE

Normal adjustment of the parking brake can be accomplished from the operator compartment. Locate the knurled handle on the parking brake lever. Turn the handle clockwise to increase brake tension. *Note: Two or three turns is usually adequate. DO NOT OVERTIGHTEN!!*

If this adjustment becomes ineffective, it will be necessary to adjust the cable length.

 **CAUTION**

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

ADJUSTING THE PARKING BRAKE CABLE LENGTH

1. Park the machine on a level surface and chock wheels.
2. Place parking brake lever in "OFF" position.
3. Turn knurled handle counter-clockwise as far as possible.
4. Raise hopper and engage safety arm.
5. Locate the cable clevis ends for the parking brake cables.
6. Disconnect clevis ends from bar.
7. Loosen jam nuts at the base of the clevis.
8. Turn clevis clockwise three or four complete turns.
9. Tighten jam nuts and re-install clevis ends onto bar.
10. Adjust knurled handle on parking brake lever.

TIRES

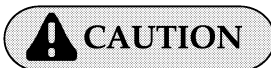
SERVICE INSTRUCTIONS

CHANGING SOLID TIRES

NOTE: The procedures which follow apply to solid tires only.

1. Remove tire from vehicle by removing the five inner lug nuts.
2. Remove the ten hex head bolts and nuts.
3. Press the tire from 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 tire on machine.

CHANGING PNEUMATIC TIRES



Since procedures for changing pneumatic tires must be performed in a safety cage and require special tools, we recommend you have these tires changed by a professional tire dealer. (They are to be inflated to 95 psi.)

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.

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BASIC MACHINE OPERATING PROBLEMS

PROBLEM	CAUSE	SOLUTION
<p>Engine will not start or runs roughly after start.</p> <p><i>NOTE: On machines with LPG Fuel, also check the following:</i></p>	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.
	Fuel line connection loose.	Tighten connection.
	Dirty air filter.	Clean or replace air filter. (See Maintenance Section.)
	Problems with spark plugs, ignition points, ignition coil, ignition switch, carburetor, regulator, wiring harness.	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 frosting up.	Open shut-off valve slowly to 1/4 open, start.	
Defective vacuum lock-off.	Replace or repair.	
<p>Engine overheats.</p>	Low coolant level.	Supply coolant.
	Clogged radiator.	Flush radiator.
	Loose fan belt.	Tighten belt.
	Defective thermostat.	Replace thermostat.
<p>NOTE: If coolant loss has not occurred, check for malfunction of the temperature sending unit.</p>		

BASIC MACHINE OPERATING PROBLEMS (CONT.)

PROBLEM	CAUSE	SOLUTION
<p>PowerBoss® moves slowly or does not move.</p>	<p>Parking brake is on.</p> <p>Directional control pedal jammed, damaged, or not adjusted properly.</p> <p>Tires skidding from contact with oil or grease.</p> <p>Wheels jammed.</p> <p>Low hydraulic fluid level.</p> <p>Hydraulic fluid temperature too high and too thin caused by excessive load, climbing, high environment temperatures, worn pump, or improper fluid.</p> <p>Damaged or worn pump drive coupling.</p> <p>Other problems with the hydraulics system: pump failure, motor failure, relief valve leaking or stuck open.</p>	<p>Release brake.</p> <p>Clear jam or adjust linkage.</p> <p>Clean tires or drive through a solvent absorbing substance.</p> <p>Clear jam.</p> <p>Add hydraulic fluid. Use the proper weight oil for the operation conditions; check pump.</p> <p>Replace damaged item.</p> <p>See Hydraulics System Problems in this section.</p>
<p>PowerBoss® creeps in neutral.</p>	<p>Directional control pedal return spring is out of adjustment.</p>	<p>Perform the adjustment procedure.</p>

SWEEPING PROBLEMS

PROBLEM	CAUSE	SOLUTION
Brushes do not turn or turn very slowly.	Hydraulic system problem: <ul style="list-style-type: none"> - 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 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 seals 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 at hopper.	Visually check and adjust, if necessary.
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.

SWEEPING PROBLEMS (CONT.)

PROBLEM	CAUSE	SOLUTION
Sweeper unit leaving debris. (Cont. from previous page)	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: - control valve - gear pump - lift cylinder - relief valve	See Hydraulics Systems Problems in this section.
	Hopper arms binding.	Lubricate or adjust arm linkage.
Hopper does not rotate or rotates too slowly.	Hopper load too heavy.	Dump more frequently.
	Hydraulics system problem: - control valve - gear pump - lift cylinder - relief valve	See Hydraulics System Problems in this section.

HYDRAULICS SYSTEM PROBLEMS

PROBLEM	CAUSE	SOLUTION
Hopper lift cylinder failure.	Line to cylinder leaking.	Tighten fittings or replace hose.
	Piston seals leaking.	Replace seals.
	Bent piston rod.	Replace rod.
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.
	Oil strainer clogged.	Replace strainer (inside reservoir).
	Incorrect oil.	Use recommended viscosity oil.

HYDRAULICS SYSTEM PROBLEMS (CONT.)

PROBLEM	CAUSE	SOLUTION
Hydraulic gear pump failure. (Cont. from previous page.)	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 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.
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.