

Minuteman[®]

PowerBoss[®]

LitterBoss[™]

OPERATION, MAINTENANCE
& TROUBLESHOOTING MANUAL
PARTS MANUAL



Minuteman PowerBoss, Inc.

175 Anderson Street

Aberdeen, North Carolina 28315 USA

(910) 944-2167 / FAX (910) 944-7409

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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.

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LitterBoss[™]

(LIMITED) PRODUCT WARRANTY

Minuteman PowerBoss, Inc. (hereafter known as PowerBoss[®]) warrants that the LitterBoss[™] 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. Additional warranty for parts only is extended to the Impeller and Impeller Housing for a period of 60 months. 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. The PowerBoss[®] machine or any of its parts returned by customer to PowerBoss[®] 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 US. On the other hand, should a part be found not defective, inspection and handling charges may be charged to the customer 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.

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.

This warranty does not apply to routine wearable parts of the PowerBoss[®] machine such as brushes, flaps, filters, seals, point, 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 PowerBoss[®] are warranted for 30 days after installation.

The warranty for optional engines shall be limited to the warranty extended to PowerBoss[®] 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
- Cylinder Head
- Camshaft
- Intake Manifold
- Connecting Rods

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 PRECAUTIONS

The follow symbols are used throughout the manual as indicated in their description.



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 equipment or property

Basic PowerBoss[®] Safety:

1. Do not operate machine unless:
 - The operator is trained and authorized
 - Operation manual is read and understood
 - The equipment is free of malfunctions
2. Before starting the engine:
 - Make sure all safety devices are operating properly
 - Check brakes and steering for proper function
 - Engage parking brake
 - Make sure directional control pedal is in neutral
 - Place throttle in idle position
 - Make sure operator is securely seated in the operator's seat
 - Make sure sweeping & vacuum controls are in the **OFF** position
3. When operating the machine:
 - Keep hands and body clear of moving parts
 - Go slowly on slippery surfaces and inclines
 - Use caution when driving in reverse
 - Always follow safety and traffic rules

4. When leaving machine unattended:
 - Always park on level surface
 - Set parking brake
 - Turn off engine and remove key
5. When servicing the LitterBoss™:
 - Always stop the engine and set parking brake before servicing
 - Avoid moving parts - Do NOT wear loose clothing when servicing the machine
 - Disconnect battery connections before servicing the machine
 - Jack the machine at proper jack points only. Use jack stands to secure raised machine
 - Wear ear and eye protection when using pressurized air or water
 - Use replacement parts from PowerBoss[®] or equivalent
 - Replace any defective safety component before operating machine



Machine emits toxic gases. Serious injury or death can result. Provide adequate ventilation.



Moving fan blades. Keep away.

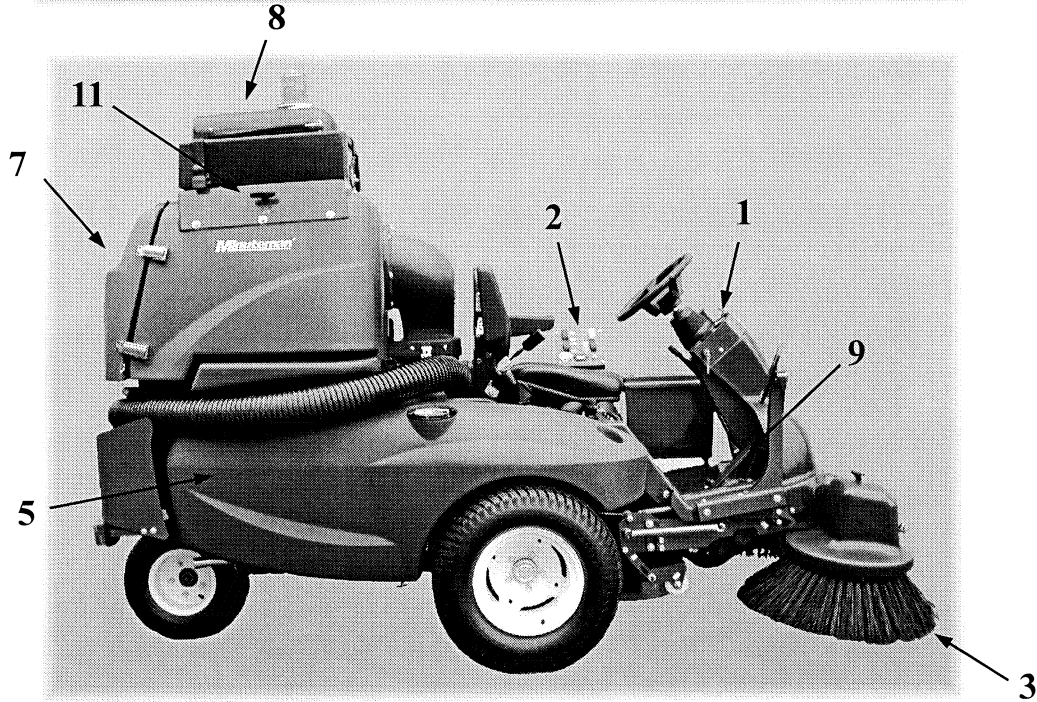
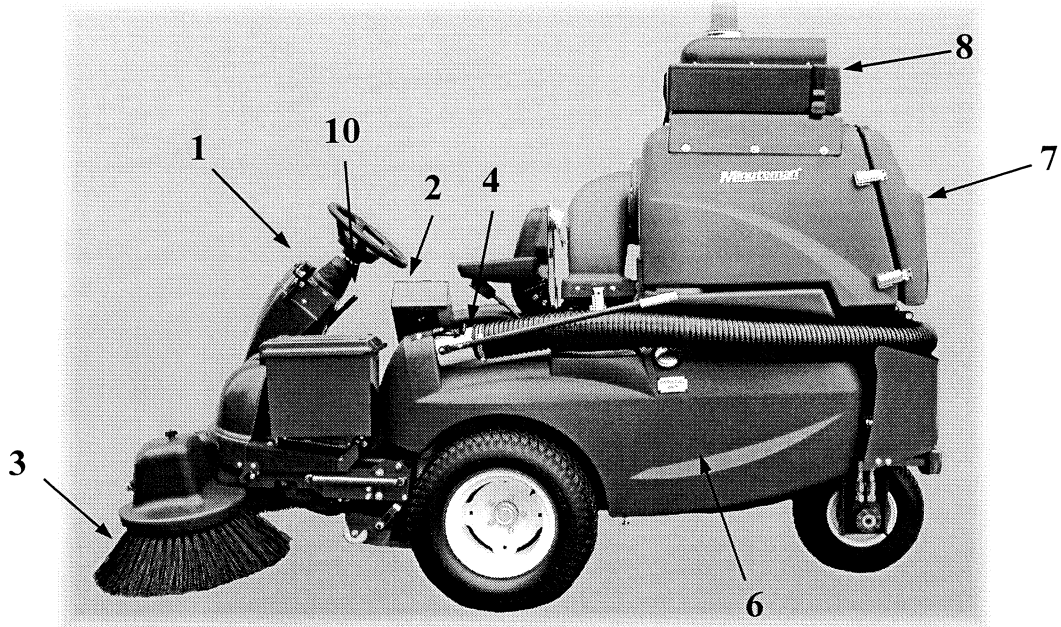


Sharp objects in debris hopper. Wear gloves and eye protection.

SAFETY LABELS

| Item | Location | Description |
|------|------------------------|--|
| 1 | Back of Seat | WARNING: Seat mounting must be checked at regular intervals. Tighten if necessary. If cracks or rust occurs replace this seat immediately. |
| 2 | Engine - Intake | CAUTION: Do not use ether or starting fluid. Severe engine damage will occur. |
| 3 | Engine - Fan Shroud | CAUTION: A solution of 50% antifreeze and 50% water must be used in this engine. (Freezing point about -34°F) Do not use 100% antifreeze or severe damage will occur. |
| 4 | Engine - Radiator Cap | CAUTION: Danger, never open when hot. |
| 5 | Engine - Fan Belt | WARNING: Keep away from fan belt drive. |
| 6 | Engine - Fan Shroud | CAUTION: Keep hands away from fan. |
| 7 | Fuel Tank | Diesel Fuel Only |
| 8 | Water Tank | WARNING: No gasoline combustible or flammable material in this tank. |
| 9 | Impeller (behind seat) | WARNING: Keep hands away from vacuum fan inlet when engine is running. |

MACHINE COMPONENTS



- 1. Instrument Panel
- 2. Control Panel
- 3. Side Brushes
- 4. Vacuum Wand
- 5. Water Tank
- 6. Fuel Tank

- 7. Hopper
- 8. Dust Filter
- 9. Forward / Reverse Pedal
- 10. Parking Brake
- 11. Filter Shaker Handle

MACHINE SPECIFICATIONS

General Machine Dimensions / Capacities

| Item | Dimension / Capacity | | |
|---------------------------------|----------------------|-----------------|---------|
| Length | (frame only) | 241.3 cm | 95 in. |
| | (frame with brushes) | 264.2 cm | 104 in. |
| Height | 1,702 mm | 67 in. | |
| Width | 1,080 mm | 42.5 in. | |
| Track | 1,143 mm | 45 in. | |
| Wheel base | 1,168 mm | 46 in. | |
| Side brush diameter | 660 mm | 26 in. | |
| Sweeping path width | 1,727 mm | 68 in. | |
| Hopper weight capacity | 91 kg | 200 lb. (advp) | |
| Hopper volume capacity | 114 L | 30 gal. (US) | |
| Water reservoir volume capacity | 87 L | 23 gal. (US) | |
| Dust filter surface area | 4.6 sq. m. | 50 sq. ft. | |
| GVWR | 771 kg | 1700 lb. (advp) | |

General Machine Performance

| Item | Measure | |
|-------------------------|----------|---------|
| Maximum forward speed | 11 km/h | 7 mph |
| Maximum reverse speed | 6.4 km/h | 4 mph |
| Minimum turning radius | 139.7 cm | 55 in. |
| Minimum isle turn width | 279.4 cm | 110 in. |

MACHINE SPECIFICATIONS
Power Type

| Engine | Type | Ignition | Cycle | Aspiration | Cylinders | Bore | Stroke |
|---|--------|--|-------|------------|--|-------|--------|
| D722 | Piston | Diesel | 4 | Natural | 3 | 67 mm | 68 mm |
| Displacement | | Net Power, Governed | | | Net Power, Maximum | | |
| 719 cc (443.88 cid) | | 2300 rpm | | | 15.6 kw @ 3600 rpm (20.9 hp) | | |
| Fuel | | Cooling System | | | Electrical System | | |
| Diesel Fuel Tank: 26.5 L (7 gal) (US) | | Water/ethylene glycol antifreeze Total: 4.8 L (1.25 gal.) (US) Radiator: 2.8 L (.75 gal.) (US) | | | 12 V nominal 40 A alternator | | |
| Idle Speed, No Load | | Full Governed Speed, Under Load | | | Engine Lubricating Oil With Filter | | |
| 900±100 rpm | | 2300±100 rpm | | | 3.22 L (3.4 qt) Exxon [®] XD-3™ 15W-40 | | |

Steering

| Type | Power Source | Emergency Steering |
|---|----------------|--------------------|
| Rear Wheel, Hydraulically Controlled | Power Steering | Manual |

Hydraulic System

| System | Capacity | Fluid Type |
|------------------------|---------------------|---------------------------------|
| Hydraulic Reservoir | 22.7 L (6 gal) (US) | Exxon [®] XD-3™ 15W-40 |
| Total Hydraulic System | 26.5 L (7 gal) (US) | |


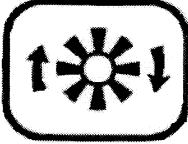

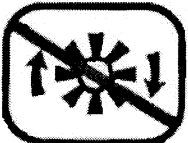





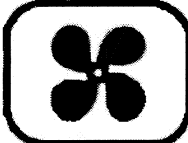




MACHINE SPECIFICATIONS**Braking System**

| Type | Operation |
|----------------|--|
| Service brakes | Mechanical drum brake (2), One per front wheel, Cable actuated |
| Parking Brake | Utilizes service brakes, cable actuated |

Tires

| Location | Type | Size |
|-----------|-----------|-----------------------------|
| Front (2) | Pneumatic | 241 x 584 mm (9.5 x 23 in.) |
| Rear (1) | Pneumatic | 203 x 457 mm (8 x 18 in.) |

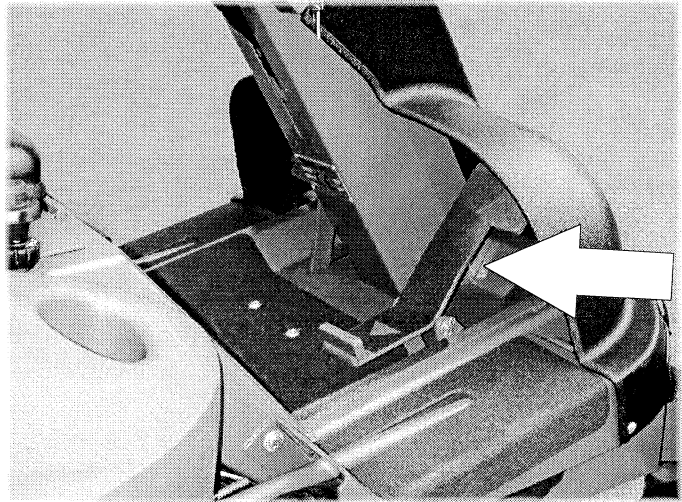
SYMBOL DEFINITIONS

| | | | |
|---|---|--|-----------------|
|  | Charge Lamp |  | Brushes ON |
|  | Parking Lamp |  | Brushes OFF |
|  | Lights (Headlights) ON |  | Water Valve ON |
|  | Lights (Headlights) OFF |  | Water Valve OFF |
|  | Throttle Position RUN |  | Impeller ON |
|  | Throttle Position GLOW PLUG WARMING |  | Impeller OFF |
|  | Throttle Position GLOW PLUG WARMING |  | Filter Shaker |

CONTROLS AND INSTRUMENTS

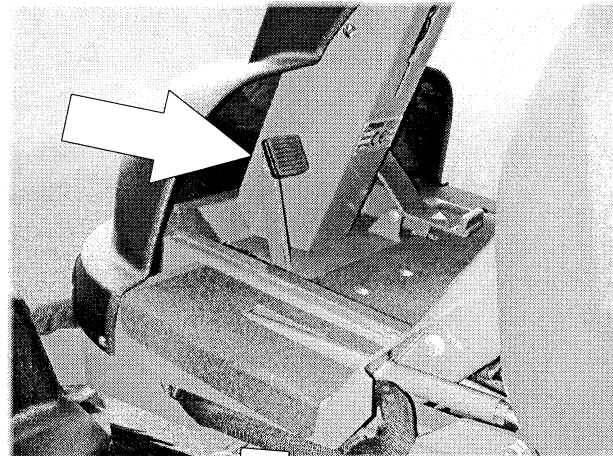
Forward / Reverse Pedal

The *forward / reverse pedal* controls the direction of the machine and the variable speed of the machine. By pushing the pedal forward from the center neutral position, the machine will travel forward. By pushing down on the heel portion, the machine will travel in reverse. The farther the pedal is moved in a direction, the faster the machine will travel in that direction. By allowing the foot pedal to return to its neutral position, the machine will come to a gradual stop. When the machine is moving and a quicker stop is desired, press the footpedal in the OPPOSITE direction of travel. For example: When traveling forward, push on the heel of the pedal to bring the machine to a quick stop.



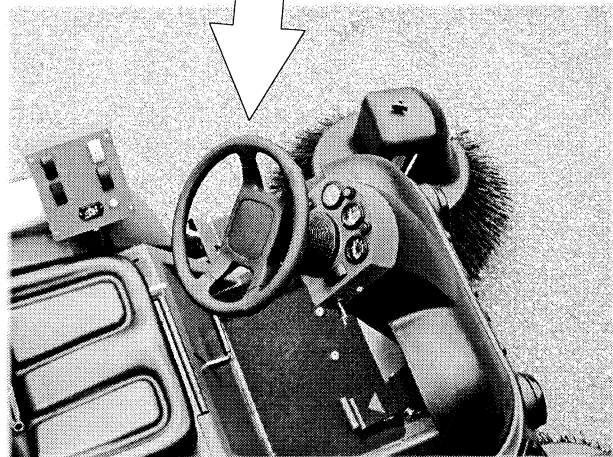
Brake Pedal

Pressing the *brake pedal* activates the brakes on the two forward wheels.



Steering Wheel

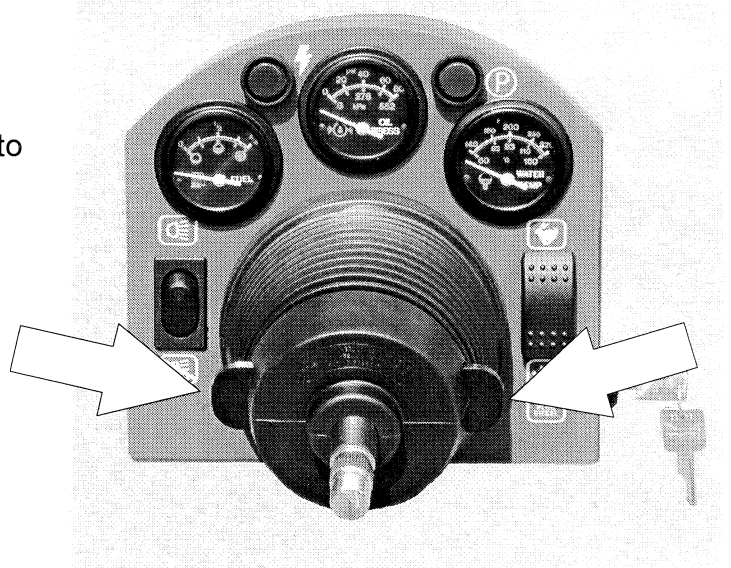
To turn the machine to the left, turn the *steering wheel* to the left. To turn the machine right, turn the wheel to the right. Remember that the machine steers from the rear and the rear end of the machine moves in a larger circle than the front.



CONTROLS AND INSTRUMENTS (Continued)**Tilt Steering Wheel:**

Grasp the steering wheel with both hands and pull the two tabs indicated toward the steering wheel. Rotate the steering wheel to the desired angle and release the tabs.

NOTE: Do not adjust the angle of the steering wheel while the machine is in motion.

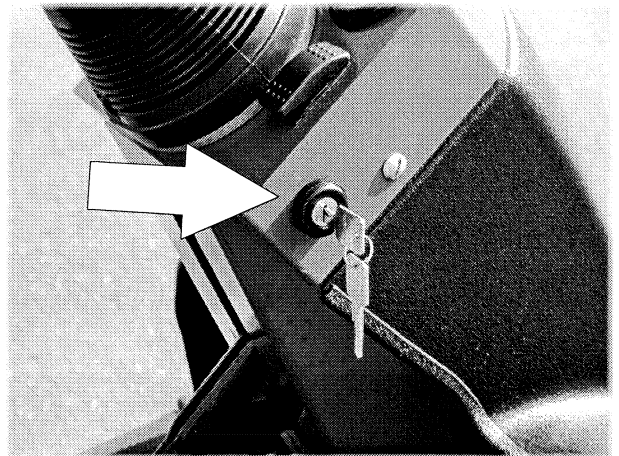
**Ignition Switch**

The *ignition switch* is used to start the engine, using a key. **FOR SAFETY:** When starting the machine, engage the parking brake and keep the foot pedal in neutral.

Preheat Glow Plugs: Turn the ignition switch counterclockwise to the “ON” position and hold down the rear of the throttle switch to activate the *glow plugs*. Hold the switch down for approximately 10 seconds.

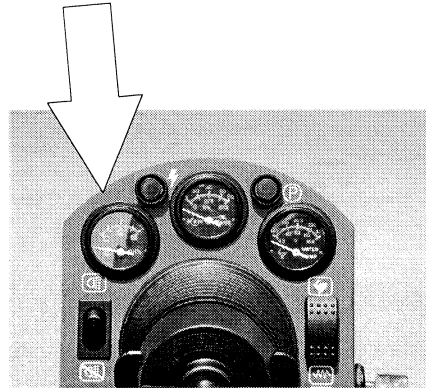
Starting the Engine: Release the throttle switch and turn the key clockwise to the “START” position. Release the key when the engine starts.

Stopping the Engine: Turn the key counterclockwise to turn the engine “OFF”.

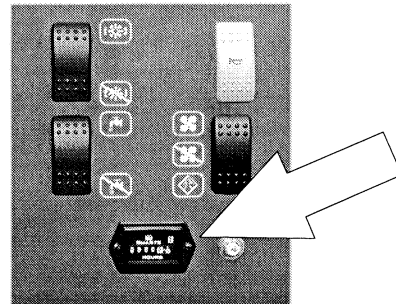


CONTROLS AND INSTRUMENTS (Continued)**Fuel Level Gauge:**

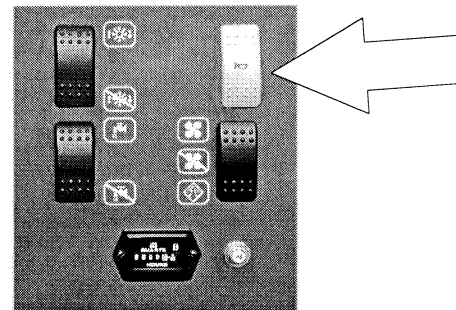
The *fuel level gauge* indicates the amount of fuel in the tank. NOTE: Do not run the fuel tank completely empty. Additional service may be required to restore the fuel system to proper running order.

**Hour Meter:**

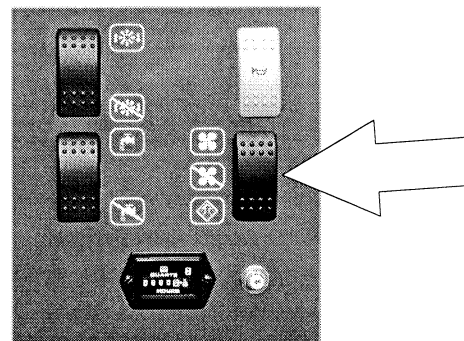
The *Hour Meter* records the total number of hours the machine has been operated. This information is used for scheduled maintenance.

**Horn Button:**

Pressing the *Horn Button* causes the horn to sound.

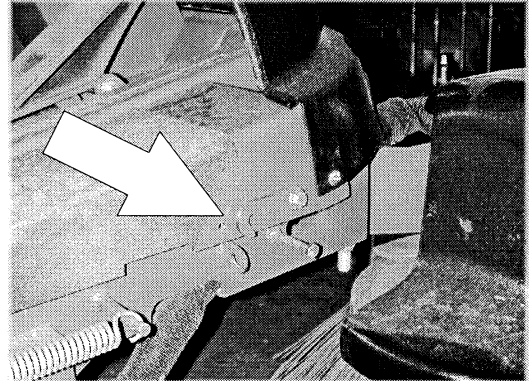
**Fan Switch / Vacuum Head:**

The *Fan Switch* has 3 positions and controls the impeller fan and dust filter shaker. In the center position, both functions are **OFF**. Push the top of the switch to engage the clutch for the vacuum fan. At the same time, the vacuum head and brooms will be lowered to the floor for cleaning. (OPTIONAL) Push and hold the bottom of the switch to activate the shaker motor. Shake the filters approximately 30 seconds. (STANDARD) Stroke filter flaps 6 to 12 times to clean filter - see item 11, page 23.

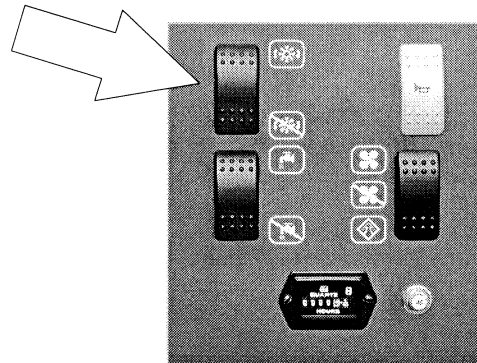


CONTROLS AND INSTRUMENTS (Continued)**Broom Arm Hooks:**

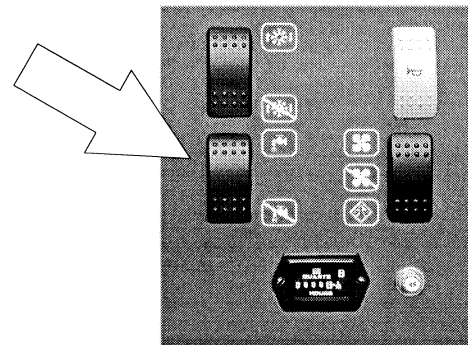
In some applications it is more desirable to use the vacuum head without the sweeping brushes. To do this, engage the two hooks on either side of the frame above the broom arms. Turn on the fan switch to lower the vacuum head. The head will lower while the brooms stay up. It is not necessary to turn the brooms or water pump on in this condition.

**Broom:**

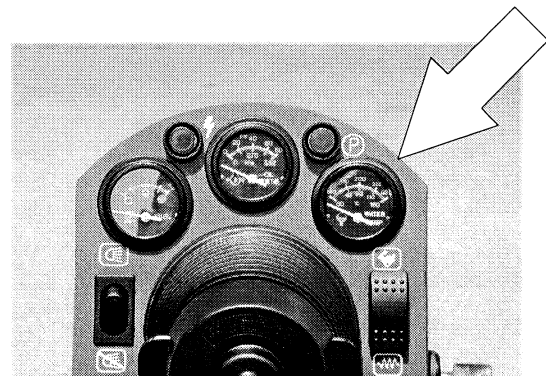
The *Broom* switch turns the brushes "ON". To turn on: Push the broom switch to the "ON" position. To stop: Push the broom switch to the "OFF" position.

**Water Pump Switch:**

The *Water Pump Switch* turns the dust control spray nozzle "ON" providing a water mist at the brooms for dust control. NOTE: See "Dust Control" in the maintenance section. To turn the pump on: Push the pump switch to the "ON" position. To turn the pump off: Push the pump switch to the "OFF" position. Do not run the pump if the tank is empty.

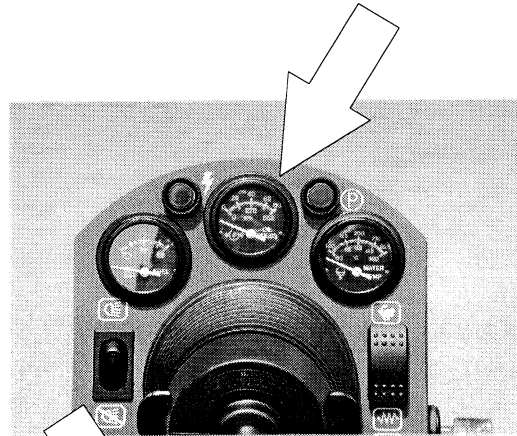
**Water Temperature Gauge:**

The *Water Temperature Gauge* monitors the coolant of the engine. Stop the machine if the gauge reads higher than 220°F (104°C). See "Cooling System" section in the Maintenance Section.

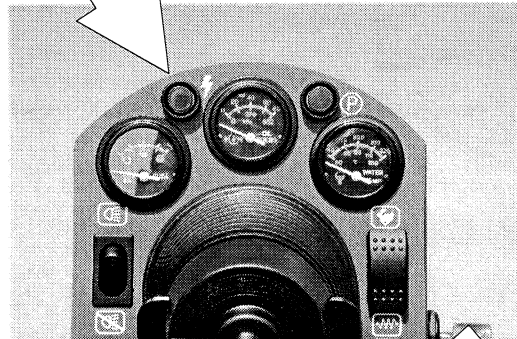


CONTROLS AND INSTRUMENTS (Continued)**Engine Oil Pressure:**

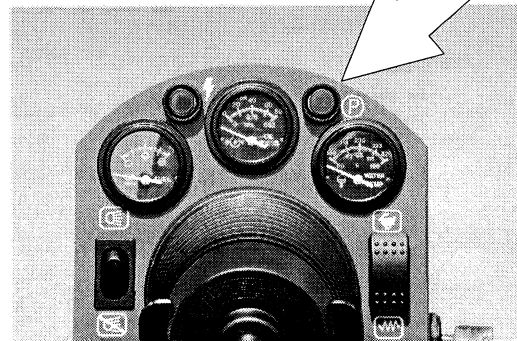
The *Engine Oil Pressure* gauge monitors the engine oil pressure. Stop the machine if the gauge reads lower than 5 psi (34.47 kilopascal). Determine the problem and correct before continuing use of the machine.

**Charge Light:**

The *Charge Light* is located on the forward instrument panel. If the light comes on while the engine is running, this indicates the electrical charging system is not working properly. Stop the machine, determine the problem and correct before continuing use of the machine.

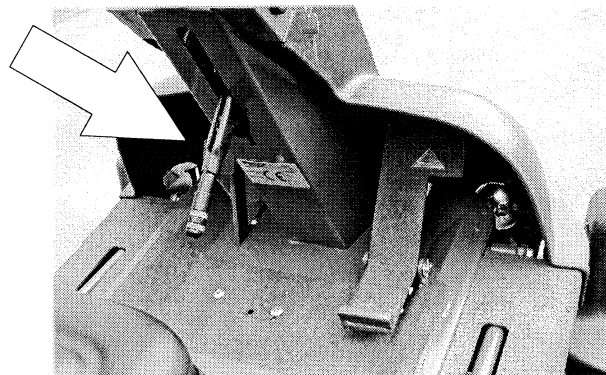
**Parking Brake Light:**

The *Parking Brake Light* is located on the forward instrument panel. This light illuminates when the parking brake is engaged or when the brake pedal is depressed.

**Parking Brake:**

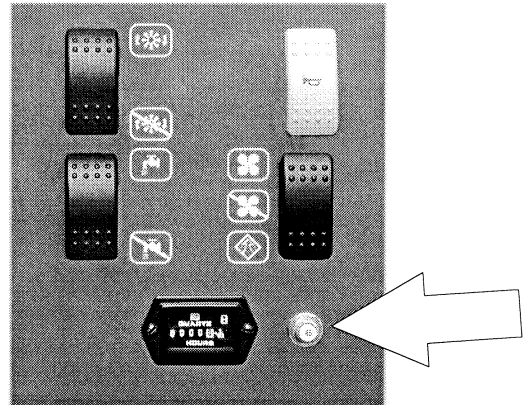
The *Parking Brake* lever engages the brakes on the two front wheels. Adjust the brakes by turning the end of the handle. To **SET** the brakes: Lift **UP** on the brake handle. To **RELEASE** the brakes: **LOWER** the handle.

FOR SAFETY: After using the machine or before servicing, stop the machine on a level surface, set the parking brake, turn **OFF** the machine and remove the key.

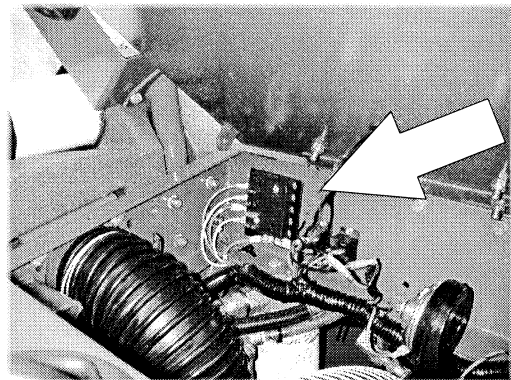


CONTROLS AND INSTRUMENTS (Continued)**Circuit Breaker:**

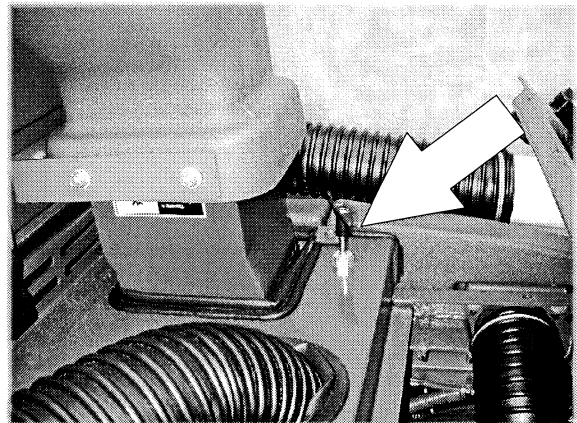
The *Circuit Breaker* interrupts all electrical functions if a circuit is overloaded. The circuit breaker is located on the control panel. Push to reset.

**Fuses:**

Fuses are used to protect most of the circuits on the machine. They are “one-time” use devices that protect the circuit from current overload. Never use fuses of **HIGHER** value than specified. The fuse panel is located under the seat.

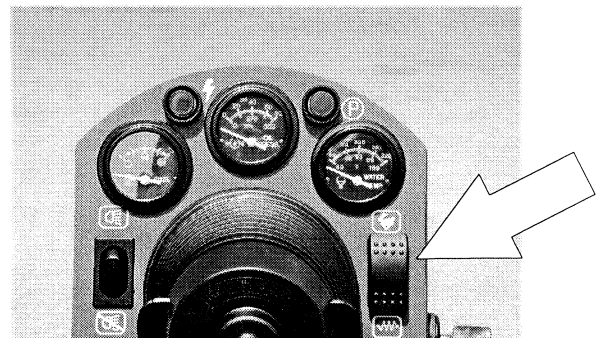
**Vacuum Fan Damper Cable:**

The *Vacuum Fan Damper Cable* moves the damper directing vacuum power to either the vacuum head or the vacuum wand. To activate the vacuum wand: Pull the cable “OUT”. To activate the Vacuum Head: Push the cable “IN”.

**Throttle Switch:**

The *Throttle Switch* is located on the forward instrument panel. It controls the engine speed. This switch has 3 positions. The rear position is for preheating the glow plugs (see “Starting Engine”). The center position is the “Start / Idle” position for the engine. The forward position is the “High / Run” speed for the engine.

IDLE SPEED: Center Position
RUN SPEED: Forward Position



CONTROLS AND INSTRUMENTS (Continued)

Hopper:

The *Hopper* is located behind the operator and above the engine. The hopper is emptied through the rear door of the hopper (see "Hopper Emptying" in the Operation Section).

WARNING: Sharp objects may be in the debris hopper. Wear gloves.

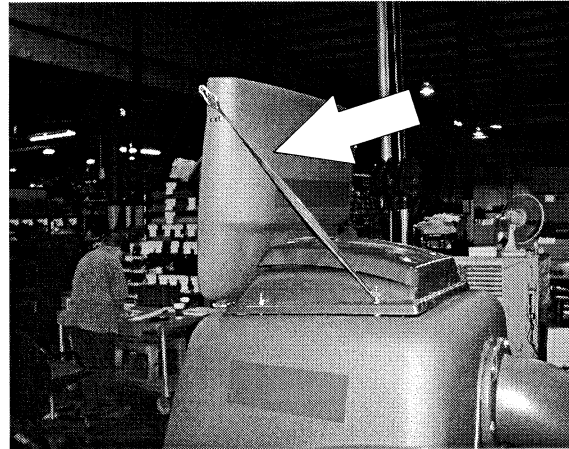
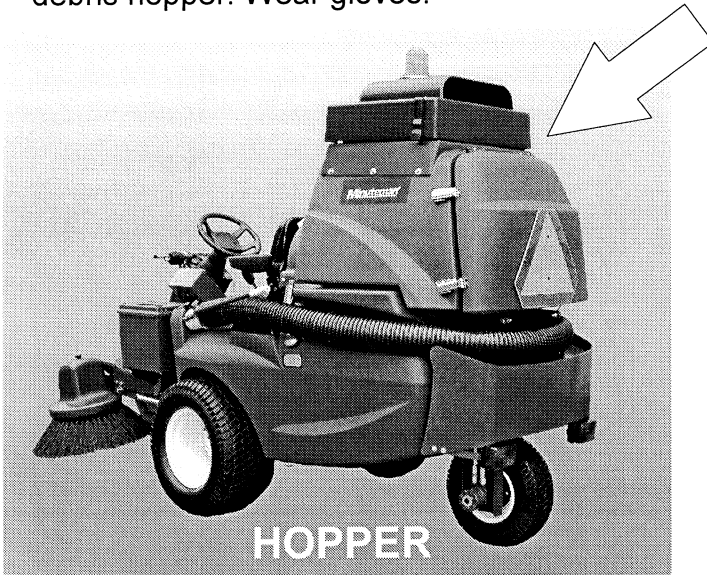


Photo 1

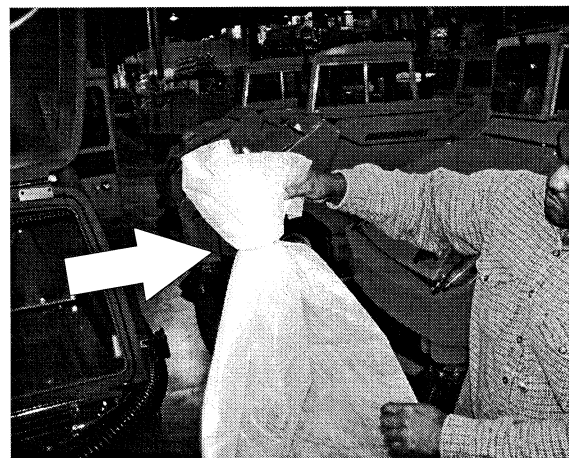


Photo 2

Installing Debris Bag:

1. Open rear door of hopper and retain with rubber lanyard. **(Photo 1)**
2. Cinch open end of bag together and place rubber band around bag about 8" down. **(Photo 2)**
3. Slide opening of bag over air chute inside of hopper. Slide bag all the way forward and secure bag to chute using rubber band. **(Photo 3)**



Photo 3

CONTROLS AND INSTRUMENTS (Continued)**Installing Debris Bag (Continued):**

4. Check that rubber band is seated in groove of chute completely.
5. Check that bag will not be caught in rear door opening. **(Photo 4)** Close and secure door. Store lanyard

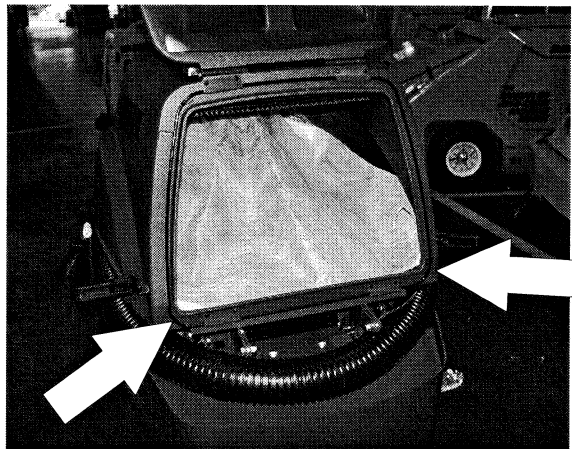


Photo 4

Installing Poly Bag:

1. Open rear door of hopper and retain with rubber lanyard. **(Photo 1)**
2. Remove wire bail from retaining clips. **(Photo 5)**
3. Insert bail into opening of poly bag: 3 - 4 inches deep into bag. **(Photo 6)**

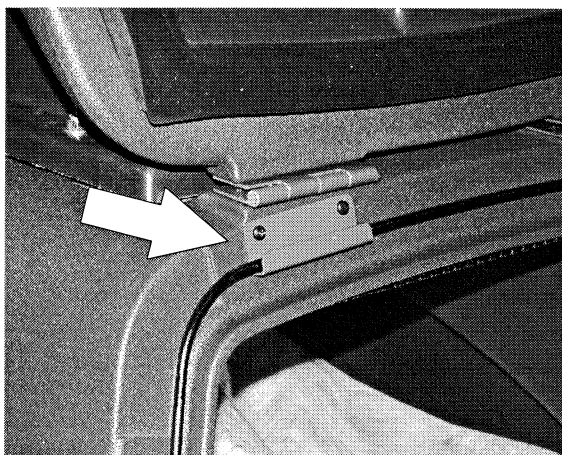


Photo 5



Photo 6

CONTROLS AND INSTRUMENTS (Continued)

Installing Poly Bag (Continued):

4. Reattach bail with bag attached to retaining clips on rear of hopper. **(Photo 7)**
5. Push loose bag into hopper and close rear door. **(Photo 8)**
6. Secure rear door and store lanyard. **(Photo 9)**



Photo 7

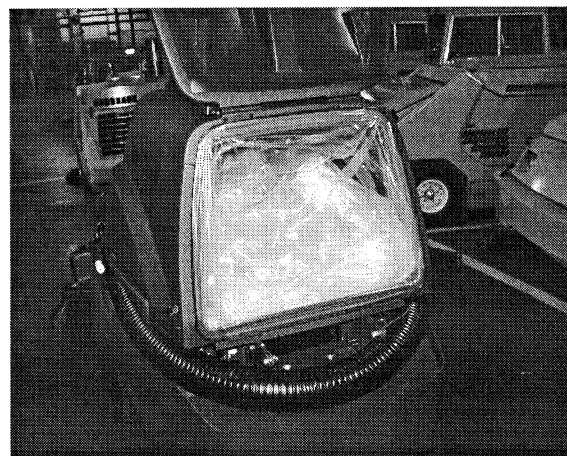


Photo 8

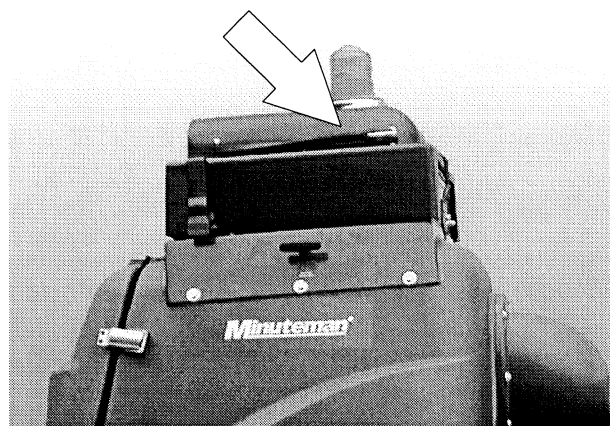


Photo 9

CONTROLS AND INSTRUMENTS (Continued)**Emptying Hopper:**

The hopper may be emptied in 3 different ways:

1. Pulling the debris bag from the hopper.
This method is most desirable if the bag is so full of light bulky debris that its size may interfere with tilt dumping, or if a large quantity of dirt and sand have been swept making the hopper extremely heavy to tilt.
2. Tilt dumping the debris bag to the ground.
This is the most commonly used method. However, the light dust that has passed through the bag will be on the floor of the hopper and will be dumped to the ground with this method.
3. Tilt dumping the debris bag into a poly bag.
If capturing all the light dust is important or if leaking of liquid from the debris bag is a concern this method should be used.

Tilt Dumping Hopper:

1. Open hopper door and retain with rubber lanyard.
2. Check that rear corners of debris bag will clear door opening. Adjust if necessary by pulling corners toward center of hopper. **WARNING:** Bag may contain sharp objects. Use gloves.
3. Release hold down latches at front of hopper and tilt hopper up using lift handle. Bag should slide out hopper opening to ground. Rubber band should still be attached to bag.
4. With hopper still raised, shake dust filter.
5. Lower hopper.

Tilt Dumping Hopper with Poly Bag:

If poly bag is not already installed, install one. See "installing poly bag".

1. Open hopper door and retain with rubber lanyard.
2. Release hold down latches at front of hopper.
3. Tilt hopper up using lift handle. Debris bag will slide into poly bag.
4. Shake filter.
5. Remove poly bag bail from retaining clips on hopper.
6. Lower Hopper.
7. Remove bail from poly bag and reattach bail to hopper.

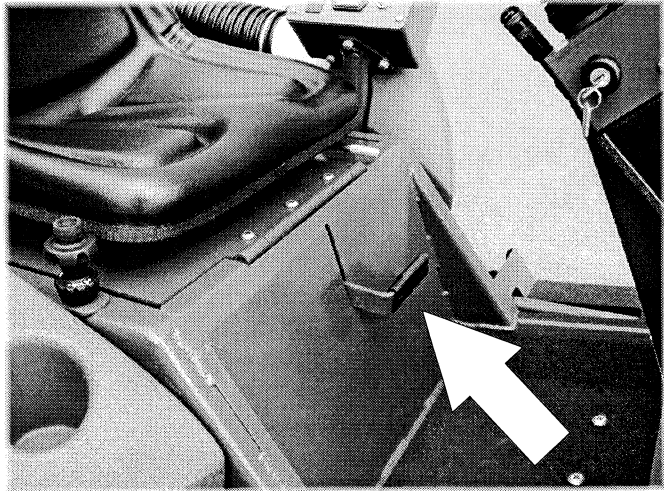
Pulling Debris Bag from Hopper:

1. Open hopper door and retain with rubber lanyard.
2. Grasp rear corners of bag and pull them straight toward opening until bag falls to ground. **WARNING:** Bag may contain sharp objects. Use gloves.
3. Bag should be cinched with rubber band upon exit from hopper.
4. Shake filter and tilt hopper to remove fine dust.

CONTROLS AND INSTRUMENTS (Continued)

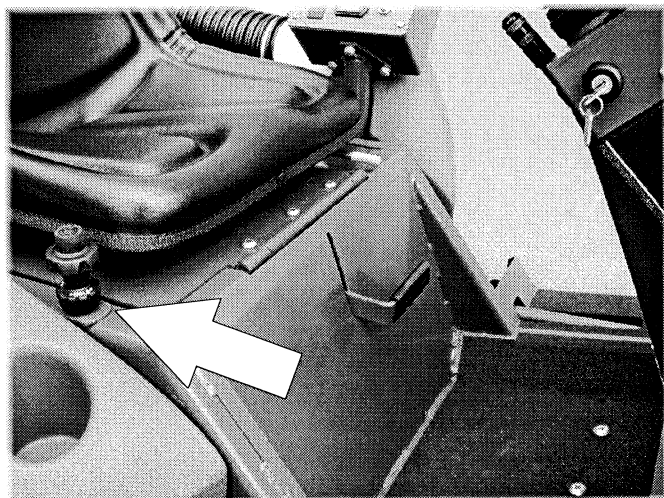
Vacuum Head Lift:

During sweeping operation, some bulky debris cannot enter the vacuum head because of size. To pick up large bulky litter, the vacuum head may be momentarily raised and then lowered onto the debris by using the *Vacuum Head Lift* handle. The handle is located on the back wall of the operator's compartment.



Vacuum Head Flap:

The Vacuum Head is equipped with a flap that can be lowered to improve the pickup of sand, dust and other fine materials. To lower the flap, locate the knob at the right side of the operator's seat. Press the center button while lifting up on the knob. To raise the flap, push the button and lower the knob. **NOTE:** For vacuuming litter, the flap should be in the raised position.



PRE-OPERATION CHECKLIST

- Check under the machine for leaks (fuel, oil, water, coolant).
- Check the engine air filter dust cap.
(Do not remove the air filter element.)
- Check the engine oil level.
- Check the fuel level gauge.
- Check the coolant in the overflow tank.
- Check the brakes for proper operation.
- Check the steering for proper operation.
- Check the hopper. Empty if required.
WARNING: Sharp objects may be in the debris hopper.
Wear gloves and eye protection.
- Check the water tank.
- Check the vacuum hoses and vacuum head skirts for wear.
- Check filter cleaning flap adjustment.

OPERATING PROCEDURES

Starting the Machine

1. Set the Parking Brake.
2. Check that the Forward / Reverse Pedal is in the Neutral Position.
3. Check that the Fan / Vacuum Head Switch is in the "OFF" position.
4. Turn the Key Switch clockwise to the "RUN" position.
5. Hold down the rear of the Throttle Switch for approximately 10 seconds to activate the Glow Plugs.
6. Release the Throttle Switch. It will now be in the "Center-Run" position. Turn the key Switch clockwise to the "START" position until the engine starts.

NOTE: Do NOT operate the starter motor for more than 10 seconds at a time. Allow the starter to cool between starting attempts to prevent damage to the starter motor. Never operate the starter motor after the engine is running.

7. Allow the engine to warm up for several minutes.
WARNING: Engine emits toxic gasses. Severe respiratory damage or asphyxiation can result. Provide adequate ventilation. Consult with your regulatory authorities for exposure limits. Keep the engine properly tuned.
8. Push the throttle switch forward to the "FAST" position.
9. Release the parking brake.
10. Drive the machine to the area to be cleaned.

Operation on Inclines

Drive the machine slowly on inclines. Use the brake pedal to control the machine speed when riding and descending inclines.

The maximum rated incline when using the machine is 8°. FOR SAFETY: When using the machine, go slowly on inclines and slippery surfaces.

Keep all movements on any slope or incline slow and gradual. Do not make sudden changes in speed or direction.

Operate the machine **UP** and **DOWN** an incline. Do not operate the machine across an incline.

Do not turn on an incline unless necessary, and then turn gradually **DOWN** the incline.

OPERATING PROCEDURES

Pre-Cleaning

Pick up large oversized debris by hand before cleaning with the machine. Do not use the machine to pick up pieces of wire, string, twine or banding material that may become entangled in the brushes or impeller fan.

Plan the cleaning route in advance. Try to sweep in long runs with minimum starting and stopping. Avoid bumping into posts or obstacles with brushes or side of the machine. When operating the machine, turn the steering wheel with smooth, even motion. Avoid sudden turns, except in emergencies. Use the dust control system as required to control dust created by the side brushes. The dust control system sends a spray of water out of the nozzles positioned above each of the side brushes.

A full tank of water will provide 180 minutes of dust control spray.

Do not use the dust control when cleaning wet surfaces.

Filling the Water Tank

1. Drive the machine to the water supply hose. Stop the machine and set the parking brake.
2. Remove the fill cap located on the right side of the machine. Fill the water tank.

NOTE: The dust control spray will stop when the water tank is empty. If this happens, switch the pump off, return to the water supply and refill the tank.

PLANNED MAINTENANCE CHART INTRODUCTION

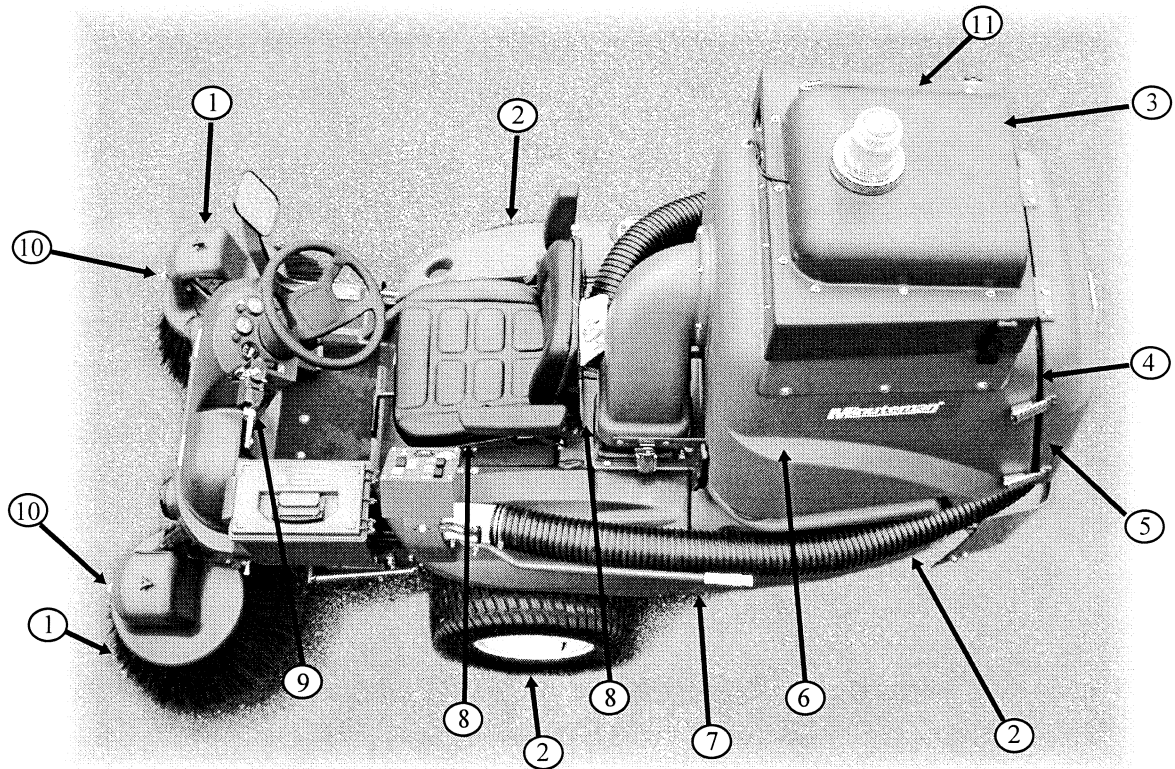
Regular maintenance on your LitterBoss™ results in better performance and a prolonged service life for the equipment and components. This section contains the following information to help you give your sweeper the maintenance attention it requires:

- 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) | | | | | KEY | DESCRIPTION | PROCEDURE | No. of Service Points |
|----------------------|-----|-----|-----|-----|------|------------------------------|--|-----------------------|
| Daily | 100 | 200 | 400 | 500 | | | | |
| X | | | | | 1 | Side brushes | Check for damage, wear and adjustment Check brush pattern | 2 2 |
| X | | | | | 3/11 | Hopper dust filters / Handle | Clean and check for damage | 1 |
| X | | | | | 8 | Vacuum fan damper | Check for debris and clean | 1 |
| X | | | | | 6 | Engine air filter | Check dust cap Replace element as necessary | 1 1 |
| X | | | | | 6 | Engine crankcase | Check oil level | 1 |
| X | | | | | 8 | Vacuum hoses | Check for damage, wear and blockage | 3 |
| X | | | | | 8 | Regeneration Hose | Check for damage, wear and blockage | 1 |
| X | | | | | 7 | Vacuum head and skirt | Check for damage and wear | 1 |
| X | | | | | 10 | Spray nozzles | Check for damage, wear and adjustment | 2 |
| X | | | | | 6 | Fuel water separator | Inspect - empty as required | 1 |

PLANNED MAINTENANCE CHART (Continued)

| FREQUENCY (IN HOURS) | | | | | KEY | DESCRIPTION | PROCEDURE | No. of Service Points |
|----------------------|-----|-----|-----|-----|-----|---------------------------|---|-----------------------|
| Daily | 100 | 200 | 400 | 500 | | | | |
| | X | | | | 8 | Chute Seal | Check for damage or wear | 4 |
| | X | | | | 4 | Hopper Seal | Check for damage or wear | 3 |
| | X | | | | 2 | Tires | Check for correct pressure, damage or wear | 3 |
| | X | | | | 5 | Hydraulic fluid reservoir | Check fluid level | 1 |
| | X | | | | 6 | Radiator | Clean core exterior | 1 |
| | | | | | | | Check coolant level | 1 |
| | X | | | | 6 | Engine | Replace air filter element | 1 |
| | X | | | | 6 | Engine crankcase | Change oil and filter element | 1 |
| | X | | | | 6 | Belts | Check belt tension | 3 |
| | X | | | | 6 | Fuel water separator | Replace element | 1 |
| | X | | | | 6 | Fuel lines | Check for damage and wear | - |
| | | X | | | 6 | Radiator hoses and clamps | Check for tightness and wear | 2 |
| | | X | | | 9 | Brake Pedal | Check travel adjustment | 1 |
| | | | X | | 6 | Engine | Change fuel filter | 1 |
| | | | | X | 5 | Hydraulic fluid reservoir | Change hydraulic fluid | 1 |
| | | | | | | | Replace suction strainer | 1 |
| | | | | | | | Replace hydraulic breather cap | 1 |
| | | | | X | 7 | Hydraulic fluid filter | Change filter element | 1 |
| | | | | X | 7 | Hydraulic hoses | Check for wear and damage | All |
| | | | | X | - | Water lines and clamps | Check for damage, tension and wear | - |
| | | | | X | 6 | Cooling system | Flush and change engine coolant | 1 |
| | | | | X | 2 | Wheel nuts | ☑ Torque wheel nuts | 4 |
| | | | | X | 8 | Battery | ☑ Clean and tighten battery cable connections | 1 |

NOTE: Also check procedures indicated (☑) after the first 50 hours of operation.

NOTE: More frequent intervals may be required in extreme conditions.

ENGINE

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

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

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.

Never bypass safety components before operating the unit.

Replace any defective safety component before operating the unit.

During the 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.

NOTE: *Diesel engines do not require periodic tune-ups. However, oil change, filter replacement and other maintenance is needed (refer to Planned Maintenance Chart for more information).*

CHANGING THE FUEL FILTER

REMOVE THE LEFT FENDER

1. Raise the seat and disconnect the 4" diameter Regeneration Hose above the left tire.
2. Remove two (2) fender bolts, one on each side of the Regeneration Hose.
2. Raise the hopper.
3. Remove the fuel cap.
4. Remove the three (3) bolts that attach the fender to the frame.
5. Remove the left fender.

REMOVE THE FUEL FILTER

1. Temporarily clamp or pinch the hoses to prevent fuel leakage. Disconnect the hoses.
2. Remove the old fuel filter noting the flow direction arrow on top of the filter.
3. Replace the fuel filter matching the flow direction arrow on top of the new filter to the old filter.
4. Reconnect the hoses.

AFTER SERVICING THE FUEL FILTER

NOTE: THE FUEL SYSTEM IS SELF PRIMING.

1. Turn the ignition key to the "ON" position for 30 seconds before attempting to start the engine.
2. Check for leaks.
3. Replace the left fender in the opposite sequence noted above.

DRAINING THE WATER TRAP

1. Locate the Water Separator on the left side of the machine beside the fuel tank.
2. Turn the valve to the CLOSED position.
3. Unscrew the water trap bowl collar counterclockwise.
4. Empty the bowl.
5. Screw the bowl collar clockwise into the head. Turn the valve to "OPEN" before starting the engine.
6. Switch the engine key to "RUN" for 15 seconds to allow the fuel pump to refill the bowl.

CLEAN/CHANGE THE AIR FILTER

NOTE: Do not operate the unit without an air filter element in place

DAILY CLEANING

1. Unclip the cap clasps.
2. Remove the dust cap and empty.
3. Replace the dust cap.

CYCLIC CLEANING

1. Remove the filter element.
2. Use compressed air to blow out all dirt and dust from the filter.
3. Wipe out the air cleaner housing with a damp cloth. Make sure all dirt is removed.
4. Replace the filter with the fins inserted into the housing first. Do not damage the fins. NOTE: If the old filter is being reused, inspect the rear gasket before replacing.
5. Replace the dust cap.
6. Check the condition of the intake hoses and clamps.

CHECK IMPELLER FAN BELT

1. Check tension. See engine manual for the correct tension.
2. Inspect the belt for cracks, glazing or fraying. Replace as required.

ADJUST VALVES (See engine manual)**CHECK ENGINE FAN BELT**

1. Check tension. Proper tension is .40in (10mm) deflection from a force of 22lb. (10Kg) applied at the mid-point of the longest span.
2. Inspect the belt for cracks, glazing or fraying. Replace as required.

PUMP DRIVE BELT

1. Check tension.
2. Inspect the belt for cracks, glazing or fraying. Replace as required.

ELECTRICAL SYSTEMS

SERVICE INSTRUCTIONS

Electrical System wiring and cables should be replaced immediately if found to be damaged, to prevent shorting, or electrical shock. Replace the battery when minimum requirements can no longer be maintained.

⚠ CAUTION *Never attempt to perform any service while the engine is running.*

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.
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.

COOLANT SYSTEMS

SERVICE INSTRUCTIONS

OPERATING TEMPERATURE

The normal operating temperature of the engine is 180° to 200°F (82° to 93°C). Abnormally high operating temperatures and overflow loss are symptoms of a clogged radiator, or the cooling fins clogged with dirt and debris. To clear the system, flush with a cleaning compound, reverse flow and flush the system.

COOLANT LEVEL

The correct coolant level in the radiator is $\frac{3}{4}$ " (1.91 cm) below the top of the radiator (excluding the fill neck). Check the coolant level in the overflow tank while the engine is hot. Use only a 50 / 50 mix of water and antifreeze.

LUBRICATION

Use SD or SE 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. Remove the drain plug and allow the oil to drain into the pan.
2. Replace the drain plug.
3. Remove the used oil filter and replace with a new one.
4. Moisten the rubber O-ring on the new filter with fresh oil.
5. Install the new oil filter.
6. Dispose of the used oil and oil filter in an approved manner.
7. Remove the engine oil cap, add 4 quarts of oil, then secure the cap.
8. Check the dipstick for proper level. Do not overfill.

HYDRAULIC SYSTEM

SERVICE INSTRUCTIONS

FILLING THE FLUID RESERVOIR

NOTE: *The reservoir is located at the rear of the machine.*

1. When the engine is cool, remove the fill cap / dipstick. Fluid level should be to the mark on the dipstick.

NOTE: DO NOT OVERFILL! DO NOT USE TRANSMISSION FLUID INSTEAD OF HYRAULIC FLUID. *Minuteman PowerBoss, Inc. recommends Exxon[®] XD-3™ 15W-40*

HYDRAULIC FLUID VISCOSITY SPECIFICATIONS

SUS @ 100°F (47°C) 510-560
SUS @ 210°F (98.9°C) 78-84

CHANGING THE HYDRAULIC FLUID

1. Turn off the engine and engage the parking brake.
2. Place a drain pan on the floor under the fluid reservoir drain.
3. Remove the drain plug.
4. Drain fluid into the pan.
5. Discard the fluid in an approved manner.
6. Re-wrap the drain plug threads with Teflon[®] tape and re-install the drain plug.
7. Remove the breather cap from top of the reservoir.
8. Fill the reservoir with new fluid.

NOTE: Six (6) gallons (US) (5.68 liters) of fluid is required.

9. Install a new filter breather cartridge.
10. Check the main line for leaks at the pump.

CHANGING THE HYDRAULIC FLUID FILTER

1. Turn off the engine and engage the parking brake.
2. Remove the oil filter 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 over tighten.

6. Start the unit, shut it off, then check for leakage.

TANKS

CLEARING OBSTRUCTIONS FROM THE SUCTION TUBE

This part of the unit rarely needs maintenance. However, if the suction tube becomes clogged, use a running garden hose to clear the tube. Check the regeneration screen in the hopper tank for obstructions. Check the hopper filter screen for debris - clean as required. The left fender acts a regeneration air chamber. By lifting the hopper and removing the drain plug on the bottom, the fender body may be flushed out by running water into the 4" dip hole on top.

BRUSHES

ADJUSTING BRUSH ANGLE

The brushes can be adjusted for contact on the outside edge of the bristles. In most cases the maximum amount of angle will be desired. To adjust, remove the knob and protective cover of the brush assembly. Locate the securing nut on front of the assembly. Loosen the nut and tilt the assembly so that the outer edge of the bristles are lowest. Hold the brush in the tilted position while tightening the nut. Replace the cover and knob.

BRUSHES (Continued)

BRUSH ADJUSTMENT

Adjusting the brushes for wear is done by adjusting the linkage arm of each brush arm assembly. Loosen the locking nut, using a $\frac{3}{4}$ " wrench. Turn the linkage arm to shorten the arm. 1 turn = $1\frac{1}{4}$ " This will cause the brush to lower. Start the machine, lower the brushes to test. Readjust if necessary. Tighten the locking nut on the adjustment arm.

MISCELLANEOUS

LATCHES AND HINGES

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

PARKING BRAKE

The parking brake on the LitterBoss™ is adjusted by turning the end of the handle either clockwise or counter-clockwise while in the down position, depending on the desired results.

REGENERATION HOSE AND PICKUP HOSE

Inspect for damage or clogs periodically.

TROUBLESHOOTING - BASIC UNIT OPERATIONS

| PROBLEM | CAUSE | SOLUTION |
|---------------------------|--|--|
| Machine does not start | Glow plug not warmed properly | Turn key to warm glow plug |
| | Out of fuel | Check fuel level. Refuel if needed. |
| | Fuel filter plugged | Replace fuel filter |
| | Fuel pump damaged | Replace fuel pump |
| | Main fuse blown | Check fuse |
| Machine does not propel | Parking brake on | Release parking brake |
| | Towing valve open | Turn towing valve 90° |
| Poor cleaning performance | Vacuum head or hose clogged | Remove clog |
| | Vacuum damper in the wrong position | Turn damper lever to change vacuum damper position |
| | Side brush bristles worn | Replace side brushes or adjust |
| | Side brush drive failure | Contact Minuteman® PowerBoss® service personnel |
| | Vacuum head not lowered | Lower Vacuum head |
| | Vacuum head seals damaged | Replace worn vacuum seals |
| | Debris bag full | Empty debris bag |
| | Driving too fast for conditions | Decrease operating speed |
| | Engine throttle too low | Increase engine throttle |
| | Hopper seals worn or damaged | Replace hopper seals |
| | Vacuum fan failure | Contact Minuteman® PowerBoss® service personnel |
| | Regeneration opening in hopper blocked | Check exit opening in hopper |
| | Hopper dust filters clogged | Clean or replace dust filter |
| Vacuum fan failure | Safety switch on | Lower hopper |
| | Fan clutch fuse blown | Replace fuse |
| Excessive dusting | Vacuum hoses damaged | Replace damaged vacuum hose |
| | Hopper dust filters clogged | Clean or replace dust filters |
| | Wet dust control spray nozzles clogged | Clean nozzles |

TROUBLESHOOTING - BASIC UNIT OPERATIONS (Continued)

| PROBLEM | CAUSE | SOLUTION |
|----------------------------------|---|---|
| Excessive dusting (Continued) | Wet dust control system not on | Press water pump switch to activate the water pump |
| | Water tank empty | Fill water tank |
| | Water filter clogged | Clean filter in tank |
| | Water pump failure | Contact Minuteman [®] PowerBoss [®] service personnel |
| | Dust control spray nozzles not properly aligned | Realign dust control spray nozzles |
| | Pump fuse blown | Replace fuse |

Your Page

Thank you for your purchase of the new industry standard for sweepers. 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. Please fill out the form below and comment on how you found our manuals.

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