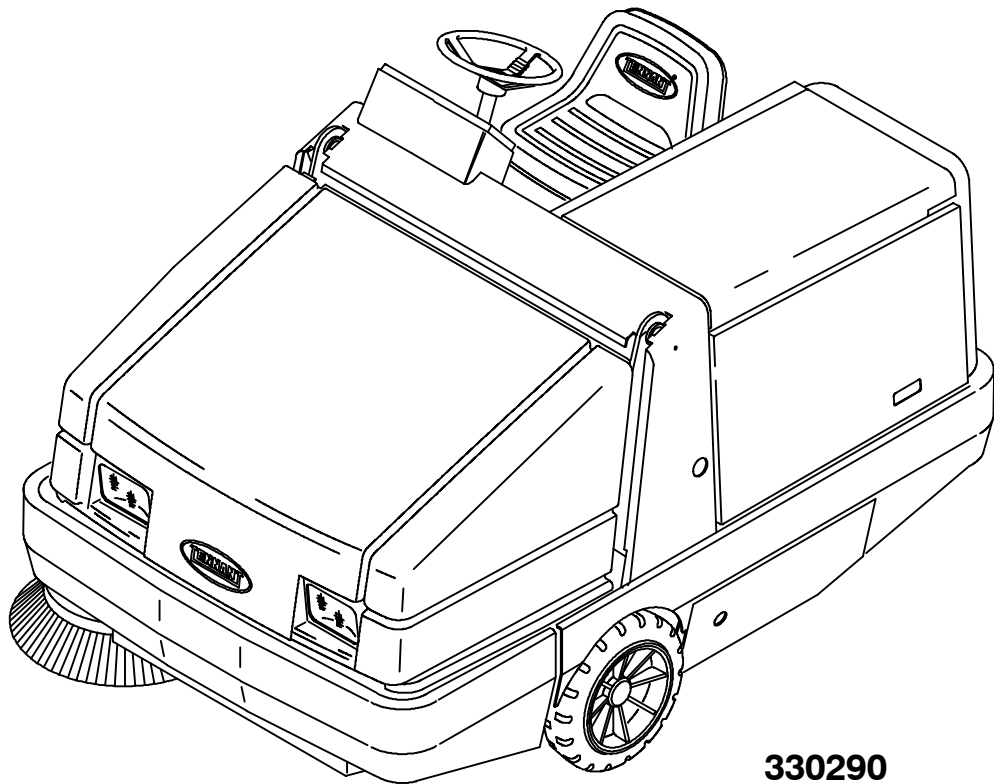




# 6500D

Operator Manual



330290

Rev. 06





This manual is furnished with each new TENNANT Model 6500D. It provides necessary operating and preventive maintenance instructions. Read this manual completely and understand the machine before operating or servicing it.

This machine will provide excellent service. However, the best results will be obtained at minimum costs if:

- The machine is operated with reasonable care.
- The machine is maintained regularly - per the maintenance instructions provided.
- The machine is maintained with TENNANT supplied or approved parts.

Manual Number - 330290

Revision: 06

Published: 9-02



**CALIFORNIA PROPOSITION 65 WARNING:**

**Engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.**

**CONTENTS**

	Page		Page
SAFETY PRECAUTIONS .....	3	CIRCUIT BREAKERS .....	36
OPERATION .....	6	FUSES .....	36
OPERATOR RESPONSIBILITY .....	6	CIRCUIT BREAKERS .....	37
MACHINE COMPONENTS .....	9	LATCHES .....	38
CONTROL PANEL SYMBOLS .....	10	HOPPER SUPPORT BAR .....	38
CONTROLS AND INSTRUMENTS .....	12	OPERATOR SEAT .....	39
OPERATION OF CONTROLS .....	14	HEATER KNOB (OPTION) .....	39
DIRECTIONAL PEDAL .....	14	AIR CONDITIONING SWITCH	
BRAKE PEDAL .....	15	(OPTION) .....	39
PARKING BRAKE LEVER .....	15	WINDSHIELD WIPER SWITCH	
HORN BUTTON .....	15	(OPTION) .....	40
MAIN BRUSH AND SIDE BRUSH		DOME LIGHT SWITCH (OPTION) ....	40
LEVER .....	16	HEATER SWITCH (OPTION) .....	40
HOPPER DOOR LEVER .....	17	PRESSURIZER SWITCH (OPTION) ..	40
HOPPER LIFT LEVER .....	18	HOW THE MACHINE WORKS .....	41
MAIN BRUSH POSITION LEVER ....	19	PRE-OPERATION CHECKLIST .....	41
MAIN BRUSH DOWN PRESSURE		STARTING THE MACHINE .....	43
KNOB .....	21	SWEEPING AND BRUSH INFORMATION	45
MAIN BRUSH ADJUSTMENT KNOB ..	22	SWEEPING .....	46
TURN SIGNAL SWITCH (OPTION) ...	23	STOP SWEEPING .....	48
HOPPER TEMPERATURE LIGHT -		EMPTYING THE HOPPER .....	50
THERMO SENTRY™ .....	24	STOP THE MACHINE .....	52
ENGINE WATER TEMPERATURE		POST-OPERATION CHECKLIST .....	53
LIGHT .....	24	ENGAGING HOPPER SUPPORT BAR ..	54
ENGINE OIL PRESSURE LIGHT .....	25	DISENGAGING HOPPER SUPPORT BAR	55
CHARGING SYSTEM LIGHT .....	25	OPERATION ON INCLINES .....	56
HOPPER DOOR LIGHT .....	26	OPTIONS .....	57
CLOGGED FILTER LIGHT .....	26	VACUUM WAND .....	57
CLOGGED FILTER LIGHT (OPTION) .	26	BLOWER WAND .....	63
GLOW PLUG LIGHT .....	27	HEATER VALVE .....	64
HOURMETER .....	27	MACHINE TROUBLESHOOTING .....	65
FUEL LEVEL GAUGE .....	27	MAINTENANCE .....	66
HAZARD LIGHT SWITCH (OPTION) ..	28	MAINTENANCE CHART .....	66
OPERATING LIGHTS SWITCH .....	28	LUBRICATION .....	68
OPERATING/HAZARD LIGHTS		ENGINE .....	68
SWITCH .....	28	REAR WHEEL SUPPORT .....	68
VACUUM FAN SWITCH .....	29	HOPPER BEARINGS .....	69
FILTER SHAKER SWITCH .....	29	FRONT WHEEL BEARINGS .....	69
VACUUM FAN/FILTER SHAKER		HYDRAULICS .....	70
SWITCH .....	29	HYDRAULIC FLUID RESERVOIR ....	70
ENGINE SPEED SWITCH .....	30	HYDRAULIC FLUID .....	70
STEERING WHEEL .....	32	HYDRAULIC HOSES .....	71
STEERING COLUMN TILT LEVER ...	32	PROPELLING MOTOR .....	71
IGNITION SWITCH .....	33	ENGINE .....	72
SIDE BRUSH POSITION LEVER .....	34	COOLING SYSTEM .....	72
SIDE BRUSH DOWN PRESSURE		AIR FILTER INDICATOR .....	73
KNOB .....	35	AIR FILTER .....	73
		FUEL FILTER .....	74
		FUEL PIPES .....	74
		PRIMING FUEL SYSTEM .....	74
		BATTERY .....	75

# CONTENTS

---

	Page
BELTS AND CHAINS .....	75
ENGINE FAN BELT .....	75
STATIC DRAG CHAIN .....	75
DEBRIS HOPPER .....	76
HOPPER DUST FILTER .....	76
TO REPLACE HOPPER DUST FILTER .....	77
THERMO SENTRY™ .....	79
BRUSHES .....	80
MAIN BRUSH .....	80
TO REPLACE MAIN BRUSH .....	81
TO CHECK AND ADJUST MAIN BRUSH PATTERN .....	83
SIDE BRUSH .....	87
TO REPLACE SIDE BRUSH .....	88
SIDE BRUSH GUARD .....	88
SKIRTS AND SEALS .....	89
HOPPER LIP SKIRTS .....	89
HOPPER SIDE SKIRT .....	89
BRUSH DOOR SKIRTS .....	89
REAR SKIRTS .....	90
SIDE BRUSH DUST CONTROL SKIRTS (OPTION) .....	90
BRUSH DOOR SEALS .....	90
HOPPER SEALS .....	91
HOPPER INSPECTION DOOR SEAL .....	91
HOPPER DOOR SEALS .....	91
HOPPER COVER SEAL (Metal Hoppers) .....	92
HOPPER DUST SEAL (Metal Hoppers) .....	92
HOPPER VACUUM FAN SEAL (Metal Hoppers) .....	92
HOPPER FILTER SEALS .....	92
BRAKES AND TIRES .....	93
SERVICE BRAKES .....	93
PARKING BRAKE .....	93
REAR WHEEL .....	93
PUSHING, TOWING, AND TRANSPORTING THE MACHINE .....	94
PUSHING OR TOWING THE MACHINE .....	94
TRANSPORTING THE MACHINE .....	94
MACHINE JACKING .....	97
STORING MACHINE .....	97
SPECIFICATIONS .....	98
GENERAL MACHINE DIMENSIONS/CAPACITIES .....	98
GENERAL MACHINE PERFORMANCE .....	98
POWER TYPE .....	99
STEERING .....	99
HYDRAULIC SYSTEM .....	99
BRAKING SYSTEM .....	99
TIRES .....	99
MACHINE DIMENSIONS .....	100
INDEX .....	100

## SAFETY PRECAUTIONS

The following precautions are used throughout this manual as indicated in their description:



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

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

The machine is suited to sweep disposable debris. Do not use the machine other than described in this Operator Manual. The machine is not designed for use on public roads.

The following information signals potentially dangerous conditions to the operator or equipment:



**WARNING: Engine emits toxic gases. Severe respiratory damage or asphyxiation can result. Provide adequate ventilation. Consult with your regulatory authorities for exposure limits. Keep engine properly tuned.**



**WARNING: Raised hopper may fall. Engage hopper support bar.**



**WARNING: Lift arm pinch point. Stay clear of hopper lift arms.**



**WARNING: Moving belt and fan. Keep away.**

**FOR SAFETY:**

1. **Do not operate machine:**
  - Unless trained and authorized.
  - Unless operator manual is read and understood.
  - If it is not in proper operating condition.
  - In flammable or explosive areas unless designed for use in those areas.
  - In areas with possible falling objects unless equipped with overhead guard.
2. **Before starting machine:**
  - Check for fuel, oil, and liquid leaks.
  - Keep sparks and open flame away from refueling area.
  - Make sure all safety devices are in place and operate properly.
  - Check brakes and steering for proper operation.
3. **When starting machine:**
  - Keep foot on brake and directional pedal in neutral.
4. **When using machine:**
  - Use brakes to stop machine.
  - Go slow on inclines and slippery surfaces.
  - Use care when reversing machine.
  - Move machine with care when hopper is raised.
  - Make sure adequate clearance is available before raising hopper.
  - Do not carry passengers on machine.
  - Always follow safety and traffic rules.
  - Report machine damage or faulty operation immediately.
5. **Before leaving or servicing machine:**
  - Stop on level surface.
  - Set parking brake.
  - Turn off machine and remove key.
6. **When servicing machine:**
  - Avoid moving parts. Do not wear loose jackets, shirts, or sleeves.
  - Block machine tires before jacking machine up.
  - Jack machine up at designated locations only. Block machine up with jack stands.
  - Use hoist or jack that will support the weight of the machine.
  - Wear eye and ear protection when using pressurized air or water.
  - Disconnect battery connections before working on machine.
  - Avoid contact with battery acid.
  - Avoid contact with hot engine coolant.
  - Allow engine to cool.
  - Keep flames and sparks away from fuel system service area. Keep area well ventilated.
  - Use cardboard to locate leaking hydraulic fluid under pressure.
  - Use TENNANT supplied or approved replacement parts.

## **SAFETY PRECAUTIONS**

---

- 7. When loading/unloading machine onto/off truck or trailer:**
  - **Turn off machine.**
  - **Use truck or trailer that will support the weight of the machine.**
  - **Use winch. Do not drive the machine onto/off the truck or trailer unless the load height is 380 mm (15 in) or less from the ground.**
  - **Set parking brake after machine is loaded.**
  - **Block machine tires.**
  - **Tie machine down to truck or trailer.**

The following safety labels are mounted on the machine in the locations indicated. If these or any label becomes damaged or illegible, install a new label in its place.

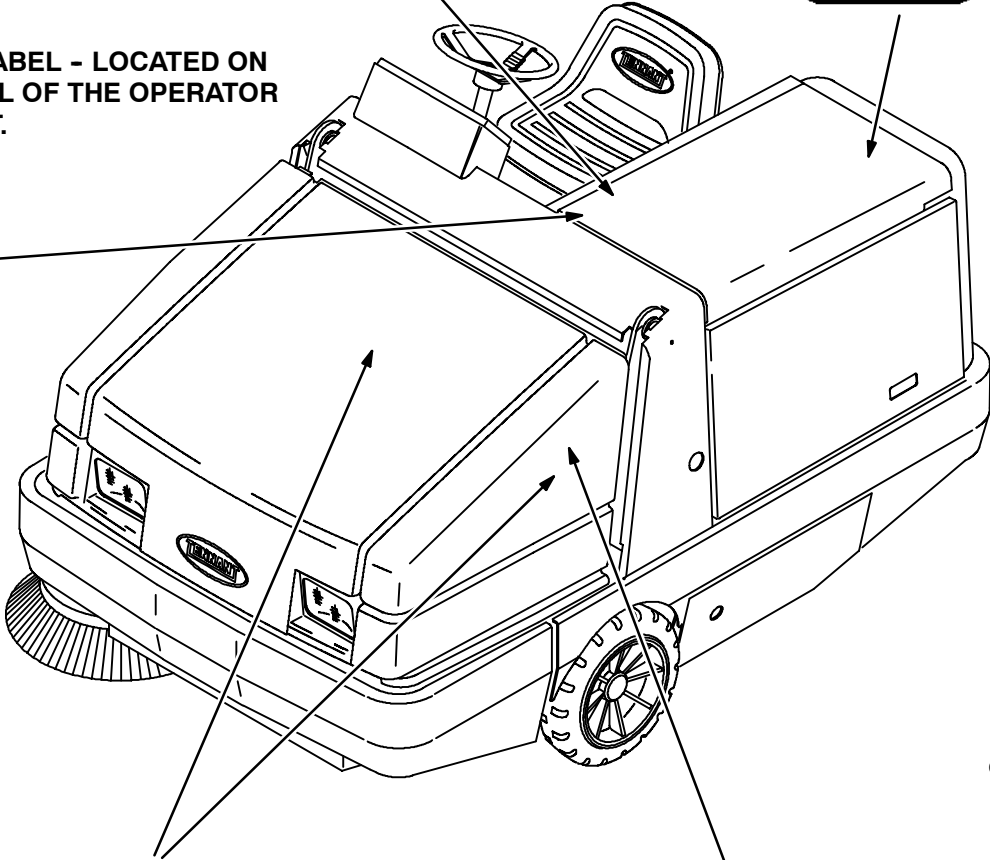
**EMISSIONS LABEL - LOCATED ON THE SIDE PANEL OF THE OPERATOR COMPARTMENT.**



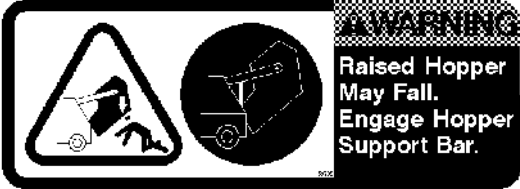
**ENGINE FAN AND BELT LABEL - LOCATED ON THE RADIATOR SHROUD.**



**FOR SAFETY LABEL - LOCATED ON THE SIDE PANEL OF THE OPERATOR COMPARTMENT.**



07748



**HOPPER SUPPORT BAR LABEL - LOCATED ON THE HOPPER SUPPORT BAR AND ON BOTH HOPPER LIFT ARMS.**

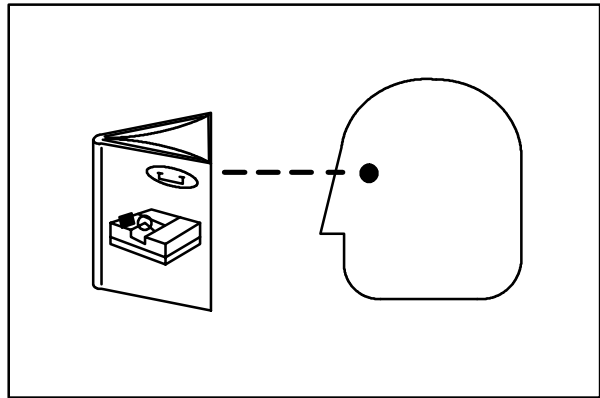


**HOPPER LIFT ARMS LABEL - LOCATED ON BOTH HOPPER LIFT ARMS.**

### OPERATOR RESPONSIBILITY

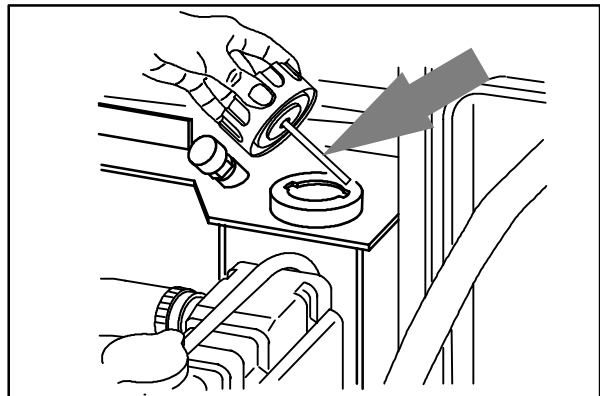
- The operator's responsibility is to take care of the daily maintenance and checkups of the machine to keep it in good working condition. The operator must inform the service mechanic or supervisor when the required maintenance intervals occur as stated in the *MAINTENANCE* section of this manual.
- Read this manual carefully before operating this machine.

**FOR SAFETY: Do not operate machine, unless operation manual is read and understood.**



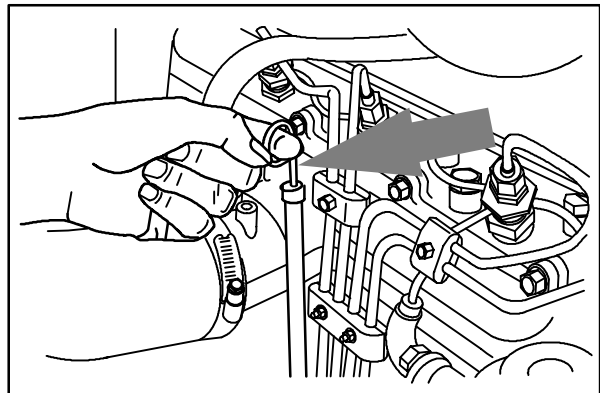
07324

- Check the machine for shipping damage. Check to make sure machine is complete per shipping instructions.
- Check the hydraulic fluid level in the hydraulic reservoir.



07750

- Check the engine oil level.

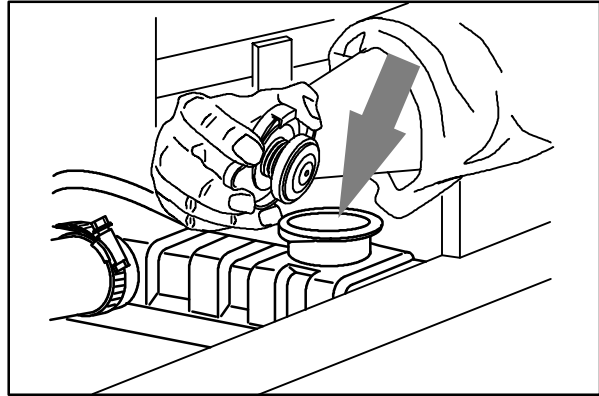


08431



- Check the radiator coolant level.

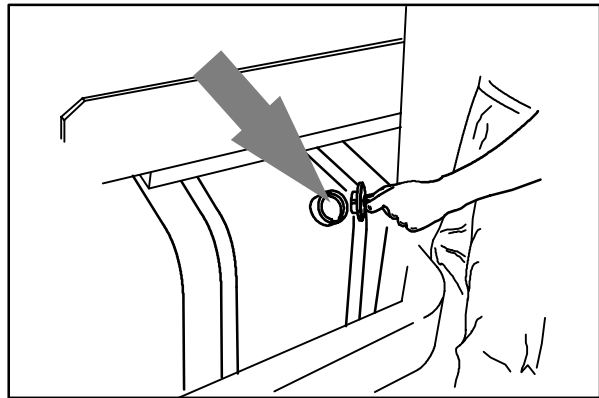
**FOR SAFETY:** When servicing machine, avoid contact with hot engine coolant.



07752

- Fill the fuel tank.

**FOR SAFETY:** When servicing machine, keep flames and sparks away from fuel system service area. Keep area well ventilated.



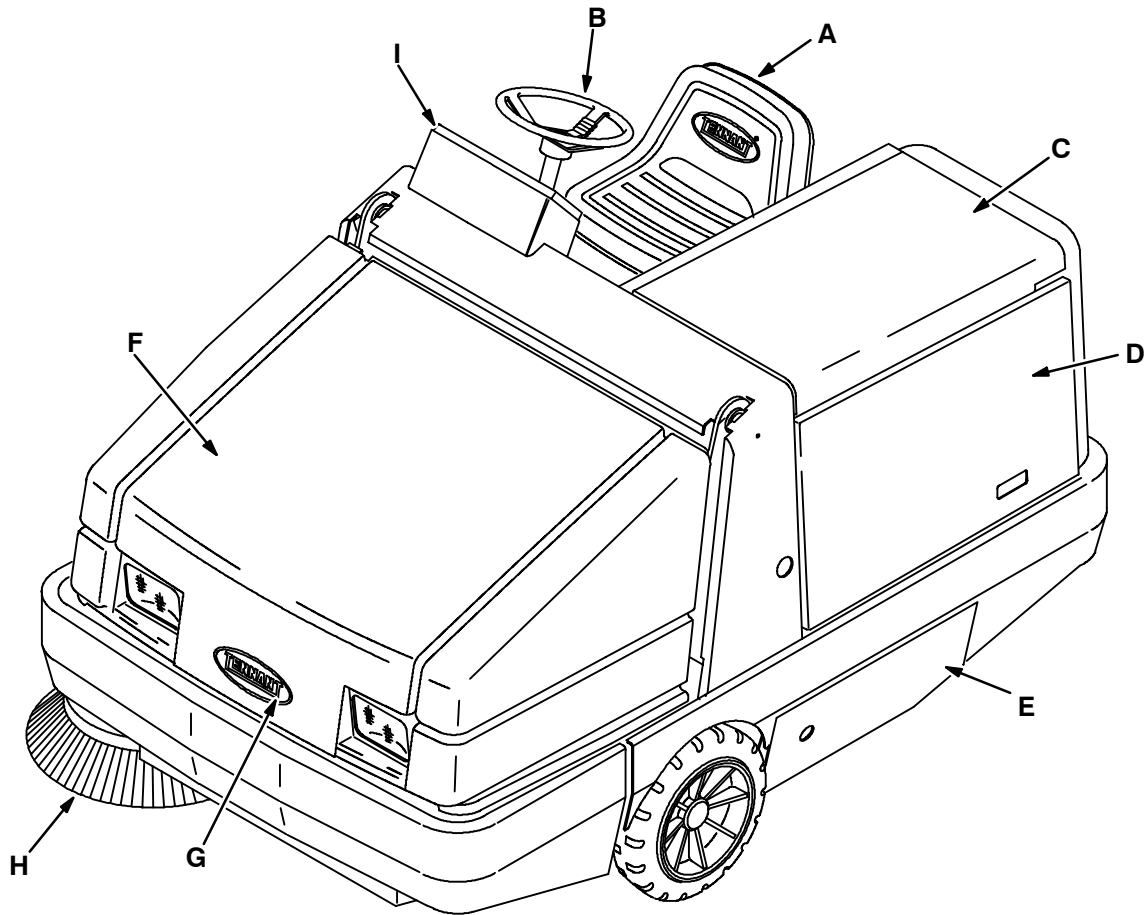
07753

## OPERATION

---

- LPG powered machines: Install the LPG fuel tank on the machine. See *CHANGING AN LPG FUEL TANK*.
- After the first 50 hours of operation, follow the recommended procedures stated in the *MAINTENANCE CHART*.
- Keep your machine regularly maintained by following the maintenance information in this manual. We recommend taking advantage of a regularly scheduled service contract from your TENNANT representative.
- Order parts and supplies directly from your authorized TENNANT representative. Use the parts manual provided when ordering parts.

## MACHINE COMPONENTS



- A. Operator Seat
- B. Steering Wheel
- C. Engine Cover
- D. Engine Side Door
- E. Main Brush Access Door
- F. Hopper Cover
- G. Hopper Access Cover
- H. Side Brush
- I. Instrument Panel

07748

# OPERATION

## CONTROL PANEL SYMBOLS

These symbols identify controls and displays on the machine:



Main and Side Brushes On



Main Brush On



Hopper Door Open



Hopper Door Close



Hopper Down



Hopper Up



Horn



Main Brush Down Pressure Light



Main Brush Down Pressure Heavy



Main Brush Float



Main Brush Down



Main Brush Up



Side Brush Down Pressure Light



Side Brush Down Pressure Heavy



Charging System



Engine Oil Pressure



Engine Water Temperature



Hopper Temperature - Thermo Sentry™



Hopper Temperature - Thermo Sentry™



Filter Clogged



Hopper Door Closed



Fuel



Hourmeter



Hazard Light



Filter Shaker



Operating Lights



Fan



Engine Speed



Side Brush Down



Side Brush Up



Circuit Breaker 1



Circuit Breaker 2



Circuit Breaker 3



Circuit Breaker 4



Circuit Breaker 5



Circuit Breaker 6



Circuit Breaker 7



Circuit Breaker 8



Circuit Breaker 9



Circuit Breaker 10



Windshield Wiper Slow



Windshield Wiper Fast



Dome Light



Heater



Cab Pressurizer Slow



Cab Pressurizer Fast



Engine speed (fast)



Engine speed (slow)

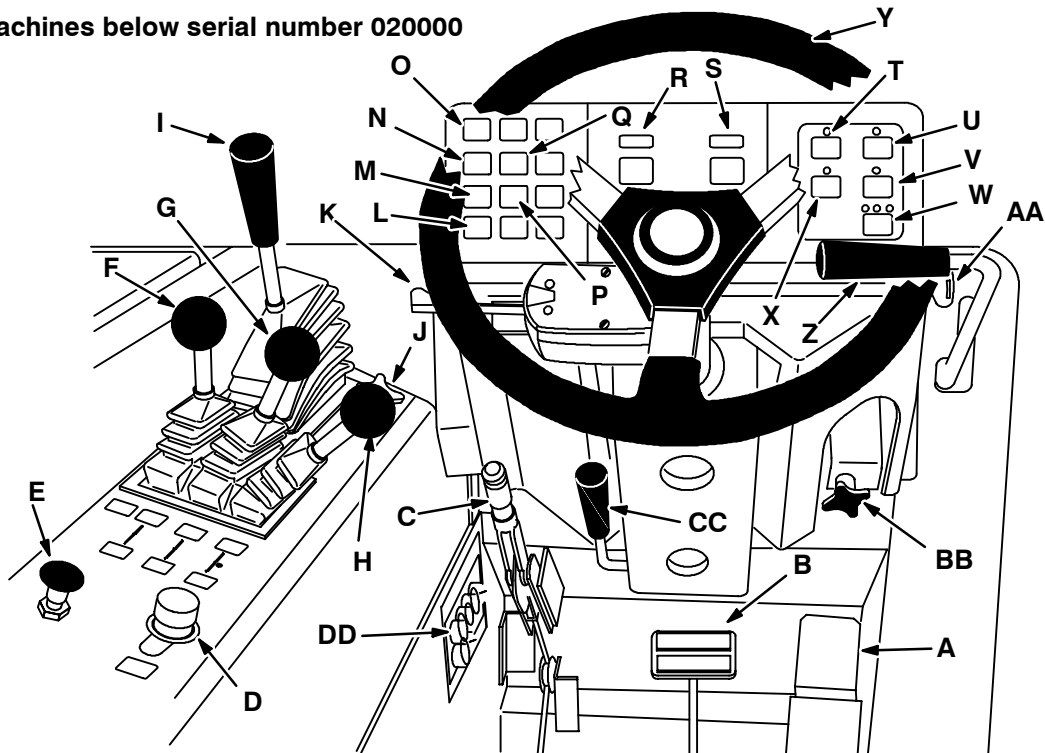


Diesel Preheat

# OPERATION

## CONTROLS AND INSTRUMENTS

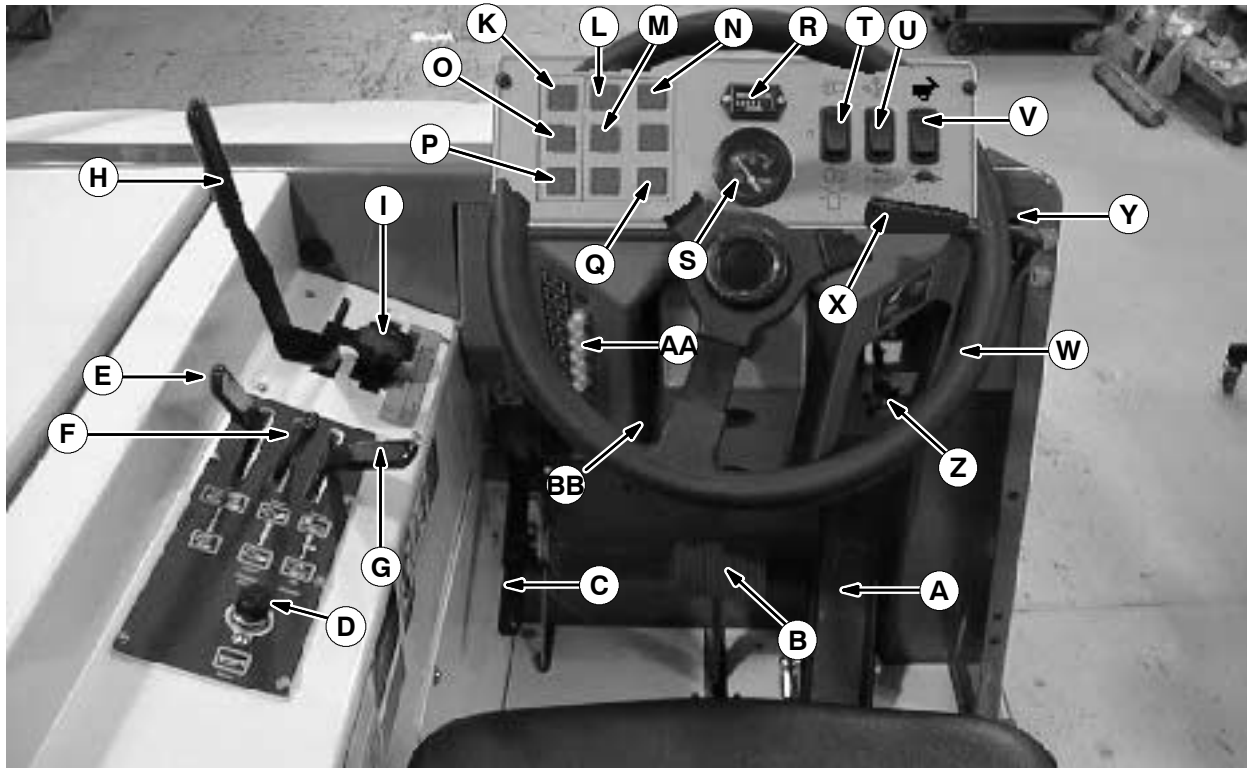
For machines below serial number 020000



08047

- A. Directional Pedal
- B. Brake Pedal
- C. Parking Brake Lever
- D. Horn Button
- E. Engine Choke Knob
- F. Main Brush And Side Brush Lever
- G. Hopper Door Lever
- H. Hopper Lift Lever
- I. Main Brush Position Lever
- J. Main Brush Down Pressure Knob
- K. Turn Signal Switch (Option)
- L. Hopper Temperature Light – Thermo Sentry™
- M. Engine Water Temperature Light
- N. Engine Oil Pressure Light
- O. Charging System Light
- P. Hopper Door Light
- Q. Clogged Filter Light
- R. Fuel Level Gauge
- S. Hourmeter
- T. Hazard Light Switch (Option)
- U. Operating Light Switch
- V. Vacuum Fan Switch
- W. Engine Speed Switch
- X. Filter Shaker Switch
- Y. Steering Wheel
- Z. Side Brush Position Lever
- AA. Ignition Switch
- BB. Side Brush Down Pressure Knob
- CC. Steering Column Tilt Lever
- DD. Circuit Breakers

For machines with serial number 020000 and above



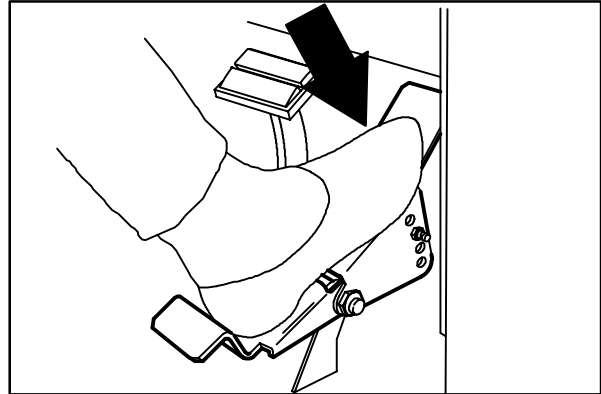
- A. Directional Pedal
- B. Brake Pedal
- C. Parking Brake Lever
- D. Horn Button
- E. Main Brush And Side Brush Lever
- F. Hopper Door Lever
- G. Hopper Lift Lever
- H. Main Brush Position Lever
- I. Main Brush Down Pressure Knob
- J. Turn Signal Switch (Not Pictured)
- K. Hopper Temperature Light – Thermo Sentry™
- L. Engine Water Temperature Light
- M. Engine Oil Pressure Light
- N. Charging System Light
- O. Hopper Door Light
- P. Clogged Filter Light (Option)
- Q. Glow Plug light
- R. Hourmeter
- S. Fuel Gauge
- T. Operating/Hazard Lights Switch
- U. Vacuum Fan/Filter Shaker Switch
- V. Engine Speed Switch
- W. Steering Wheel
- X. Side Brush Position Lever
- Y. Ignition Switch
- Z. Side Brush Down Pressure Knob
- AA. Circuit Breakers
- BB. Steering Column Tilt Lever (Option)

## OPERATION OF CONTROLS

### DIRECTIONAL PEDAL

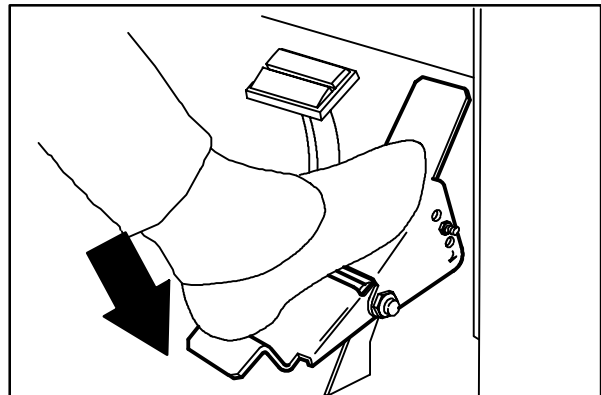
The directional pedal controls direction of travel and the propelling speed of the machine. You change the speed of the machine with the pressure of your foot; the harder you press the faster the machine travels.

Forward: Press the top of the directional pedal with the toe of your foot.



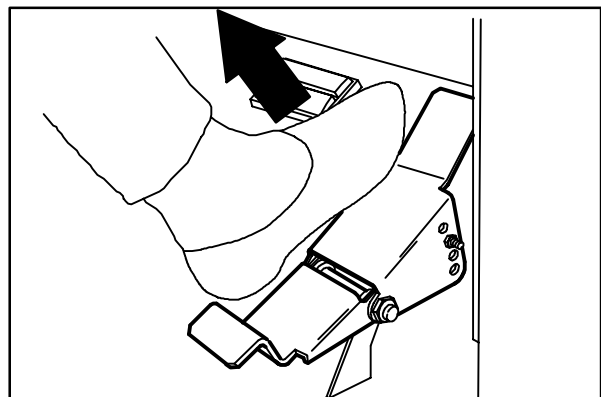
07790

Reverse: Press the bottom of the directional pedal with the heel of your foot.



07791

Neutral: Take your foot off the directional pedal and it will return to the neutral position.



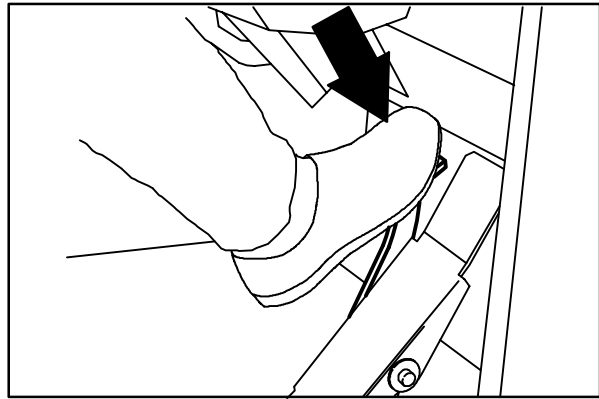
07792



**BRAKE PEDAL**

The brake pedal stops the machine.

Stop: Take your foot off the directional pedal and let it return to the neutral position. Step on the brake pedal.



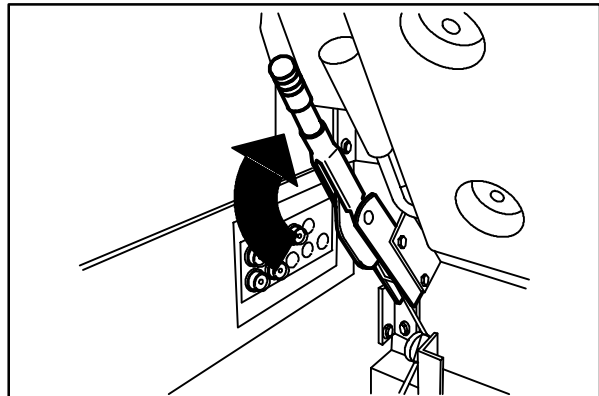
07754

**PARKING BRAKE LEVER**

The parking brake lever sets and releases the front wheel brakes.

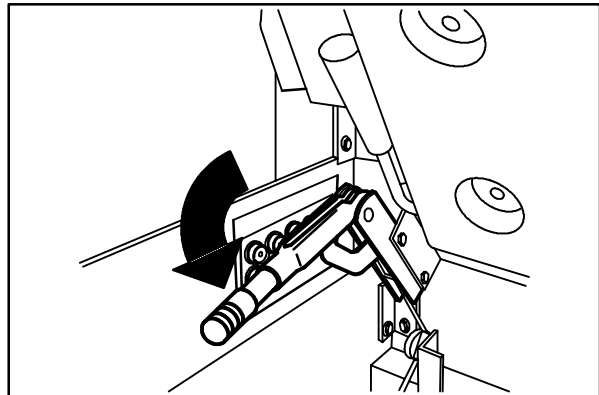
Set: Pull the parking brake lever up.

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



07794

Release: Push the parking brake lever down.

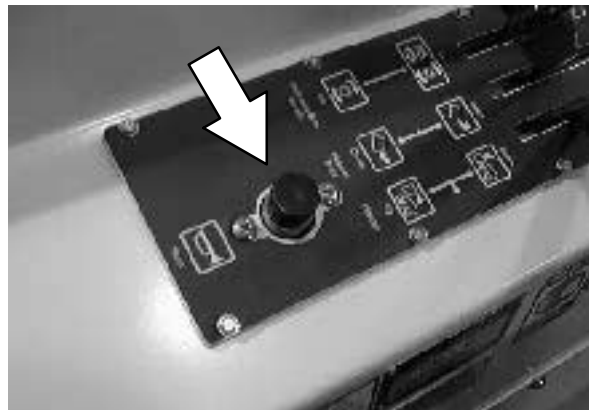


07793

**HORN BUTTON**

The horn button operates the horn.

Sound: Press the button.

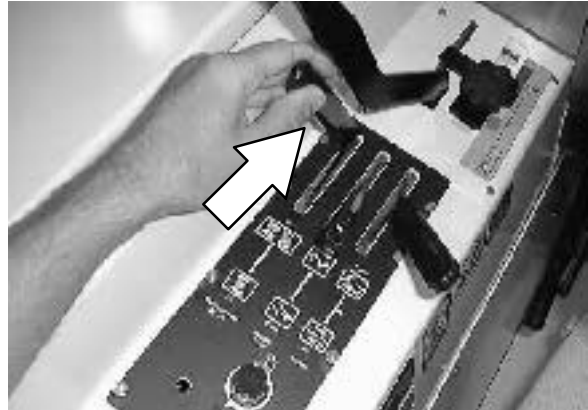


## OPERATION

### MAIN BRUSH AND SIDE BRUSH LEVER

The main brush and side brush lever controls the main brush and side brush rotation.

Main Brush and Side Brush On: Push the main brush and side brush lever into the **On** position.

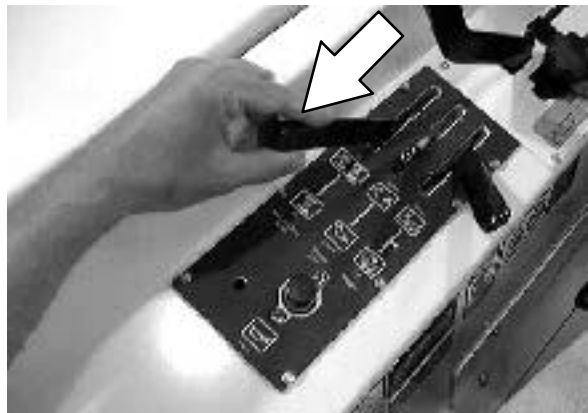


Main Brush and Side Brush Off: Pull the main brush and side brush lever into the middle position.



Main Brush On: Pull the main brush and side brush lever into the **On** position.

*NOTE: Always raise the main brush when the machine is not being operated for some time. This prevents the main brush from getting a flat spot.*



## HOPPER DOOR LEVER

The hopper door lever opens and closes the hopper door and dust door. Open the hopper door when sweeping. Close the hopper door when emptying the hopper to control debris and dust.

Open: Push the hopper door lever into the **Open** position and leave it there.



Hold: Release the hopper door lever into the middle position.



Close: Pull and hold the hopper door lever into the **Close** position.

*NOTE: The hopper door will not close if the main brush, side brush, and vacuum fan are operating.*



## OPERATION

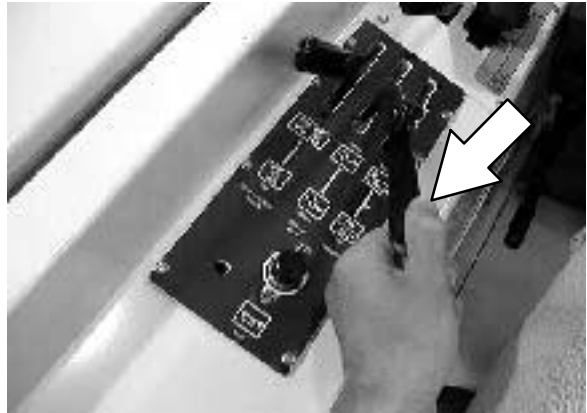
### HOPPER LIFT LEVER

The hopper lift lever raises and lowers the hopper.

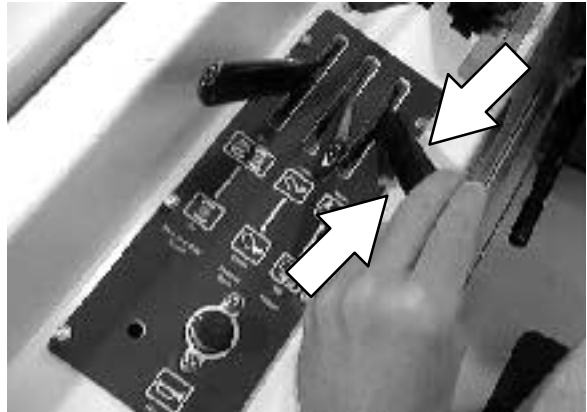
Up: Pull and hold the hopper lift lever into the **Up** position.

 **WARNING: Raised hopper may fall.  
Engage hopper support bar.**

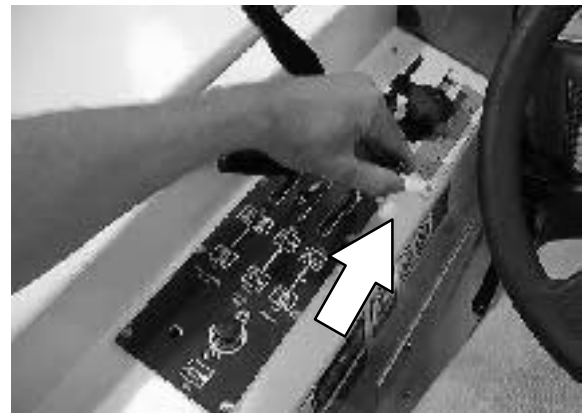
*NOTE: The hopper will not raise if the main brush, side brush, and vacuum fan are operating.*



Hold: Release the hopper lift lever up and into the middle position.



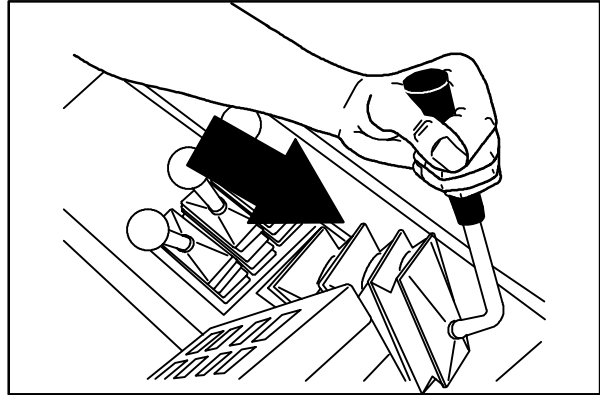
Down: Push and hold the hopper lift lever into the **Down** position.



### MAIN BRUSH POSITION LEVER (For machines below serial number 020000)

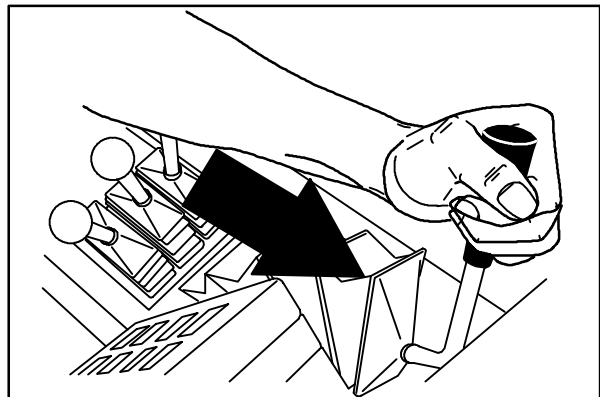
The main brush position lever lowers and raises the main brush. The main brush can be lowered into two sweeping positions; down and float. Down is used for general sweeping. Float is used when sweeping extremely uneven surfaces.

Down: Pull the main brush position lever back and to the left and over into the **Down** position.



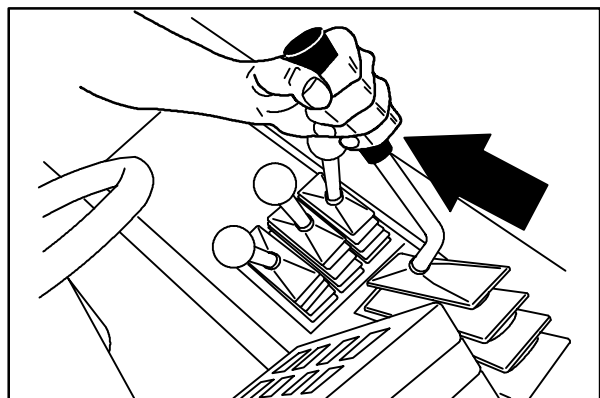
07782

Float: Pull the main brush position lever back and to the left and over into the Float position.



07783

Up: Pull the main brush position lever all the way back and to the right into the up position.



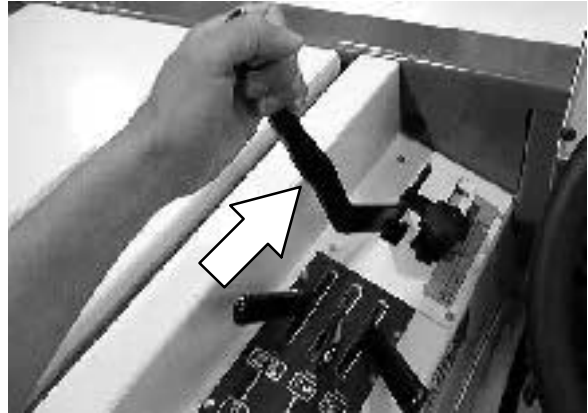
07784

## OPERATION

### MAIN BRUSH POSITION LEVER (For machines serial number 020000 and above)

The main brush position lever lowers and raises the main brush. The main brush can be lowered into one sweeping position, which is set by the main brush adjustment knob.

Down: Pull the main brush position lever back and to the left and over into the down position.



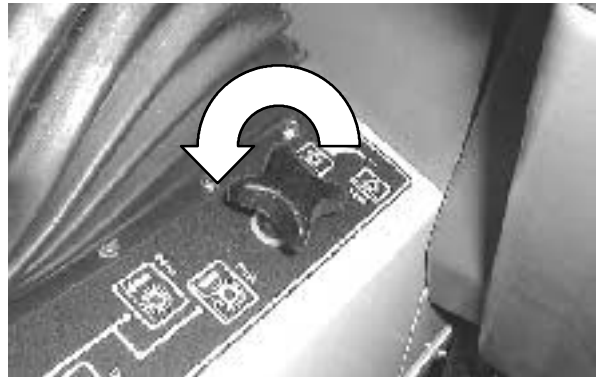
Up: Pull the main brush position lever all the way back and to the right into the **Up** position.



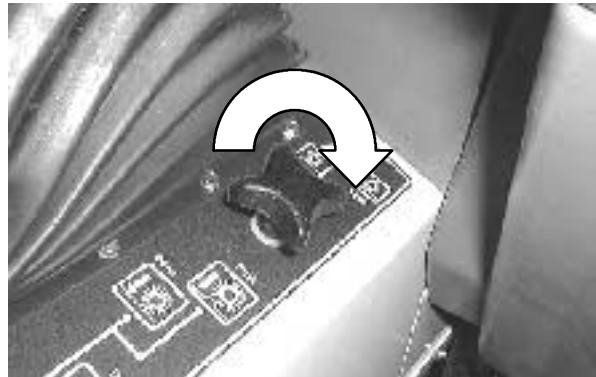
**MAIN BRUSH DOWN PRESSURE KNOB  
(For machines below serial number 020000)**

The main brush down pressure knob changes the main brush contact with the sweeping surface.

Heavy: Turn the main brush down pressure knob counter-clockwise.



Light: Turn the main brush down pressure knob clockwise.



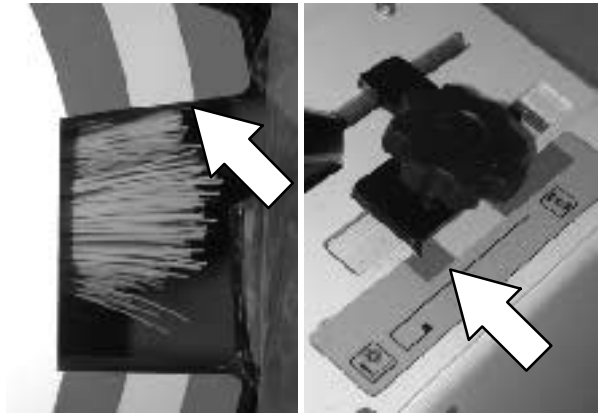
## OPERATION

### MAIN BRUSH ADJUSTMENT KNOB (For machines serial number 020000 and above)

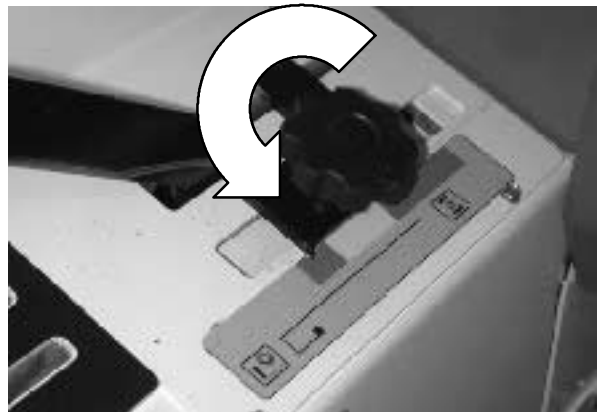
The main brush adjustment knob controls the amount of contact the main brush has with the sweeping surface.

Note the length of the main brush bristles with the color band on the brush idler plate before moving the main brush adjustment knob.

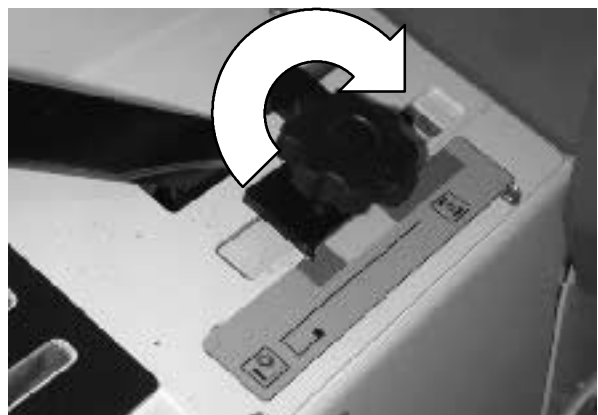
Align the pointer from the plate located under the knob, to match the same color band as the brush idler plate.



Loosen adjustment knob: Turn the adjustment plate knob counter-clockwise until the plate can slide along the adjustment panel.



Secure adjustment knob: Turn the adjustment plate knob clockwise until the knob is hand tight and the plate cannot slide in the adjustment panel.

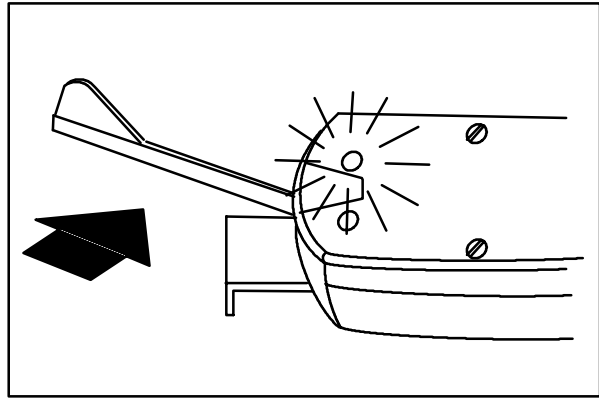




**TURN SIGNAL SWITCH (OPTION)**

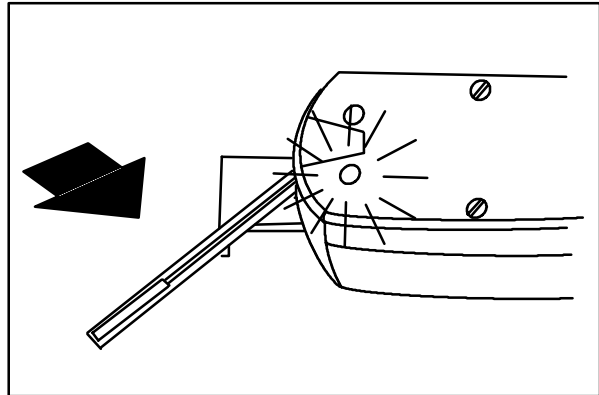
The turn signal switch operates the turn signals.

Right: Push the switch lever forward.



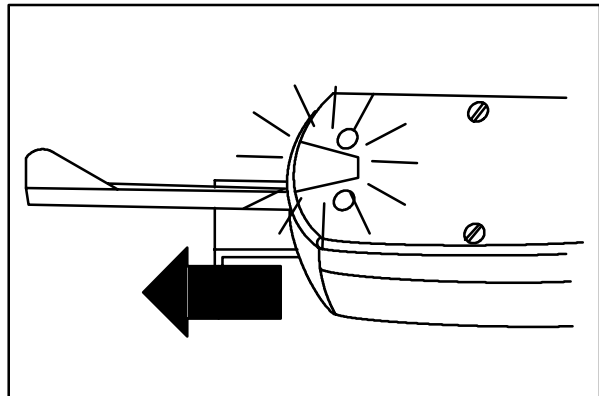
06487

Left: Pull the switch lever back.



06488

Flashers: Pull out the knob.



06745

## OPERATION

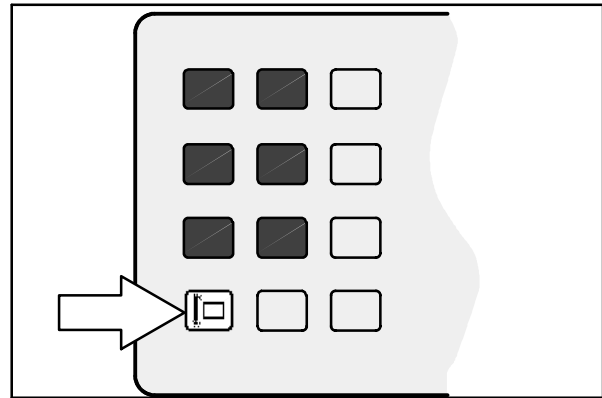
### HOPPER TEMPERATURE LIGHT - THERMO SENTRY™

The hopper temperature light comes on when there is too much heat in the hopper, possibly from a fire. The Thermo Sentry will stop the vacuum fan.

The Thermo Sentry™ has to be reset manually, see *THERMO SENTRY* in *MAINTENANCE*.

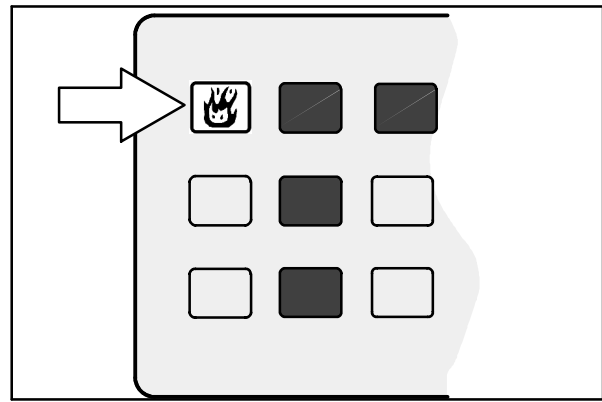
**(For machines below serial number 020000)**

The light location is as shown.



**(For machines serial number 020000 and above)**

The light location is as shown.

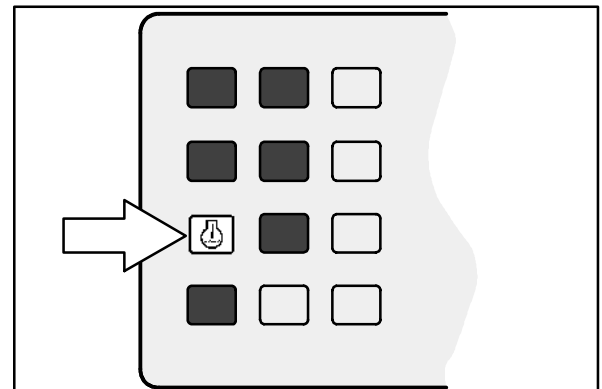


### ENGINE WATER TEMPERATURE LIGHT

The engine water temperature light comes on when the temperature of the engine coolant is more than 107° C (225° F). Stop operating the machine. Locate the problem and have it corrected.

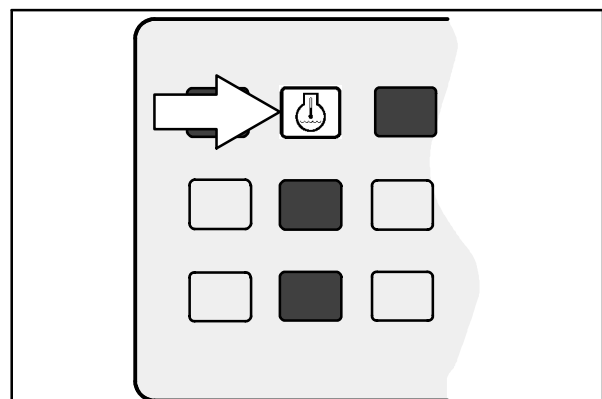
**(For machines below serial number 020000)**

The light location is as shown.



**(For machines serial number 020000 and above)**

The light location is as shown.

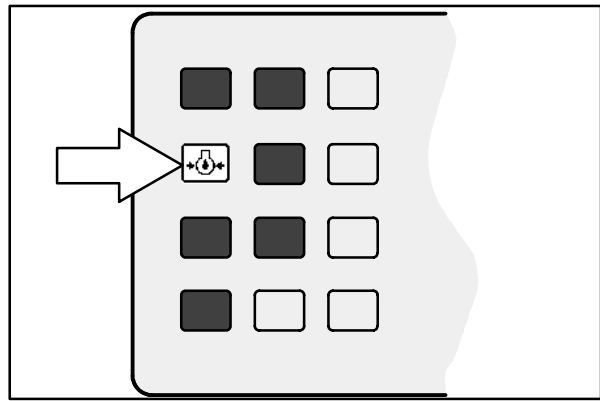


**ENGINE OIL PRESSURE LIGHT**

The engine oil pressure light comes on when the engine oil pressure falls below 35 kPa (5 psi). Stop operating the machine. Locate the problem and have it corrected.

**(For machines below serial number 020000)**

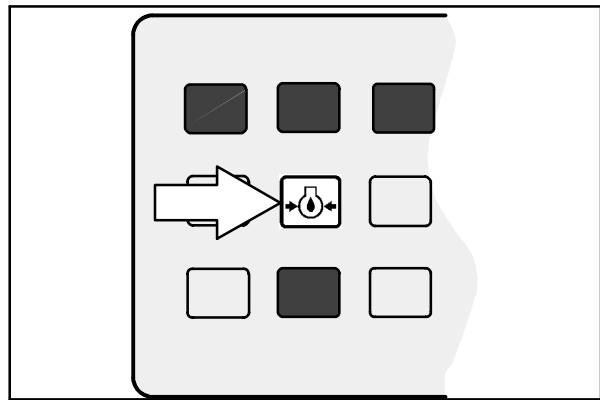
The light location is as shown.



07758

**(For machines serial number 020000 and above)**

The light location is as shown.

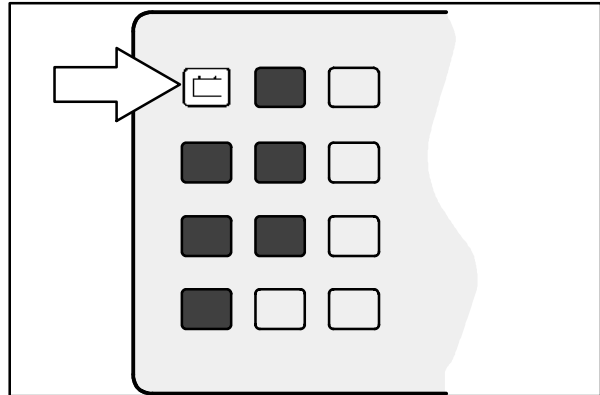


**CHARGING SYSTEM LIGHT**

The charging system light comes on when the existing voltage potential of the battery is not within normal range - 10 to 14 Volts. Stop operating the machine. Locate the problem and have it corrected.

**(For machines below serial number 020000)**

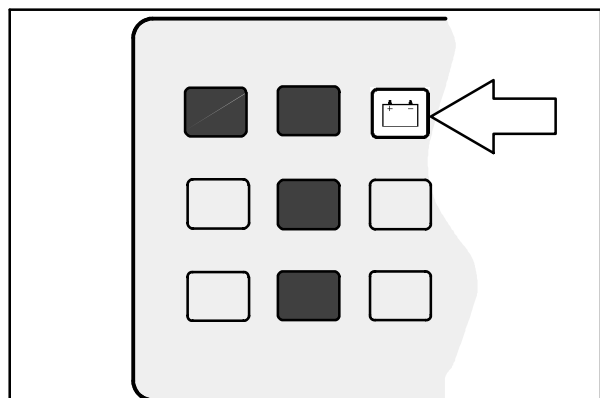
The light location is as shown.



07757

**(For machines serial number 020000 and above)**

The light location is as shown.



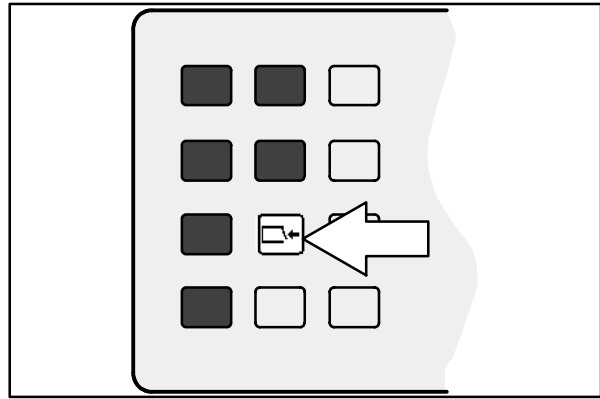
## OPERATION

### HOPPER DOOR LIGHT

The hopper door light comes on when the hopper door is closed. Make sure the hopper door is open and the hopper door light is off, before sweeping with the machine.

**(For machines below serial number 020000)**

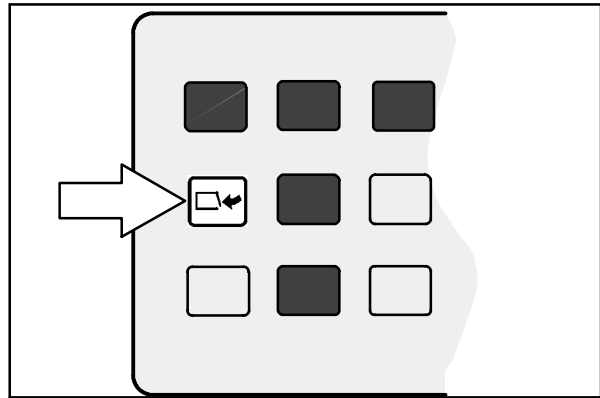
The light location is as shown.



07763

**(For machines serial number 020000 and above)**

The light location is as shown.



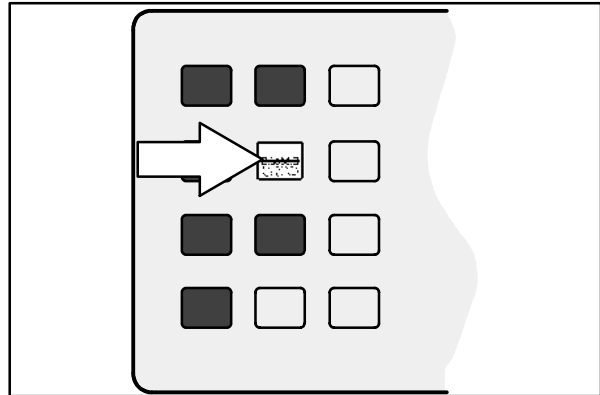
### CLOGGED FILTER LIGHT

The clogged filter light comes on when the hopper dust filter is clogged.

To clean the filter, press the filter shaker switch. If the clogged filter light remains lit, manually clean the hopper dust filter. See *HOPPER DUST FILTER* in *MAINTENANCE*.

**(For machines below serial number 020000)**

The light location is as shown.

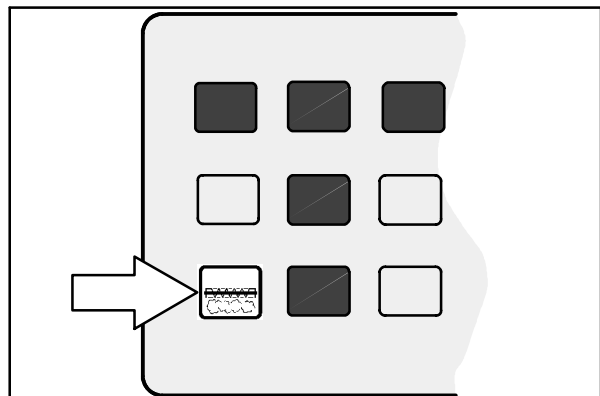


07762

### CLOGGED FILTER LIGHT (OPTION)

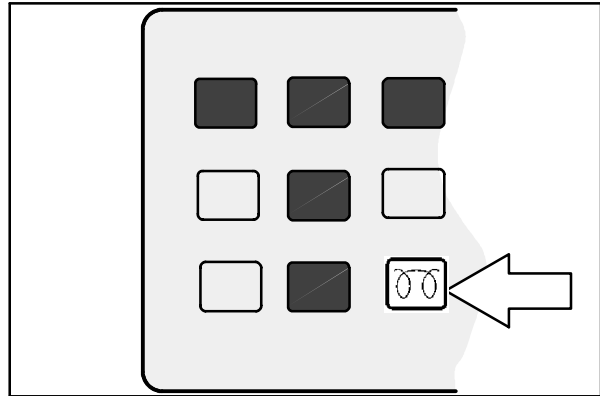
**(For machines serial number 020000 and above)**

The light location is as shown.



**GLOW PLUG LIGHT (For machines serial number 020000 and above ONLY)**

The glow plug light comes on when the ignition switch is turned counterclockwise to the preheat position. The light will go out when the engine is ready to start.

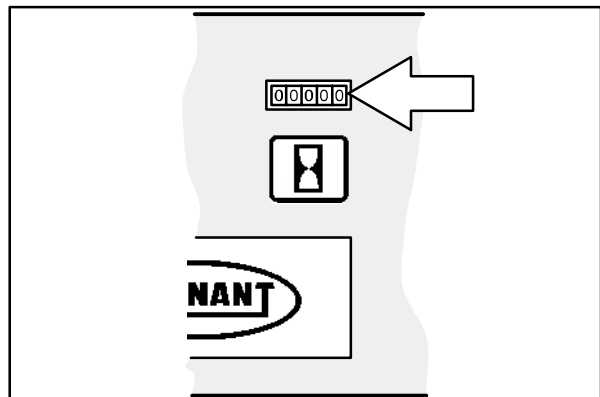


**HOURMETER**

The hourmeter records the number of hours the machine has been operated. Use this information to determine machine maintenance intervals.

**(For machines below serial number 020000)**

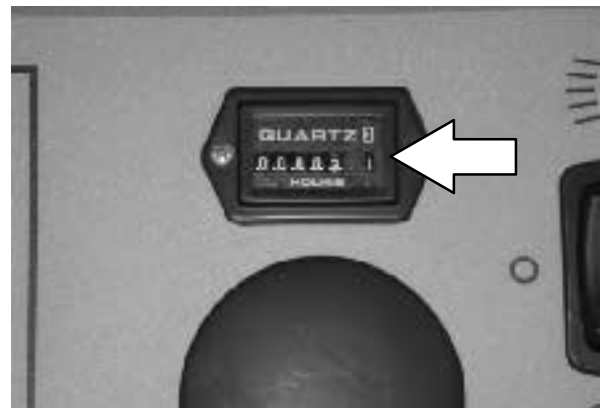
The light location is as shown.



07765

**(For machines serial number 020000 and above)**

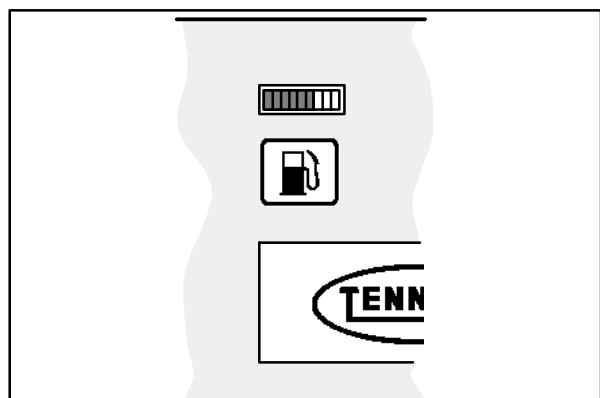
The light location is as shown.



**FUEL LEVEL GAUGE (For machines below serial number 020000)**

The fuel level gauge indicates how much fuel is in the fuel tank with a segmented LED light. When the tank is full, all ten of the segments are lit. As the fuel tank empties, the segments shut off. The fuel tank is empty when all ten of the segments have shut off.

*NOTE: Do not let the fuel tank empty completely. Air can enter the fuel system. The fuel system will need bleeding before the next engine start.*



07764

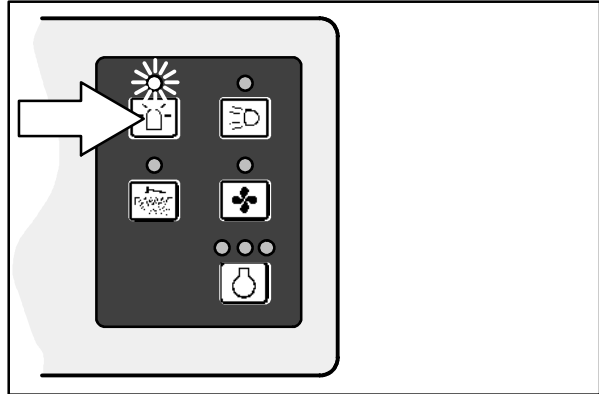
## OPERATION

### HAZARD LIGHT SWITCH (OPTION) (For machines below serial number 020000)

The hazard light switch powers on and off the hazard light.

On: Press the hazard light switch. The indicator light above the switch will come on.

Off: Press the hazard light switch. The indicator light above the switch will go off.



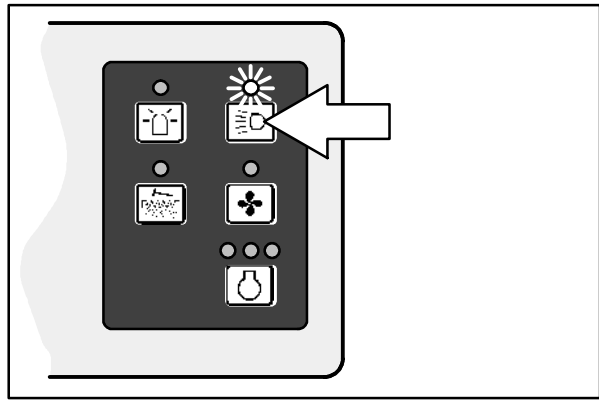
07766

### OPERATING LIGHTS SWITCH (For machines below serial number 020000)

The operating lights switch powers on and off the headlights and taillights.

On: Press the operating lights switch. The indicator light above the switch will come on.

Off: Press the operating lights switch. The indicator light above the switch will go off.



07768

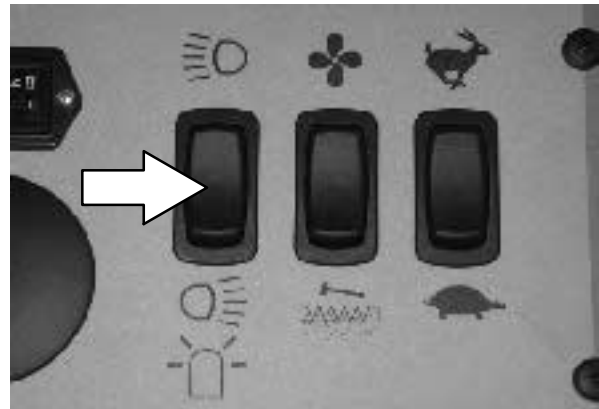
### OPERATING/HAZARD LIGHTS SWITCH (For machines serial number 020000 and above)

The operating/hazard light switch powers on and off the operating/hazard lights.

Operating Lights On: Press the top of the switch.

Operating/Hazard Lights On: Press the bottom of the switch.

Off: Press the switch to the middle off position.



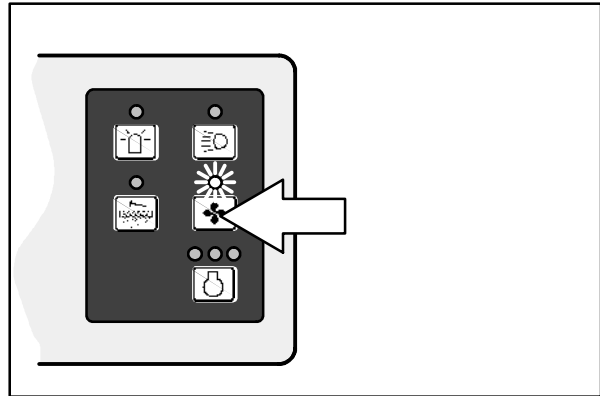
**VACUUM FAN SWITCH  
(For machines below serial number 020000)**

The vacuum fan switch starts and stops the vacuum fan.

**Start:** Press the vacuum fan switch. The indicator light above the switch will come on.

**Stop:** Press the vacuum fan switch. The indicator light above the switch will go off.

*NOTE: The vacuum fan will not operate unless the main brush and side brush are on.*



07769

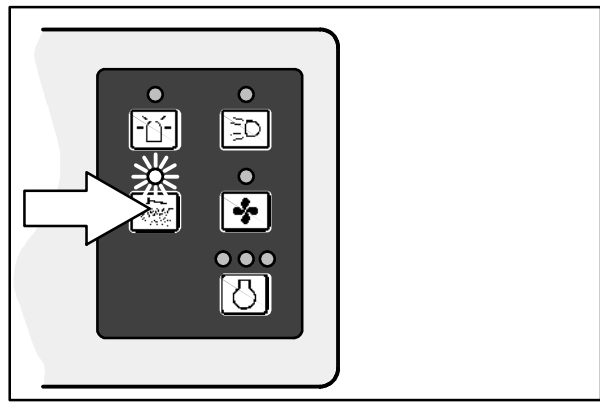
**FILTER SHAKER SWITCH  
(For machines below serial number 020000)**

The filter shaker switch starts the hopper dust filter shaker. The shaker automatically operates for 10 seconds.

**Start:** Press the filter shaker switch. The indicator light will remain on while the filter shaker is operating.

*NOTE: The vacuum fan shuts off while the filter shaker is operating.*

*NOTE: Close the hopper door before operating the filter shaker.*



07767

**VACUUM FAN/FILTER SHAKER SWITCH (For machines serial number 020000 and above)**

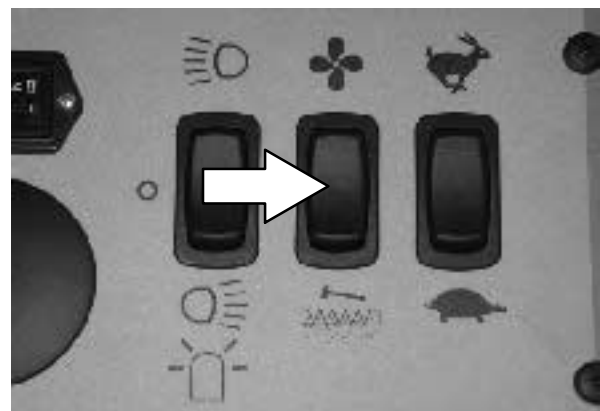
The vacuum fan/filter shaker switch starts and stops the vacuum fan and the hopper dust filter shaker.

**Start Vacuum Fan:** Press the top of the switch.

**Stop Vacuum Fan:** Press the switch to the middle off position.

**Start Filter Shaker:** Press and hold the bottom of the switch.

**Stop Filter Shaker:** Release the switch.

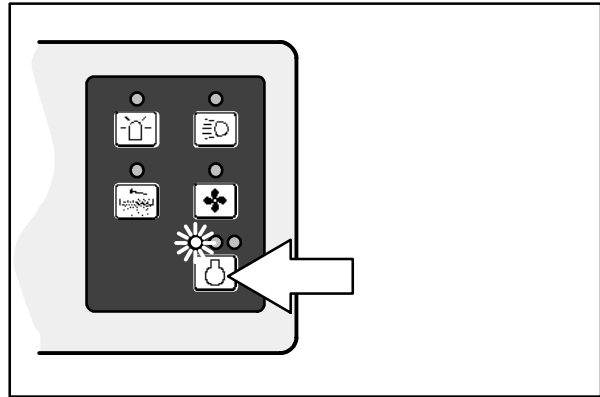


# OPERATION

## ENGINE SPEED SWITCH (For machines below serial number 020000)

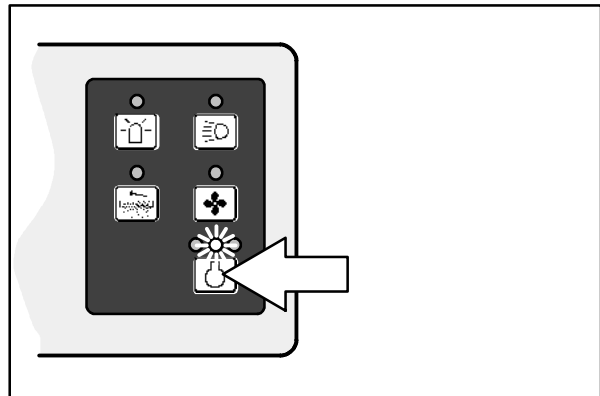
The engine speed switch controls engine governed speed. The three indicator lights above the switch show the engine speed; Idle, Fast1, or Fast2.

Idle: The engine will automatically start in idle speed. To return the engine to idle from another engine speed, press the engine speed switch until the first indicator light comes on.



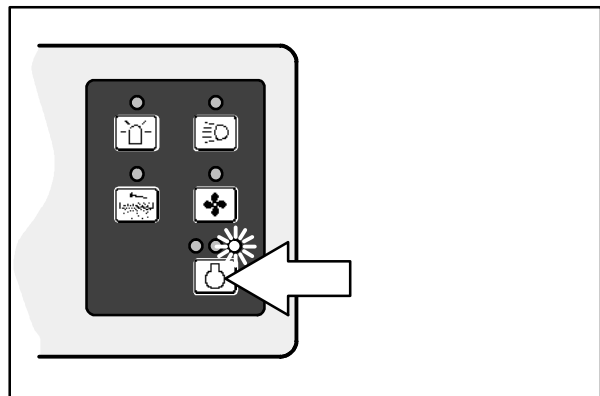
07770

Fast 1: Press the engine speed switch until the second indicator light comes on. This speed is for general sweeping.



07771

Fast 2: Press the engine speed switch until the third indicator light comes on. This speed is for sweeping light litter.



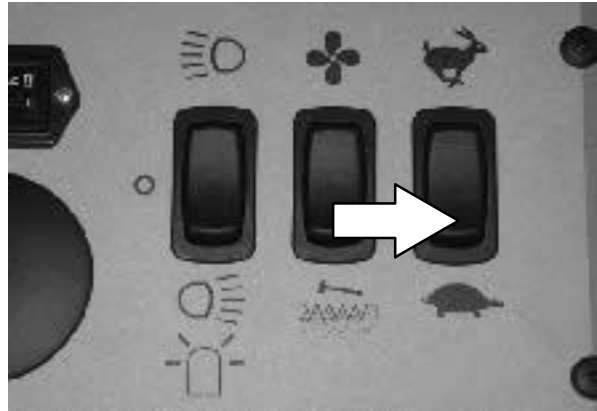
07772



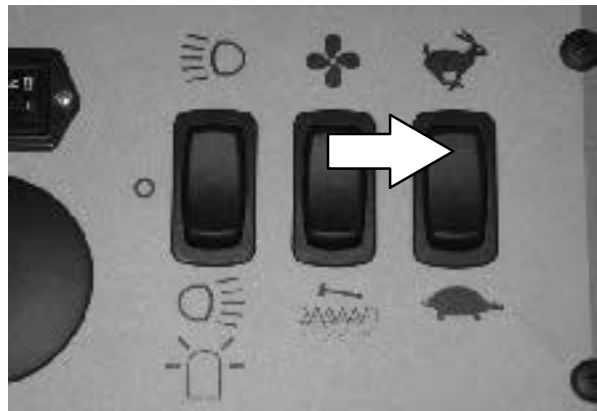
**ENGINE SPEED SWITCH (For machines serial number 020000 and above)**

The engine speed switch controls engine governed speed. The engine has three speeds; Idle, Fast1, or Fast2.

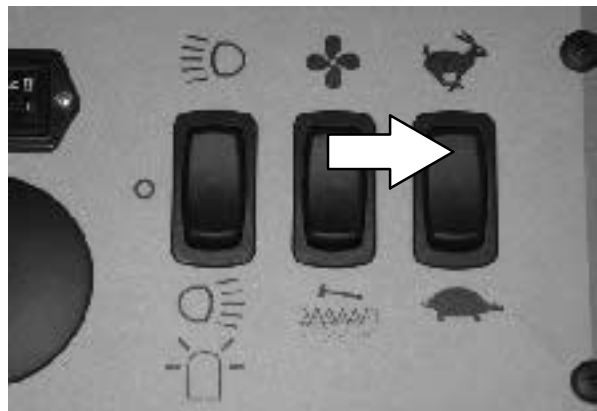
**Idle:** The engine will automatically start in idle speed. To return the engine to idle from another engine speed, press the bottom of the engine speed switch twice.



**Fast 1:** Press the top of the engine speed switch once from the idle engine speed. This speed is for general sweeping.



**Fast 2:** Press the top of the engine speed switch twice from the engine idle speed. This speed is for sweeping light litter.



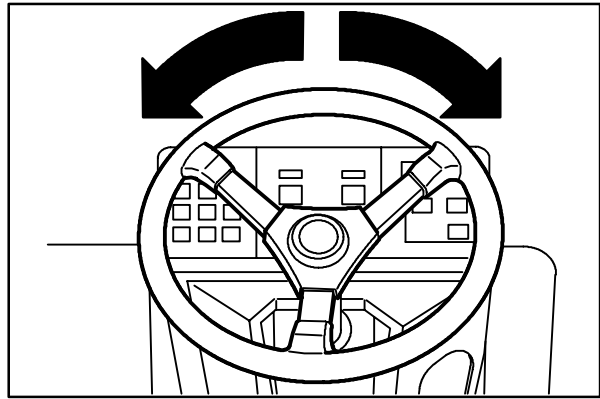
## OPERATION

### STEERING WHEEL

The steering wheel controls the machine's direction. The machine is very responsive to the steering wheel movements.

Left: Turn the steering wheel to the left.

Right: Turn the steering wheel to the right.



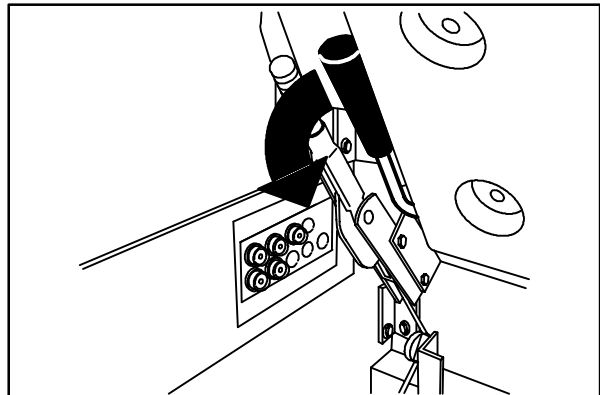
07801

### STEERING COLUMN TILT LEVER (Option)

The steering column tilt lever controls the angle of the steering column.

Adjust: Pull down on the tilt lever, move the column up or down, and release the tilt lever.

*NOTE: Machines below serial number 020000 are all equipped with tilt steering.*



07802

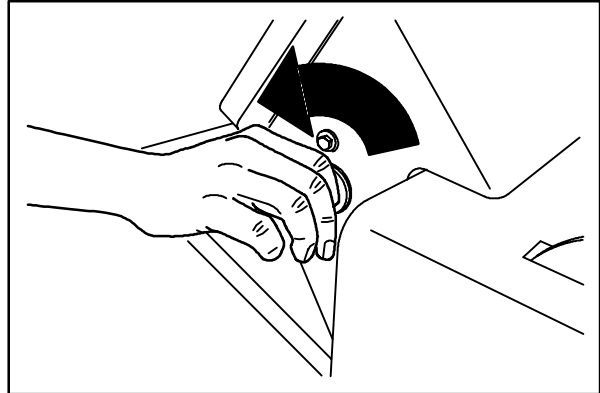
**IGNITION SWITCH**

The ignition switch starts and stops the engine with a key.

**FOR SAFETY: When starting machine, keep foot on brake and directional pedal in neutral.**

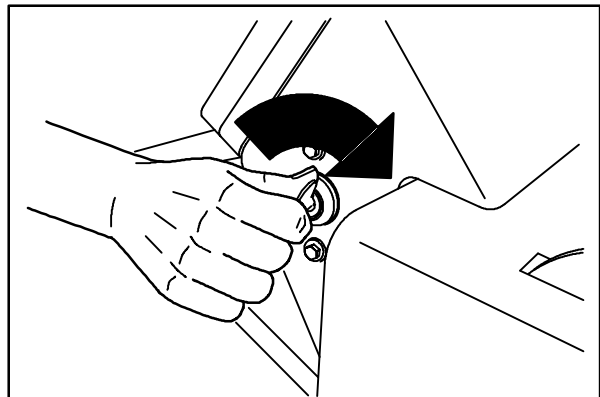
**Preheat:** Turn the key all the way counter-clockwise and hold it there until the glow plug light goes off.

*NOTE: For machines not equipped with a glow plug light, hold the key for 15 to 60 seconds, depending on the weather conditions.*



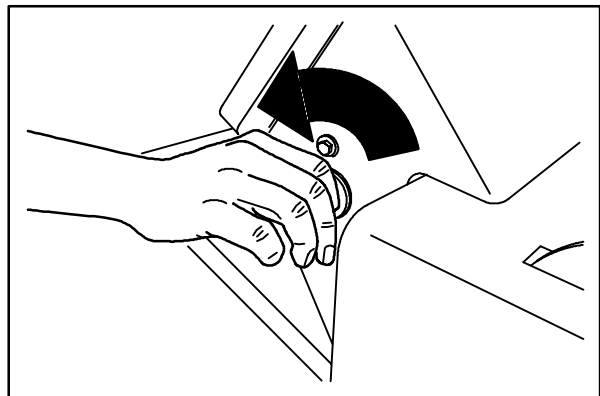
07805

**Start:** Turn the key all the way clockwise. Release the key as soon as the engine starts.



07804

**Stop:** Turn the key counter-clockwise.



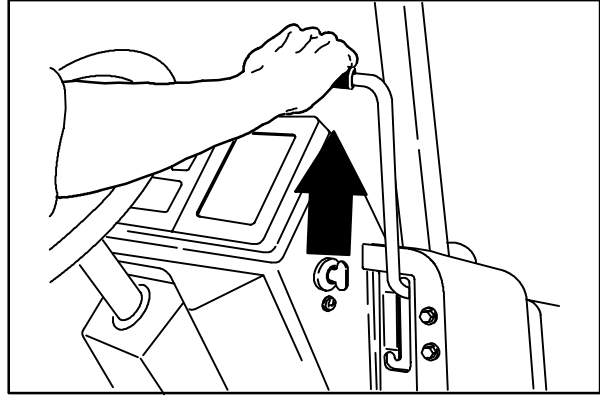
07805

## OPERATION

### SIDE BRUSH POSITION LEVER

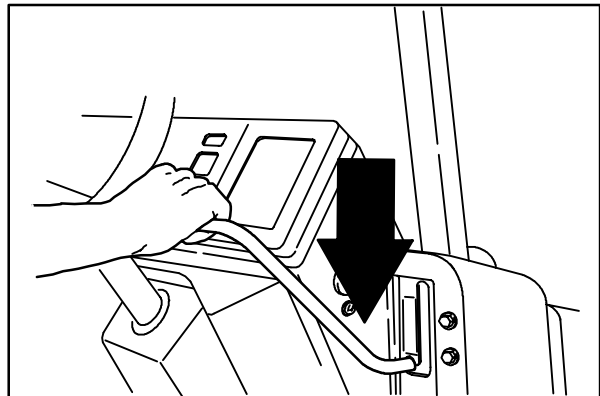
The side brush position lever lowers and raises the side brush.

Down: Pull the side brush position lever back and to the right into the **Down** slot.



07785

Up: Pull the side brush position lever back and to the left into the **Up** slot.



07786

**SIDE BRUSH DOWN PRESSURE KNOB**

The side brush down pressure knob changes the side brush contact with the sweeping surface.

Heavy: Turn the side brush down pressure knob counter-clockwise.



07799

Light: Turn the side brush down pressure knob clockwise.



07800

## OPERATION

### CIRCUIT BREAKERS

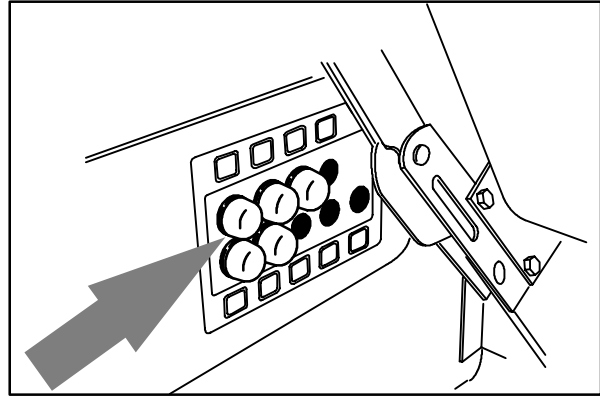
(For machines below serial number 020000)

The circuit breakers are resettable electrical circuit protection devices. Their design stops the flow of current in the event of a circuit overload. Once a circuit breaker is tripped, it must be reset manually. Press the reset button after the breaker has cooled down.

If the overload that caused the circuit breaker to trip is still there, the circuit breaker will continue to stop current flow until the problem is corrected.

All the circuit breakers are located in the operator compartment except CB-10. It is located in the cab control panel.

The chart lists the circuit breakers and the electrical components they protect.



07806

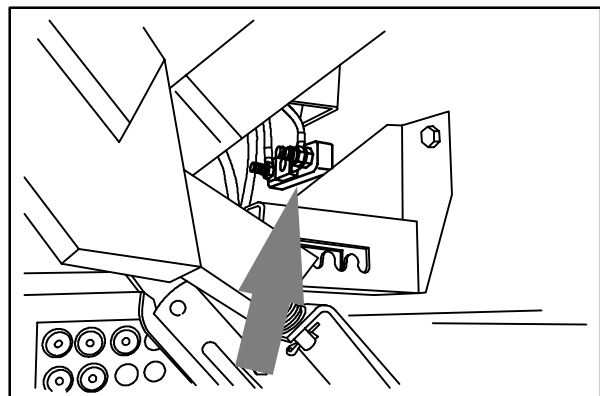
Circuit Breaker	Rating	Circuit Protected
CB-1	15 A	Engine and throttle
CB-2	15 A	Vacuum fan, filter shaker
CB-3	15 A	Operating lights
CB-4	15 A	Hazard light, back-up alarm
CB-5	15 A	Horn
CB-6	2.5 A	Instrument panel
CB-7	15 A	Heater/defrost, windshield wiper
CB-8	15 A	Turn Signals
CB-9	15 A	Auxiliary side brush
CB-10	15 A	Cab Pressurizer

### FUSES

(For machines below serial number 020000)

Fuses are a one-time protection device designed to stop the flow of current in the event of a circuit overload. Never substitute higher value fuses than specified.

The fuse is located in the operator compartment under the steering column.



08033

Fuse	Rating	Circuit Protected
FU-1	40 A	Glow plugs

**CIRCUIT BREAKERS**  
**(For machines serial number 020000 and above)**

The circuit breakers are resettable electrical circuit protection devices. Their design stops the flow of current in the event of a circuit overload. Once a circuit breaker is tripped, it must be reset manually. Press the reset button after the breaker has cooled down.

If the overload that caused the circuit breaker to trip is still there, the circuit breaker will continue to stop current flow until the problem is corrected.

All the circuit breakers are located in the operator compartment except CB-10 thru 12. They are located in the cab control panel.

The chart lists the circuit breakers and the electrical components they protect.



<b>Circuit Breaker</b>	<b>Rating</b>	<b>Circuit Protected</b>
CB-1	40 A	Glow plugs
CB-2	15 A	Engine start
CB-3	15 A	Engine cntrl panel
CB-4	15 A	Horn, Hazard lights
CB-5	15 A	Vacuum fan, filter shaker
CB-6	2.5 A	Operating light, side brush light
CB-7	15 A	Backup alarm, beacon lights
CB-8	15 A	Cab heater, defrost, dome light, wiper motor (options)
CB-9	15 A	Cab pressurizer fan (option)
CB-10		Open
CB-11	30 A	Cab AC condenser
CB-12	30 A	Cab AC fan

## OPERATION

### LATCHES

The side doors, rear doors, engine cover, hopper cover, and cab door are secured with latches.

Open the Main Brush Side Doors: Push down on the door latch.

Open the Engine Side Door: Pull up on the door latch.

Open the Engine Cover: Push in on the cover latch.

Open the Cab Door: Pull up on the door handle.

**(For machines below serial number 020000)**

Open the rear Grille Doors: Push down on the door latch.

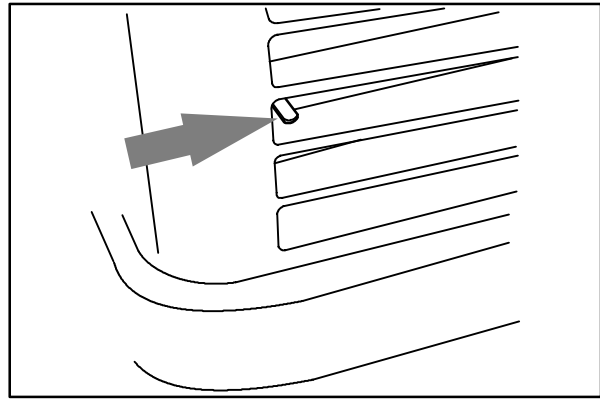
Open the Hopper Cover: Push the cover latch to the right and pull up on the hopper cover.

**(For machines serial number 020000 and above)**

Open the right rear Grille Door: Pull the door open.

Open the left rear Grille Door: Push down on the door latch.

Open the Hopper Cover: Pull the rubber cover latch forward and pull up on the hopper cover.



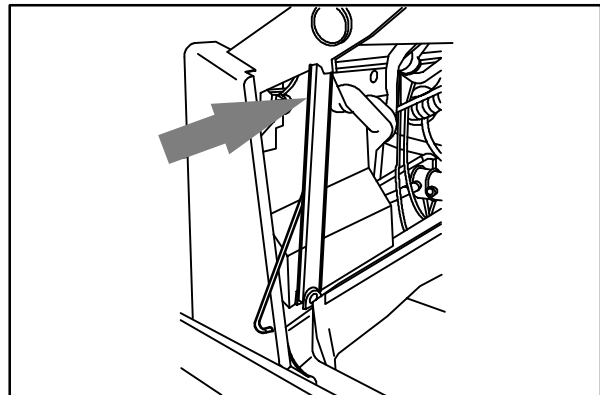
08149

### HOPPER SUPPORT BAR

The hopper support bar is located on the operator's side of the hopper. The hopper support bar holds the hopper in the raised position to allow work under the hopper. **DO NOT** rely on the machine hydraulic system to keep the hopper raised.



**WARNING: Raised hopper may fall.  
Engage hopper support bar.**



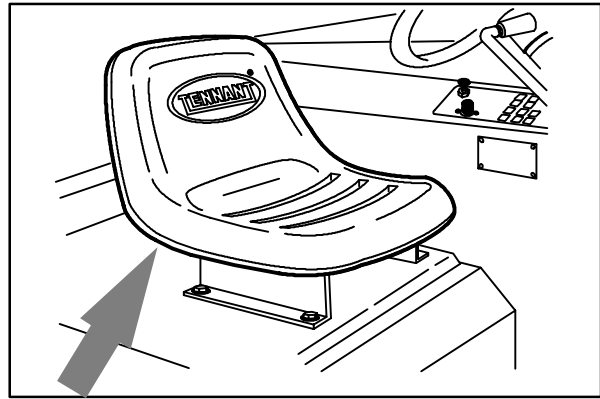
07803



**OPERATOR SEAT**

The operator seat is a fixed back style with a forward-backward adjustment.

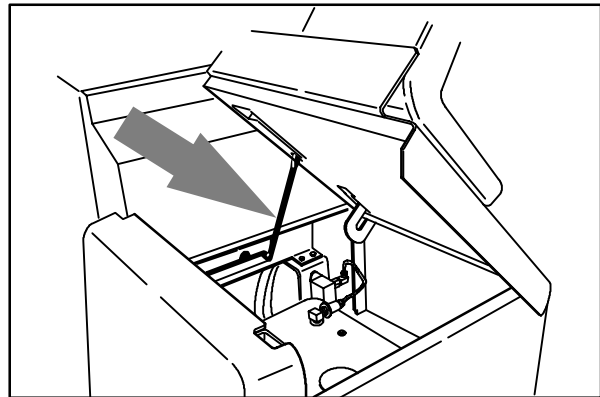
**Adjust:** Remove the seat mounting bolts, move the seat to the position desired, and reinstall and tighten the bolts.



07798

**Lift:** Pull up on the seat mounting plate until the seat mount locks up.

**Lower:** Pull on the release lever and lower the seat mounting plate.



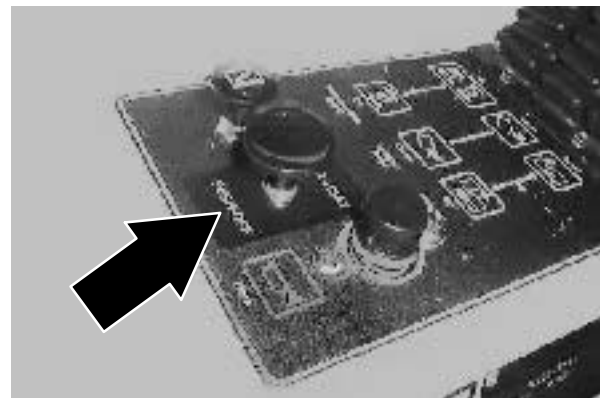
08052

**HEATER KNOB (OPTION)**

The heater knob controls the cab heater on the cab option.

**On:** Pull the knob out until the air temperature is at the desired comfort level. For maximum heat, pull the knob out all the way.

**Off:** Push the knob in all the way.

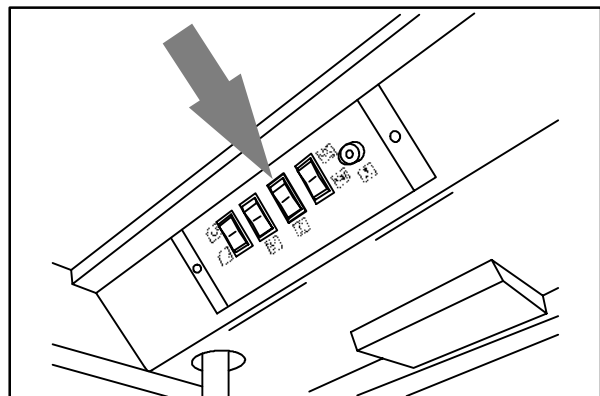


**AIR CONDITIONING SWITCH (OPTION)**

The air conditioning switch operates the cab's air conditioning in the optional cab.

**On:** Press the top of the switch.

**Off:** Press the bottom of the switch.



08131

## OPERATION

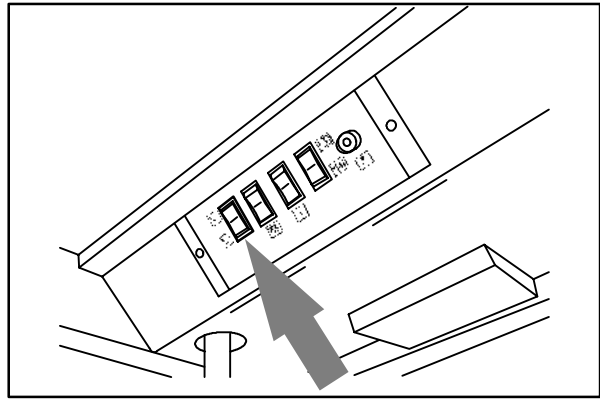
### WINDSHIELD WIPER SWITCH (OPTION)

The windshield wiper switch operates the windshield wiper on the cab option. The wiper can be operated at two speeds.

Slow: Press the top of the switch.

Fast: Press the bottom of the switch.

Off: Return the switch to the middle position.



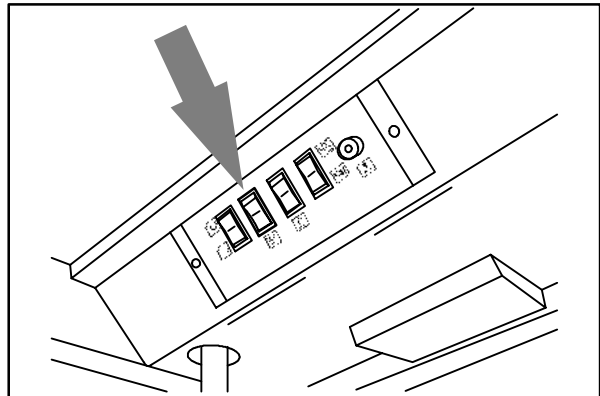
08129

### DOME LIGHT SWITCH (OPTION)

The dome light switch controls the dome light on the cab option.

On: Press the top of the switch.

Off: Press the bottom of the switch.



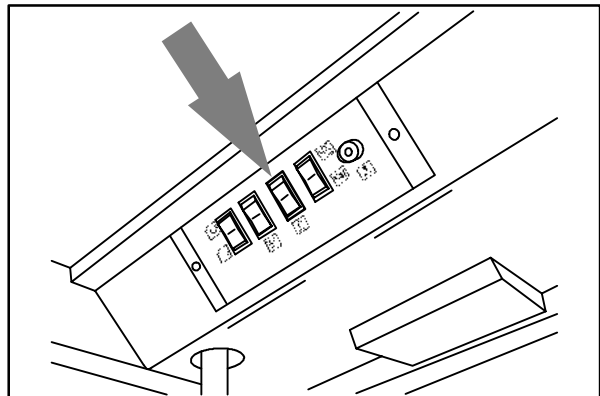
08130

### HEATER SWITCH (OPTION)

The heater switch controls the cab heater on the cab option.

On: Press the top of the switch.

Off: Press the bottom of the switch.



08131

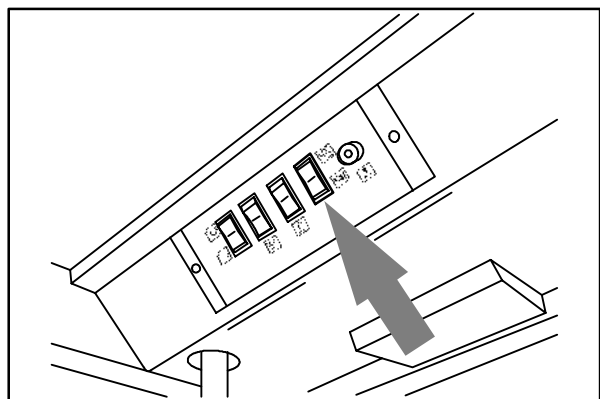
### PRESSURIZER SWITCH (OPTION)

The pressurizer switch operates the cab pressurizer on the cab option. The pressurizer can be operated at two speeds.

Slow: Press the top of the switch.

Fast: Press the bottom of the switch.

Off: Return the switch to the middle position.



08132

---

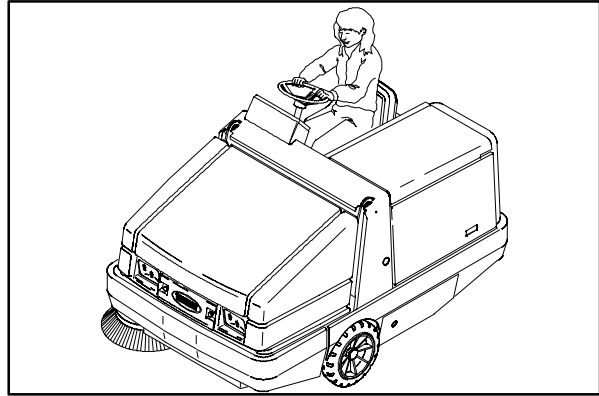
**HOW THE MACHINE WORKS**

---

The steering wheel controls the direction of machine travel. The directional pedal controls the speed and forward/reverse direction. The brake pedal slows and stops the machine.

The side brush sweeps debris into the path of the main brush. The main brush sweeps debris from the floor into the hopper. The vacuum system pulls dust and air through the hopper and the hopper dust filter.

When sweeping is finished, clean the hopper dust filter and empty the hopper.



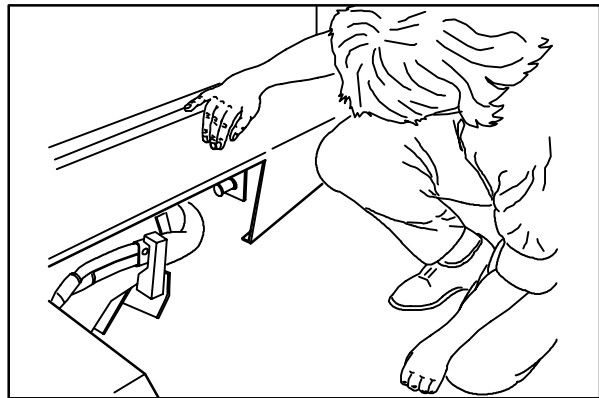
07816

---

**PRE-OPERATION CHECKLIST**

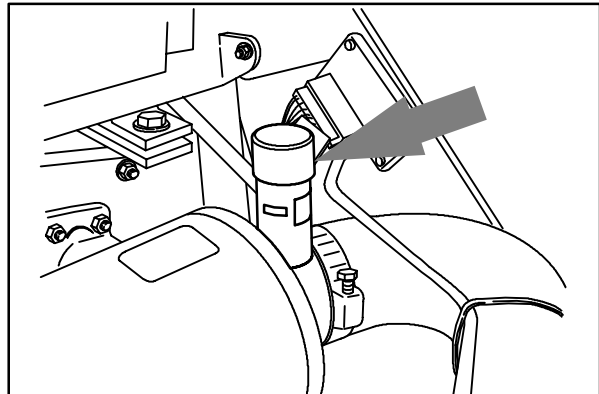
---

- Check under the machine for leaks (fuel, oil, coolant).



07807

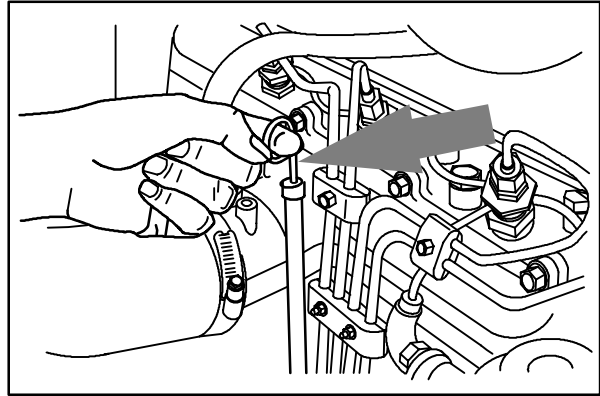
- Check the engine air filter indicator.



07808

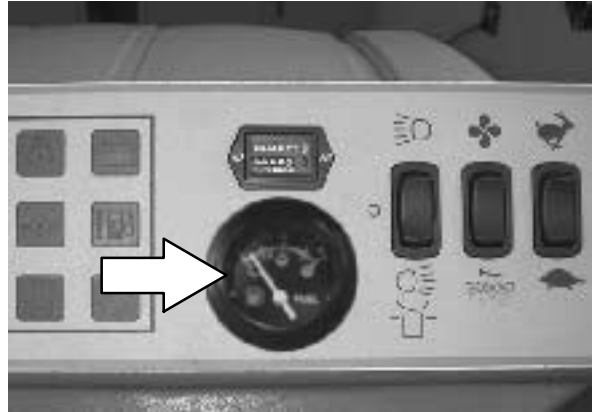
## OPERATION

- Check the engine oil level.

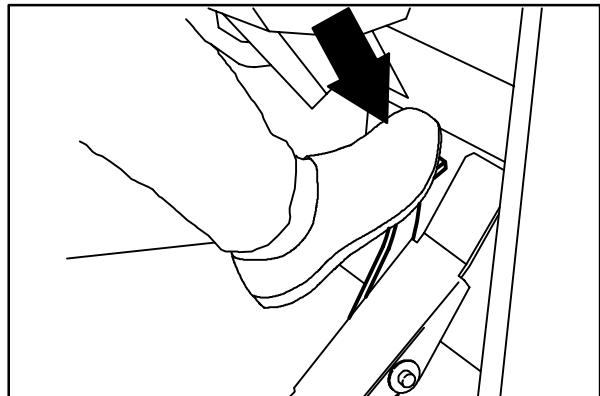


08431

- Check fuel level.



- Check the brakes and steering for proper operation.



07754

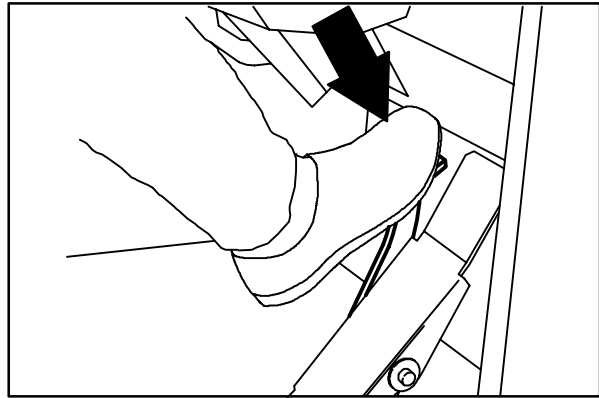
---

**STARTING THE MACHINE**

---

1. You must be in the operator's seat with the directional pedal in neutral, and your foot on the brake pedal or with the parking brake set.

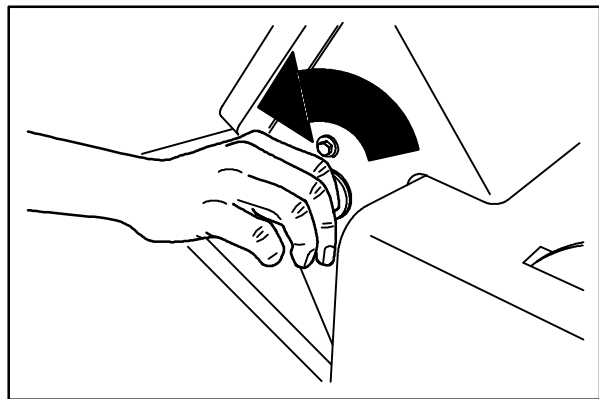
**For Safety: When starting machine, keep foot on brake and directional pedal in neutral.**



07754

2. Turn the ignition switch key all the way counter-clockwise and hold it there until the glow plug light goes off.

*NOTE: For machines not equipped with a glow plug light, hold the key for 15 to 60 seconds, depending on the weather conditions.*



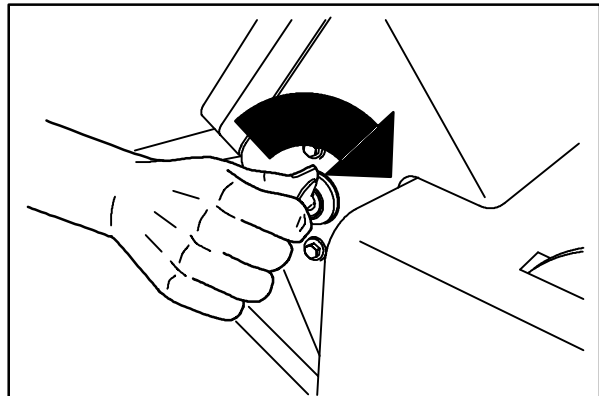
07805

3. Turn the ignition switch key clockwise until the engine starts.

*NOTE: Do not operate the starter motor for more than 10 seconds at a time or after the engine has started. Allow the starter to cool between starting attempts or damage to the starter motor may occur.*



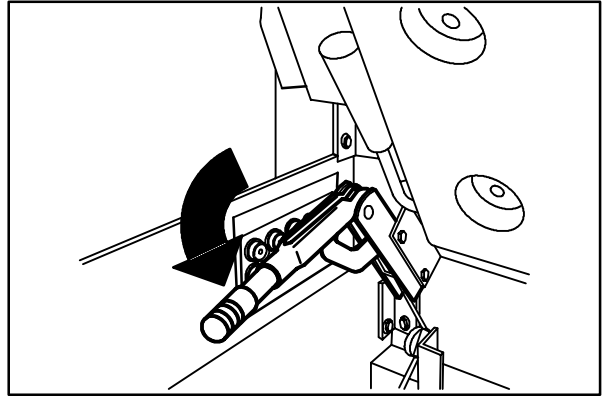
**WARNING: Engine emits toxic gases. Severe respiratory damage or asphyxiation can result. Provide adequate ventilation. Consult with your regulatory authorities for exposure limits. Keep engine properly tuned.**



07804

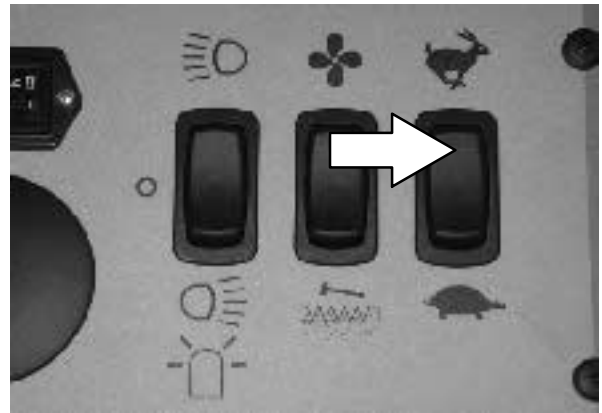
## OPERATION

4. Release the machine parking brake.

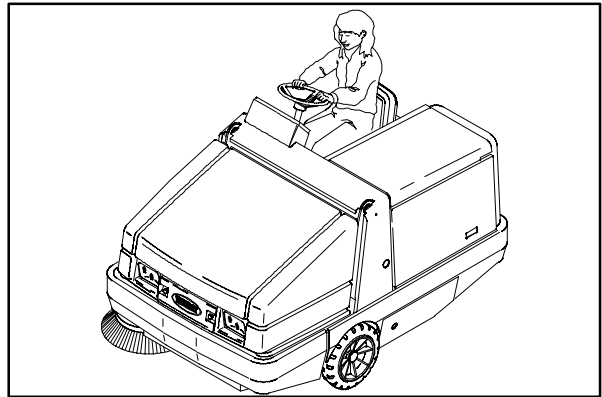


07793

5. Select the (Fast 1) engine speed with the engine speed switch.



6. Drive the machine to the area being swept.



07816

## SWEEPING AND BRUSH INFORMATION

Pick up oversized debris before sweeping. Flatten or remove bulky cartons from aisles before sweeping. Pick up pieces of wire, twine, string, etc., which could become entangled in brush or brush plugs.

Plan the sweeping in advance. Try to arrange long runs with minimum stopping and starting. Sweep debris from very narrow aisles into main aisles ahead of time. Do an entire floor or section at one time. Sweep as straight a path as possible. Avoid bumping into posts or scraping the sides of the sweeper. Overlap the brush paths.

Avoid turning the steering wheel too sharply when the machine is in motion. The machine is very responsive to the movement of the steering wheel. Avoid sudden turns, except in emergencies.

Speed up the engine to (Fast 2) when picking up light litter. This will improve both litter pickup and hopper loading. Do not use the (Fast 2) speed in dusty environments. The machine can dust and clog the hopper dust filter. Operate the engine in the (Fast 1) position when picking up general debris.

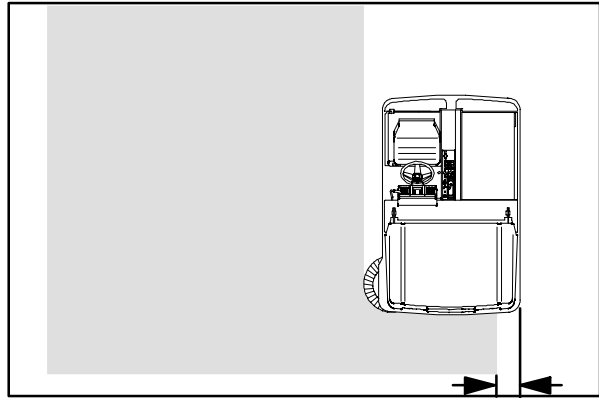
For best results, use the correct brush type for your sweeping application. The following are recommendations for main and side brush applications.

### ***Nylon 8-double Row Main Brush*** -

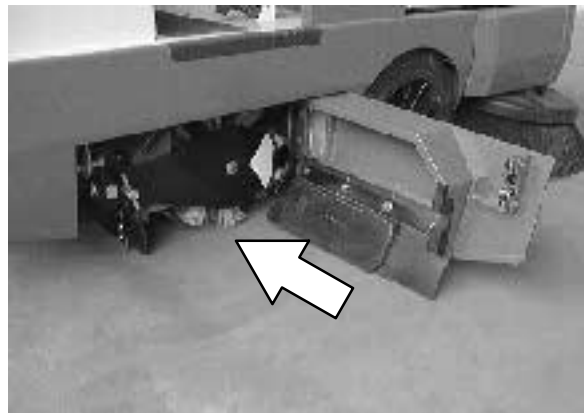
Recommended for general sweeping, and has good hopper loading. Nylon has the longest life of the bristle types. Use this brush for sweeping rough or irregular surfaces.

***Polypropylene and Wire 8-double Row Main Brush*** - The wire bristles loosen slightly packed soilage and heavier debris. The polypropylene bristles sweep up the debris with excellent hopper loading.

***Crinkle Wire 8-double Row Main Brush*** - The stiff wire bristles cut through compacted grime, hard to sweep dirt, and dirt mixed with oil, grease, or mud. This brush is recommended for foundry sweeping where heat may melt synthetic bristles. This brush has good hopper loading ability, but is not recommended for dusty applications.



07817



## OPERATION

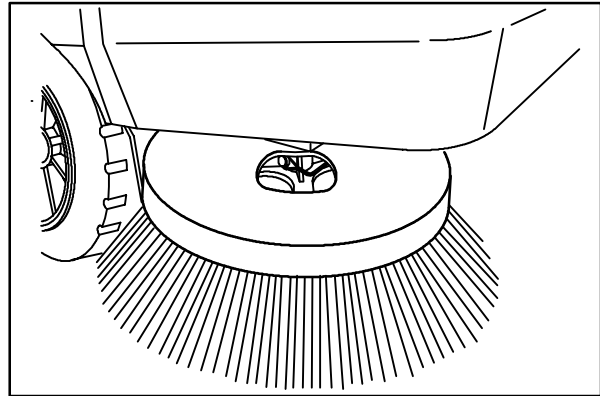
**Nylon 24-row Main Brush** - Recommended for severe dust conditions on rough surfaces. This brush has excellent pickup and long life.

**Fiber and Wire 24-row Main Brush** - Offers good sweeping action and pickup in heavy dust concentrations. This brush is recommended where soilage is slightly encrusted. The brush is not recommended for heavy buildup or hard packed soilage.

**Polypropylene Side Brush** - A good general purpose brush for sweeping of light to medium debris in both indoor and outdoor applications. This brush is recommended when bristles may get wet.

**Nylon Side Brush** - A longer life, general purpose brush that is recommended for rough surfaces.

**Flat Wire Side Brush** - Recommended for outside and curb-side sweeping where soilage is heavy or compacted. The stiff wire bristles dig out soilage. This brush is also recommended for foundry sweeping where heat may melt synthetic bristles.



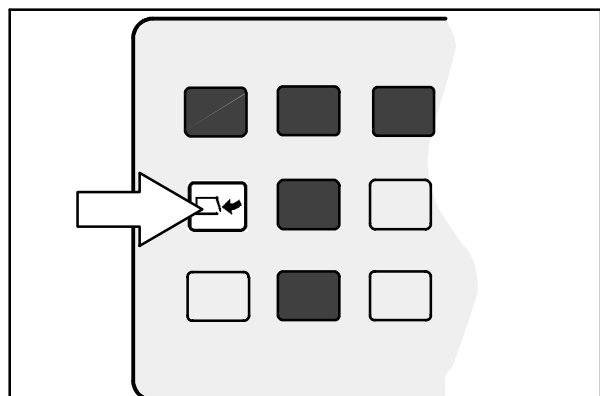
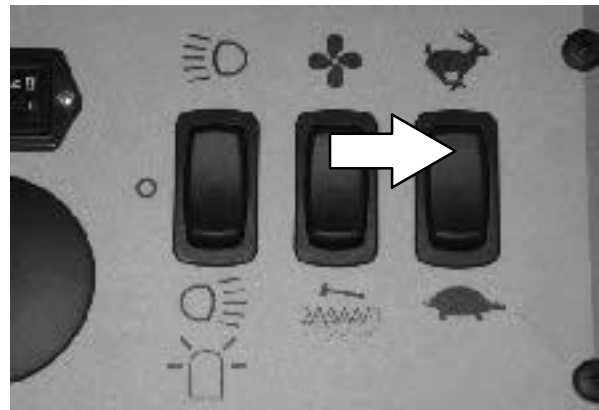
08046

---

## SWEEPING

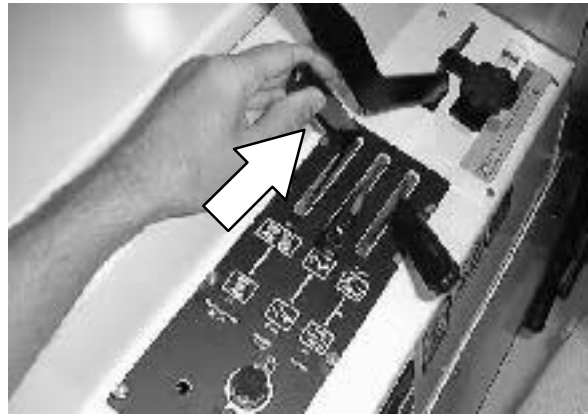
---

1. Select an engine speed.
2. Make sure the hopper door light is off. If the hopper door light is on, open the hopper door.

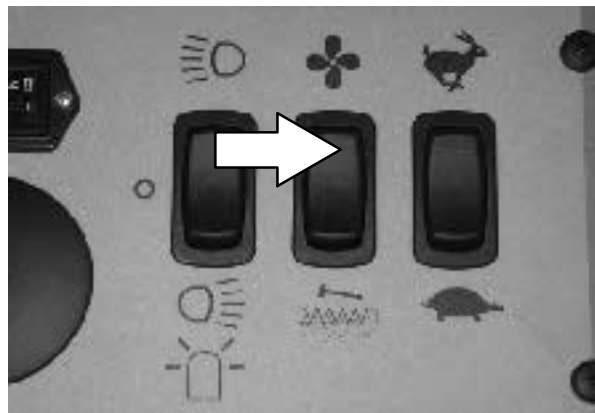




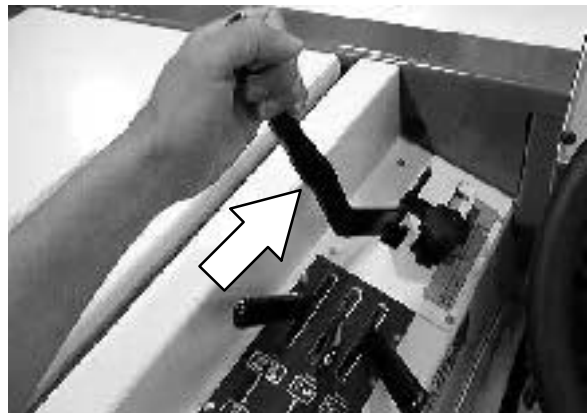
3. Push the main brush and side brush lever into the **On** position, or pull the lever into the **On** position.



4. Press the vacuum fan switch to start the vacuum.

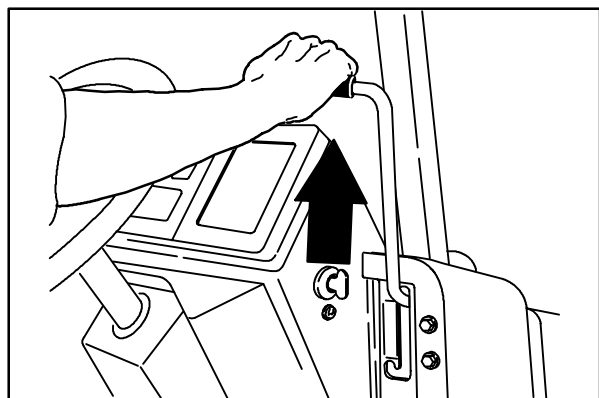


5. Pull the main brush position lever back and to the left into the **Down** position.



6. Pull the side brush position lever back and to the right into the **Down** slot.

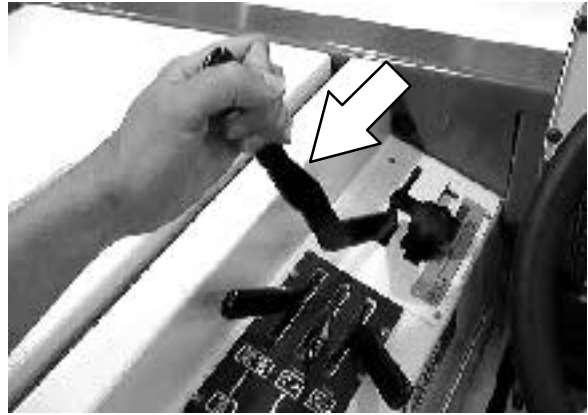
7. Sweep as needed.



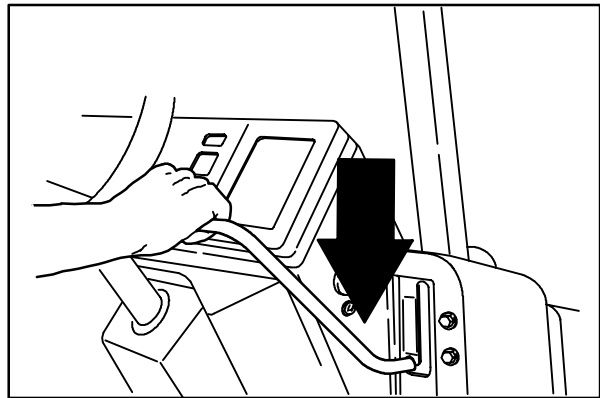
07785

## STOP SWEEPING

1. Pull the main brush position lever all the way back and to the right into the **Up** position.



2. Pull the side brush position lever back and to the left into the **Up** slot.



07786

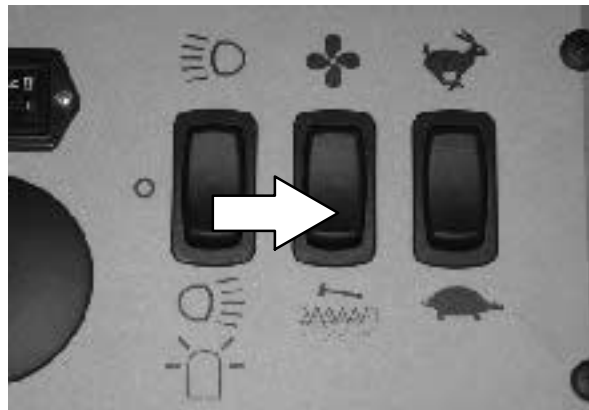
3. Pull the main brush and side brush lever into the middle (Off) position.



4. Pull the hopper door lever into the **Close** position until the hopper door light comes on.

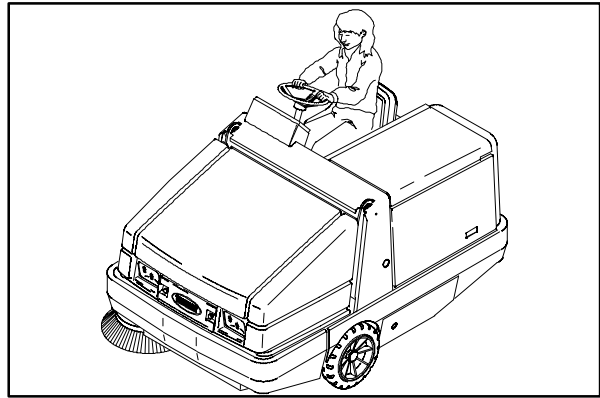


5. Press and hold the filter shaker switch for about 10 seconds to shake the hopper dust filter.



## EMPTYING THE HOPPER

1. Slowly drive the machine to the debris site or debris container.



07816

2. Pull the hopper door lever into the **Close** position until the hopper door light comes on.



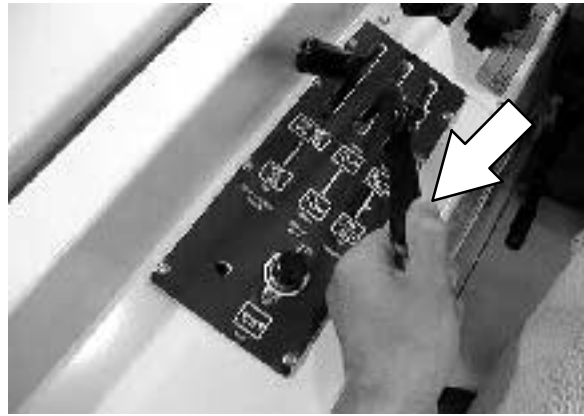
3. Release the hopper door lever into the middle (Hold) position.



- Pull the hopper lift lever into the **Up** position and raise the hopper to the desired height.

**FOR SAFETY: When using machine, make sure adequate clearance is available before raising hopper.**

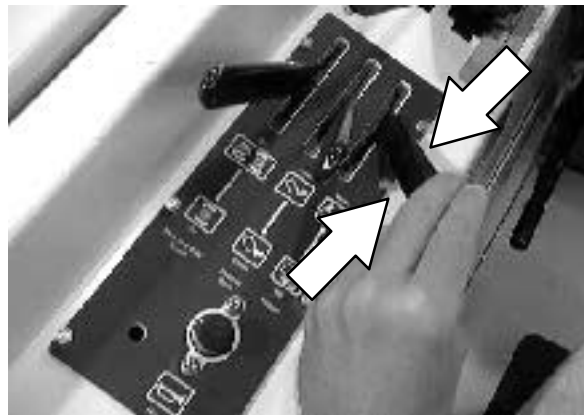
*NOTE: Be aware that the minimum ceiling height needed to high dump the hopper is 2745 mm (9 ft.).*



- Release the hopper lift lever up and into the middle (Hold) position.

**FOR SAFETY: When using machine, move machine with care when hopper is raised.**

- Drive the machine up to the debris container.
- Lower the hopper into the debris container to control dust.
- Push the hopper door lever into the **Open** position and leave it there.

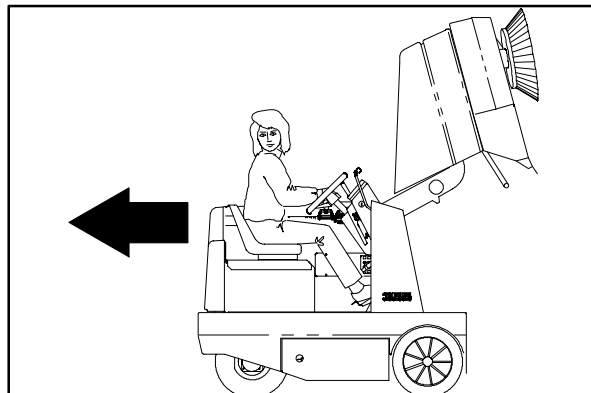


- Raise the hopper enough and/or close the hopper door to clear the top of the debris container.



- Slowly back the machine away from the debris site or debris container.

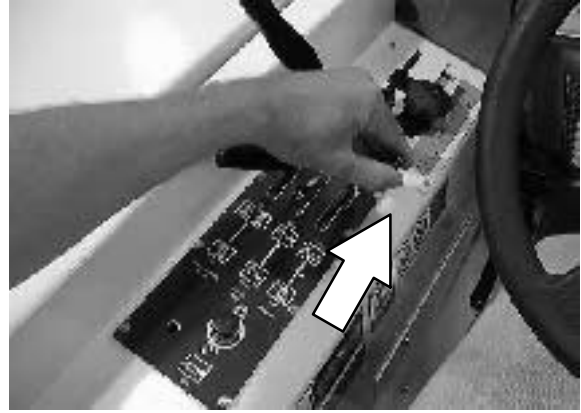
**For Safety: When using machine, use care when reversing machine.**



07999

## OPERATION

11. Push the hopper lift lever into the **Down** position.

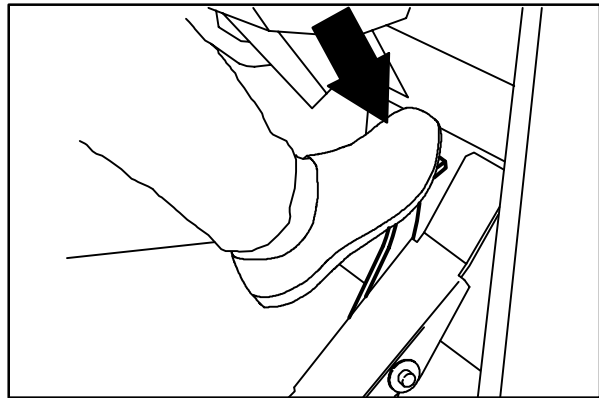


---

### STOP THE MACHINE

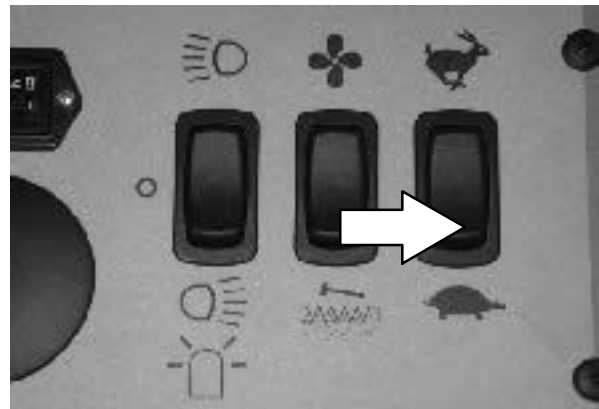
---

1. Stop sweeping.
2. Take your foot off the directional pedal. Step on the brake pedal.

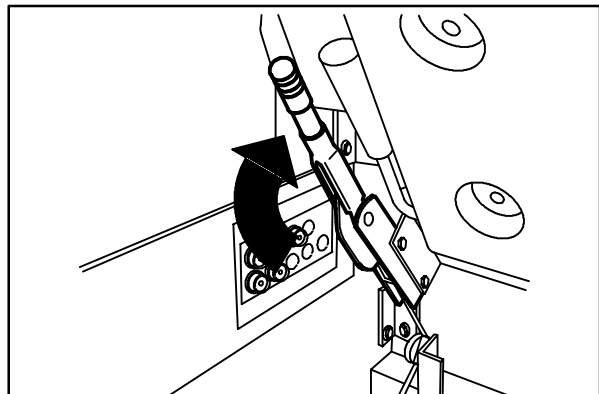


07754

3. Select the (Idle) position with the engine speed switch.



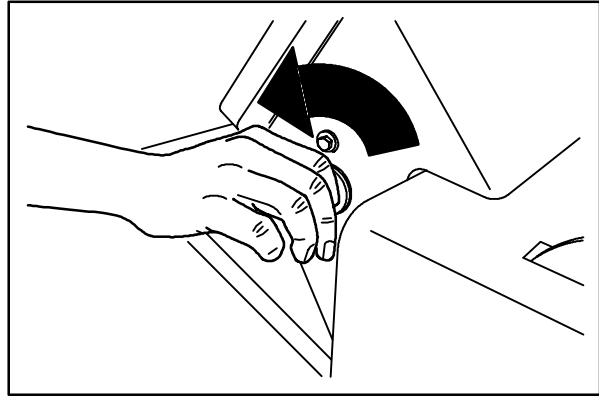
4. Set the machine parking brake.



07794

5. Turn the ignition switch key counter-clockwise to stop the engine. Remove the switch key.

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



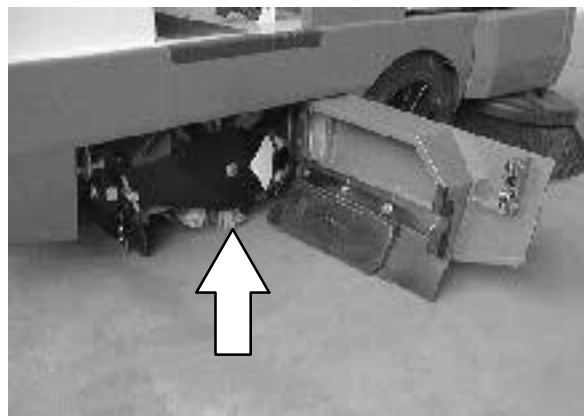
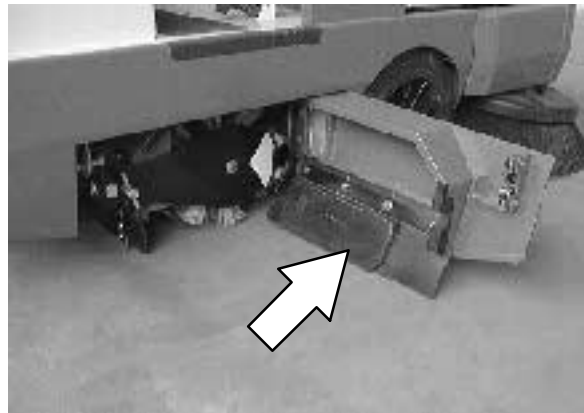
07805

---

**POST-OPERATION CHECKLIST**

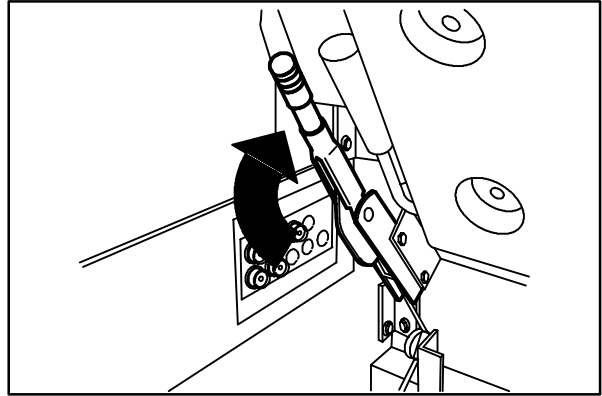
---

- Check the brush skirts for damage, wear, and adjustment.
  
- Check the brushes adjustment. See *TO CHECK AND ADJUST MAIN BRUSH PATTERN* and *SIDE BRUSH* in *MAINTENANCE*.
  
- Check for wire or string tangled on the main and side brushes
  
- Check for fuel odor that indicates a fuel leak.
  
- Check under the machine for leak spots (fuel, oil, coolant).
  
- Check the service records to determine maintenance requirements.



## ENGAGING HOPPER SUPPORT BAR

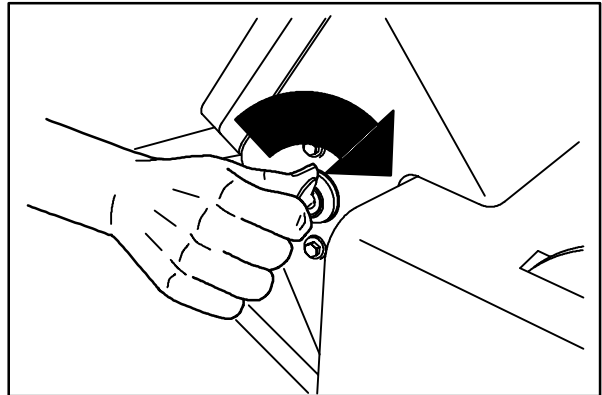
1. Set the machine parking brake.



07794

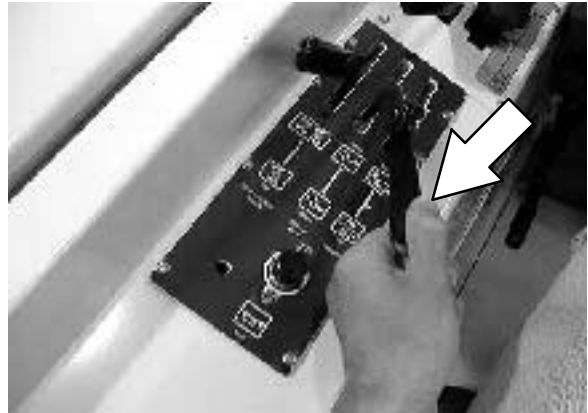
2. Start the engine.

**For Safety: When starting machine, keep foot on brake and directional pedal in neutral.**



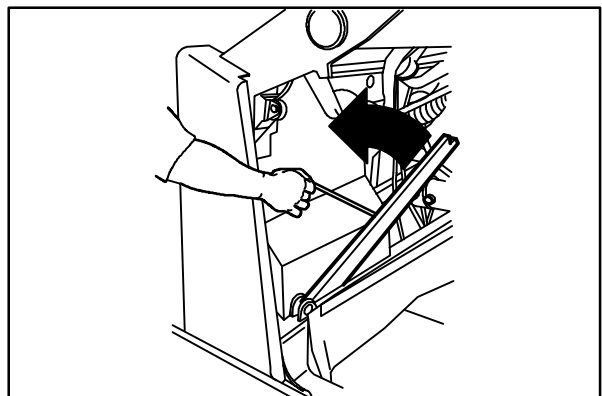
07804

3. Raise the hopper all the way up.



4. Lift and position the hopper support bar under the hopper lift arm.

**⚠ WARNING: Raised hopper may fall. Engage hopper support bar.**

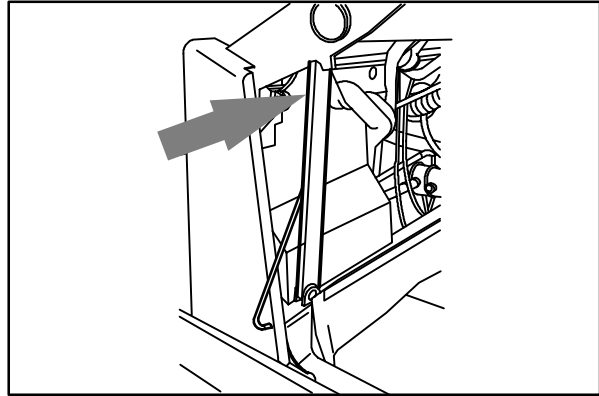


08003



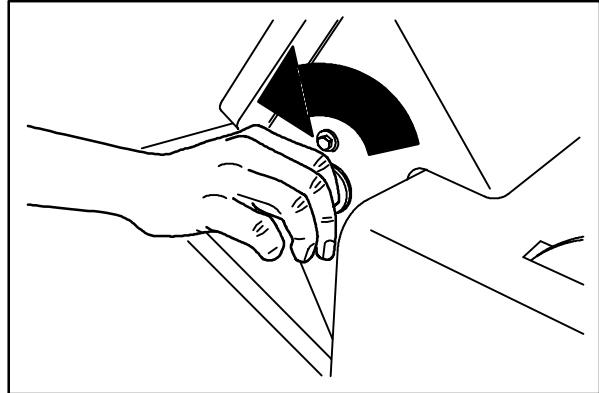
5. Slowly lower the hopper so the lift arm rests on the support bar.

**⚠ WARNING: Lift arm pinch point. Stay clear of hopper lift arms.**



07803

6. Shut the engine off.



07805

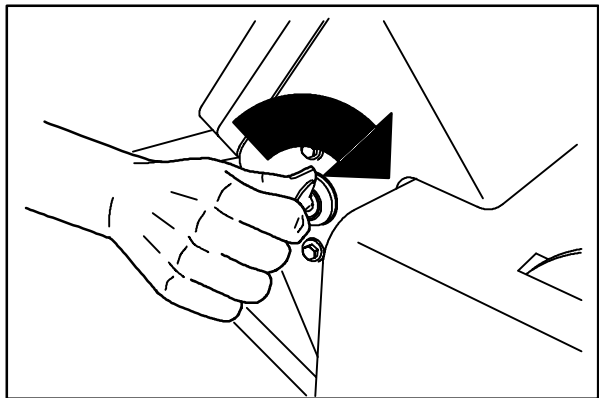
---

**DISENGAGING HOPPER SUPPORT BAR**

---

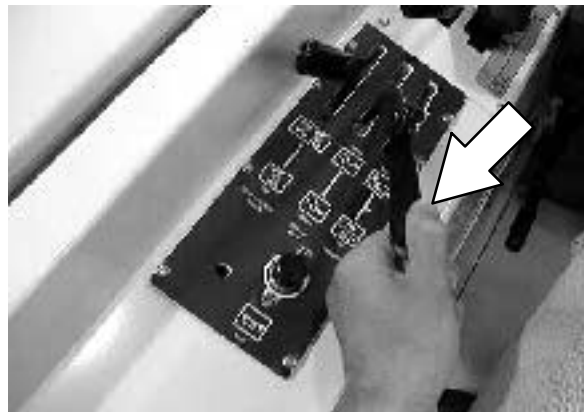
1. Start the engine.

**FOR SAFETY: When starting machine, keep foot on brake and directional pedal in neutral.**



07804

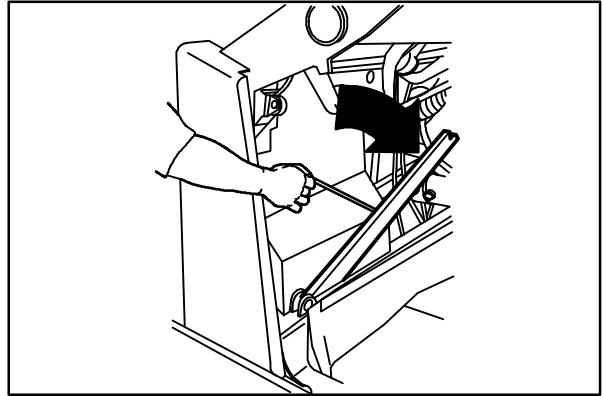
2. Raise the hopper slightly to release the hopper support bar.



## OPERATION

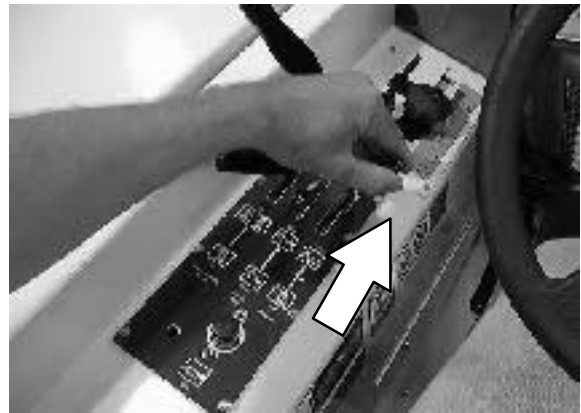
- Put the support bar in its storage position.

**!** **WARNING: Lift arm pinch point. Stay clear of hopper lift arms.**

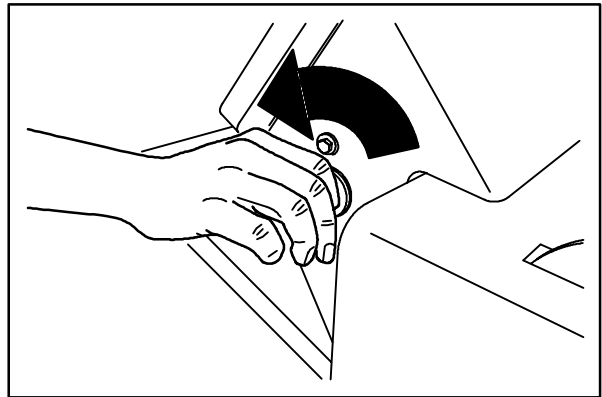


08004

- Lower the hopper.



- Shut the engine off.



07805

---

### OPERATION ON INCLINES

---

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

The maximum rated incline is 6°.

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

---

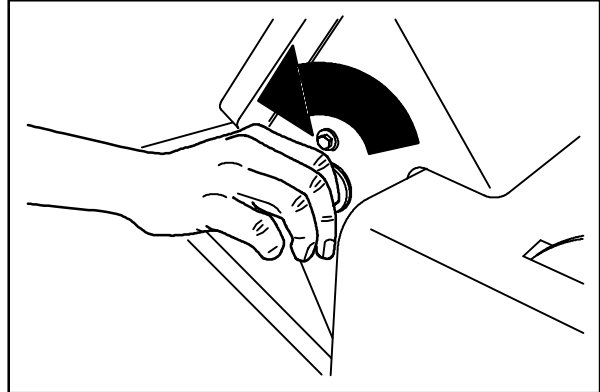
**OPTIONS**

---

**VACUUM WAND**

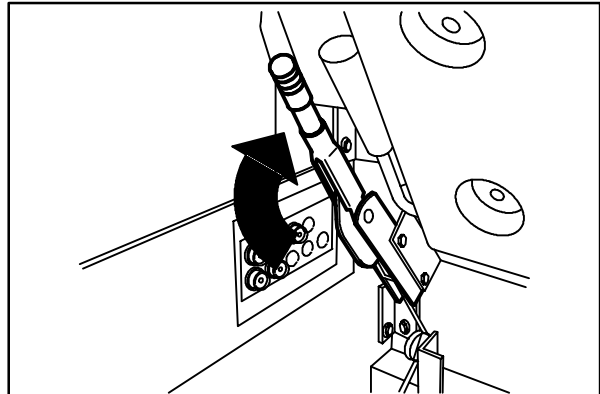
The vacuum wand uses the machine's vacuum system. The vacuum hose and wand allow pick-up of debris that is out of reach of the machine.

1. Stop the machine within reach of the area to be vacuumed.
2. Shut the engine off.



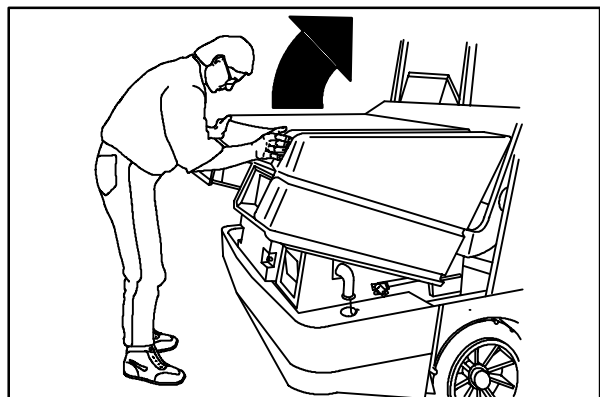
07805

3. Set the machine parking brake.



07794

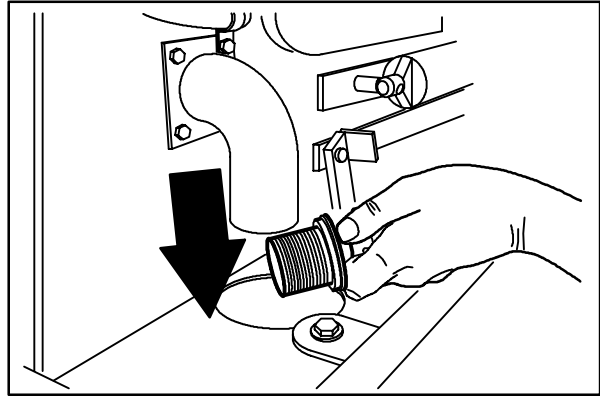
4. Open the hopper cover.



08133

## OPERATION

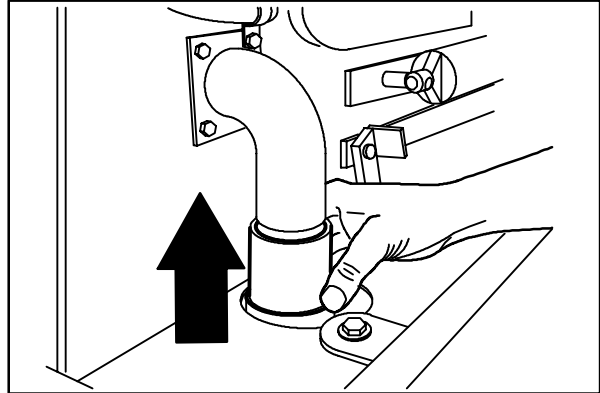
5. Remove the vacuum plug from the side of the hopper.



08134

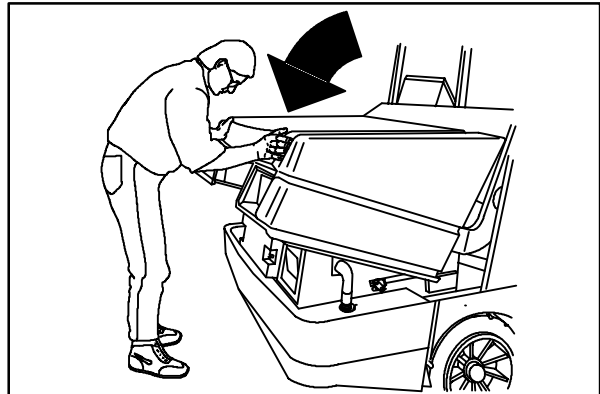
6. Remove the vacuum wand and hose from the mounting clips.

7. Connect the vacuum hose to the hopper connection.



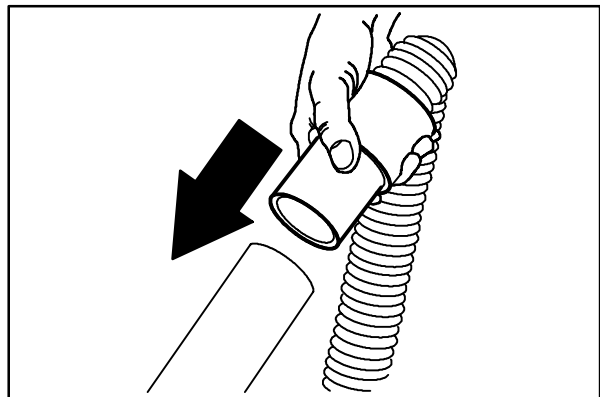
08136

8. Close the hopper cover.



08728

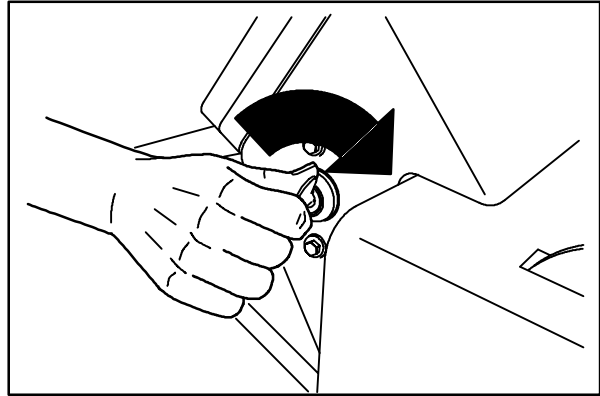
9. Connect the vacuum hose to the vacuum wand.



08138

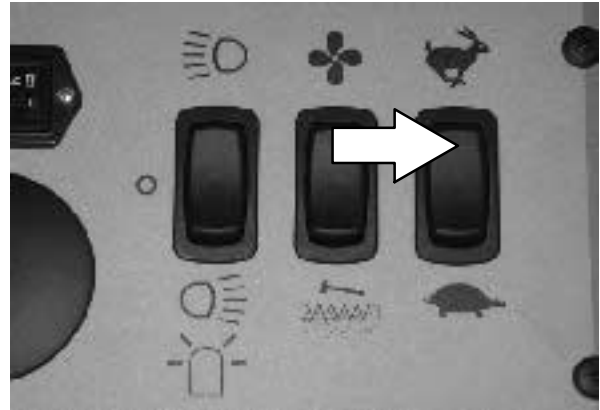
10. Start the engine.

**FOR SAFETY:** When starting machine, keep foot on brake and directional pedal in neutral.



07804

11. Select the (Fast 2) engine speed with the engine speed switch.

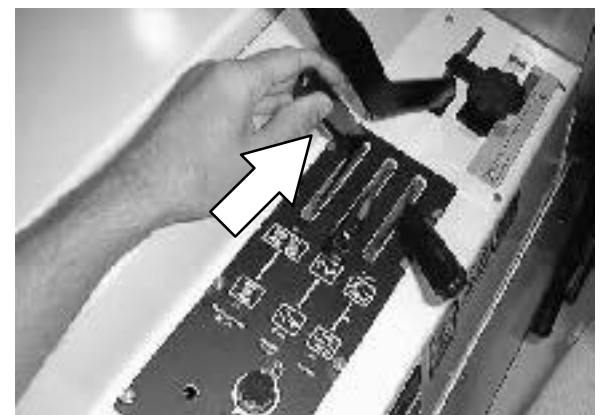


12. Pull and hold the hopper door lever into the **Close** position until the hopper door light comes on.



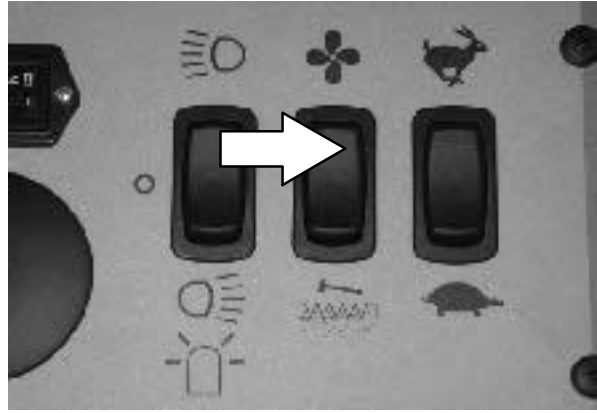
13. Push the main brush and side brush lever into the **On** position.

*NOTE: Always raise the brushes when turning them on for the vacuum wand. This prevents them from making brush marks in the floor.*



## OPERATION

14. Press the vacuum fan switch to start the vacuum.



15. Vacuum the area as needed.

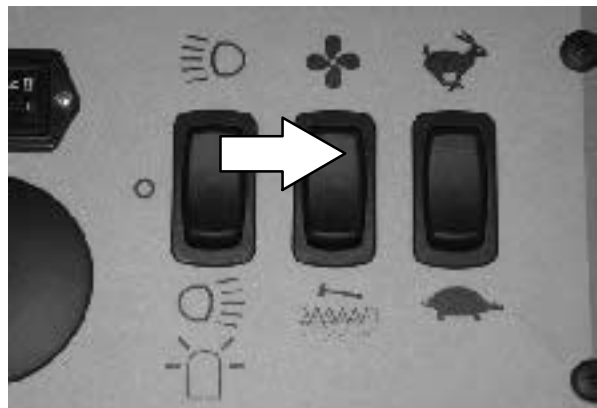


08140

16. Pull the main brush and side brush lever into the middle position.



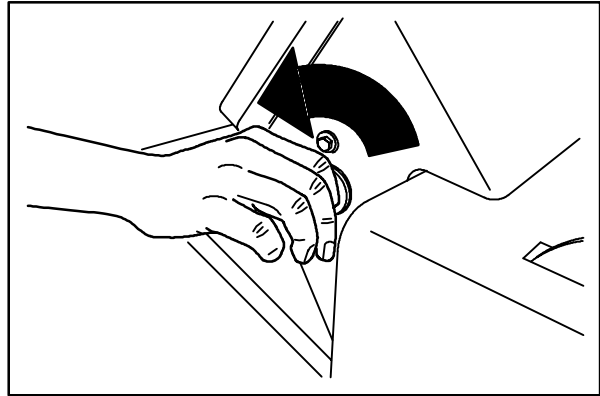
17. Press the vacuum switch to shut off the vacuum.



18. Push the hopper door lever into the **Open** position and leave it there.



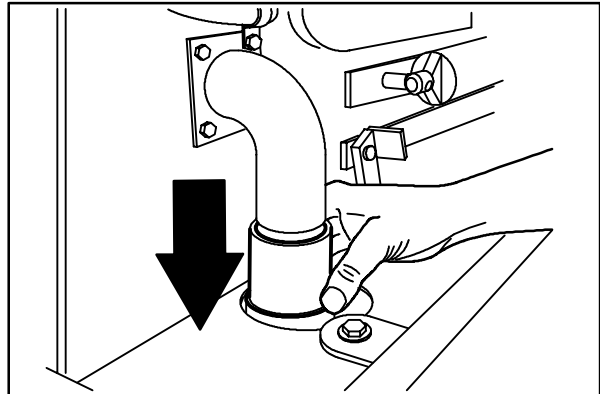
19. Shut the engine off.



20. Open the hopper cover.

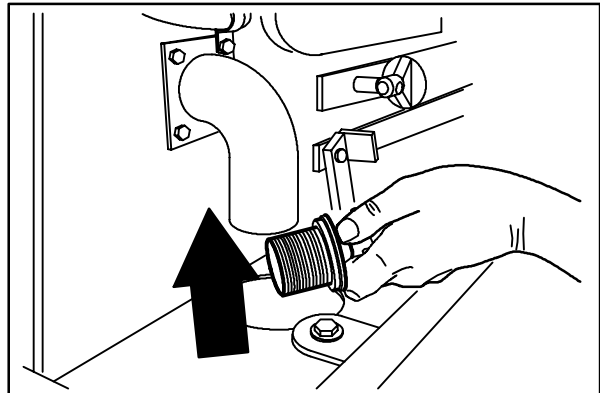
07805

21. Remove the vacuum hose from the hopper connection.



08137

22. Put the vacuum plug in the hopper connection.

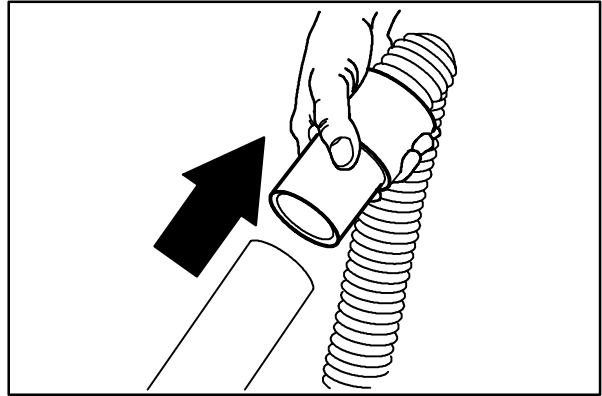


08135

23. Close the hopper cover.

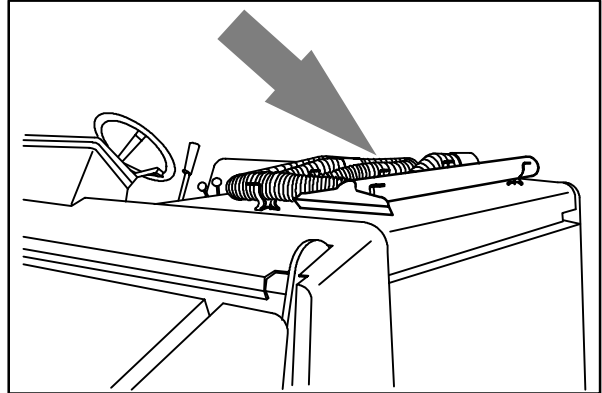
## OPERATION

24. Disconnect the vacuum hose from the vacuum wand.



08139

25. Put the vacuum wand and hose in the mounting clips.



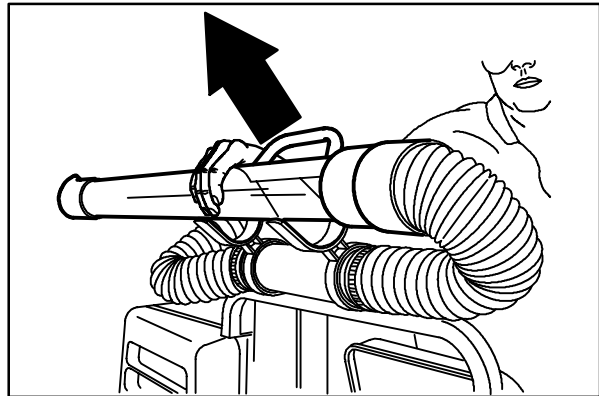
08141



**BLOWER WAND**

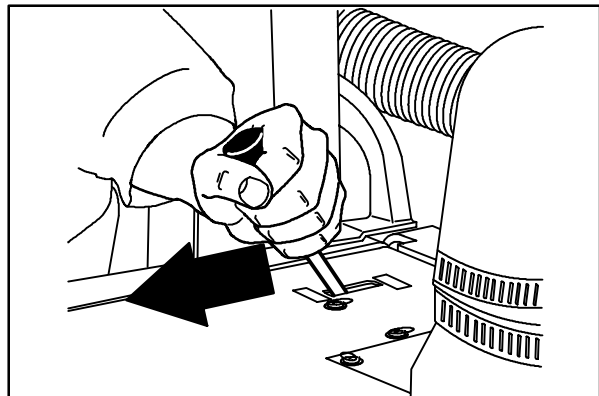
The blower wand uses the machine's vacuum exhaust. The blower wand allows the operator to blow debris out from areas while sweeping with the machine.

1. Remove the blower attachment from the back of the machine.



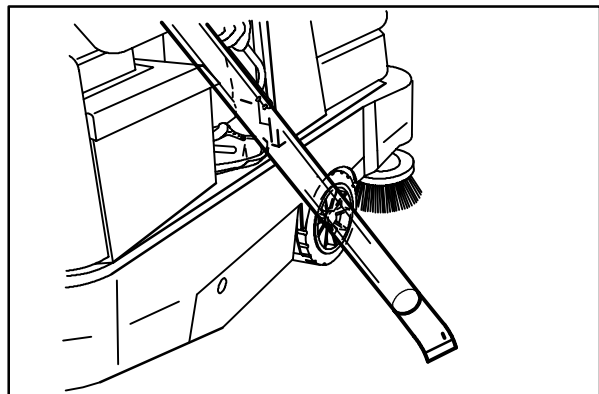
08142

2. Move the lever on the engine cover forward into the **ON** position to start airflow through the wand.



08144

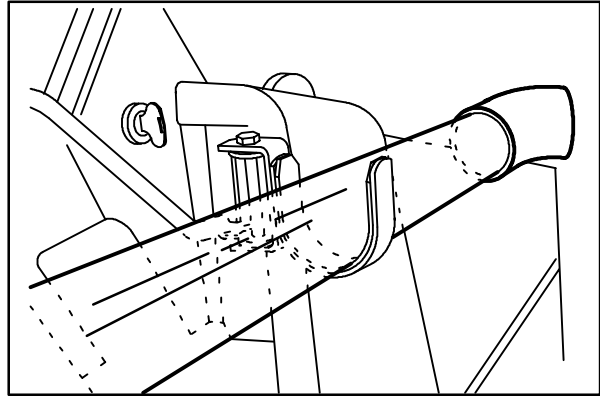
3. Direct the wand into the area of debris.



08146

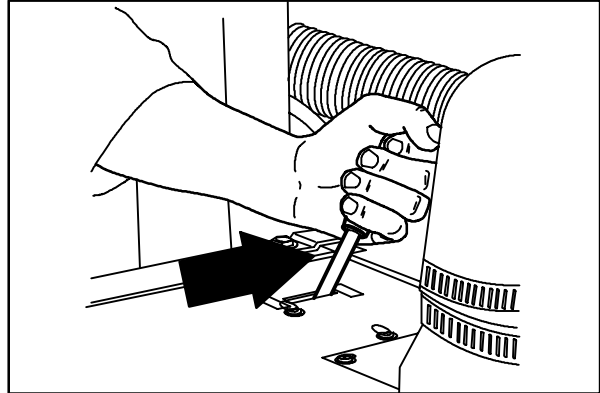
## OPERATION

The operator can rest the wand on the side bracket.



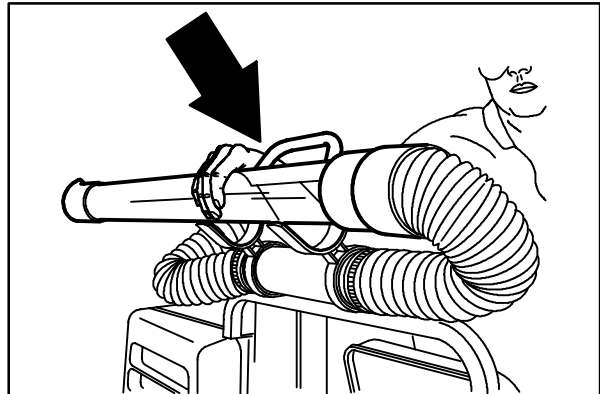
08147

4. Move the lever on the engine cover backward into the **OFF** position to stop airflow through the wand.



08145

5. Put the blower attachment on the back of the machine.

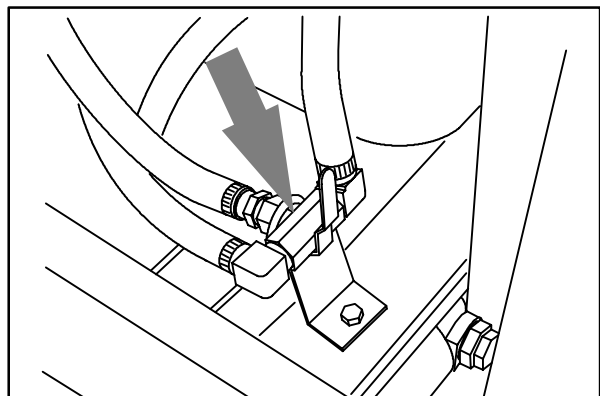


08143

### HEATER VALVE

The heater valve is located at the bottom of the engine compartment. The valve controls the flow of hot coolant to the heater core.

Turning the valve handle 90° to the valve opens the valve, allowing coolant to flow to the heater core. Turning the handle straight with the valve closes the valve, stopping the flow.

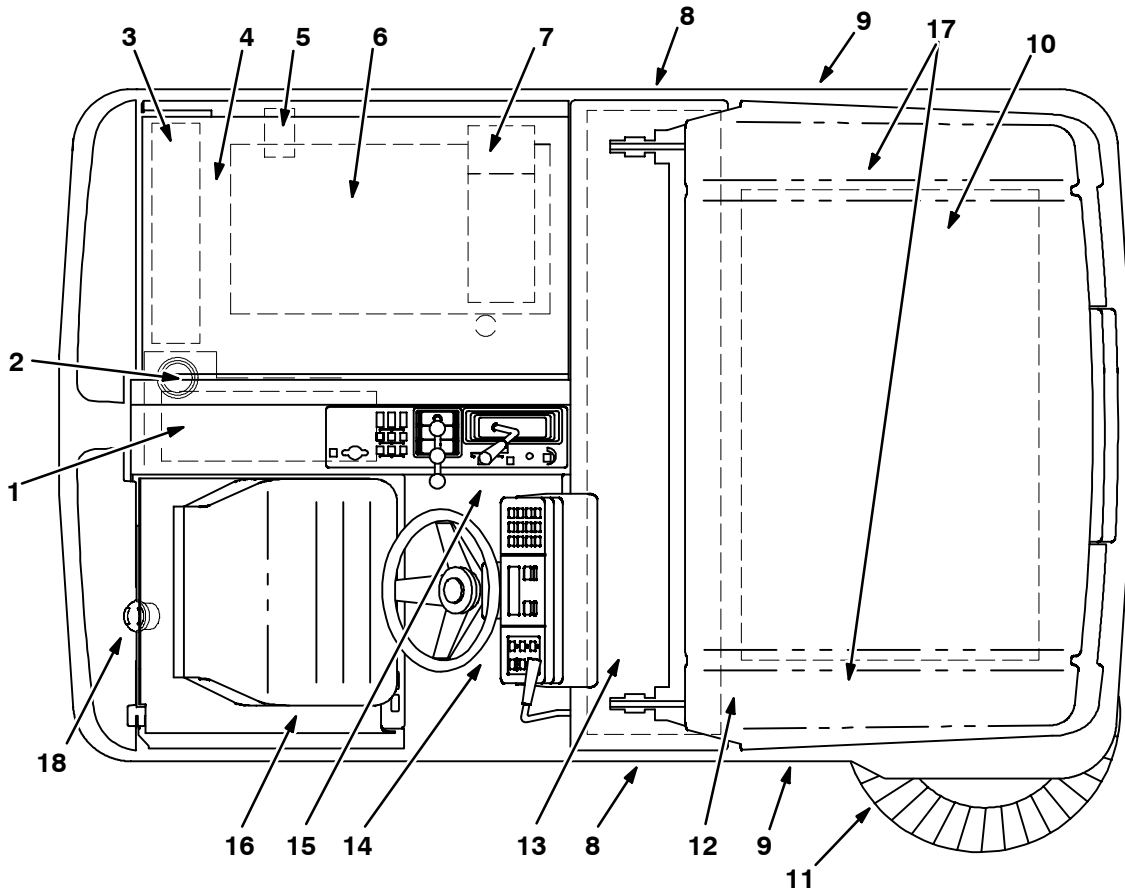


08569

**MACHINE TROUBLESHOOTING**

Problem	Cause	Remedy	
Excessive dusting	Brush skirts and dust seals worn, damaged, out of adjustment	Replace or adjust brush skirts or dust seals	
	Hopper dust filter clogged	Shake and/or clean or replace dust filter	
	Hopper dust filter not shaking clean	Connect shaker solenoid spring	
		Install filter shaker plate correctly	
		Insert shaker solenoid pin into the hole of filter element comb	
	Engine operating at (Fast 2) speed	Operate engine at (Fast 1) speed	
	Vacuum hose damaged	Replace vacuum hose	
	Vacuum fan failure	Contact TENNANT service personnel	
	Hopper door partially or completely closed	Open the hopper door	
Thermo Sentry™ tripped	Reset Thermo Sentry™		
Poor sweeping performance	Brush bristles worn	Replace brushes	
	Main and side brushes not adjusted properly	Adjust main and side brushes	
	Debris caught in main brush drive mechanism	Free drive mechanism of debris	
	Main brush drive failure	Contact TENNANT service personnel	
	Side brush drive failure	Contact TENNANT service personnel	
	Hopper full	Empty hopper	
	Hopper lip skirts worn or damaged	Replace lip skirts	
	Hopper door partially or completely closed	Open the hopper door	
	Wrong sweeping brush	Contact TENNANT representative for recommendations	
	Main brush in <b>Down</b> position	Put main brush in <b>Float</b> position	

**MAINTENANCE**



07747

**MAINTENANCE CHART**

Interval	Key	Description	Procedure	Lubricant/ Fluid	No. of Service Points
Daily	7	Engine air filter	Check indicator	-	1
			Empty dust cap	-	1
	6	Engine crankcase	Check oil level	EO	1
	8	Brush compartment skirts	Check for damage, wear and adjustment	-	5
	12	Hopper lip skirts	Check for damage, wear and adjustment	-	3
	12	Hopper side skirt	Check for damage and wear	-	1
	13	Main brush	Check for damage, wear, and adjustment	-	1
			Check brush pattern	-	1
	11	Side brush	Check for damage, wear, and adjustment	-	1
Check brush pattern			-	1	

Interval	Key	Description	Procedure	Lubricant/ Fluid	No. of Service Points
50 Hours	13	Main brush	Rotate end-for-end	-	1
	6	Fuel pipes and clamps	Check for tightness and wear	-	1
100 Hours	6	Engine crankcase	Change oil and filter	EO	1
	4	Engine fan belt	Check tension	-	1
	10	Hopper dust filter	Check for damage, clean or re- place	-	1
	3	Radiator	Clean core exterior	-	1
			Check coolant level	WG	1
	2	Hydraulic fluid reservoir	Check fluid level	HYDO	1
	1	Rear tire	Check pressure	-	1
	8	Main brush and hopper seals	Check for damage or wear	-	8
200 Hours	3	Radiator hoses and clamps	Check for tightness and wear	-	2
	15	Parking brake	Check adjustment	-	1
	14	Brake pedal	Check and adjust travel	-	1
	1	Rear wheel support bear- ings	Lubricate	SPL	2
	17	Hopper bearings	Lubricate	SPL	2
	11	Side brush guard	Rotate 90°	-	1
400 Hours	9	Front wheel bearings	Check, lubricate, and adjust	SPL	2
	6	Fuel filter	Replace cartridge	-	1
	18	Fuel tank	Remove sediment	-	1
800 Hours	3	Cooling system	Flush	WG	1
	2	Hydraulic fluid reservoir	Replace hydraulic breather	-	1
			Replace suction strainer	-	1
			Change hydraulic fluid	HYDO	1
	5	Hydraulic fluid filter	Change filter element	-	1
	2	Hydraulic hoses	Check for wear and damage	-	31
	1	Propelling motor	*Torque shaft nut	-	1
	1	Rear wheel	*Torque wheel nuts	-	1
16	Battery	*Clean and tighten battery cable connections	-	1	

**LUBRICANT/FLUID**

EO . . . . Engine oil, diesel *rating* above CD grade only

HYDO . . . Tennant Company or approved hydraulic fluid

WG . . . . Water and permanent-type ethylene glycol anti-freeze, -34° C (-30° F)

SPL . . . . Special lubricant, Lubriplate EMB grease (TENNANT part no. 01433-1)

*NOTE: Also check procedures indicted (\*) after the first 50-hours of operation.*

## LUBRICATION

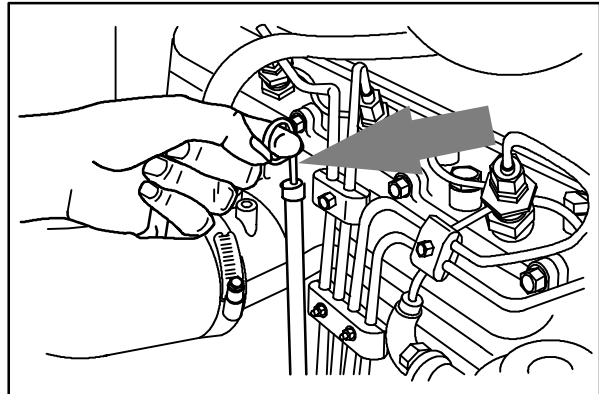
### ENGINE

Check the engine oil level daily. Change the engine oil and oil filter every 100 hours of machine operation. Use engine oil with a diesel rating *above* CD grade only.

The following recommended oil grades are for use in engines during changing seasonal temperatures:

SINGLE AND MULTI-VISCOSITY OILS		
Below 32° F (Below 0° C)	32° to 77° F (0° to 25° C)	Above 77° F (Above 25° C)
10W	20	30
10W30		

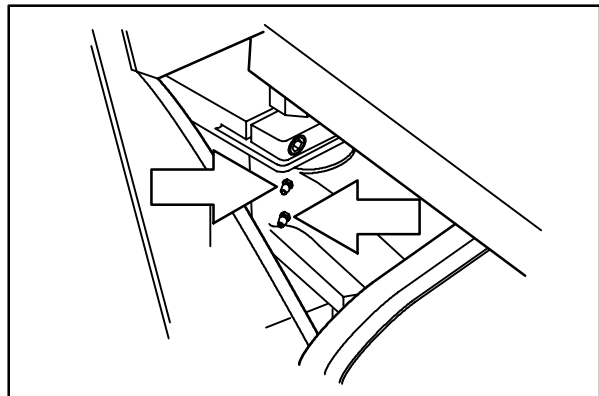
Fill the engine with oil to the level indicated on the oil dipstick. Low oil level is indicated by the mark closest to the end of the dipstick. Full level is indicated by the mark closest to the top of the dipstick. The engine oil capacity is 6 L (6.35 qt) without the oil filter.



08431

### REAR WHEEL SUPPORT

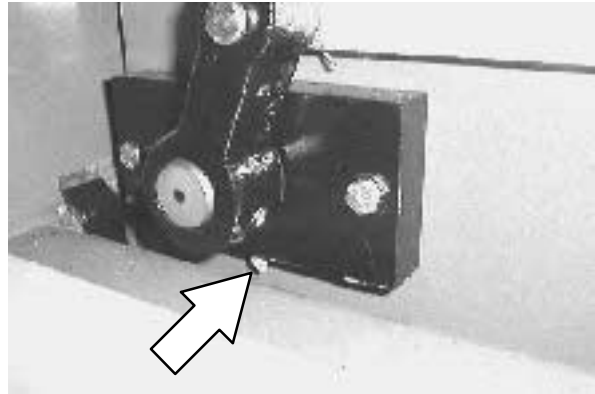
The rear wheel support pivots the rear wheel. The support has two grease fittings for the bearings. The rear wheel support bearings must be lubricated every 200 hours of operation. Use Lubriplate EMB grease (TENNANT part no. 01433-1).



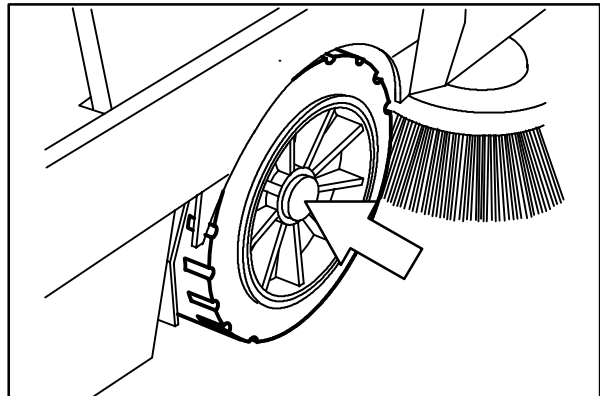
08005

**HOPPER BEARINGS**

The hopper pivots on the hopper bearings whenever the hopper is raised or emptied. The hopper bearings must be lubricated after every 200 hours of operation. Use Lubriplate EMB grease (TENNANT part no. 01433-1).

**FRONT WHEEL BEARINGS**

Inspect the front wheel bearings for seal damage, and repack and adjust every 400 hours of operation. Use Lubriplate EMB grease (TENNANT part no. 01433-1).



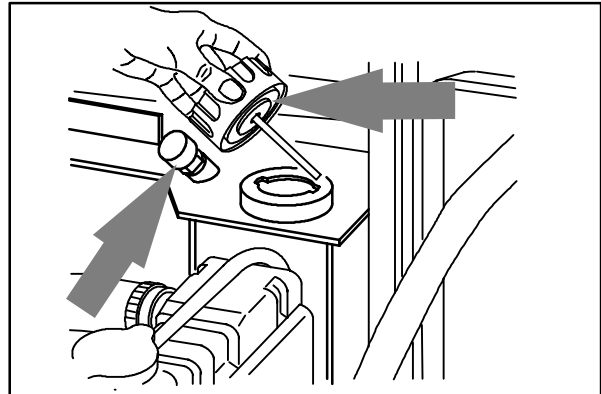
08006

## HYDRAULICS

### HYDRAULIC FLUID RESERVOIR

The reservoir is located in the engine compartment next to the radiator.

Mounted on top of the reservoir is a filler cap with a fluid level dipstick. The reservoir also has a hydraulic breather located next to the filler cap. Replace the hydraulic breather after every 800 hours of operation.

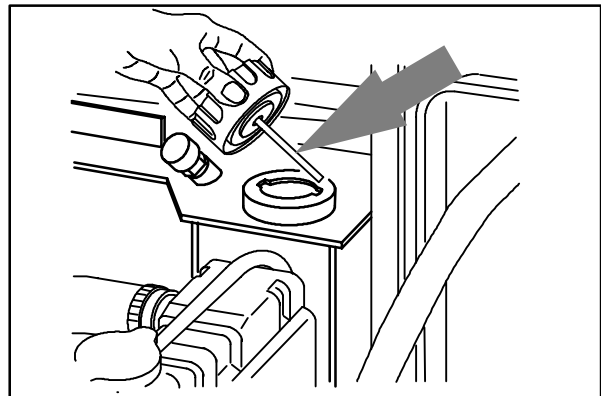


08007

Check the hydraulic fluid level at operating temperature every 100 hours of operation. Make sure the hopper is down when checking hydraulic fluid level. The end of the dipstick is marked with FULL and ADD levels to indicate the level of hydraulic fluid in the reservoir.

Lubricate the filler cap gasket with a film of hydraulic fluid before putting the cap back on the reservoir.

**ATTENTION! Do not overfill the hydraulic fluid reservoir or operate the machine with a low level of hydraulic fluid in the reservoir. Damage to the machine hydraulic system may result.**



07750

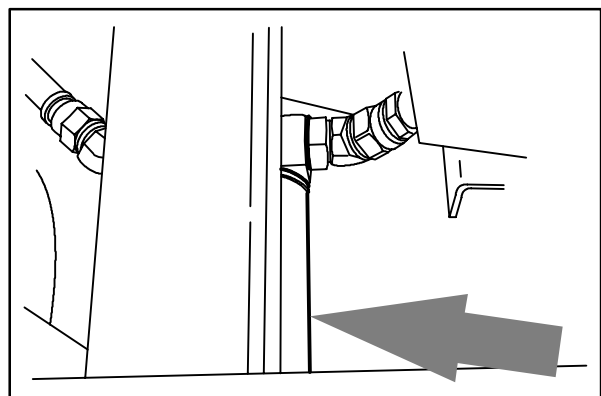
Drain and refill the hydraulic fluid reservoir with new hydraulic fluid every 800 hours of operation.

The hydraulic fluid filter is located at the bottom of the engine compartment. Replace the filter element every 800 hours of operation.

The reservoir has a built-in strainer outlet that filters hydraulic fluid before it enters the system. Replace the strainer every 800 hours of operation.

### HYDRAULIC FLUID

The quality and condition of the hydraulic fluid play a very important role in how well the machine operates. TENNANT's hydraulic fluid is specially selected to meet the needs of TENNANT machines.



08051



TENNANT's hydraulic fluids provide a longer life for the hydraulic components. There are two fluids available for different temperature ranges:

TENNANT part no.	Ambient Temperature
65869	above 7° C (45° F)
65870	below 7° C (45° F)

The higher temperature fluid has a higher viscosity and should not be used at the lower temperatures. Damage to the hydraulic pumps may occur because of improper lubrication.

The lower temperature fluid is a thinner fluid for colder temperatures.

If a locally-available hydraulic fluid is used, make sure the specifications match TENNANT hydraulic fluid specifications. Using substitute fluids can cause premature failure of hydraulic components.

European manufactured machines are filled with locally available hydraulic fluids. Check the label on the hydraulic fluid reservoir.

**ATTENTION! Hydraulic components depend on system hydraulic fluid for internal lubrication. Malfunctions, accelerated wear, and damage will result if dirt or other contaminants enter the hydraulic system.**

**HYDRAULIC HOSES**

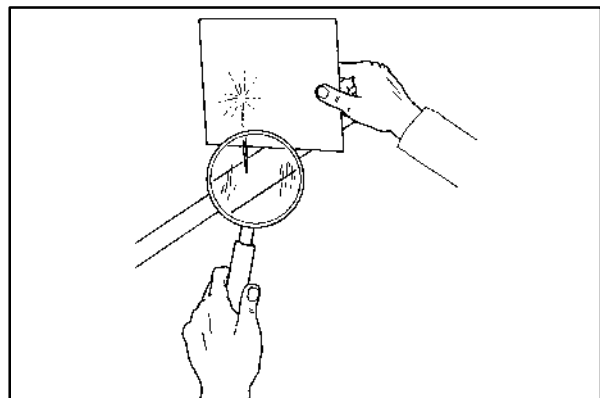
Check the hydraulic hoses every 800 hours of operation for wear or damage.

Fluid escaping at high pressure from a very small hole can be almost invisible, and can cause serious injuries.

See a doctor at once if injury results from escaping hydraulic fluid. Serious infection or reaction can develop if proper medical treatment is not given immediately.

**FOR SAFETY: When servicing machine, use cardboard to locate leaking hydraulic fluid under pressure.**

If you discover a fluid leak, contact your mechanic/supervisor.



00002

**PROPELLING MOTOR**

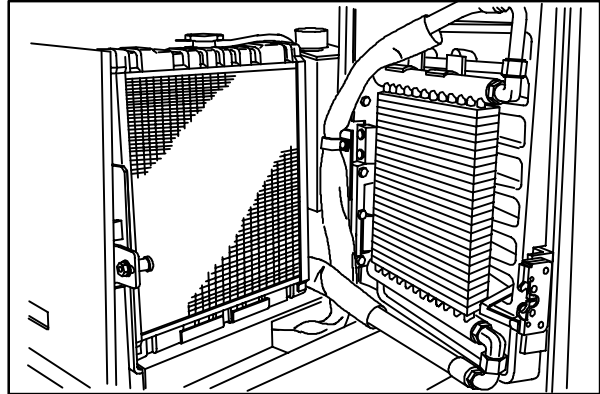
Torque the shaft nut to 270 Nm (200 ft. lb) after the first 50-hours of operation, and every 800 hours there after.

## ENGINE

### COOLING SYSTEM

Check the radiator core exterior for debris every 100 hours of operation. Blow or rinse all dust, which may have collected on the radiator, in through the grille and radiator fins, opposite the direction of normal air flow. The grille and hydraulic cooler open for easier cleaning. Be careful not to bend the cooling fins when cleaning. Clean thoroughly to prevent the fins becoming encrusted with dust. Clean the radiator and cooler only after the radiator has cooled to avoid cracking.

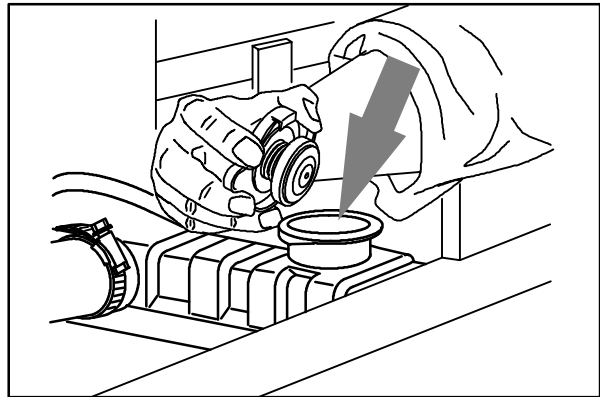
**FOR SAFETY: When servicing machine, wear eye and ear protection when using pressurized air or water.**



07809

Check the radiator coolant level every 100 hours of operation. Use clean water mixed with a permanent-type, ethylene glycol antifreeze to a  $-34^{\circ}\text{C}$  ( $-30^{\circ}\text{F}$ ) rating.

**FOR SAFETY: When servicing machine, avoid contact with hot engine coolant.**



07752

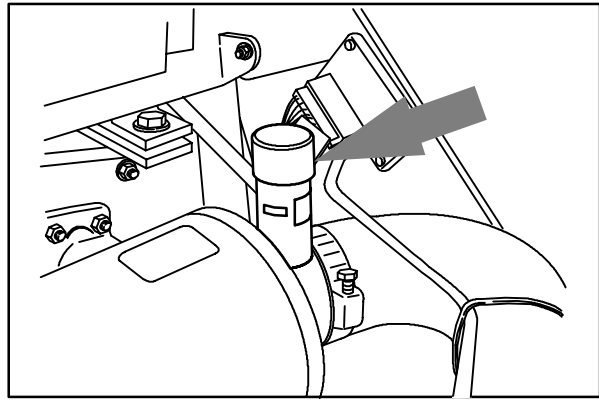
Check the radiator hoses and clamps every 200 hours of operation. Tighten the clamps if they are loose. Replace the hoses and clamps if the hoses are cracked, harden, or swollen.

Flush the radiator and the cooling system every 800 hours of operation, using a dependable cleaning compound.

**AIR FILTER INDICATOR**

The air filter indicator shows when to replace the air filter element. Check the indicator daily. The indicator's red line will move as the air filter element fills with dirt. Do not replace the air filter element until the red line reaches 5 kPa (20 in H<sub>2</sub>O) and the "SERVICE WHEN RED" window is filled with red. The indicator's red line may return to a lower reading on the scale when the engine shuts off. The red line will return to a correct reading after the engine runs for a while.

Reset the air filter indicator by pushing the reset button on the end of the indicator after replacing the air filter element.



07808

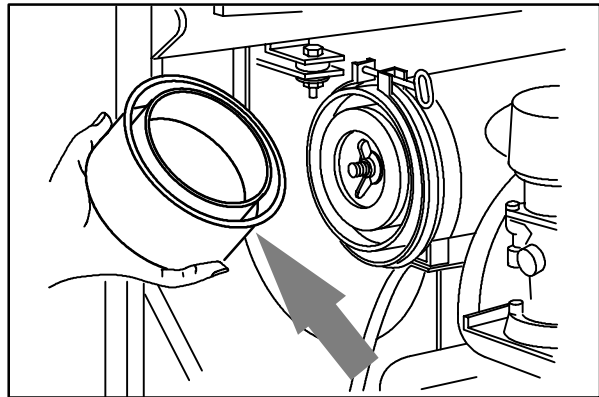
**AIR FILTER**

The engine air filter housing has a dust cap and a dry cartridge-type air filter element. Empty the dust cap daily. The air filter must be replaced whenever the filter element is damaged or when the air filter indicator shows a restriction. The air filters cannot be cleaned.

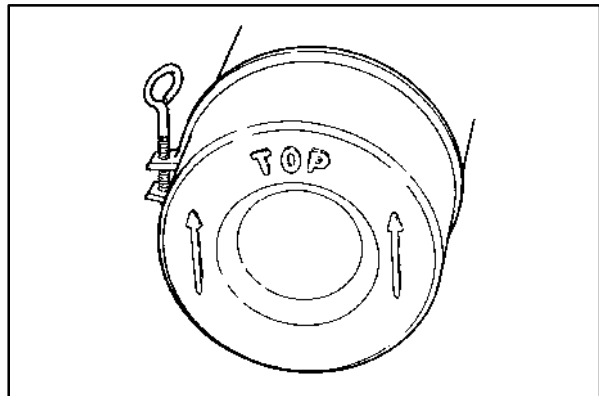
Machines have a heavy duty air filter safety element. It is inside the standard element. Replace this element after the regular element has been damaged or changed three times.

Install the dust cap on the air filter housing with the arrows pointing up.

Replace the air filter element only when the air filter indicator shows restriction in the air intake system. Do not remove the air filter element from the housing unless it is restricting air flow.



08008



02492

### FUEL FILTER

The fuel filter cartridge filters impurities from the fuel. It is located on the left side of the engine.

Replace the fuel filter element every 400 hours of operation.

**FOR SAFETY: When servicing machine, keep flames and sparks away from fuel system service area. Keep area well ventilated.**

### FUEL PIPES

Check the fuel pipes every 50 hours of operation. If the clamp band is loose, apply oil to the screw of the band, and securely tighten the band.

Made of rubber, the fuel pipes become worn out whether the engine has been used much or not. Replace the fuel pipes and clamp bands every two years.

If the fuel pipes and clamp bands are found worn or damaged before two years' time, replace or repair them at once. Bleed the fuel system after replacement of any of the fuel pipes, see *TO PRIME THE FUEL SYSTEM*. When the fuel pipes are not installed, plug both ends with clean cloth or paper to prevent dirt from entering the pipes. Dirt in the pipes can cause fuel injection pump malfunction.

### PRIMING FUEL SYSTEM

Typical diesel fuel systems require priming to remove pockets of air in the fuel lines and fuel components. This is usually required after running out of fuel, changing fuel filter elements or repairing a fuel system component. Air in the fuel system prevents smooth engine operation.

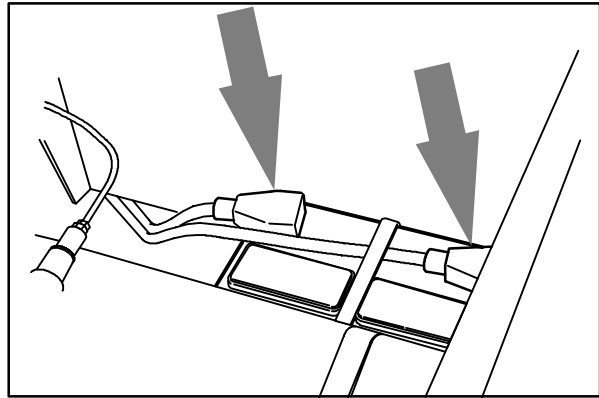
This fuel system however is self-priming. The return line comes from the top of the injector which causes all air to escape through the return line.

**BATTERY**

The battery for the machine is a low maintenance battery. Do not add water to the battery or remove the battery vent plugs.

After the first 50 hours of operation, and every 800 hours after that, clean and tighten the battery connections.

**For Safety: When servicing machine, avoid contact with battery acid.**



08050

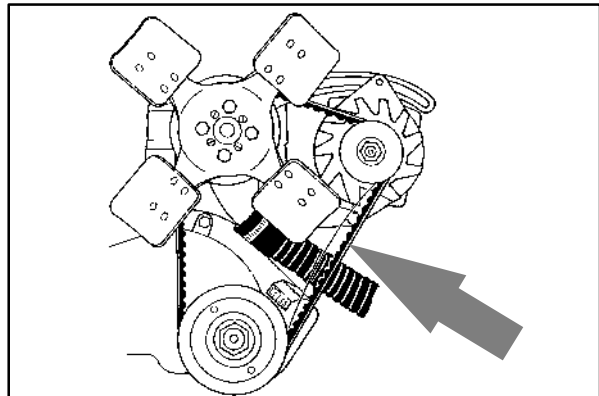
**BELTS AND CHAINS**

**ENGINE FAN BELT**

The engine fan belt is driven by the engine crankshaft pulley and drives the engine fan and alternator pulleys. Proper belt tension is obtained when the belt deflects 7 to 9 mm (0.28 to 0.35 in) from a force of 10 kg (22 lb) applied at the mid-point of the longest span.

Check and adjust the belt tension every 100 hours of operation.

 **WARNING: Moving belt and fan. Keep away.**

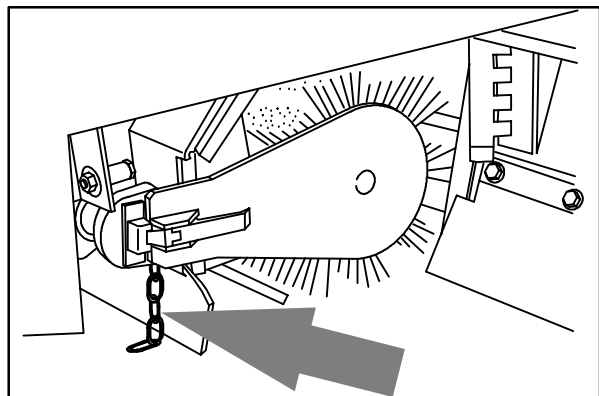


00577

**STATIC DRAG CHAIN**

A static drag chain prevents the buildup of static electricity in the machine. The chain is attached to the machine by a rear main brush skirt retaining bolt.

Make sure the chain is touching the floor at all times.



08009

## DEBRIS HOPPER

---

### HOPPER DUST FILTER

The dust filter filters the air pulled up from the hopper. The dust filter is equipped with a shaker to remove the accumulated dust particles. The dust filter shaker is operated by the filter shaker switch.

The standard dust filter works very well for normal sweeping applications. The synthetic filter works well for humid or wet applications. The surface load filter works well for heavy fine dust applications. It keeps the dust on the outer surface of the filter, making filter shaking more effective.

Shake the dust filter before emptying the hopper and at the end of every work shift. Check and clean or replace the dust filter every 100 hours of operation.

To clean the dust filter, use one of the following methods:

- SHAKING – Press the filter shaker switch.
- TAPPING – Tap the filter gently on a flat surface with the dirty side down. Do not damage the edges of the filter element or the filter will not seat properly in the filter frame.
- AIR – Always wear eye protection when using compressed air. Blow air through the dust filter opposite the direction of the arrows. Never use more than 690kPa (100 psi) of air pressure and never closer than 50 mm (2 in) away from the filter. This may be done with the dust filter in the machine.

**FOR SAFETY: When servicing machine, wear eye and ear protection when using pressurized air or water.**

- WATER – Rinse the synthetic filter with a low pressure garden hose through the dust filter opposite the direction of the arrows. Both the standard and surface load dust filters can also be rinsed, but the filters will degrade with each rinsing and should be replaced after rinsing five times.

*NOTE: Be sure the dust filter is dry before reinstalling it in the machine.*



**TO REPLACE HOPPER DUST FILTER**

1. Stop the engine and set the machine parking brake.

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

2. Open the hopper cover.
3. For machines with the metal hopper, remove the four knobs, washers and the two retaining brackets from the filter cover.



4. Disconnect the filter shaker wire. For machines with the metal hopper, lift the dust filter cover for access to the wire.

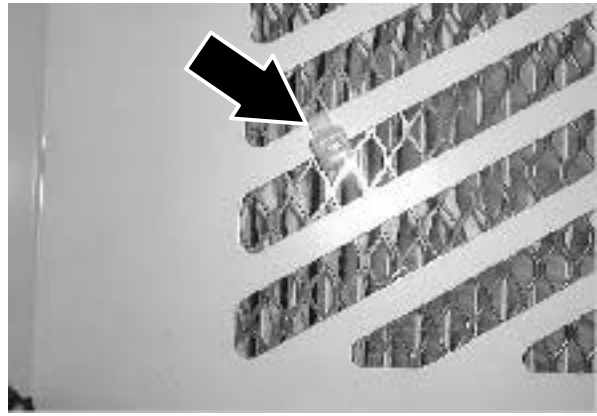


5. Lift the dust filter element assembly out from the hopper.

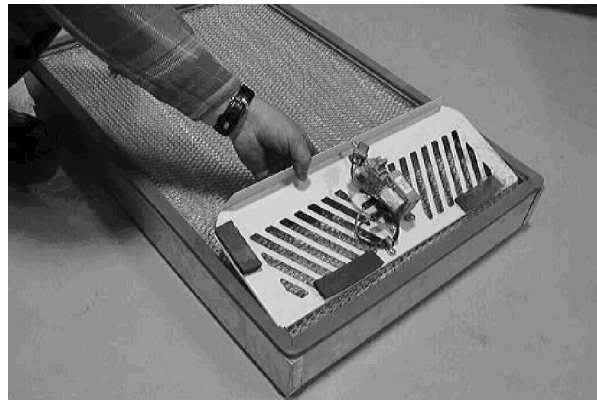


## MAINTENANCE

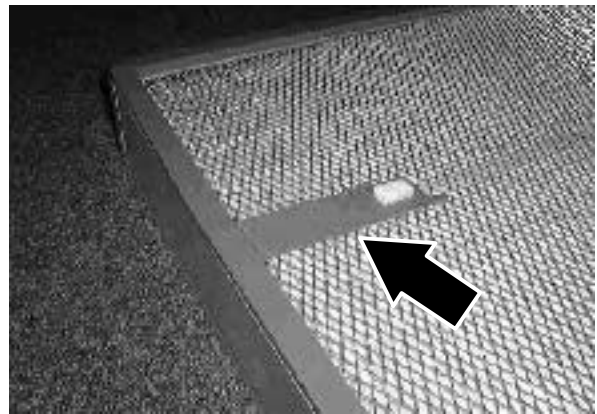
6. Cut the four cable ties that are holding the filter shaker plate to the element.



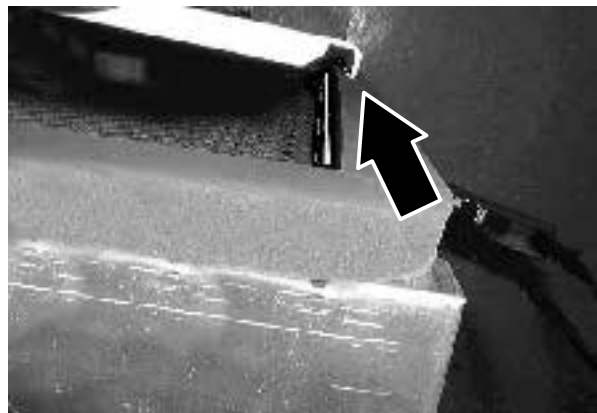
7. Remove the filter shaker plate from the dust filter element.
8. Clean or discard the dust filter element as required.



9. Remove the shipping tab from the dust filter element if a new element will be inserted into the machine.

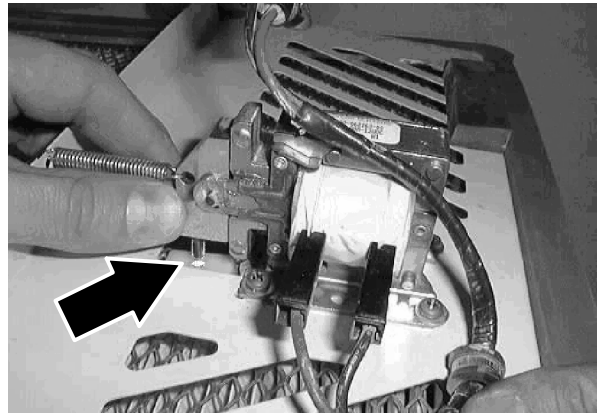


10. Place the filter shaker plate onto the new or cleaned dust filter element. Make sure the lip on the filter shaker plate is fastened over the lip on the dust filter element.

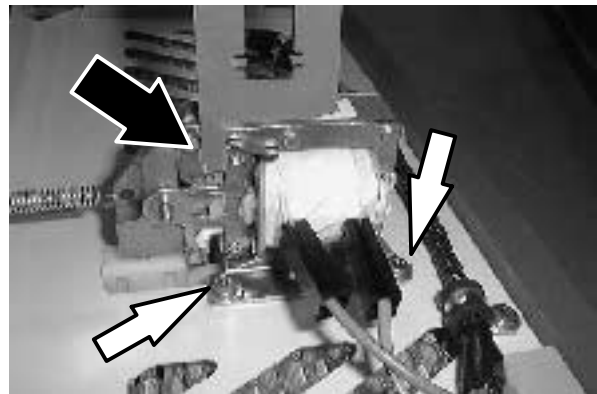




11. Insert the pin from the shaker into the hole on the dust filter element comb.



12. Check the shaker solenoid gap with the end of the shipping tab. The gap should be the same width as the tab. If it is not, loosen the mounting screws, adjust the gap by repositioning the shaker solenoid, then tighten the screws.



13. Place the dust filter element assembly into the hopper and reconnect the filter shaker wire. Fasten the assembly to the element with four new cable ties.
14. For machines with the metal hopper, center the dust filter cover over the element, then push the cover back until the rear vacuum fan seal is pressed against the hopper insert.
15. For machines with the metal hopper, fasten the dust filter cover onto the element with the retainer brackets, washers, and knobs.

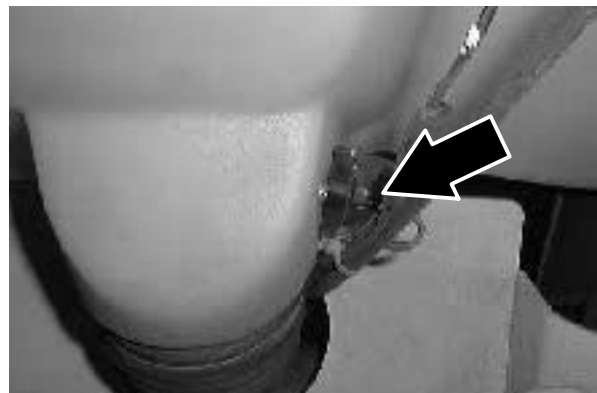


16. Close the hopper cover.

**THERMO SENTRY™**

The Thermo Sentry™ senses the temperature of the air pulled up from the hopper. If there is a fire in the hopper, the Thermo Sentry™ stops the vacuum fan and cuts off the air flow.

Reset the Thermo Sentry™ by pushing in its reset button.



## BRUSHES

---

### MAIN BRUSH

The main brush is cylindrical and spans the width of the machine, sweeping debris into the hopper.

Check the brush daily for wear or damage. Remove any string or wire tangled on the main brush, main brush drive hub, or main brush idler hub.

Check the main brush pattern daily. The pattern should be 50 to 65 mm (2.0 to 2.5 in) wide with the main brush in the **Down** position.

**(For machines below serial number 020000)**

Adjust the main brush pattern by turning the main brush pressure knob located next to the brush position lever.

Rotate the main brush end-for-end every 50 hours of operation for maximum brush life and best sweeping performance.

Replace the main brush when the remaining bristles measure 30 mm (1.25 in) in length.

**(For machines serial number 020000 and above)**

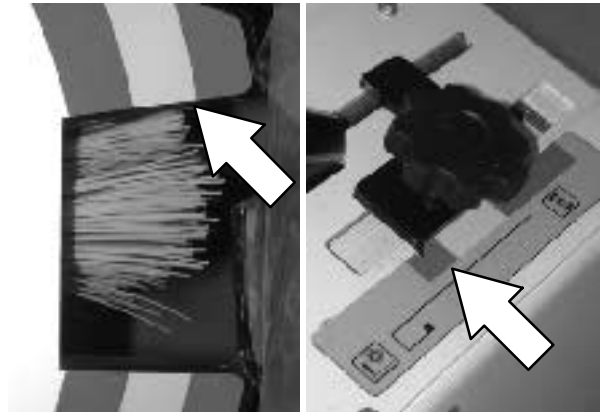
Adjust the main brush pattern by setting the main brush adjustment plate.

Note the length of the main brush bristles with the color band on the brush idler plate before moving the main brush adjustment knob.

Align the pointer from the plate located under the knob, to match the same color band as the brush idler plate.

Rotate the main brush end-for-end every 50 hours of operation for maximum brush life and best sweeping performance.

Replace the main brush when the remaining bristles measure 50 mm (2.0 in) in length.



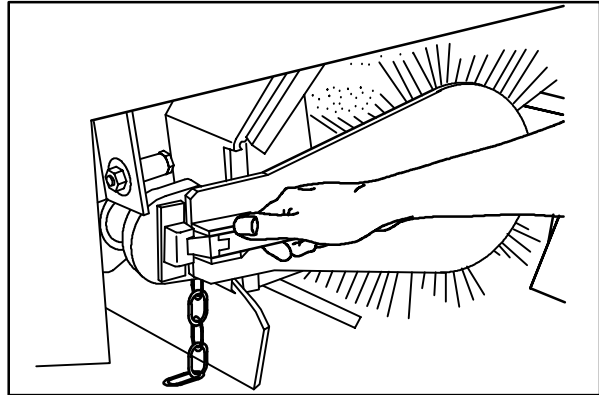
**TO REPLACE MAIN BRUSH**

(For machines below serial number 020000)

1. Stop the engine and set the machine parking brake.

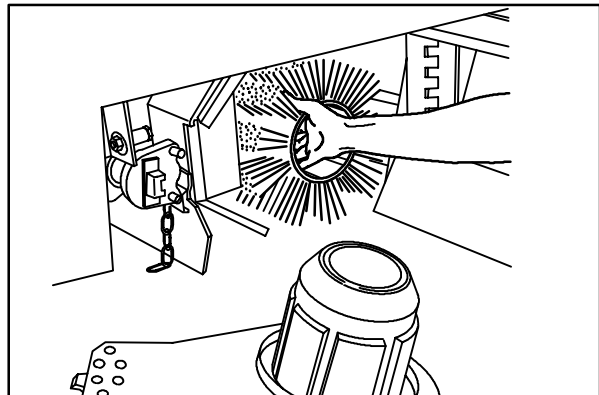
**FOR SAFETY: Before leaving or servicing machine; stop on level surface, set parking brake, turn off machine and remove key.**

2. Raise the main brush.
3. Open the right side main brush access door.
4. Unlatch and remove the brush idler plate.

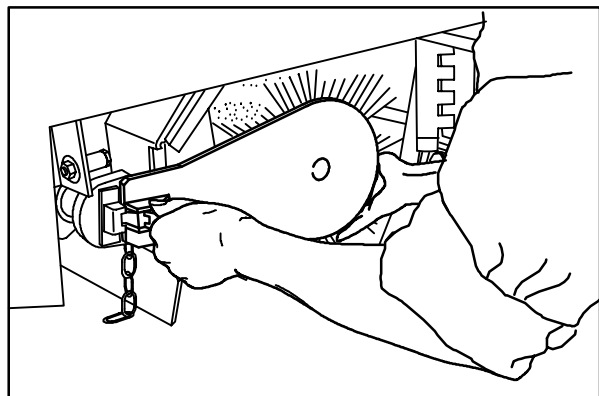


08016

5. Grasp the main brush; pull it off the brush drive plug and out of the main brush compartment.
6. Put the new or rotated end-for-end main brush on the floor next to the access door.
7. Slide the main brush onto the drive plug. Rotate the brush until it engages the drive plug, and push it all the way onto the plug.
8. Slide the main brush idler plate plug onto the main brush.
9. Latch the idler plate onto the machine frame.
10. Close the right side main brush access door.



08017



08018

## MAINTENANCE

### TO REPLACE MAIN BRUSH

(For machines serial number 020000 and above)

1. Stop the engine and set the machine parking brake.

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

2. Raise the main brush.
3. Open the right side main brush access door.
4. Unscrew and remove the mounting knob and brush idler plate.



5. Grasp the main brush; pull it off the brush drive plug and out of the main brush compartment.
6. Put the new or rotated end-for-end main brush on the floor next to the access door.
7. Slide the main brush onto the drive plug. Rotate the brush until it engages the drive plug, and push it all the way onto the plug.



8. Replace the brush idler plate, and secure with the mounting knob.
9. Close the right side main brush access door.



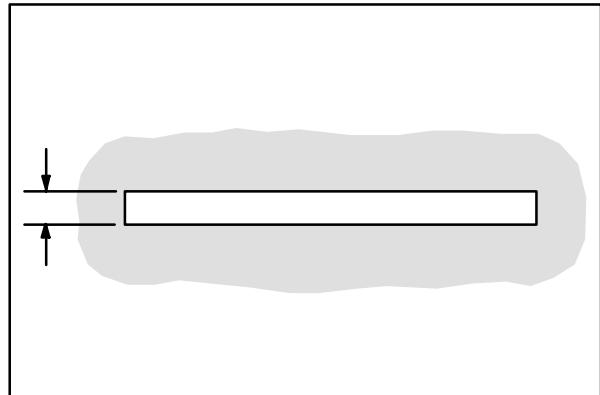
**TO CHECK AND ADJUST MAIN BRUSH PATTERN**

(For machines below serial number 020000)

1. Apply chalk, or some other material that will not blow away easily, to a smooth, level floor.
2. Raise the side brush and main brush and position the main brush over the chalked area.
3. Start the main brush.
4. Lower the main brush for 15 to 20 seconds while keeping a foot on the brakes to keep the machine from moving. This will lower the rotating main brush.

*NOTE: If chalk or other material is not available, allow the brushes to spin on the floor for two minutes. A polish mark will remain on the floor.*

5. Raise the main brush.
6. Stop the main brush.
7. Drive the machine off the test area.
8. Observe the width of the brush pattern. The proper brush pattern width is 50 to 65 mm (2.0 to 2.5 in).



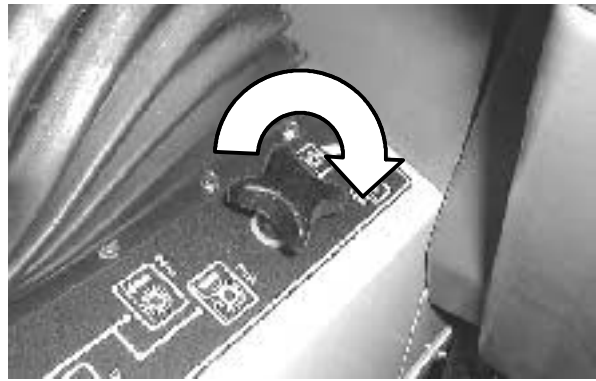
00582

9. To increase the width of the main brush pattern, turn the main brush down pressure knob counter-clockwise.

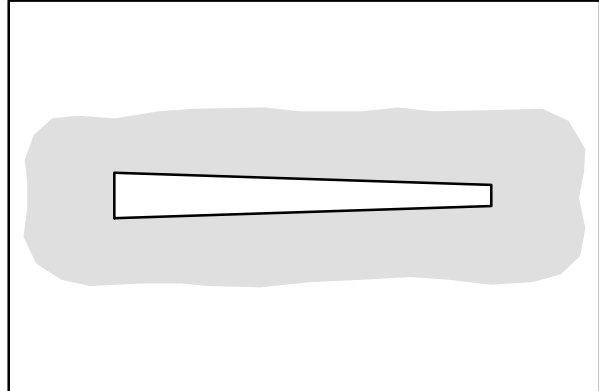


## MAINTENANCE

To decrease the width of the main brush pattern, turn the main brush down pressure knob clockwise.

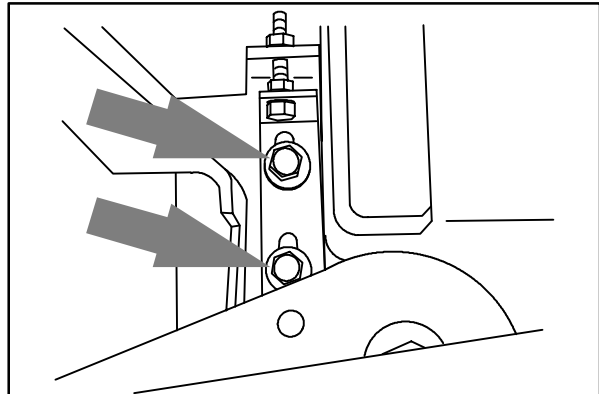


If the main brush pattern is tapered, more than 15 mm (0.5 in) on one end than the other, adjust the taper with the taper adjustment bracket at the drive end of the brush.



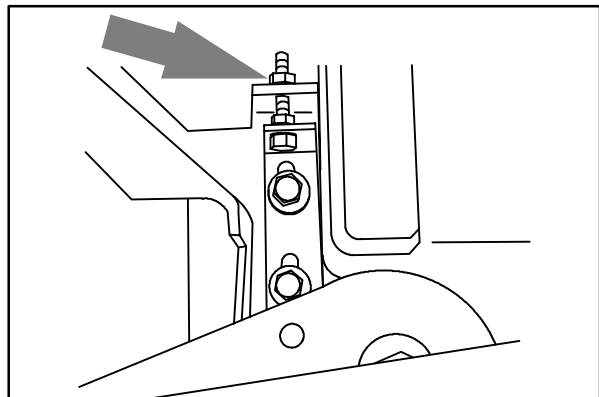
00601

- A. Loosen the bracket mounting bolts.



08216

- B. Turn the taper adjustment nut counter-clockwise to increase the pattern width at the brush drive end, and clockwise to decrease the pattern width at the brush drive end. Tighten the mounting bolts.
- C. Check the main brush pattern and readjust as necessary. Then adjust the width of the main brush pattern.



08215

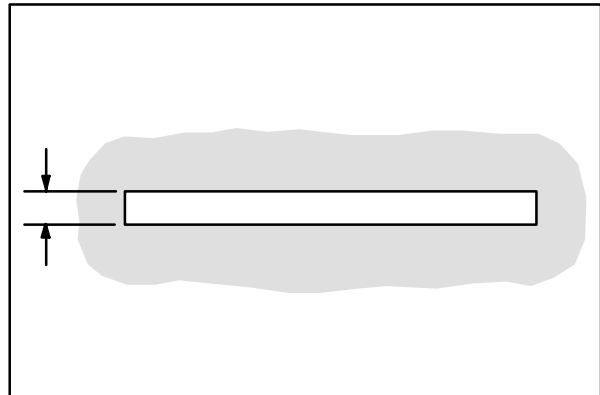
**TO CHECK AND ADJUST MAIN BRUSH PATTERN**

(For machines serial number 020000 and above)

1. Apply chalk, or some other material that will not blow away easily, to a smooth, level floor.
2. Raise the side brush and main brush and position the main brush over the chalked area.
3. Start the main brush.
4. Lower the main brush for 15 to 20 seconds while keeping a foot on the brakes to keep the machine from moving. This will lower the rotating main brush.

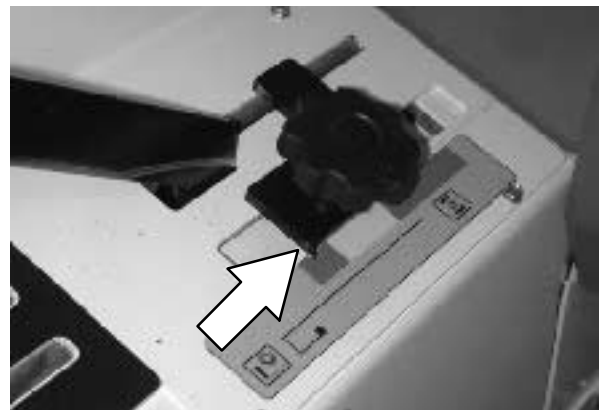
*NOTE: If chalk or other material is not available, allow the brushes to spin on the floor for two minutes. A polish mark will remain on the floor.*

5. Raise the main brush.
6. Stop the main brush.
7. Drive the machine off the test area.
8. Observe the width of the brush pattern. The proper brush pattern width is 50 to 65 mm (2.0 to 2.5 in).



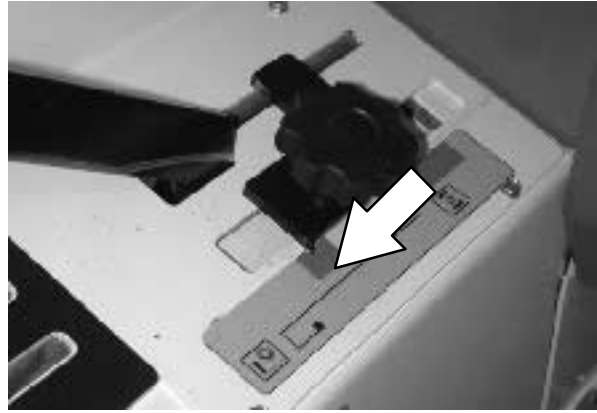
00582

9. To increase the width of the main brush pattern, loosen the main brush adjustment knob and slide the main brush adjustment plate forward 7 to 14 mm (0.25-0.50 in).

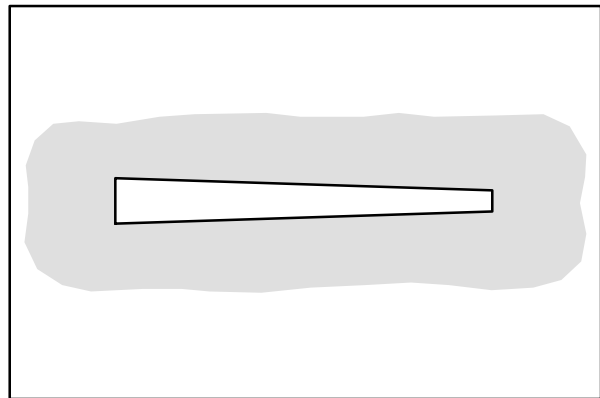


## MAINTENANCE

To decrease the width of the main brush pattern, loosen the main brush adjustment knob and slide the main brush adjustment plate back 7 mm (0.25 in).

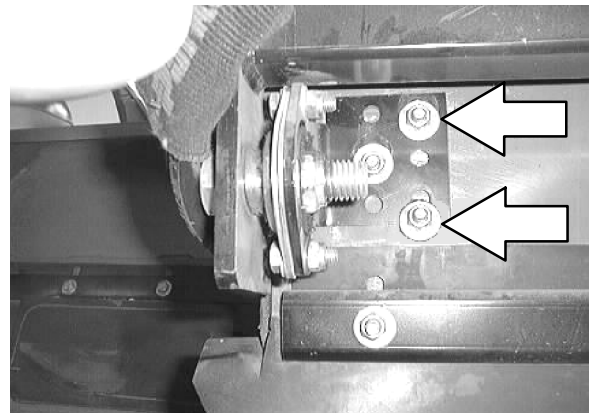


If the main brush pattern is tapered, more than 15 mm (0.5 in) on one end than the other, adjust the taper with the taper adjustment bracket at the drive end of the brush.



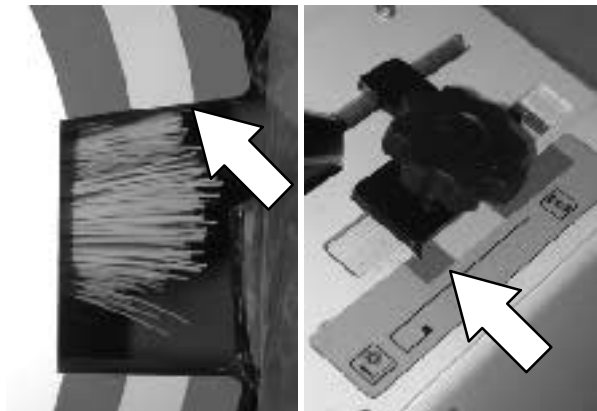
00601

A. Loosen the shaft bearing bracket mounting bolts.



B. Move the bracket up or down in the slots and tighten the mounting bolts.

C. Check the main brush pattern and readjust as necessary. Set the main brush adjustment knob to match the same color band as the brush idler plate.



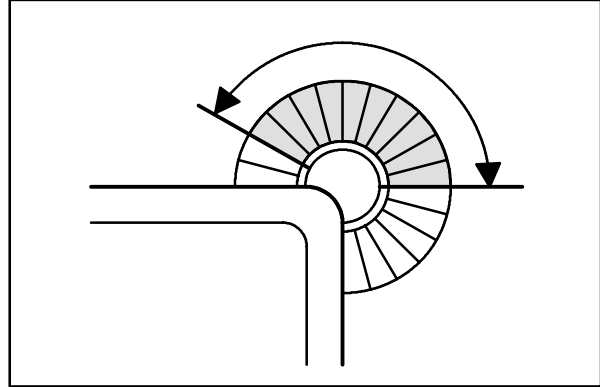


**SIDE BRUSH**

The side brush sweeps debris along edges into the path of the main brush.

Check the brush daily for wear or damage. Remove any string or wire found tangled on the side brush or side brush drive hub.

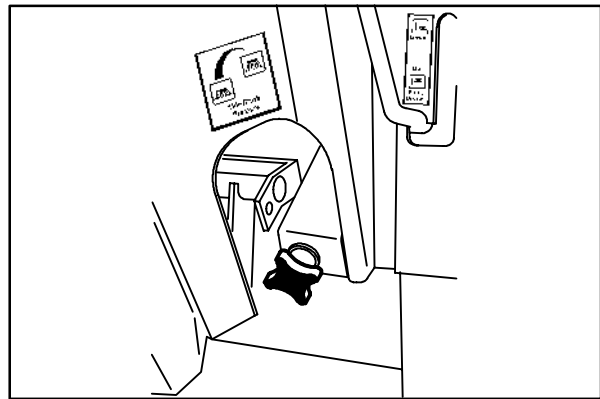
Check the side brush pattern daily. The side brush bristles should contact the floor in a 10 o'clock to 3 o'clock pattern when the brush is in motion.



350327

Adjust the side brush pattern by the side brush down pressure knob. Turn the knob counter-clockwise to increase the brush contact with the sweeping surface, and clockwise to decrease the brush contact with the sweeping surface.

The side brush should be replaced when it no longer sweeps effectively for your application. A guideline length is when the remaining bristles measure 50 mm (2 in) in length. You may change the side brush sooner if you are sweeping light litter, or wear the bristles shorter if you are sweeping heavy debris.



07799

## MAINTENANCE

### TO REPLACE SIDE BRUSH

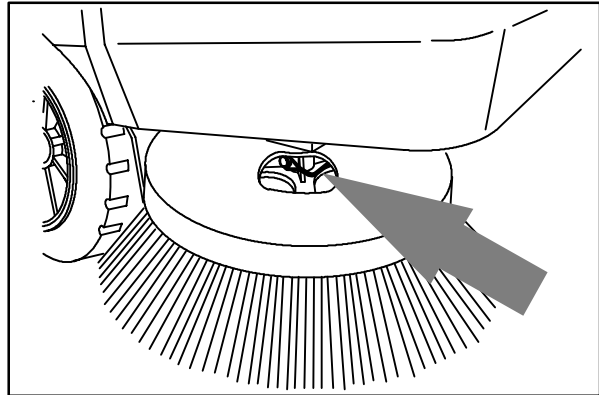
1. Empty the debris hopper.
2. Set the machine parking brake.
3. Stop the engine.

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

4. Raise the side brush.
5. Remove the side brush retaining pin from the side brush drive shaft by pulling the pin keeper off over the end of the pin.
6. Slide the side brush off the side brush drive shaft.

*NOTE: Remove the drive hub and put it on the new brush if one is not installed.*

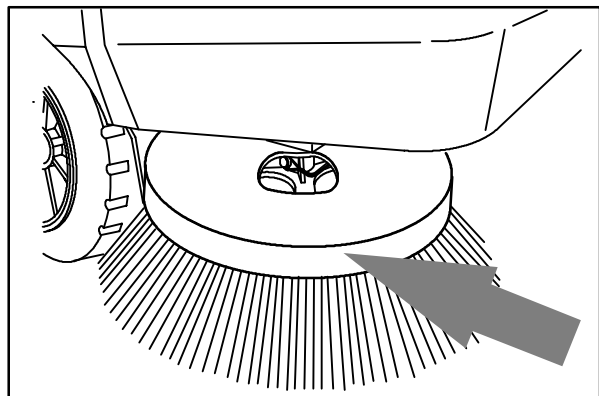
7. Slide the new side brush onto the side brush drive shaft.
8. Insert the side brush retaining pin through the side brush hub and shaft.
9. Secure the pin by clipping the pin keeper over the end of the pin.
10. Disengage the hopper support bar and lower the hopper.
11. Adjust the side brush pattern with the side brush down pressure knob.



08019

### SIDE BRUSH GUARD

Rotate the side brush guard 90° every 200 hours of operation. Replace the brush guard after all four sides have been used.



08049

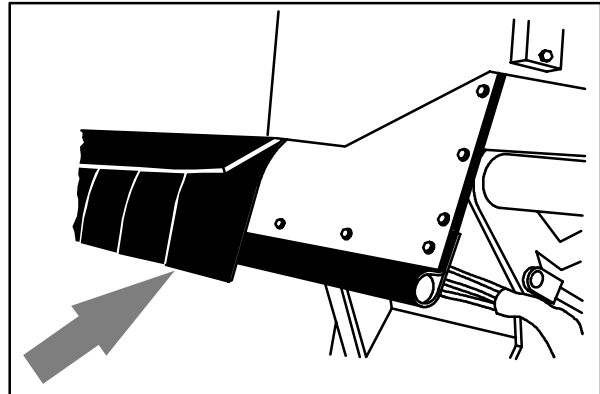
**SKIRTS AND SEALS**

**HOPPER LIP SKIRTS**

The hopper lip skirts are located on the bottom rear of the hopper. The skirts float over debris and help deflect that debris into the hopper. The hopper lip skirts consist of five bottom lip segments and two additional side lip segments.

Check the hopper lip skirts for wear or damage daily.

Replace the hopper lip skirts when they no longer touch the floor.

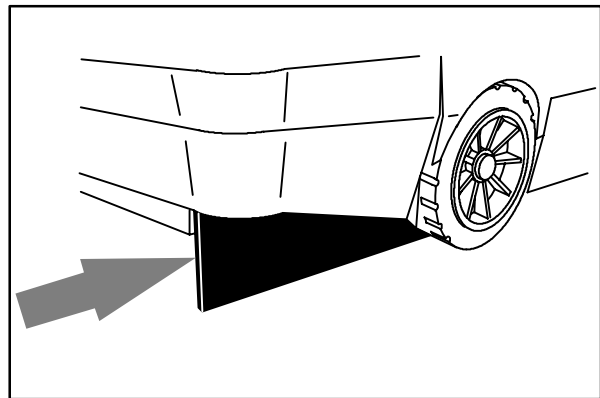


08020

**HOPPER SIDE SKIRT**

The hopper side skirt is located on the left side of the hopper.

Check the hopper side skirt for wear or damage daily.



08214

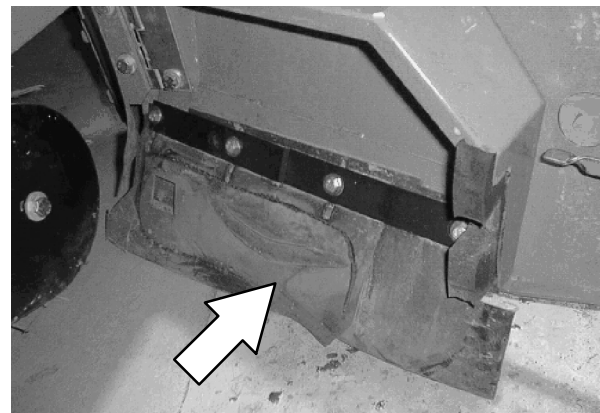
**BRUSH DOOR SKIRTS**

The brush door skirts are located on the bottom of each of the two main brush doors. The skirts should clear the floor by 3 to 6 mm (0.12 to 0.25 in).

Check the skirts for wear or damage and adjustment daily.

*NOTE: The brush door skirts have slotted holes to allow for a ground clearance adjustment. The door must be closed for proper adjustment.*

*NOTE: Rear tire pressure will affect skirt clearances.*



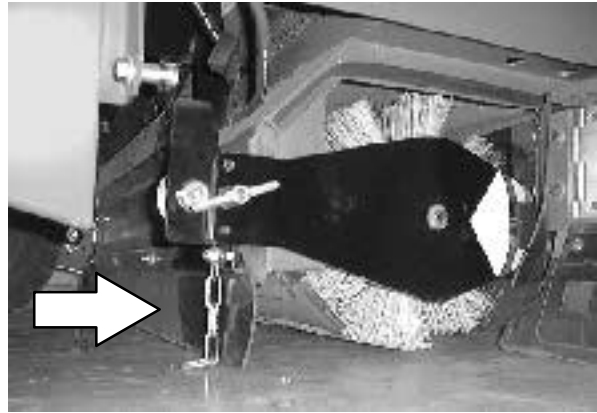
## MAINTENANCE

### REAR SKIRTS

The two rear skirts are located on the bottom rear of the main brush compartment. The vertical skirt should clear the floor up to 5 mm (0.25 in) in dusty conditions, and touch the floor otherwise. The recirculation skirt is self-adjusting.

Check the skirts for wear or damage and adjustment daily.

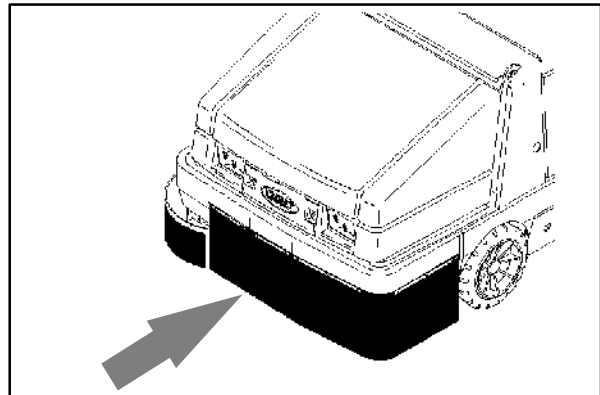
*NOTE: Rear tire pressure will affect skirt clearances.*



### SIDE BRUSH DUST CONTROL SKIRTS (OPTION)

The side brush dust control skirts wrap around the side brush and the bottom of the hopper.

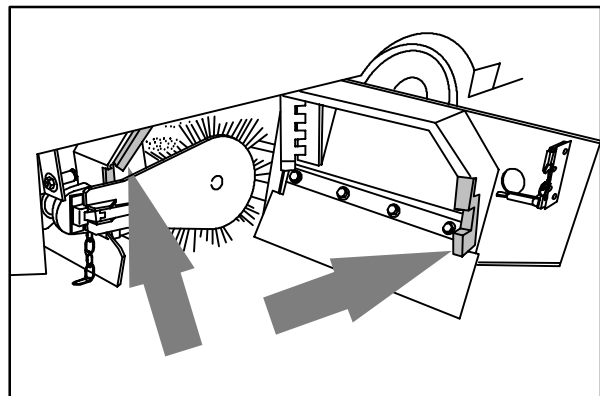
Check the side brush dust control skirts for wear or damage daily.



### BRUSH DOOR SEALS

The brush door seals are located on both main brush doors and on corresponding portions of the main frame.

Check the seals for wear or damage every 100 hours of operation.

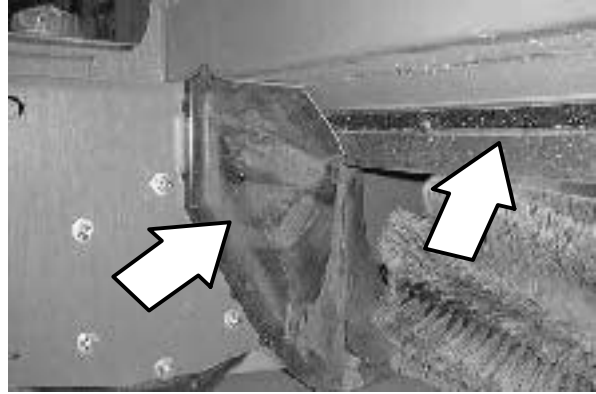


08022

**HOPPER SEALS**

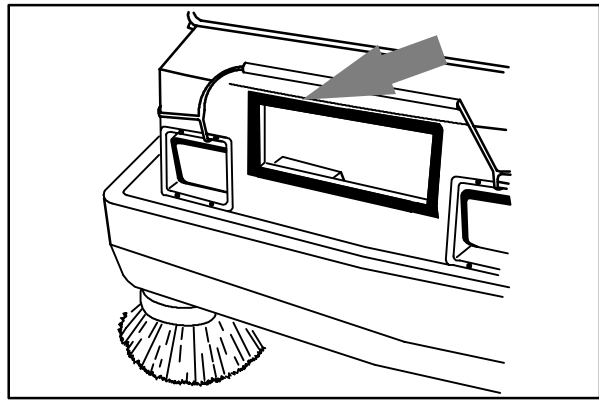
The hopper seals are located on the front and side portions of the machine frame that contact the hopper.

Check the seals for wear or damage every 100 hours of operation.

**HOPPER INSPECTION DOOR SEAL**

The hopper inspection door seal is located on the hopper and seals the front of the debris hopper.

Check the seal for wear or damage every 100 hours of operation.

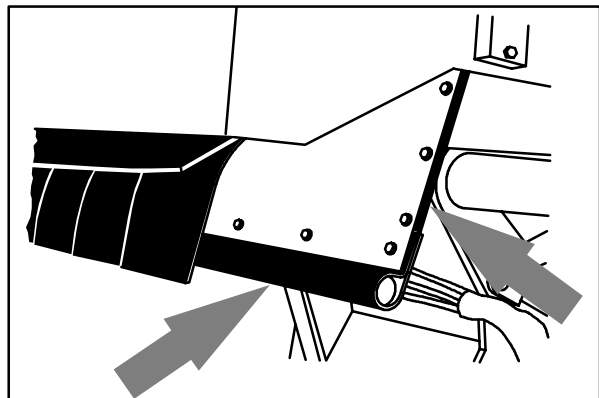


08024

**HOPPER DOOR SEALS**

The hopper door seals are located on the hopper door. They seal the hopper when the hopper door is closed.

Check the seals for wear or damage every 100 hours of operation.



08025

## MAINTENANCE

### HOPPER COVER SEAL (Metal Hoppers)

The hopper cover seal is located on the top edges of the hopper insert. It seals the hopper filter compartment.

Check the seal for wear or damage every 100 hours of operation.



### HOPPER DUST SEAL (Metal Hoppers)

The hopper dust seal is located under the hopper insert along the top of the hopper.

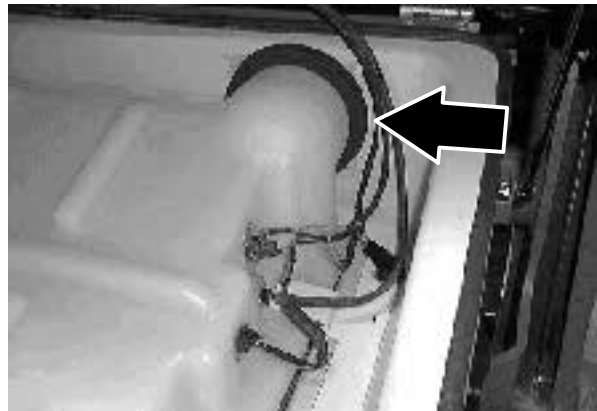
Check the seal for wear or damage every 100 hours of operation. You can reach the seal by removing the hopper insert.



### HOPPER VACUUM FAN SEAL (Metal Hoppers)

The hopper vacuum fan seal is mounted on the neck of the filter cover around the vacuum fan inlet.

Check the seal for wear or damage every 100 hours of operation. You can reach the seal by removing the hopper insert.



### HOPPER FILTER SEALS

The hopper filter seals are mounted on both sides of the hopper dust filter element. For plastic hopper machines, there is also a seal mounted on the hopper under the filter.

Check the seals for wear or damage after every 100 hours of operation. You can reach the seals by lifting the dust filter cover and removing the filter element.



**BRAKES AND TIRES**

**SERVICE BRAKES**

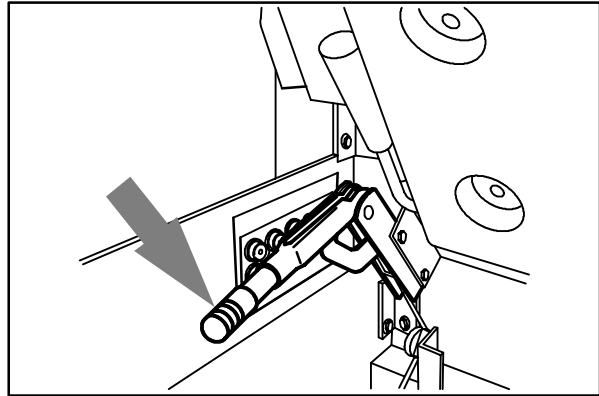
The mechanical service brakes are located on the front wheels. The brakes are operated by the foot brake pedal and connecting cables.

Check the brake adjustment every 200 hours of operation. The brake pedal should not travel more than 25 mm (1 in) to fully engage the brakes.

**PARKING BRAKE**

The parking brake is set with the parking brake lever that activates the service brakes.

Adjust the parking brake whenever it becomes very easy to set the parking brake, when the machine rolls after setting the parking brake, and every 200 hours of operation. The parking brake may be tightened by turning the knurled knob on the end of the parking brake clockwise.

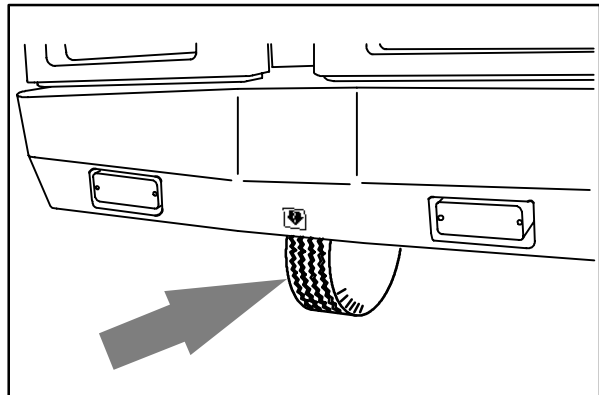


08053

**TIRES**

The standard front machine tires are solid. The standard rear machine tire is pneumatic.

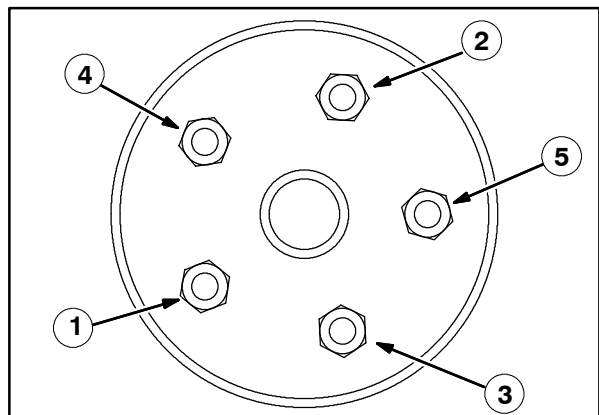
Check the rear tire pressure every 100 hours of operation. The proper tire air pressure is  $790 \pm 35$  kPa ( $115 \pm 5$  psi).



08028

**REAR WHEEL**

Torque the rear wheel nuts in a star pattern twice to 142 to 157 Nm (105 to 115 ft. lb) after the first 50-hours of operation, and every 800 hours there after.



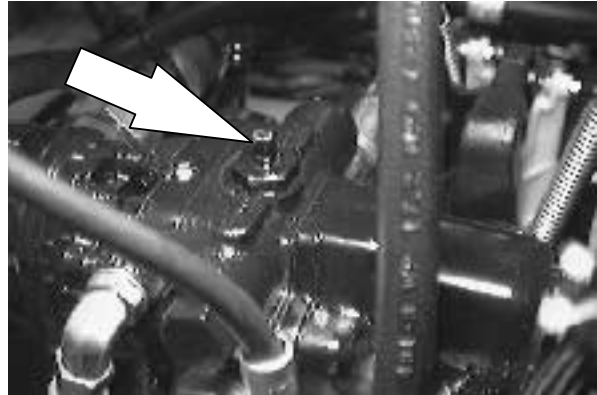
## PUSHING, TOWING, AND TRANSPORTING THE MACHINE

### PUSHING OR TOWING THE MACHINE

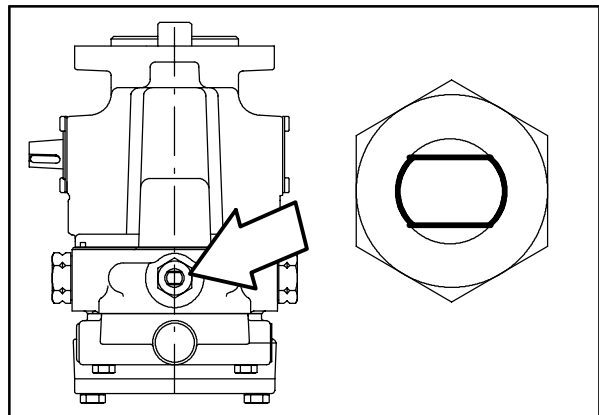
If the machine becomes disabled, it can be pushed from the front or rear, but towed only from the rear.

The propelling pump has a bypass valve to prevent damage to the hydraulic system when the machine is being pushed or towed. This valve allows a disabled machine to be moved for a *very short distance* and at a speed to not exceed 1.6 kph (1 mph). The machine is NOT intended to be pushed or towed a long distance or at a high speed.

**ATTENTION! Do not push or tow machine for a long distance and without using the bypass valve, or the machine hydraulic system may be damaged.**



Turn the bypass valve 90° from the normal position before pushing or towing the machine. **The illustration shows the bypass valve in the pushing or towing position.**



### TRANSPORTING THE MACHINE

1. Position the rear of the machine at the loading edge of the truck or trailer.

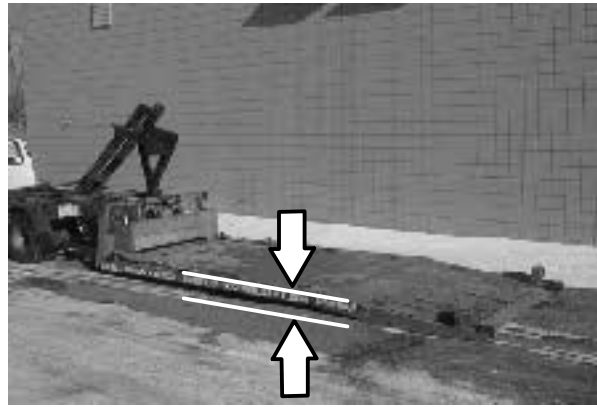
**FOR SAFETY: Use truck or trailer that will support the weight of the machine.**

*NOTE: Empty the hopper before transporting the machine.*

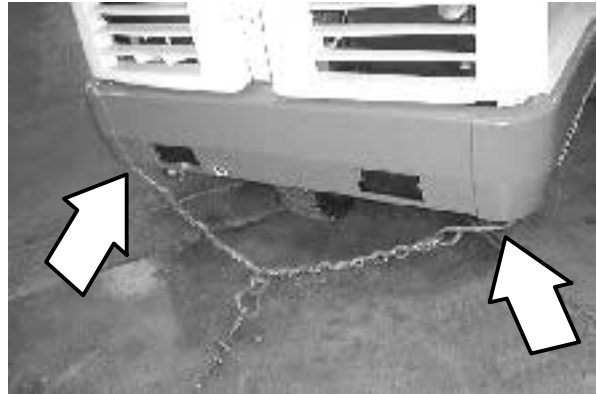


- If the loading surface is not horizontal or is higher than 380 mm (15 in) from the ground, use a winch to load machine.

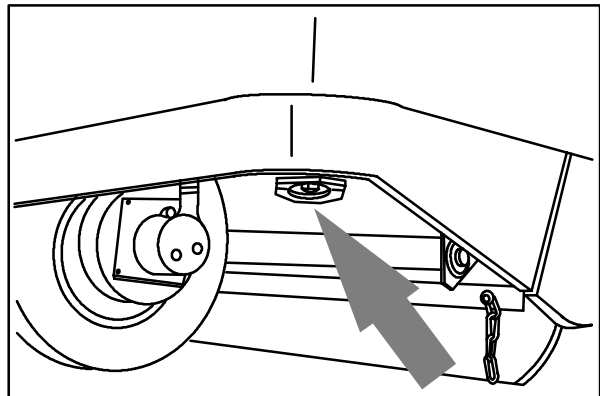
If the loading surface is horizontal AND is 380 mm (15 in) or less from the ground, the machine may be driven onto the truck or trailer.



- To winch the machine onto the truck or trailer, attach the winching chains in the holes at the bottom of the rear bumper.



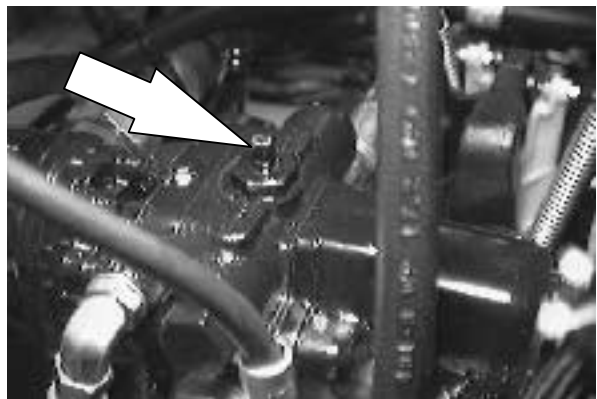
If the machine has the optional rear tie down brackets, attach the winching chains to them.



08151

- Turn the bypass valve 90° from the normal position before winching the machine onto the truck or trailer. See *PUSHING OR TOWING THE MACHINE* section of this manual. Make sure the machine is centered.

**FOR SAFETY: When loading machine onto truck or trailer, use winch. Do not drive the machine onto the truck or trailer unless the loading surface is horizontal AND is 380 mm (15 in) or less from the ground.**



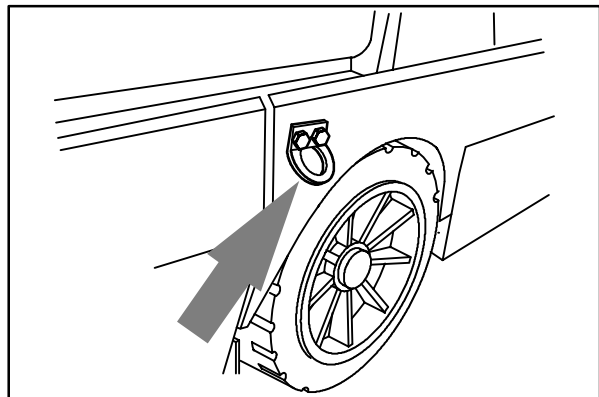
## MAINTENANCE

5. Position the machine onto the truck or trailer as far as possible. If the machine starts to veer off the centerline of the truck or trailer, stop and turn the steering wheel to center the machine.
6. Set the parking brake and block the machine tires. Tie down the machine to the truck or trailer before transporting.

The front tie down locations are the holes in the wheel pockets at the front of the machine frame.



If the machine has the optional front tie down brackets above the front tires, attach the winching chains to them.

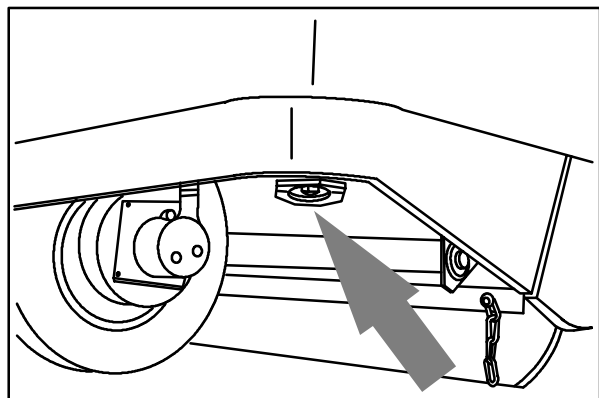


08152

The rear tie down locations are in the holes at the bottom of the rear bumper. If the machine has the optional rear tie down brackets, use them to tie down the machine.

7. If the loading surface is not horizontal or is higher than 380 mm (15 in) from the ground, use a winch to unload machine.

If the loading surface is horizontal AND is 380 mm (15 in) or less from the ground, the machine may be driven off the truck or trailer.



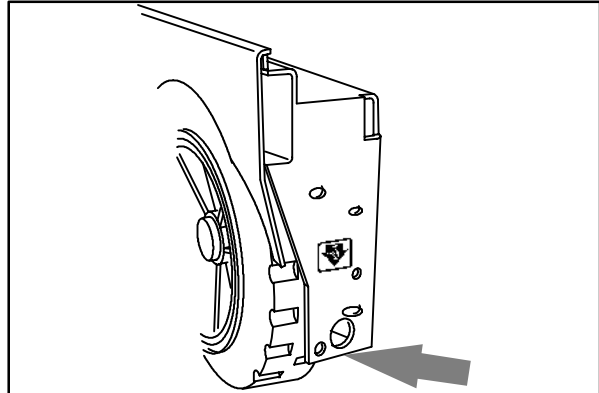
08151

**FOR SAFETY: When unloading machine off truck or trailer, use winch. Do not drive the machine off the truck or trailer unless the loading surface is horizontal AND 380 mm (15 in) or less from the ground.**

**MACHINE JACKING**

Empty the hopper before jacking the machine. You can jack up the machine for service at the designated locations. Use a hoist or jack that will support the weight of the machine. Always stop the machine on a flat, level surface and block the tires before jacking the machine up.

The front jacking locations are on the flat bottom edge of the front of the machine frame next to the front tires.

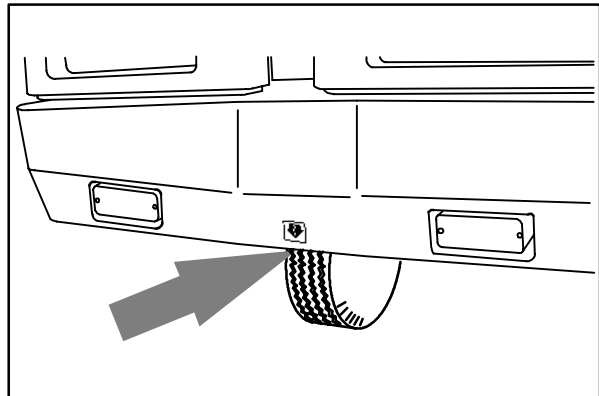


08029

The rear jacking location is the middle flat bottom edge of the rear bumper between the taillights.

**FOR SAFETY: When servicing machine, block machine tires before jacking machine up.**

**FOR SAFETY: When servicing machine, jack machine up at designated locations only. Block machine up with jack stands.**



08030

**STORING MACHINE**

Before storing the machine for an extended period of time, the machine needs to be prepped to lessen the chance of rust, sludge, and other undesirable deposits from forming. Contact TENNANT service personnel.

# SPECIFICATIONS

## SPECIFICATIONS

### GENERAL MACHINE DIMENSIONS/CAPACITIES

Item	Dimension/capacity
Length	2360 mm (93 in)
Width	1590 mm (62.5 in)
Height	1475 mm (58 in)
Height with overhead guard	2080 mm (82 in)
Height with overhead guard and hazard light	2270 mm (89.5 in)
Height with cab	2100 mm (82.62 in)
Height with cab and hazard light	2285 mm (90 in)
Track	1345 mm (53 in)
Wheelbase	1135 mm (44.75 in)
Main brush diameter	355 mm (14 in)
Main brush length	1145 mm (45 in)
Side brush diameter	660 mm (26 in)
Sweeping path width	1145 mm (45 in)
Sweeping path width with side brush	1560 mm (61.5 in)
Main brush pattern width	50 to 65 mm (2.0 to 2.5 in)
Hopper weight capacity (with plastic hopper)	409 kg (900 lb)
Hopper weight capacity (with metal hopper)	545 kg (1200 lb)
Hopper volume capacity	396 L (14 cu ft)
Dust filter area	7.2 m <sup>2</sup> (77 sq ft)
GVWR	1927 kg (4250 lb)
Sound level	80 dBa
Ceiling height minimum dumping clearance	2745 mm (9 ft)

### GENERAL MACHINE PERFORMANCE

Item	Measure
Maximum forward speed	13.7 kmh (8.5 mph)
Maximum reverse speed	4.0 kmh (2.5 mph)
Minimum aisle turn width, left	2870 mm (113 in)
Minimum aisle turn width, right	4725 mm (186 in)
Maximum rated climb and descent angle	6°

**POWER TYPE**

Engine	Type	Ignition	Cycle	Aspiration	Cylinders	Bore	Stroke
Kubota V1505-B	Piston	Diesel	4	Natural	4	78 mm (3.07 in)	78.4 mm (3.08 in)
	Displacement		Net power, governed			Net power, maximum	
	1500 cc (91.4 cu in)		24.6 kw (34 hp) @ 2400 rpm			27.2 kw (37.5 hp) @ 3000 rpm	
	Fuel		Cooling system			Electrical system	
	Diesel Fuel tank: 36 L (9.6 gal)		Water/ethylene glycol antifreeze			12 V nominal	
			Total: 4.5 L (1.2 gal)			50 A alternator	
			Radiator: 3.8 L (1 gal)				
	Idle speed, no load		(Fast 1) governed speed, under load			(Fast 2) governed speed, under load	
	950 ± 50 rpm		2000 ± 50 rpm			2400 ± 50 rpm	
	Engine lubricating oil without filter						
6 L (6.35 qt) diesel rated engine oil <i>above</i> CD grade only							

**STEERING**

Type	Power source	Emergency steering
Rear wheel, hydraulic cylinder and rotary valve controlled	Hydraulic accessory pump	Manual

**HYDRAULIC SYSTEM**

System	Capacity	Fluid Type
Hydraulic reservoir	24.6 L (6.5 gal)	TENNANT part no. 65869 - above 7° C (45° F)
Hydraulic total	N/A L (N/A gal)	TENNANT part no. 65870 - below 7° C (45° F)

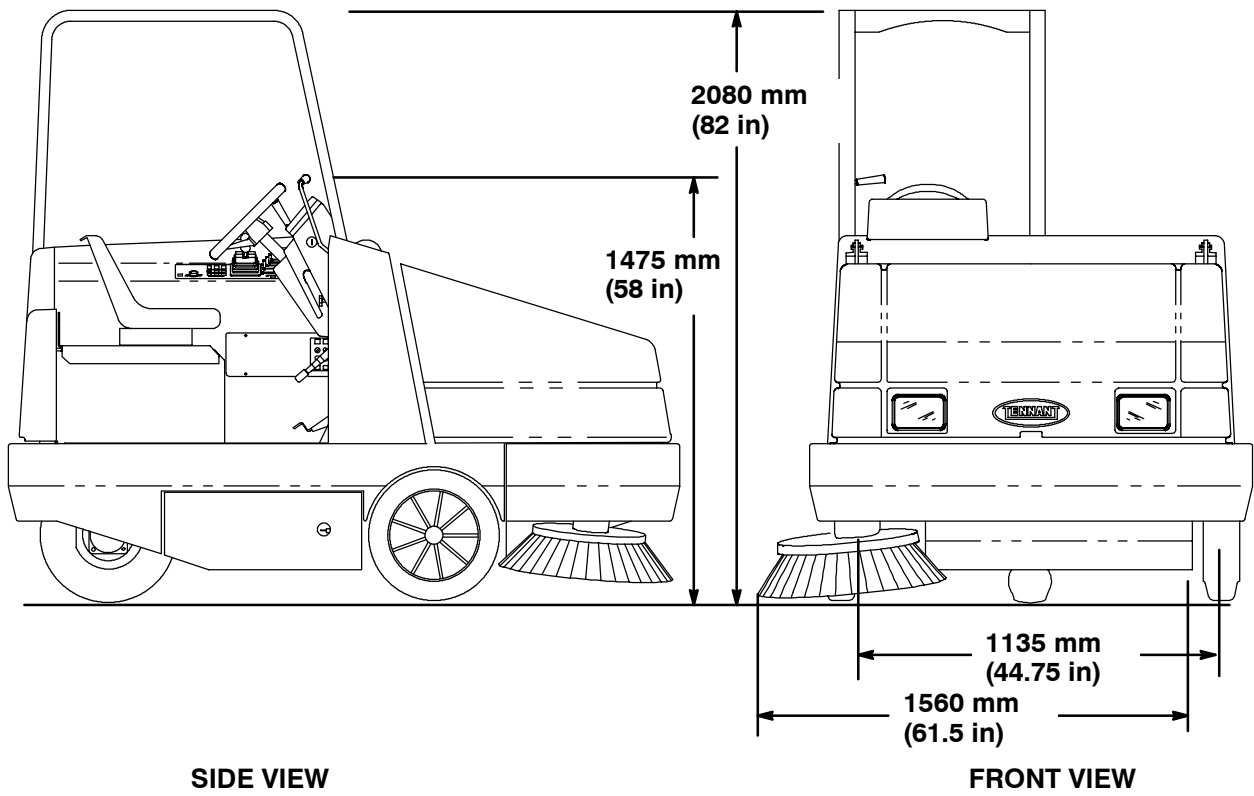
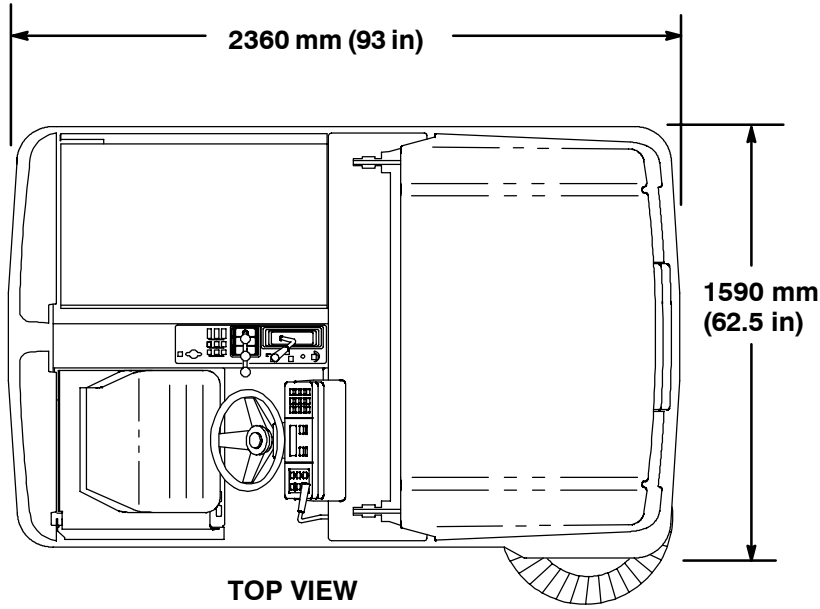
**BRAKING SYSTEM**

Type	Operation
Service brakes	Mechanical drum brakes (2), one per front wheel, cable actuated
Parking brake	Utilize service brakes, cable actuated

**TIRES**

Location	Type	Size	Pressure
Front (2)	Solid	5 x 18 in	-
Rear (1)	Pneumatic	6 x 19 in	790 ± 35 kPa (115 ± 5 psi)

# SPECIFICATIONS



## INDEX

## A

Air conditioning switch (option), 39  
 Air filter, 73  
   Dust cap, 73  
   Element, 73  
   Heavy duty filter option, 73  
 Air filter indicator, 73  
 Aisle turn, 98

## B

Battery, 75  
   Charging system, Light, 25  
 Bearings  
   Front wheel, 69  
   Hopper, 69  
 Belts, 75  
   Engine fan belt, 75  
 Blower wand, 63–64  
 Brake pedal, 15  
 Brakes, 42, 93  
   Parking, Adjustment, 93  
   Service, 93  
   System specifications, 99  
 Brushes, 45–46, 53, 80–84  
   Adjusting main brush taper, 84–88  
   Checking main brush pattern, 83–87  
   Checking side brush pattern, 87  
   Door latch, 38  
   Door seals, 90  
   Door skirts, 89  
   Main brush, 80–83  
   Main brush bristle length, 80  
   Replacing main brush, 81–83  
   Replacing side brush, 88  
   Side brush, 87–88  
   Side brush bristle length, 87  
 Button, Horn, 15  
 Bypass valve, 94

## C

Cab  
   Air conditioning switch, 39  
   Dome light switch, 40  
   Door latch, 38  
   Heater knob (option), 39  
   Heater switch, 40  
   Pressurizer switch, 40  
   Windshield wiper switch, 40  
 Capacities, 98  
 Chains, 75  
   Static drag, 75  
 Charging system light, 25  
 Circuit breakers, 36, 37  
 Clogged filter light, 26  
 Clogged filter light (option), 26  
 Control panel  
   Clogged filter light, 26  
   Clogged filter light (option), 26  
   Engine oil pressure, 25  
   Engine speed switch, 30, 31  
   Engine water temperature light, 24  
   Filter shaker switch, 29  
   Fuel level gauge, 27  
   Glow Plug light, 27  
   Hazard light switch, 28  
   Hopper door light, 26  
   Hopper temperature light, 24  
   Hourmeter, 27  
   Operating lights switch, 28  
   Operating/hazard lights switch, 28  
   Vacuum fan switch, 29  
   Vacuum fan/filter shaker switch, 29  
 Controls, 12  
   Air conditioning switch (option), 39  
   Brake pedal, 15  
   Charging system light, 25  
   Circuit breakers, 36, 37  
   Clogged filter light, 26  
   Clogged filter light (option), 26  
   Directional pedal, 14  
   Dome light switch, 40  
   Engine oil pressure light, 25  
   Engine speed switch, 30, 31  
   Engine water temperature light, 24  
   Filter shaker switch, 29  
   Fuel level gauge, 27  
   Fuse, 36  
   Glow Plug light, 27

Controls (continued), 12  
Hazard light switch, 28  
Heater knob (option), 39  
Heater switch, 40  
Hopper door lever, 17  
Hopper door light, 26  
Hopper lift lever, 18  
Hopper temperature light, 24  
Horn button, 15  
Hourmeter, 27  
Ignition switch, 33  
Latches, 38  
Main brush and side brush lever, 16  
Main brush down pressure knob, 21  
Main brush position lever, 19, 20  
Operating lights switch, 28  
Operating/hazard lights switch, 28  
Operation, 14–32  
Parking brake lever, 15  
Pressurizer switch, 40  
Side brush down pressure knob, 35  
Side brush position lever, 34  
Steering column tilt lever, 32  
Steering wheel, 32  
Symbols, 10–11  
Turn signal switch, 23  
Vacuum fan switch, 29  
Vacuum fan/filter shaker switch, 29  
Windshield wiper switch, 40

Covers  
Engine, Latch, 38  
Hopper  
Latch, 38  
Seals, 92

**D**

Debris hopper, 76–78  
Dimensions, 98  
Directional pedal, 14  
Disengaging hopper support bar, 55–56  
Dome light switch, 40  
Doors  
Brush  
Latch, 38  
Seals, 90  
Skirts, 89  
Cab, Latch, 38  
Engine side, Latch, 38  
Grille, Latch, 38  
Hopper, Seals, 91  
Hopper Inspection, Seal, 91  
Right rear Grille, Latch, 38

Dust Control, Skirts, 90  
Dust filter, 76–78  
Changing, 76–77  
Cleaning, 76

**E**

Electrical  
Circuit breakers, 36, 37  
Fuse, 36  
Ignition switch, 33  
Emptying the hopper, 50–51  
Engaging hopper support bar, 54–55  
Engine, 72–74  
Air filter, 73  
Air filter indicator, 41, 73  
Coolant temperature, Light, 24  
Cooling system, 72  
Cover latch, 38  
Fan belt, 75  
Fuel filter, 74  
Fuel pipes, 74  
Lubrication, 68  
Oil capacity, 68  
Oil level, 6, 42  
Oil pressure, Light, 25  
Priming fuel system, 74  
Side door latch, 38  
Specifications, 99  
Speed switch, 30, 31  
Engine oil pressure light, 25  
Engine speed switch, 30, 31  
Engine water temperature light, 24

**F**

Filter shaker switch, 29  
Fuel filter, 74  
Fuel level, 42  
Fuel level gauge, 27  
Fuel pipes, 74  
Fuel system  
Fuel pipes, 74  
Priming, 74  
Fuel tank, 7  
Fuse, 36



**G**

Gauge, Fuel level, 27  
 Glow Plug light, 27  
 Grease fittings  
   Hopper bearings, 69  
   Rear wheel support, 68

**H**

Hazard light switch, 28  
 Heater knob (option), 39  
 Heater switch, 40  
 Heater valve, 64  
 Hopper, 76–78  
   Changing dust filter, 76–77  
   Clogged filter  
     Light, 26  
     Light (option), 26  
   Cover latch, 38  
   Cover seal, 92  
   Disengaging hopper support bar, 55–56  
   Door lever, 17  
   Door light, 26  
   Door seals, 91  
   Dust filter, 76–78  
   Dust seal, 92  
   Engaging hopper support bar, 54–55  
   Filter cleaning, 76  
   Filter shaker, 29  
   Inspection door seal, 91  
   Lift, 18  
   Lip skirts, 89  
   Seals, 91  
   Side skirt, 89  
   Support bar, 38  
   Temperature, Light, 24  
   Thermo-Sentry, 79  
   Thermo-sentry, 24  
   Filter seals, 92  
   Vacuum fan seal, 92  
 Hopper door, Operate, 17  
 Hopper door lever, 17  
 Hopper door light, 26  
 Hopper lift lever, 18  
 Hopper support bar, 38  
 Hopper temperature light, 24

Horn button, 15  
 Hourmeter, 27  
 How the machine works, 41  
 Hydraulic fluid, 70–71  
 Hydraulic fluid reservoir, 70  
 Hydraulic hoses, 71  
 Hydraulics, 70–71  
   Fluid, 70–71  
   Fluid filter, 70  
   Fluid level, 6, 70  
   Hoses, 71  
   Propelling motor, 71  
   Reservoir, 70  
   System specifications, 99

**I**

Ignition switch, 33

**J**

Jack points, 97–98

**K**

Knobs  
   Heater (option), 39  
   Main brush down pressure, 21  
   Side brush down pressure, 35

**L**

Latches, 38  
   Cab door, 38  
   Engine cover, 38  
   Engine side door, 38  
   Grille doors, 38  
     Right rear, 38  
   Hopper cover, 38  
   Main brush doors, 38  
 Levers  
   Hopper door, 17  
   Hopper lift, 18  
   Main brush and side brush, 16  
   Main brush position, 19, 20  
   Parking brake, 15  
   Side brush position, 34  
   Steering column tilt, 32

**Lights**

- Charging system, 25
- Clogged filter, 26
- Clogged filter (option), 26
- Engine oil pressure, 25
- Engine water temperature, 24
- Glow Plug , 27
- Hazard light switch, 28
- Hopper door, 26
- Hopper temperature, 24
- Operating lights switch, 28
- Operating/hazard lights switch, 28

**Lubrication, 68**

- Engine, 68
- Front wheel bearings, 69
- Hopper bearings, 69
- Rear wheel support, 68

**M**

- Machine components, 9
- Machine dimensions, 100
- Machine jacking, 97–98
- Machine leaks, 41, 53
- Machine tie down location, 96
- Main brush, 45–46, 80–83
  - Adjust brush taper, 84–88
  - Bristle length, 80
  - Checking brush pattern, 83–87
  - Door latch, 38
  - Door seals, 90
  - Door skirts, 89
  - Down pressure, 21
  - Lever, 16
  - Main brush adjustment plate, 22
  - Maintenance, 80
  - Position, 19, 20
  - Replacing, 81–83
- Main brush adjustment plate, 22
- Main brush and side brush lever, 16
- Main brush down pressure knob, 21
- Main brush position lever, 19, 20
- Maintenance, 66–87
  - Intervals, 66–67
  - Recommended, 8
- Maintenance chart, 66–67
- Motors, Propelling, 71

**O**

- Operating lights switch, 28
- Operating/hazard lights switch, 28
- Operation, 6–54
- Operation on inclines, 56
- Operator Responsibility, 6
- Operator seat, 39
- Options, 57–64
  - Air conditioning switch, 39
  - Blower wand, 63–64
  - Cab door latch, 38
  - Clogged filter light, 26
  - Dome light switch, 40
  - Hazard light switch, 28
  - Heater knob, 39
  - Heater switch, 40
  - Heater valve, 64
  - Heavy duty air filter, 73
  - Pressurizer switch, 40
  - Side brush dust control skirts, 90
  - Turn signal switch, 23
  - Vacuum wand, 57–62
  - Windshield wiper switch, 40

**P**

- Parking brake, 93
  - Adjustment, 93
- Parking brake lever, 15
- Pedals
  - Brake, 15
  - Directional, 14
- Post-operation checklist, 53–54
- Pre-operation checklist, 41–42
- Pressurizer switch, 40
- Priming fuel system, 74
- Pushing machine, 94
- Pushing or towing the machine, 94
- Pushing, towing, and transporting machine, 94

**R**

- Radiator, 72
  - Coolant level, 7, 72
  - Coolant type, 72
  - Flushing system, 72
  - Hoses, 72
- Rear wheel, 93

## S

## Safety

- Disengaging hopper support bar, 55–56
- Engaging hopper support bar, 54–55
- Hopper support bar, 38
- Labels, 5
- Precautions, 3

## Seals, 89–92

- Brush doors, 90
- Hopper, 91
- Hopper cover, 92
- Hopper door, 91
- Hopper dust, 92
- Hopper inspection door, 91
- Hopper filter seals, 92
- Hopper vacuum fan seal, 92

## Seat, 39

- Adjustment, 39
- Lift, 39

## Service records, 53

## Side Brush, Dust skirts, 90

## Side brush, 46, 87–88

- Bristle length, 87
- Checking brush pattern, 87
- Down pressure, 35
- Lever, 16
- Position, 34
- Replacing, 88

## Side brush down pressure knob, 35

## Side brush dust control skirts, 90

## Side brush guard, 88

## Side brush position lever, 34

## Skirts, 53, 89–90

- Brush doors, 89
- Hopper Lip, 89
- Hopper side, 89
- Rear, 90
- Side brush dust control, 90

## Specifications, 98–100

- Braking system, 99
- Hydraulic system, 99
- Machine capacities, 98
- Machine dimensions, 98
- Machine performance, 98
- Power type, 99
- Steering, 99
- Tires, 99

## Starting the machine, 43–44

## Static drag chain, 75

## Steering, 42

- Specifications, 99

## Steering column tilt lever, 32

## Steering wheel, 32

## Stop sweeping, 48

## Stop the machine, 52–53

## Storing machine, 97

## Sweeping, 46–47

## Sweeping and brush information, 45–46

## Switches

- Air conditioning (option), 39
- Dome light, 40
- Engine speed, 30, 31
- Filter shaker, 29
- Hazard light, 28
- Heater, 40
- Ignition, 33
- Operating lights, 28
- Operating/hazard lights, 28
- Pressurizer, 40
- Turn signal, 23
- Vacuum fan, 29
- Vacuum fan/filter shaker, 29
- Windshield wiper, 40

## T

## Thermo-sentry, 79

## Thermo-sentry, 24

## Tie down location, 96

## Tires, 93–94

- Pressure, 93
- Rear wheel, 93
- Specifications, 99

Towing machine, 94  
Transporting machine, 94  
Transporting the machine, 94  
Travel speed, 98  
Troubleshooting, 65  
Turn signal switch, 23

### V

Vacuum fan switch, 29  
Vacuum fan/filter shaker switch, 29  
Vacuum wand, 57–62

### W

Windshield wiper switch, 40