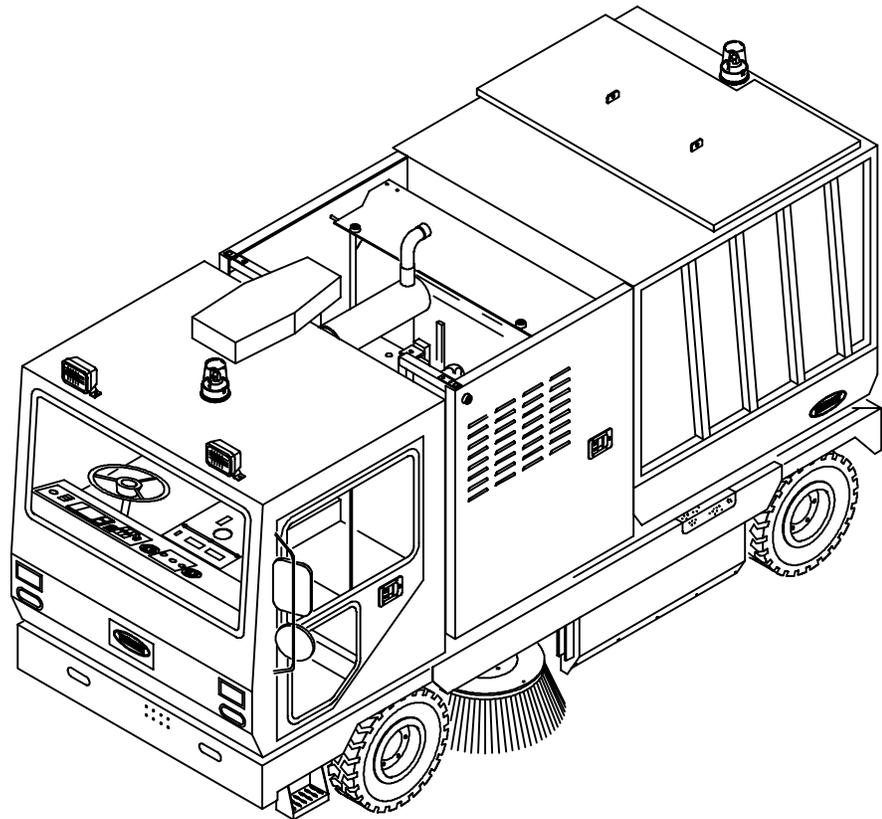




830

Operator Manual



MM332



This manual is furnished with each new TENNANT Model 830. 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 equivalent parts.

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

FOR SAFETY:

1. **Do Not Operate Machine:**
 - Unless Trained And Authorized.
 - Unless Operation Manual Is Read And Understood.
 - In Flammable Or Explosive Areas Unless Designed For Use In Those Areas.
2. **Before Starting Machine:**
 - Check For Fuel 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 Lever 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.
 - Do Not Carry Riders 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 Of Adequate Capacity To Lift 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.



WARNING: Machine Can Emit Excessive Noise. Consult With Your Regulatory Agency For Exposure Limits. Hearing Loss Can Result. Wear Hearing Protection.



WARNING: Raised Hopper May Fall. Engage (2) Hopper Support Pins.



WARNING: Raised Hopper May Fall. Engage Hopper Support Bar.



WARNING: Raised Hopper May Fall. Engage Hopper Support Pin.



WARNING: Brush Linkage Pinch Points. Stay Clear When Linkage Is Moving.



WARNING: Side Brush Can Move. Do Not Step On Side Brush.



WARNING: Hopper Door Pinch Point. Stay Clear Of Hopper Door.

SAFETY PRECAUTIONS



WARNING: High Dump Vertical Clearance. Stay Clear Of Overhead Obstructions And Power Lines.



WARNING: Conveyor Throws Debris. Conveyor Pinch Point. Stay Clear When In Operation.



WARNING: Flammable Materials Can Cause Explosion Or Fire. Do Not Use Flammable Materials In Tank. Only Use Water.



WARNING: Engine Emits Toxic Gases. Severe Respiratory Damage Or Asphyxiation Can Result. Provide Adequate Ventilation. Consult With Your Regulatory Agency For Exposure Limits. Keep Engine Properly Tuned.



WARNING: Lift Arm Pinch Point. Stay Clear Of Hopper Lift Arms.



WARNING: Moving Belt And Fan Blades. Keep Away.



WARNING: Do Not Store Hopper Support Bar On Cylinders.

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.

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.

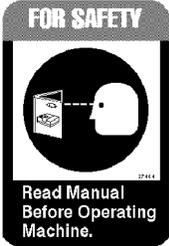
EMISSIONS LABEL -
Located On The Operator Dash.



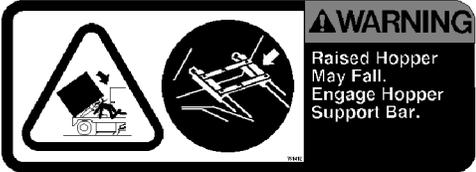
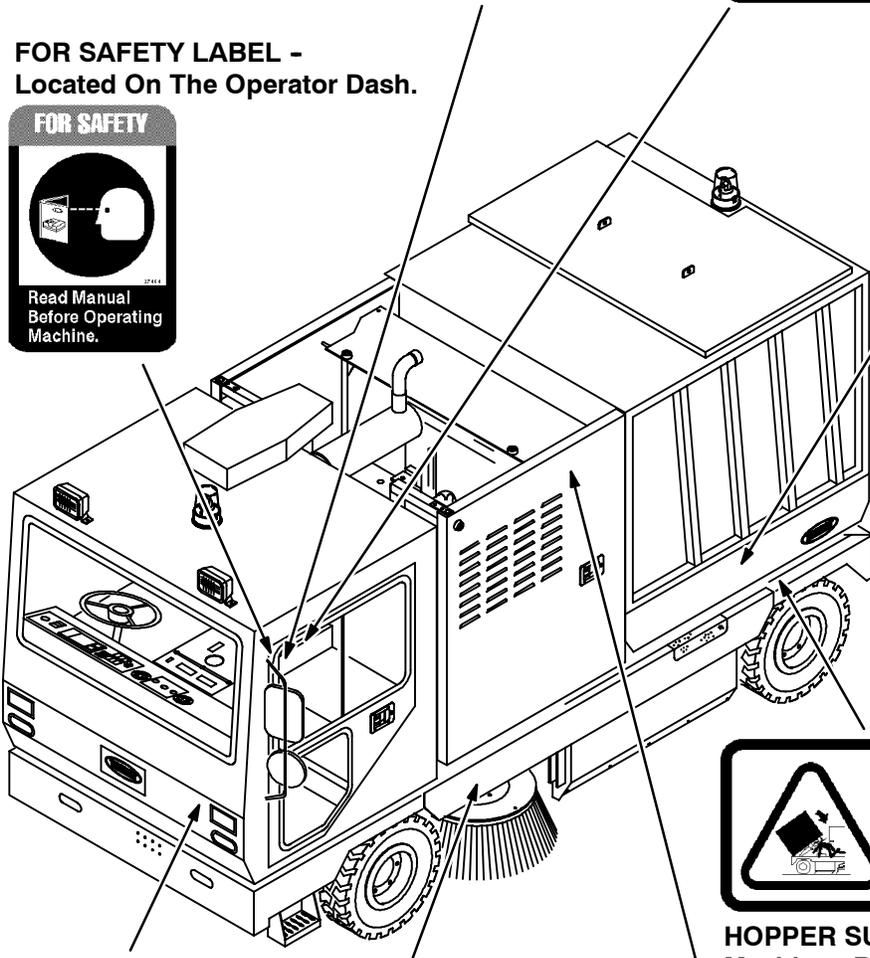
HIGH DUMP LABEL -
Located On The Operator Dash.



FOR SAFETY LABEL -
Located On The Operator Dash.



LIFT ARMS LABEL -
Located On The Hopper Lift.



HOPPER SUPPORT BAR LABEL (For Machines Below Serial Number 001710) -
Located On The Machine Frame.



BRUSH LINKAGE LABEL (VARIO SWEEPING BRUSH™ OR AUXILIARY SIDE BRUSH) -
Located On The Front Of The Machine.



SIDE BRUSH LABEL -
Located Above The Side Brush(es).



HOPPER SUPPORT PIN LABEL (For Machines Serial Number 001710 And Above) -
Located On The Support Pin.

SAFETY PRECAUTIONS

VACUUM WAND OPTION NOISE LABEL -
 Located On The Hopper Door



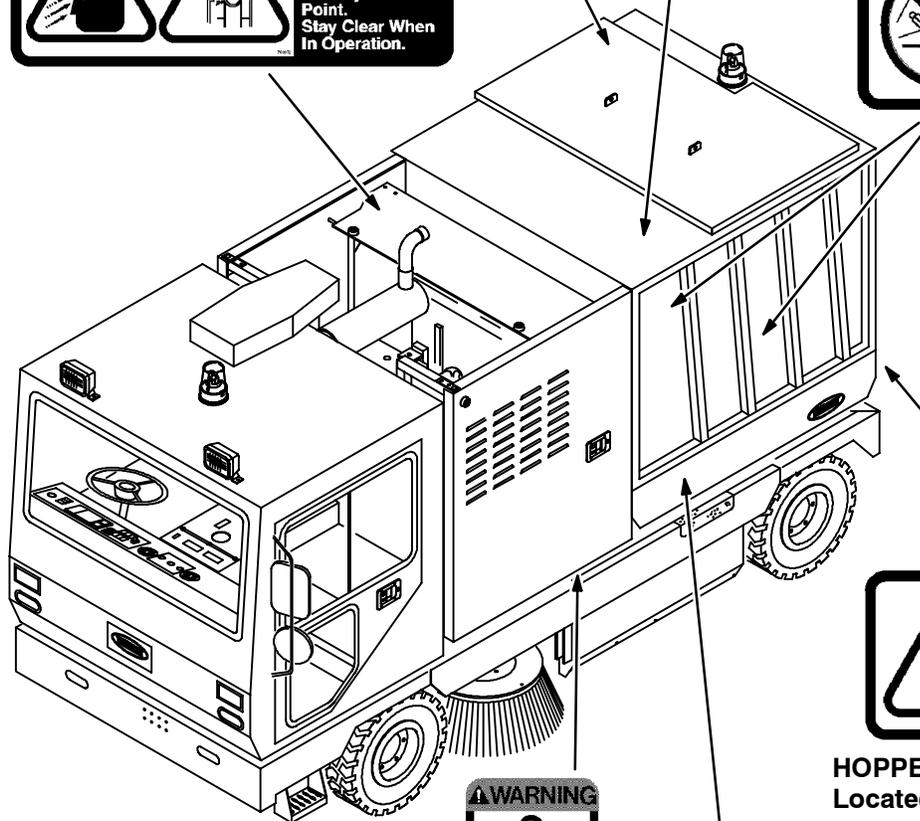
HOPPER SUPPORT PIN LABEL (For Machines Serial Number 001710 And Above) -
 Located On The Upper Support Cylinder.



CONVEYOR LABEL -
 Located At The Top Of The Conveyor.



HOPPER TILT CYLINDERS LABEL (For Machines Below Serial Number 001710) -
 Located On The Hopper Tilt Cylinders.



HOPPER DOOR LABEL -
 Located Below The Hopper Door.

FLAMMABLE MATERIALS LABEL (Wet Dust Control Option) -
 Located On The Water Tank.



HOPPER SUPPORT PINS LABEL (High Dump Model) -
 Located On The Machine Frame Next To The Support Pins.

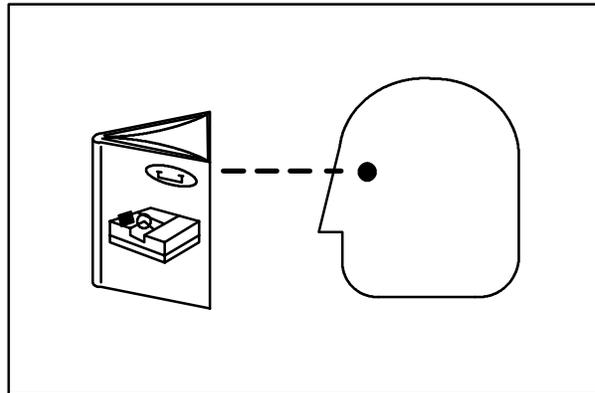
OPERATION

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.

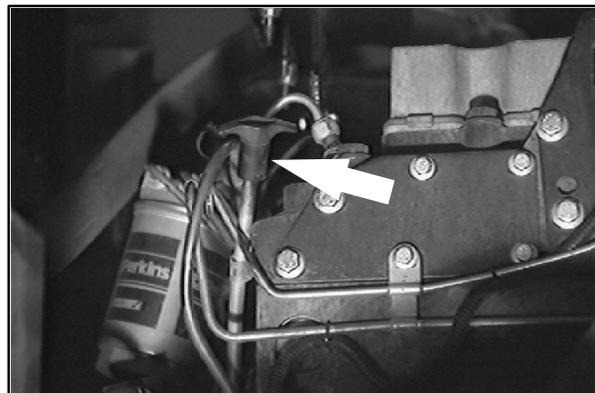
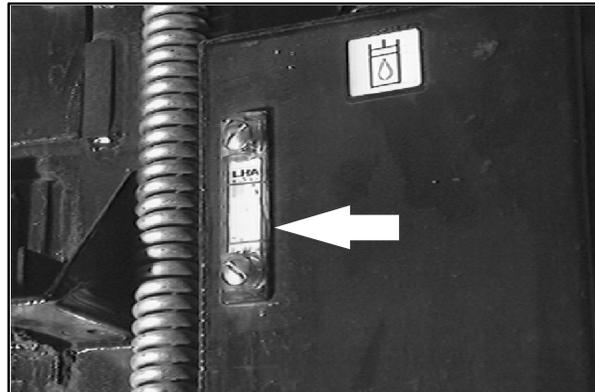
FOR SAFETY: Do Not Operate Machine, Unless Operation Manual Is Read And Understood.

- The model 830 has a GVWR of 9072 kg (20,000 lb) or 4536 kg (10,000 lb) per axle. Operate only on surfaces capable of supporting this weight.
- 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.



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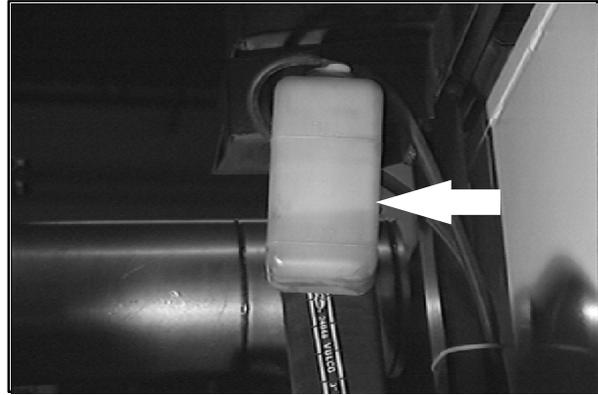
- Check the engine oil level.



OPERATION

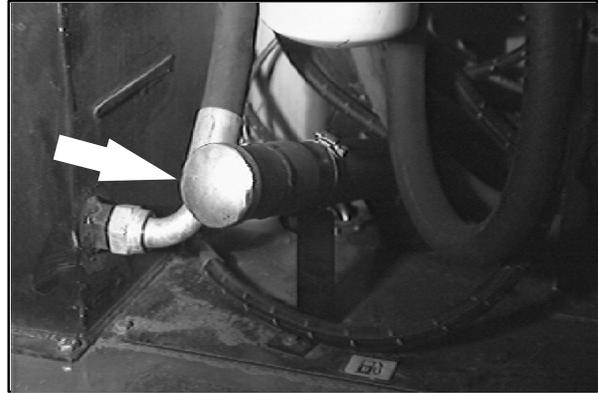
- Check the radiator coolant level.

FOR SAFETY: When Servicing Machine, Avoid Contact With Hot Engine Coolant.

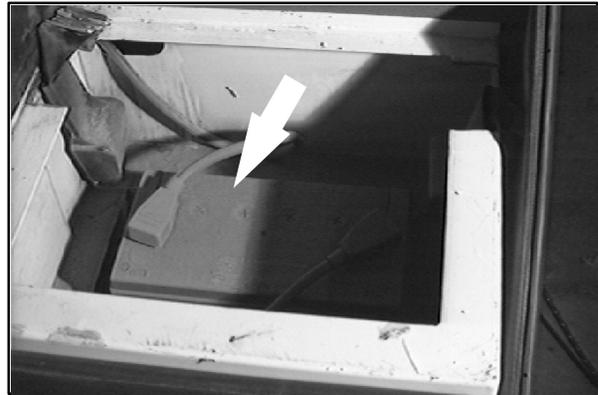


- Fill the fuel tank.

FOR SAFETY: When Servicing Machine, Keep Flames And Sparks Away From Fuel System Service Area. Keep Area Well Ventilated.



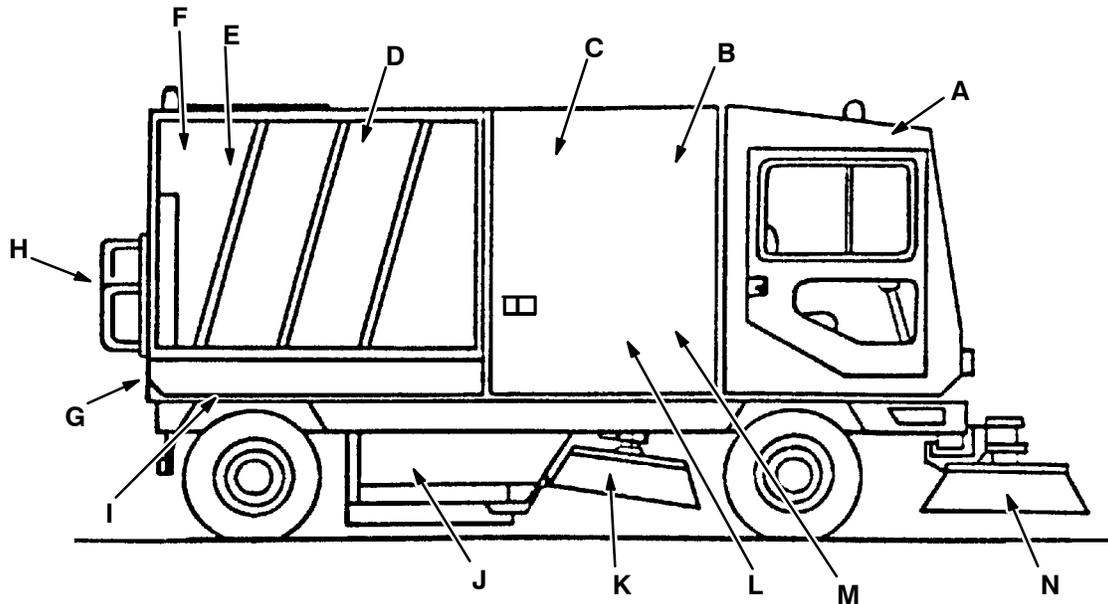
- Check the electrolyte level in the battery.



- Check the tire pressure for all four tires. See *TIRES* in the *MAINTENANCE* section.
- 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. Cab | H. Vacuum Wand |
| B. Diesel Engine | I. Hopper Lift |
| C. Conveyor | J. Main Brush |
| D. Hopper | K. Side Brush(es) |
| E. Dust Filters | L. Water Tank (left side) |
| F. Vacuum Fan | M. Fuel Tank |
| G. Hopper Door | N. Vario Sweeping Brush™ (Option) or
Auxiliary Side Brush (Option) |

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OPERATION

CONTROL PANEL SYMBOLS

These symbols identify controls and displays on the machine:



Auxiliary Side Brush/Vario Sweeping Brush™ Up



Auxiliary Side Brush/Vario Sweeping Brush™ Right



Auxiliary Side Brush/Vario Sweeping Brush™ Down



Auxiliary Side Brush/Vario Sweeping Brush™ Left



Vario Sweeping Brush™ Left Side



Vario Sweeping Brush™ Right Side



Auxiliary Side Brush/Vario Sweeping Brush™ Front Tilt Up



Auxiliary Side Brush/Vario Sweeping Brush™ Front Tilt Down



Auxiliary Side Brush/Vario Sweeping Brush™ Side Tilt Left



Auxiliary Side Brush/Vario Sweeping Brush™ Side Tilt Right



Fuel



Engine Water Temperature



Hourmeter



Glow Plug (Preheat)



Turn Signals



Bright Headlights



Oil Pressure



Charging System



Parking Brake



Solution Level



Hopper Overload



Hopper Door



Main Brush Off



Vacuum Wand Door



Hopper Tilted



Hopper Door Latch



Main Brush Down and On



Hopper Door Open



Water On



Hopper Up



Flashing Lights



Hopper Down



Hazard Light



Main Brush Up



Rear Spot Light



Main Brush Down and On



Front Spot Light



Filter Shaker



Side Brush Spot Light



Left Side Brush



Forward



Side Brush Down and On



Reverse



Water Valve Flow Rate



Air Conditioner



Vario Sweeping Brush™ Rotation Counter-clockwise



Fan



Auxiliary Side Brush/Vario Sweeping Brush™ Rotation Clockwise



Heater



Right Side Brush



Debris Lift Forward Direction



Side Brush Down and On



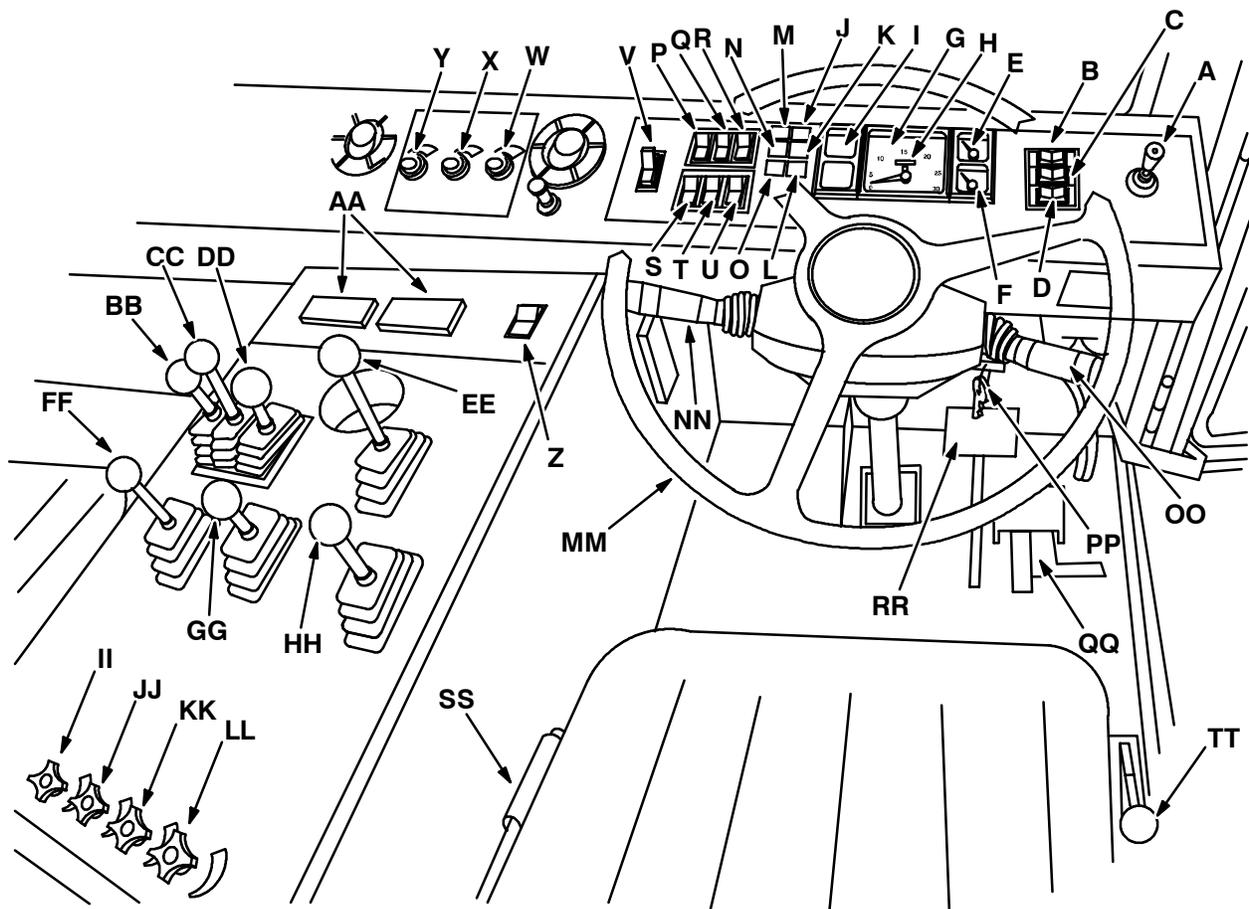
Debris Lift Reverse Direction



Fuse

OPERATION

CONTROLS AND INSTRUMENTS



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- A. Vario Sweeping Brush™ Lever (Option) or Auxiliary Side Brush Lever (Option)
- B. Vario Sweeping Brush™ Switch (Option)
- C. Vario Sweeping Brush™ Front Angle Switch (Option) or Auxiliary Side Brush Front Angle Switch (Option)
- D. Vario Sweeping Brush™ Side Angle Switch (Option)
- E. Fuel Level Gauge
- F. Engine Water Temperature Gauge
- G. Tachometer
- H. Hourmeter
- I. Indicating lights section consisting of:
 - Charging System Light
 - Engine Oil Pressure Light
 - Glow Plugs Light
 - Signal Light
 - Bright Headlights Light
 - Parking Brake Light
 - Water Tank Low Light
- J. Hopper Overload Light (High Dump Model)
- K. Hopper Door Light
- L. Conveyor Up And Main Brush Off Light
- M. Vacuum Wand Door Light (Option)
- N. Hopper Tilt Light
- O. Conveyor Down And Main Brush On Light
- P. Water Pump Switch (Option)

- Q. 4-way Flashers Switch**
- R. Hazard Light Switch**
- S. Front Night Sweeping Light Switch (Option)**
- T. Rear Night Sweeping Light Switch (Option)**
- U. Side Brush Spot Light Switch**
- V. Directional Lever**
- W. Air Conditioner Knob (Option)**
- X. Fan Knob**
- Y. Heater Knob**
- Z. Debris Lift Switch**
- AA. Fuses**
- BB. Hopper Door Lever**
- CC. Hopper Lever**
- DD. Main Brush And Conveyor Lever**
- EE. Vacuum Fan And Filter Shaker Lever**
- FF. Left Side Brush Lever (Option)**
- GG. Vario Sweeping Brush™ Direction Lever (Option) or
Auxiliary Side Brush Direction Lever (Option)**
- HH. Right Side Brush Lever**
- II. Left Side Brush Water Valve Knob (Option)**
- JJ. Vario Sweeping Brush™ Left Water Valve Knob (Option)**
- KK. Vario Sweeping Brush™ Right Water Valve Knob (Option)**
- LL. Right Side Brush Water Valve Knob (Option)**
- MM. Steering Wheel**
- NN. Parking Lights, Headlights, Bright Headlights, And Signals Switch**
- OO. Windshield Wiper And Washer Switch**
- PP. Ignition Switch**
- QQ. Propelling Pedals**
- RR. Brake Pedal**
- SS. Parking Brake Lever**
- TT. Throttle Lever**

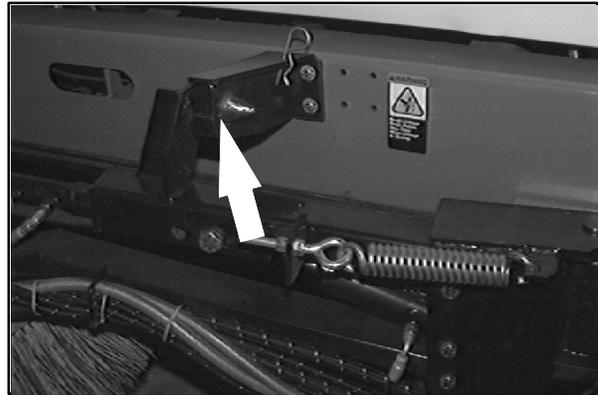
OPERATION OF CONTROLS

VARIO SWEEPING BRUSH™ LOCK PIN (OPTION)

The Vario Sweeping Brush™ lock keeps the brush arm locked in the storage position during transport of the machine, or when the brush is not being used. Unlock the brush arm before using the Vario Sweeping Brush™.

Unlock: Pull out the hair cotter pin out of the end of the lock pin.

Lock: Insert the lock pin and secure with the hair cotter pin.



VARIO SWEEPING BRUSH™ LEVER (OPTION)

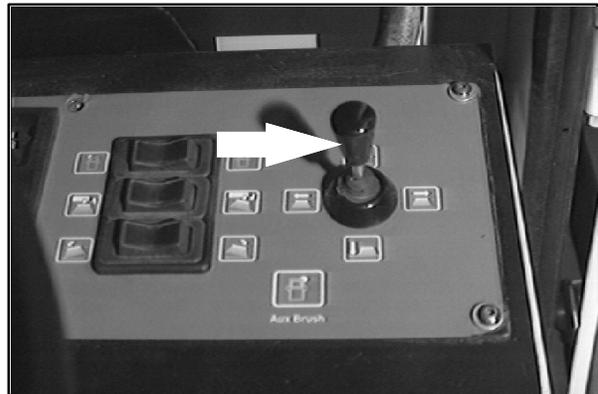
The Vario Sweeping Brush™ lever controls the right-left and up-down movement of the sweeping brush.

Right: Move and hold the lever to the right into the position until the brush has moved to the desired location.

Left: Move and hold the lever to the left into the position until the brush has moved to the desired location.

Up: Move and hold the lever up into the position until the brush has moved to the desired location.

Down: Move and hold the lever down into the position until the brush has moved to the desired location.

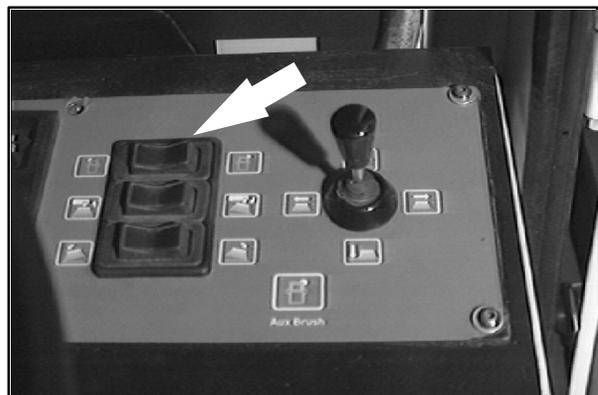


VARIO SWEEPING BRUSH™ SWITCH (OPTION)

The Vario Sweeping Brush™ switch controls the swing of the sweeping brush to the left or right.

Left: Press and hold the switch in the position until the brush has moved to the left as far as desired.

Right: Press and hold the switch in the position until the brush has moved to the right as far as desired.

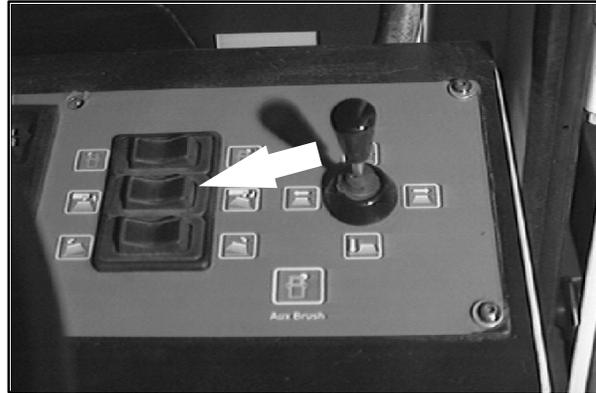


VARIO SWEEPING BRUSH™ FRONT ANGLE SWITCH (OPTION)

The Vario Sweeping Brush™ front angle switch controls the front angle of the sweeping brush.

Decrease Front Angle: Press and hold the switch in the position.

Increase Front Angle: Press and hold the switch in the position.

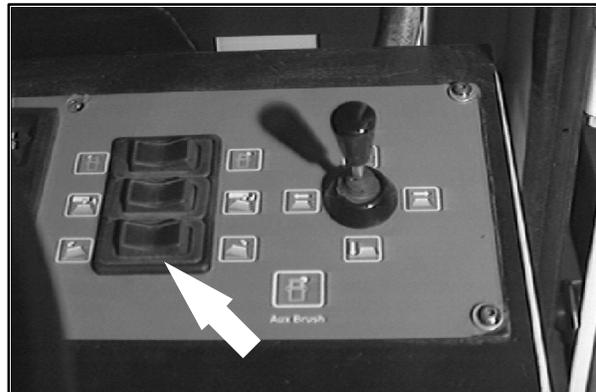


VARIO SWEEPING BRUSH™ SIDE ANGLE SWITCH (OPTION)

The Vario Sweeping Brush™ side angle switch controls the side angle of the sweeping brush.

Tilt to the Left: Press and hold the switch in the position until the brush is tilted to the angle desired, when operating the brush on the left side of the machine.

Tilt to the Right: Press and hold the switch in the position until the brush is tilted to the angle desired, when operating the brush on the right side of the machine.

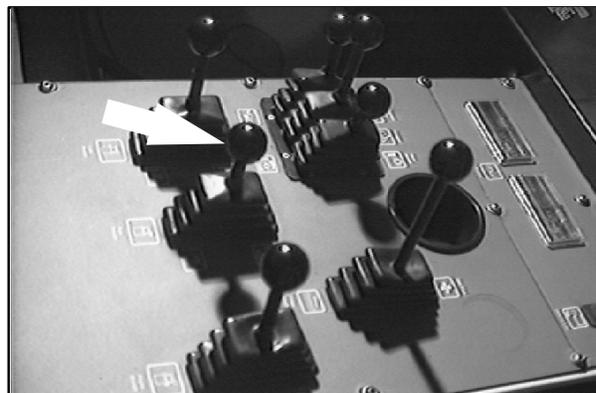


VARIO SWEEPING BRUSH™ DIRECTION LEVER (OPTION)

The Vario Sweeping Brush™ direction lever controls the direction of rotation of the sweeping brush.

Clockwise: Pull the lever into the position when operating the brush on the left side of the machine.

Counter-clockwise: Push the lever into the position when operating the brush on the right side of the machine.



OPERATION

VARIO SWEEPING BRUSH™ LEFT WATER VALVE KNOB (OPTION)

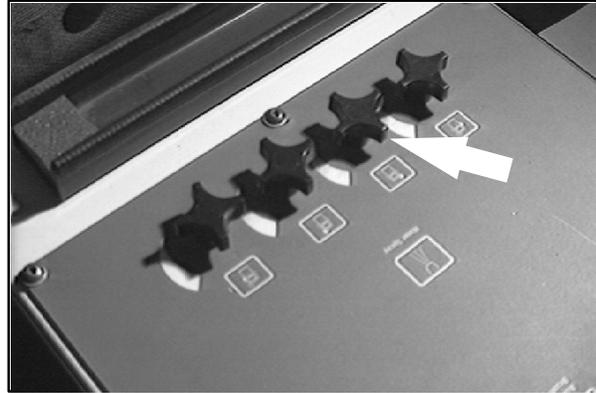
The Vario Sweeping Brush™ left water valve knob controls the amount of water spray to the sweeping brush when it is on left side of the machine.

Increase Water Spray: Turn the water valve knob counter-clockwise.

Decrease Water Spray: Turn the water valve knob clockwise.

Stop Water Spray: Turn the water valve knob clockwise until it comes to a complete stop to close the water supply. If this is NOT done when the machine is shut off, water will continue to flow.

NOTE: The water pump needs to be on for the water valves to operate.



VARIO SWEEPING BRUSH™ RIGHT WATER VALVE KNOB (OPTION)

The Vario Sweeping Brush™ right water valve knob controls the amount of water spray to the sweeping brush when the it is on the right side of the machine.

Increase Water Spray: Turn the water valve knob counter-clockwise.

Decrease Water Spray: Turn the water valve knob clockwise.

Stop Water Spray: Turn the water valve knob clockwise until it comes to a complete stop to close the water supply. If this is NOT done when the machine is shut off, water will continue to flow.

NOTE: The water pump needs to be on for the water valves to operate.



AUXILIARY SIDE BRUSH LEVER (OPTION)

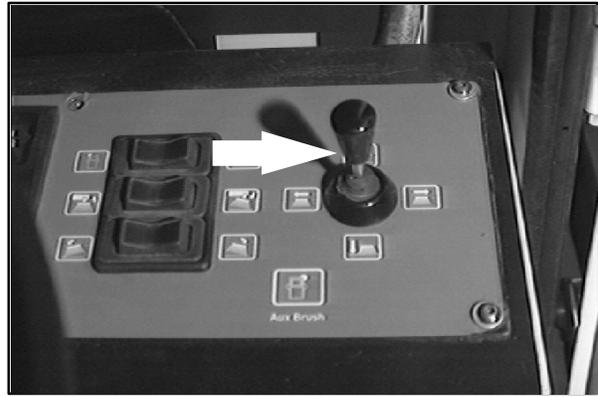
The auxiliary side brush lever controls the right-left and up-down movement of the side brush.

Right: Move and hold the lever to the right into the position until the brush has moved to the desired location.

Left: Move and hold the lever to the left into the position until the brush has moved to the desired location.

Up: Move and hold the lever up into the position until the brush has moved to the desired location.

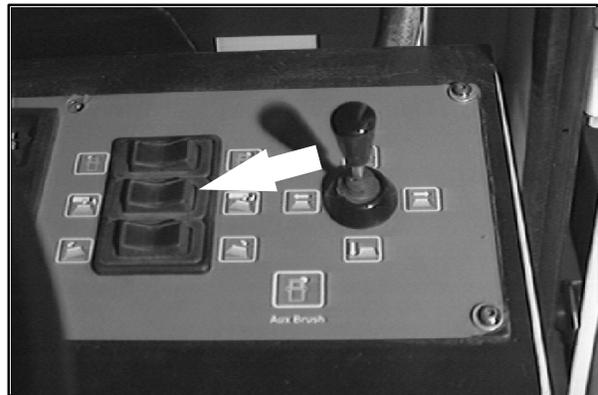
Down: Move and hold the lever down into the position until the brush has moved to the desired location.

**AUXILIARY SIDE BRUSH FRONT ANGLE SWITCH (OPTION)**

The auxiliary side brush switch controls the front angle of the side brush.

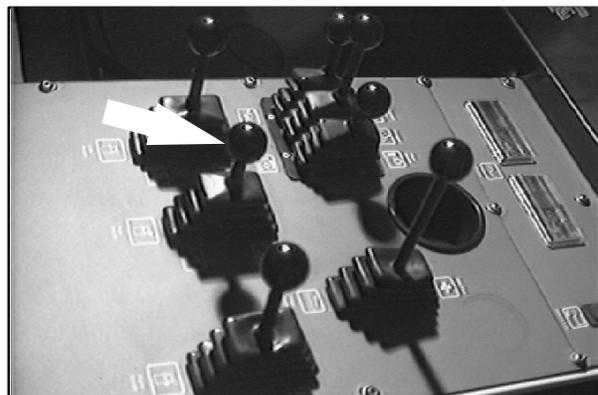
Decrease Front Angle: Press and hold the switch in the position.

Increase Front Angle: Press and hold the switch in the position.

**AUXILIARY SIDE BRUSH DIRECTION LEVER (OPTION)**

The auxiliary side brush direction lever controls the of rotation of the side brush.

On: Push the lever into the position when operating the brush on the right side of the machine.

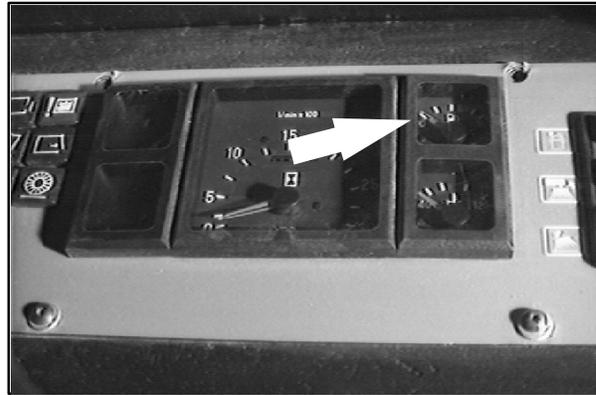


OPERATION

FUEL LEVEL GAUGE

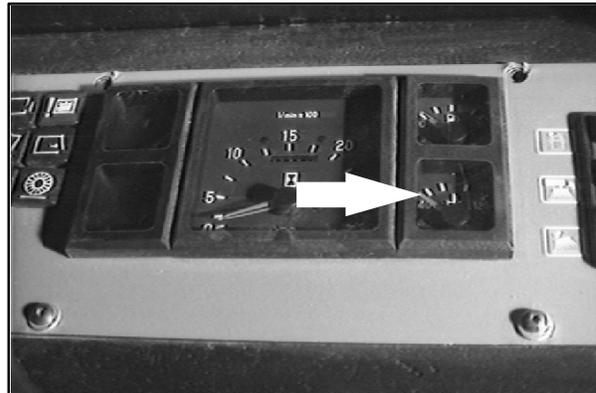
The fuel level gauge indicates how much fuel is in the fuel tank.

NOTE: Do not let the fuel tank empty completely. Air can enter the fuel system and require bleeding, before the next engine start.



ENGINE WATER TEMPERATURE GAUGE

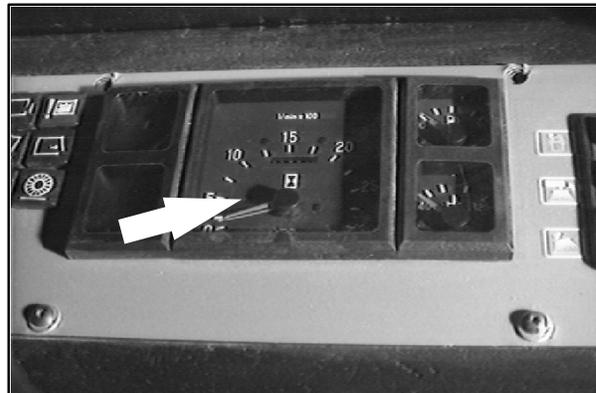
The engine water temperature gauge shows the engine coolant temperature. If the engine coolant temperature rises above 120° C (250° F), stop operating the machine, locate the problem and have it corrected.



TACHOMETER

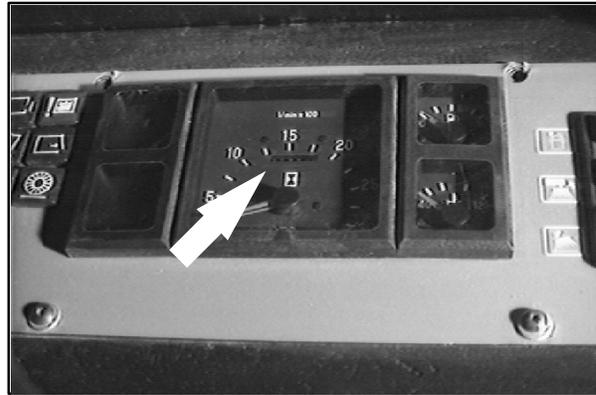
The tachometer shows the engine RPM. Move the throttle lever till the tachometer shows the desired engine RPM for the type of sweeping you are doing. Refer to the chart in the *SWEEPING* section.

NOTE: If the tachometer does not engage when first starting the machine, rapidly increase the throttle until it engages. Then adjust the throttle to the desired engine RPM.



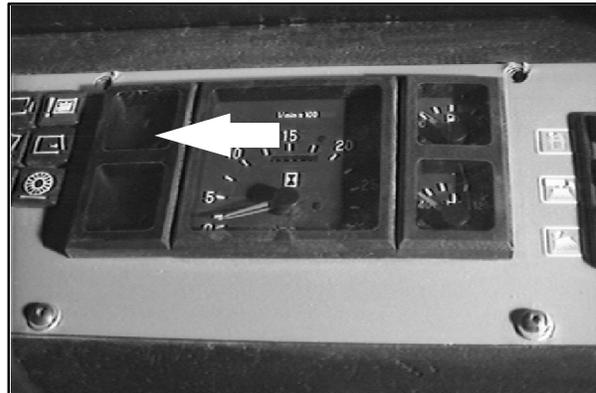
HOURMETER

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

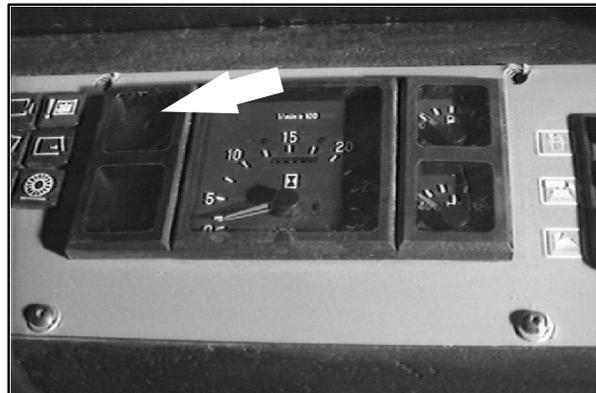
**CHARGING SYSTEM LIGHT**

The charging system light comes on when the existing voltage potential of the battery is not within normal range - 12 to 14 Volts. Stop operating the machine. Locate the problem and have it corrected.

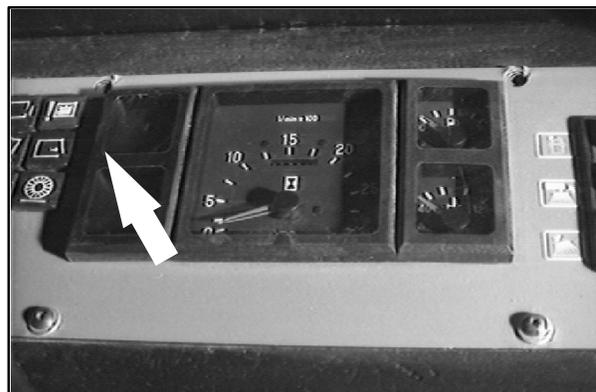
NOTE: If the charging system light stays on when first starting the machine, rapidly increase the throttle until the light goes out. Then adjust the throttle to the desired engine RPM.

**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.

**GLOW PLUGS LIGHT**

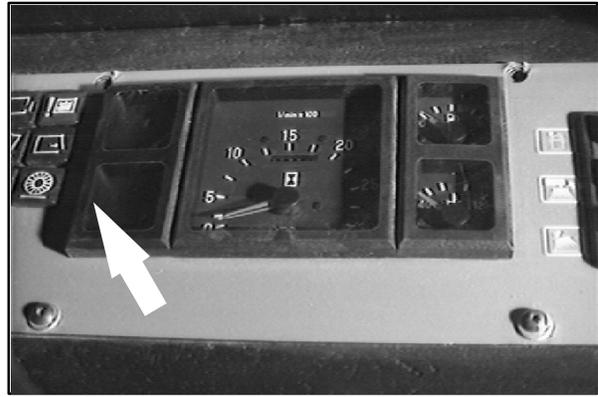
The glow plugs light comes on when the ignition switch is turned counter-clockwise to the accessories position. The light will go out when the engine is ready to start, usually 5 to 30 seconds depending on the weather conditions.



OPERATION

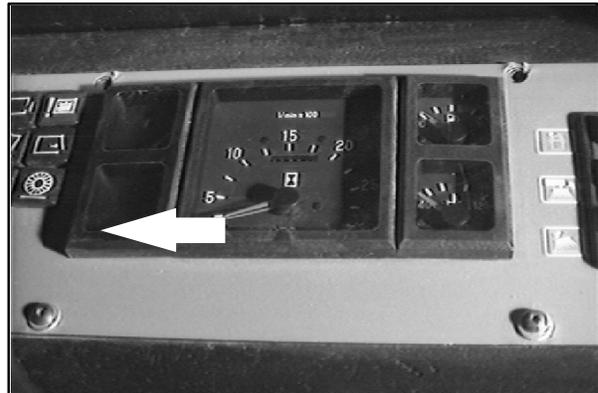
SIGNAL LIGHT

The signal light arrows flash when the turn signals are used, and the 4-way warning lights are on.



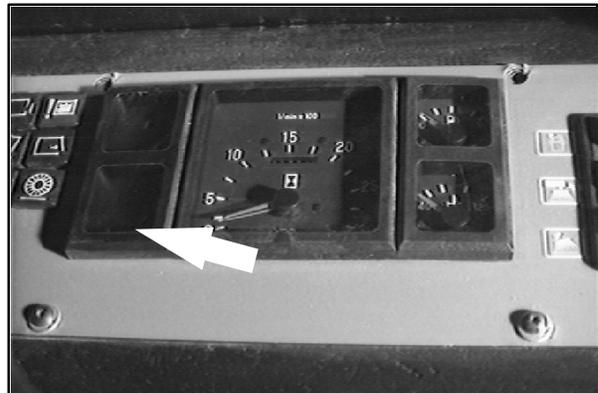
BRIGHT HEADLIGHTS LIGHT

The bright headlights light comes on when the bright headlights are on.



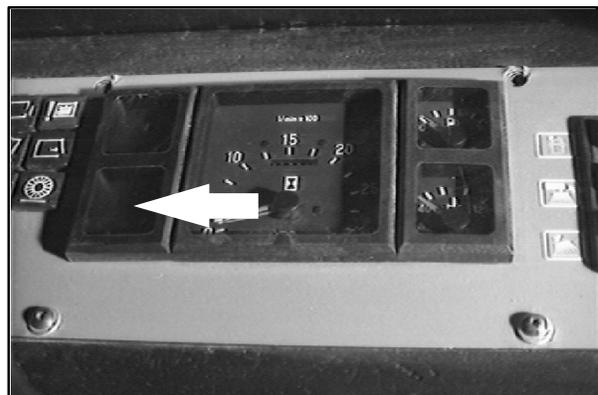
PARKING BRAKE LIGHT

The parking brake light comes on when the parking brake is set.



WATER TANK LOW LIGHT (OPTION)

The water tank low light comes on when the water tank level is low. The water pump will shut off soon after this light comes on.

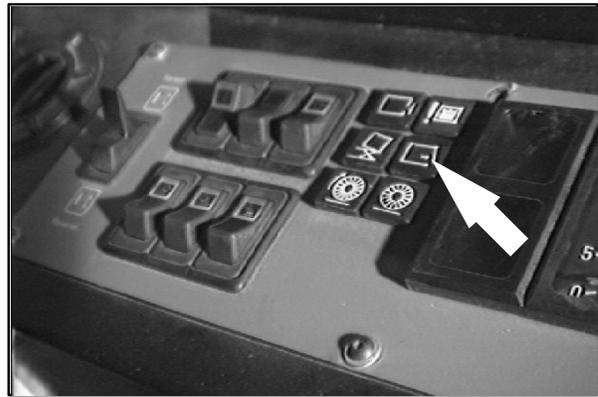


HOPPER OVERLOAD LIGHT - (High Dump Model)

The hopper overload light comes on when the hopper is loaded more than 2040 kg (4500 lb). When the hopper overload light is on, the hopper can only be tilted to low dump.

**HOPPER DOOR LIGHT**

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

**HOPPER TILT LIGHT**

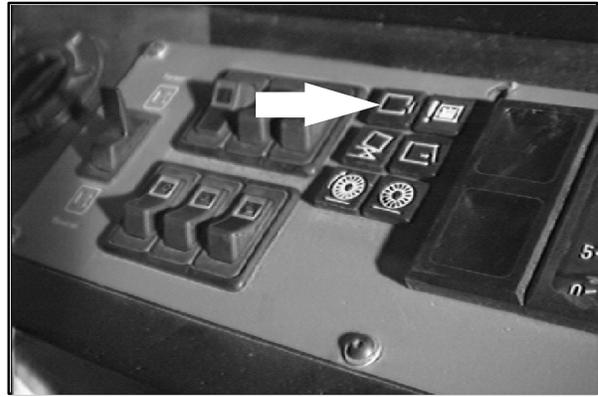
The hopper tilt light comes on when the hopper is tilted back. Make sure the hopper is lowered into the sweeping position and the hopper tilt light is off before sweeping with the machine.



OPERATION

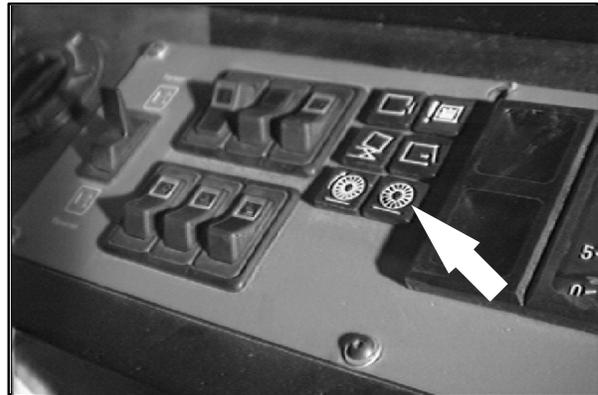
VACUUM WAND DOOR LIGHT (OPTION)

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



CONVEYOR UP AND MAIN BRUSH OFF LIGHT

The green *conveyor up and main brush off* light comes on when the conveyor is raised to the transporting height and the main brush is off. Make sure the *conveyor up and main brush off* light is on before transporting the machine. This green light may turn off while transporting. If the red *conveyor down and main brush on* light comes on while transporting, relift the conveyor.



CONVEYOR DOWN AND MAIN BRUSH ON LIGHT

The red *conveyor down and main brush on* light comes on when the conveyor is lowered to the sweeping height and the main brush is rotating. Make sure the *conveyor down and main brush on* light is on when sweeping with the machine.



WATER PUMP SWITCH (OPTION)

The water pump switch powers on and off the water pump for the dust control system.

On: Press the top of the water pump switch. The light will come on.

Off: Press the bottom of the water pump switch. The light will go off.



4-WAY WARNING LIGHTS SWITCH

The 4-way warning lights switch powers on and off the warning lights.

On: Press the top of the 4-way warning lights switch. The light will come on.

Off: Press the bottom of the 4-way warning lights switch. The light will go off.

**HAZARD LIGHTS SWITCH**

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

On: Press the top of the hazard lights switch. The light will come on.

Off: Press the bottom of the hazard lights switch. The light will go off.

**REAR NIGHT SWEEPING LIGHT SWITCH (OPTION)**

The rear night sweeping light switch powers on and off the rear sweeping light.

On: Press the top of the rear night sweeping light switch. The light will come on.

Off: Press the bottom of the rear night sweeping light switch. The light will go off.

**FRONT NIGHT SWEEPING LIGHT SWITCH (OPTION)**

The front night sweeping light switch powers on and off the front sweeping light.

On: Press the top of the front night sweeping light switch. The light will come on.

Off: Press the bottom of the front night sweeping light switch. The light will go off.



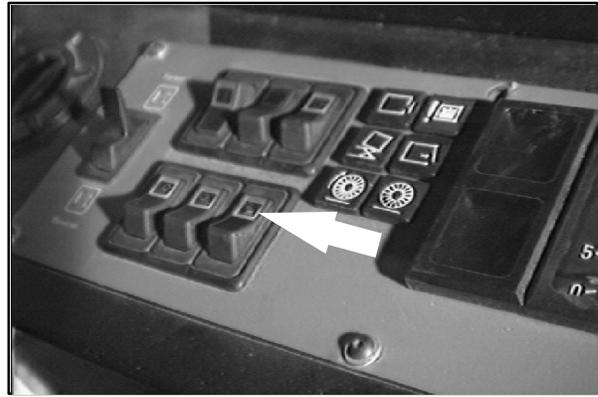
OPERATION

SIDE BRUSH SPOT LIGHT SWITCH

The side brush spot light switch powers on and off the side brush spot light.

On: Press the top of the side brush spot light switch. The light will come on.

Off: Press the bottom of the side brush spot light switch. The light will go off.



DIRECTIONAL LEVER

The directional lever controls the forward-reverse direction of travel of the sweeper.

Forward: Push the lever up into the **Forward** position.

Neutral: Place the lever in the middle, or neutral position.

NOTE: Machine will not start unless the directional lever is in the neutral position.

Reverse: Pull the lever down into the **Reverse** position.



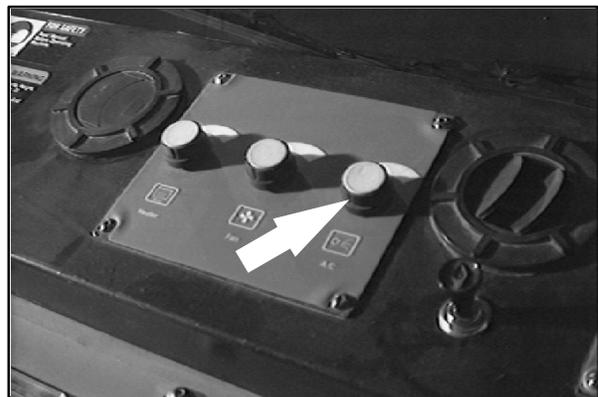
AIR CONDITIONER KNOB (OPTION)

The air conditioner knob controls the air conditioner temperature.

Increase The Cool Temperature: Turn the air conditioner knob clockwise.

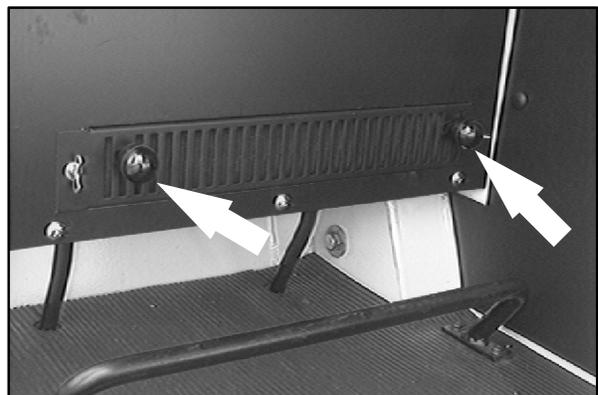
Decrease The Cool Temperature: Turn air conditioner the knob counter-clockwise.

NOTE: The air conditioner will NOT work unless the fan is turned on.



RECIRCULATION AIR CONTROL KNOBS (For Machines Below Serial Number 001548)

The recirculation air control knobs improve the heating or cooling of the cab air. To recirculate the air, loosen the knobs, slide the vent to the left, and then tighten the knobs. Slide the vent to the right if only fresh outside air is desired.



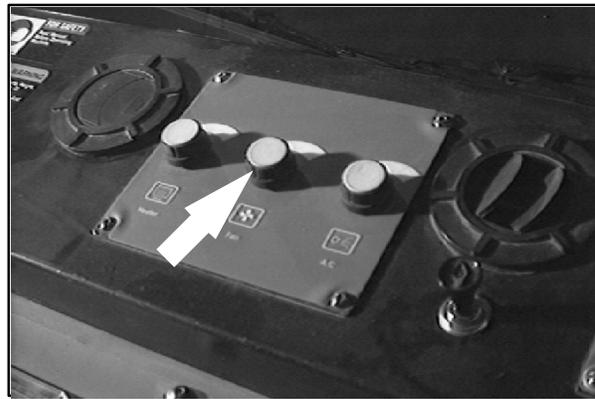
FAN KNOB

The fan knob controls the fan speed for the heater and air conditioner.

Increase: Turn the fan knob clockwise.

Decrease: Turn the fan knob counter-clockwise.

NOTE: This switch does not turn off when the ignition is turned off.

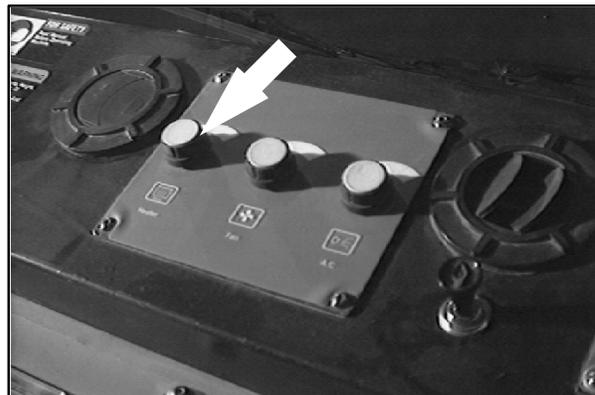


HEATER KNOB

The heater knob controls the heater temperature.

Increase: Turn the heater knob clockwise.

Decrease: Turn heater the knob counter-clockwise.

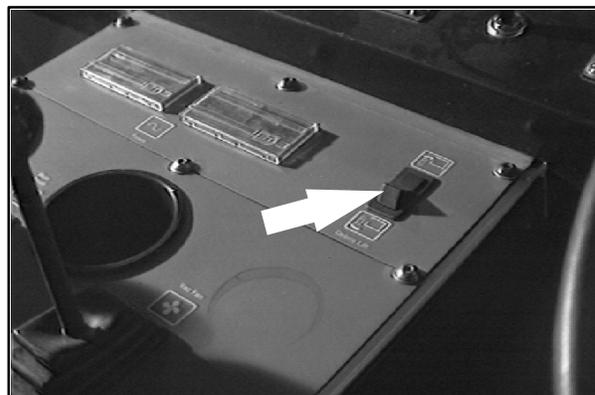


DEBRIS LIFT DIRECTION SWITCH

The debris lift direction switch controls the direction of the debris conveyor.

Forward: Place the debris lift switch in the position. This direction lifts debris into the hopper.

Reverse: Place the debris lift switch in the position. This direction reverses the conveyor to release debris clogged in the conveyor. Reverse is also used when cleaning the conveyor.

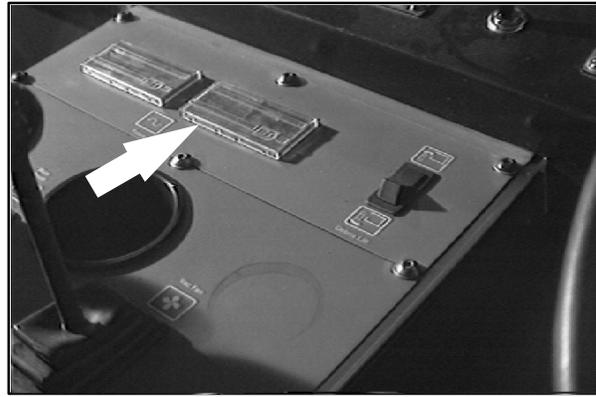


OPERATION

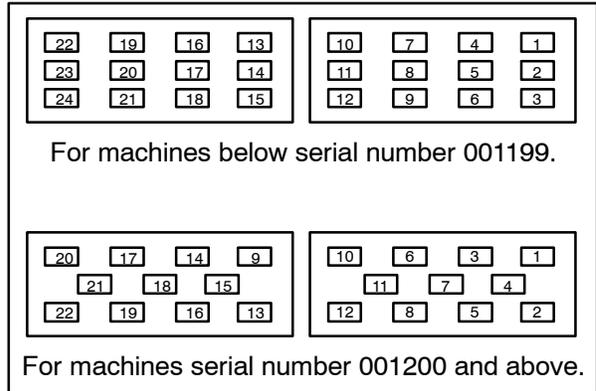
FUSES

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 fuses are located in the center control panel.



Fuse	Rating	Circuit Protected
FU-1	15 A	Glow plugs
FU-2	15 A	Wipers switch
FU-3	15 A	Water pump (option)
FU-4	10 A	Lighter
FU-5	15 A	Auxiliary front brush (option)
FU-6	20 A	Heater/air conditioner
FU-7	10 A	Thermo Sentry™
FU-8	7.5 A	Indicator lights
FU-9	30 A	Run position (ignition)
FU-10	15 A	Forward/reverse
FU-11	5 A	Clogged debris lift
FU-12	7.5 A	Debris lift
FU-13	5 A	Brake lights
FU-14	15 A	Turn signals /4-way flashers
FU-15	10 A	Hazard lights
FU-16	7.5 A	Horn
FU-17	10 A	Radio (option)
FU-18	25 A	Operating lights
FU-19		Spare
FU-20		Spare
FU-21	20 A	Night sweeping lights

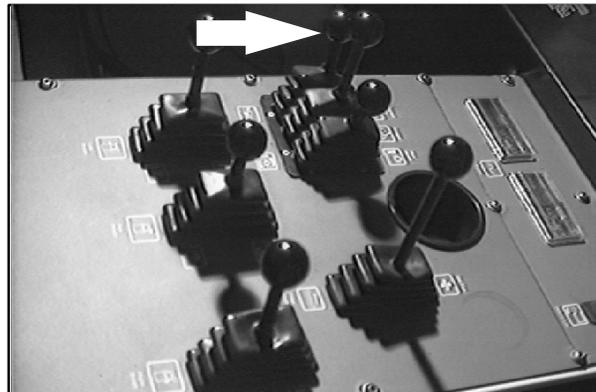


HOPPER DOOR LEVER

The hopper door lever latches and unlatches the hopper door. When the hopper is tilted out, the hopper door will swing open when it is unlatched.

Unlatch: Pull the hopper door lever in the position.

Latch: Push the hopper door lever in the position when the hopper is in the sweeping position.



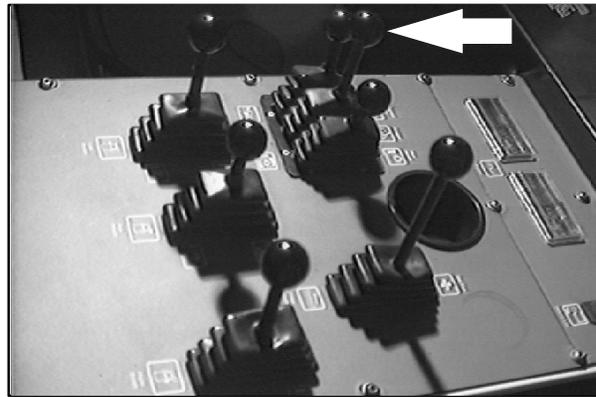
HOPPER LEVER

The hopper lever controls the tilt of the hopper, and lift of the hopper only on the high dump model. The throttle should be at idle.

Tilt Out and Lift: Pull and hold the hopper lever in the position. The hopper first tilts out, then lifts on the high dump model.

Hold: Release the hopper lever into the middle position.

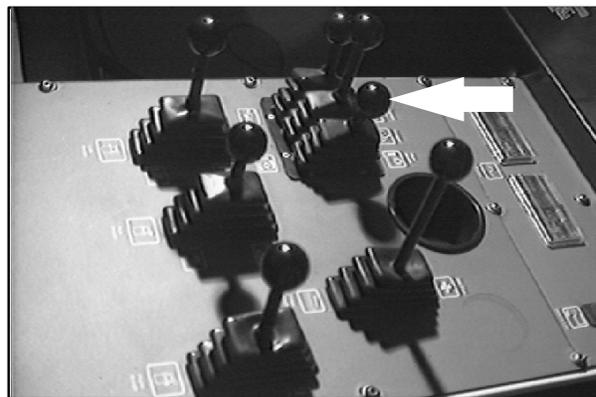
Tilt In and Lower: Push and hold the hopper lever in the position. The hopper first lowers on the high dump model, then tilts in.

**MAIN BRUSH AND CONVEYOR LEVER**

The main brush and conveyor lever controls the position and rotation of the main brush and the position of the conveyor.

Lower and Start: Pull and hold the main brush and conveyor lever in the position until the conveyor down and main brush on light comes on.

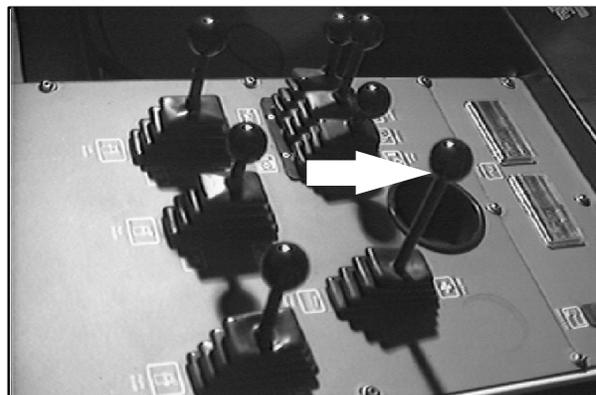
Raise and Stop: Push and hold the main brush and conveyor lever in the position. When the *conveyor up and main brush off* light comes on, hold in this position for about 5 seconds before releasing.

**VACUUM FAN AND FILTER SHAKER LEVER**

The vacuum fan and filter shaker lever controls the vacuum fan and filter shaker.

Vacuum Fan On: Push the vacuum fan and filter shaker lever into the position. The throttle should be at idle.

Filter Shaker On: Pull and hold the vacuum fan and filter shaker lever into the position for 20 to 30 seconds before tilting the hopper.



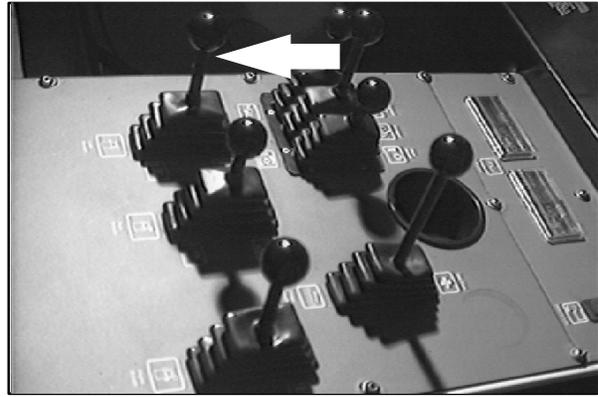
OPERATION

LEFT SIDE BRUSH LEVER (OPTION)

The left side brush lever controls the left side brush position and rotation.

Down and On: Push the left side brush lever into the position. The throttle should be at 1800 RPM.

Up and Off: Pull the left side brush lever into the position.

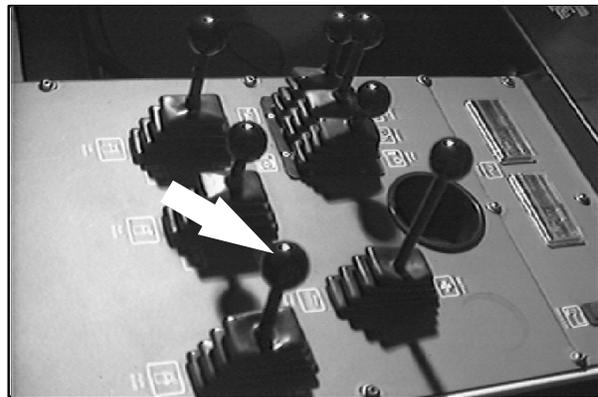


RIGHT SIDE BRUSH LEVER

The right side brush lever controls the right side brush position and rotation.

Down and On: Push the right side brush lever into the position. The throttle should be at 1800 RPM.

Up and Off: Pull the right side brush lever into the position.



LEFT SIDE BRUSH WATER VALVE KNOB (OPTION)

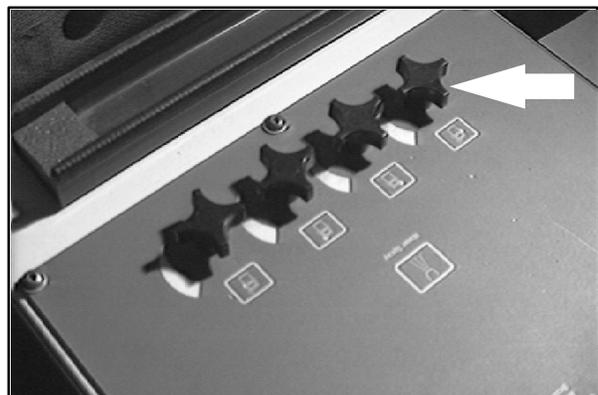
The left side brush water valve knob controls the amount of water spray to the left side brush.

Increase Water Spray: Turn the left side brush water valve knob counter-clockwise.

Decrease Water Spray: Turn the left side brush water valve knob clockwise.

Stop Water Spray: Turn the water valve knob clockwise until it comes to a complete stop to close the water supply. If this is NOT done when the machine is shut off, water will continue to flow.

NOTE: The water pump needs to be on for the water valves to operate.



RIGHT SIDE BRUSH WATER VALVE KNOB (OPTION)

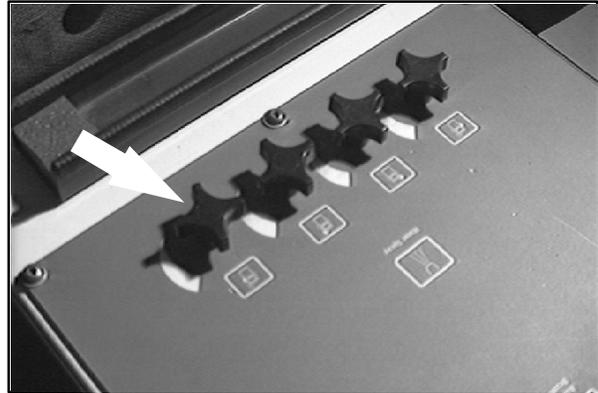
The right side brush water valve knob controls the amount of water spray to the right side brush.

Increase Water Spray: Turn the right side brush water valve knob counter-clockwise.

Decrease Water Spray: Turn the right side brush water valve knob clockwise.

Stop Water Spray: Turn the water valve knob clockwise until it comes to a complete stop to close the water supply. If this is NOT done when the machine is shut off, water will continue to flow.

NOTE: The water pump needs to be on for the water valves to operate.



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.

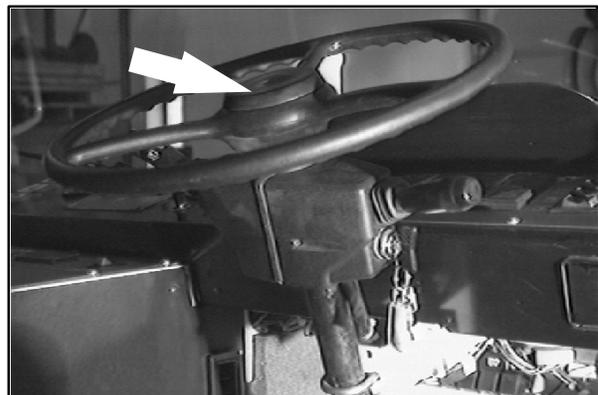
NOTE: The machine has 4-wheel steering. Watch the swing of the rear corners of the machine when turning.



HORN BUTTON

The horn button operates the horn.

Sound: Press the button.



OPERATION

PARKING LIGHTS, HEADLIGHTS, BRIGHT HEADLIGHTS, AND SIGNALS SWITCH

The parking lights, headlights, bright headlights, and signal switch controls the parking lights, headlights, and signals.

Parking and Headlights Off: Turn the switch knob all the way forward.

Parking Lights On: Turn the switch knob to the first click.

Headlights On: Turn the switch knob to the second click.

Bright Headlights On: Push the switch lever down.

Bright Headlights Off: Pull the switch lever up.

Flash Bright Headlights: Pull the switch lever up, then release.

Signals: Push the switch lever forward for the right signal. Pull the switch lever back for the left signal.



WINDSHIELD WIPER AND WASHER SWITCH

The windshield wiper and washer switch controls the windshield wipers and windshield washer fluid spray.

Windshield Wipers Off: Push the lever all the way down.

Windshield Wipers Slow Speed: Pull the switch lever to the first position.

Windshield Wipers High Speed: Pull the switch lever to the second position.

Windshield Washer Fluid Spray: Push the switch lever end in.



IGNITION SWITCH

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

Preheat: Turn the key counter-clockwise. The glow plugs light will come on. When the glow plug light goes out, usually for 5 to 30 seconds depending on the weather conditions, the engine is ready to start.

NOTE: The preheat is not necessary if the temperature is above 10° C (50° F).

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

Stop: Turn the key counter-clockwise.

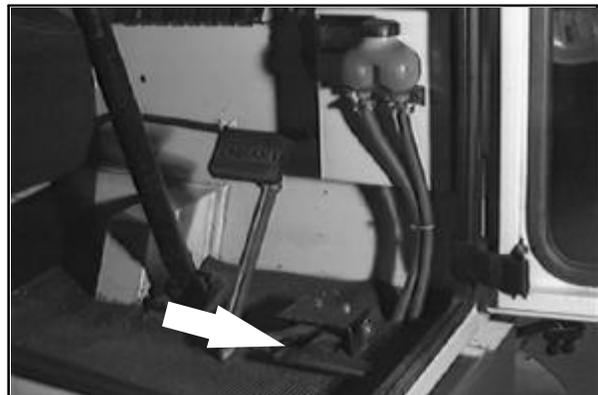


PROPELLING PEDALS

The propelling pedals control 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.

The right pedal is used mainly for sweeping, and uses the manual throttle.

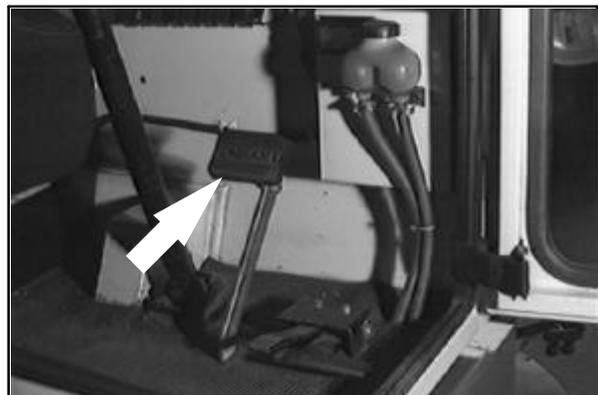
The left pedal is used mainly for transporting the machine, and overrides the manual throttle.



BRAKE PEDAL

The brake pedal stops the machine.

Stop: Take your foot off the propelling pedal and step on the brake pedal.



OPERATION

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.

Release: Push in the release button on the end of the lever handle and push the lever down.

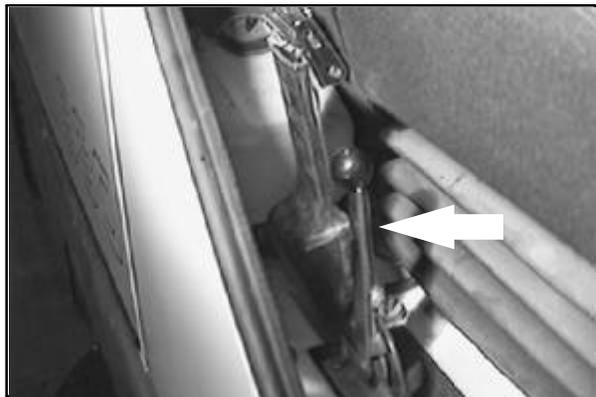


THROTTLE LEVER

The throttle lever controls the engine speed.

Fast: Push the lever forward.

Idle: Pull the lever backward.



LATCHES

The cab doors, side doors, and main brush access doors are secured with latches.

Open the Cab Doors: Pull out on the latch handle.

Open the Side Doors: Pull out on the latch handle.

Open the Main Brush Access Doors: For machines below serial number 001710, turn the door knob counter-clockwise until the knob comes loose from the machine frame. For machines serial number 001710 and above, pull on the rubber latch until the door is loose. Remove the door by pulling the door from the pins in the machine frame.



OPERATOR SEAT

The operator seat has two adjustments. The adjustments are for the front to rear seat position and ride stiffness.

The seat front-to-rear position is adjusted by the seat position lever.

Adjust: Push the lever to the left, slide the seat backward or forward to the desired position and release the lever.



The ride stiffness is adjusted with the stiffness knob.

Adjust: Turn the knob clockwise to increase the ride stiffness, and counter-clockwise to decrease the ride stiffness.

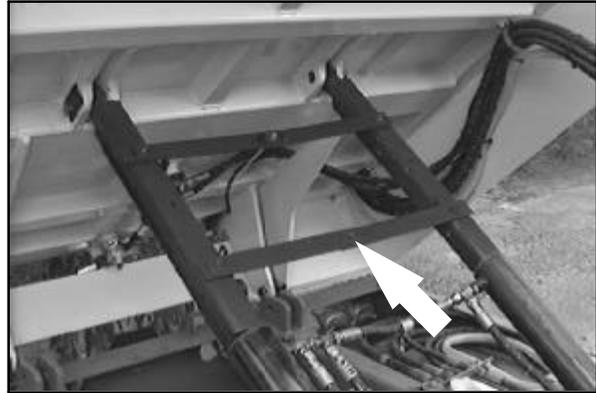


OPERATION

HOPPER SUPPORT BAR (For Machines Below Serial Number 001710)

The hopper support bar holds the hopper in the tilted position to allow work under the hopper. DO NOT rely on the machine hydraulic system to keep the hopper raised.

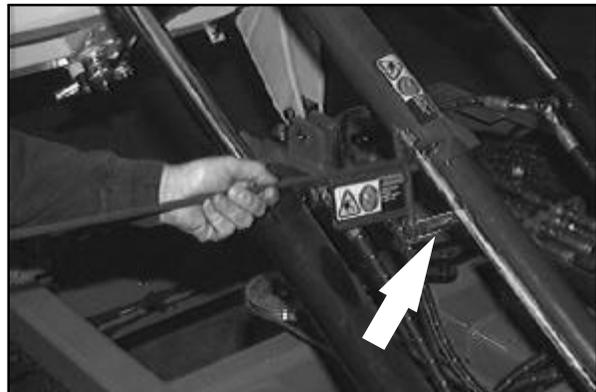
 **WARNING: Raised Hopper May Fall. Engage Hopper Support Bar.**



HOPPER SUPPORT PIN (For Machines Serial Number 001710 And Above)

The hopper support pin holds the hopper in the tilted position to allow work under the hopper. DO NOT rely on the machine hydraulic system to keep the hopper raised.

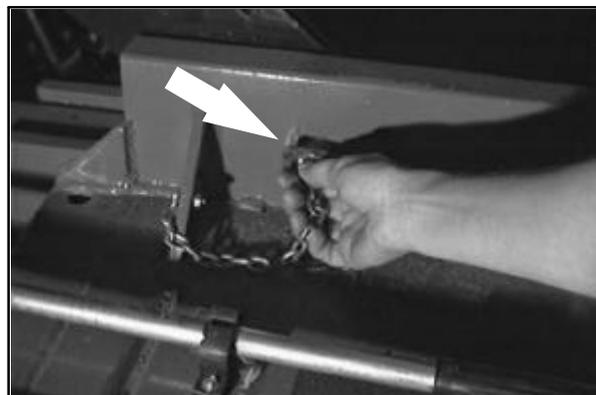
 **WARNING: Raised Hopper May Fall. Engage Hopper Support Pin.**



HOPPER SUPPORT PINS (High Dump Model)

The hopper support pins 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 (2) Hopper Support Pins.**



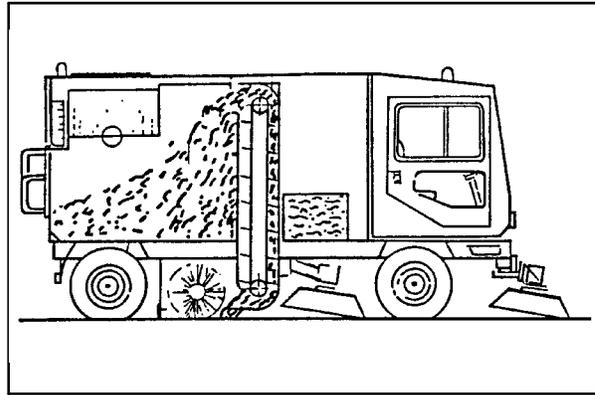
HOW THE MACHINE WORKS

The steering wheel controls the direction of machine travel. The directional lever controls the forward/reverse direction. The propelling pedal controls machine speed. 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 surface onto the conveyor, which transfers the debris into hopper. The vacuum system pulls dust and air through the hopper and the hopper dust filters.

The machine has a left side brush, a Vario Sweeping Brush™, and an auxiliary side brush option. There is also a dust control water system.

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



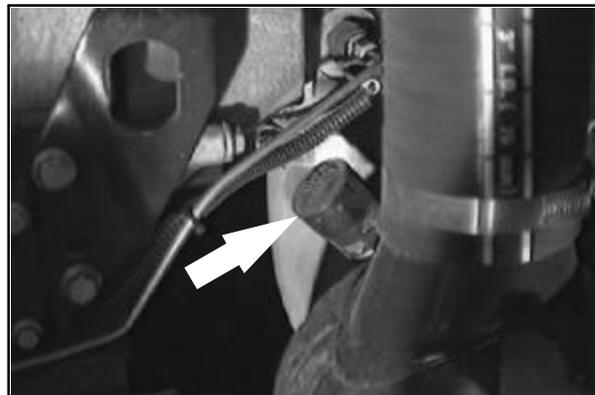
09540

PRE-OPERATION CHECKLIST

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

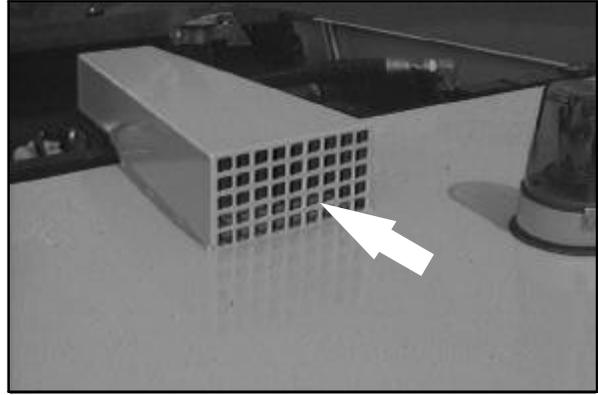


- Check the engine air filter indicator.



OPERATION

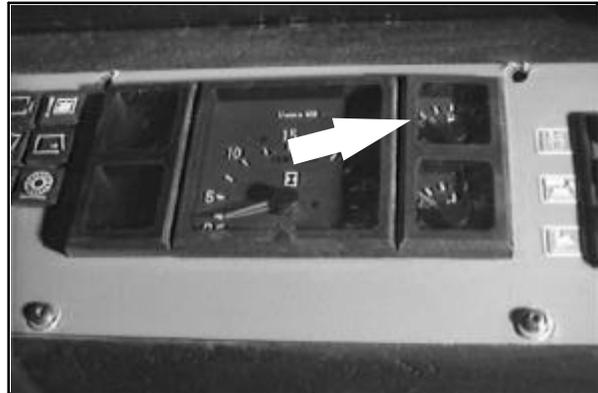
- Check the air filter intake screen at the top of the cab for obstructions.



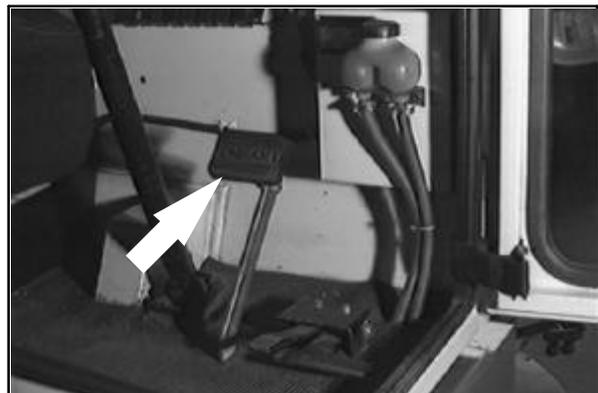
- Check the engine oil level.



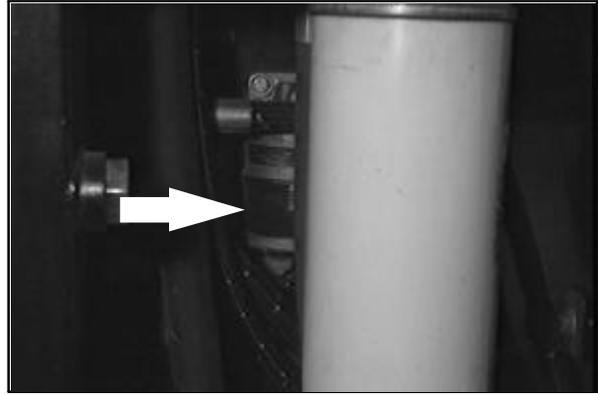
- Check fuel level.



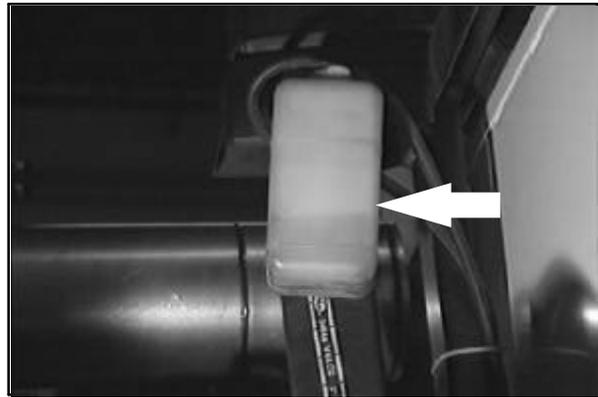
- Check the brakes and steering for proper operation.



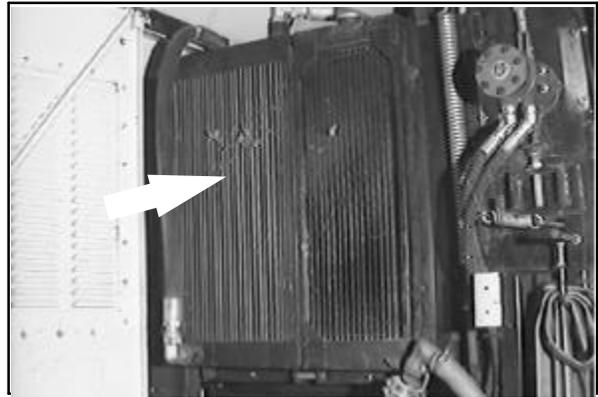
- Check fuel filter water trap for water.



- Check the coolant level in the overflow reservoir.



- Check the radiator core exterior and hydraulic cooler fins for debris.

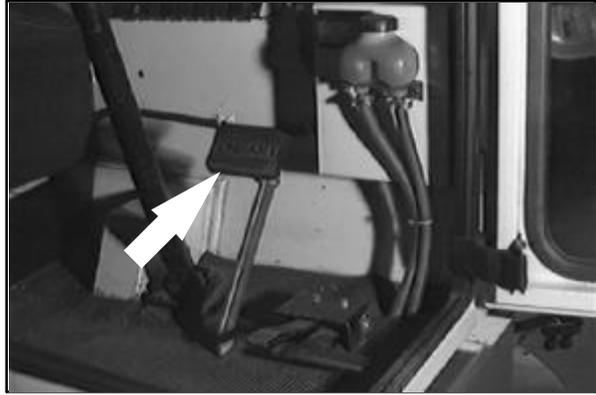


- Check the windshield washer fluid level.



STARTING THE MACHINE

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



2. Move the throttle lever back to the idle position.



3. Make sure the directional lever is in neutral.

NOTE: Machine will not start unless the directional lever is in the neutral position.



4. Turn the key counter-clockwise. The glow plug light will come on. When the glow plug light goes out, usually for 5 to 30 seconds depending on the weather conditions, the engine is ready to start.

NOTE: The preheat is not necessary if the temperature is above 10° C (50° F).



- 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 attempt or damage to the starter motor may occur.

- Allow the engine and hydraulic system to warm up three to five minutes.

⚠ WARNING: Engine Emits Toxic Gases. Severe Respiratory Damage Or Asphyxiation Can Result. Provide Adequate Ventilation. Consult With Your Regulatory Agency For Exposure Limits. Keep Engine Properly Tuned.

NOTE: If the tachometer does not engage or if the charging system light stays on, rapidly increase the throttle until the light goes out and the tachometer engages. Then adjust the throttle to the desired engine RPM.

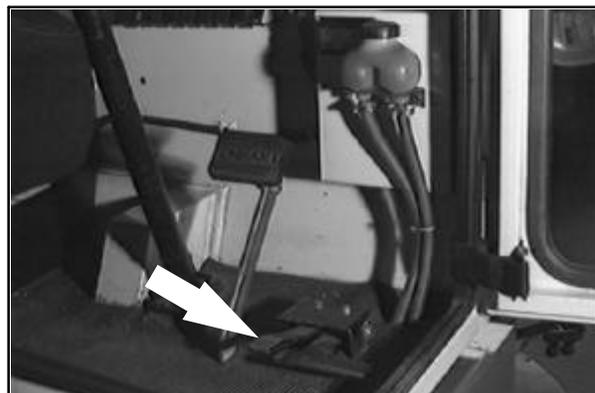
- Release the machine parking brake.

- Place the directional lever in the **Forward** position.

- Press on the left propelling pedal to transport the machine. The more foot pressure, the faster the machine will travel.

- Drive the machine to the area to be swept. When transporting to sweeping area, hydraulically lift the conveyor and all the brushes. If equipped with the Vario Sweeping Brush™, lock the brush into the travel support with the guide pin. Every 10 minutes relift the conveyor and all the brushes to keep them from slowly lowering into their operating positions.

FOR SAFETY: When Using Machine, Always Follow Safety And Traffic Rules.



SWEEPING AND BRUSH INFORMATION

The model 830 has a GVWR of 9072 kg (20,000 lb) or 4536 kg (10,000 lb) per axle. Operate only on surfaces capable of supporting this weight.

Avoid bulky debris such as crates, boxes, tree branches, and very heavy material. Avoid pieces of straps, twine, rope, 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 as straight a path as possible. Overlap the brush paths.

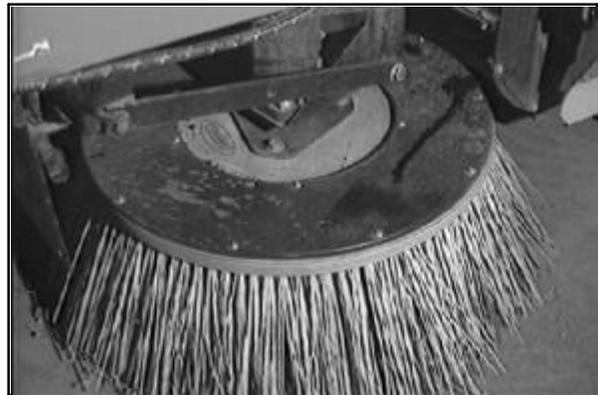
Avoid turning the steering wheel too sharply when the machine is in motion. The machine is very responsive to the movement of the steering wheel. Avoid sudden turns, except in emergencies.

Use the wet dust control option in dusty conditions.

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

Polypropylene and Wire Side Brush - Recommended for general purpose sweeping. Best combination of sweeping and aggressiveness.

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.

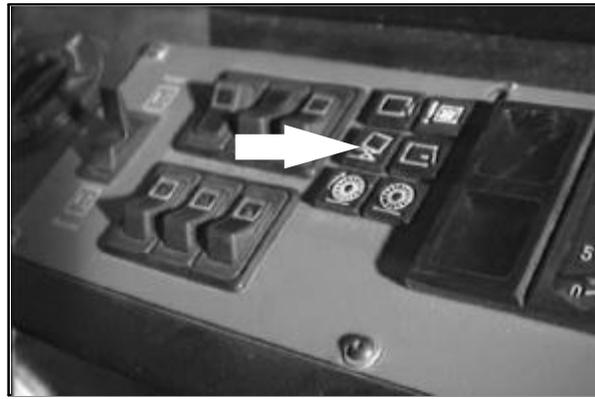


SWEEPING

1. Make sure the hopper door light is off. If the hopper door light is on, latch the hopper door.



2. Make sure the hopper tilt light is off. If the hopper tilt light is on, lower the hopper till the light goes off.



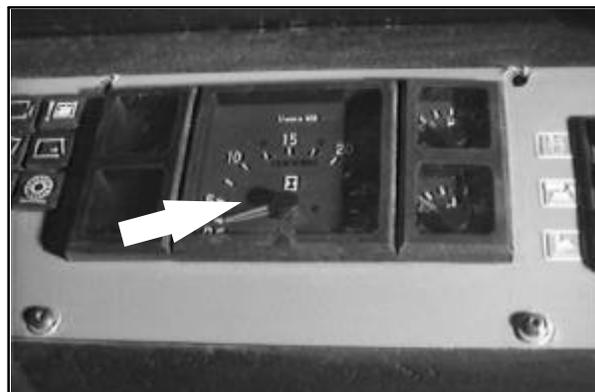
3. Move the throttle lever till the tachometer shows the desired engine RPM for the type of sweeping you are doing. Refer to the following chart.

Debris	Engine RPM	Travel Speed
Fine Dust	1500 RPM	Normal
Light Debris (Leaves grass) (Shake filter often)	2000 RPM	Normal
Wet Sweeping (Vacuum fan on)	2000 RPM	Normal
General Debris	1800 RPM	Normal
Heavy Debris	2000 RPM	Slower than Normal
Vacuum Wand (Ear plugs mandatory)	2500 RPM	None



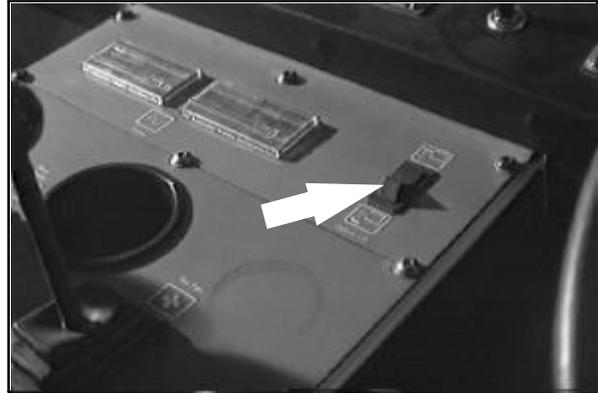
NOTE: Do NOT sweep with engine speed higher than 2000 RPM.

NOTE: If the tachometer does not engage, rapidly increase the throttle until the tachometer engages. Then adjust the throttle to the desired engine RPM.

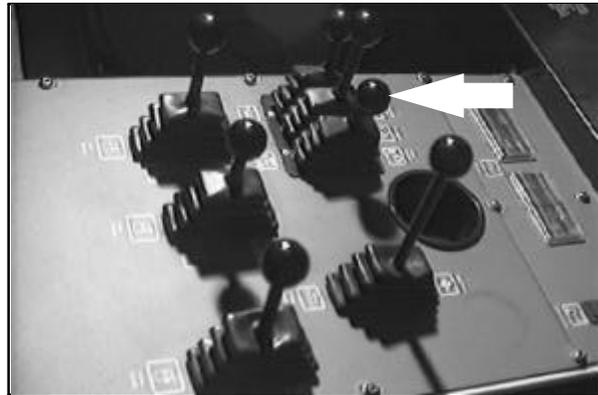


OPERATION

4. Make sure the debris lift switch is in the forward position.

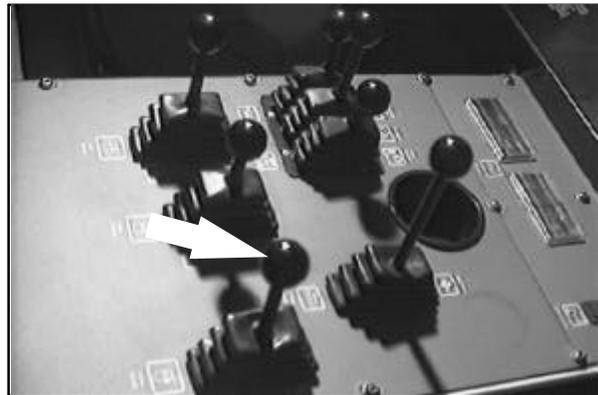


5. Lower and start the main brush with the main brush and conveyor lever. The conveyor down and main brush on light will come on.

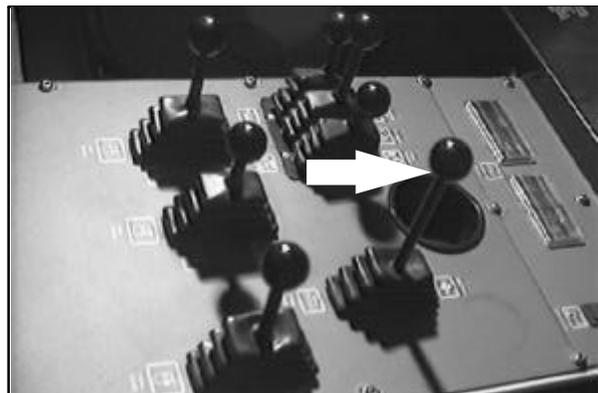


6. Lower the side brush with the right side brush lever.

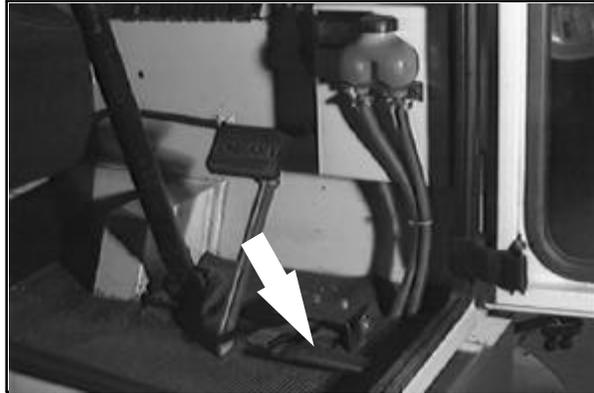
7. Lower the optional side brushes, if equipped and needed.



8. Start the vacuum fan with the vacuum fan and filter shaker lever.

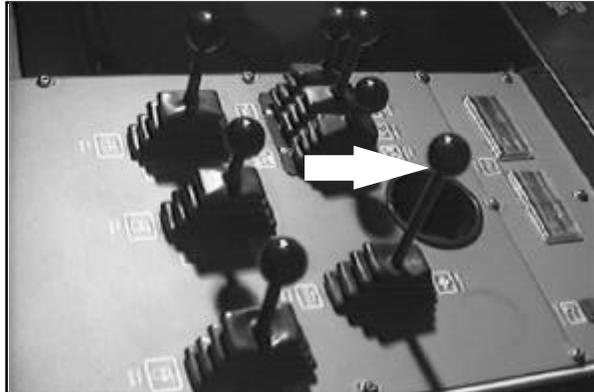


9. Press the right propelling pedal and start sweeping.



10. In dusty conditions, periodically shake the dust filters with the vacuum fan and filter shaker lever.

NOTE: Shake the dust filter before tilting the hopper.

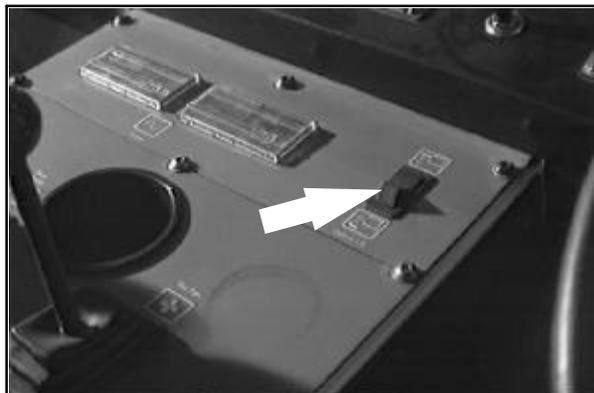


11. Stop sweeping if the conveyor overload alarm sounds. This alarm means that either a large object is jammed in the conveyor, that there is too much heavy debris in the conveyor, or that the hopper opening is filled.

If a large object is jammed in the conveyor, the alarm will sound constantly even *after* the machine is stopped. To clear the jammed object, stop sweeping, reduce the engine speed, and place the debris lift direction switch in the reverse position until the debris is removed. Then place the switch back in the forward position and continue sweeping.

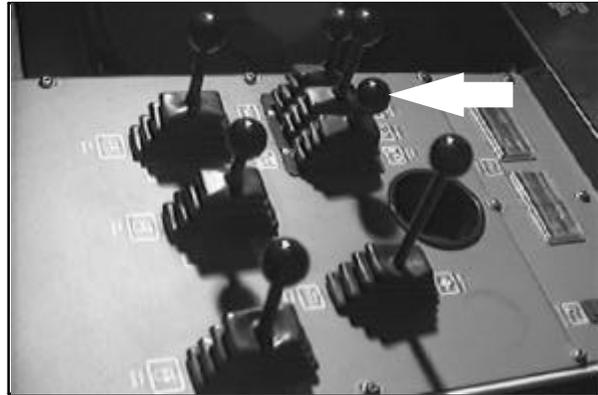
If there is too much heavy debris in the conveyor, the alarm will sound constantly *until* the machine has stopped. This means that the debris must be swept at a slower travel speed.

If the hopper opening is filled, the alarm will *chirp* intermittently. The opening can be cleared by redistributing the debris in the hopper. To do this, stop sweeping, raise the main brush and conveyor, and tilt the hopper back. Return the hopper to the sweeping position and continue to sweep.

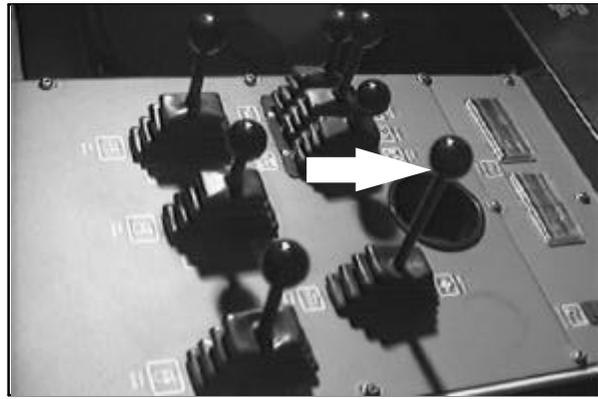


STOP SWEEPING

1. Raise the main brush with the main brush and conveyor lever. The *conveyor up and main brush off* light will come on.

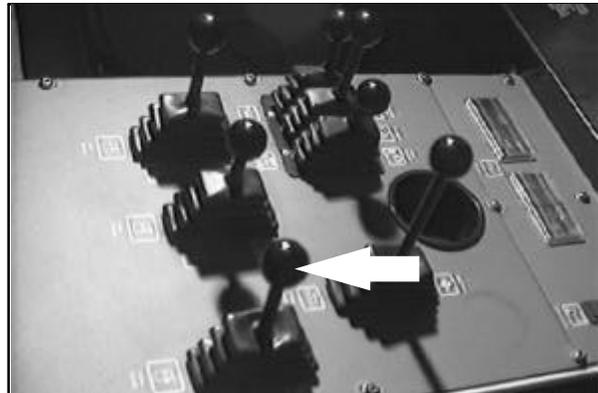


2. Stop the vacuum fan with the vacuum fan and filter shaker lever.



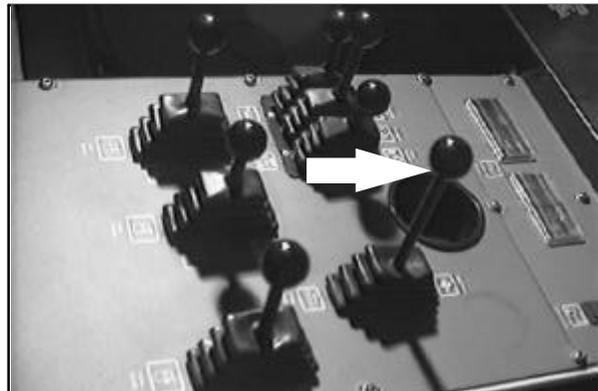
3. Raise the side brush with the right side brush lever.

4. Raise the optional side brushes if used.



5. Shake the dust filters with the vacuum fan and filter shaker lever.

NOTE: Shake the dust filter before tilting the hopper.



EMPTYING THE HOPPER

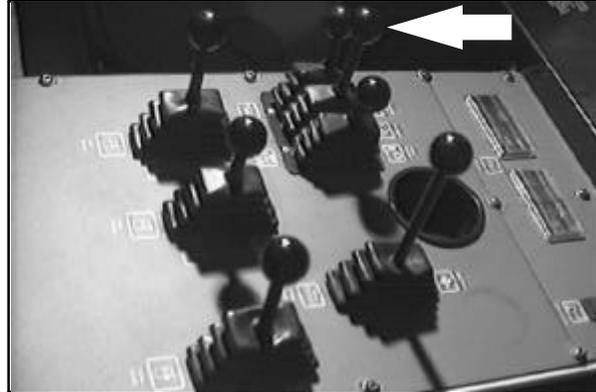
1. Slowly drive the machine to the debris collection site or debris container. Make sure the machine is on level ground before dumping the hopper.
2. Tilt and lift the hopper with the hopper lever to the desired height for the debris container.

NOTE: Be aware that the minimum ceiling height needed to high dump the hopper is 4115 mm (13.5 ft).

⚠ WARNING: High Dump Vertical Clearance. Stay Clear Of Overhead Obstructions And Power Lines.

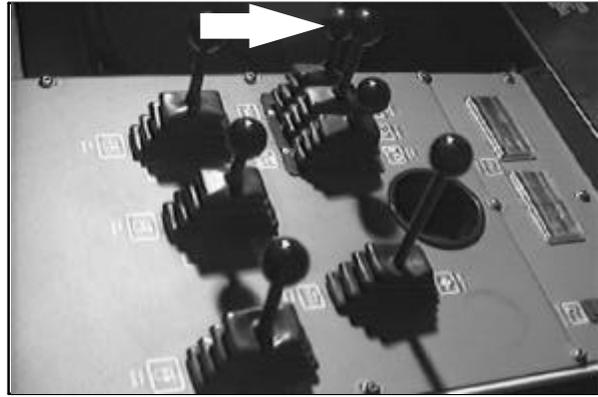
3. Release the hopper lever in the middle (Hold) position.
4. Place the directional lever in the **Reverse** position and slowly back the machine up to the debris site or container.

FOR SAFETY: When Using Machine, Move Machine With Care When Hopper Is Raised.



OPERATION

5. Pull the hopper door lever into the position.

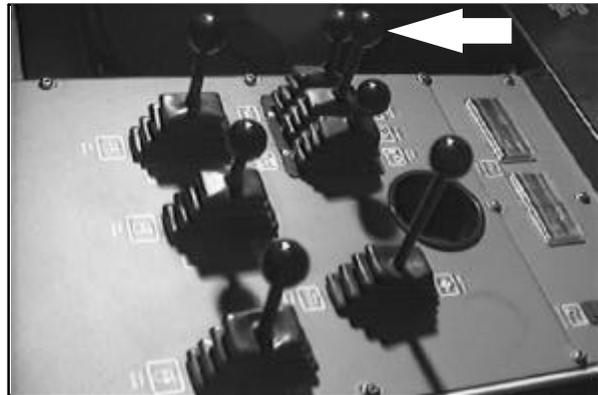


6. Place the direction lever into the **Forward** position and slowly drive the machine away from the debris site or debris container.

FOR SAFETY: When Using Machine, Move Machine With Care When Hopper Is Raised.

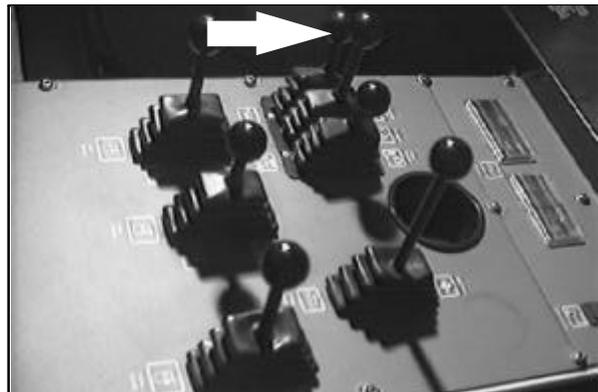


7. Push and hold the hopper lever in the position until the hopper has completely lowered and moved backed into the sweeping position. The hopper tilt light will go off.



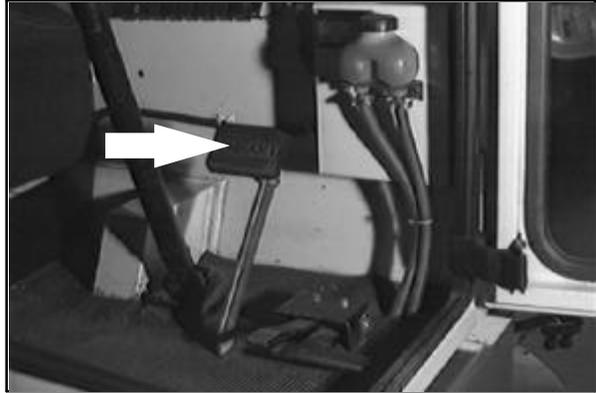
8. Push the hopper door lever into the position.

 **WARNING: Hopper Door Pinch Point. Stay Clear Of Hopper Door.**



STOP THE MACHINE

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



3. Move the throttle lever back to the idle position.



4. Set the machine parking brake.



OPERATION

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

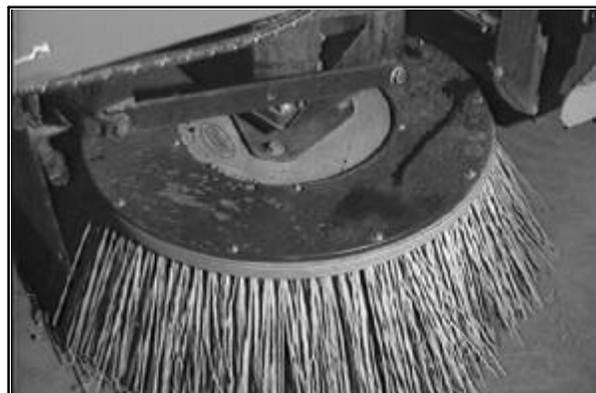
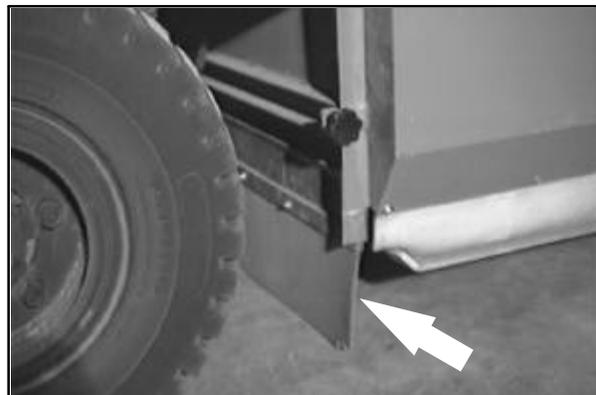
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, Turn Off Machine And Remove Key.

6. Turn off all accessories such as lights, water valves, and the cab fan. Even with the machine off, many of these accessories will continue to operate unless turned off.



POST-OPERATION CHECKLIST

- Check the main brush adjustment. See *TO CHECK AND ADJUST MAIN BRUSH PATTERN* in *MAINTENANCE*.
- Check the brush skirts for damage and wear.
- 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 OR PIN

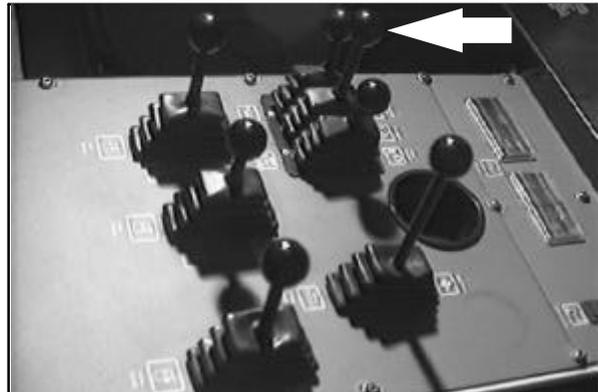
1. Set the machine parking brake.



2. Start the engine.



3. Tilt the hopper all the way back.



OPERATION

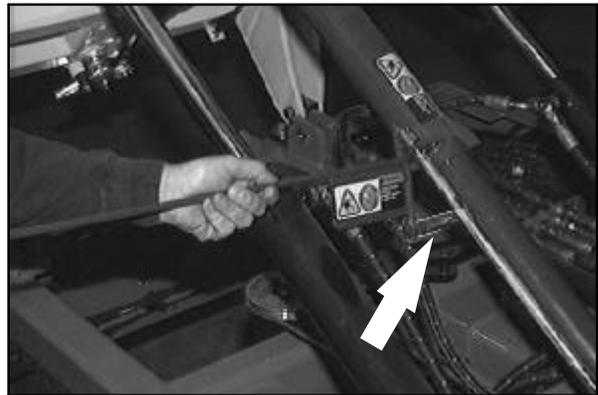
4. For machine below serial number 001710, remove the hopper support bar from the storage location on the right rear fender and place the support bar on top of the cylinder rods with the tapered ends toward the hopper.

 **WARNING: Raised Hopper May Fall. Engage Hopper Support Bar.**



For machine serial number 001710 and above, remove the hopper support pin from the storage location on the right rear fender and place it into the hole of the hopper support cylinder.

 **WARNING: Raised Hopper May Fall. Engage Hopper Support Pin.**



5. Shut the engine off.



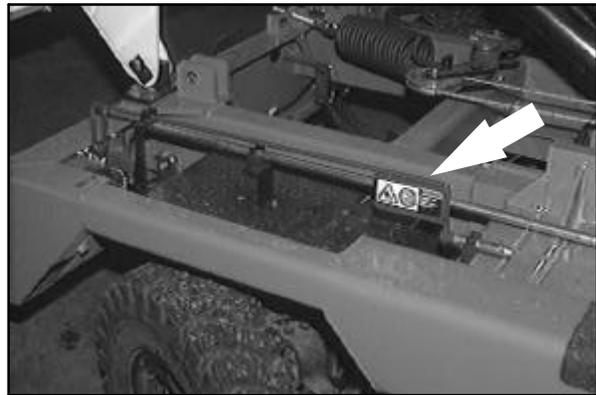
DISENGAGING HOPPER SUPPORT BAR OR PIN

1. For machine below serial number 001710, remove the hopper support bar and fasten it in the storage location on the right rear fender. Do NOT store the hopper support bar on the hopper tilt cylinders.

 **WARNING: Do Not Store Hopper Support Bar On Cylinders.**



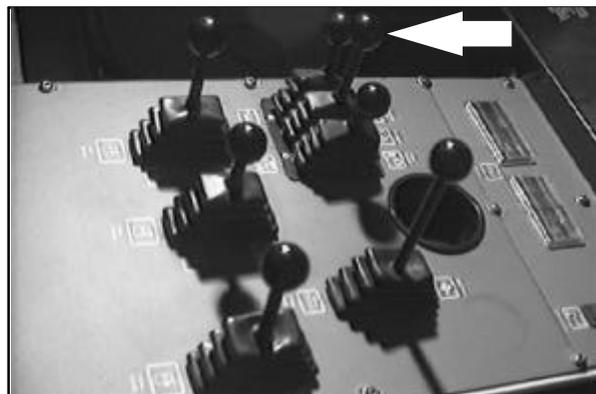
For machine serial number 001710 and above, remove the hopper support pin and fasten it in the storage location on the right rear fender.



2. Start the engine.



3. Lower the hopper.



OPERATION

4. Shut the engine off.



ENGAGING HOPPER SUPPORT PINS (High Dump Model)

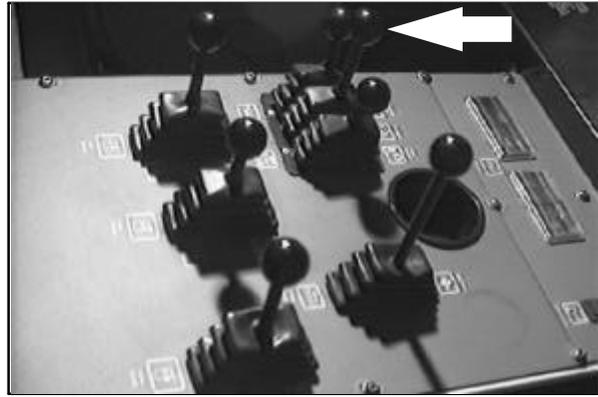
1. Set the machine parking brake.



2. Start the engine.

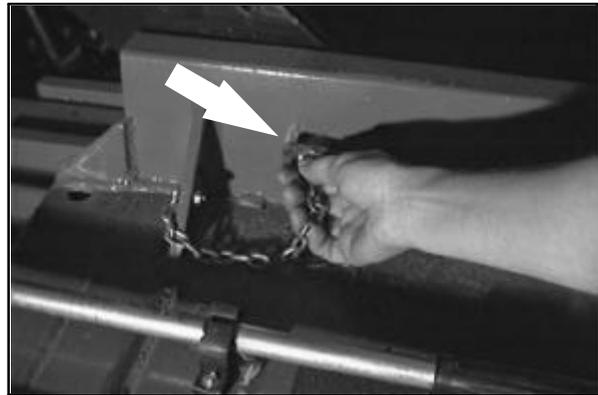


3. Raise the hopper all the way up.



4. Install the red support pins in the designated hole on both sides of the machine.

 **WARNING: Raised Hopper May Fall. Engage (2) Hopper Support Pins.**



5. Shut the engine off.

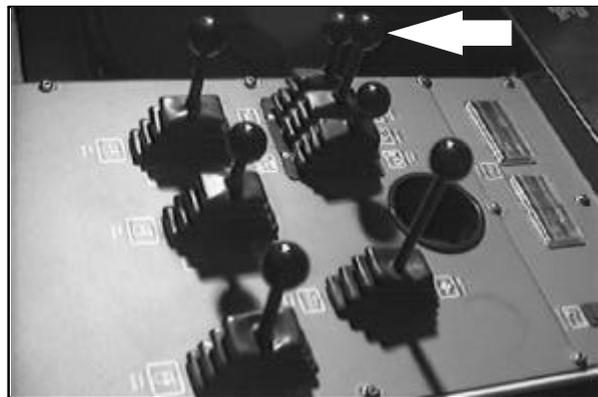


DISENGAGING HOPPER SUPPORT PINS (High Dump Model)

1. Start the engine.



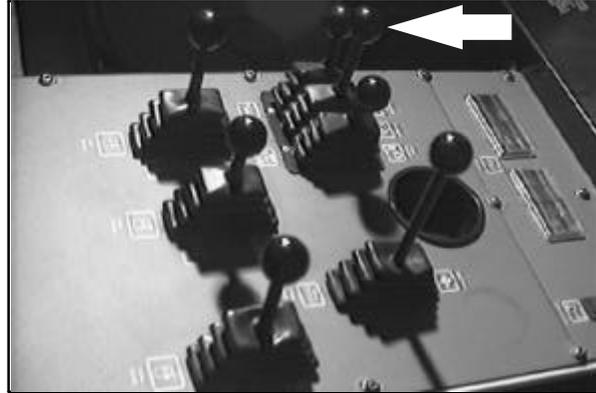
2. Raise the hopper slightly to relieve pressure on the hopper support pins.



3. Pull the support pins out of both sides of the machine.



4. Lower the hopper.



5. Shut the engine off.



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 12° with an empty hopper, and 8° with a full hopper.

Do not drive the machine on inclines with the hopper raised.

**FOR SAFETY: When Using Machine,
Move Machine With Care When Hopper
Is Raised.**

OPTIONS

VARIO SWEEPING BRUSH™

The Vario Sweeping Brush™ allows side brush sweeping on the left or right side of the machine. The brush arm moves along the front of the machine. The brush angle, movement, front and side tilt, and direction of rotation are adjusted for the right or left side.

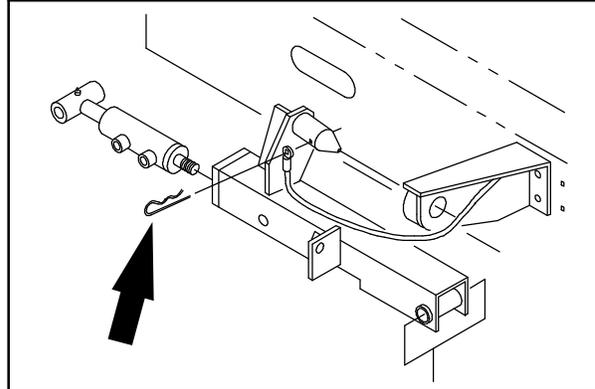
NOTE: The brush arm is locked to the front of the machine during transport. Make sure to take the hair cotter pin from the lock pin before the brush is operated.

⚠ WARNING: Brush Linkage Pinch Points. Stay Clear When Linkage Is Moving.

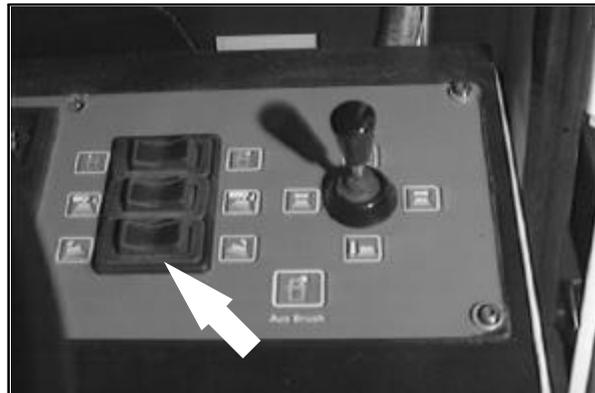
1. Move the Vario Sweeping Brush™ to the side of the machine needed, for left, and for right, with the Vario Sweeping Brush™ switch.

2. Adjust the side angle of the brush with the Vario Sweeping Brush™ side angle switch. Use for the left side of the machine, and for the right side of the machine.

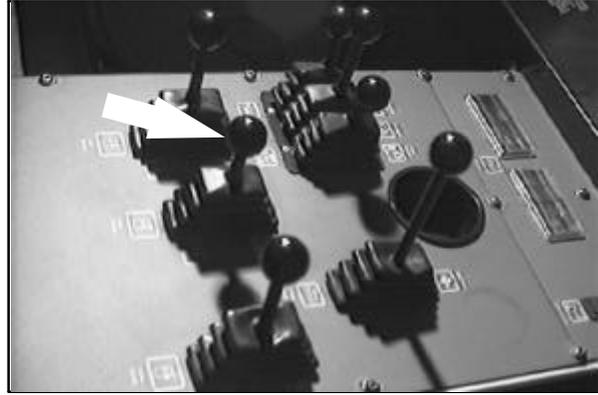
3. Adjust the front angle of the brush, for less angle, and for more angle, with the Vario Sweeping Brush™ front angle switch.



10186



- Choose the rotation of the brush with the Vario Sweeping Brush™ direction lever. Use clockwise rotation for the left side of the machine, and counter-clockwise rotation for the right side of the machine.

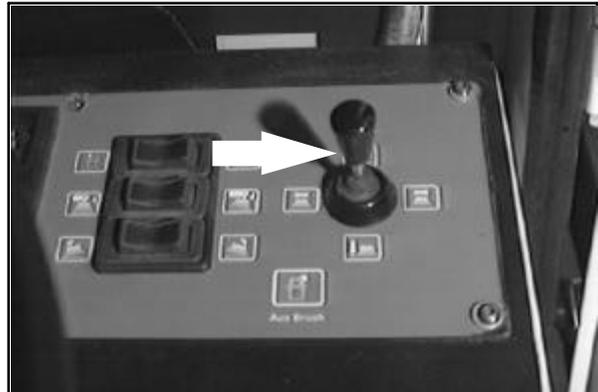


AUXILIARY SIDE BRUSH

The auxiliary side brush allows side brush sweeping on the right side of the machine. The brush arm moves along the front of the machine. The brush movement, front tilt angle, and direction of rotation are adjusted for the right or left side.

The brush arm is latched to the front of the machine during transport. Make sure the brush is unlatched before the brush is operated.

- Move the auxiliary side brush across the front of the machine to the desired location with the auxiliary side brush lever.

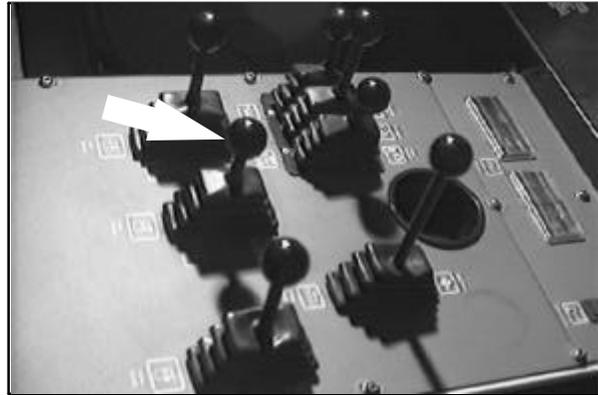


- Adjust the front angle of the brush, for less angle, and for more angle, with the auxiliary side brush front angle switch.



OPERATION

3. Choose the rotation of the brush with the auxiliary side brush direction lever for the right side of the machine.

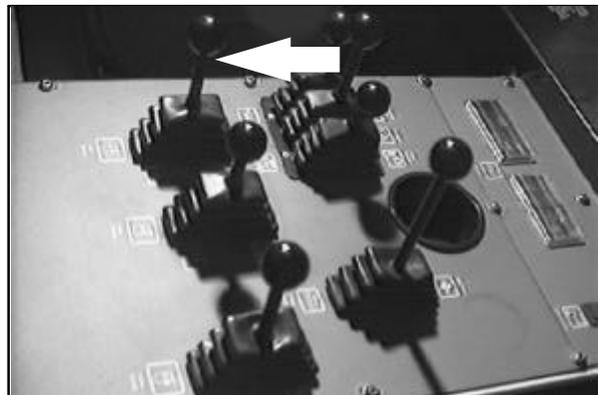


LEFT SIDE BRUSH

The left side brush is located on the left side of the machine directly in front of the main brush compartment.

Lower and start, and raise the left side brush with the left side brush lever.

NOTE: For better leaf pick-up, remove the skirt between the two side brushes.



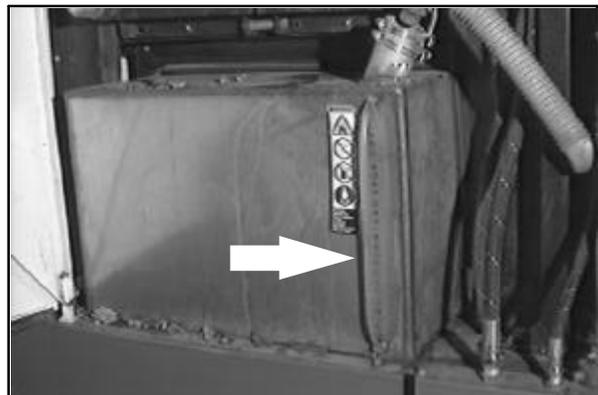
DUST CONTROL SYSTEM

The water spray dust control system is useful in dusty conditions to control the dust created by the side brushes. The system consists of a water tank, a water pump, and spray nozzles for each of the side brushes.

1. Fill the water tank. The clear hose on the side of the tank indicates the water level in the tank.

 **WARNING: Flammable Materials Can Cause Explosion Or Fire. Do Not Use Flammable Materials In Tank. Only Use Water.**

NOTE: Turn off the conveyor and main brush when filling the water tank.



2. Turn on the water pump with the water pump switch.



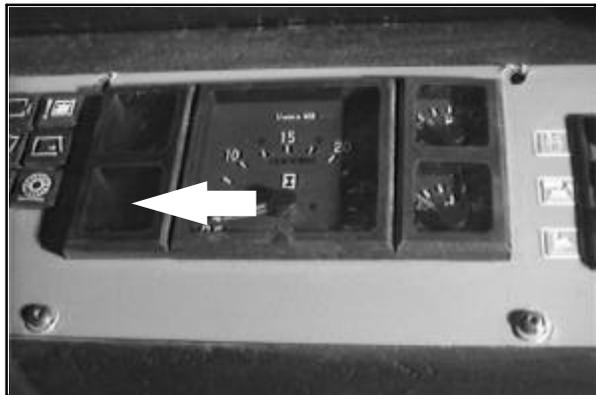
3. Adjust the amount of water spray to each of the side brushes, with the water valve knobs. Turn the water valve knob clockwise until it comes to a complete stop to close the water supply. If this is NOT done when the machine is shut off, water will continue to flow.

NOTE: The water pump needs to be on for the water valves to operate.



4. The water tank low light will come on when the water level is low in the tank. The water pump will shut off soon after this light comes on.

NOTE: Do not use the water system on wet roads. Turn off the water pump and water valves.

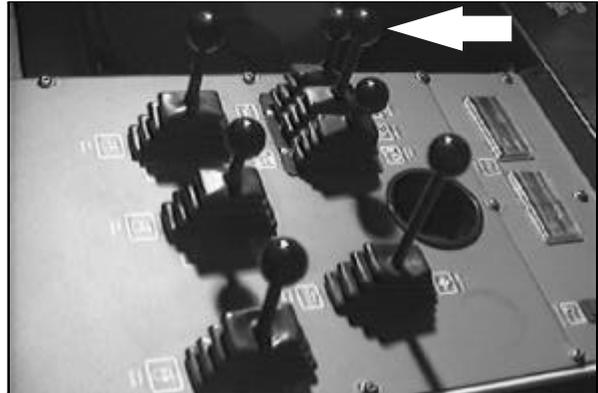


OPERATION

VACUUM WAND

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

1. Tilt the hopper back.



2. Remove the vacuum wand door tool from under the hopper.

⚠ WARNING: Lift Arm Pinch Point. Stay Clear Of Hopper Lift Arms.



3. Close the vacuum door with the vacuum wand door tool. Place the tool back in its storage location under the hopper.

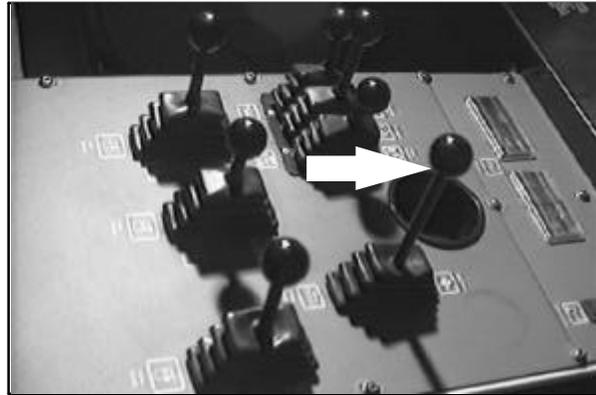
⚠ WARNING: Conveyor Throws Debris. Conveyor Pinch Point. Stay Clear When In Operation.

4. Lower the hopper.

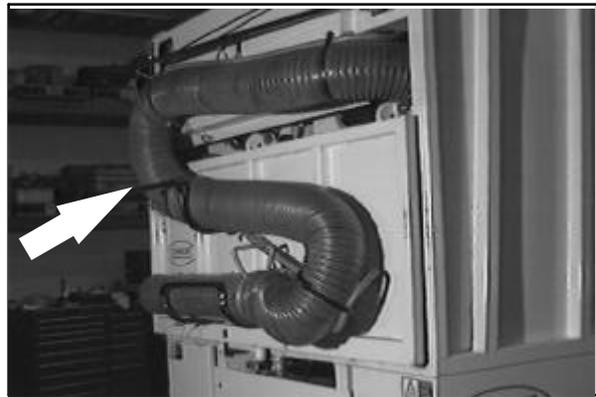


5. Start the vacuum fan.
6. Move the throttle to 2400 - 2500 RPM.

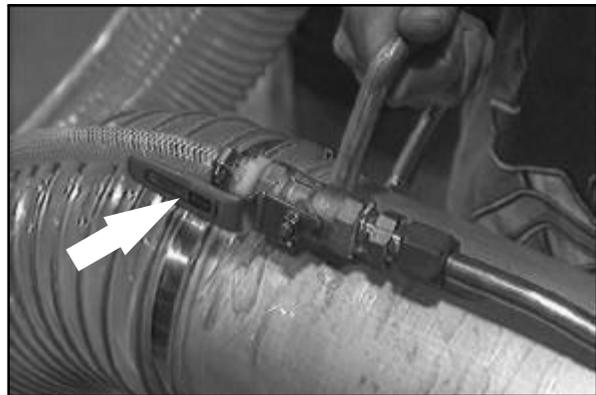
⚠ WARNING: Machine Can Emit Excessive Noise. Consult With Your Regulatory Agency For Exposure Limits. Hearing Loss Can Result. Wear Hearing Protection.



7. Remove the wand from the hopper door vacuum as required.



8. Turn the water valve open (if equipped) when picking up mud or when wanting to clean the vacuum wand. Turning the valve handle straight with the valve (as shown) opens the valve. Turning the valve handle 90° to the valve (toward the operator) closes the valve.



9. Put the vacuum wand back on the hopper door.
10. Reduce the throttle RPM.
11. Shut off the vacuum fan.
12. Tilt the hopper back.
13. Open the vacuum door.
14. Lower the hopper.

OPERATION

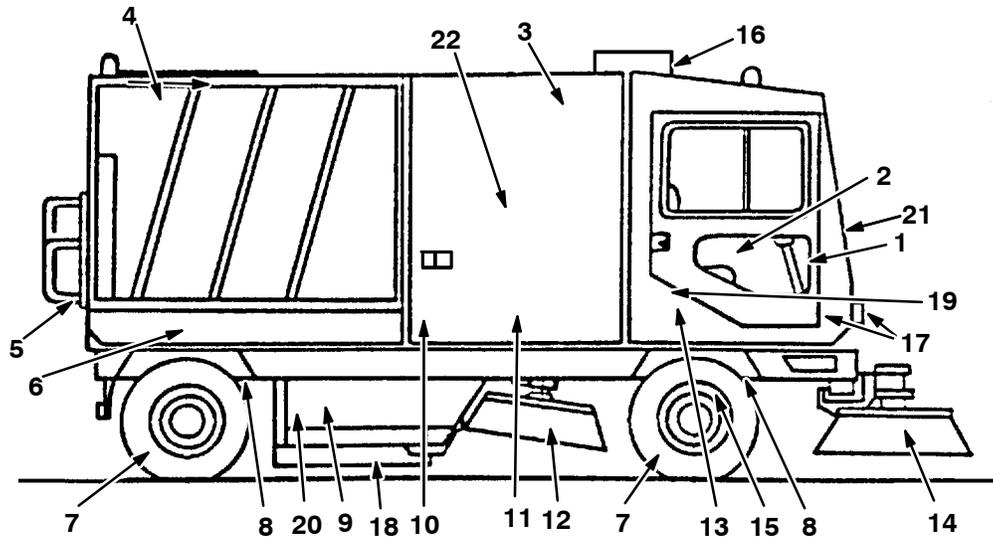
MACHINE TROUBLESHOOTING

Problem	Cause	Remedy
Machine does not start	Directional lever in forward or reverse	Place directional lever in neutral
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 not down completely	Lower hopper completely
	Hopper rear door open	Close and latch hopper rear door
	Vacuum wand door closed	Open vacuum wand door
	Vacuum fan not on	Turn vacuum fan on
	Vacuum fan failure	Contact TENNANT service personnel
	Thermo Sentry™ tripped	Reset Thermo Sentry™
	Water tank empty	Fill water tank
	Wet dust control filter clogged	Clean or replace filter

MACHINE TROUBLESHOOTING

Problem	Cause	Remedy
Poor sweeping performance	Brush bristles worn	Replace brushes
	Wrong sweeping brush	Contact TENNANT representative for recommendations
	Main, side or aux. brushes not adjusted properly	Adjust main, side or aux. brushes
	Main, side or aux. brush drive failure	Contact TENNANT service personnel
	Debris caught in main brush drive mechanism or conveyor	Free drive mechanism or conveyor of debris
	Conveyor in reverse	Switch conveyor to forward direction
	Conveyor failure	Contact TENNANT service personnel
	Conveyor skirts worn or damaged	Replace conveyor skirts
	Hopper full	Empty hopper
	Hopper not down completely	Lower hopper completely
	Hopper rear door open	Close and latch hopper rear door
	Vacuum wand door closed	Open vacuum wand door
	Vacuum fan not on	Turn vacuum fan on
	Vacuum fan failure	Contact TENNANT service personnel
	Worn brush skids	Replace brush skids
Brush skids not completely down	Check for obstruction then lower skids completely	

MAINTENANCE



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MAINTENANCE CHART

Interval	Key	Description	Procedure	Lubricant/ Fluid	No. of Service Points
Daily	10	Conveyor	Check chain tension	-	2
			Lubricate chain	EO	2
			Wash internally	-	1
			Lubricate bearings	SPL	4
	3	Engine air filter	Check indicator	-	1
	16	Engine air intake screen	Check and clean	-	1
	3	Engine crankcase	Check oil level	EO	1
	3	Fuel filter water trap	Check for water, drain	-	1
	3	Radiator	Check and clean core exterior	-	1
			Check coolant level in overflow reservoir	WG	1
	3	Hydraulic fluid cooler	Check and clean cooler fins	-	1
	11	Hydraulic fluid reservoir	Check fluid level	HYDO	1
	1	Brake fluid reservoir	Check fluid level	BF	1
	10	Conveyor skirts and paddles	Check for damage and wear	-	All
	9	Brush compartment skirts	Check for damage and wear	-	3
	5	Hopper door seal	Check for damage and wear	-	1
	9	Main brush	Check for damage, wear, and adjustment	-	1
			Check brush pattern	-	1
	12	Side brush(es)	Check for damage and wear	-	1-3
	4	Hopper dust filter	Shake	-	1
19	Windshield washer reservoir	Check fluid level	WF	1	
50 Hours	3	Fuel lines and clamps	Check for tightness and wear	-	1
	7	Tires	Check pressure	-	4
	8	Steering	Align wheels	-	1
	17	Cab filters	Clean	-	1
	22	Main brush/conveyor lift	Purge hydraulic fluid air	-	1

Interval	Key	Description	Procedure	Lubricant/ Fluid	No. of Service Points	
100 Hours	9	Brush compartment, hopper seals, skid flap	Check for damage or wear	-	All	
	3	Engine crankcase	*Change oil and filter element	EO	1	
	3	Engine fan belt	Check tension	-	1	
	3	Air conditioner belt (option)	Check tension	-	1	
	3	Engine air filter	Check the dust cap	-	1	
	6	Hopper lift	Lubricate	SPL	5	
	7	Tires	Check wheel nut torque	-	4	
	20	Main brush door knobs	Lubricate	SPL	2	
	9	Main brush support rods	Lubricate	SPL	8	
	18	Skids	Check for wear	-	2	
200 Hours	3	Radiator hoses and clamps	Check for tightness and wear	-	2	
	13	Parking brake	Check adjustment	-	1	
			Lubricate pivot	SPL	1	
		Service brakes	Lubricate brake pedal	SPL	1	
	8	Steering	Lubricate steering cylinder	SPL	2	
	8	Suspension	Lubricate wheel CV joints, leaf springs, and pivots	SPL	22	
			Throttle linkage	Lubricate	SPL	1
			Speed pedal	Lubricate	SPL	1
	14	Auxiliary side brush	Lubricate rotation and guides	SPL	2	
	14	Vario sweeping brush	Lubricate rotation and guides	SPL	2	
	12	Side brush	Lubricate pivot	SPL	2	
	3	Fuel filter	Replace	-	1	
	7	Tires	Check wear and rotate	-	4	
			Hydraulic hoses	Check for wear and damage	-	All
	2	Battery	*Clean and tighten battery cable connections	-	1	
			Check electrolyte level	DW	1	
		Wet dust control system	Clean water filter	-	1	
21	Windshield wiper blades	Check for wear	-	2		
400 Hours	15	Differential	Check oil level	-	1	
800 Hours	11	Hydraulic reservoir	Replace filler cap and filter element	-	1	
			Change hydraulic fluid	HYDO	1	
	11	Hydraulic fluid filter	Change filter element	-	1	
1600 Hours	15	Differential	Change gear lubricant	GL	1	
	3	Cooling system	Flush	WG	1	

LUBRICANT/FLUID

BF Brake fluid

EO Engine oil, SAE-CD/SE rated

HYDO . TENNANT or approved hydraulic fluid

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

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

DW Distilled water

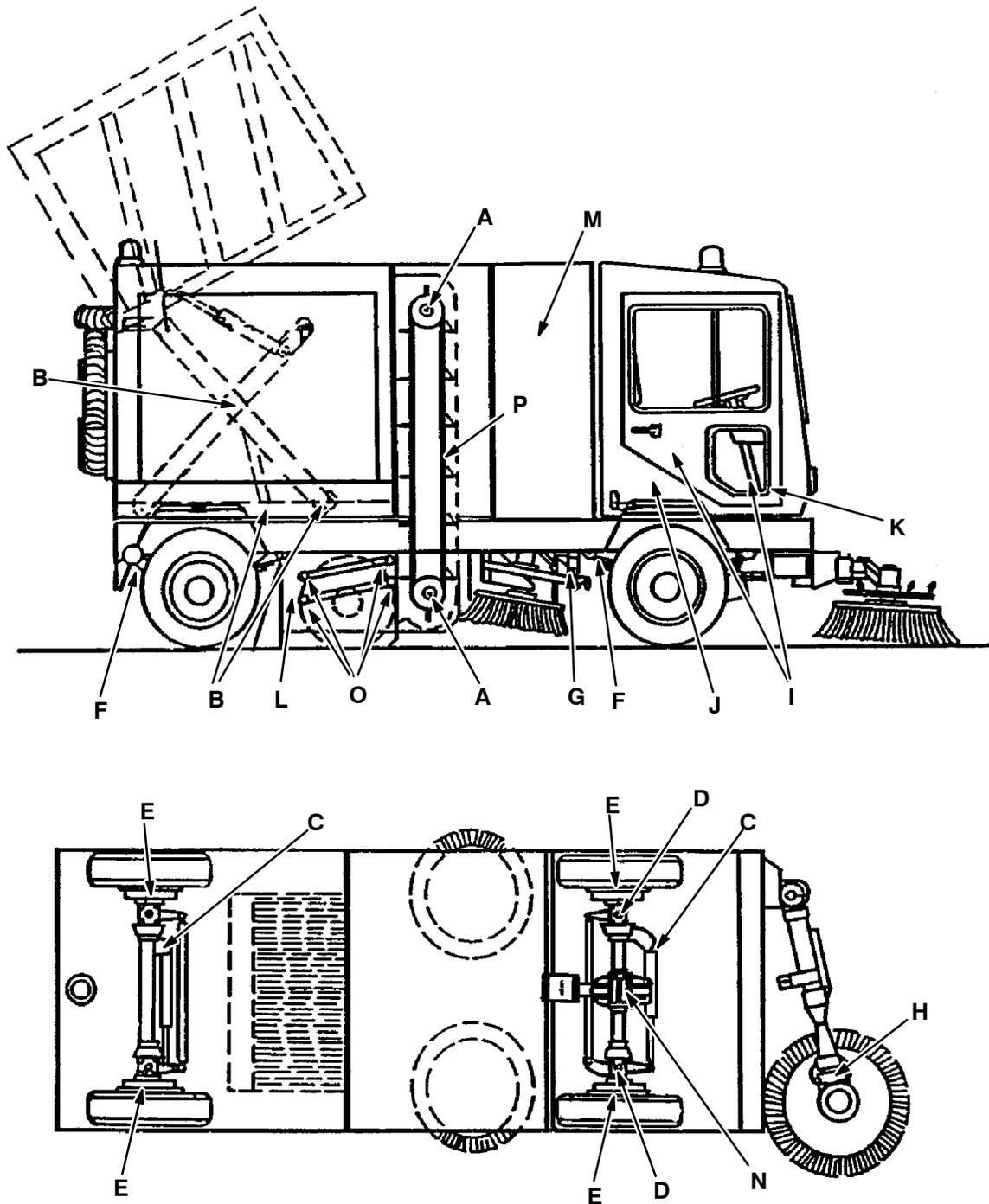
WF Automotive-type windshield washer fluid

GL SAE 90 weight gear lubricant

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

NOTE: More frequent intervals may be required in extremely dusty conditions.

LUBRICATION



09541

A. CONVEYOR BEARINGS

There are four bearing grease fittings. Lubricate daily with Lubriplate EMB grease (TENNANT part no. 01433-1).

B. HIGH DUMP HOPPER LIFT (OPTION)

The hopper lift has seven grease fittings. Four grease fittings are at the base of the two lift cylinders, two for each cylinder. Another grease fitting is located on the cross shaft of the hopper lift. The last two grease fittings are located on the roller bearings on front of the hopper lift arms. Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 100 hours of operation.

C. STEERING CYLINDER

Each steering cylinder has one grease fitting. Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 200 hours of operation.

D. WHEEL CV JOINTS

There are two CV joints located at each front wheel. Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 200 hours of operation.

E. WHEEL PIVOTS POINTS

The wheel pivots points have eight grease fittings. Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 200 hours of operation.

F. WHEEL LEAF SPRINGS

The wheel leaf springs have twelve grease fittings. Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 200 hours of operation.

G. SIDE BRUSH PIVOT

Each side brush pivot has a grease fitting. Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 200 hours of operation.

H. AUXILIARY SIDE BRUSH/ VARIO SWEEPING BRUSH™ (OPTION)

The brush pivot has two grease fittings. Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 200 hours of operation.

I. SERVICE AND PARKING BRAKES

The parking brake pivot and the brake pedal each have one grease fitting. Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 200 hours of operation.

J. THROTTLE LINKAGE

Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 200 hours of operation.

K. PROPELLING PEDAL

Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 200 hours of operation.

L. MAIN BRUSH DOOR KNOBS (For machines below serial number 001710)

Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 100 hours of operation.

M. ENGINE

Check the engine oil level daily. Change the engine oil and oil filter every 100 hours of machine operation. Use 10W30 SAE-CD/SE rated engine oil.

The engine oil drain is accessed through the right side door.

Fill the engine with oil to the level indicated on the oil dipstick. The engine oil capacity is 7.6 L (8 qt) including the oil filter.

N. DIFFERENTIAL

Check the lubricant level in the differential every 400 hours of operation by removing the filler plug.

Change the differential lubricant every 1600 hours of operation. Use SAE 90 weight gear lubricant.

O. MAIN BRUSH SUPPORT RODS

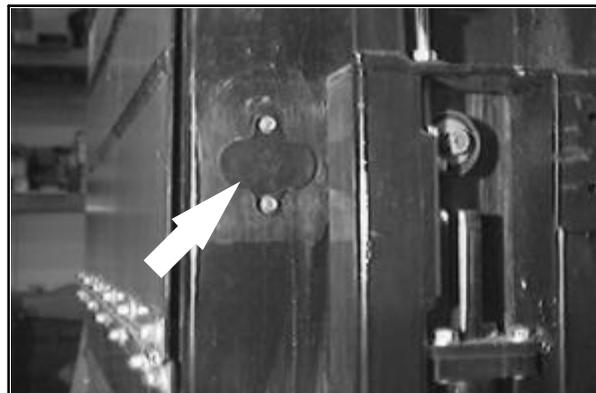
The main brush support rods have a total of eight grease fittings, four on each side. Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 100 hours of operation.

P. CONVEYOR CHAIN

The conveyor chains should be lubricated with engine oil daily.

Remove the access covers on the sides of the conveyor. Run the conveyor in reverse at idle. Oil the chain making sure to lubricate the o-rings on the chain. Put the access covers back on the sides of conveyor.

**FOR SAFETY: When Servicing Machine,
Avoid Moving Parts. Do Not Wear Loose
Jackets, Shirts, Or Sleeves.**



HYDRAULICS

HYDRAULIC FLUID RESERVOIR

The reservoir is located on the right side of the machine next to the engine.

Check the hydraulic fluid level at *operating temperature* daily. Make sure the hopper is down when checking hydraulic fluid level. The sight gauge is marked with full, the black line, and add, the red line, levels to indicate the level of hydraulic fluid in the reservoir. Cold fluid level is mid-point of add and full lines.

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.

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

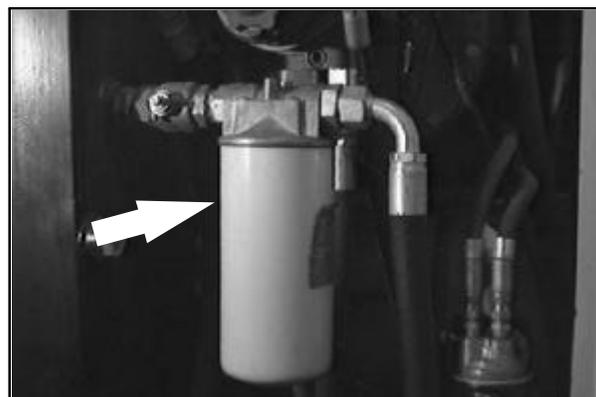
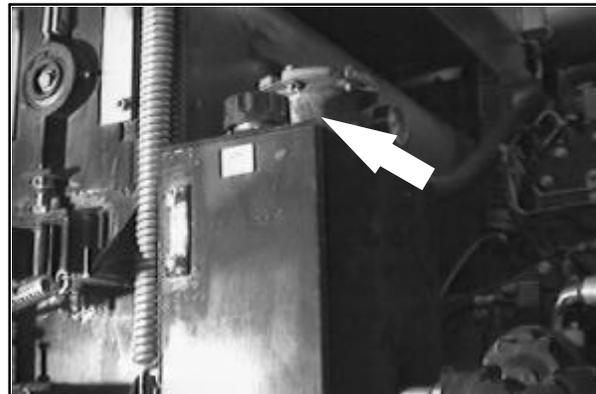
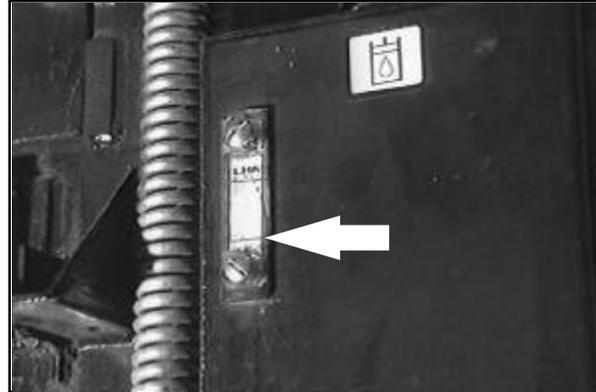
Mounted on top of the reservoir is a filler cap with a built-in breather. Replace the cap every 800 hours of operation.

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

The reservoir has a built-in filter, located next to the filler cap, that filters hydraulic fluid as it returns to the tank. Replace the filter element every 800 hours of operation, or if the gauge reads in the *red zone*.

The hydraulic fluid filter is located on the side of the hydraulic reservoir that filters hydraulic fluid before it enters the system.

Replace the filter element every 800 hours of operation.



MAINTENANCE

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.

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

TENNANT part no.	Ambient Temperature
65870 (Mobil no. DTE13M)	above 0° C (32° F)*
74217 (Mobil no. DTE11M)	below 0° C (32° F)**

* For ambient temperatures below 27° C (80° F), use the hydraulic cooler blocker.

** For ambient temperatures below 10° C (50° F), use the hydraulic cooler blocker.

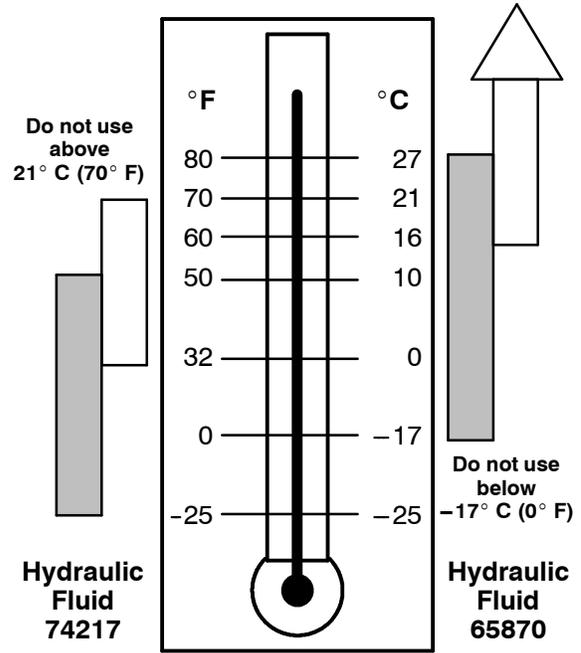
NOTE: On turbo engines the hydraulic cooler blocker is not used. The hydraulic fluid is thermostatically controlled.

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.

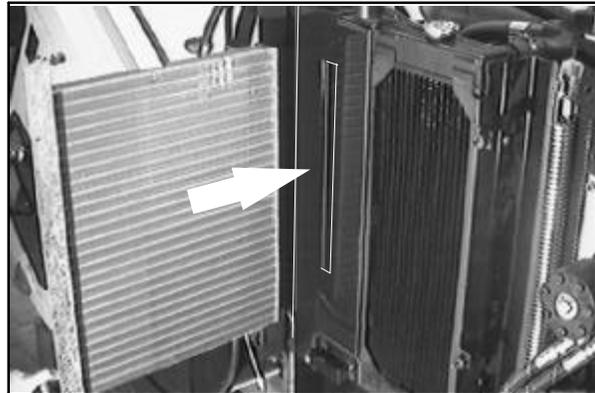
The lower temperature fluid is a thinner fluid for colder temperatures.

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.

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.



 Use Cooler Blocker (Standard Engines)



HYDRAULIC HOSES

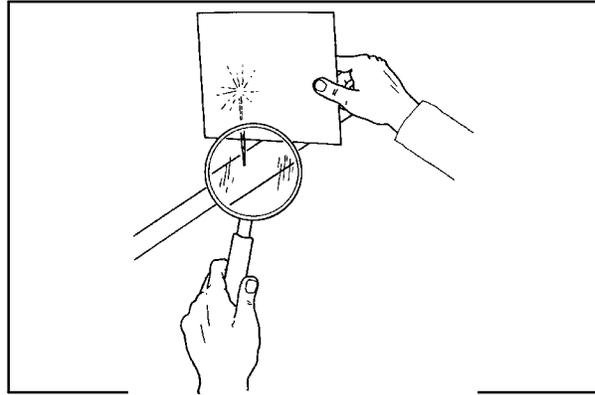
Check the hydraulic hoses every 200 hours of operation for wear or damage.

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.

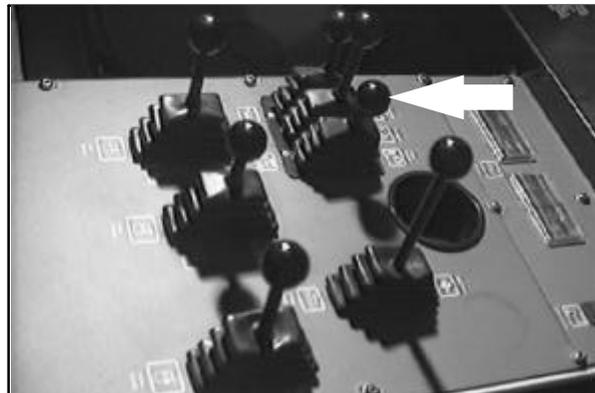


00002

PURGING AIR FROM THE HYDRAULIC CONVEYOR LIFT SYSTEM

When the machine has been used for some time, air can get trapped in the hydraulic fluid and cause the conveyor lift cylinder to slowly leak down from the raised position. If a hydraulic component in the lift system has been replaced, air will get into the hydraulic fluid. This air must be purged from the system. The conveyor lift cylinders have a built-in feature called *re-phasing* that allows the air trapped in the system to escape. When the conveyor lift cylinders are at the top of their stroke, tiny bleed holes in the cylinder are exposed allowing the air to escape.

Purge air from the hydraulic system after every 50 hours of operation or after a hydraulic component in the lift system has been changed. To purge air from the hydraulic system, hold the main brush and conveyor lever in the position. When the *conveyor up and main brush off* light comes on, hold in this position for about 5 minutes to force air from the system.

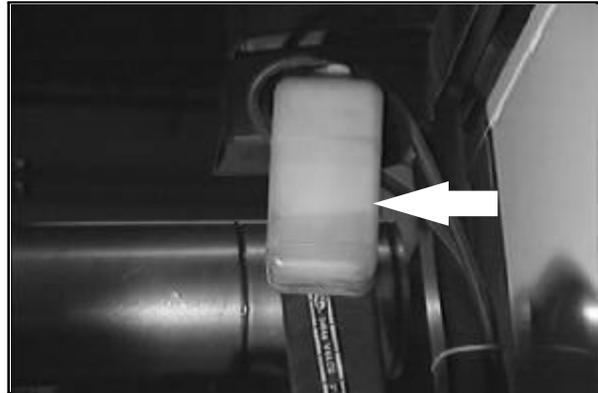


ENGINE

COOLING SYSTEM

Check the radiator coolant level daily in the overflow reservoir. Use clean water mixed with a permanent-type, ethylene glycol antifreeze to a -34°C (-30°F) rating. Add coolant to the overflow reservoir.

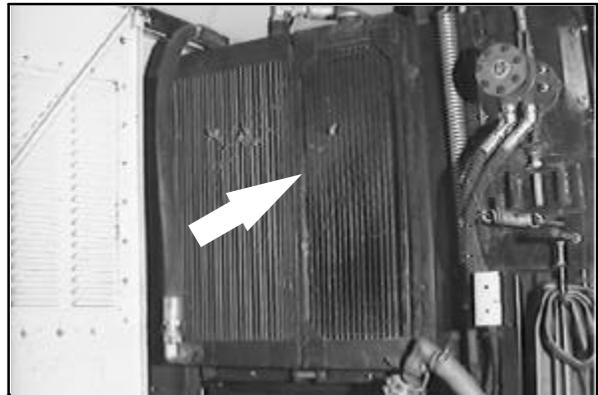
FOR SAFETY: When Servicing Machine, Avoid Contact With Hot Engine Coolant.



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.

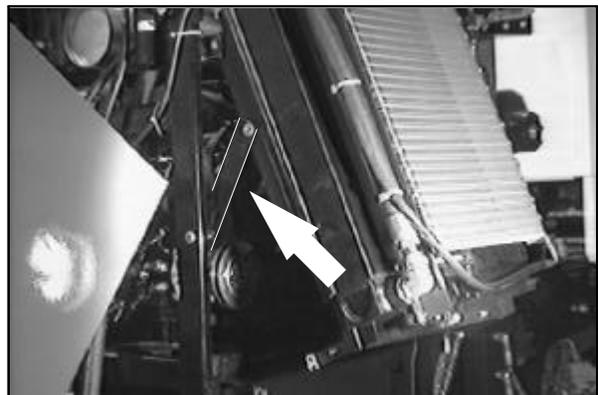
Check the radiator core exterior and hydraulic cooler fins for debris daily. The hydraulic cooler blocker (if used) must be removed to clean the hydraulic cooler fins. Blow or rinse all dust, which may have collected on the radiator, in through the grille and radiator fins, opposite the direction of normal air flow. 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.



Flush the radiator and the cooling system every 1600 hours of operation, using a dependable cleaning compound.

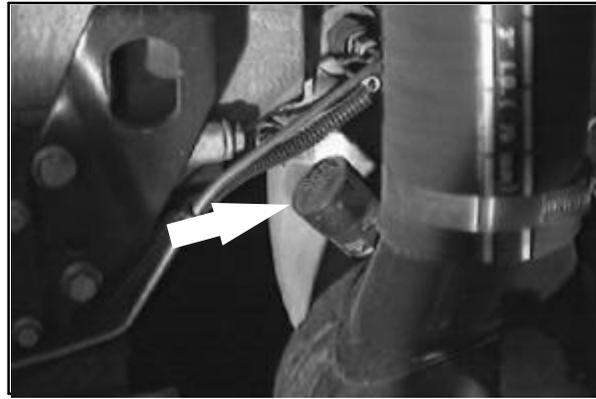
The radiator and hydraulic cooler assembly pivots forward for cleaning or for accessing the front of the engine. To pivot forward, unscrew the bottom two bolts, pull the assembly forward and engage the locking latch.



AIR FILTER INDICATOR

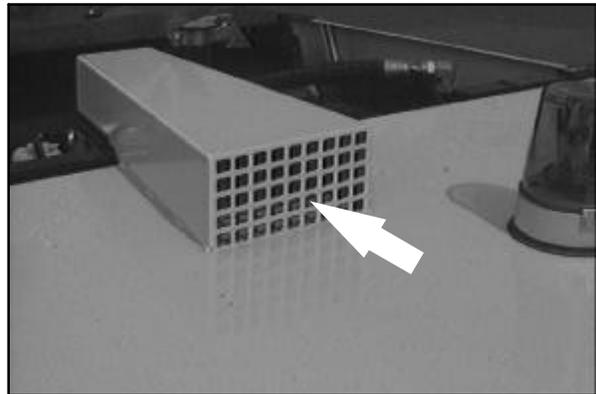
The air filter indicator shows when to clean or replace the air filter element. Check the indicator daily. The indicator's red line will move as the air filter element fills with dirt. Do not clean or replace the air filter element until the red line reaches 5 kPa (20 in H₂O) and the "SERVICE WHEN RED" 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 cleaning or replacing the air filter element.



AIR INTAKE SCREEN

Check the air intake screen located on top of the cab for obstructions daily.



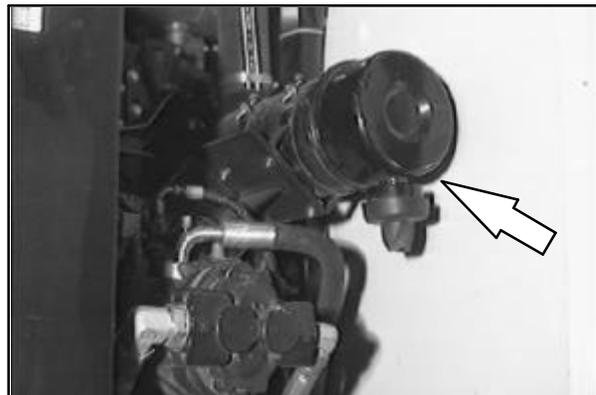
AIR FILTER

The engine air filter housing has a dust cap and a dry cartridge-type air filter element. Check the dust cap every 100 hours of operation to make sure it is expelling dust. Replace the dust cap if the rubber is worn.

The air filter element must be replaced whenever it is damaged or has been cleaned three times. Inside the air filter element is a safety element. Replace this element, do not clean it, after the regular element has been damaged or cleaned three times.

Service 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.

To clean the filter element, remove it from the filter housing. Carefully clean the end cap and the interior of the housing with a damp cloth. Clean the housing sealing surfaces.

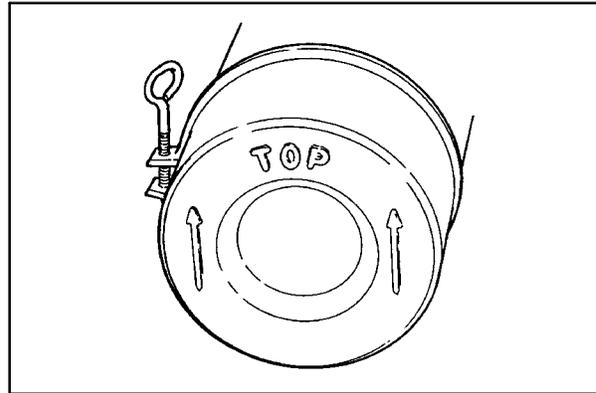


MAINTENANCE

Using an air hose, direct clean, dry air, maximum 205 kPa (30 psi), up and down the pleats on the inside of the element. Do not rap, tap or pound dust out of the element.

FOR SAFETY: When Servicing Machine, Wear Eye And Ear Protection When Using Pressurized Air Or Water.

After cleaning the air filter element, inspect it for damage by placing a bright light inside. The slightest rupture requires replacement of the element. Inspect the seals on the ends of the element, they should be flexible and undamaged.



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

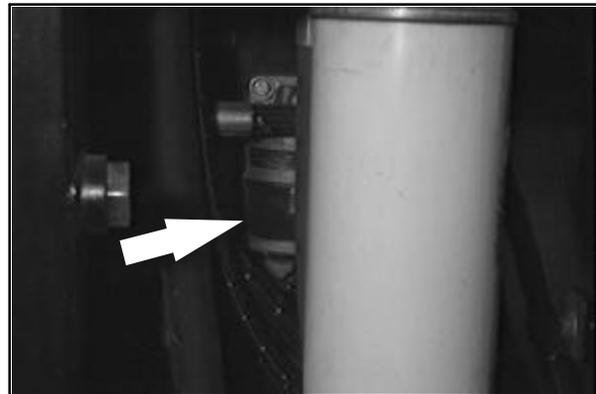
FUEL FILTER

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

Replace the fuel filter element every 200 hours of operation.

FOR SAFETY: When Servicing Machine, Keep Flames And Sparks Away From Fuel System Service Area. Keep Area Well Ventilated.

Check the fuel filter water trap daily for water. Drain any water visible in the bowl.



FUEL LINES

Check the fuel lines 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 lines may become worn out whether the engine has been used much or not. Replace the fuel lines and clamp bands every two years.

FOR SAFETY: When Servicing Machine, Keep Flames And Sparks Away From Fuel System Service Area. Keep Area Well Ventilated.

If the fuel lines 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 lines, see *TO PRIME THE FUEL SYSTEM*. When the fuel lines are not installed, plug both ends with clean cloth or paper to prevent dirt from entering the lines. Dirt in the lines can cause fuel injection pump malfunction.

PRIMING FUEL SYSTEM

Priming the fuel system removes pockets of air in the fuel lines and fuel components. Air in the fuel system will prevent smooth engine operation.

Prime the fuel system after running out of fuel, changing the fuel filter, disconnecting the low pressure fuel lines, or any part of the low pressure fuel system leaks during engine operation.

TO PRIME FUEL SYSTEM

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

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, And Turn Off Machine. Keep Flames And Sparks Away From Fuel System Service Area. Keep Area Well Ventilated.

2. Fill the fuel tank.
3. Manually operate the priming pump until fuel, free from air, comes from the filter vent point.
4. Loosen the return connection of the fuel injection pump.
5. Operate the priming pump until fuel, free from air, comes from the injection pump vent point.
6. Loosen all four of the high pressure fuel line connections at the injectors.

ATTENTION! The engine may start running spontaneously if all four of the fuel line connections are not loosened.

7. Operate the starter motor until fuel, free from air, comes from the line connections.

NOTE: Operating the throttle in the Fast position will increase the fuel flow speedup the bleeding process. After bleeding is finished, return the throttle to Idle.

8. Tighten the high pressure fuel line connections. The engine is now ready to start.

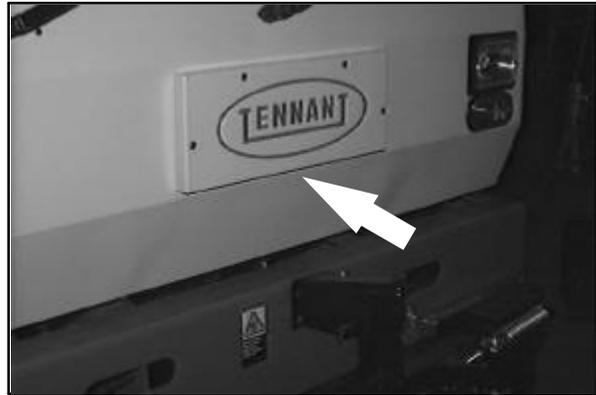
NOTE: If the engine runs correctly for a short time and then stops, or runs roughly, check for air in the fuel system. If there is air in the system, there is probably leakage in the low pressure system.

9. Turn the ignition switch off.

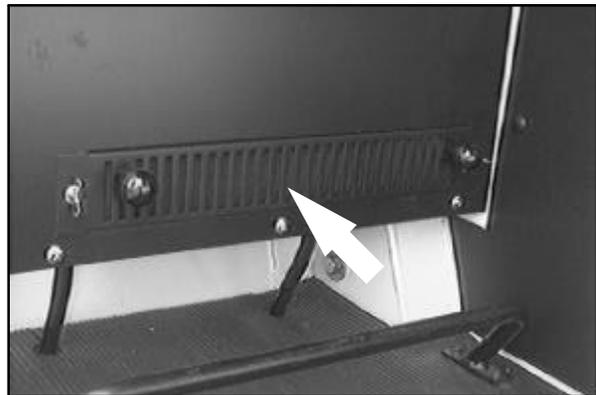
MAINTENANCE

CAB FILTERS

Check and clean the cab filters after every 50 hours of operation. Replace when necessary. The fresh air cab filter is located on the front of the cab. Tap this filter clean.



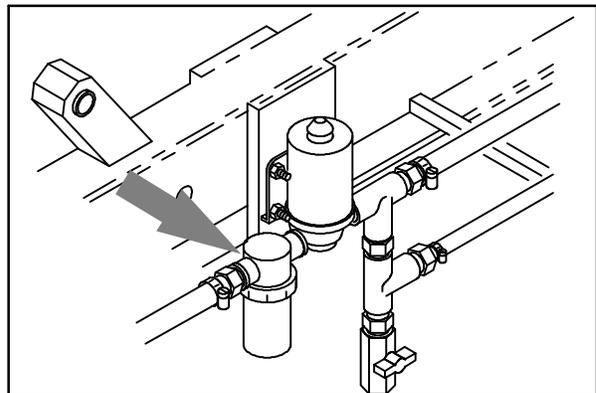
The cab recirculation filter is located on the inside front of the cab in front of the passenger seat. Clean this filter with soap and water.



WET DUST CONTROL FILTER (OPTION)

The wet dust control filter is located under the cab between the front wheels.

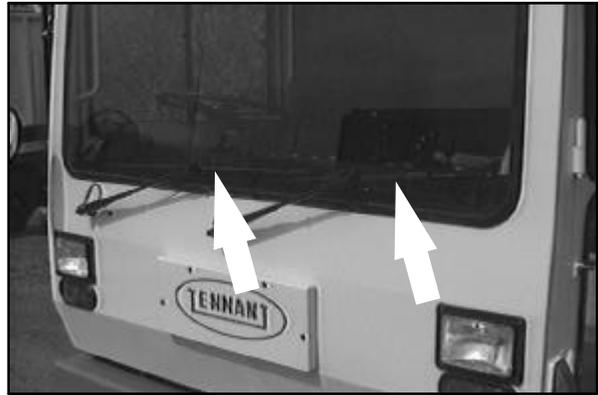
Clean the water filter every 200 hours of operation by removing and flushing with clean water.



09218

WINDSHIELD WIPER BLADES

Check the windshield wiper blades for wear every 200 hours of operation. Replace when necessary.



WINDSHIELD WASHER FLUID

Check the windshield washer fluid level daily. Fill with automotive-type windshield washer fluid.



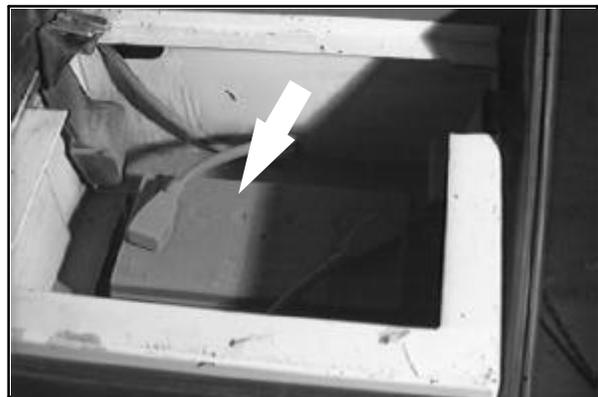
BATTERY

The battery is located under the passenger seat.

After the first 50 hours of operation, and every 200 hours after that, clean and tighten the battery connections.

Check the electrolyte level every 200 hours of operation. Only add distilled water.

**FOR SAFETY: When Servicing Machine,
Avoid Contact With Battery Acid.**



BELTS AND CHAINS

ENGINE BELT

The engine fan belt is driven by the engine crankshaft pulley and drives the alternator pulley. Proper belt tension is 10 mm (0.40 in) from a force of 4 to 5 kg (8 to 10 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 Blades. Keep Away.**

AIR CONDITIONER BELT

The air conditioner belt is driven by the engine crankshaft pulley and drives the compressor. Proper belt tension is 4 mm (0.19 in) from a firm force of a finger applied at the mid-point of the longest span.

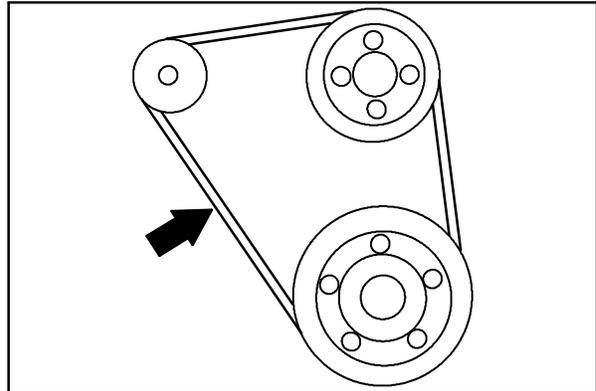
Check and adjust the belt tension after the first 10 hours of operation and then every 100 hours after that.

 **WARNING: Moving Belt And Fan Blades. Keep Away.**

STATIC DRAG CHAIN

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

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



08935

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 vacuum fan and filter shaker lever.

Shake the dust filter before tilting or dumping the hopper and at the end of every work shift.

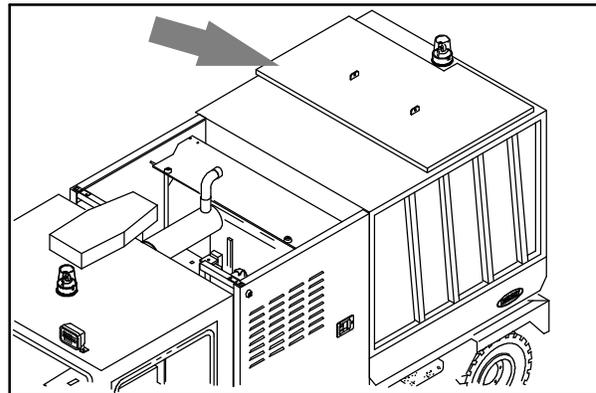
To clean the dust filter, use the vacuum fan and filter shaker lever.

TO REMOVE OR 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. Remove the top hopper cover.
3. Remove the nuts holding the filter shaker frame in the hopper.
4. Pull the filter shaker frame and filter out of the hopper.
5. Drill out the rivets holding the filter to the shaker frame.
6. Put the new separators into the new filter bag pockets.
7. Take the rods out of the old filter, and put them in the new filter.
8. Put the filter into the shaker frame.
9. Stretch the filter over the edges of the shaker frame. Pull the drawstring tight.
10. Drill and rivet the filter to the shaker frame.
11. Put the filter shaker frame and filter in the hopper.
12. Install the retaining nuts for the filter shaker frame and tighten.



09212

MAINTENANCE

13. Check the seals on the top hopper cover and the hopper. Replace any that is worn or damaged.
14. Put the top hopper cover back on the hopper. Make sure the cover has a good seal before tightening the hardware.

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. The Thermo Sentry™ is located at the rear of the hopper.

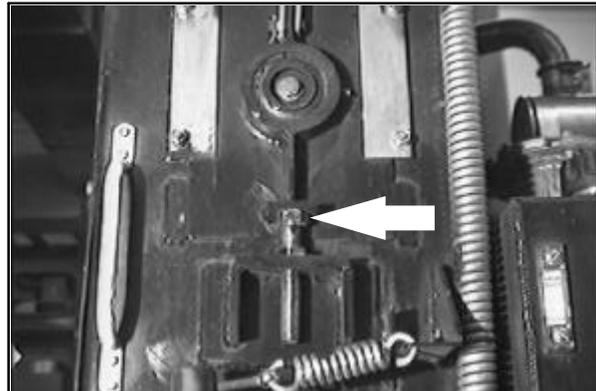
Remove the access panel above the hopper door. Reset the Thermo Sentry™ by pushing in its reset button.

CONVEYOR

The conveyor transports debris picked up by the main brush to the hopper, by means of a paddle system.

Check tension, clean, and lubricate the conveyor chain tensions daily. The conveyor chain is tensioned automatically by the springs. However, the tensioner stop bolt must be kept snug to the bottom of the bearing housing. Do not overtighten this adjustment, or premature wear of the chain may result.

Check the conveyor skirts and paddles for damage and wear daily.



BRUSHES

MAIN BRUSH

The main brush is cylindrical and spans the width of the machine, sweeping debris into the conveyor, which deposits the 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 100 to 125 mm (4 to 5 in) wide. Adjust the main brush pattern with the main brush down pressure nut located under the hopper.

Replace the main brush when the remaining bristles measure 50 mm (2 in) in length.

TO REPLACE MAIN BRUSH

1. Park the machine on level ground and set the machine parking brake.
2. Lower the main brush.
3. Stop the engine.

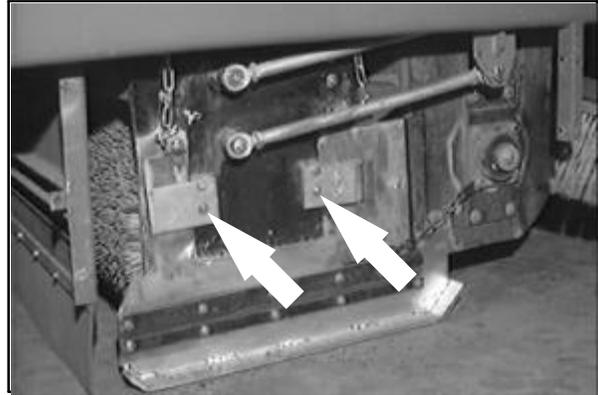
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, Turn Off Machine And Remove Key.

4. Remove the right side main brush access door.

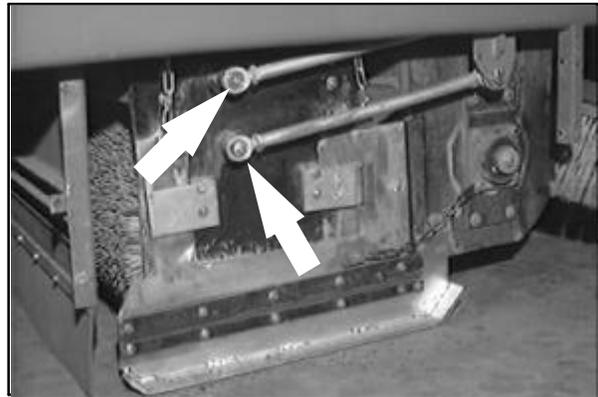


MAINTENANCE

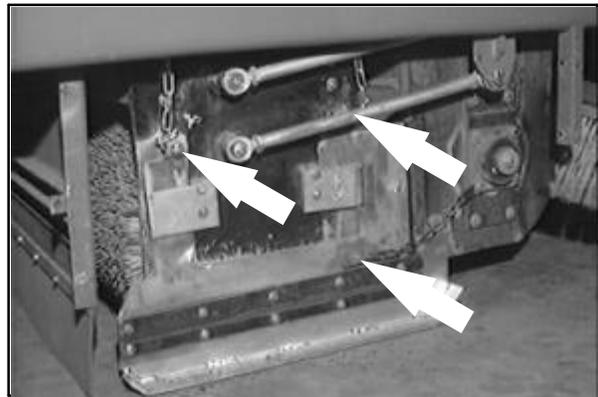
5. Remove the hardware holding the skid plates to the brush idler plate.



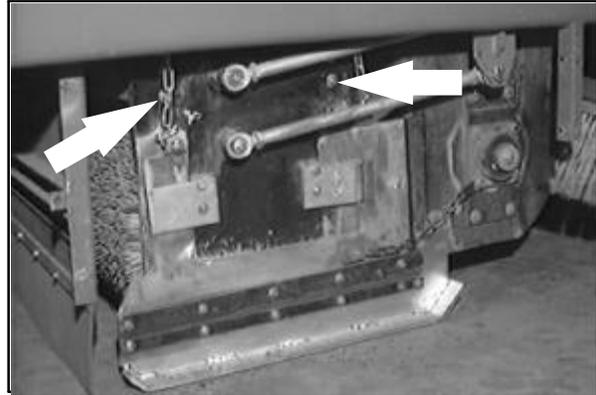
6. Remove the hardware holding the links to the brush idler plate.



7. Remove the brush chains and the skid chain.



8. Remove the hardware holding the idler plate onto the machine.
9. Remove the brush idler plate.
10. Grasp the main brush; pull it off the brush drive plug and out of the main brush compartment.
11. Put the new brush on the ground next to the access door.
12. 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.
13. Slide the main brush idler plate plug onto the main brush.
14. Mount the idler plate onto the machine with the hardware removed earlier.
15. Mount the brush chains and the skid chain.
16. Mount the links to the idler plate with the hardware removed earlier.
17. Mount the skid plates to the idler plate with the hardware removed earlier.
18. Put the right side main brush access door back on the machine.
19. Check and adjust the main brush pattern.

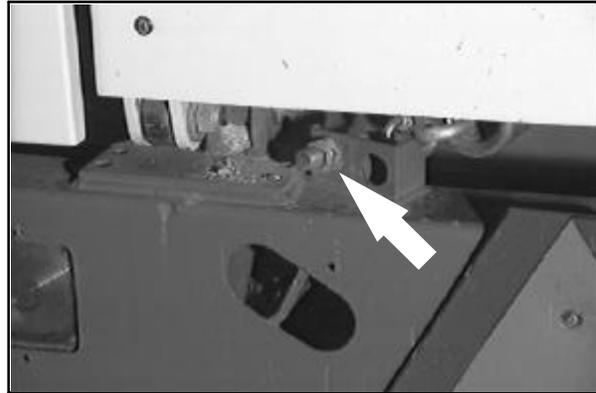


MAINTENANCE

TO CHECK AND ADJUST MAIN BRUSH PATTERN

1. Park the machine on level ground and set the machine parking brake.
2. Lower the main brush and allow the brush to rotate in one place for 2 minutes.
3. Raise the main brush.
4. Drive the machine off the test area.
5. Observe the width of the brush pattern. The proper brush pattern width is 100 to 125 mm (4 to 5 in).
6. To increase the width of the main brush pattern, turn the main brush down pressure nut counter-clockwise.

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



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.

The side brush pattern is set at the factory.

The side brush should be replaced when it no longer sweeps effectively for your application. A guideline length is when the remaining bristles measure 75 mm (3 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.

TO REPLACE SIDE BRUSH

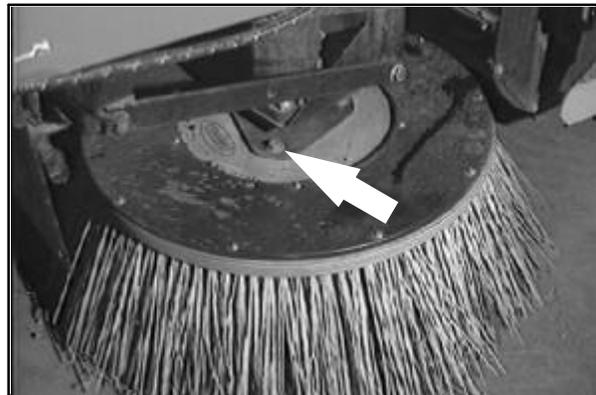
1. Raise the side brush.
2. Stop the engine and set the machine parking brake.

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, Turn Off Machine And Remove Key.

3. Remove the side brush retaining hardware holding the brush to the drive hub.

⚠ WARNING: Side Brush Can Move. Do Not Step On Side Brush.

4. Mount the new side brush to the drive hub with the hardware removed earlier.



SKIRTS AND SEALS

BRUSH ACCESS DOOR SKIRTS

The brush access door skirts are located on the bottom of each of the two main brush access doors. The skirts should touch the skid plates on either side of the machine.

Check the skirts for wear or damage daily.

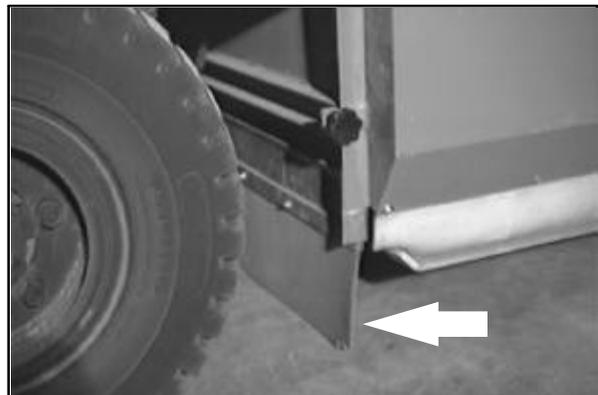


BRUSH COMPARTMENT REAR SKIRT

The brush compartment skirt is located at the rear of the brush compartment. The skirt should clear the ground by 3 mm (0.125 in).

Check the skirt for wear or damage daily.

NOTE: Tire pressure and a full hopper will affect skirt clearances.



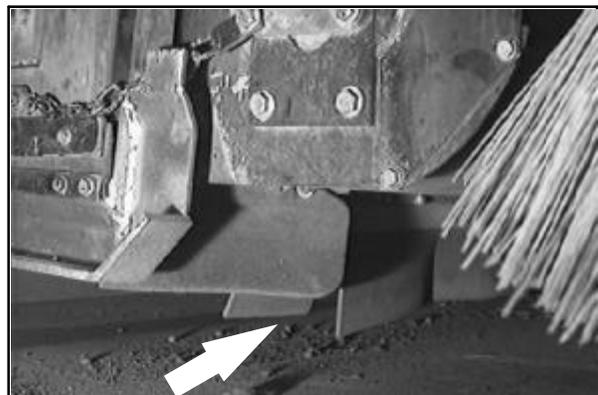
CONVEYOR SKIRTS

The conveyor has a lip skirt located at the bottom rear of the conveyor and two side skirts. The skirts should touch the ground when the conveyor is lowered into the sweeping position.

Check the skirts for wear or damage daily.

Replace the skirts when they no longer touch the ground.

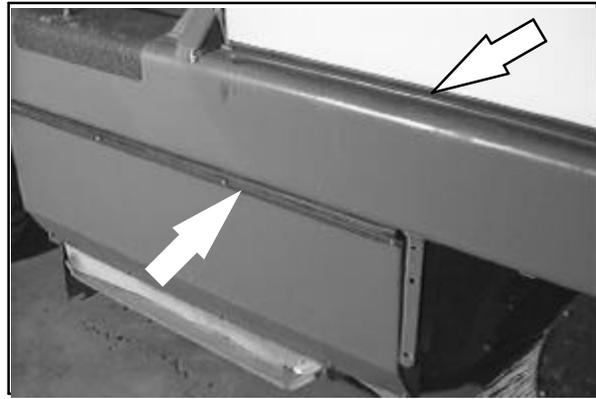
NOTE: Tire pressure and a full hopper will affect skirt clearances.



DOOR SEALS

The brush access doors, the cab doors, and side doors seals are located along the door edges.

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

**CONVEYOR SEALS**

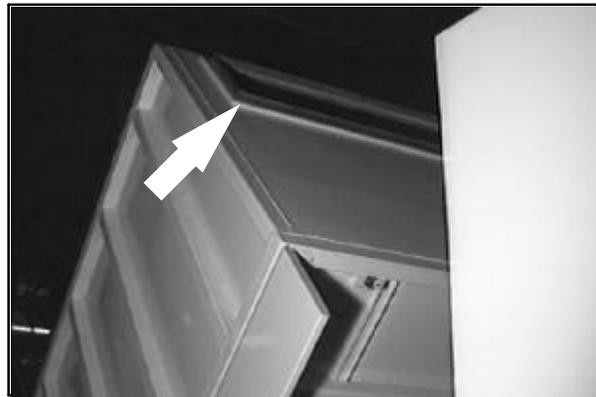
The conveyor seals are located on the machine frame where the conveyor makes contact with the frame.

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

**HOPPER SEALS**

The hopper seals are located on the hopper door, the hopper filter cover, the dust filter, and the front opening of the hopper.

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



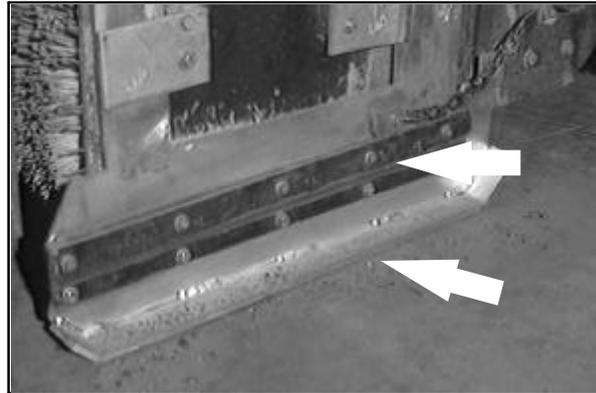
SKIDS

SKIDS

The skids are located on either side of the brush compartment. They skim the ground when the conveyor is lowered into the sweeping position and are designed to contain debris between the main brush and the conveyor lip.

Check the skids for wear after every 100 hours of operation. The skids should be replaced when the thickness is less than 1 mm (0.04 in).

The skids are attached to the upper plate by means of a rubber flap which absorbs shock. Check the rubber flaps every 100 hours of operation for damage or wear.



BRAKES AND TIRES

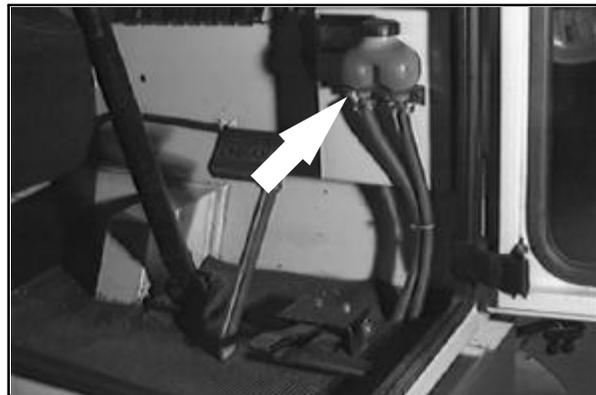
SERVICE BRAKES

The hydraulic service brakes are located on all four wheels.

The brake fluid reservoir is located in the cab, under the dashboard.

Check the brake fluid level every daily.

The service brakes adjust automatically when the brakes are activated in reverse. Periodically brake several times while driving in reverse to set the service 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, when the machine rolls after setting the parking brake, and every 200 hours of operation.



TIRES

The machine tires are pneumatic. The wheels consist of a 3-piece rim, flap, tube and tire.

Check the tire pressure every 50 hours of operation. The proper tire air pressure is:

- bias ply tire . . . 759–828 kPa (110–120 psi).
- radial tire 930–1000 kPa (135–145 psi).

NOTE: The machine is equipped with 3-piece rims. If the tire pressure falls below 550 kPa (80 psi), the tire and wheel assembly should be brought to an industrial tire service center for repair and/or refilling.

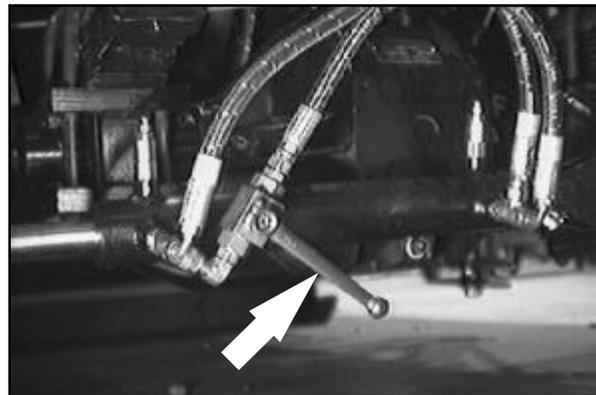
Check the tires for wear and rotate every 200 hours of operation.



WHEEL ALIGNMENT

When the machine has been used for some time, air can get trapped in the hydraulic steering system. This can keep the wheels from tracking properly. The front axle is equipped with a hydraulic valve for aligning the wheels. This should be done after every 50 hours of operation or when the machine is not tracking properly.

To align the wheels, start the machine and turn the steering wheel fully to the left. Move the machine slightly forward and backward to get the full left hand turn. Apply the parking brake. Find the red valve handle and place it on the steering valve located on the front axle. Open the valve by turning the handle 90° in the counter-clockwise direction. Release the parking brake and turn the steering wheel fully to the right. Move the machine slightly forward and backward to get the full right hand turn. Apply the parking brake. Close the valve by turning the handle 90° in the clockwise direction. Remove the red valve handle.



WHEEL NUTS

Check the wheel nut torque on the four wheels every 100 hours of operation. The proper torque is 260 – 305 Nm (190 – 225 ft lb).

PUSHING OR TOWING MACHINE

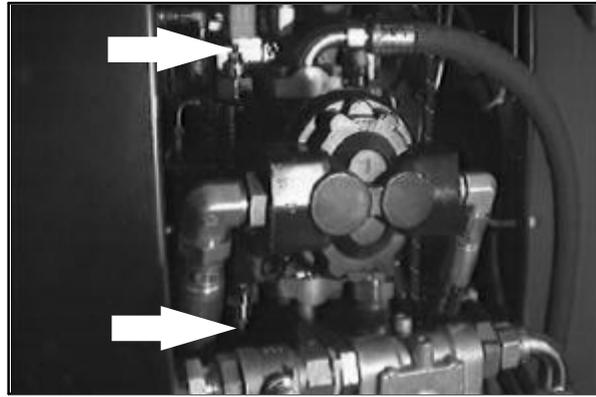
The propelling pump has a towing by-pass valves to prevent damage to the hydraulic system when the machine is being towed.

Loosen the nuts on the by-pass valves with a 13 mm wrench. Turn in the set screws with a 4 mm allen wrench until they are below the surface of the nut. Tighten the nuts.

You can push the machine from the rear, and tow it from the front.

When finished towing, loosen the nuts on the by-pass valves with a 13 mm wrench. Turn out the set screws till they top out with a 4 mm allen wrench. Tighten the nuts.

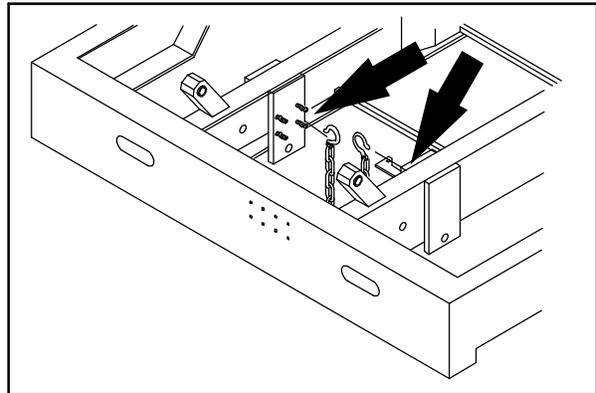
ATTENTION! Do not push or tow the machine without using the towing valve, or the machine hydraulic system may be damaged.



MACHINE TIE-DOWNS

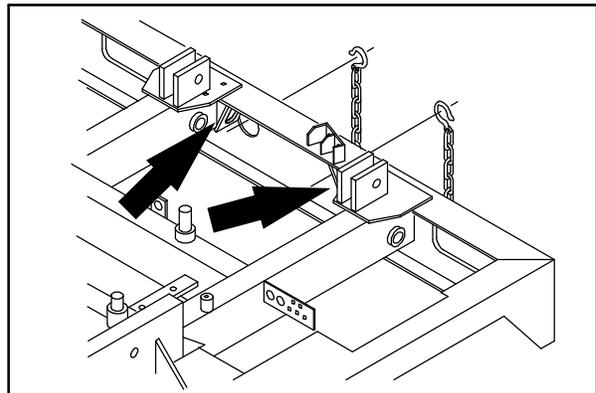
The machine must be tied down on the main frame. The front tie-down locations are on the inside channels of the main frame. Always set the machine parking brake and block the tires before tying machine down.

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, Turn Off Machine And Remove Key. Block Machine Tires.



10184

The rear tie-down locations are through the rear channels of the main frame.



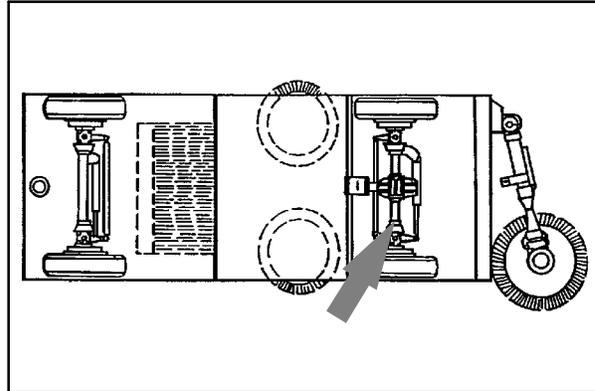
10185

MACHINE JACKING

You can jack up the machine for service at the designated locations. Use a jack of adequate capacity and good working condition; a 4-ton jack for empty hopper, and a 6-ton jack with full hopper.

Always stop the machine on a flat, level surface and block the tires before jacking up the machine.

The front jacking locations are the front axle.

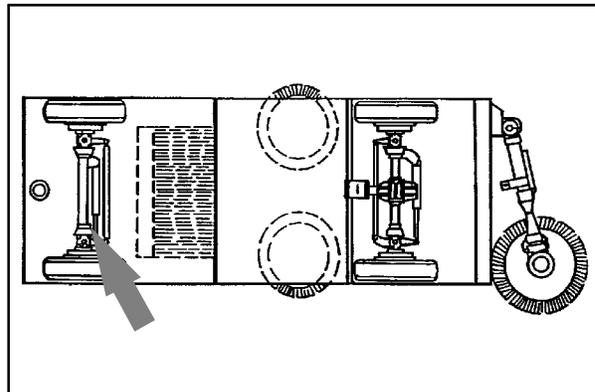


09541

The rear jacking locations are the rear axle.

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.



09541

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.

FREEZE PROTECTION FOR WET DUST CONTROL SYSTEM

1. Open the water valve knobs on the dash panel to drain the lines.
2. Drain the water tank with the drain valve located under the tank.
3. Lay the vacuum wand option, if machine is equipped, on the ground and open the water valve on the wand. Leave the valve open.
4. Drain the water lines and pump by opening the drain valve at the water pump under the cab.
5. Remove the water filter cap, located next to the water pump, and empty it.
6. Leave the valves open if the machine is to be stored, or not used for an extended period.

SPECIFICATIONS

GENERAL MACHINE DIMENSIONS/CAPACITIES

Item	Dimension/capacity
Length	4290 mm (169 in)
Length with auxiliary brush option	5155 mm (203 in)
Width	1765 mm (69.5 in)
Height with hazard light	2540 mm (100 in)
Track	1510 mm (59.5 in)
Wheelbase	2920 mm (115 in)
Main brush diameter	610 mm (24 in)
Main brush length	1295 mm (51 in)
Side brush diameter	810 mm (32 in)
Sweeping path width, main brush only	1300 mm (51 in)
Sweeping path width, main brush and two side brushes	2050 mm (81 in)
Sweeping path width, main brush, two side brushes, and front side brush	3000 mm (118 in)
Main brush pattern width	100 to 125 mm (4 to 5 in)
Hopper weight capacity, Low dump model	3496 kg (7700 lb)
Hopper weight capacity, High dump model	2270 kg (5000 lb)
Hopper volume capacity	2600 L (3.4 yd ³)
Dust filter area	20 m ² (211 sq ft)
Wet dust control water tank (option)	348L (92 gal)
GVWR	9072 kg (20,000 lb)
Axle rating (front and rear)	5000 kg (11,000 lb)
Ceiling height minimum dumping clearance, low dump model	3045 mm (10 ft)
Ceiling height minimum dumping clearance, high dump model	4115 mm (13.5 ft)

GENERAL MACHINE PERFORMANCE

Item	Measure
Maximum forward speed	40.2 kmh (25 mph)
Maximum reverse speed	19.3 kmh (12 mph)
Minimum steering diameter	8700 mm (343 in)
Minimum turning radius	3960 mm (13 ft)
Maximum rated climb and descent angle	12° Empty hopper, 8° Full hopper

SPECIFICATIONS

POWER TYPE

Engine	Type	Ignition	Cycle	Aspiration	Cylinders	Bore	Stroke
Perkins	Piston	Diesel	4	Natural (Turbo)	4	100 mm (3.937 in)	127 mm (5.00 in)
	Displacement		Net power, governed			Net power, maximum	
	4.00 L (243 cu in)		63.4 kw (85 hp) @ 2500 rpm 84 kw (113 hp) @ 2500 rpm - (Turbo)			67.1 kw (90 hp) @ 2800 rpm 84 kw (114 hp) @ 2800 rpm - (Turbo)	
	Fuel		Cooling system			Electrical system	
	Diesel Fuel tank: 98.4 L (26 gal)		Water/ethylene glycol antifreeze			12 V nominal	
			Total: 14.2 L (3.75 gal)			105 A alternator	
			Radiator: 0.95 L (1 qt)			12V Battery - 730 cca	
	Idle speed, no load		Governed speed, under load				
	1000 to 1200 rpm		2500 rpm maximum				
	Engine lubricating oil with filter						
	7.6 L (8 qt) 10W30 SAE-CD/SE rated engine oil						
	Air conditioner						
	Refrigerant R134a - total system capacity, 1.4 kg (3 lb)						

STEERING

Type	Power source	Emergency steering
Front and rear wheels, hydraulic cylinder, steering rod, and rotary valve controlled	Hydraulic accessory pump	Manual

HYDRAULIC SYSTEM

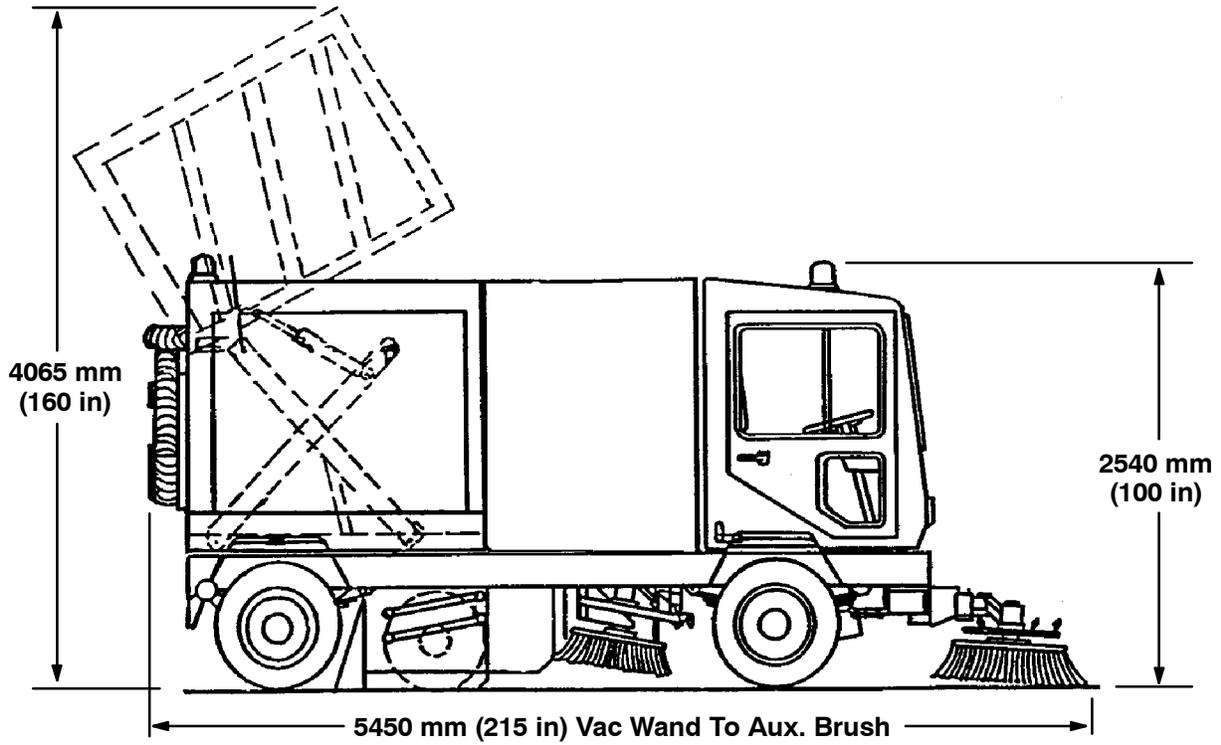
System	Capacity	Fluid Type
Hydraulic reservoir	68.2 L (18 gal)	TENNANT part no. 65870 (Mobil no. DTE13M) - above 0° C (32° F)
Hydraulic total	121 L (32 gal)	TENNANT part no. 74217 (Mobil no. DTE11M) - below 0° C (32° F)

BRAKING SYSTEM

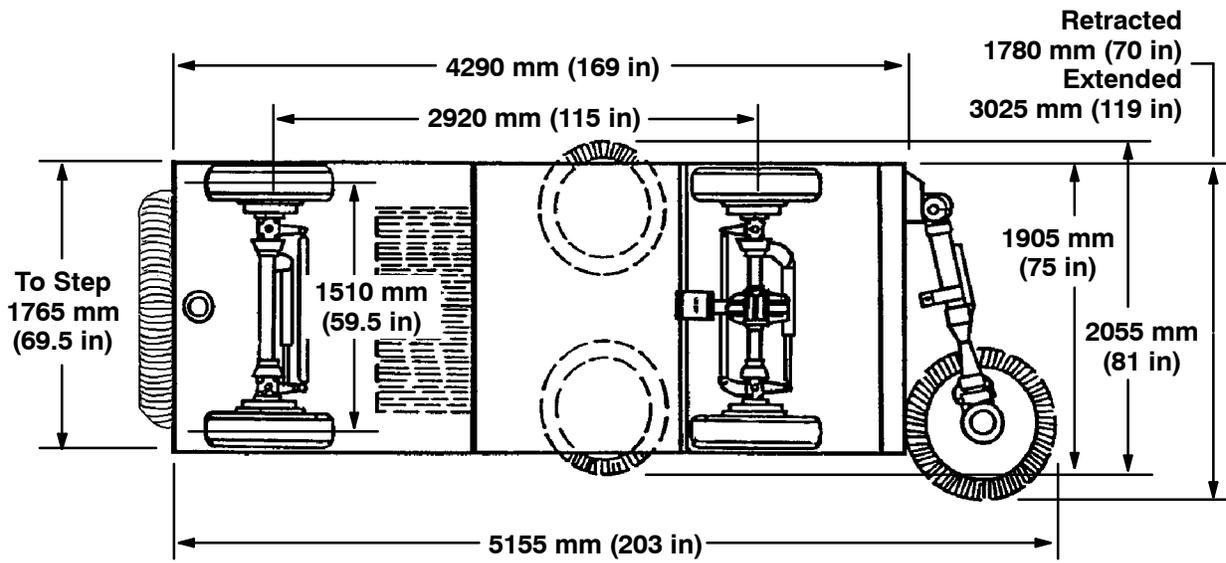
Type	Operation
Service brakes	Hydraulic drum dual brakes (4), one per each wheel, foot brake master cylinder activated
Parking brake	Utilize service brakes on front wheels, cable actuated

TIRES

Location	Type	Size	Ply Rating	Pressure
Front and Rear (4)	Bias Ply Pneumatic	7 x 12 in	12	759-828 kPa (110-120 psi)
Front and Rear (4)	Radial Pneumatic	7 x 12 in	16	930-1000 kPa (135-145 psi)



SIDE VIEW



BOTTOM VIEW

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