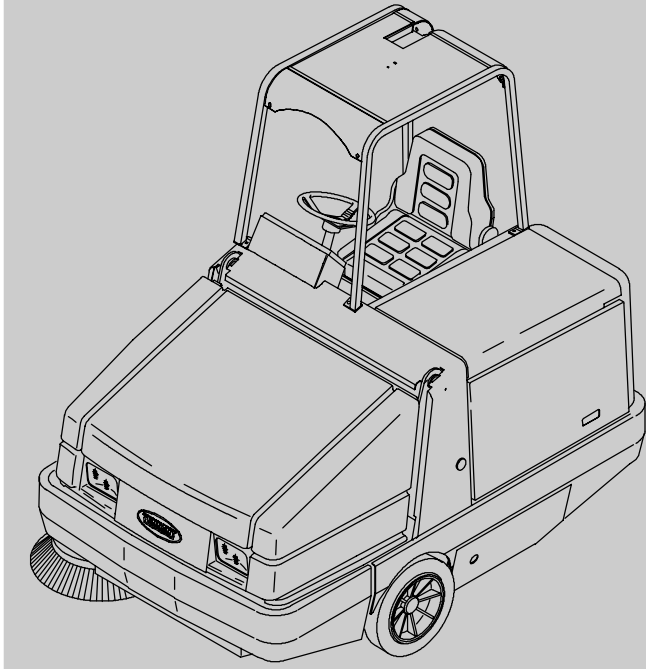




6550

(Electric)

Sweeper Operator Manual



North America / International

www.tennantco.com

330350
Rev. 09 (05-2007)





This manual is furnished with each new model. It provides necessary operation and 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 machine maintenance instructions provided.
- The machine is maintained with manufacturer supplied or equivalent parts.

	PROTECT THE ENVIRONMENT Please dispose of packaging materials, old machine components such as batteries, hazardous fluids such as antifreeze and oil, in an environmentally safe way according to local waste disposal regulations.
	Always remember to recycle.

MACHINE DATA	
Please fill out at time of installation for future reference.	
Model No. -	_____
Serial No. -	_____
Machine Options -	_____
Sales Rep. -	_____
Sales Rep. phone no. -	_____
Customer Number -	_____
Installation Date -	_____

Tennant Company
PO Box 1452
Minneapolis, MN 55440
Phone: (800) 553-8033 or (763) 513-2850
www.tennantco.com

Thermo-Sentry, Perma-Filter, and VCS are US registered trademarks of Tennant Company.

Specifications and parts are subject to change without notice.

Copyright © 2006, 2007 TENNANT Company, Printed in U.S.A.

CONTENTS

	Page		Page
SAFETY PRECAUTIONS	3	OPERATION ON INCLINES	40
OPERATION	6	MACHINE TROUBLESHOOTING	41
OPERATORS RESPONSIBILITY	6	MAINTENANCE	42
MACHINE COMPONENTS	7	MAINTENANCE CHART	42
CONTROL PANEL SYMBOLS	8	LUBRICATION	44
CONTROLS AND INSTRUMENTS	10	PROPELLING GEARBOX	44
OPERATION OF CONTROLS	11	REAR WHEEL SUPPORT BEARING .	44
DIRECTIONAL PEDAL	11	HOPPER BEARINGS	44
DIRECTIONAL PEDAL TOE ANGLE		STEERING LINK	45
(OPTION)	12	FRONT WHEEL BEARINGS	45
BRAKE PEDAL	12	HYDRAULICS	46
PARKING BRAKE LEVER	12	HYDRAULIC FLUID RESERVOIR	46
HORN BUTTON	13	HYDRAULIC FLUID	47
BRUSH PRESSURE GAUGE	13	HYDRAULIC HOSES	47
MAIN BRUSH AND SIDE BRUSH		BATTERIES	48
LEVER	14	CHARGING THE BATTERIES	50
HOPPER DOOR LEVER	15	BELTS AND CHAINS	52
HOPPER LIFT LEVER	16	VACUUM FAN DRIVE BELT	52
MAIN BRUSH POSITION LEVER	17	STATIC DRAG CHAIN	52
MAIN BRUSH DOWN PRESSURE		DEBRIS HOPPER	53
KNOB	18	HOPPER DUST FILTER	53
POWER KILL SWITCH	18	TO REPLACE HOPPER	
HOPPER TEMPERATURE LIGHT -		DUST FILTER	54
THERMO SENTRY	19	THERMO SENTRY	56
HOPPER DOOR LIGHT	19	BRUSHES	57
CLOGGED FILTER LIGHT	19	MAIN BRUSH	57
MAIN BRUSH SHUT DOWN LIGHT ..	19	TO REPLACE MAIN BRUSH	57
BATTERY DISCHARGE INDICATOR .	20	TO CHECK AND ADJUST MAIN	
HOURMETER	20	BRUSH PATTERN	58
HAZARD LIGHT SWITCH (OPTION) ..	20	SIDE BRUSH	61
OPERATING LIGHTS SWITCH	20	TO REPLACE SIDE BRUSH	62
VACUUM FAN SWITCH	21	SIDE BRUSH GUARD	62
FILTER SHAKER SWITCH	21	SKIRTS AND SEALS	63
STEERING WHEEL	21	HOPPER LIP SKIRTS	63
SIDE BRUSH POSITION LEVER	22	HOPPER SIDE SKIRT	63
ON-OFF SWITCH	23	BRUSH DOOR SKIRTS	63
SIDE BRUSH DOWN PRESSURE		REAR SKIRTS	64
KNOB	24	BRUSH DOOR SEALS	64
STEERING COLUMN TILT LEVER ...	24	HOPPER SEALS	64
CIRCUIT BREAKERS	25	HOPPER INSPECTION DOOR SEAL .	64
LATCHES	25	HOPPER DOOR SEALS	65
OPERATOR SEAT	26	HOPPER COVER SEAL	65
HOPPER SUPPORT BAR	27	HOPPER DUST SEAL	65
HOW THE MACHINE WORKS	28	SIDE BRUSH DUST CONTROL	
PRE-OPERATION CHECKLIST	28	SKIRTS (OPTION)	65
STARTING THE MACHINE	29	HOPPER VACUUM FAN SEAL	66
SWEEPING AND BRUSH INFORMATION	30	HOPPER FILTER SEALS	66
SWEEPING	31	BRAKES AND TIRES	67
STOP SWEEPING	33	SERVICE BRAKES	67
EMPTYING THE HOPPER	34	PARKING BRAKE	67
STOP THE MACHINE	36	TIRES	67
POST-OPERATION CHECKLIST	37	REAR WHEEL	67
ENGAGING HOPPER SUPPORT BAR ..	38		
DISENGAGING HOPPER SUPPORT BAR	39		

CONTENTS

	Page
PUSHING, TOWING, AND TRANSPORTING THE MACHINE	68
PUSHING OR TOWING THE MACHINE	68
TRANSPORTING THE MACHINE	68
MACHINE JACKING	71
ELECTRIC MOTORS	71
STORING MACHINE	71
SPECIFICATIONS	72
POWER TYPE	73
STEERING	73
HYDRAULIC SYSTEM	73
BRAKING SYSTEM	73
TIRES	73
MACHINE DIMENSIONS	74
INDEX	75

SAFETY PRECAUTIONS

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



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

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

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

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



WARNING: Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and open flame away. Keep covers open when charging.



WARNING: Hazardous voltage. Shock can result. Disconnect batteries before working on machine. Only qualified personnel should work inside panel.



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



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

FOR SAFETY:

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

SAFETY PRECAUTIONS

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

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

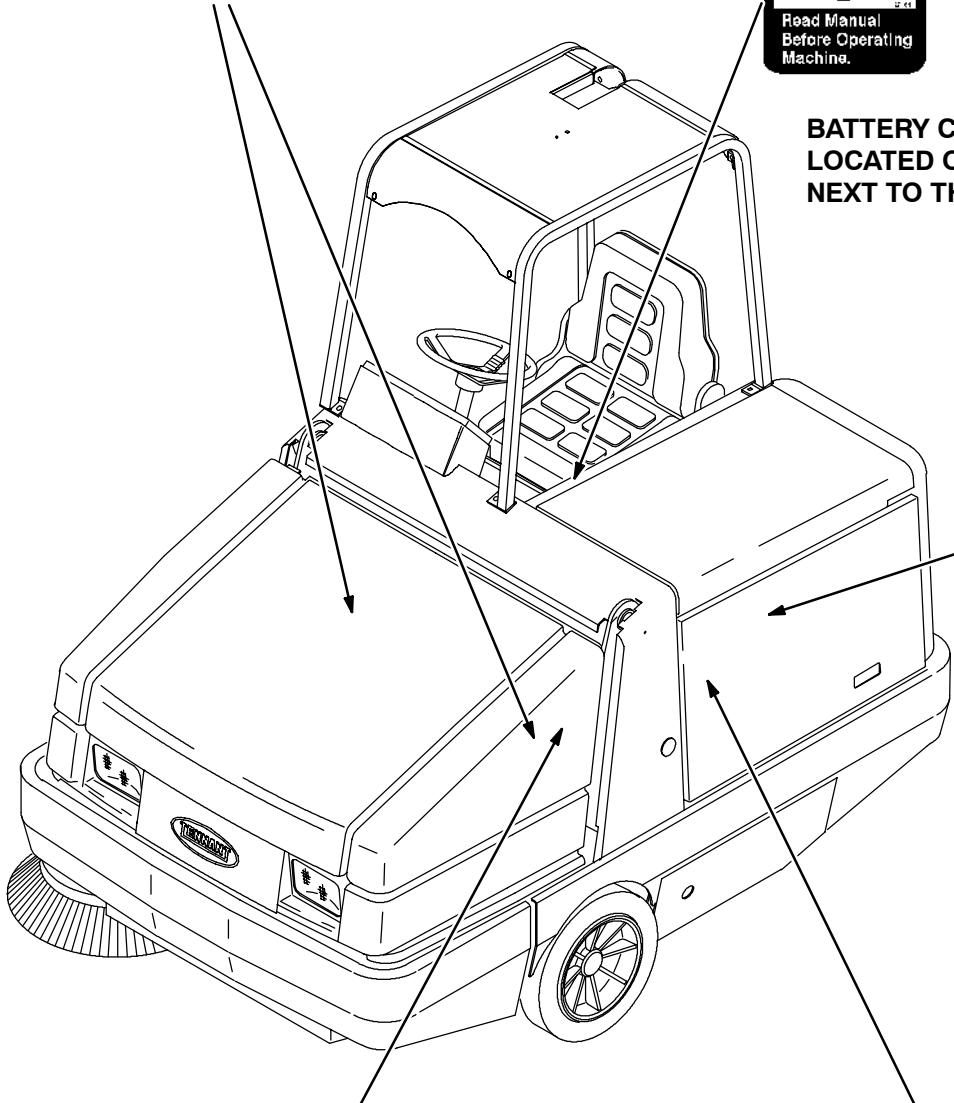
HOPPER SUPPORT BAR LABEL - LOCATED ON THE HOPPER SUPPORT BAR AND ON BOTH HOPPER LIFT ARMS.



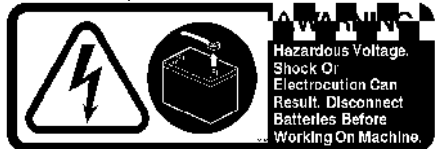
FOR SAFETY LABEL - LOCATED ON THE SIDE PANEL OF THE OPERATOR COMPARTMENT.



BATTERY CHARGING LABEL - LOCATED ON THE RELAY PANEL NEXT TO THE BATTERIES.



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



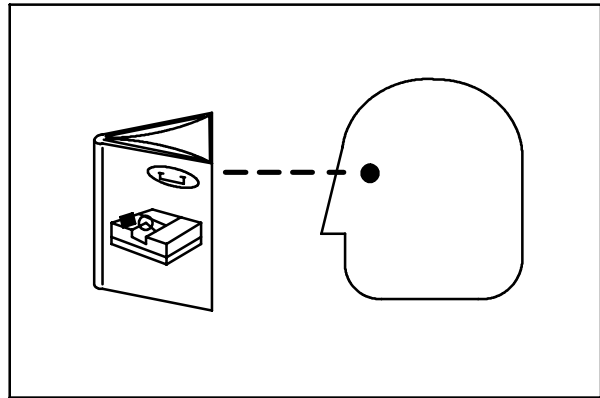
HAZARDOUS VOLTAGE LABEL - LOCATED ON THE ELECTRICAL COMPONENTS BOX COVER.

351840

OPERATORS RESPONSIBILITY

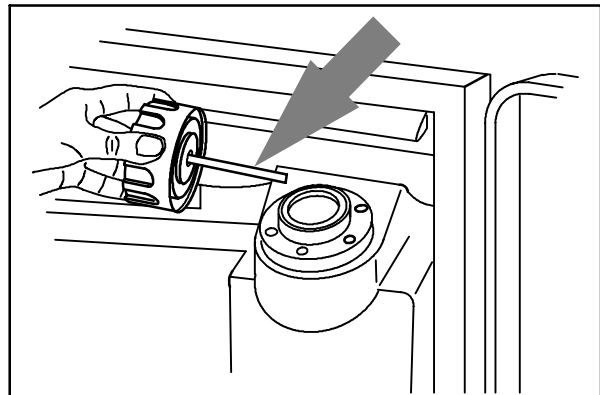
- The operator's responsibility is to take care of the daily maintenance and checkups of the machine to keep it in good working condition. The operator must inform the service mechanic or supervisor when the required maintenance intervals occur as stated in the *MAINTENANCE* section of this manual.
-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

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



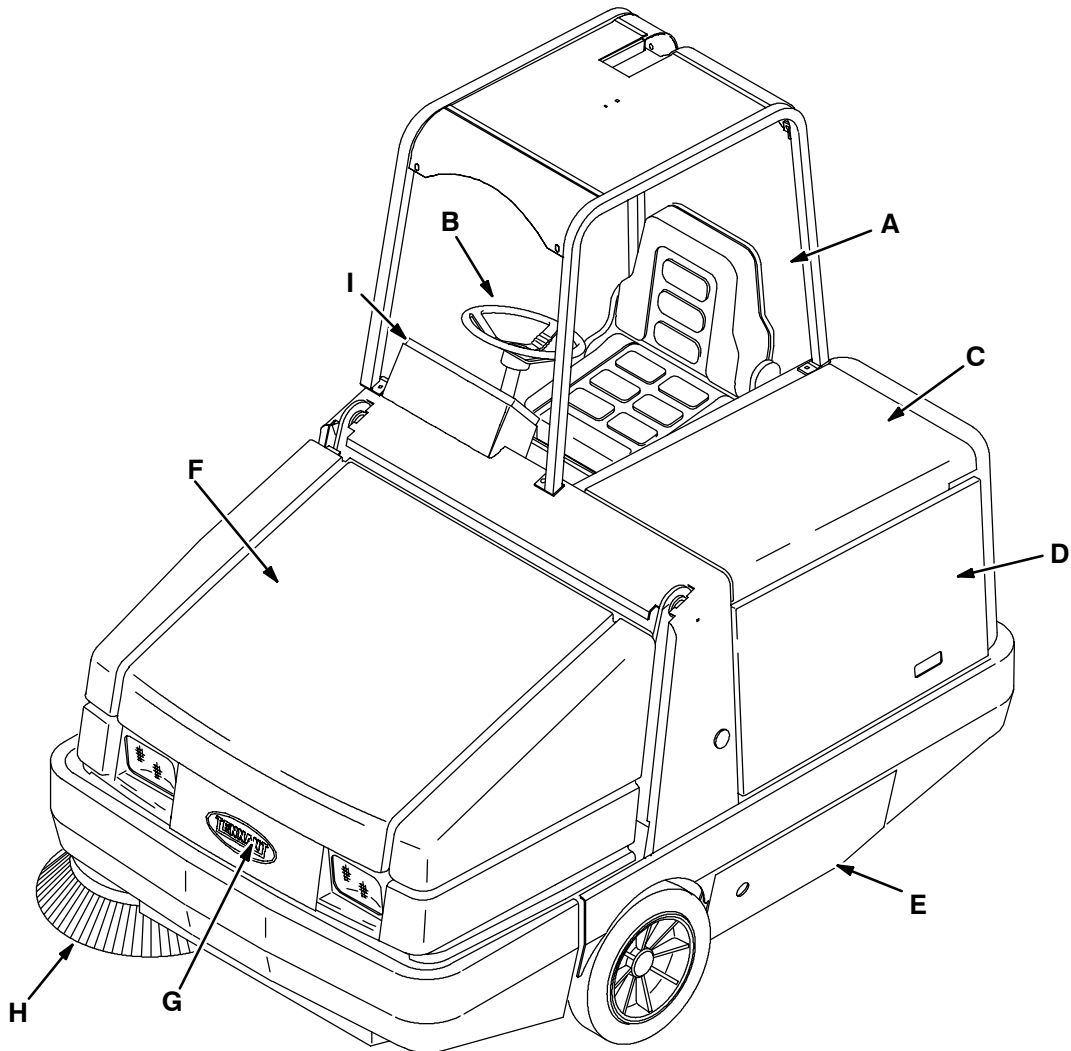
07324

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



08218

MACHINE COMPONENTS



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

351840

OPERATION

CONTROL PANEL SYMBOLS

These symbols identify controls and displays on the machine:



Main and Side Brushes On



Hopper Temperature - Thermo Sentry



Main Brush On



Filter Clogged



Hopper Door Open



Hopper Door Closed



Hopper Door Close



Battery



Hopper Down



Hourmeter



Hopper Up



Hazard Light



Horn



Filter Shaker



Main Brush Down Pressure Light



Operating Lights



Main Brush Down Pressure Heavy



Fan



Main Brush Down



Side Brush Down



Main Brush Up



Side Brush Up



Side Brush Down Pressure Light



Circuit Breaker 1



Side Brush Down Pressure Heavy



Circuit Breaker 2



Main Brush Down Force



Circuit Breaker 3



Circuit Breaker 4



Circuit Breaker 5



Circuit Breaker 6



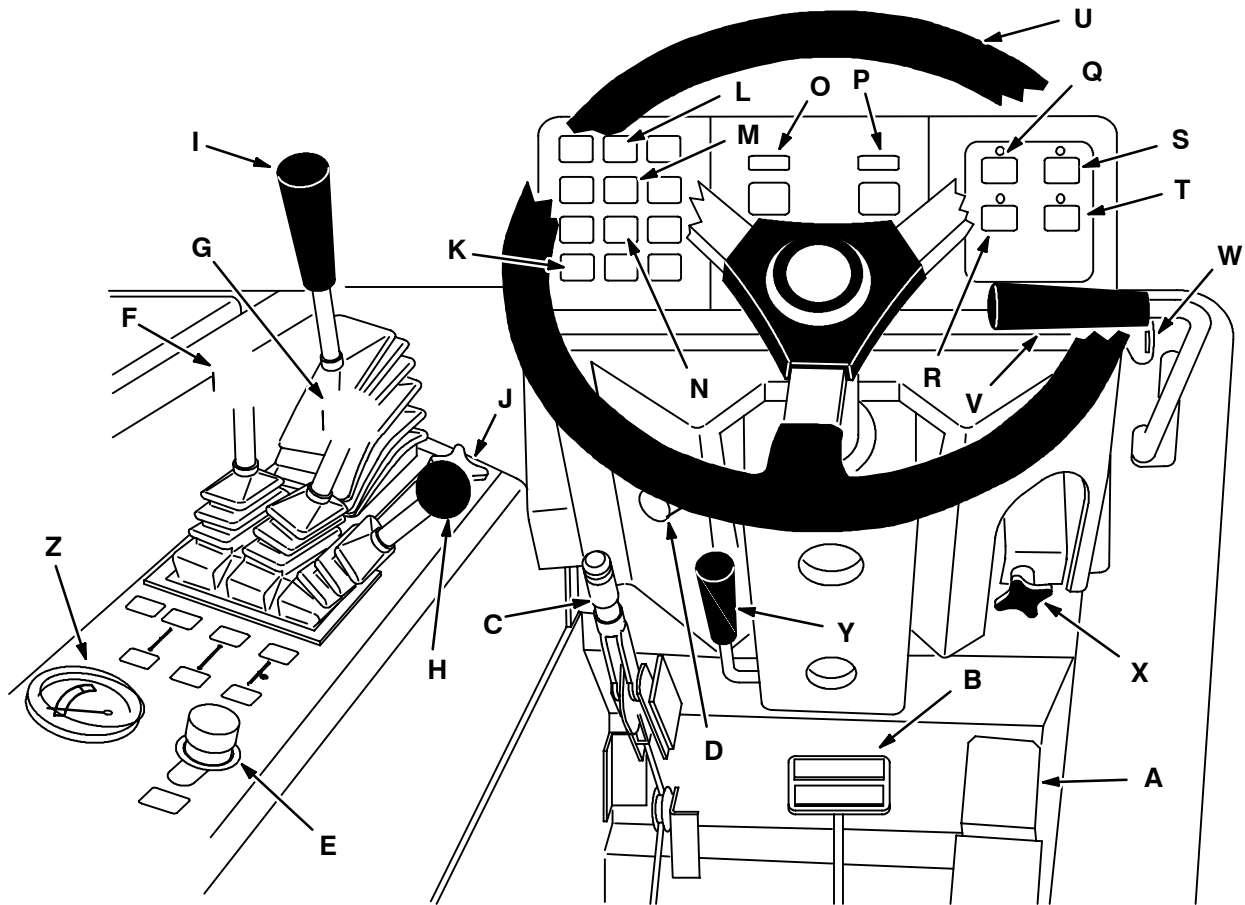
Circuit Breaker 7



Circuit Breaker 8

OPERATION

CONTROLS AND INSTRUMENTS



08219

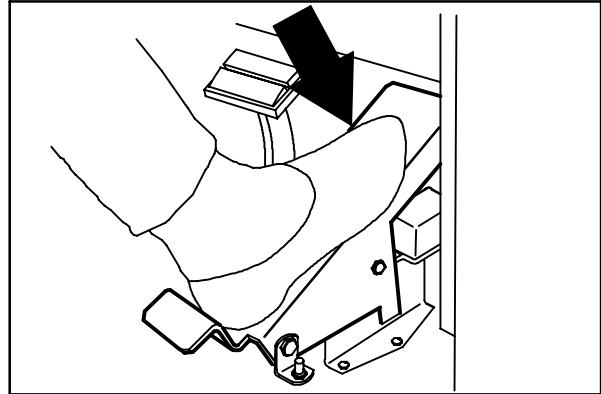
- A. Directional Pedal
- B. Brake Pedal
- C. Parking Brake Lever
- D. Power Kill Switch
- E. Horn Button
- F. Main Brush And Side Brush Lever
- G. Hopper Door Lever
- H. Hopper Lift Lever
- I. Main Brush Position Lever
- J. Main Brush Down Pressure Knob
- K. Hopper Temperature Light – Thermo Sentry
- L. Main Brush Shut Down Light
- M. Clogged Filter Light
- N. Hopper Door Light
- O. Battery Discharge Indicator
- P. Hourmeter
- Q. Hazard Light Switch (Option)
- R. Filter Shaker Switch
- S. Operating Light Switch
- T. Vacuum Fan Switch
- U. Steering Wheel
- V. Side Brush Position Lever
- W. On-Off Switch
- X. Side Brush Down Pressure Knob
- Y. Steering Column Tilt Lever
- Z. Brush Pressure Gauge

OPERATION OF CONTROLS

DIRECTIONAL PEDAL

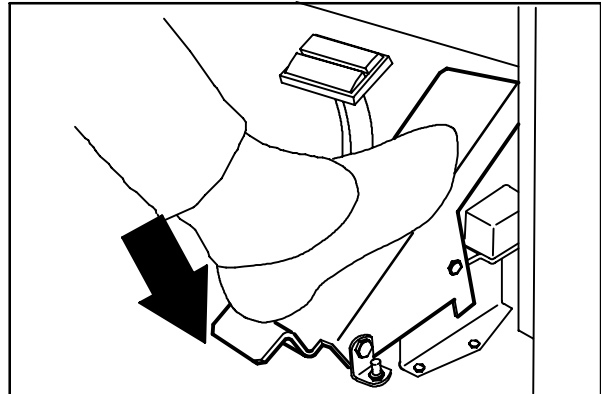
The directional pedal controls direction of travel and the propelling speed of the machine. You change the speed of the machine with the pressure of your foot; the harder you press the faster the machine travels.

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



08225

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

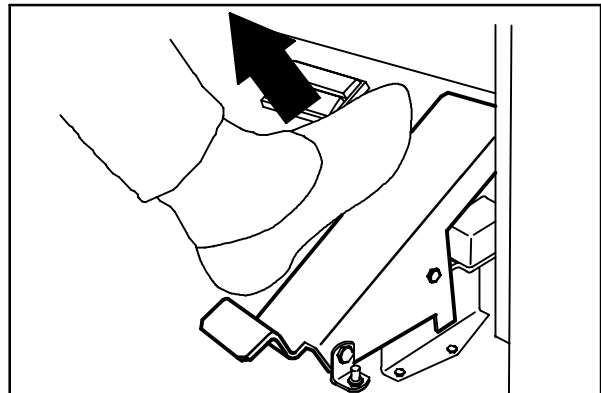


08226

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

NOTE: When changing direction from forward to reverse using the directional pedal, the machine will move a short distance forward before changing direction. Use the brakes to stop the machine.

FOR SAFETY: When using machine, use brakes to stop machine.

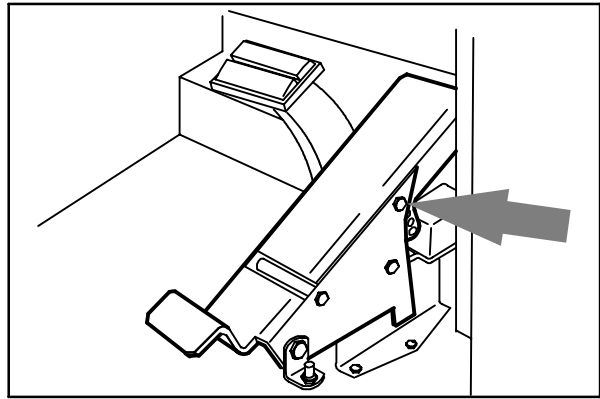


08227

OPERATION

DIRECTIONAL PEDAL TOE ANGLE (OPTION)

The directional pedal toe angle allows you to adjust of the pedal toe angle. Remove the clevis pin, move the top of the pedal to the angle needed, and slide the clevis pin through the adjustment holes.

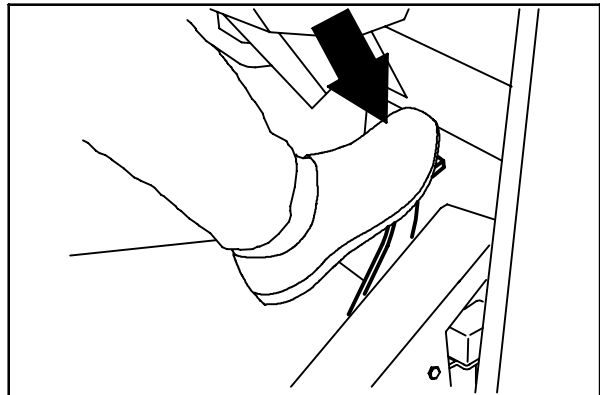


08292

BRAKE PEDAL

The brake pedal stops the machine.

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



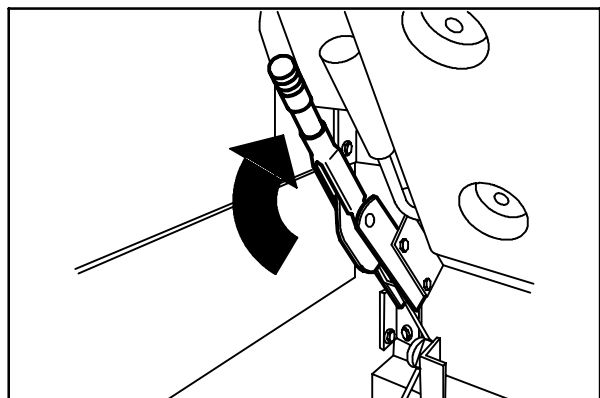
08234

PARKING BRAKE LEVER

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

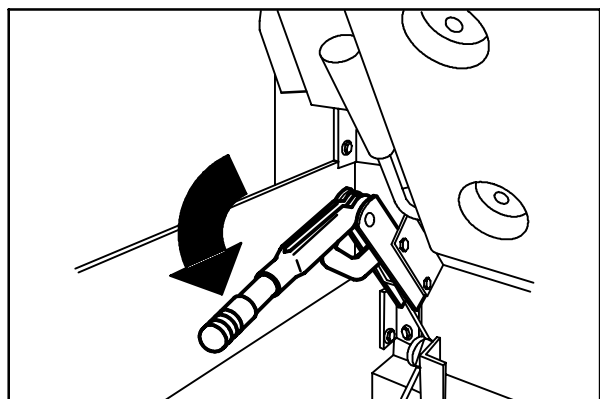
Set: Pull the parking brake lever up.

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



08224

Release: Push the parking brake lever down.

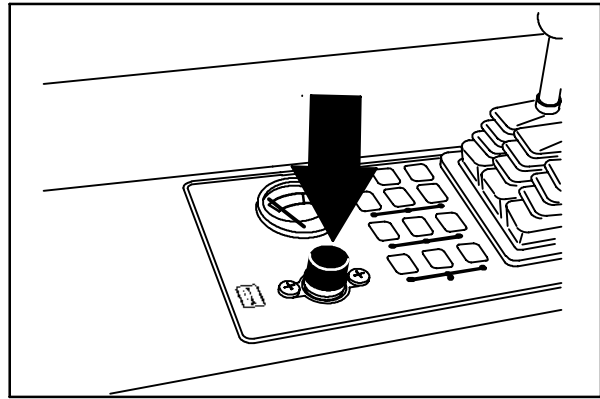


08223

HORN BUTTON

The horn button operates the horn.

Sound: Press the button.

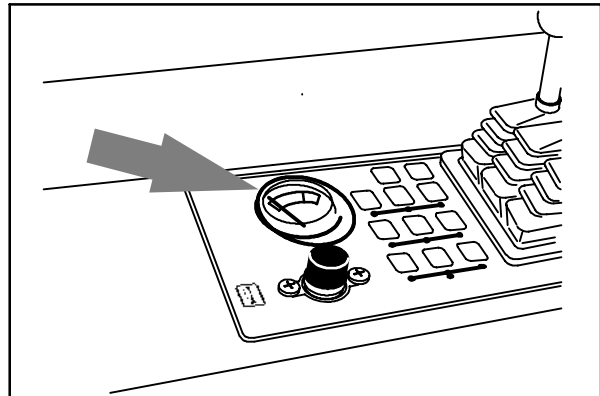


08220

BRUSH PRESSURE GAUGE

The brush pressure gauge shows the pressure of the main brush against the floor. The needle should be in the white zone. If the needle is in the red zone, reduce the main brush pressure with the main brush pressure knob.

NOTE: The brush pattern should be 50 to 75 mm (2.0 to 3.0 in).



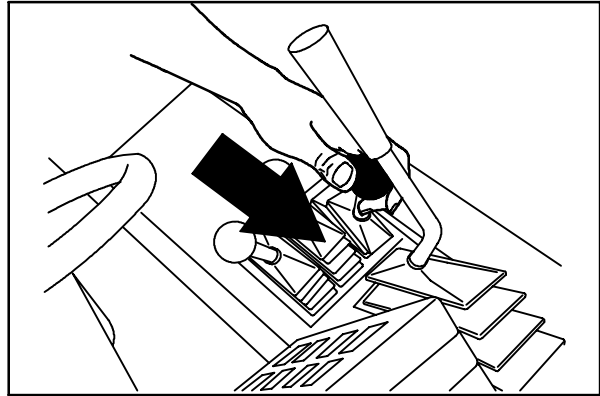
08221

OPERATION

MAIN BRUSH AND SIDE BRUSH LEVER

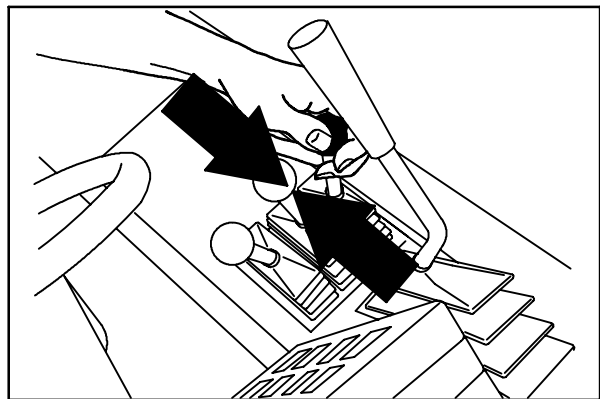
The main brush and side brush lever controls the main brush and side brush rotation.

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



07773

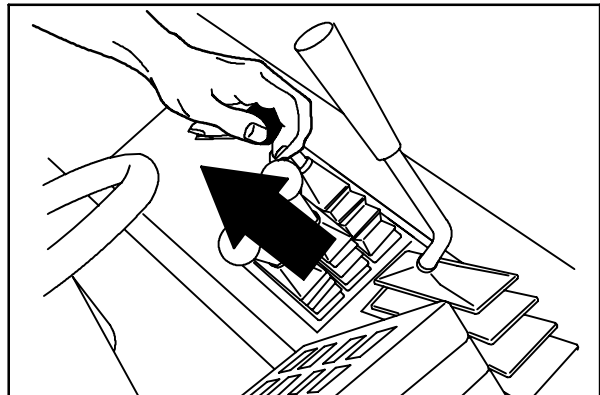
Main Brush and Side Brush Off: Pull the main brush and side brush lever into the middle position.



07774

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

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

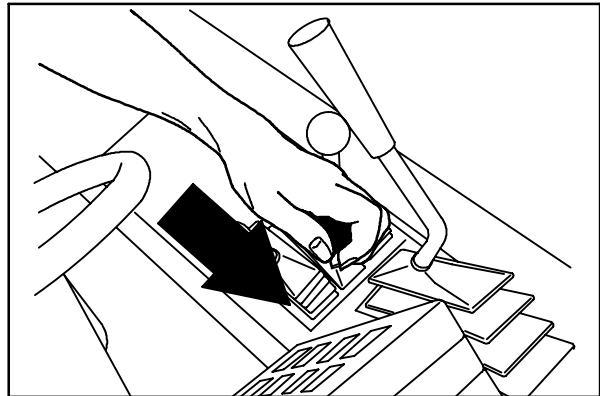


07775

HOPPER DOOR LEVER

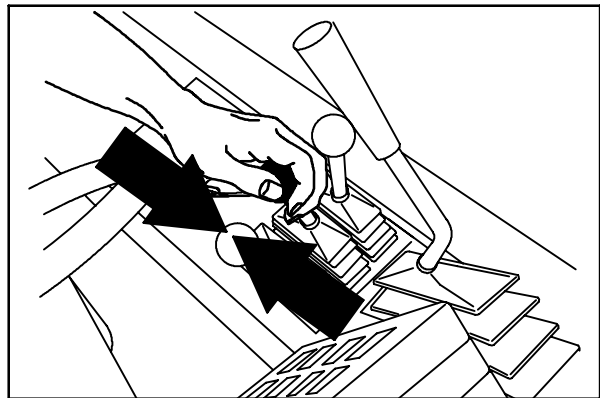
The hopper door lever opens and closes the hopper door. Open the hopper door when sweeping. Close the hopper door when emptying the hopper to control debris and dust.

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



07776

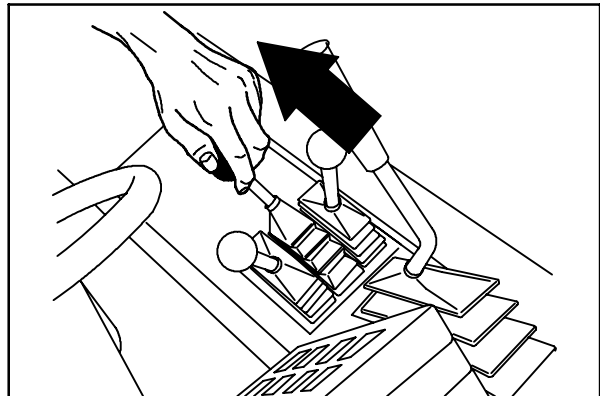
Hold: Release the hopper door lever into the middle position.



07777

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

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



07778

OPERATION

HOPPER LIFT LEVER

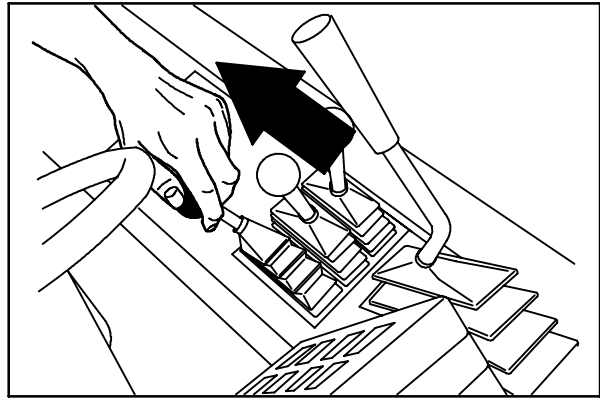
The hopper lift lever raises and lowers the hopper.

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



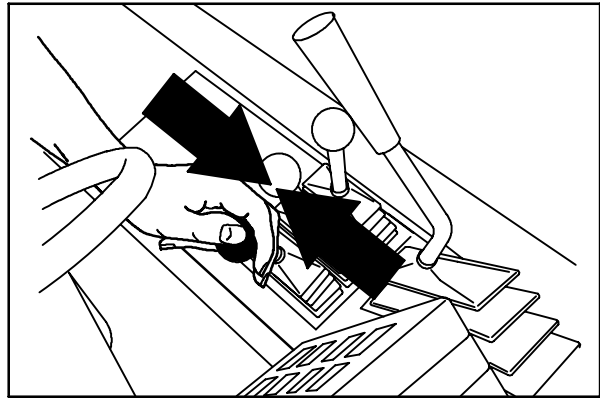
**WARNING: Raised hopper may fall.
Engage hopper support bar.**

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



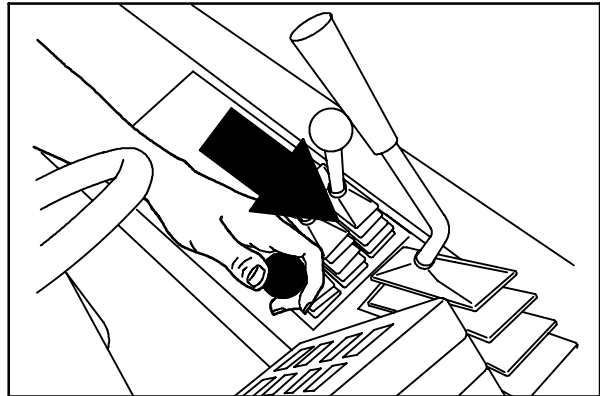
07779

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



07780

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

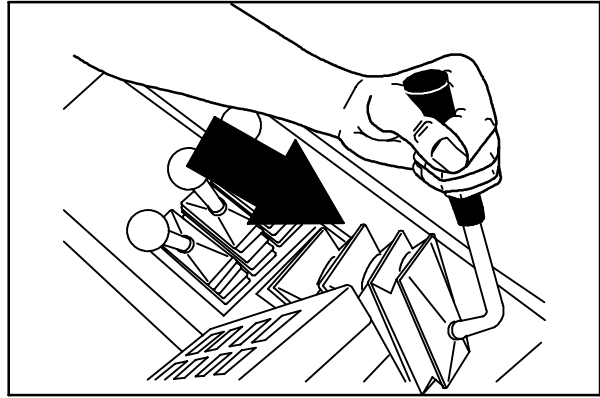


07781

MAIN BRUSH POSITION LEVER

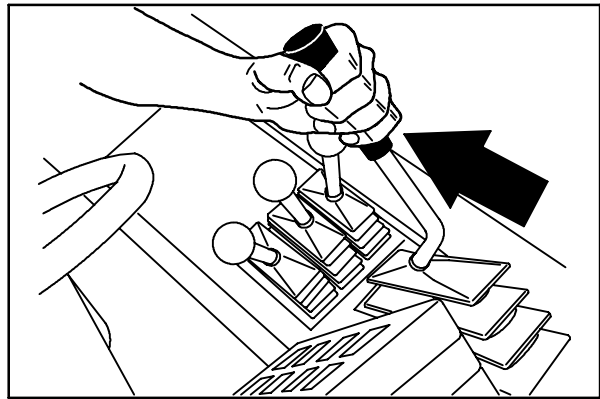
The main brush position lever lowers and raises the main brush.

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



07782

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



07784

OPERATION

MAIN BRUSH DOWN PRESSURE KNOB

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

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



Light: Turn the main brush down pressure knob clockwise.

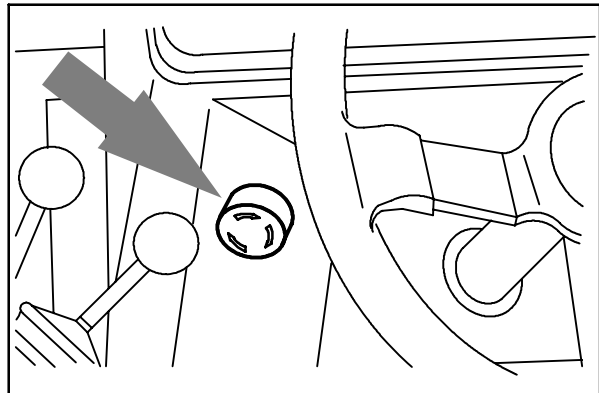


POWER KILL SWITCH

The power kill switch halts all power to the machine.

Halt: Hit the power kill switch.

Restart: Turn the power kill switch to the right to release the switch. Turn the on-off switch key fully clockwise, then release the switch key.

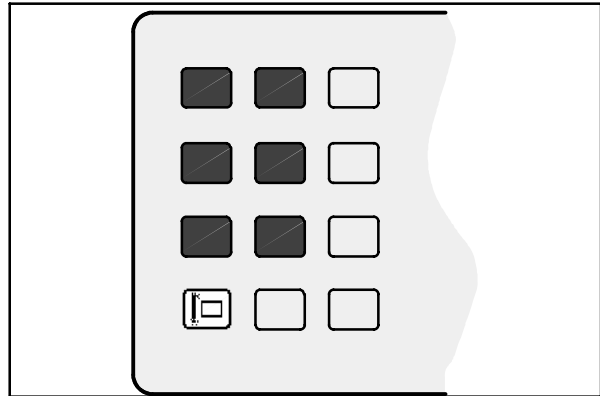


08237

HOPPER TEMPERATURE LIGHT - THERMO SENTRY

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

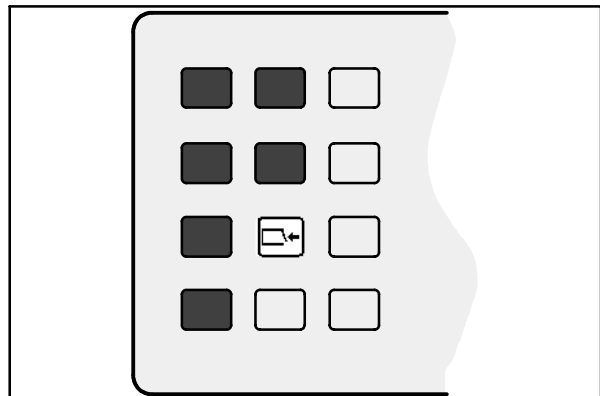
The Thermo Sentry has to be reset manually, see *THERMO SENTRY* in *MAINTENANCE*.



07760

HOPPER DOOR LIGHT

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

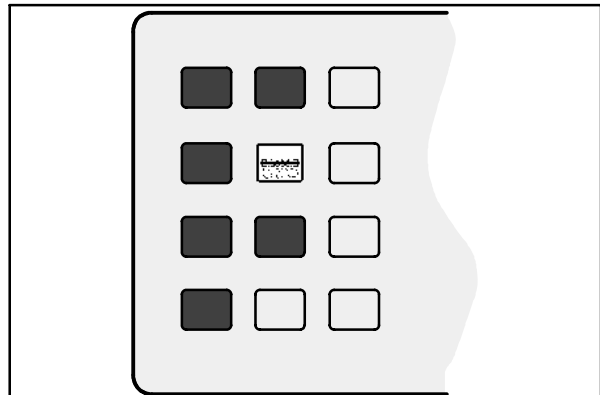


07763

CLOGGED FILTER LIGHT

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

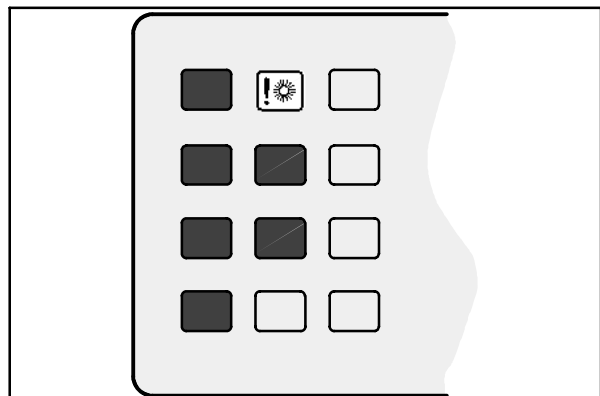
To clean the filter, press the filter shaker switch. If the clogged filter light remains lit, manually clean the hopper dust filter. See *HOPPER DUST FILTER* in *MAINTENANCE*.



07762

MAIN BRUSH SHUT DOWN LIGHT

The main brush shut down light comes on when there is excessive down pressure for the main brush, or there is a problem with the main and side brush hydraulic motor circuit. The brush pressures can be reduced with the main brush and side brush pressure knobs.



07761

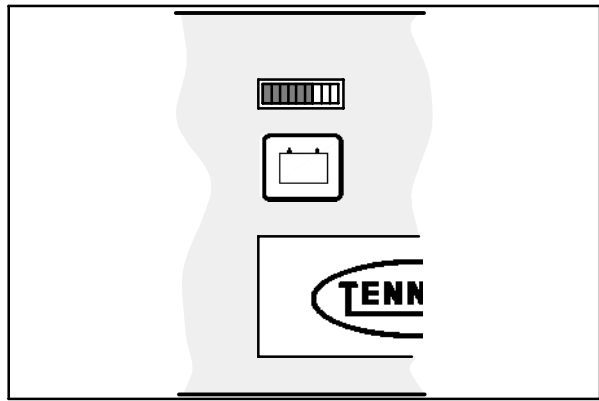
OPERATION

BATTERY DISCHARGE INDICATOR

The battery discharge indicator shows the charge level of the batteries with a segmented LED light. When the batteries are fully charged, all of the segments are lit. As the batteries discharge, the segments shut off.

Recharge the batteries when the last two segments are flashing.

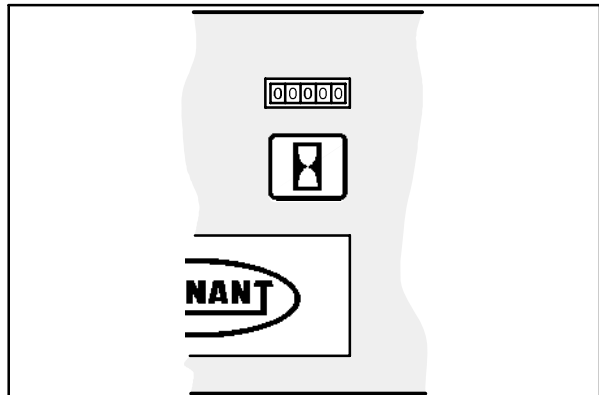
NOTE: The reading of the battery discharge indicator is not accurate when the machine is first powered on. Operate the machine a few minutes before reading the charge level of the batteries.



08233

HOURLMETER

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



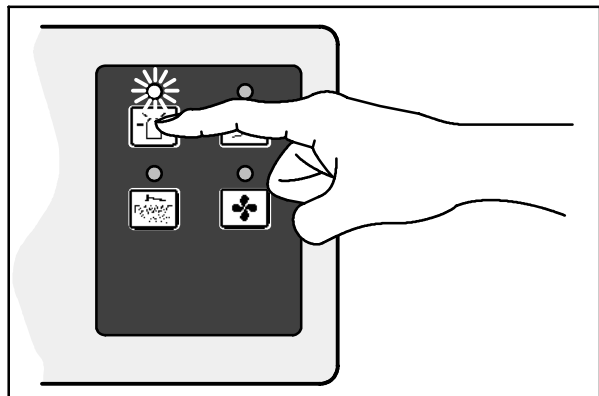
07765

HAZARD LIGHT SWITCH (OPTION)

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

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

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



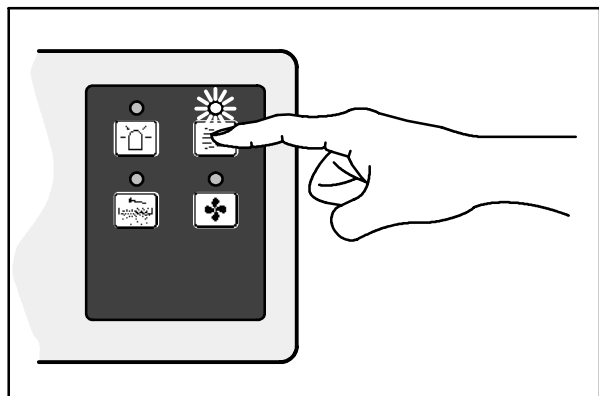
08228

OPERATING LIGHTS SWITCH

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

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

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



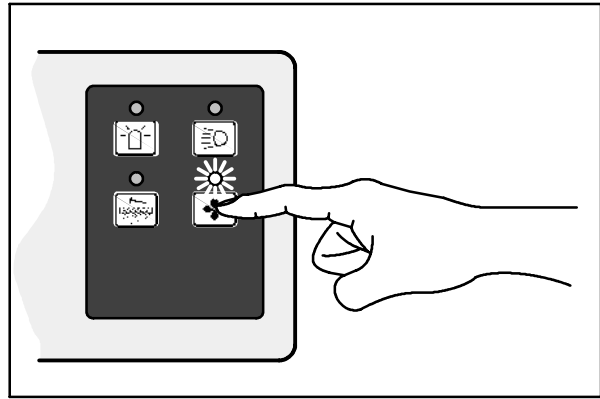
08230

VACUUM FAN SWITCH

The vacuum fan switch starts and stops the vacuum fan.

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

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



08231

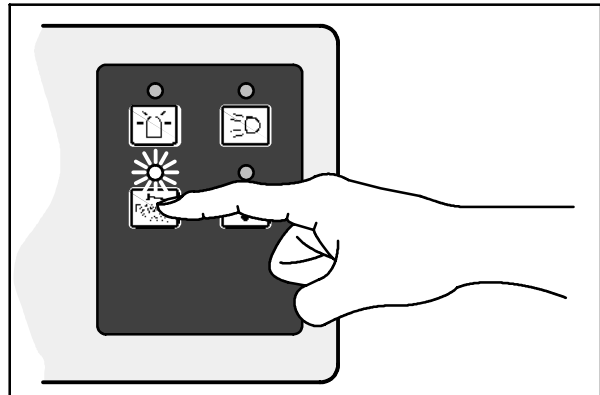
FILTER SHAKER SWITCH

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

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

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

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



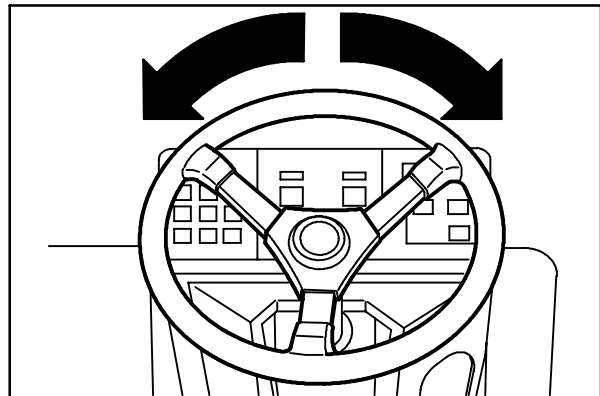
08229

STEERING WHEEL

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

Left: Turn the steering wheel to the left.

Right: Turn the steering wheel to the right.



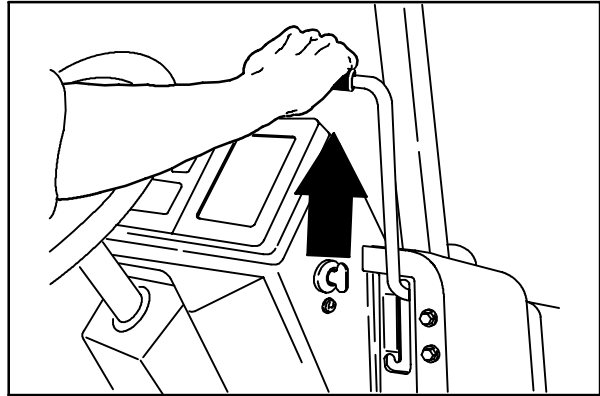
07801

OPERATION

SIDE BRUSH POSITION LEVER

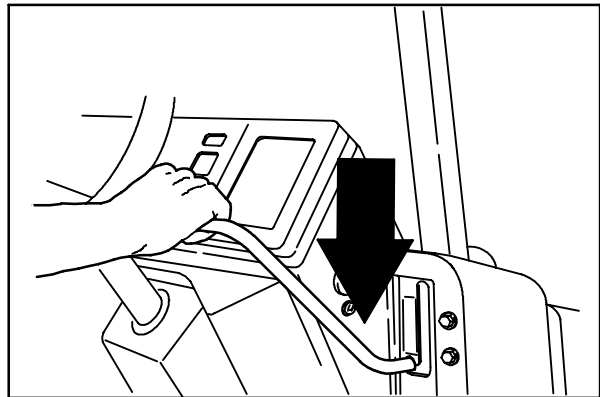
The side brush position lever lowers and raises the side brush.

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



07785

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



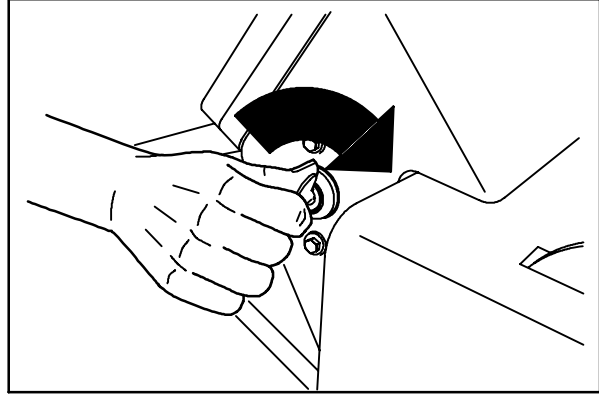
07786

ON-OFF SWITCH

The on-off switch controls the machine power with a key.

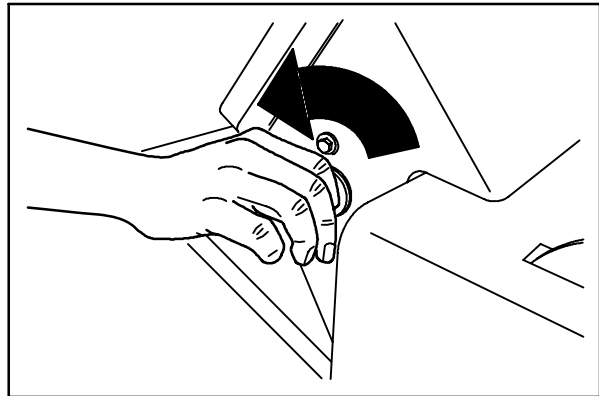
**For Safety: When Starting Machine,
Keep Foot On Brake And Directional
Pedal In Neutral.**

Start: Turn the key all the way clockwise, then release the switch key.



07804

Stop: Turn the key counter-clockwise.



07805

OPERATION

SIDE BRUSH DOWN PRESSURE KNOB

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

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



07799

Light: Turn the side brush down pressure knob clockwise.

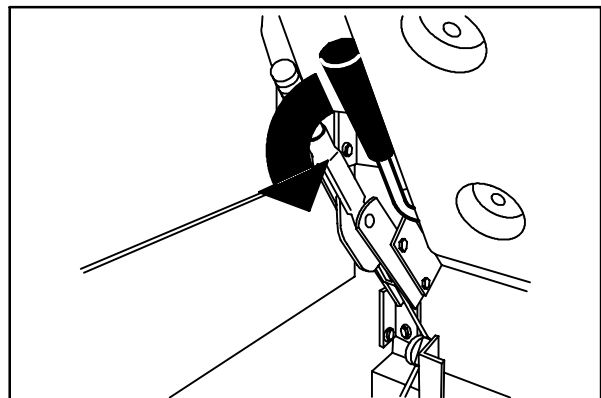


07800

STEERING COLUMN TILT LEVER

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

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



08222

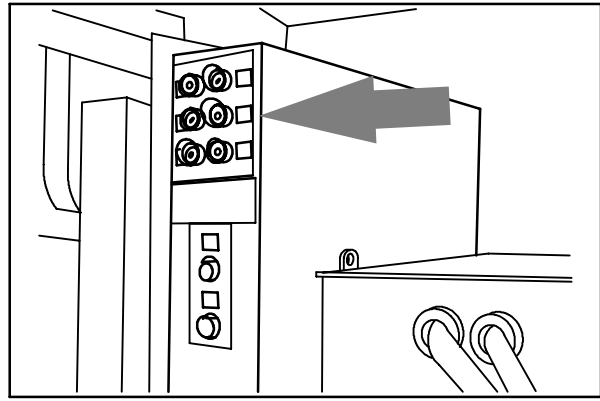
CIRCUIT BREAKERS

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

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

The circuit breakers are located next to the batteries.

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



08238

Circuit Breaker	Rating	Circuit Protected
CB-1	5 A	Instrument panel, power supply, speed control
CB-2	10 A	Filter shaker
CB-3	10 A	Operating lights
CB-4	10 A	Hazard light, back-up alarm
CB-5	10 A	Horn
CB-6	10 A	Open slot
CB-7	40 A	Vacuum fan motor
CB-8	80 A	Hydraulic pump motor

LATCHES

The side doors, rear doors, battery cover, and hopper cover are secured with latches.

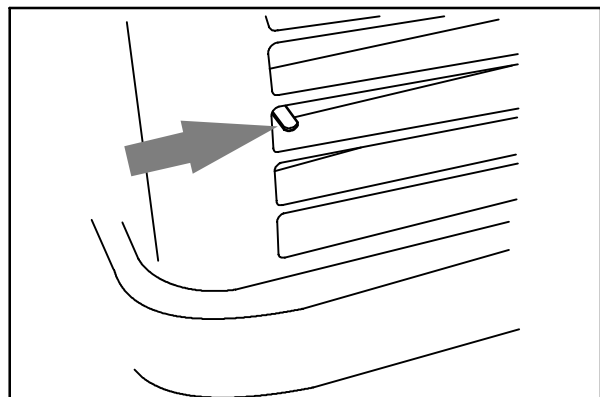
Open the Main Brush Side Doors: Push down on the door latch.

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

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

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

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



08149

OPERATION

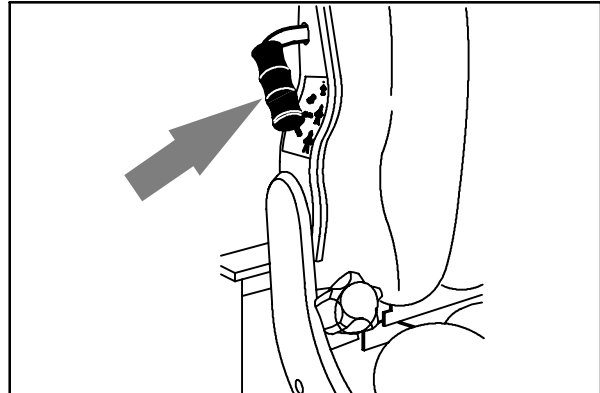
OPERATOR SEAT

The operator seat has three adjustments. The adjustments are for the operator's weight, backrest angle, and the front-to-rear seat position.

NOTE: The operator seat contains a safety switch. The operator has to be in the operator seat to start the machine. If the switch is deactivated while the machine is propelling, power is interrupted. The directional pedal has to be cycled through neutral before turning on machine power.

The operator's weight adjustment is controlled with the weight adjustment lever. The lever has three positions; light-weight, middle-weight, and heavy-weight.

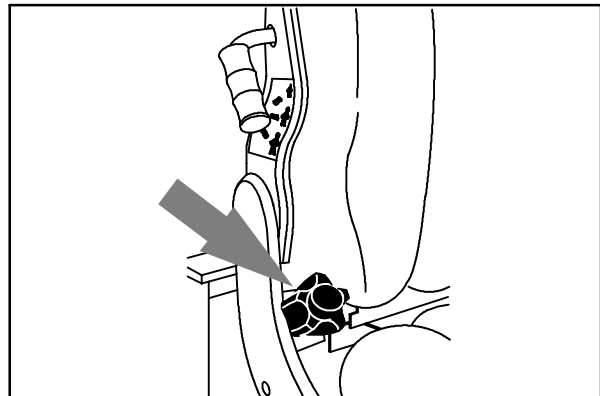
Adjust: Pull the lever up for the light-weight position, move the lever to the middle position for middle-weight, and push the lever down for the heavy-weight position.



07795

The backrest angle is adjusted using the angle knob.

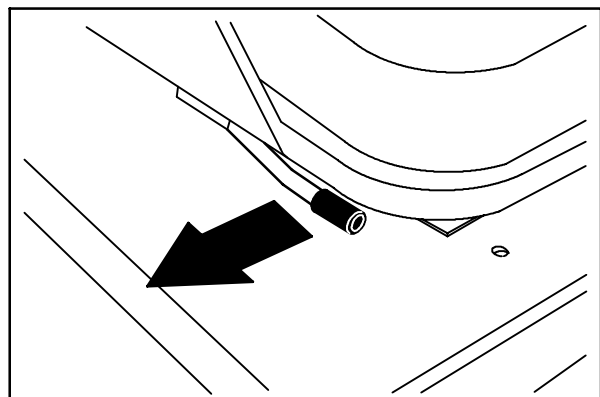
Adjust: Turn the angle knob clockwise to decrease the angle of the backrest. Turn the knob counter-clockwise to increase the angle of the backrest.



07796

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

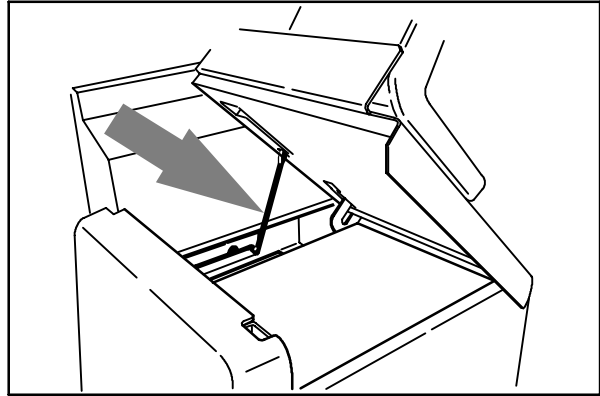
Adjust: Pull the lever out, slide the seat backward or forward to the desired position and release the lever.



07797

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

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



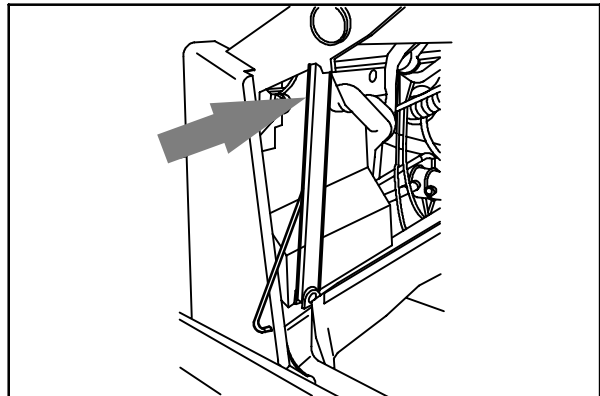
08232

HOPPER SUPPORT BAR

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



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



07803

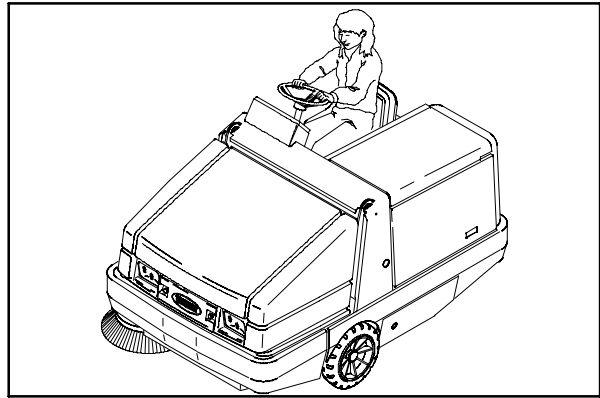
OPERATION

HOW THE MACHINE WORKS

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

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

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



07816

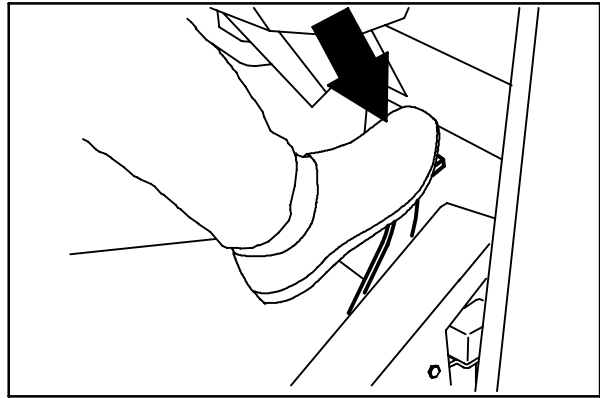
PRE-OPERATION CHECKLIST

- Check the hydraulic fluid level. (if applicable)
- Check the battery fluid and charge level.
- Check the skirts and seals for damage and wear.
- Check the condition of the sweeping brushes. Remove any string, banding, plastic wrap, or other debris wrapped around them.
- Check the sweeping brush patterns for adjustment.
- Check the condition of the hopper dust filter and seals. Clean as required.
- Check the brakes and steering for proper operation.
- Empty the debris hopper.
- Check the service records to determine maintenance requirements.

STARTING THE MACHINE

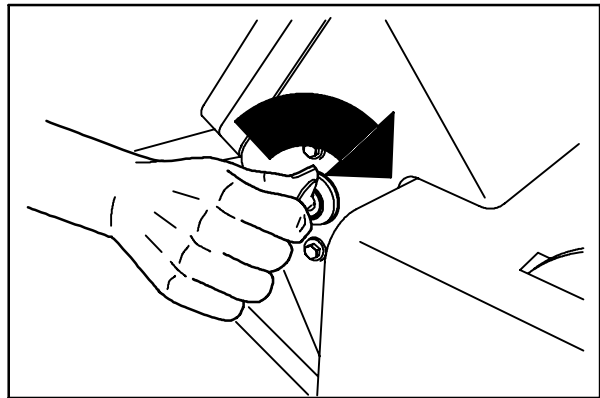
1. You must be in the operator's seat with the directional pedal in neutral, and your foot on the brake pedal or with the parking brake set.

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



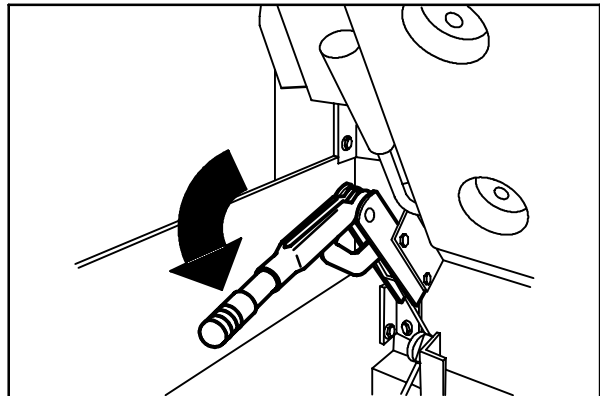
08234

2. Turn the on-off switch key fully clockwise to start the machine power, then release the switch key.



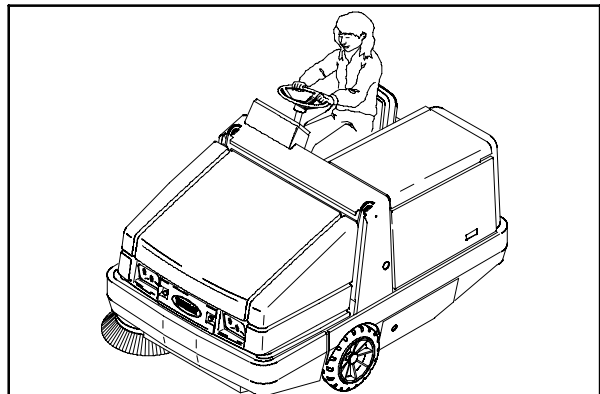
07804

3. Release the machine parking brake.



08223

4. Drive the machine to the area being swept.



07816

SWEEPING AND BRUSH INFORMATION

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

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

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

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

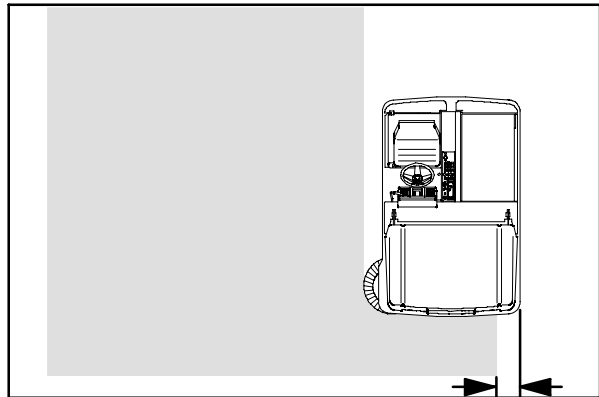
Check the main brush pattern daily. The pattern should be 50 to 75 mm (2.0 to 3.0 in) wide with the main brush in the **Down** position. Adjust the main brush pattern by turning the main brush pressure knob located next to the brush position lever.

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

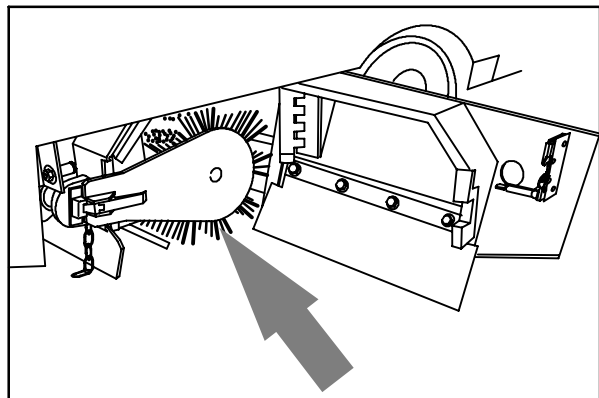
Nylon 8-double Row Main Brush -

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

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



07817



08002

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

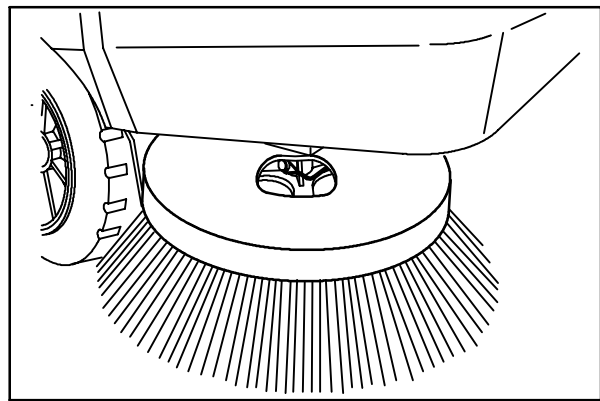
Nylon 24-row Main Brush – Recommended for severe dust conditions on rough surfaces. This brush has excellent pickup and long life.

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

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

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

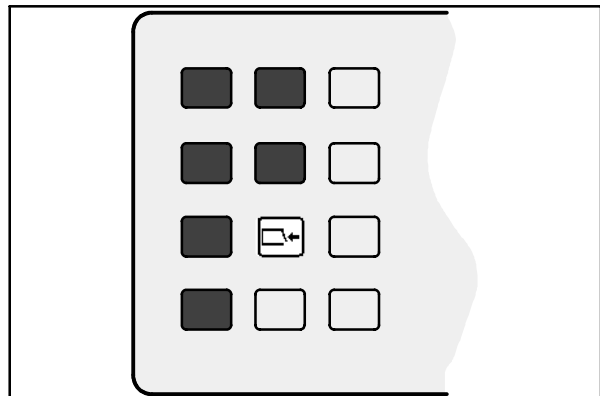
Flat Wire Side Brush – Recommended for outside and curbside sweeping where soilage is heavy or compacted. The stiff wire bristles dig out soilage. This brush is also recommended for foundry sweeping where heat may melt synthetic bristles.



08046

SWEEPING

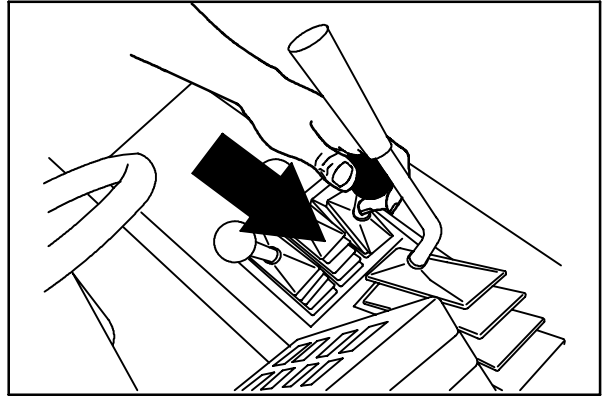
1. Make sure the hopper door light is off. If the hopper door light is on, open the hopper door.



07763

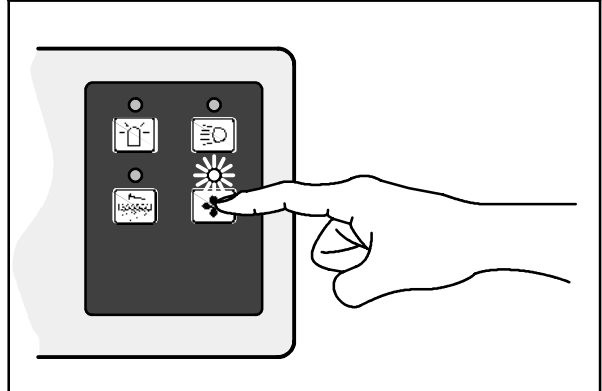
OPERATION

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



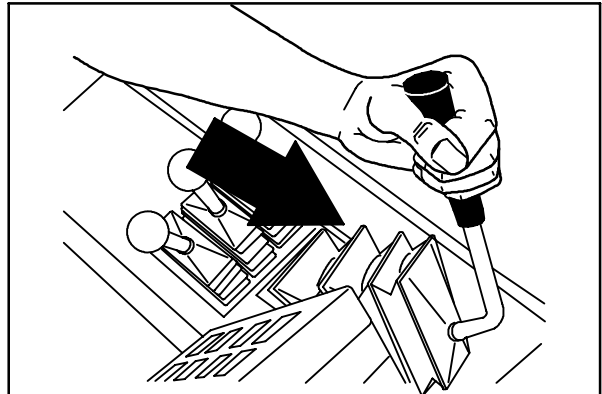
07773

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



08231

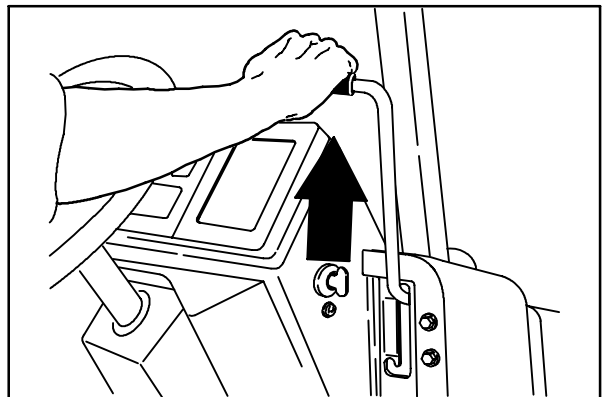
4. Pull the main brush position lever back and to the left into the **Down** position.



07782

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

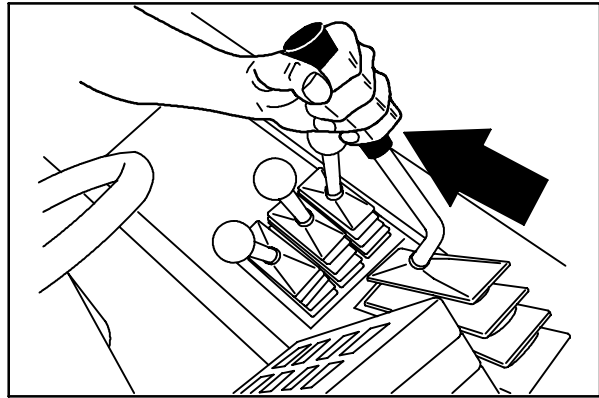
6. Sweep as needed.



07785

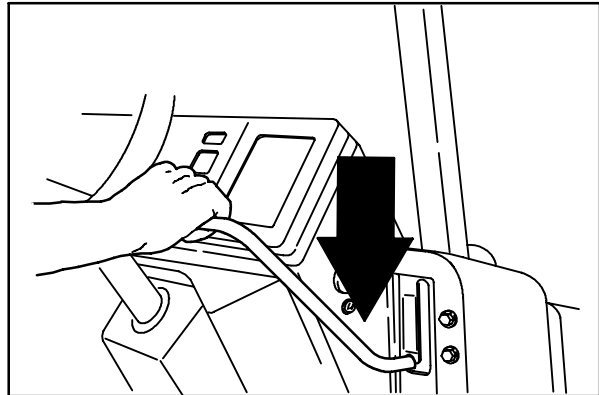
STOP SWEEPING

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



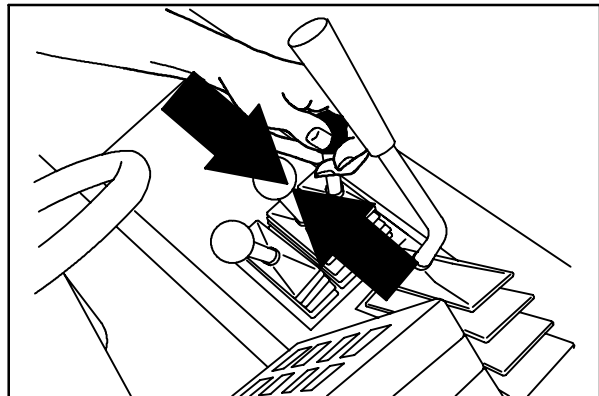
07784

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



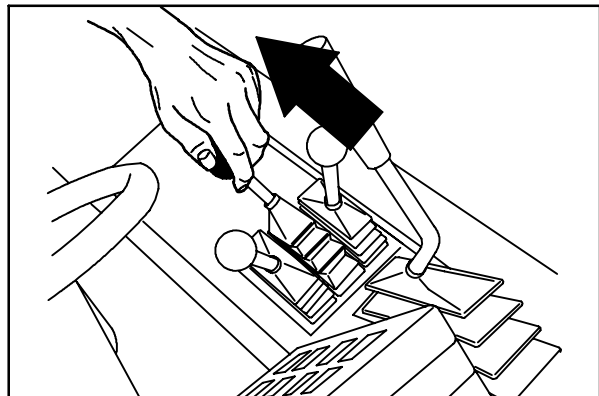
07786

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



07774

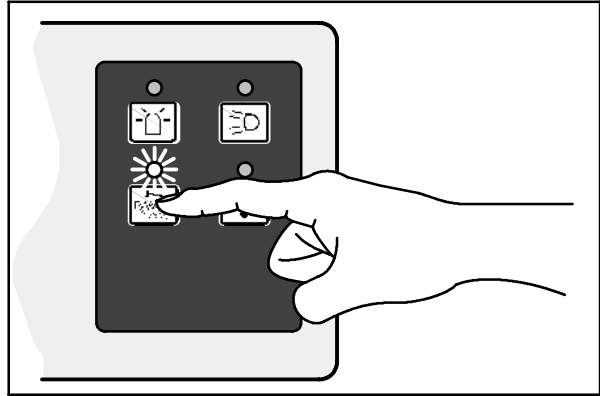
4. Pull the hopper door lever into the **Close** position until the hopper door light comes on.



07778

OPERATION

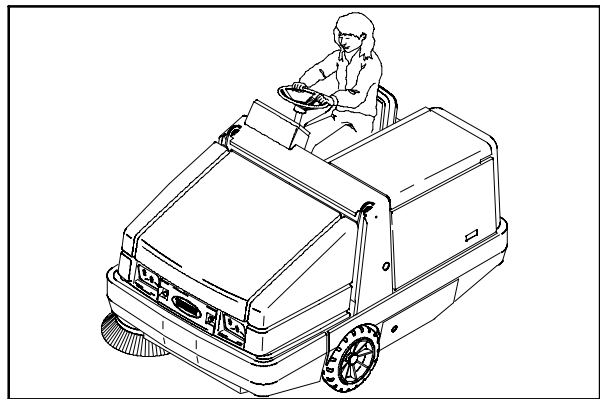
5. Press the filter shaker switch to shake the hopper dust filter.



08229

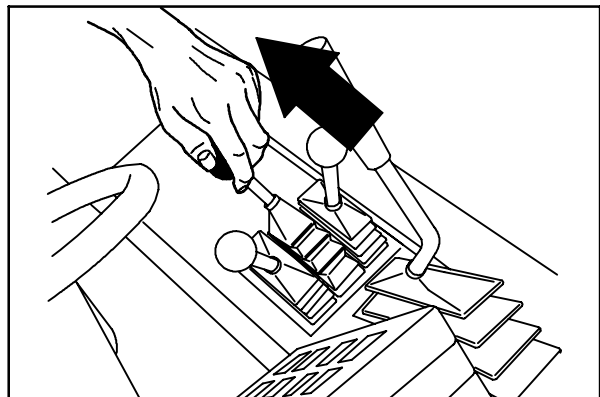
EMPTYING THE HOPPER

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



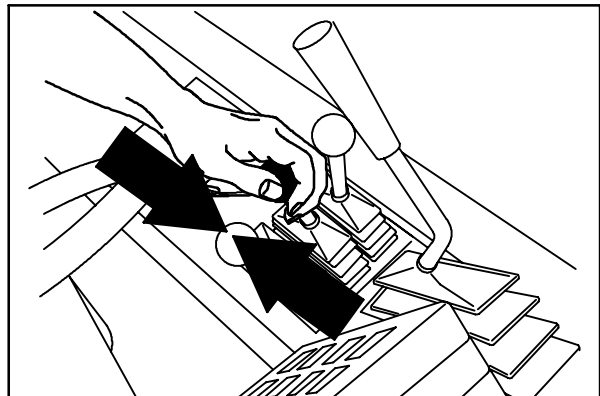
07816

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



07778

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

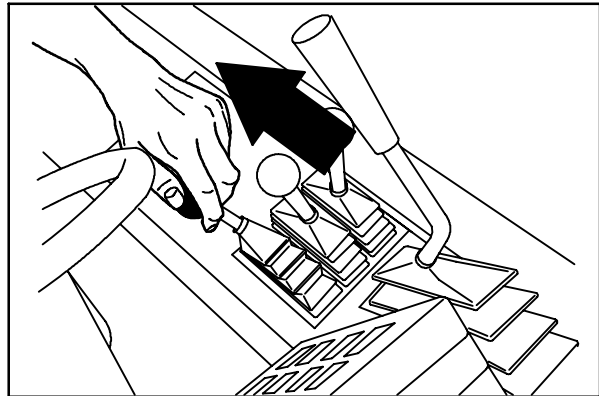


07777

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

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

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

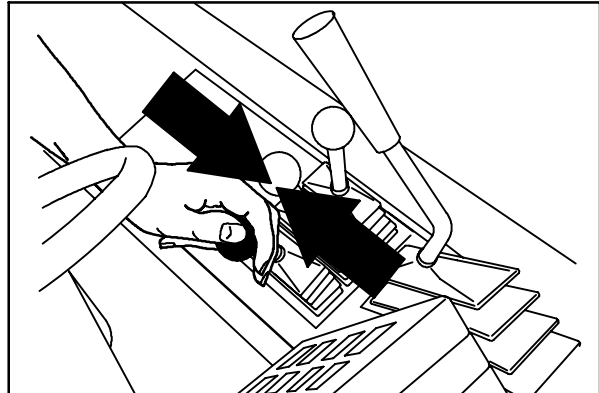


07779

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

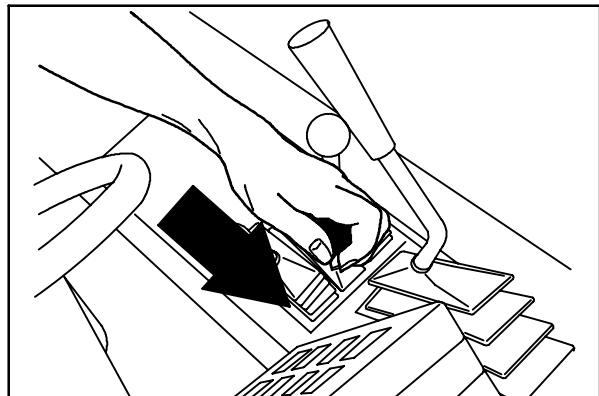
FOR SAFETY: When using machine, move machine with care when hopper is raised.

- Drive the machine up to the debris container.
- Lower the hopper into the debris container to control dust.



07780

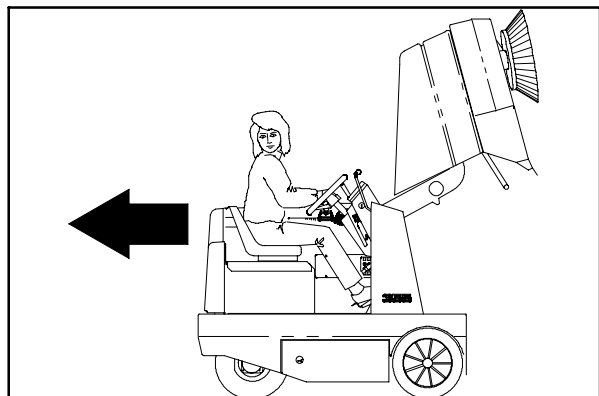
- Push the hopper door lever into the **Open** position and leave it there.
- Raise the hopper enough and/or close the hopper door to clear the top of the debris container.



07776

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

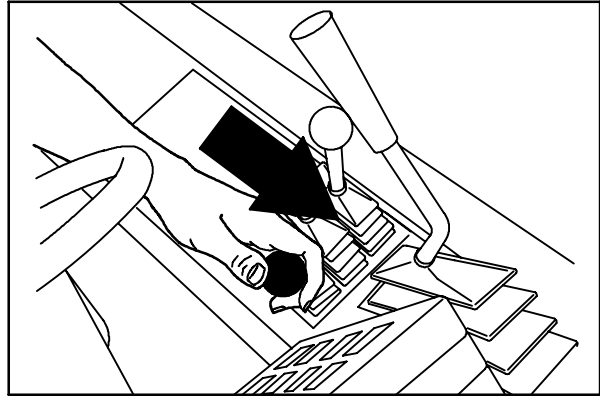
FOR SAFETY: When using machine, use care when reversing machine.



07999

OPERATION

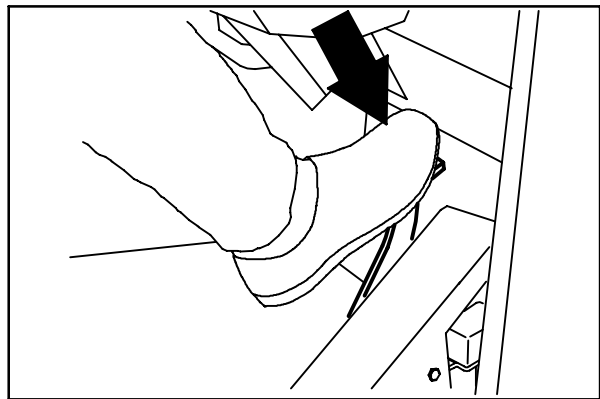
11. Push the hopper lift lever into the **Down** position.



07781

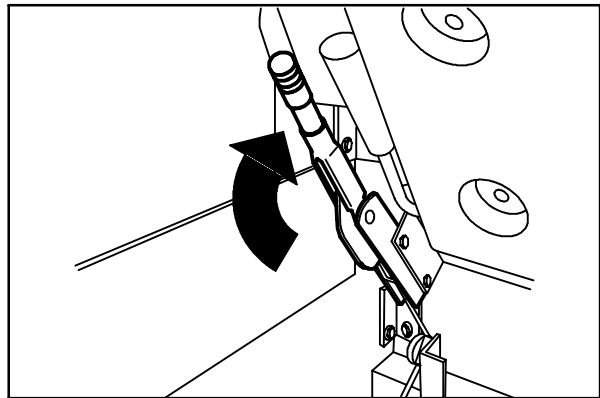
STOP THE MACHINE

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



08234

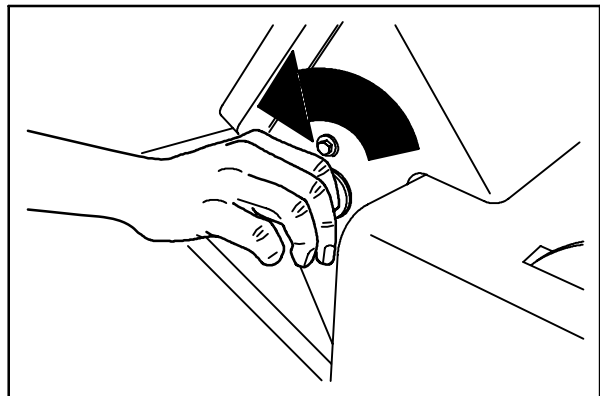
3. Set the machine parking brake.



08224

4. Turn the on-off switch key counter-clockwise to stop the machine power. Remove the switch key.

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



07805

POST-OPERATION CHECKLIST

Check this list of items after you have finished sweeping with the machine with the machine powered on:

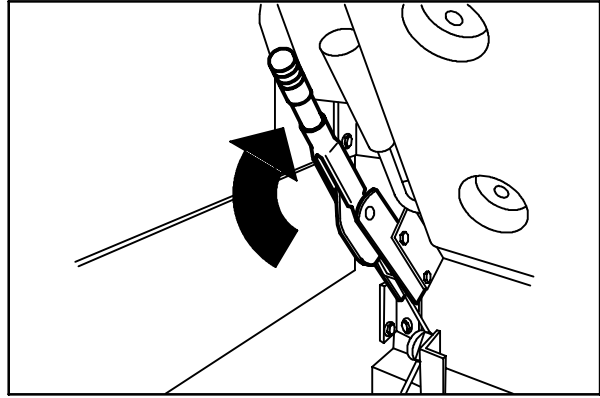
- Check the battery fluid and charge level.

NOTE: The reading on the battery discharge indicator is not accurate when the machine is first powered on. Operate the machine a few minutes before reading the charge level of the batteries.

- Check the hydraulic fluid level. (if applicable)
- Check the skirts and seals for damage and wear.
- Check the condition of the sweeping brushes. Remove any string, banding, plastic wrap, or other debris wrapped around them.
- Check the sweeping brush patterns for adjustment.
- Check the condition of the hopper dust filter and seals. Clean as required.
- Check the brakes and steering for proper operation.
- Empty the debris hopper.
- Check the service records to determine maintenance requirements.

ENGAGING HOPPER SUPPORT BAR

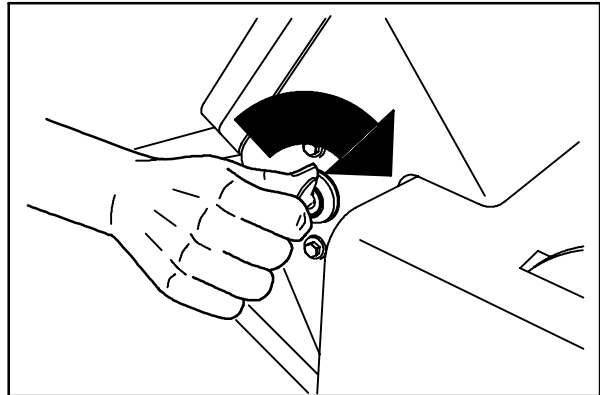
1. Set the machine parking brake.



08224

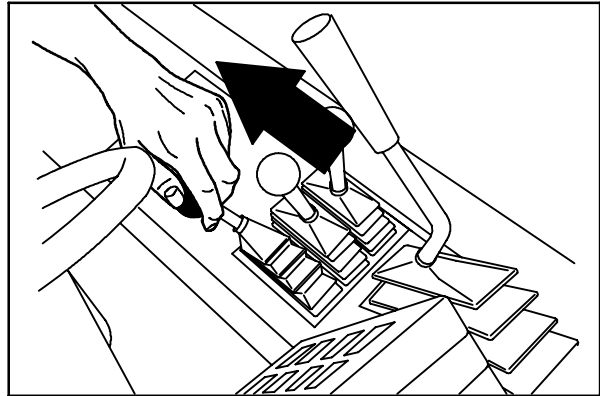
2. Turn the machine power on.

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



07804

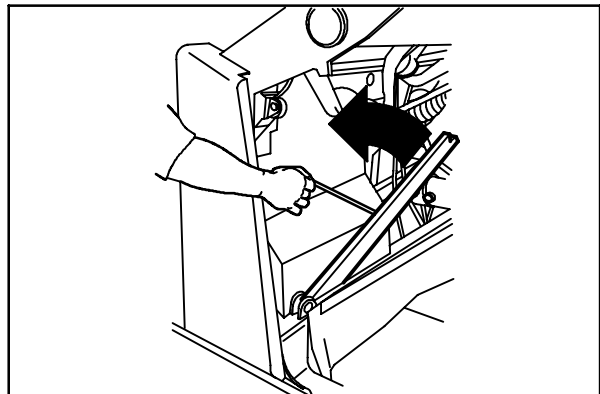
3. Raise the hopper all the way up.



07779

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

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

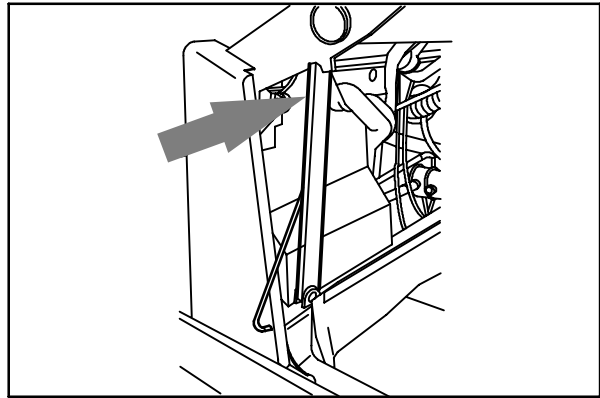


08003

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

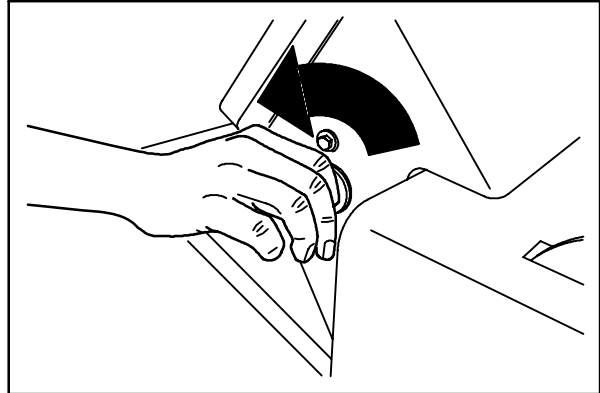


WARNING: Lift arm pinch point. Stay clear of hopper lift arms.



07803

6. Turn the machine power off.

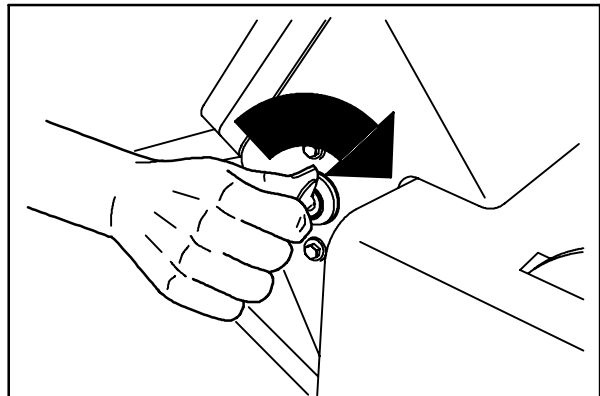


07805

DISENGAGING HOPPER SUPPORT BAR

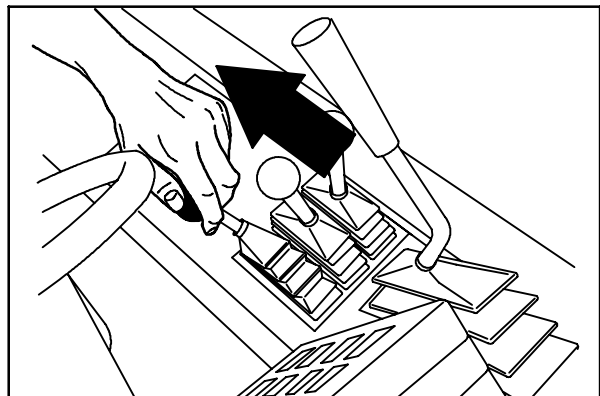
1. Turn the machine power on.

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



07804

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



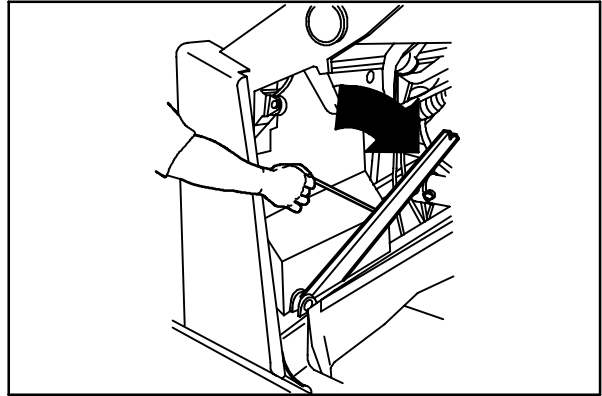
07779

OPERATION

- Put the support bar in its storage position.

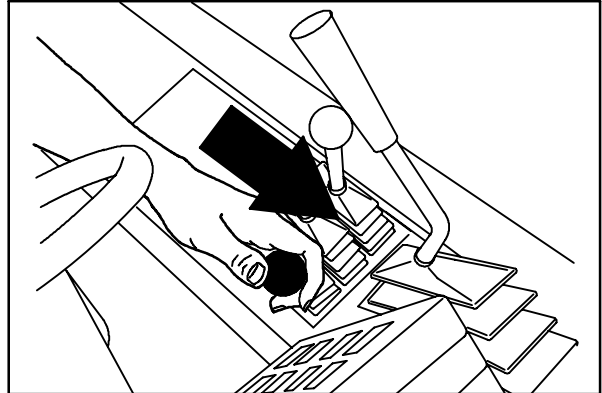


WARNING: Lift arm pinch point. Stay clear of hopper lift arms.



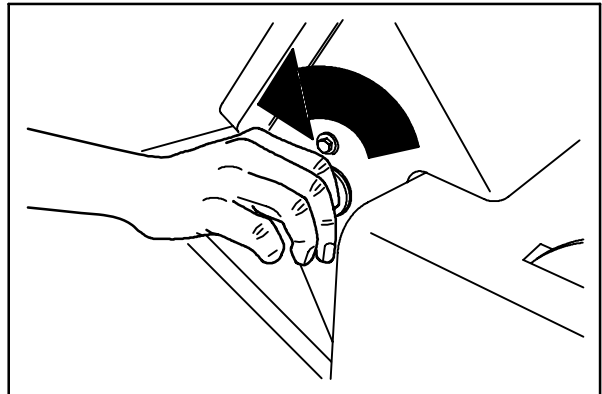
08004

- Lower the hopper.



07781

- Turn the machine power off.



07805

OPERATION ON INCLINES

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

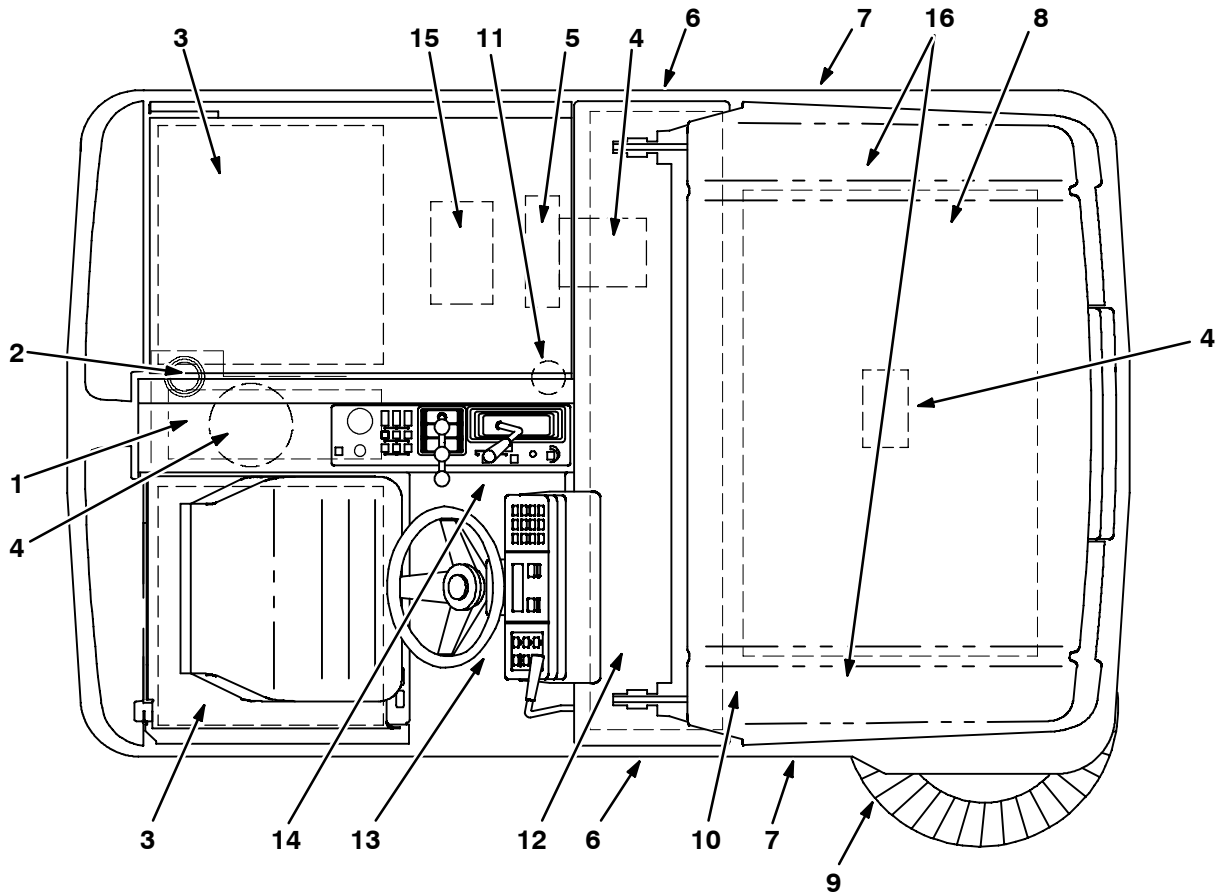
The maximum rated incline is 6°.

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

MACHINE TROUBLESHOOTING

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

MAINTENANCE



08246

MAINTENANCE CHART

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

Interval	Key	Description	Procedure	Lubricant/ Fluid	No. of Service Points
Daily	6	Brush compartment skirts	Check for damage, wear and adjust	-	5
	10	Hopper lip skirts	Check for damage, wear and adjust	-	3
	12	Main brush	Check for damage, wear, and adjust	-	1
			Check brush pattern	-	1
	9	Side brush	Check for damage, wear, and adjust	-	1
			Check brush pattern	-	1

Interval	Key	Description	Procedure	Lubricant/ Fluid	No. of Service Points
50 Hours	12	Main brush	Rotate end-for-end	-	1
		Batteries	Check electrolyte level	DW	2
100 Hours	8	Hopper dust filter	Check for damage, clean or replace	-	1
	2	Hydraulic fluid reservoir	Check fluid level	HYDO	1
	6	Main brush and hopper seals	Check for damage or wear	-	8
	1	Propelling gearbox	Check lubricant level	-	1
	1	Tires	Check for wear and damage	-	3
200 Hours	14	Parking brake	Check adjustment	-	1
	13	Brake pedal	Check and adjust travel	-	1
	1	Rear wheel support bearing	Lubricate	SPL	1
	16	Hopper bearings	Lubricate	SPL	2
	1	Steering link	Lubricate	SPL	1
	5	Vacuum fan drive belt	Check for wear	-	1
	9	Side brush guard	Rotate 90°	-	1
400 Hours	7	Front wheel bearings	Check, lubricate, and adjust	SPL	2
	15	Electric accessory motor	Check carbon brushes	-	4
800 Hours	2	Hydraulic fluid reservoir	Replace filler cap	-	1
			Replace suction strainer	-	1
			Change hydraulic fluid	HYDO	1
	11	Hydraulic fluid filter	Change filter element	-	1
	2	Hydraulic hoses	Check for wear and damage	-	21
	3	Batteries	*Clean and tighten battery cable connections	-	2
	1	Propelling gearbox	*Change gear lubricant	GL	1
			*Change fill-level plug seals	-	1
4	Electric propelling motors	Check carbon brushes	-	4	

LUBRICANT/FLUID

HYDO . Tennant Company or approved hydraulic fluid, SHP 5/20

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

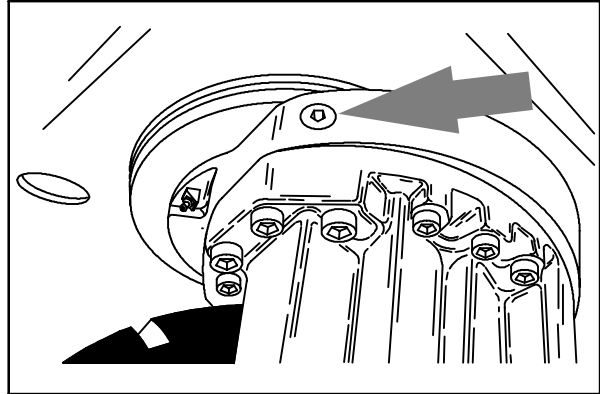
GL SAE 90 Gear weight lubricant

DW Distilled Water

LUBRICATION

PROPELLING GEARBOX

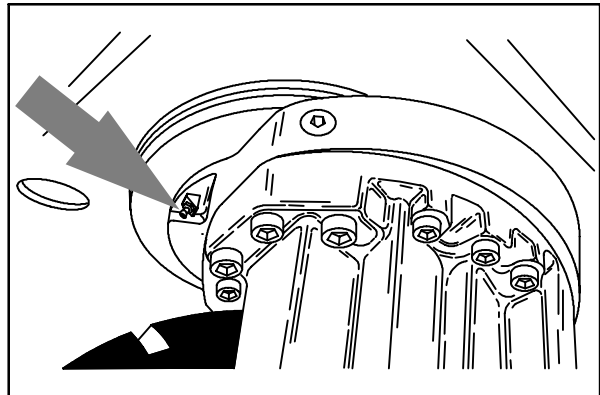
Check the lubricant level in the propelling gearbox every 100 hours of operation. Change the gear lubricant, and the drain and fill-level plug seals after the first 50 hours of operation, and then every 800 hours of operation. Use SAE 90 weight gear lubricant.



08244

REAR WHEEL SUPPORT BEARING

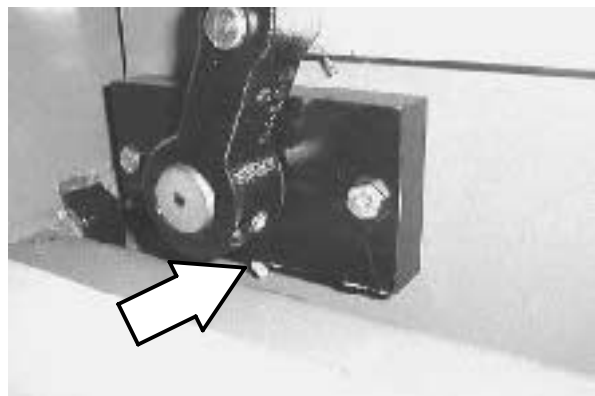
The rear wheel support has two grease fittings for the bearing. Raise the machine so the rear wheel support assembly is off the floor. Fill one of the grease fittings while rotating the gearbox from stop to stop. Fill the second grease fitting while rotating the gearbox back to the original position. The bearing cavity is full when grease comes out of the fittings or out of the top seal. Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 200 hours of operation or after steam cleaning the gearbox area.



08245

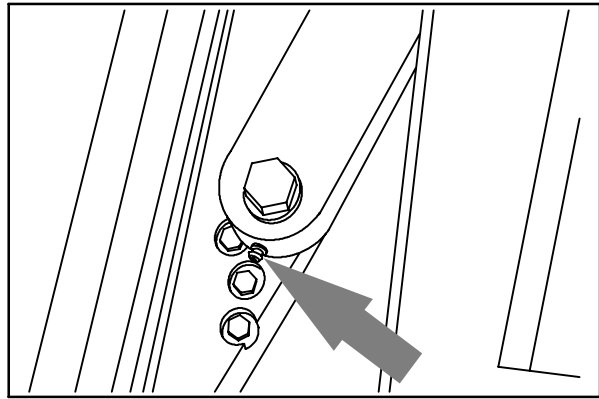
HOPPER BEARINGS

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



STEERING LINK

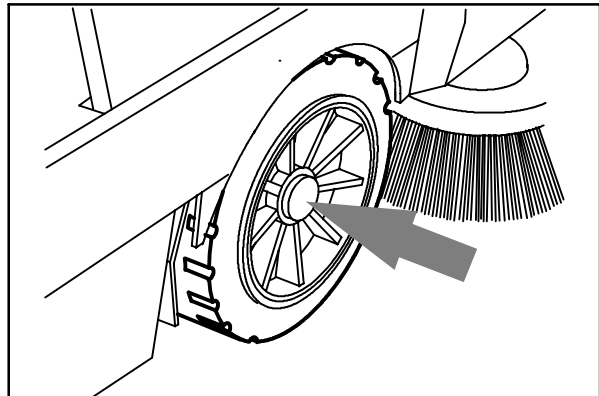
The steering link has a grease fitting located on the end of the link. Lubricate with Lubriplate EMB grease (TENNANT part no. 01433-1) every 200 hours of operation.



08291

FRONT WHEEL BEARINGS

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



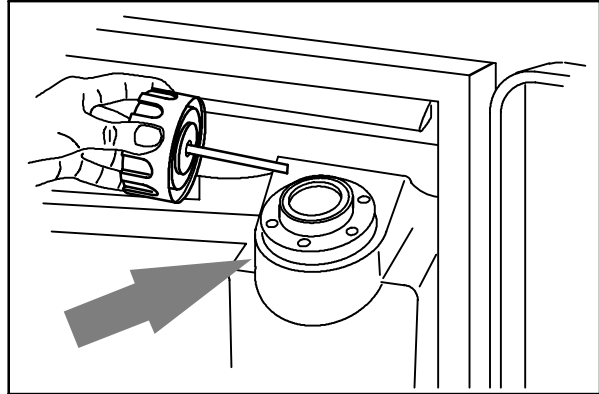
08006

HYDRAULICS

HYDRAULIC FLUID RESERVOIR

The reservoir is located in battery compartment above the battery.

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

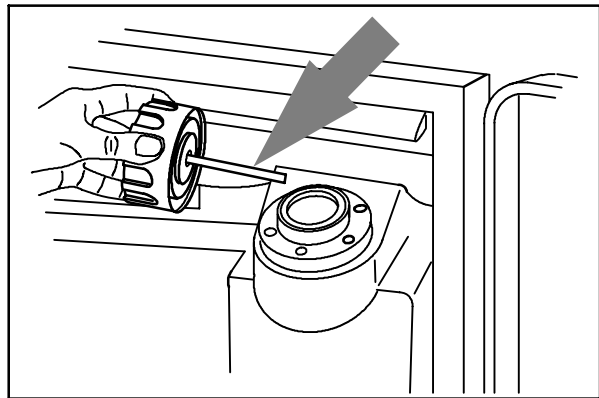


08241

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

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

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

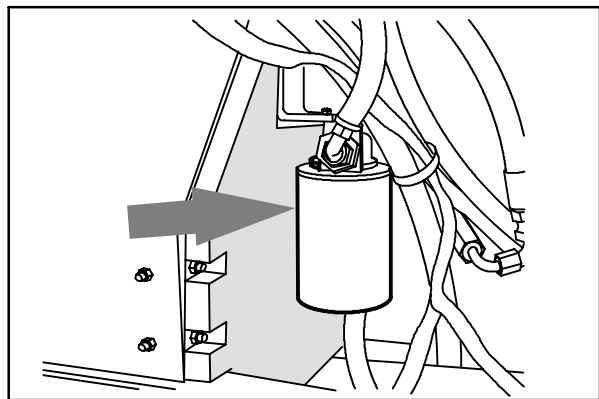


08218

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

The hydraulic fluid filter is located behind the vacuum fan and hopper lift cylinder. Replace the filter element every 800 hours of operation.

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



08217

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 is one recommended fluid.

TENNANT part no.	Fluid Weight
65870	SHP 5/20

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

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

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

HYDRAULIC HOSES

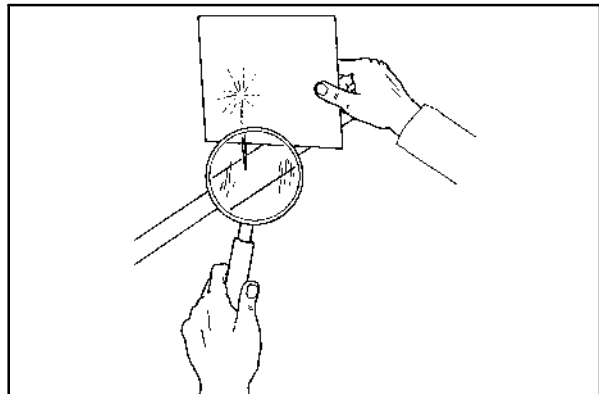
Check the hydraulic hoses every 800 hours of operation for wear or damage.

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

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

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

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



00002

BATTERIES

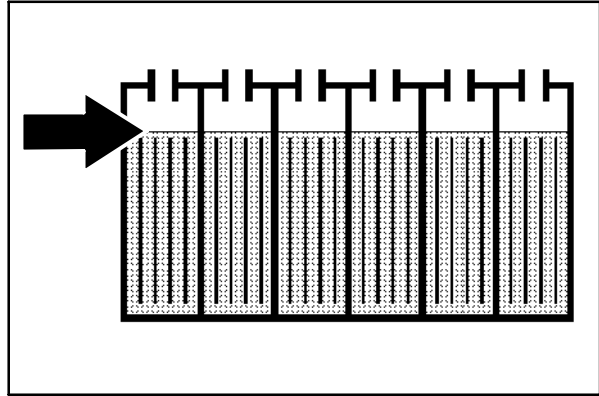
The batteries are unique in that they hold their power for long periods of time. The lifetime of the batteries is limited by the number of charges the batteries receive. To get the most life from the batteries, charge them when the battery discharge indicator flashes.

Periodically clean the top surface of the batteries and the terminals, and check for loose connections. Use a strong solution of baking soda and water. Brush the solution sparingly over the battery tops, terminals, and cable clamps.

Use a wire brush to clean the terminal posts and the cable connectors. After cleaning, apply a coating of clear battery post protectant to the terminals and the cable connectors.

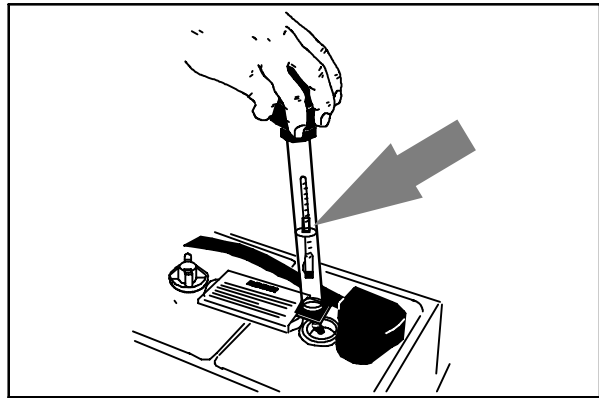
Keep the tops of the batteries clean and dry. Keep all metallic objects off the top of the batteries, which may cause a short circuit. Replace any worn or damaged wires.

Check the electrolyte level in each battery cell before and after charging, and after every 50 hours of operation. Do not charge the batteries unless the fluid is slightly above the battery plates. If needed, add just enough distilled water to cover the plates. Never add acid to the batteries. Do not overfill. Always keep the battery caps on, except when adding water or taking hydrometer readings.



Measuring the specific gravity using a hydrometer is a way to determine the charge level and condition of the batteries. If one or more of the battery cells reads lower than the other battery cells (0.050 or more), the cell is damaged, shorted, or is about to fail.

NOTE: Do not take readings immediately after adding distilled water. If the water and acid are not thoroughly mixed, the readings may not be accurate. Check the hydrometer readings against the following chart to determine the remaining battery charge level:



08248

Specific Gravity at 27° C (80° F)	Battery Condition
1.315	100% charged
1.264	75% charged
1.213	50% charged
1.162	25% charged
1.110	Discharged

NOTE: If the readings are taken when the battery electrolyte is any temperature other than 27° C (80° F), the reading must be temperature corrected. Add or subtract to the specific gravity reading 0.004, 4 points, for each 6° C (10° F) above or below 27° C (80° F).

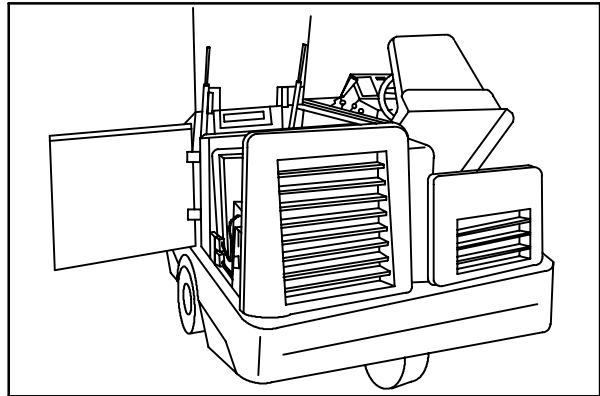
MAINTENANCE

CHARGING THE BATTERIES

1. Drive the machine to a flat, dry surface in a well ventilated area.
2. Turn the machine power off and set the machine parking brake.

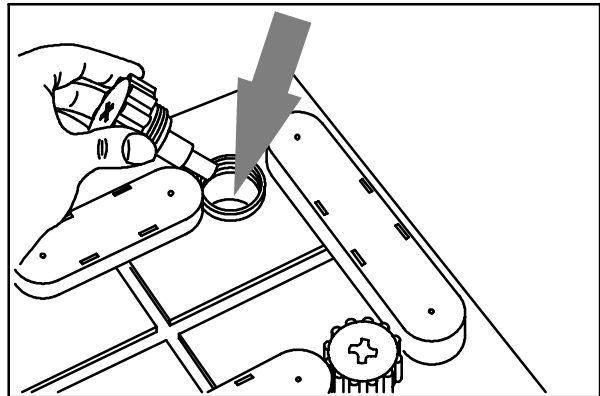
FOR SAFETY: Before leaving or servicing machine; stop on level surface, set parking brake, turn off machine and remove key.

3. Open the side door, battery cover, and lift the seat to get access to the batteries.



08236

4. Check the electrolyte level in all the battery cells.

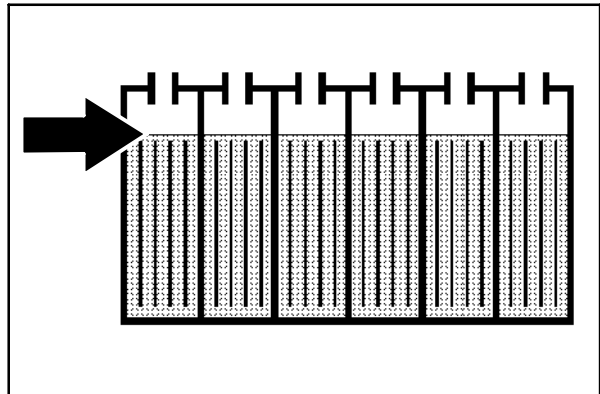


08247

5. If the level is low, add just enough distilled water to cover the battery plates. **DO NOT OVERFILL.** The batteries can overflow during charging due to expansion.

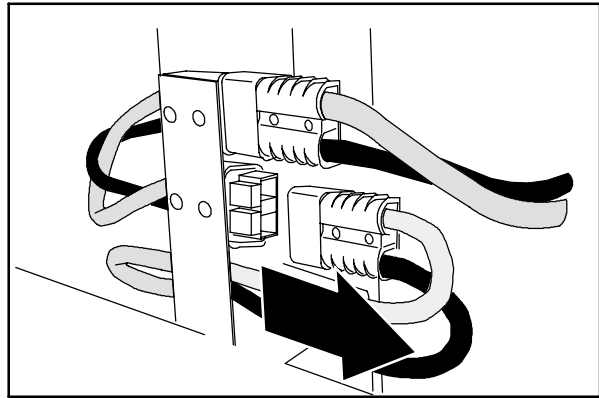
NOTE: Make sure the battery caps are in place while charging.

FOR SAFETY: When maintaining or servicing machine, avoid contact with battery acid.



- Unplug the machine connector from the bottom connector.

NOTE: Leave the top connector in place.



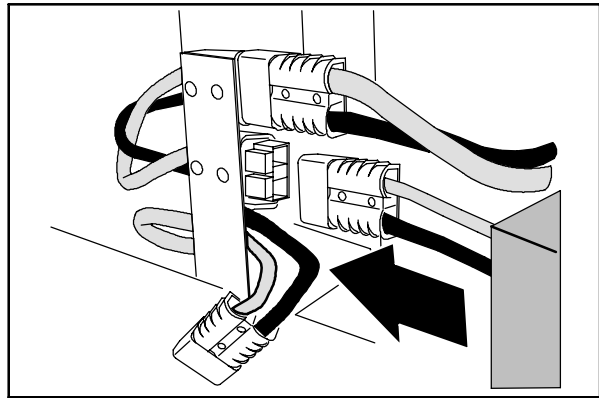
08242

- Plug the charger connector into the bottom connector.



WARNING: Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and open flame away. Keep covers open when charging.

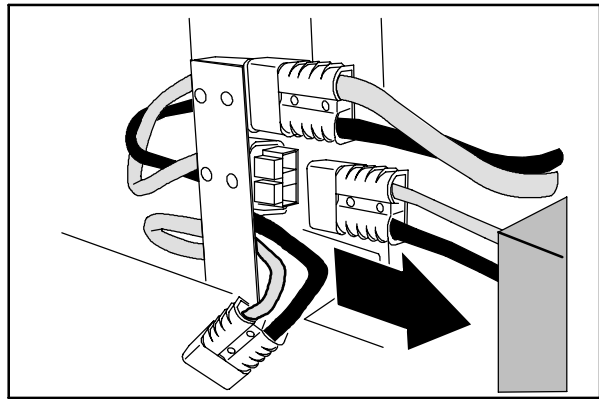
- The TENNANT charger will start automatically. When the batteries are fully charged, the TENNANT charger will automatically turn off.



08239

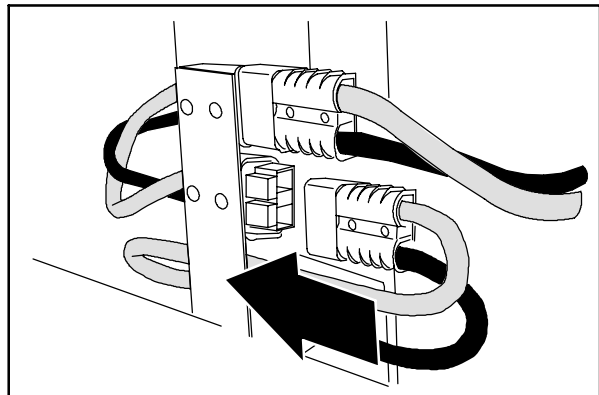
- Unplug the charger connector from the bottom connector on the machine.

- Check the electrolyte level in each battery cell after charging. If needed, add enough distilled water to raise the electrolyte level to about 12 mm (0.4 in) below the bottom of the sight tubes.



08240

- Plug the machine connector into the bottom connector.
- Close the side door, battery cover, and lower the seat.

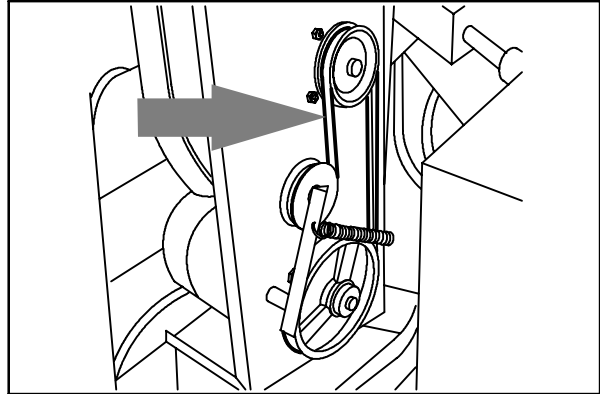


10957

BELTS AND CHAINS

VACUUM FAN DRIVE BELT

Check the vacuum fan belt every 200 hours for wear. The spring idler keeps tension on the belt.

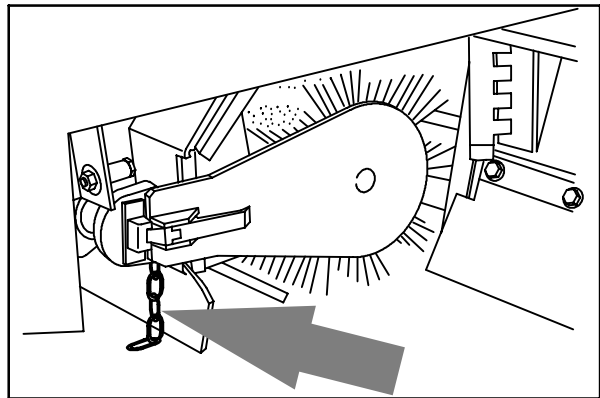


08290

STATIC DRAG CHAIN

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

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



08009

DEBRIS HOPPER

HOPPER DUST FILTER

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

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

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

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

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

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

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

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



MAINTENANCE

TO REPLACE HOPPER DUST FILTER

1. Turn the machine power off and set the machine parking brake.

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

2. Open the hopper cover.
3. Remove the four knobs, washers and the two retaining brackets from the filter cover.



4. Lift the dust filter cover and disconnect the filter shaker wire.



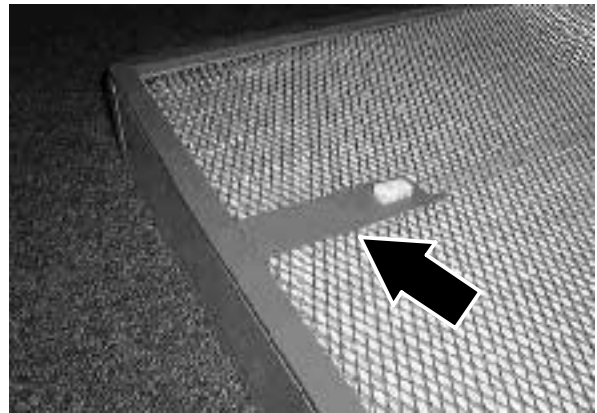
5. Lift the dust filter element assembly out from the hopper insert.



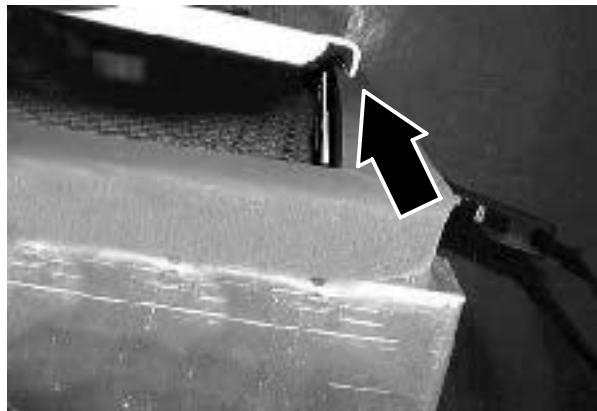
6. Remove the filter shaker plate from the dust filter element.
7. Clean or discard the dust filter element as required.



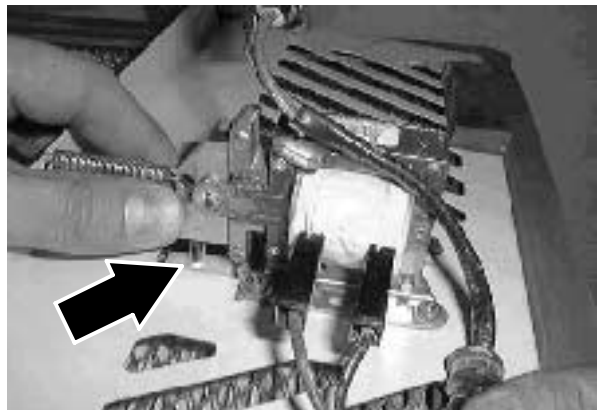
8. Remove the shipping tab from the dust filter element if a new element will be inserted into the machine.



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

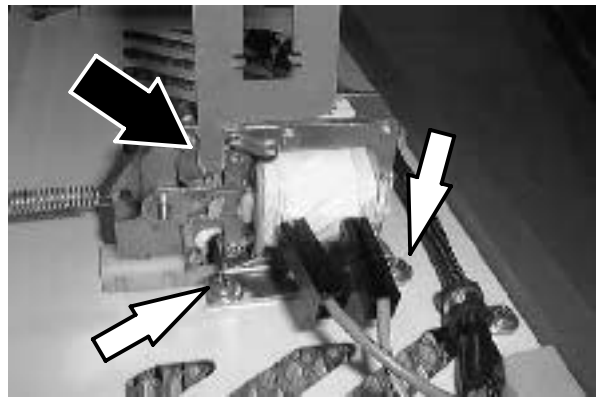


10. Insert the pin from the shaker into the hole on the dust filter element comb.



MAINTENANCE

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



12. Place the dust filter element assembly into the hopper insert and reconnect the filter shaker wire.
13. Center the dust filter cover over the element, then push the cover back until the rear vacuum fan seal is pressed against the hopper insert.
14. Fasten the dust filter cover onto the element with the retainer brackets, washers, and knobs.



15. Close the hopper cover.

THERMO SENTRY™

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

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



BRUSHES

MAIN BRUSH

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

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

Check the main brush pattern daily. The pattern should be 50 to 75 mm (2.0 to 3.0 in) wide with the main brush in the **Down** position. Adjust the main brush pattern by turning the main brush pressure knob located next to the brush position lever.

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

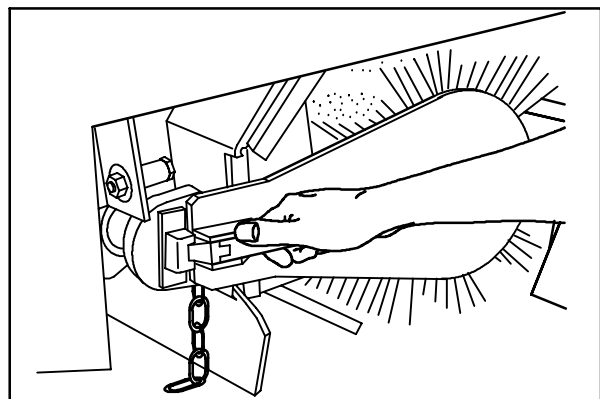
Replace the main brush when the remaining bristles measure 30 mm (1.25 in) in length.

TO REPLACE MAIN BRUSH

1. Turn the machine power off and set the machine parking brake.

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

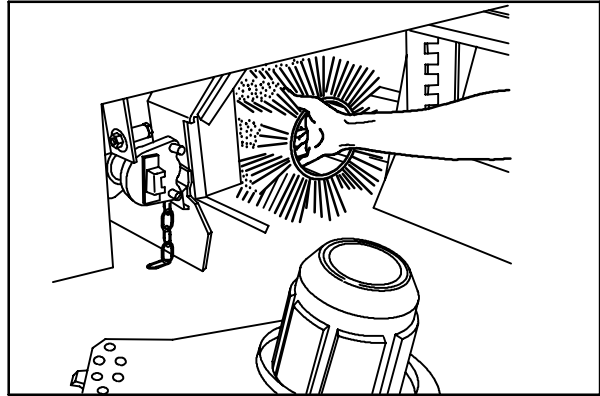
2. Raise the main brush.
3. Open the right side main brush access door.
4. Unlatch and remove the brush idler plate.



08016

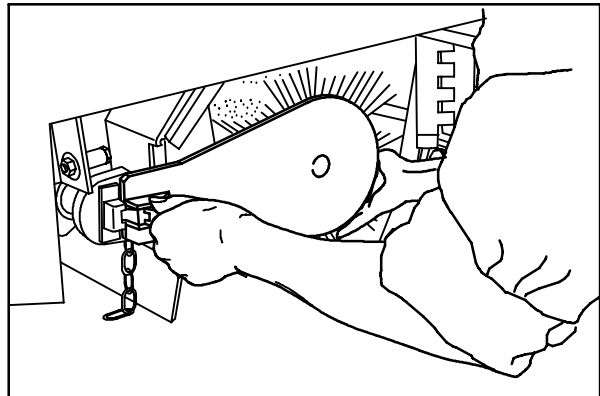
MAINTENANCE

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



08017

9. Latch the idler plate onto the machine frame.
10. Close the right side main brush access door.



08018

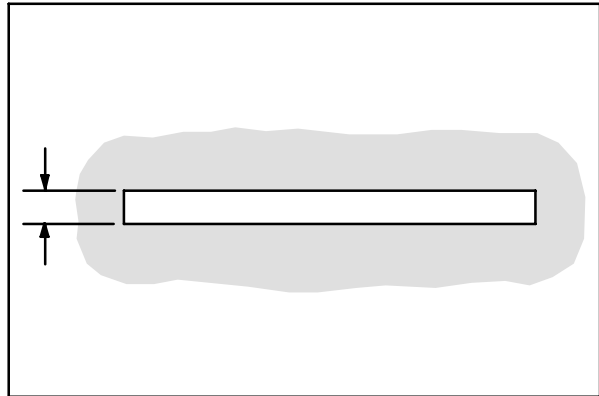
TO CHECK AND ADJUST MAIN BRUSH PATTERN

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

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

5. Raise the main brush.
6. Stop the main brush.
7. Drive the machine off the test area.

8. Observe the width of the brush pattern. The proper brush pattern width is 50 to 75 mm (2.0 to 3.0 in).



00582

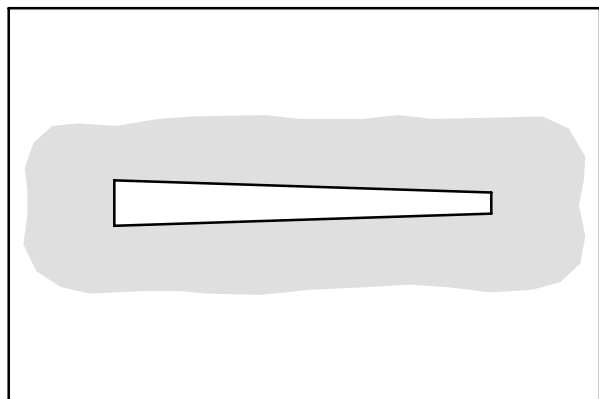
9. To increase the width of the main brush pattern, turn the main brush down pressure knob counter-clockwise.



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



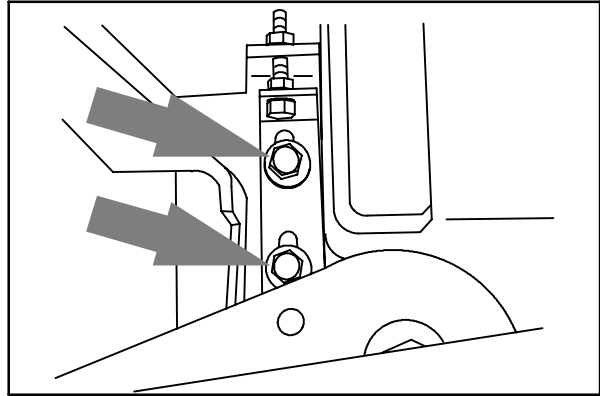
If the main brush pattern is tapered, more than 15 mm (0.5 in) on one end than the other, adjust the taper with the taper adjustment bracket at the drive end of the brush.



00601

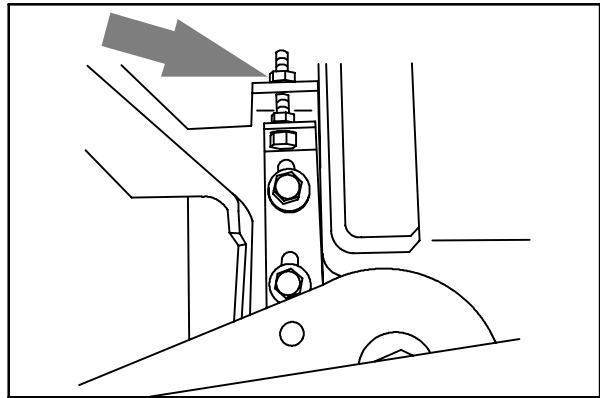
MAINTENANCE

- A. Loosen the bracket mounting bolts.



08216

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



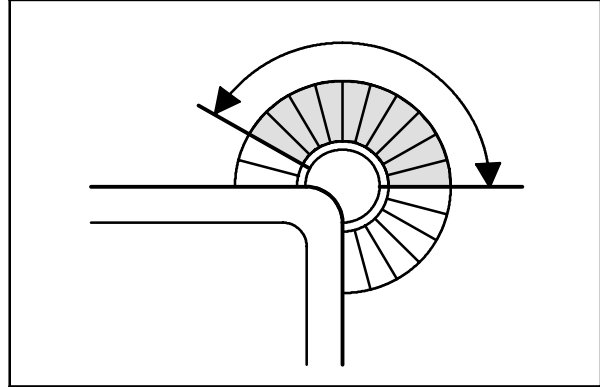
08215

SIDE BRUSH

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

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

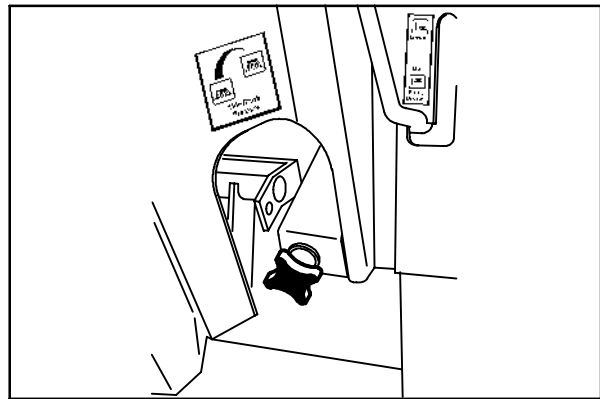
Check the side brush pattern daily. The side brush bristles should contact the floor in a 10 o'clock to 3 o'clock pattern when the brush is in motion.



350327

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

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



07799

MAINTENANCE

TO REPLACE SIDE BRUSH

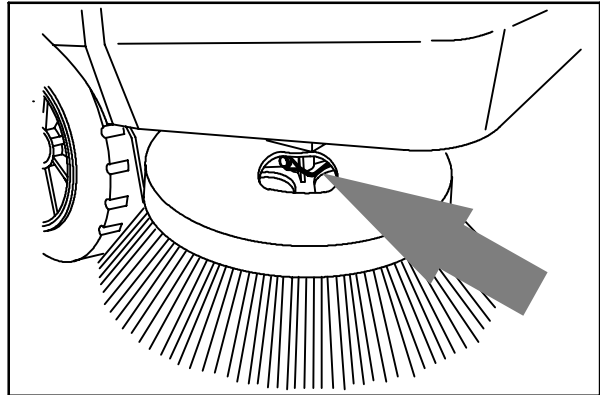
1. Empty the debris hopper.
2. Set the machine parking brake.
3. Turn the machine power off.

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

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

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

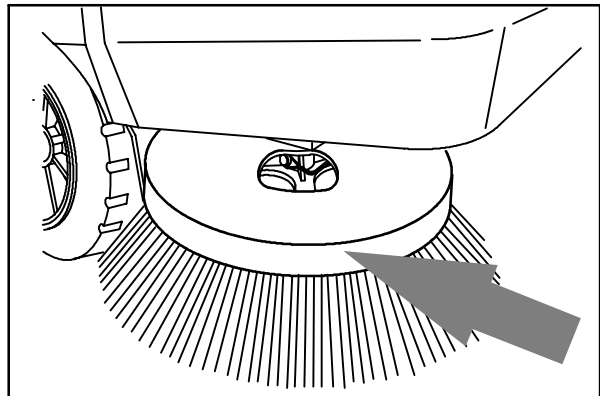
7. Slide the new side brush onto the side brush drive shaft.
8. Insert the side brush retaining pin through the side brush hub and shaft.
9. Secure the pin by clipping the pin keeper over the end of the pin.
10. Disengage the hopper support bar and lower the hopper.
11. Adjust the side brush pattern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



08019

SIDE BRUSH GUARD

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



08049

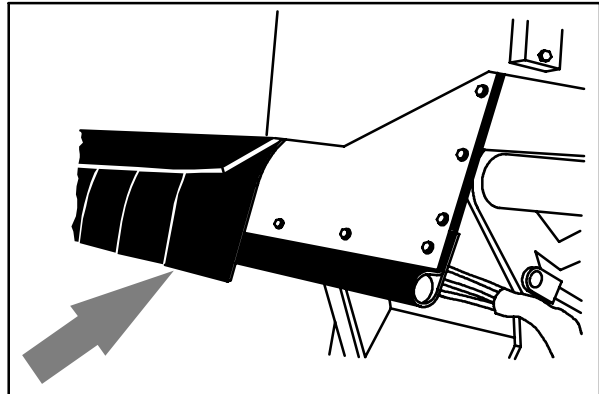
SKIRTS AND SEALS

HOPPER LIP SKIRTS

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

Check the hopper lip skirts for wear or damage daily.

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

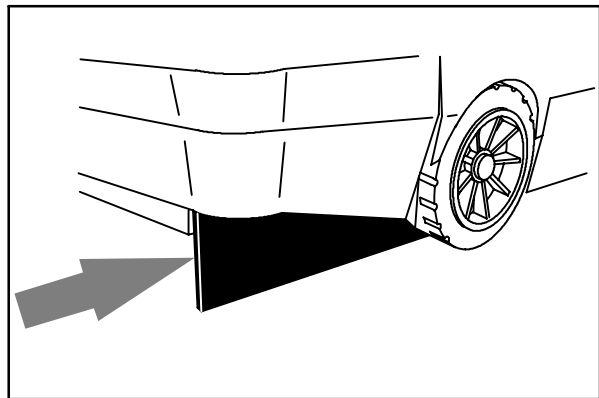


08020

HOPPER SIDE SKIRT

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

Check the hopper lip skirts for wear or damage daily.



08214

BRUSH DOOR SKIRTS

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

Check the skirts for wear or damage and adjustment daily.

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

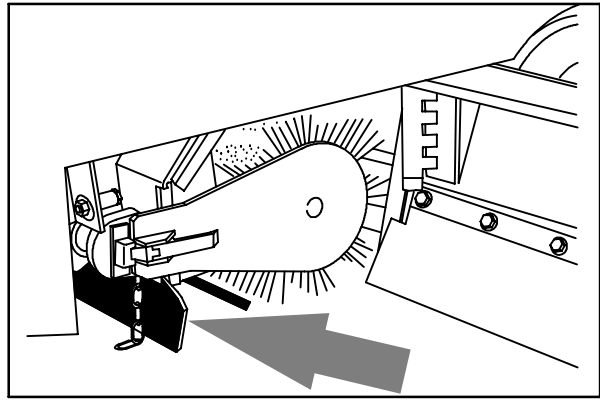


MAINTENANCE

REAR SKIRTS

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

Check the skirts for wear or damage and adjustment daily.

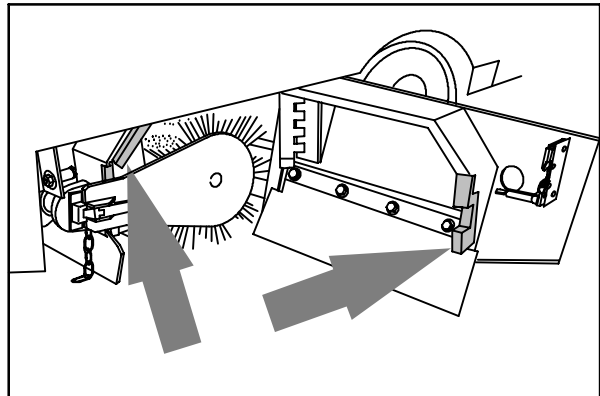


08021

BRUSH DOOR SEALS

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

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

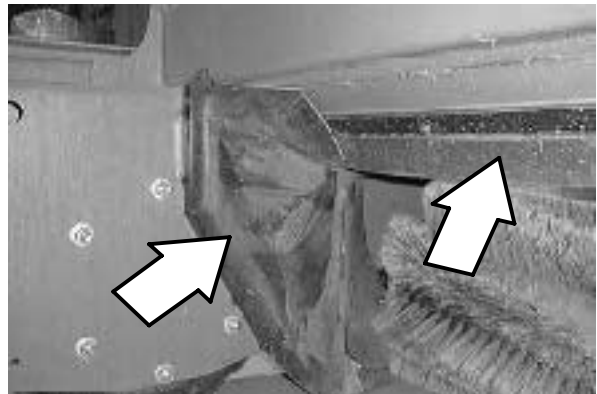


08022

HOPPER SEALS

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

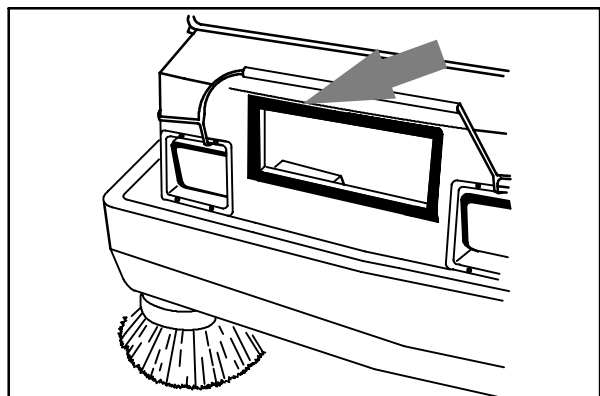
Check the seals for wear or damage every 100 hours of operation.



HOPPER INSPECTION DOOR SEAL

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

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

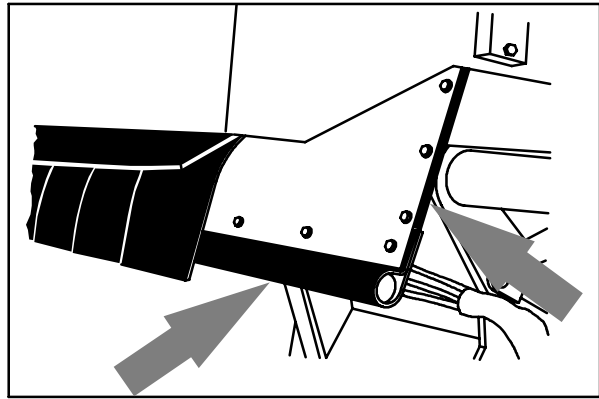


08024

HOPPER DOOR SEALS

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

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



08025

HOPPER COVER SEAL

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

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



HOPPER DUST SEAL

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

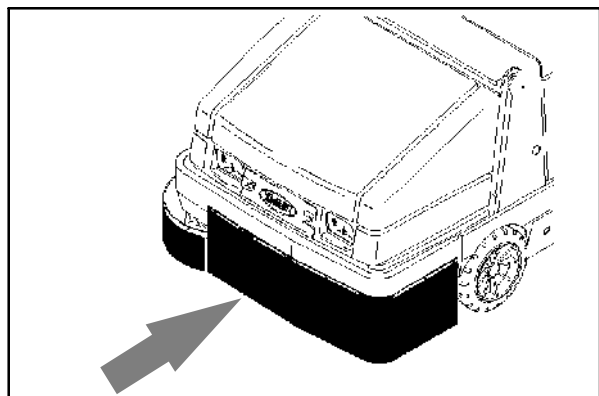
Check the seal for wear or damage every 100 hours of operation. You can reach the seal by removing the hopper insert.



SIDE BRUSH DUST CONTROL SKIRTS (OPTION)

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

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

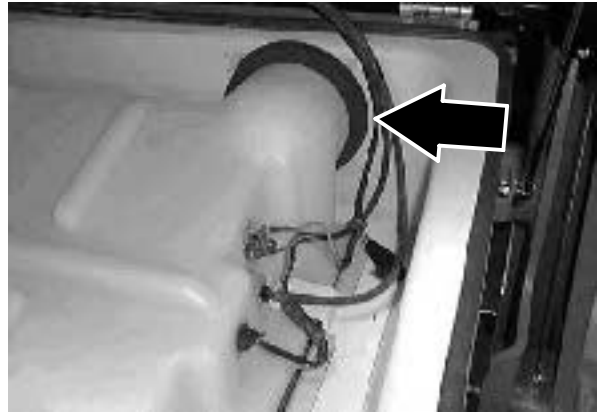


MAINTENANCE

HOPPER VACUUM FAN SEAL

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

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



HOPPER FILTER SEALS

The hopper filter seals are mounted on both sides of the hopper dust filter element.

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



BRAKES AND TIRES

SERVICE BRAKES

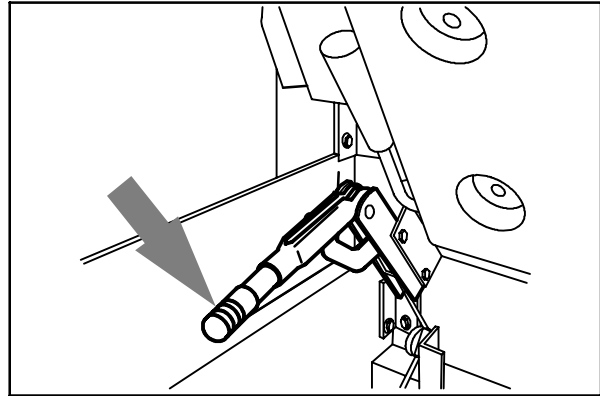
The mechanical service brakes are located on the front wheels. The brakes are operated by the foot brake pedal and connecting cables.

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

PARKING BRAKE

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

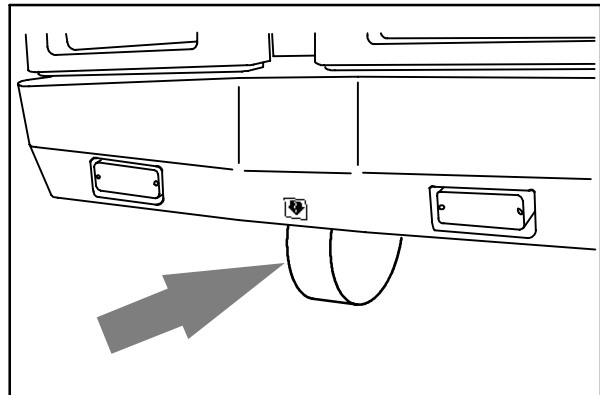
Adjust the parking brake whenever it becomes very easy to set the parking brake, when the machine rolls after setting the parking brake, and every 200 hours of operation. The parking brake may be tightened by turning the knurled knob on the end of the parking brake clockwise.



08924

TIRES

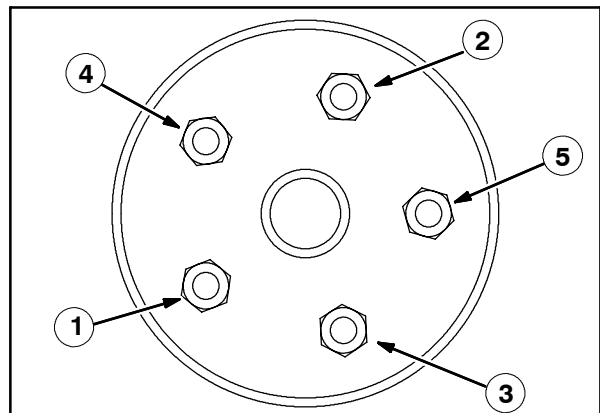
All the tires on the machine are solid. The tires should be inspected for wear and damage every 100 hours of operation.



08235

REAR WHEEL

If replacing the rear wheel, torque the rear wheel nuts in a star pattern twice to 122 to 150 Nm (90 to 110 ft lb).



PUSHING, TOWING, AND TRANSPORTING THE MACHINE

PUSHING OR TOWING THE MACHINE

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

Only push or tow the machine for a *very short distance* and do not exceed 3.2 kp/h (2 mph). It is NOT intended to be pushed or towed for a long distance or at a high speed.

ATTENTION! Do not push or tow machine for a long distance or damage may occur to the propelling system.

TRANSPORTING THE MACHINE

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

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

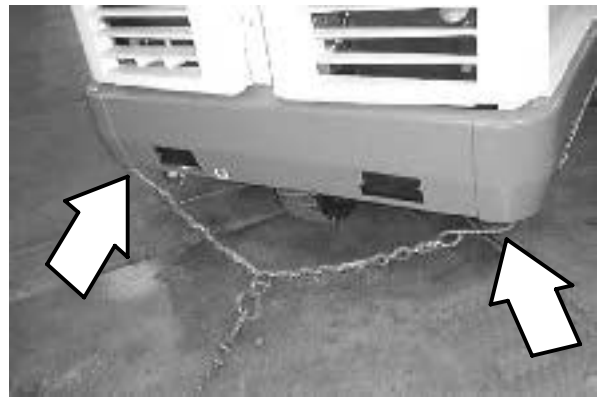
NOTE: Empty the hopper before transporting the machine.

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

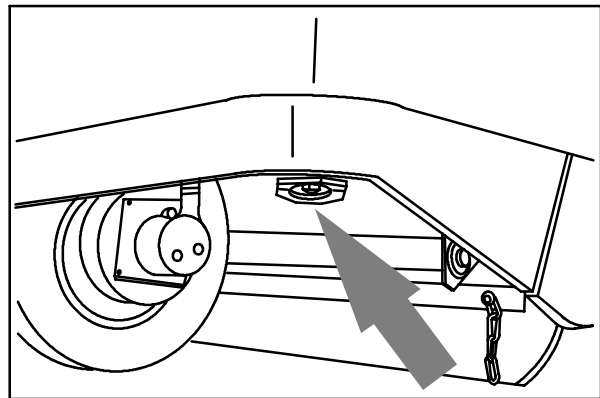
If the loading surface is horizontal AND is 380 mm (15 in) or less from the ground, the machine may be driven onto the truck or trailer.



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



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



08151

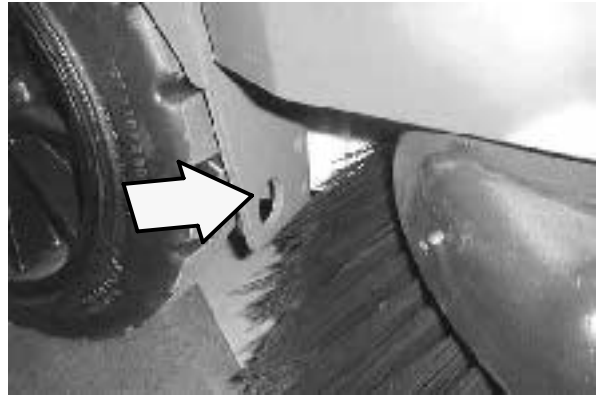
FOR SAFETY: When loading machine onto truck or trailer, use winch. Do not drive the machine onto the truck or trailer unless the loading surface is horizontal AND is 380 mm (15 in) or less from the ground.

4. Position the machine onto the truck or trailer as far as possible. If the machine starts to veer off the centerline of the truck or trailer, stop and turn the steering wheel to center the machine.

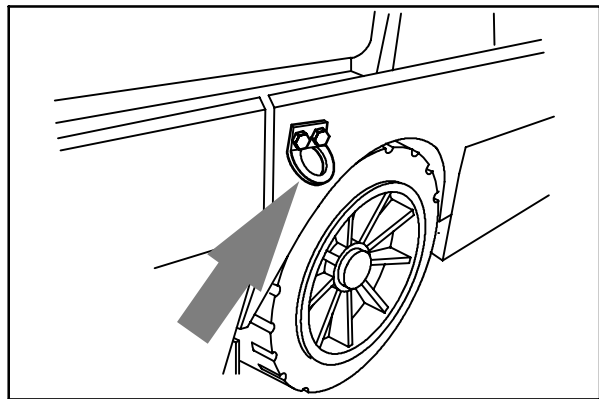
MAINTENANCE

5. Set the parking brake and block the machine tires. Tie down the machine to the truck or trailer before transporting.

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

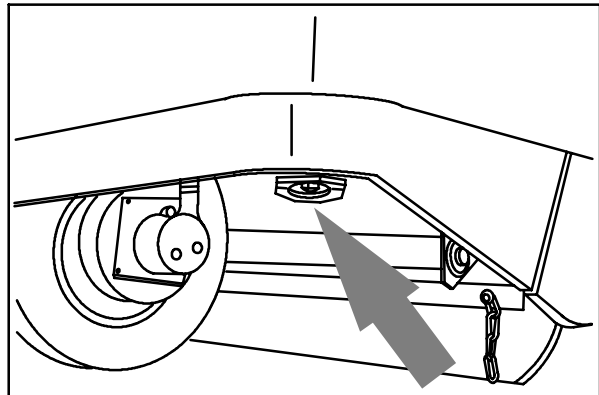


If the machine has the optional front tie down brackets above the front tires, attach the winching chains to them.



08152

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



08151

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

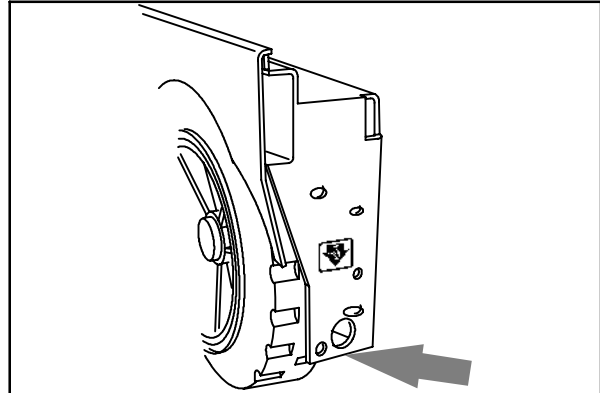
If the loading surface is horizontal AND is 380 mm (15 in) or less from the ground, the machine may be driven off the truck or trailer.

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

MACHINE JACKING

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

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

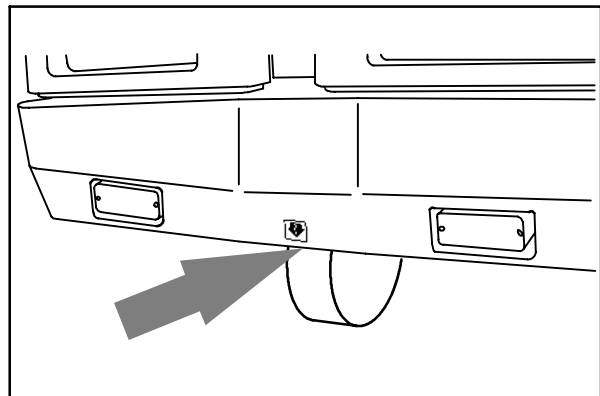


08029

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

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

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



08243

ELECTRIC MOTORS

The carbon brushes on the electric accessory motor should be inspected after every 400 hours of machine operation. The carbon brushes on the electric propelling motor should be inspected after every 800 hours of machine operation.

STORING MACHINE

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

SPECIFICATIONS

SPECIFICATIONS

GENERAL MACHINE DIMENSIONS/CAPACITIES

Item	Dimension/capacity
Length	2360 mm (93 in)
Width	1585 mm (62.5 in)
Height	1470 mm (58 in)
Height with overhead guard	2080 mm (82 in)
Height with overhead guard and hazard light	2270 mm (89.5 in)
Track	1345 mm (53 in)
Wheelbase	1135 mm (44.75 in)
Main brush diameter	355 mm (14 in)
Main brush length	1145 mm (45 in)
Side brush diameter	660 mm (26 in)
Sweeping path width	1145 mm (45 in)
Sweeping path width with side brush	1560 mm (61.5 in)
Main brush pattern width	50 to 75 mm (2.0 to 3.0 in)
Hopper weight capacity	475 kg (1050 lb)
Hopper volume capacity	395 L (14 cu ft)
Dust filter area	7 m ² (77.6 sq ft)
GVWR	2812 kg (6200 lb)
Ceiling height minimum dumping clearance	2745 mm (9 ft)

GENERAL MACHINE PERFORMANCE

Item	Measure
Maximum forward speed	8.5 kmh (5.3 mph)
Maximum reverse speed	6.6 kmh (3.5 mph)
Minimum aisle turn width, left	2845 mm (112 in)
Minimum aisle turn width, right	4725 mm (186 in)
Maximum rated climb and descent angle	6° (Full Hopper), 8° (Empty Hopper)

POWER TYPE

Type	Quantity	Volts	Ah Rating	Weight
Batteries	2	18	600 @ 6 hr rate	375 kg (830 lb)

Type	VDC	Amp	Hz	Phase	VAC
Chargers	36	120	60	1	480
	36	120	60	3	480
	36	120	50	1	220
	36	120	50	3	480

STEERING

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

HYDRAULIC SYSTEM

System	Capacity	Fluid Type
Hydraulic reservoir	26.5 L (7 gal)	TENNANT part no. 65870
Hydraulic total	34 L (9 gal)	
Propelling gearbox	2.6 L (2.7 qt)	SAE 90 Gear weight lubricant

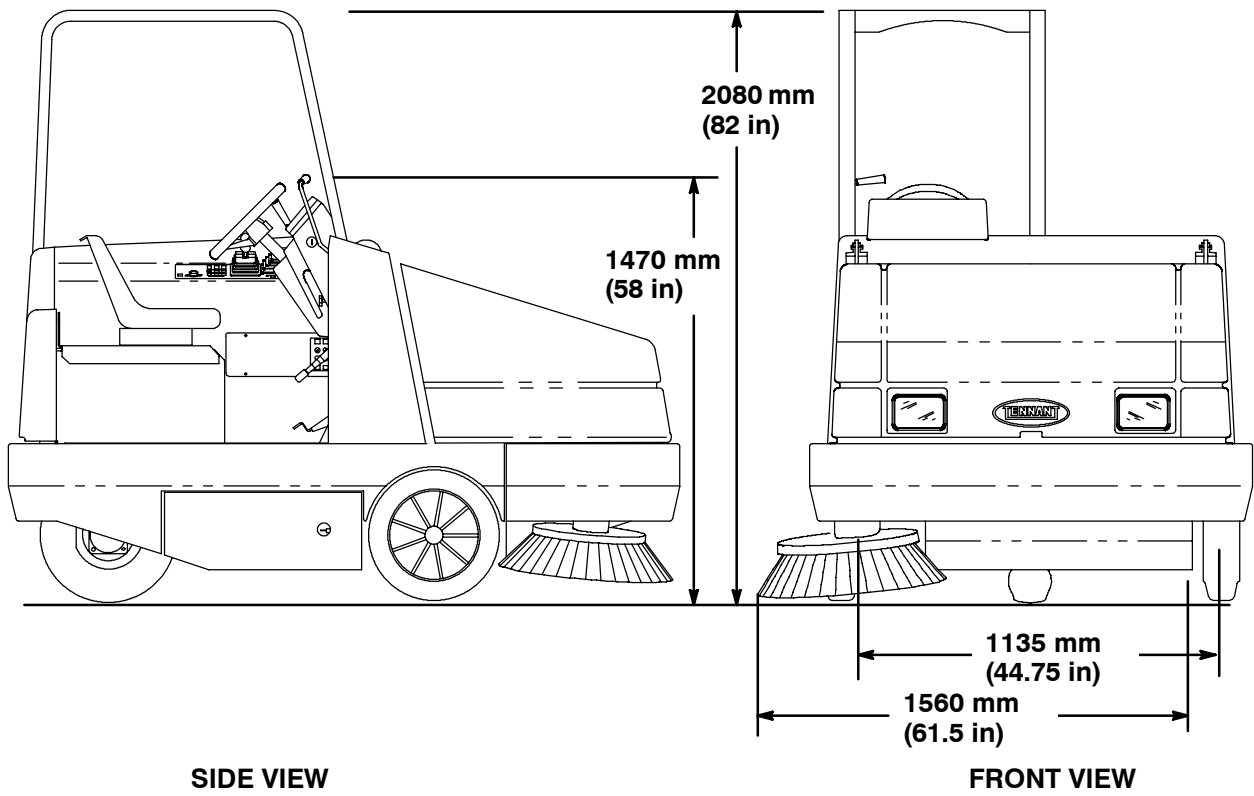
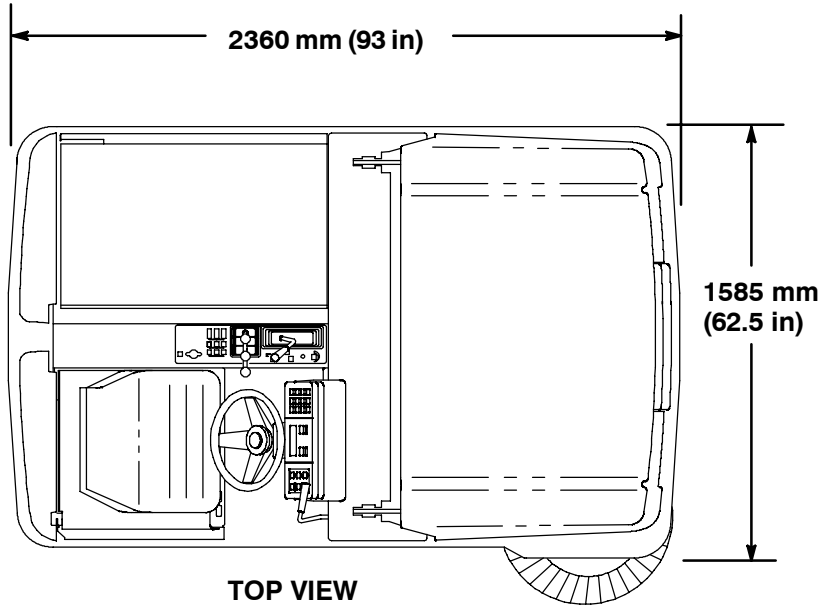
BRAKING SYSTEM

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

TIRES

Location	Type	Size
Front (2)	Solid	5 x 18 in
Rear (1)	Solid	6 x 19 in

SPECIFICATIONS



INDEX

A

Aisle turn, 72

B

Batteries, 48

- Charger specifications, 73
- Charging, 50–53
- Check charge level, 37
- Discharge indicator, 20
- Specifications, 73

Battery, Cover latch, 25

Battery discharge indicator, 20

Bearings

- Front wheel, 45
- Hopper, 44
- Rear wheel support, 44

Belts, 52

- Vacuum fan drive, 52

Brake pedal, 12

Brakes, 67

- Parking, Adjustment, 67
- Service, 67
- System specifications, 73

Brush pressure gauge, 13

Brushes, 30–32, 37, 57–62

- Adjusting main brush taper, 59–61
- Checking main brush pattern, 58–61
- Checking side brush pattern, 61
- Door latch, 25
- Door seals, 64
- Door skirts, 63
- Main brush, 57
- Main brush bristle length, 57
- Replacing main brush, 57–59
- Replacing side brush, 62
- Side brush, 61–63
- Side brush bristle length, 61

Button, Horn, 13

C

Capacities, 72

Chains, 52

- Static drag, 52

Circuit breakers, 25

Clogged filter light, 19

Control panel, 19–22

- Clogged filter light, 19
- Filter shaker switch, 21

Hazard light switch, 20

Hopper door light, 19

Hopper temperature light, 19

Hourmeter, 20

Main brush shut down light, 19

Operating lights switch, 20

Vacuum fan switch, 21

Controls, 10–28

Brake pedal, 12

Circuit breakers, 25

Clogged filter light, 19

Directional pedal, 11

Filter shaker switch, 21

Hazard light switch, 20

Hopper door lever, 15

Hopper door light, 19

Hopper lift lever, 16

Hopper temperature light, 19

Horn button, 13

Hourmeter, 20

Latches, 25

Main brush and side brush lever, 14

Main brush down pressure knob, 18

Main brush position lever, 17

Main brush shut down light, 19

On-off switch, 23

Operating lights switch, 20

Operation, 11–27

Parking brake lever, 12

Power kill switch, 18

Side brush down pressure knob, 24

Side brush position lever, 22

Steering column tilt lever, 24

Steering wheel, 21

Symbols, 8–10

Vacuum fan switch, 21

Covers

Battery, Latch, 25

Hopper

Latch, 25

Seals, 65

D

Debris hopper, 53–56

Dimensions, 72

Directional pedal, 11

Disengaging hopper support bar, 39–41

Doors

Brush

Latch, 25

Seals, 64

Skirts, 63

Grille, Latch, 25

- Hopper, Seals, 65
- Hopper Inspection, Seal, 64
- Side, Latch, 25
- Dust Control, Skirts, 65
- Dust filter, 53
 - Changing, 54
 - Cleaning, 53
- E**
- Electric motors, 71
- Electrical
 - Circuit breakers, 25
 - On-off switch, 23
- Emptying the hopper, 34–36
- Engaging hopper support bar, 38–40
- F**
- Filter shaker switch, 21
- G**
- Gauge, Brush pressure, 13
- Grease fittings
 - Hopper bearings, 44
 - Rear wheel support bearing, 44
 - Steering link, 45
- H**
- Hazard light switch, 20
- Hopper, 53–56
 - Changing dust filter, 54
 - Clogged filter, Light, 19
 - Cover latch, 25
 - Cover seal, 65
 - Disengaging hopper support bar, 39–41
 - Door lever, 15
 - Door light, 19
 - Door seals, 65
 - Dust filter, 53
 - Dust seal, 65
 - Engaging hopper support bar, 38–40
 - Filter cleaning, 53
 - Filter shaker, 21
 - Inspection door seal, 64
 - Lift, 16
 - Lip skirts, 63
 - Seals, 64
 - Side skirt, 63
 - Support bar, 27
 - Temperature, Light, 19
 - Thermo-Sentry, 56
 - Thermo-sentry, 19
 - Filter seals, 66
 - Vacuum fan seal, 66
- Hopper door, Operate, 15
- Hopper door lever, 15
- Hopper door light, 19
- Hopper lift lever, 16
- Hopper support bar, 27
- Hopper temperature light, 19
- Horn button, 13
- Hourmeter, 20
- How the machine works, 28
- Hydraulic fluid, 47
- Hydraulic fluid reservoir, 46
- Hydraulic hoses, 47
- Hydraulics, 46–48
 - Fluid, 47–49
 - Fluid filter, 46
 - Fluid level, 6, 46
 - Hoses, 47
 - Reservoir, 46
 - System specifications, 73
- I**
- Indicator, Battery discharge, 20
- J**
- Jack points, 71–73
- K**
- Knobs
 - Main brush down pressure, 18
 - Side brush down pressure, 24
- L**
- Latches, 25
 - Battery cover, 25
 - Grille doors, 25
 - Hopper cover, 25
 - Main brush doors, 25
 - Side door, 25
- Levers
 - Hopper door, 15
 - Hopper lift, 16
 - Main brush and side brush, 14
 - Main brush position, 17
 - Parking brake, 12

Side brush position, 22
Steering column tilt, 24

Lights

Clogged filter, 19
Hazard light switch, 20
Hopper door, 19
Hopper temperature, 19
Main brush shut down, 19
Operating lights switch, 20

Lubrication, 44

Front wheel bearings, 45
Hopper bearings, 44
Propelling gearbox, 44
Rear wheel support bearing, 44
Steering link, 45

M

Machine components, 7

Machine dimensions, 74

Machine jacking, 71–73

Machine leaks, 28, 37

Machine tie down location, 70

Main brush, 30–32, 57–61

Adjust brush taper, 59–61
Bristle length, 57
Checking brush pattern, 58–61
Door latch, 25
Door seals, 64
Door skirts, 63
Down pressure, 18
Lever, 14
Maintenance, 30, 57
Position, 17
Replacing, 57–59

Main brush and side brush lever, 14

Main brush down pressure knob, 18

Main brush position lever, 17

Main brush shut down light, 19

Maintenance, 42–63

Intervals, 42–44
Recommended, 6

Maintenance chart, 42–44

Motors, Electric, 71

O

On-off switch, 23

Operating lights switch, 20

Operation on inclines, 40

Operator Responsibility, 6

Operator seat, 26

Options

Hazard light switch, 20
Power kill switch, 18
Side brush dust control skirts, 65

P

Parking brake, 67

Adjustment, 67

Parking brake lever, 12

Pedals

Brake, 12
Directional, 11
Toe angle, 12

Post-operation checklist, 37

Power kill switch, 18

Pre-operation checklist, 28

Propelling gearbox, Lubrication, 44

Pushing machine, 68

Pushing or towing the machine, 68

Pushing, towing, and transporting machine, 68

R

Rear Wheel, 67

S

Safety

Disengaging hopper support bar, 39–41
Engaging hopper support bar, 38–40
Hopper support bar, 27
Labels, 5
Precautions, 3

Seals, 63–67

Brush doors, 64
Hopper, 64
Hopper cover, 65
Hopper door, 65
Hopper dust, 65
Hopper inspection door, 64
Hopper filter seals, 66
Hopper vacuum fan seal, 66

- Seat, 26
 - Adjustments, 26
 - Lift, 27
 - Service records, 37
 - Side Brush, Dust skirts, 65
 - Side brush, 31, 61–63
 - Bristle length, 61
 - Checking brush pattern, 61
 - Down pressure, 24
 - Lever, 14
 - Position, 22
 - Replacing, 62
 - Side brush down pressure knob, 24
 - Side brush dust control skirts, 65
 - Side brush guard, 62
 - Side brush position lever, 22
 - Skirts, 37, 63–65
 - Brush doors, 63
 - Hopper Lip, 63
 - Hopper side, 63
 - Rear, 64
 - Side brush dust control, 65
 - Specifications, 72–74
 - Braking system, 73
 - Hydraulic system, 73
 - Machine capacities, 72
 - Machine dimensions, 72
 - Machine performance, 72
 - Power type, 73
 - Propelling gearbox, 73
 - Steering, 73
 - Tires, 73
 - Starting the machine, 29–31
 - Static drag chain, 52
 - Steering, Specifications, 73
 - Steering column tilt lever, 24
 - Steering wheel, 21
 - Stop sweeping, 33
 - Stop the machine, 36–37
 - Storing machine, 71
 - Sweeping, 31–33
 - Sweeping and brush information, 30–32
 - Switches
 - Filter shaker, 21
 - Hazard light, 20
 - On-off, 23
 - Operating lights, 20
 - Power kill, 18
 - Vacuum fan, 21
- T**
- Thermo-sentry, 56
 - Thermo-sentry, 19
 - Tie down location, 70
 - Tires, 67–69
 - Specifications, 73
 - Towing machine, 68
 - Transporting machine, 68
 - Transporting the machine, 68
 - Travel speed, 72
 - Troubleshooting, 41
- V**
- Vacuum fan, Belt, 52
 - Vacuum fan switch, 21
- W**
- Wheel, Rear, 67