



Electronic Service Manuals

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6150

BATTERY POWER SWEEPER



Operator's Manual

READ THIS BOOK

This book has important information for the use and safe operation of this machine. Failure to read this book prior to operating or attempting any service or maintenance procedure to your machine could result in injury to you or to other personnel; damage to the machine or to other property could occur as well. you must have training in the operation of this machine before using it.

All directions given in this book are as seen from the operator's position at the rear of the machine.

American-Lincoln®

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SPECIFICATIONS

SWEEP PATH		50 inches (127 cm) with single side broom 62 inches (157.5 cm) with optional dual side brooms
TRAVEL SPEED		
Gas/LP	Diesel	Battery
0 - 5 MPH	0 - 8 MPH	0 - 4 MPH
TURNING RADIUS		
Left		53.5 inches (136 cm)
Right		82.0 inches (208 cm)
AISLE WIDTH FOR U-TURN		90 inches (229 cm)
MAXIMUM RATED CLIMB		
Gas/LP		8°
Diesel		8°
Battery		6°
DIMENSIONS		
Length	87 inches (221 cm)	
Width		51.50 inches (131 cm)
Height		53.00 inches (135 cm)
Height w/Overhead Guard		77.75 inches (197.5 cm)
WEIGHT		
Gas/LP		2100 lbs. (955 kg)
Diesel		2100 lbs. (955 kg)
Battery		3420 lbs. (1555 kg)
POWER SOURCE		
Gas/LP		20 HP (14.933 kw), 2-cylinder liquid-cooled Kawasaki 24 HP (17.9 kw), 3-cylinder liquid-cooled Kubota
Diesel		20 HP (14.933 kw), 3-cylinder liquid-cooled Kubota
Battery		36 volt system, 2.5 HP (1.87 kw) series wound drive motor
ELECTRICAL SYSTEM		
Gas/Diesel/LP		12 volts
Battery-Powered		36 volts

HYDRAULIC SYSTEM

GAS/DIESEL/LP POWERED MACHINES

The engine furnishes power through a coupling to a fixed displacement hydraulic gear pump. The pump provides controlled oil flow to various operator controlled hydraulic valves which supply hydraulic power to the hopper dump system and motors on the rear wheel, main broom, side broom, and vacuum fan. Hydraulic system is protected by two filters, 100 micron and a 25 micron.

BATTERY POWERED MACHINES

The battery powered electric motor furnishes power through a coupling to a fixed displacement hydraulic gear pump. The pump provides controlled oil flow to various operator controlled hydraulic valves which supply hydraulic power to the hopper dump system and motors on the main broom and side broom. Hydraulic system is protected by two filters, 100 micron and 25 micron.

STEERING

Fully Power Steering with single rear wheel steer.

BRAKES

Foot operated drum brakes on front wheels. Hand operated parking brake. When engaged, parking brake locks the brake foot pedal in the down position.

MAIN BROOM

One-piece, disposable unit with poly core. Standard bristle type is Proex fiber. A variety of bristle types are available. No tool broom installation or removal easily completed within five (5) minutes. Broom position can be placed into the free float or restricted down position. Broom pattern is adjusted by control in operator's compartment. Offers excellent performance on rough or uneven surfaces.

Length	36 inches (91.5 cm)
Diameter	14 inches (35.5 cm)
Bristle Length	3.25 inches (8.26 cm)

SIDE BROOM

Rotary, disposable type. May be raised, lowered, and adjusted using controls in operator's compartment. Broom is retractable to prevent damage caused by hitting walls and racks. No tool broom installation or removal.

Diameter	21 inches (53.4 cm)
----------	---------------------

FILTER SYSTEM

One panel filter offers a total filter area of 78 square feet (7.25 m²) and controls dust particles down to two microns in size utilizing pre-clean baffling system. No tool panel filter installation or removal in less than two minutes. Panel filter cleaned utilizing patented 'beater bar' shaker controlled by the operator. A high volume, 9 inch vacuum fan provides excellent dust control. Filter can be washed.

HOPPER

Constructed of steel, hopper provides adequate ground clearance and floating flaps.

Capacity	10 ft. ³ (283 L)
Weight Capacity	700 lbs. (317.5 kg)

BROOMS CONTROLS

A separate lever raises and lowers the main broom which allows it to be set in the restricted down or free float position. Side broom raise/lower level.

DUMPING SYSTEM

Variable dump empties debris from ground level up to 60 inches.

CONTROLS

A single foot pedal controls travel speed, forward and reverse direction. Equipped with hopper raise/lower lever, brooms and vacuum on/off lever, filter shaker and horn buttons, key start ignition, battery condition meter (battery machines only), hour meter, fuel gauge (gas machines only), hydraulic oil level, sight gauge and throttle control.

TIRES

Front
Rear

Gas/LP/Diesel

Two 16" Pneumatic
One 16" Pneumatic

Battery

Two 16" Solid Urethane
One 16" Solid

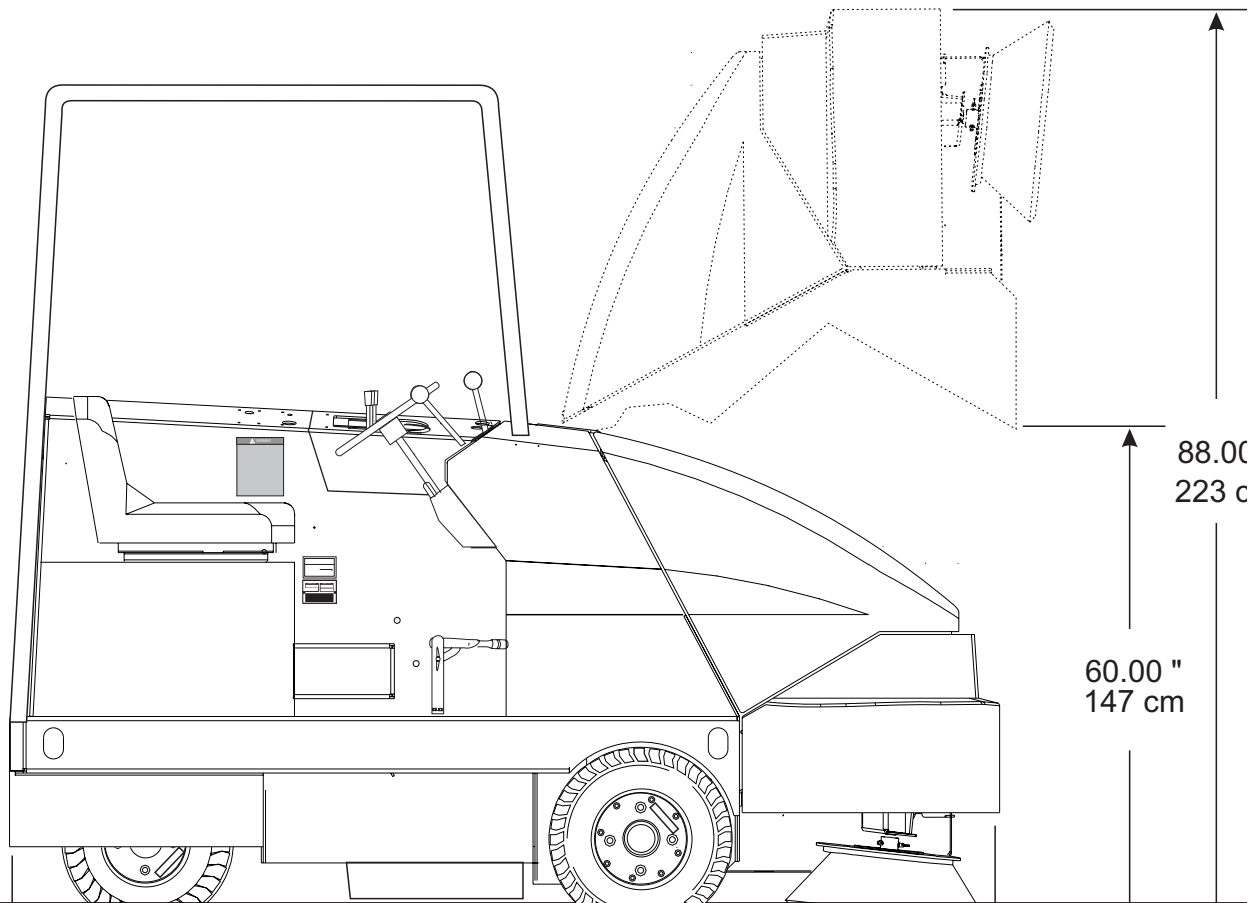
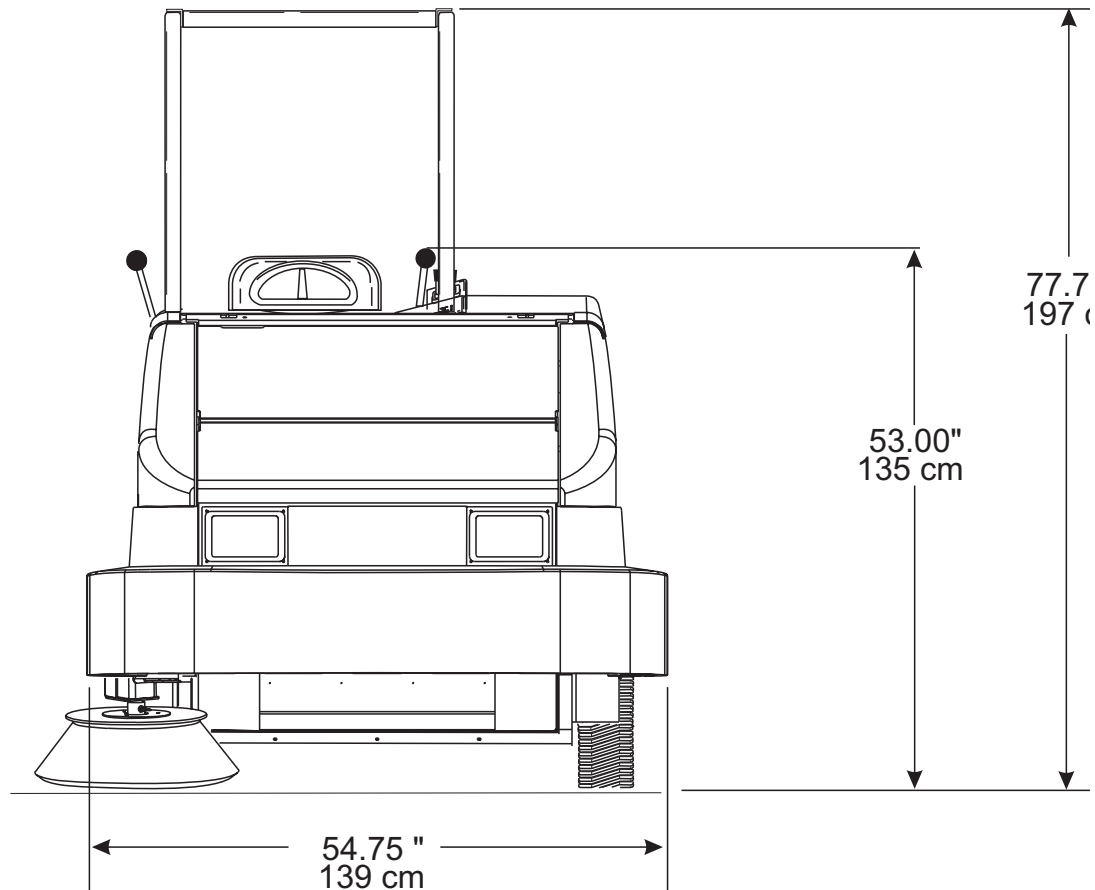
STANDARD EQUIPMENT

Headlights	Dash Lights	Taillight
Timed Shaker System	Transport Tie Down Cutouts	Adjustable Seat

OPTIONAL EQUIPMENT

Overhead Guard	Non-Marking Tires Solid Pneumatic	
Vacuum Wand	Turn Signals	Brake Light
Clogged Filter Indicator	Vacuumized Right Curb Broom	Hydraulic Oil Cooler
Dual Curb Brooms	Back-Up Alarm	Strobe Amber Light
Stainless Steel Hopper	Rear Work Light	Safety Tape
Solid Cushion Tires	Arm Rests & Seat Belts	
Wet Sweep By-Pass	Hopper Fire Safety Sensor	

MACHINE DIMENSIONS





YOUR SWEEPER HAS BEEN SHIPPED COMPLETE, BUT DO NOT ATTEMPT TO OPERATE WITHOUT READING AND FOLLOWING THESE INSTRUCTIONS.

PREPARATION

1. Uncrate the sweeper and carefully remove packing material.
2. Inspect the battery connections.
- 3.^ Fill fuel tank with appropriate fuel.
- 3.* Install motive power batteries. (See Battery Installation Instructions)
- 4.* Charge batteries using instructions provided with charger. (See Battery Charging Instructions)



WARNING

Risk of personal injury. Never fill fuel tank while engine is running. Always be sure gasoline container and sweeper are electrically connected prior to pouring fuel. This can easily be done by providing an insulated wire (Permanently attached to the container) with a battery clip attached to the other end.

- 4.^ Check engine crankcase oil level.
- 5.^ Check radiator coolant level. Permanent type antifreeze is added at the factory to provide protection to approximately -35° F (-2° C). To retain this level of protection always add 1/2 part water to 1/2 part antifreeze.
6. Check fluid level in hydraulic reservoir which is located in the engine compartment. The hydraulic reservoir is full when fluid can be seen in the sight glass on the side of the reservoir. To get an accurate reading the hopper must be in the "DOWN" position. If fluid is required add HYDRAULIC FLUID ONLY. Use Ford Automatic Transmission Fluid Type "F".

^For Gas/LP/Diesel Machines Only

*For Battery Machines Only

SAFETY PRECAUTIONS

THE FOLLOWING STATEMENTS ARE USED THROUGHOUT THIS MANUAL AS INDICATED IN THEIR DESCRIPTIONS:



DANGER

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



WARNING

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



CAUTION

To warn of hazards or unsafe practices which could result in minor personal injury.

ATTENTION

To warn of unsafe practices which could result in extensive equipment damage.

NOTE

To give important information or to warn of unsafe practices which could result in equipment damage.

THE FOLLOWING INFORMATION SIGNALS POTENTIALLY DANGEROUS CONDITIONS TO THE OPERATOR OR EQUIPMENT. READ THIS MANUAL CAREFULLY. KNOW WHEN THESE CONDITIONS CAN EXIST. THEN, TAKE NECESSARY STEPS TO TRAIN MACHINE OPERATING PERSONNEL.

FOR THE SAFE OPERATION OF THIS MACHINE, READ AND UNDERSTAND ALL WARNINGS, CAUTIONS AND NOTES.



WARNING

Machines can ignite flammable materials and vapors. Do not use with or near flammables such as: gasoline, grain dust, solvents and thinners.



WARNING

Heavy machinery. Improper use can cause personal injury.



WARNING

Operate only when lids, doors, and access panels are securely closed.



WARNING

Use care when reversing machine in confined area.



WARNING

When servicing the machine disconnect the battery first to prevent possible injury.



WARNING

When working on the machine, empty hopper, disconnect battery, clear area of people and obstructions, use additional people and proper procedures when lifting the machine.



WARNING

Always empty the Hopper and Disconnect Battery before doing maintenance.



WARNING

You must have training in the operation of this machine before using it. **READ THE INSTRUCTION BOOK.**



WARNING

Do not operate this machine unless it is completely assembled.



WARNING

Do not use this machine as a step or furniture.



WARNING

Be careful when operating the machine on a ramp or incline. Always move slowly on a ramp. Do not turn this machine on a ramp. Do not stop and leave this machine on a ramp.



WARNING

Stop and leave this machine on a level surface. When you stop the machine, put the power switch in the “OFF” position and Engage the parking brake.



WARNING

To prevent injury, and damage to the machine, do not lift the machine or move it to an edge of a stair or loading dock.



WARNING

Lead acid batteries generate gases which can cause an explosion. Keep sparks and flames away from batteries. NO SMOKING. Charge batteries only in area with good ventilation.



WARNING

Always wear eye protection and protective clothing when working near batteries. Remove all jewelry. Do not put tools or other metal objects across the battery terminals, or the tops of batteries.



WARNING

Maintenance and repairs must be done by authorized personnel only. Tighten all fasteners. Keep adjustments according to the specifications given in the service manual for the machine. Keep the electrical parts of the machine dry. For storage, keep the machine in a building.



WARNING

Make sure that all labels, decals, warnings, cautions and instructions are fastened to the machine. Get new labels and decals from American Lincoln.



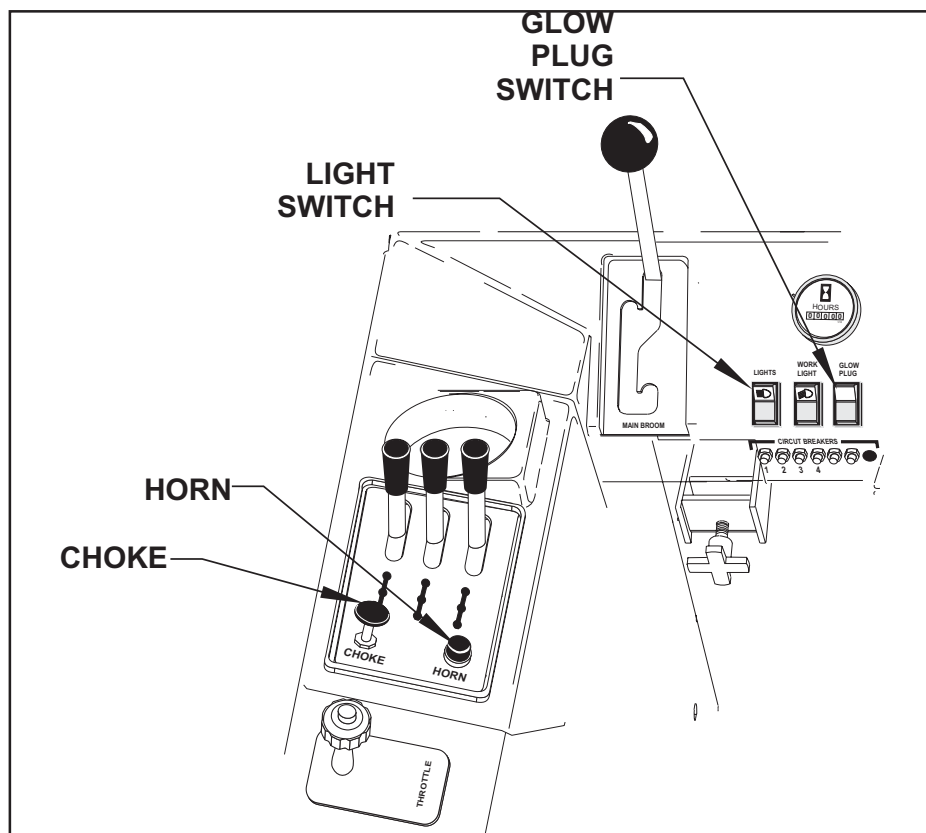
WARNING

To maintain stability of this sweeper in normal operation, the counterweights, over-head guard, rear bumper guard or any similar equipment installed by the manufacturer as original equipment, should never be removed. If it becomes necessary to remove such equipment for repair or maintenance. This equipment must be reinstalled before the sweeper is placed back in operation.



WARNING

The hopper could lower unexpectedly and cause personal injury. Engage the hopper safety arm before working under the hopper.



C0701A

FIGURE 1

HORN BUTTON

The horn button is located on the left side console next to the choke control. Push the button to sound the horn. The horn button is always active.

LIGHT SWITCH

The light switch is located on the instrument panel and controls the headlights, taillights and instrument panel lights. To turn on the lights press the upper portion of the switch. The upper portion of the switch will illuminate to indicate the lights are "ON". The light switch is always active.

GLOW PLUG SWITCH (Diesel Only)

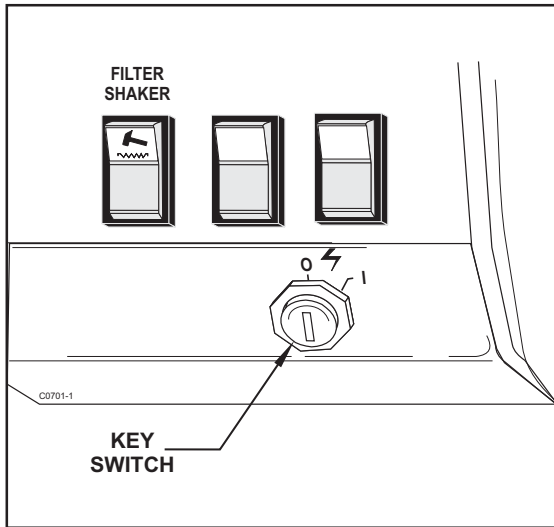
The glow plug switch is a momentary type rocker switch that is located on the instrument panel and is used to start the diesel engine. It should be noted that under no circumstances should Ether or other starting aids be used in conjunction with the glow plugs. To prevent damage to the glow plug switch, do not use for more than 60 seconds. The key switch must be placed in the "ON" position before using the glow plug switch.

CHOKE CONTROL

The choke control is located on the left side console and is used to aid in starting the engine. The choke governs the mixture of air and fuel during the combustion cycle of the engine operation. The choke should be pulled up during the start of the engine and then gradually pushed back down after engine warm up.

To turn on the choke for "Cold" starting, pull "UP" on the control.

To turn off the choke once engine has been started gradually push the control "DOWN".



C0701-1 **FIGURE 2**

KEY SWITCH

The keyed ignition switch is located on the instrument panel to the right of the steering column. The key switch is a four position switch that controls power to the sweeper systems and accessories.

BATTERY POWERED MACHINES

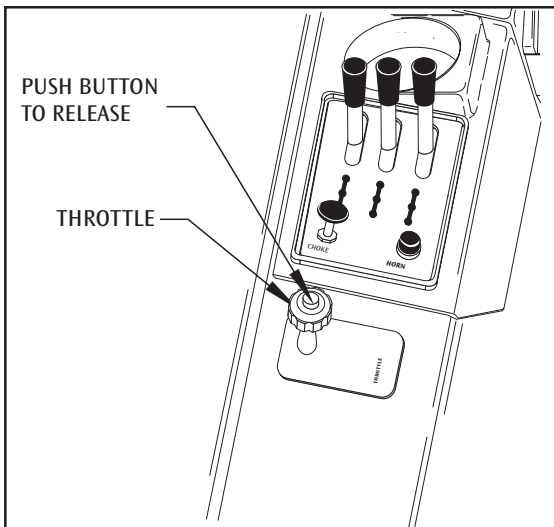
The "O" position will shut off power to the machine propulsion and sweeping systems.

The "I" position provides power to all sweeper systems and accessories.

GAS/DIESEL/LP POWERED MACHINES

The "O" position will shut off the engine.

The "I" position provides power to all sweeper systems and accessories.



C0702 **FIGURE 3**

THROTTLE

The engine speed is controlled by a locking push-pull control which is located on the operator's compartment side console.

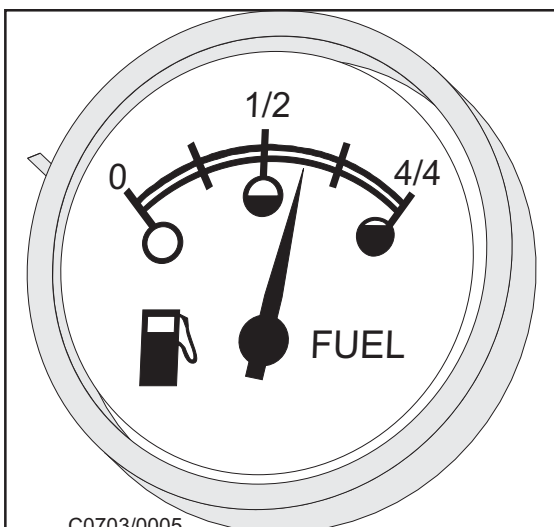
The position of the throttle determines the operating speed of the engine. The position is variable from idle to max engine speed and may be adjusted to suit operating conditions.

The locking feature of the engine throttle control consists of a rubberized push button that unlocks the control for adjustment.

Push down on the button while positioning the control to the desired setting, then release the button to unlock the throttle in place.

Pull up on the throttle to increase engine speed.

Push down on the throttle to decrease engine speed.

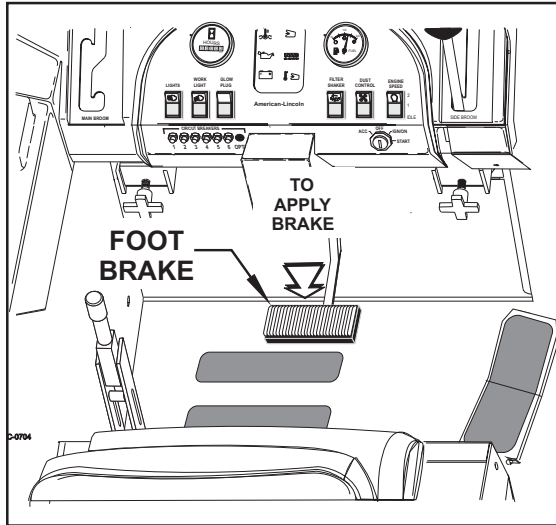


C0703 **FIGURE 4**

FUEL GAUGE

The fuel gauge is located on the instrument panel and indicates the level of fuel in the tank. The fuel gauge is powered by the key switch. The key switch must be in the "I" position for the fuel gauge to work. The fuel gauge is not included on machines that use Battery or Liquid Propane fuel.

SWEeper CONTROLS/INSTRUCTIONS



C0704 FIGURE 5

FOOT BRAKE

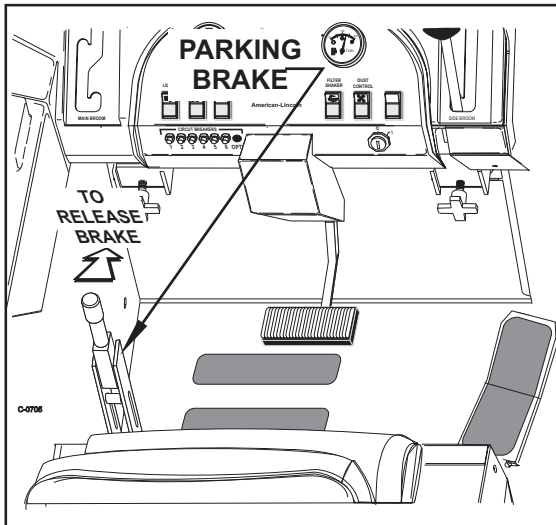
The foot brake pedal is located on the floor of the operator's compartment to the left of the directional control pedal.

To stop, apply foot pressure to the brake pedal.

PARKING BRAKE

The parking brake lever is located on the operator's compartment left side panel near the floor. When engaged the parking brake "locks" the foot pedal in the down position.

- To engage the parking brake, place the lever in the upright position.
- To disengage the parking brake, move the lever forward.
- To Adjust The Parking brake "Grab" Turn the knob on the top of the lever.
- To increase "Grab" Turn the knob in a clockwise direction.
- To decrease "Grab" Turn the knob in a counter-clockwise direction.



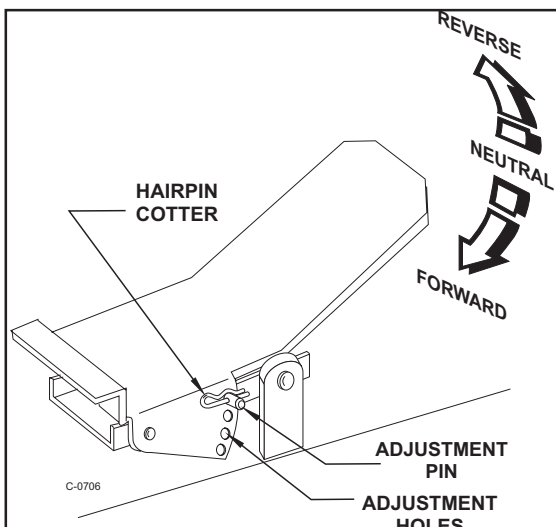
C0705 FIGURE 6

FOOT PEDAL

The Foot Pedal is located on the floor of operator's compartment to the right of the brake pedal. The foot pedal provides control of direction/speed and has an automatic safety feature that limits foot pedal travel while the hopper is raised. The pedal height is adjustable to provide for operator comfort.

TO GO FORWARD: Place pressure on the upper portion of the pedal. Speed increases when additional pressure is placed on the pedal.

TO GO BACKWARD: Put pressure on the lower portion of the pedal. Speed increases when additional pressure is placed on the pedal.

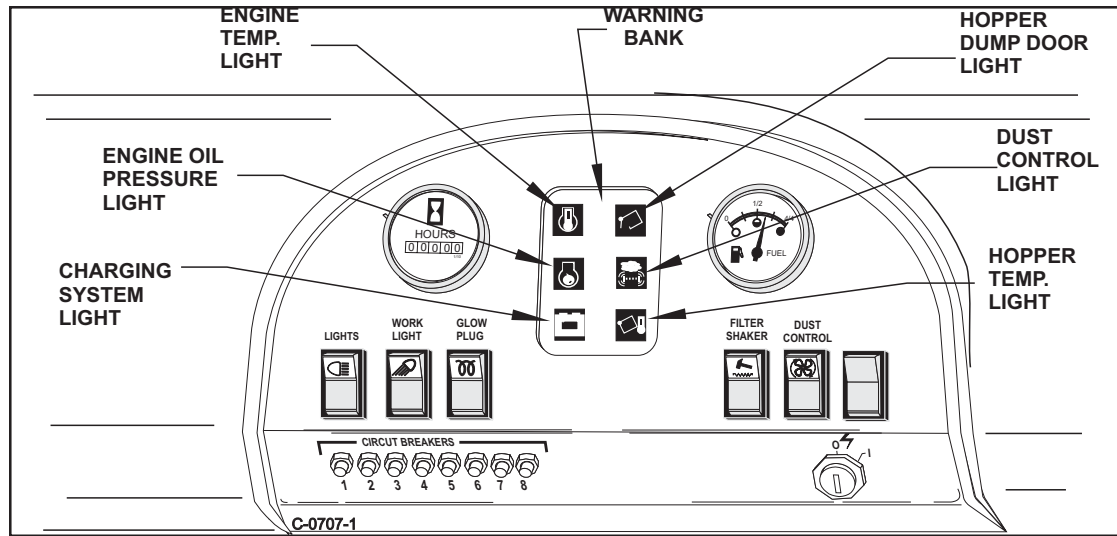


C0706 FIGURE 7

- To increase braking action while sweeper is moving forward, gently put pressure on the lower portion of the pedal.
- To Increase braking action while traveling in reverse, gently put pressure on the upper portion of the pedal.

To adjust the foot pedal height for operator comfort

1. Remove the hairpin cotter from the adjustment pin.
2. Remove the adjustment pin from the foot pedal assembly.
3. Align the holes in the lower bracket with one of the four adjustment holes on the foot pedal to set the foot pedal height.
4. With the holes aligned at the desired height, insert the adjustment pin
5. Reinstall the hairpin cotter.



C0707-1

FIGURE 8

WARNING BANK

The Warning Bank is located on the instrument panel and provides the operator with six fault/status indicators for engine and sweeper systems. The Operator should monitor the indicators while sweeping. It is very important that the operator be familiar with the meaning of each indicator.



ENGINE TEMP LIGHT

The engine temperature light illuminates to indicate an engine cooling system fault. When this occurs the operator must turn off the sweeper immediately and have the cooling system serviced by a qualified service technician.



ENGINE OIL PRESSURE LIGHT

When the oil pressure drops below approximately 5 psi an automatic protection circuit shuts down the engine and illuminates the light to indicate low engine oil pressure. When this occurs have the sweeper serviced by a qualified service technician.



CHARGING SYSTEM LIGHT

The charging system light illuminates to indicate a charging system fault. When this occurs the sweeper charging system is not working properly and must be serviced by a qualified service technician.



DUST CONTROL LIGHT

The Dust Control Light Illuminates to indicate that the dust control filter is clogged. When this occurs, stop sweeping and use the filter shaker to clear dirt and debris from the filter. After using the filter shaker continue sweeping.



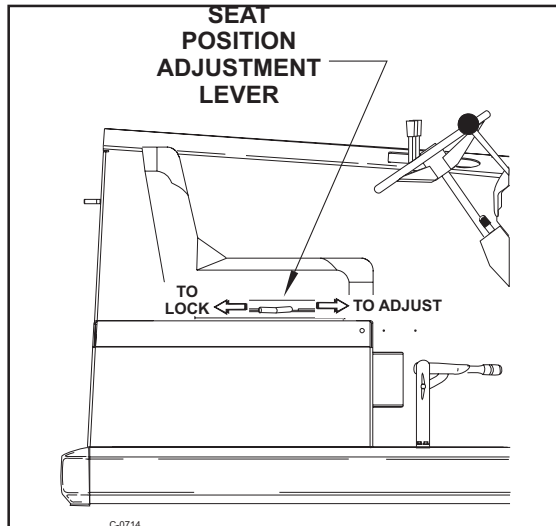
HOPPER TEMPERATURE LIGHT

When the temperature of the air moving through the dust control system in the hopper exceeds 140° F, an automatic protection feature shuts down the dust control fan and illuminates the hopper temperature light. When this occurs shut down the sweeper and carefully investigate for a possible fire in the hopper. The temperature switch must be manually reset.



DUMP DOOR LIGHT

The dump door light will illuminate when the dump door is not fully open. The light warns the operator to open the hopper dump door completely before sweeping. Do not sweep when the light is illuminated.



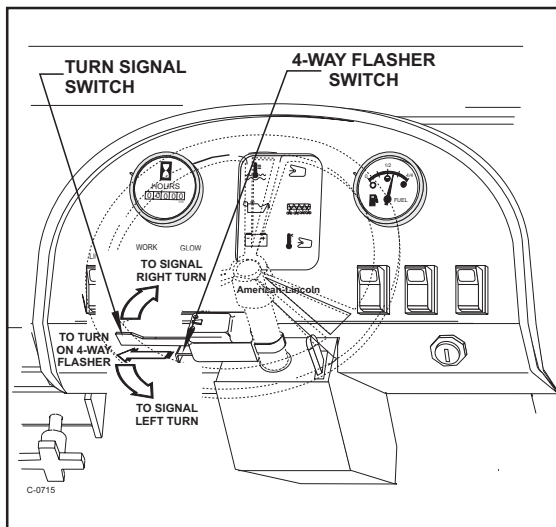
C0714

FIGURE 9

SEAT POSITION ADJUSTMENT

The seat adjustment lever is located on the right side of the seat base. The lever is spring loaded to the “LOCK” position.

To adjust the seat, push “FORWARD” on the lever and move seat to desired position then release the lever to “LOCK” the seat in place.



C0715

FIGURE 10

TURN SIGNALS - 4 WAY (OPTION)

The turn signal switch is located on the steering column and functions the same as a typical automotive turn signal. The operator must return the lever to the centered position after the turn has been completed.

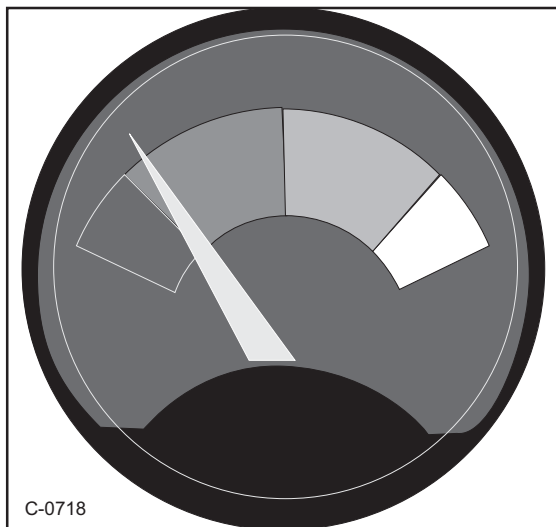
-To signal a right hand turn move the lever to the “FORWARD” position.

-To signal a left hand turn position the lever to the “BACKWARD” position.

-To use the 4-way Flashers pull out on the turn signal lever.

BACK UP ALARM (OPTION)

The backup alarm is activated by a switch in the foot pedal and automatically emits a loud audible noise when the machine is driven in reverse.



C-0718

C0718

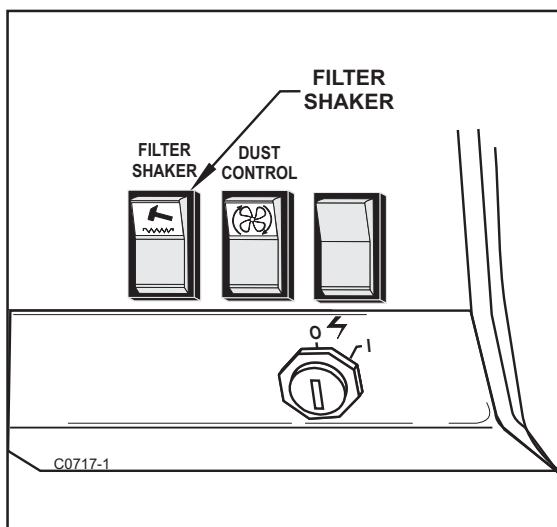
FIGURE 11

BATTERY CONDITION METER (Battery Power Only)

The battery condition meter is located on the right side of the instrument panel. The condition meter indicates the level of charge in the batteries. The batteries are sufficiently charged when the needle stays in the green area on the gauge while the machine is being operated.

Charge the batteries when the needle drops into the red zone while operating the machine,

Do not operate the machine if the needle stays in the red zone. Operating the sweeper with discharged batteries will degrade battery life.



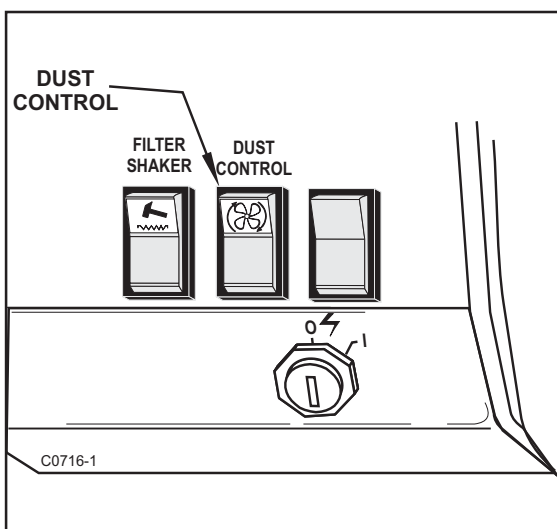
C0717-1 FIGURE 12

FILTER SHAKER SWITCH

The filter shaker switch is located on the instrument panel below the fuel gauge. This is a momentary switch that will activate the filter shaker motors for 20 to 30 seconds to clear the dust control filter. The impeller fan will stop when the filter shaker has been activated.

The filter shaker will only operate with the hopper in the "DOWN" position. Use the filter shaker to clear the filter when the dust control light on the warning bank illuminates and just before dumping the hopper.

To activate the filter shaker press the upper portion of the filter shaker switch momentarily and release. The filter shaker will operate for 20 to 30 seconds.



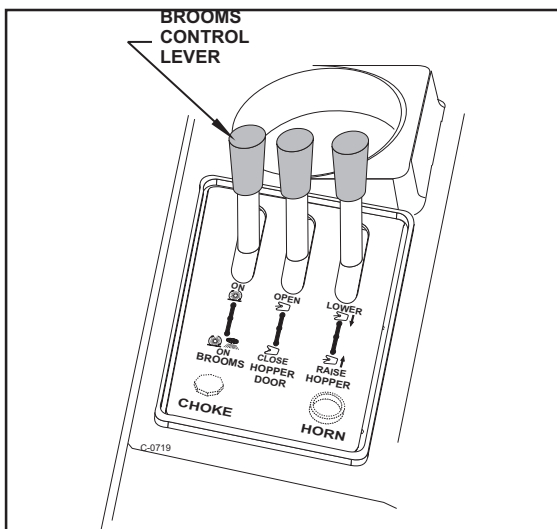
C0716-1 FIGURE 13

DUST CONTROL SWITCH

The dust control is a two position switch that is located on the instrument panel next to the engine speed switch. The switch controls the vacuum fan in the dust control system.

To turn on the dust control system for "NORMAL" Sweeping, press on the top portion of the switch.

To Turn off the dust control system for sweeping in wet conditions, press on the lower portion of the switch. This will prevent the filter from being damaged by water pickup while sweeping.



C0719 FIGURE 14

BROOMS CONTROL LEVER

The brooms control lever is located on the operator's compartment center console. The lever is a three position hydraulic valve that controls hydraulic power to the main broom and side broom.



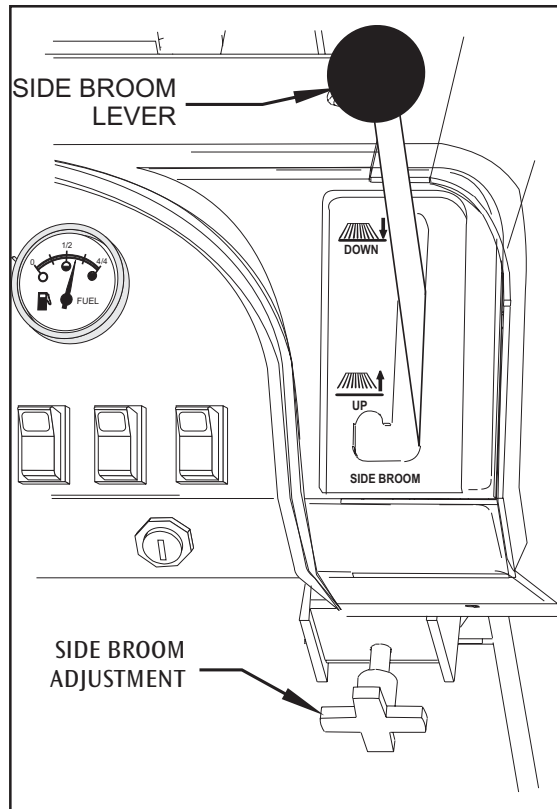
WARNING

To prevent injury, Do not turn on the brooms with the hopper raised.

To turn on the main broom only, move the lever to the forward position.

To turn on the main broom and the side broom, move the lever fully backwards.

To turn off the brooms and provide hydraulic power to the hopper lift system place the lever in the center position.



C0720

FIGURE 15

SIDE BROOM LEVER

The side broom lever is located on the right side of the instrument panel. The side broom lever raises and lowers the side broom. Use the brooms lever on the operator's center console to turn on the side broom.

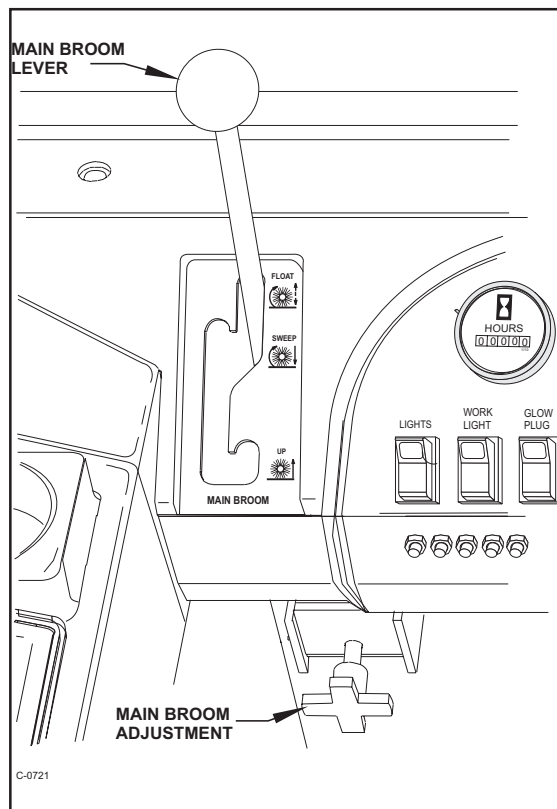
To raise the side broom, pull the lever back into the "UP" position.

To lower the side broom, move the lever out of the detented "UP" position and move it forward to the "DOWN" position.

SIDE BROOM ADJUSTMENT

The side broom lever has an adjustment for changing the sweep height to compensate for broom wear. The side broom adjustment is located under the right side of the instrument panel.

To Adjust the side broom height turn the threaded knob.



C0721

FIGURE 16

MAIN BROOM LEVER

The main broom lever is located on the left side of the instrument panel. The main broom lever has three positions and controls the main broom sweep height. Use the brooms lever on the operator's center console to turn on the main broom.

To lower the main broom, grasp the lever and move it to the left out of the "UP" position and place in the "SWEEP" or "FLOAT" position.

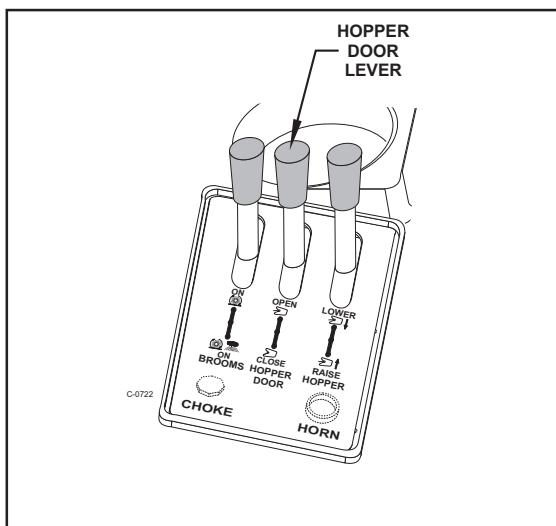
The "SWEEP" position is used for normal sweeping and should be used under most sweeping conditions.

The "FLOAT" position is used for sweeping very uneven surfaces only. Using the Float position will cause premature wear on the main broom if used under normal operating conditions for extended periods of time.

MAIN BROOM ADJUSTMENT

The main broom lever has an adjustment for changing the sweep height to compensate for broom wear. The main broom adjustment is located under the left side of the instrument panel.

To Adjust the main broom height turn the threaded knob.



C0722 FIGURE 17

HOPPER DOOR LEVER

The hopper door lever is located on the operator's compartment center console and is used to close and open the hopper dump door. The lever is a three position hydraulic valve that is spring loaded to the center position which "HOLDS" the hopper door in position.

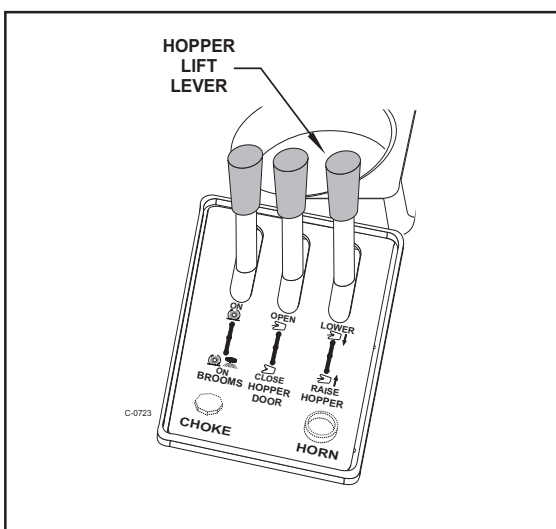
NOTE

To provide hydraulic power to the hopper controls, the broom control lever must be in the center "Neutral" Position

To ensure the door is fully open while sweeping, monitor the Hopper Dump Door light on the Warning Bank. The light will illuminate when the door is not fully open.

To open the hopper dump door for sweeping or dumping, push the lever forward in the "OPEN" direction until the hopper dump door light goes out.

To close the hopper dump door for dumping or transporting, pull the lever fully back in the "CLOSE" direction and hold for 3 seconds or until you hear the door close.



C0723 FIGURE 18

HOPPER LIFT LEVER

The hopper lift lever is located on the operator's compartment center console. The lever is a three position hydraulic valve that controls the operation of the hopper lift system. The lever is spring loaded to the center position which stops hopper movement and "HOLDS" the hopper at the present position.

NOTE

To provide hydraulic power to the hopper controls, the broom control lever must be in the center "Neutral" Position

To raise the hopper for dumping, move the lever back to the "RAISE" position and hold until the hopper reaches the desired height, then release.



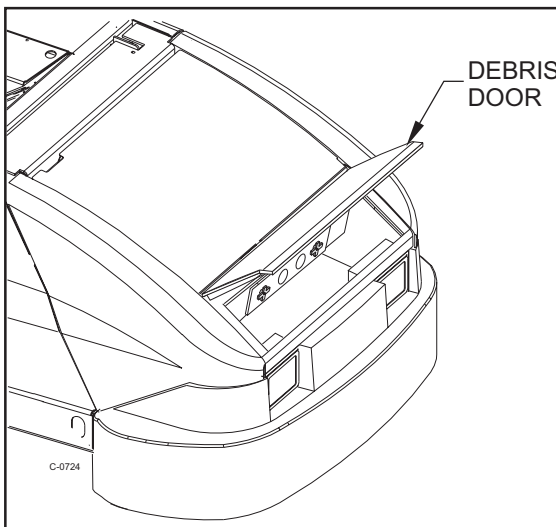
WARNING

To prevent injury, Do not turn on the brooms with the hopper raised.

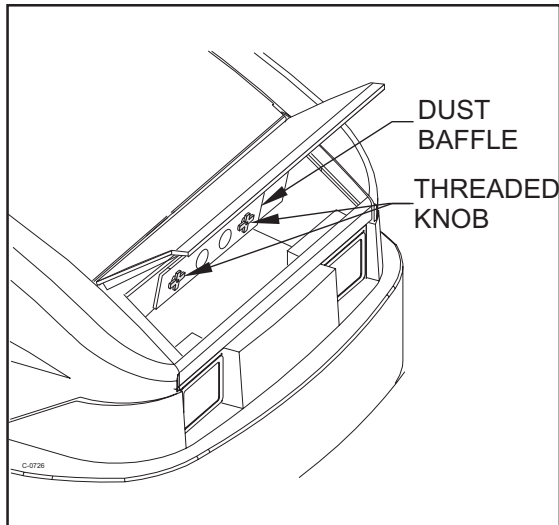
To lower the hopper after dumping, move the lever forward to the "LOWER" position until the hopper is fully lowered and seated in the sweeper, then release.

DEBRIS DOOR

The hopper debris door provides the operator with easy access to the hopper debris compartment for refuse disposal or visual inspection of the removable filter baffle and hopper debris compartment. The debris door must be closed while sweeping. Failure to close the door completely will cause poor dust control while sweeping.



C0724 FIGURE 19



C0726 FIGURE 20

DUST BAFFLE

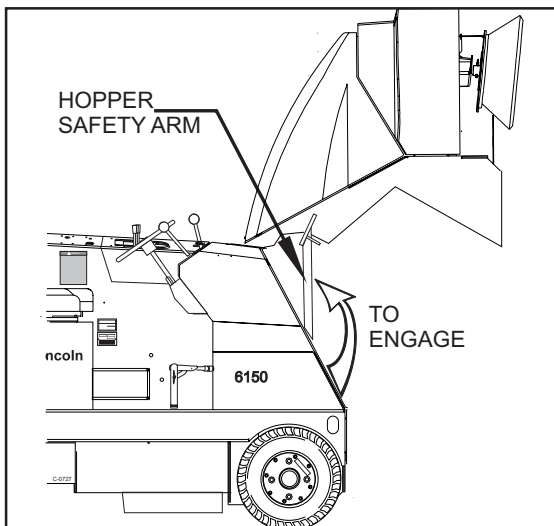
The dust baffle is located in the hopper and may be removed for cleaning. The dust baffle is mounted to the hopper with two threaded knobs for easy removal.

The debris door must be opened to gain access to the dust baffle.

Remove and clean the dust baffle when debris becomes lodged in the baffle passages.

To remove the baffle, turn the two threaded knobs counter-clockwise and lift the baffle off the studs.

To install the baffle, position the baffle on the studs and turn the two threaded knobs clockwise.



C0727 FIGURE 21

HOPPER SAFETY ARM

The hopper safety arm is located near the right front wheel well. The safety arm will prevent the hopper from dropping unexpectedly during service/maintenance.



WARNING

The Hopper Could Drop Unexpectedly And Cause Injury. Engage The Safety Arm Before Working Under Hopper.

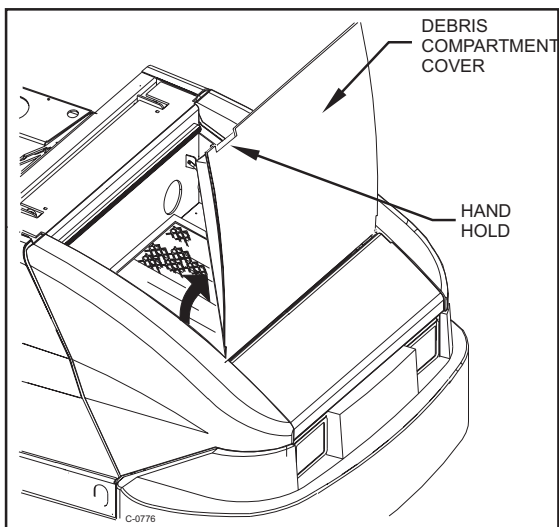


WARNING

For Safety Always Empty Hopper Before Servicing.

TO ENGAGE THE SAFETY ARM:

1. Empty hopper.
2. Set the parking brake.
3. Raise the hopper.
4. Lift safety arm to engage the slot on the hopper frame.
5. When work has been completed, replace the safety arm to the stowed position.



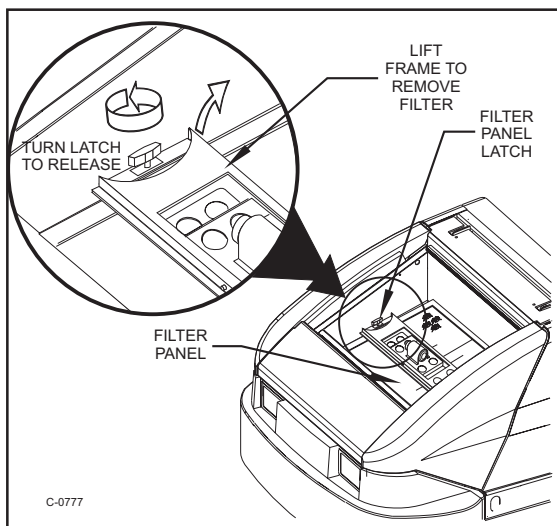
C0776 FIGURE 22

HOPPER FILTER COMPARTMENT COVER

The Hopper Filter Compartment Cover is located on the top of the hopper and opens forward for access to the filter compartment for service and inspection of the dust control filter and operational hopper temp sensor.

Use the hand hold provided to open the cover.

Inspect the cover gaskets daily. Replace any cover gaskets that show signs of deterioration. Failure to maintain the gaskets in serviceable condition will degrade dust control at the floor and will result in less than minimal sweeping performance.



C0777 FIGURE 23

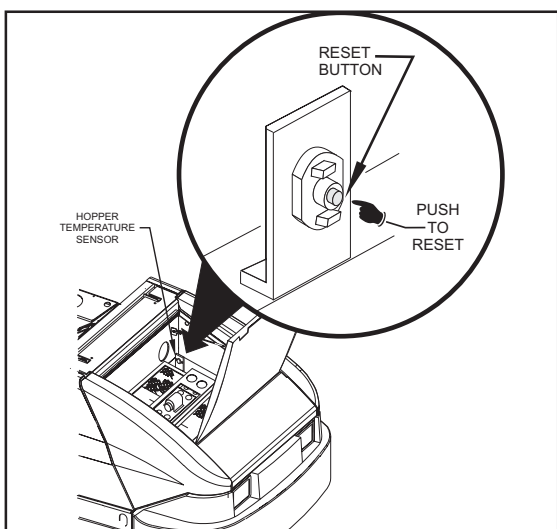
FILTER PANEL LATCH

The filter panel is located in the hopper filter compartment and will need to be removed periodically for cleaning or replacement. Removal of the filter panel requires no tools. The hopper cover must be opened to gain access to the filter compartment. The panel filter is held in place by a hinged frame and latch.

To remove the panel filter, turn the knob counter clockwise and lift the hinged frame.

The panel filter can now be lifted out and cleaned or replaced. (See Filter Cleaning Instructions in the Manual.)

To install the replacement panel filter, lower the frame and turn the knob clockwise to lock the filter in place.



C0778 FIGURE 24

HOPPER TEMP SENSOR (OPTION)

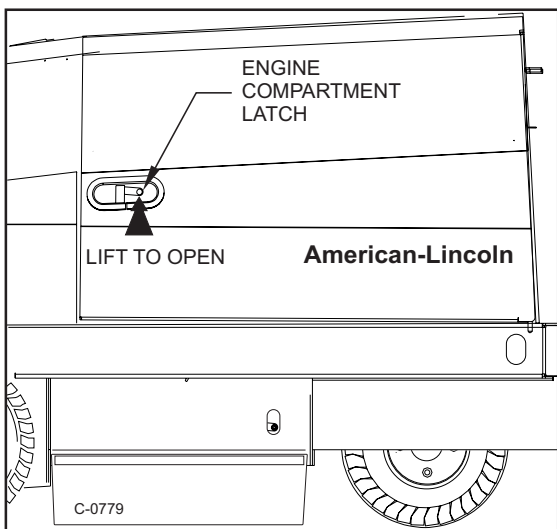
The temp sensor switch monitors the hopper air temperature near the vac fan. When the temperature of the air moving through the hopper exceeds 140°F the switch trips which turns off the dust control fan and illuminates the hopper temp light on the warning bank.

The hopper temp sensor is a resetable thermal switch which is located in the hopper filter compartment near the vacuum fan intake.

When the hopper temp light illuminates, carefully investigate for a possible fire in the hopper.

The sensor will not reset until the temperature in the hopper has dropped below 133°F.

To reset the temp sensor, press the reset button.



C0779 FIGURE 25

ENGINE COMPARTMENT LATCH

The engine cover encloses the entire engine, radiator and hydraulic reservoir assembly. The cover can be swung open to allow easy access to the engine and hydraulics for service or inspection.

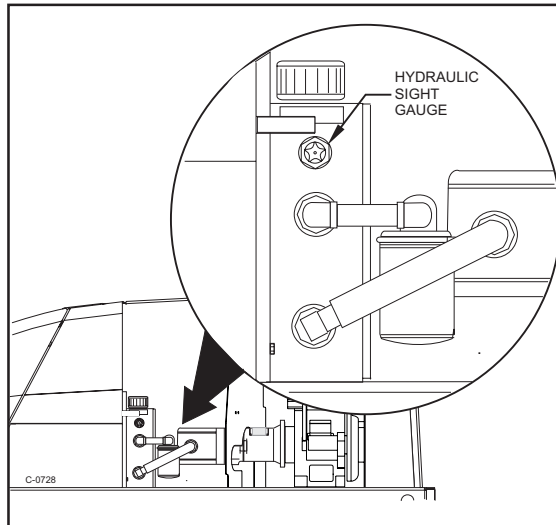


WARNING

Operate Only When Lids, Doors, And Access Panels Are Securely Closed.

To open the cover, lift the cover latch lever up. Swing the cover open.

The cover will latch automatically when the cover is closed. After closing the engine cover, check to be certain the latch has fully engaged.



C0728 FIGURE 26

HYDRAULIC RESERVOIR LEVEL SIGHT GAUGE

The sight gauge is located on the side of the hydraulic reservoir in the engine compartment. The sight gauge is used to indicate the level of fluid in the reservoir. Fluid level must be visible in the sight gauge when the hopper is in the down position.

MAIN BROOM COMPARTMENT DOORS

The main broom compartment doors are located behind the front tires on both sides of the sweeper. The doors provide access to the main broom for service or inspection.



WARNING

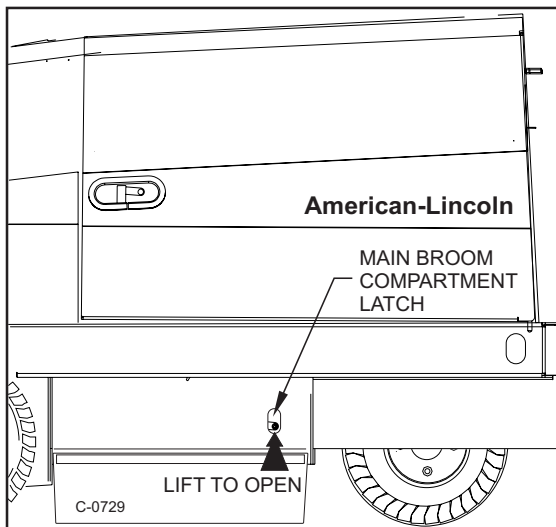
Operate Only When Lids, Doors, And Access Panels Are Securely Closed.

Open the right side door to remove or replace the main broom. The right side door is an integral part of the main broom drive system and must be closed for operation.

Open the left side broom door for inspection. Check the drive hub for banding and shrink wrap which have a tendency to get tangled in the broom driver.

To open the main broom door, reach inside the hole in the door and lift up on the latch handle.

The door latch will automatically engage when the door is closed.



C0729 FIGURE 27

SEAT COMPARTMENT COVER

The seat compartment cover opens to allow easy access to various components which will need to be inspected or serviced periodically. The cover opens forward and has a safety latch to hold the cover in the open position.

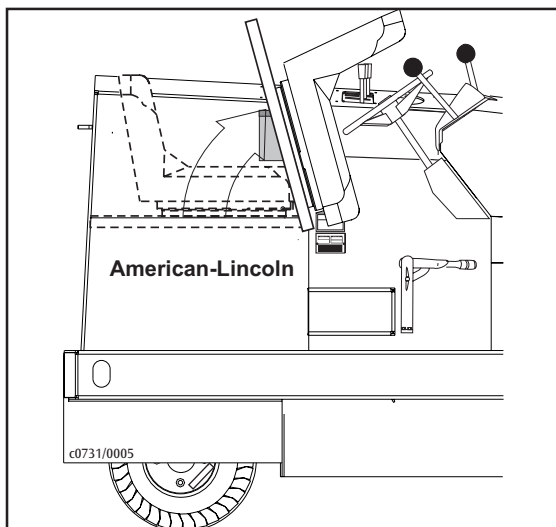


WARNING

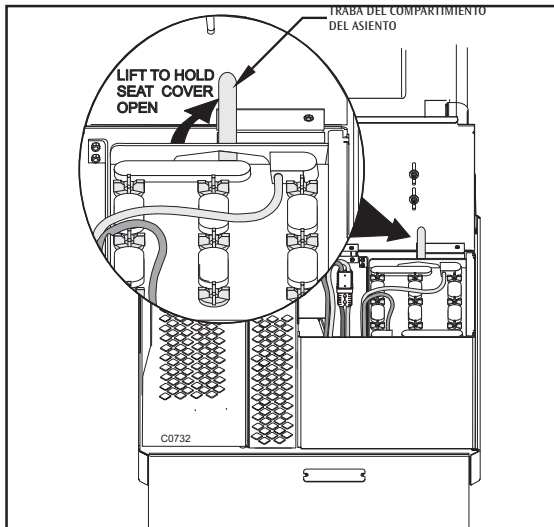
Lead acid batteries generate gases which can cause an explosion. Keep sparks and flames away from batteries. NO SMOKING. Charge batteries only in area with good ventilation and keep the seat cover open to vent explosive hydrogen gas.

On battery powered machines the compartment below the seat contains the charging connector for the batteries. Use the safety latch to hold the cover open while charging the batteries.

On Gas/Diesel/LP powered machines the seat compartment contains the fuel tank.



C0731 FIGURE 28



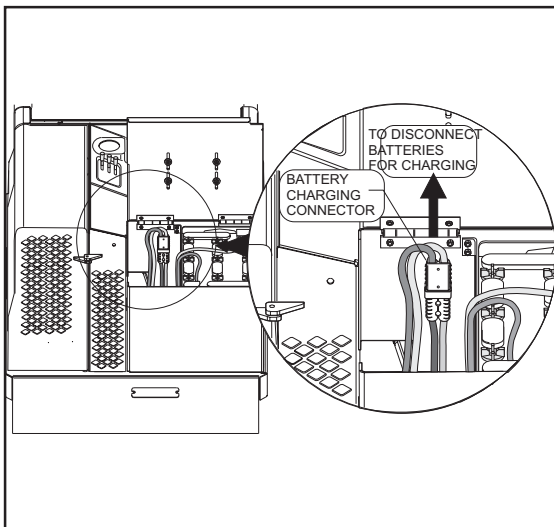
C0732

FIGURE 29

SEAT COMPARTMENT LATCH

The seat compartment latch is located under the seat compartment cover and is used to hold the cover open while charging the batteries.

To hold the seat compartment cover open, lift the latch to the vertical position and release the cover to rest on the latch.



C0730

FIGURE 30

BATTERY CHARGING CONNECTOR

The batteries on battery powered machines are connected to the machine through a heavy duty two conductor connector. The connector allows an easy method of disconnecting power to the machine for service or charging of the batteries.

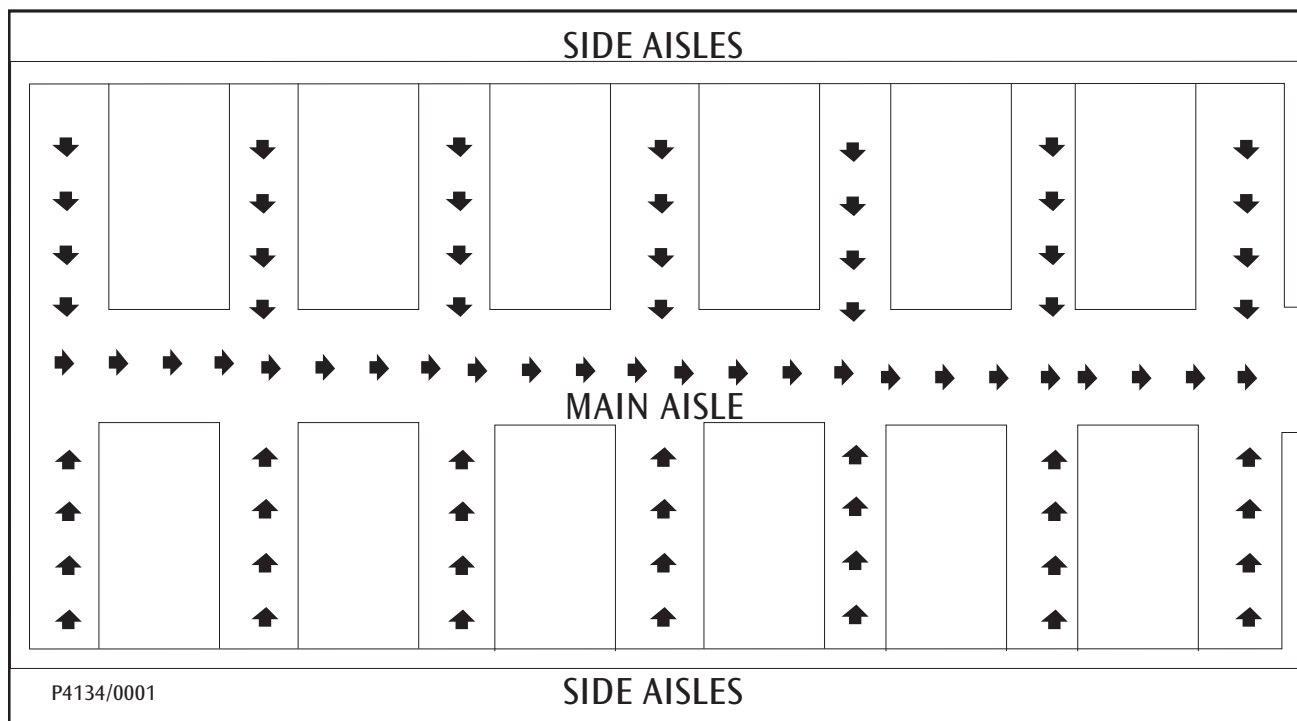
Plug the charger into the connector to charge the batteries.



WARNING

Disconnecting the battery connector with the key switch in the "I" position will cause sparks that could ignite explosive hydrogen gas generated by the batteries. To prevent serious injury or possible property damage, turn key switch to "O" position before disconnecting battery cable from machine charging or service.

HELPFUL HINTS FOR SWEEPING



P4134

FIGURE 31

HOW TO SWEEP

The sweeper is intended for use on hard relatively flat surfaces such as cement, asphalt, and wood block floors. Exercise care when maneuvering to keep wheels from dropping off curbs or into pot holes. Do not sweep over obstructions.



WARNING

Do Not Turn The Steering Wheel Sharply When The Machine Is In Motion. The Sweeper Is Very Responsive To Movement Of The Steering Wheel. Do Not Make Sudden Turns.

The sweeper is designated for dry sweeping conditions. Wet clay and muddy type material will adhere to surface of sweeping chamber and hopper. Sweeping performance will degrade if these surfaces are not kept clean. Large heavy objects such as bricks, large stone, and iron parts should not be swept. Damage to the main broom or other sweeping system components is possible. String, rope, wire or metal strapping longer than 18 inches should not be swept. These items have a tendency to wrap around moving parts. This can cause damage or degrade sweeping performance.

SWEEPING GUIDELINES

In actual sweeping, there is no single pattern that can be set forth in this manual. Each installation has its own conditions, and the operator can readily set his own pattern using these guidelines.

- Pick up large debris before sweeping with machine.
- Use the machine to sweep debris from narrow aisles into main aisle.
- After the machine has made a sweeping run, push the filter shaker control button for 20 to 30 seconds, the filter shakers will unload accumulated dust from the filter media.
- Sweep debris from main aisle.
- Overlap of broom paths when sweeping. This will eliminate leaving dirty patches.
- Empty hopper when the sweeper leaves debris, while sweeping
- Sweep in straight paths. Do not bump posts. Do not scrape the sides of the machine.

NOTE

**Replace main broom when bristles are worn to 1.75 inch (3.5 cm) length.
Replace side broom when bristles fail to sweep debris into the path of the main broom.**

SWEEPING VARIOUS TYPES OF DEBRIS

For heavy sand, dirt, or excessive scattered debris, travel slowly with machine to allow main broom to deliver best results. Do not expect a completely clean surface on the first pass under these conditions. Sometimes it is necessary to have extra broom pressure where debris is excessively heavy. See "Main Broom Adjustment" for information on adjusting broom to a "heavy" sweeping pattern. Material that adheres to the sweeping surface: This type of wet or sticky material will require more broom pressure.

BATTERY MACHINE OPERATION

Charge the batteries after operating the machine. See the battery charging instructions in the is manual. Use the pre-start check-list and follow the service chart for daily check points. Read and follow the safety precautions to assure safe, trouble free operation.



WARNING

Lead acid batteries generate gases which can cause an explosion. Keep sparks and flames away from batteries. NO SMOKING. Charge batteries only in area with good ventilation and keep the seat cover open to vent explosive hydrogen gas.



WARNING

Always wear eye protection and protective clothing when working near batteries. Remove all jewelry. Do not put tools or other metal objects across the battery terminals or the tops of the batteries.

GAS/LP/MACHINE OPERATION

See the LP instructions in this manual for fueling and service instructions on the LP fuel system and replacement of tanks. Use the pre-start check-list and follow the service chart for daily check points. Read and follow the safety precautions to assure safe, trouble free operation. Gasoline powered machines use regular grade unleaded gasoline. Turn the engine off before dispensing fuel into the gasoline powered machine.



WARNING

To prevent possible fire: Never fill fuel tank while engine is running. Always be sure gasoline container and sweeper are electrically grounded before dispensing gas. This can be done by permanently attaching an insulated wire with a battery clip on the end to the gasoline container.



WARNING

All internal combustion engines give off harmful fumes and gases while running. Do not start or run the engine in an enclosed area where the exhaust gases can accumulate. Avoid breathing these gases as they contain poisonous carbon monoxide which can endanger your health or life if inhaled steadily for even a few minutes.



WARNING

Check for gas odor before and during starting operations. If gas odor is noticed, stop and check for leaks or component malfunctions in the fuel system. Check fuel supply hoses for proper connection and signs of abrasion. Do not start engine when gas odor is present.



WARNING

Keep cigarettes, sparks, and open flame away when working on LP equipment, use caution when inspecting for gas leaks or when LP tanks are present.



WARNING

Do not run engine in an enclosed area. Exhaust gases contain carbon monoxide, an odorless and deadly poison. Do not operate the engine without adequate ventilation.

OPERATING INSTRUCTIONS

BEFORE STARTING

1. Set Parking Brake.
2. Make sure all controls are in the "Off" position.
3. Be sure accelerator and directional control pedal is in neutral.

PRE-START CHECK LIST

Before starting the engine, perform these pre-start checks.

1. Check engine air filter element indicator.
2. Check engine oil level.
3. Check radiator coolant level.
4. Check hydraulic fluid level.
5. Check fuel level.
6. Check all systems for leaks.
7. Check brakes and controls for proper operation.
8. Check broom patterns
9. Check to ensure that all covers, panels and access doors are securely closed.

NOTE

When Machine Has Been Stored In Below Freezing Temperatures, Run Engine At The "1" (low) Speed Setting With Machine Standing Still For 5 To 10 Minutes To Warm Engine And Hydraulic Oil.

TO START BATTERY MACHINES

Starting the battery powered models is accomplished by turning the key switch to the "I" (on) position. It is important to note that the batteries should be fully charged and serviced prior to using the machine.

TO CHARGE BATTERIES

Charge the batteries at the end of each day or when the battery condition meter indicates low battery voltage. The batteries need to be charged when the needle stays in the "red" zone while the machine is being operated. When charging batteries, only use the quick disconnect provided ensure correct polarity. Follow the "Battery Charging Instructions" provided in the service section of this manual.

TO START GAS ENGINE

Use the choke in extremely cold temperatures, (under 32 F. or 0 C.),

1. Pull choke if needed.
2. Set the engine speed switch to the "1" (low) Speed setting.
3. Turn key to "START" position until engine starts, then release. (The key switch will return to the "ON" position.)
4. Push in choke after engine starts running (If used).

TO START PROPANE ENGINE

Perform these checks in addition to the Pre-Start check list.

1. Check connections for leaks
2. Open the LP storage tank valve.
3. Check the regulator. Momentarily press fuel primer on the regulator cover to bleed air out of the system.
4. Set the engine speed switch to the "IDLE" (low) Speed setting.
5. Turn key to "START" position until engine starts, then release. (The key switch will return to the "ON" position.)

TO START DIESEL ENGINE

When starting the diesel engine, it should be noted that under no circumstances should Ether or any other starting fluids be used in conjunction with the glow plugs. Do not use the glow plugs for more than 60 seconds at a time or damage to the plugs may result. The key switch must be placed in the "ON" position before using the glow plug switch.

1. Perform the Pre-Start checks found previously in this manual.
2. Turn the ignition switch to the "ON" position and place the engine speed switch to the high speed (2) position.
3. Push and hold the glow plug switch for approximately 30 seconds. Under cold starting conditions, the glow plug switch may be held longer but do not hold the switch for more than 60 seconds to prevent damage to the glow plugs.
4. Turn the key switch to the start position and hold until engine starts. If the engine does not start immediately, release the key switch after 15 seconds to prevent damage to the starter.
5. Release the glow plug switch when the engine starts.

TO DRIVE SWEEPER FOR TRANSPORT

1. Ensure the main broom lever and the side broom lever are in "UP" position with all other sweeping controls in the "OFF" position.
2. Release the parking brake.
3. Place the engine speed switch in the "1" or "2" position.
4. Push forward on the foot pedal to start the sweeper moving.
5. Vary your foot pressure on the pedal to obtain the desired speed.
6. To stop, allow the foot pedal to return to the centered position. (Pedal will return to neutral when pressure is released)



WARNING

Do Not Turn The Steering Wheel Sharply When The Machine Is In Motion. The Sweeper Is Very Responsive To Movement Of The Steering Wheel. Do Not Make Sudden Turns.



WARNING

Machines Can Ignite Flammable Materials And Vapors. Do Not Use With Or Near Flammables Such As: Gasoline, Grain Dust, Solvents And Thinners.

TO SWEEP WITH THE MACHINE

1. Move the broom control lever to the "ON" position.
2. Lower the side and main broom to the floor. (The main broom control may be placed in either the "FLOAT" or "SWEEP" position).
3. Press the Dust Control Switch to the "ON" position.
4. Push forward on directional control pedal to place machine in motion.
5. Vary foot pressure on the directional control pedal to obtain desired travel speed.
6. Read the "Helpful Hints for Sweeping" in this manual for tips on maximizing sweeping performance.



WARNING

Stop And Leave This Machine On A Level Surface. When You Stop The Machine, Put The Key Switch In The "OFF" Position And Engage The Parking Brake.

TO STOP SWEEPING

1. Allow directional control pedal to return to neutral (centered) position. (Pedal will automatically return to neutral when foot pressure is released.)
2. Depress the foot brake.
3. Press the Dust Control Switch to the "OFF" position..
4. Place the broom controls (Side and Main) in the "UP" position.
5. Move the Broom Control lever to the center "OFF" position.
6. Push engine speed switch to the "IDLE" position.
7. Set parking brake.

OPERATING INSTRUCTIONS

TO EMPTY DEBRIS HOPPER

1. Press the engine speed switch to the "1" (Normal) or "2" (High) position.
2. Engage parking brake.
3. Move the Hopper Dump door lever to the "CLOSE" Position until door is closed.
4. Move the hopper lift lever to the "RAISE" position until the hopper reaches the desired height.
5. Disengage Parking Brake.
6. Drive forward slowly with the hopper raised to clear refuse container before opening the hopper dump door.
7. Engage Parking Brake.
8. Push the hopper dump door lever forward to the "OPEN" position. This will allow debris in the hopper to fall out into the refuse container.
9. Move the hopper dump door lever to the "CLOSE" Position until door is closed.
10. Disengage Parking Brake. •
11. Drive in reverse slowly to clear the refuse container.
12. Engage Parking Brake.
13. Move the hopper lift lever forward to the "LOWER" position and hold until hopper is seated in place.
14. Move the hopper dump door lever to the "OPEN" position until the dump door opens.



WARNING

Do Not Turn off the engine with the hopper in the lifted position.

NOTE

After Stopping The Engine, Perform These Post Operation Checks.

POST OPERATION CHECK LIST

1. Clean debris hopper.
2. Check sweeping brooms for wear or damage.
3. Check all flaps for wear, damage and adjustment.
4. Fill the fuel tank.
5. Check all systems for leaks.
6. Close the LP storage tank valve. (LP Powered machines only)



WARNING

The Gasoline Tank Fill Cap Is Located Behind The Drivers Seat, Do Not Mistake The Hydraulic Reservoir For The Gasoline Tank.

BATTERY CHARGING INSTRUCTIONS

Charge the batteries at the end of each day or when the battery condition meter indicates low battery voltage. The batteries need to be charged when the needle stays in the "red" zone while the machine is being operated. When charging the batteries, only use the quick disconnect provided ensure correct polarity.

Check the liquid level in the batteries at least once a week and add water when low. Use only distilled water. Fill the batteries after charging the batteries to prevent electrolyte from spilling over on the tops of the batteries during the charging process.



WARNING

The use of an extension cord with the charger should be avoided. Risk of fire and electrical shock is possible if the wrong type or size extension cord is used. If an extension cord must be used, only use a three conductor number 12 AWG cord with ground, properly wired, in good electrical condition and keep it as short as possible. Locate all cords so that they cannot be stepped on, tripped over, or otherwise subjected to damage or stress.

BATTERY CHARGING INSTRUCTIONS - cont.



WARNING

Verify that the AC power source to which the charger is to be connected is capable of supplying the current specified on the charger nameplate.



WARNING

Keep all charger ventilation holes at least 2 inches away from walls or other objects. Do not allow vent holes to become obstructed.



WARNING

Do not operate charger that has been damaged or shows physical signs of damage. Have charger serviced by a qualified professional repair person.



WARNING

Lead acid batteries generate gases which can cause an explosion. Keep sparks and flames away from batteries. **NO SMOKING.** Charge batteries only in area with good ventilation and keep the top cover open while charging batteries. Do not disconnect the charger from the batteries before disconnecting the AC power cord. Disconnecting the battery cable with the charger plugged in could cause an explosion.



WARNING

Disconnecting the battery connector with the key switch in the "I" position will cause sparks that could ignite explosive hydrogen gas generated by the batteries. To prevent serious injury or possible property damage, turn key switch to "O" position before disconnecting battery cable from machine for charging or service.

MACHINE STORAGE

GASOLINE POWERED MACHINES

Machines to be stored over 30 days should be completely drained of fuel to prevent gum deposits forming on essential carburetor parts, fuel filter and tank.

The use of a fuel additive, such as STA-BIL, or an equivalent, will minimize the formation of fuel gum deposits during storage. Such an additive may be added to the gasoline in the fuel tank of the engine.

The following procedure should be used to prepare the machine for storage:

1. All fuel should be removed from the tank. Run the engine until it stops from lack of fuel.
2. While engine is still warm, drain oil from the crankcase. Refill with fresh oil.
3. Remove spark plug, pour approximately 1/2 ounce (15 grams) of engine oil into cylinder and crank slowly to distribute oil. Replace spark plug.
4. Store in a clean and dry area.

BATTERY POWERED MACHINES

All wet batteries will slowly discharge on standing and will discharge much faster when warm than when cold. At normal temperature of 80°F (26°C) loss of capacity by self-discharge, starting with a fully charged battery, may amount to an average of .001 specific gravity per day over a 30 day period. The battery should be given a booster charge when a specific gravity falls .040.

Do not discharge the batteries excessively. Excessive discharge can cause polarity reversal of the individual cells in the battery which will lead to complete failure of the batteries.

Use a hydrometer to monitor the specific gravity of the individual cells in the batteries. When checking the specific gravity of the batteries, you should not see a large difference between individual cells. The batteries may need to be replaced if the battery shows a significant difference of specific gravity between the cells.

The specific gravity of the electrolyte should measure 1.285 when fully charged. Check items for proper operation. If service is required, please contact an authorized American Lincoln distributor.

ORDERING PARTS

Parts may be ordered from American-Lincoln authorized distributors. Record the information from the American-Lincoln serial plate to avoid delays in filling your order:

Model:	Serial No.:
Part No.:	Code:
Fuel:	Rated Power:
IPX3	
Weight:	
	
	
	

- 1. Use the model number, catalog number, and serial number when ordering.
- 2. Give the part number, description, and quantity of parts needed.
- 3. Give shipping instructions for either freight, UPS, or parcel post.

Parts and supplies listed in this manual can be ordered from the following address:

Nilfisk-Advance, Inc. American-Lincoln Div.	American-Lincoln authorized distributor
14600 21st Avenue North Plymouth, MN 55447 1-800-214-7700	

MACHINE CATALOG NUMBERS

576-502 Battery Sweeper (Battery & Charger not included)

