CROSSWIND SERIES J

OPERATORS MANUAL

Sweeper Serial Number______________________________

Chassis Serial Number______________________________

Elgin Sweeper Company
Subsidiary of Federal Signal Corporation
1300 West Bartlett Road, Elgin Illinois 60120
Phone 847/741-5370

P/N 0701425-A
Welcome to the Best Recirculating Air Sweeper Available
The Elgin Crosswind® Series J

This manual will assist in the proper operation and care of the Elgin Crosswind Series J Sweeper. It contains specific information on features and specifications, suggested operating techniques, preventive maintenance hints and instructions for making repairs and adjustments.

Read this manual carefully and completely before operating the sweeper. Working with unfamiliar equipment can lead to accidents. **Understand and follow all safety information when operating the sweeper.**

Elgin employees carefully inspected the sweeper before it left the factory. Your Elgin equipment dealer inspected the sweeper and made certain that it was in proper working order prior to delivery.

To keep the Crosswind sweeper in good working condition, it is important to follow all maintenance and service schedules, including

- **DAILY SERVICE** - After every shift or 10 hours
- **PERIODIC SERVICE** - After each period of 50, 150, 500 or 1000 hours

Refer to the maintenance schedule in the Maintenance Section. This schedule is also displayed on the sweeper.

Keep this manual in a convenient place for reference. If a problem develops with the sweeper, your Elgin Dealer has the factory-trained service personnel, genuine Elgin parts and necessary tools and equipment to meet your specific needs.

If you should need to contact the factory regarding operation, maintenance or repair, please feel free to call Elgin at 847/741-5370.
LIMITED WARRANTY

Each machine manufactured by ELGIN SWEEPER COMPANY (“ESCO” or the “Company”) is warranted against defects in material and workmanship for a period of 12 months provided the machine is used in a normal and reasonable manner. This limited warranty is applicable only to the original user-purchaser for a period of twelve (12) months (as measured from the date of delivery to the original user-purchaser) and is not transferable.

During the Limited Warranty Period ESCO will cause to be repaired or replaced, as the Company may elect, any part or parts of such machine that the Company’s examination discloses to be defective in material or workmanship. Repairs or replacements are to be made at the selling Elgin distributor’s location or at other locations approved by ESCO.

The ESCO Limited Warranty shall not apply to:

1. Major components or trade accessories such as, but not limited to, trucks, engines, hydraulic pumps and motors, tires and batteries that have a separate warranty by the original manufacturer.
2. Normal adjustments and maintenance services.
3. Normal wear parts such as, but not limited to, brooms, oils, fluids, filters, broom wire, shoe runners, rubber deflectors and suction hoses.
4. Failures resulting from the machine being operated in a manner or for a purpose not recommended by ESCO.
5. Repairs, modifications or alterations without the express written consent of ESCO, which, in the Company’s sole judgment, have adversely affected the machine’s stability, operation or reliability as originally designed and manufactured.
6. Items subjected to misuse, negligence, accident or improper maintenance.
*NOTE* The use in the product of any part other than parts approved by ESCO may invalidate this warranty. ESCO reserves the right to determine, in its sole discretion, if the use of non-approved parts operates to invalidate the warranty. Nothing contained in this warrant shall make ESCO liable for loss, injury or damage of any kind to any person or entity resulting from any defect or failure in the machine.

TO THE EXTENT LIMITED BY LAW, THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

This warranty is also in lieu of all other obligations or liabilities on the part of ESCO, including but not limited to, liability for incidental and consequential damages on the part of the Company or the seller. ESCO makes no representation that the machine has the capacity to perform any functions other than as contained in the Company's written literature, catalogs or specifications accompanying delivery of the machine. No person or affiliated company representative is authorized to alter the terms of this warranty, to give any other warranties or to assume any other liability on behalf of ESCO in connection with the sale, servicing or repair of any machine manufactured by the Company.

ESCO reserves the right to make design changes or improvements in its products without imposing any obligation upon itself to change or improve previously manufactured products.

ELGIN SWEEPER COMPANY, 1300 West Bartlett Road, Elgin, Illinois 60120, U.S.A.
# Table of Contents

## Safety
- General ................................................................. S-1
- Crosswind Safety Labels ........................................... S-9

## Description
- Elgin Crosswind Series J ........................................... D-1
- Crosswind Left Side View ......................................... D-2
- Crosswind Right Side View ....................................... D-3
- Crosswind Rear View ............................................... D-4
- Principles of Operation
  - Why Sweep? ..................................................... D-5
  - Crosswind Recirculating Air Sweeper ......................... D-5
  - Water Spray .................................................... D-7
  - Brooms .......................................................... D-7
  - Pickup Head .................................................... D-8
  - Hopper .......................................................... D-8
  - Controls ........................................................ D-9
- General Data ....................................................... D-10

## Operation
- Control Console ................................................... O-1
- Startup Checklist ................................................ O-8
- Operating The Auxiliary Engine ................................. O-13
- Starting Auxiliary Engine ....................................... O-13
- Cold Weather Starting .......................................... O-14
- Shutting Down The Auxiliary Engine ......................... O-15
- Automatic Engine Shutdown ..................................... O-16
- Raising Hopper .................................................... O-16
- LCD Screens ....................................................... O-20
- Indicator Lights And Icons ...................................... O-23
- Transporting ....................................................... O-23
- Sweeping ............................................................ O-25
  - Preparation For Sweeping .................................... O-25
  - Sweeping Path ................................................ O-31
  - Sweeping Tips ................................................ O-32
  - Centerboard .................................................. O-33
  - Vacuum Enhancer .............................................. O-34
  - Large Pieces of Debris ...................................... O-35
  - Optional Side Air Blast .................................... O-35
- Dumping the Hopper .............................................. O-36
- At End Of Shift .................................................... O-38
- Washdown .......................................................... O-39
- High Pressure Washdown (Option) ............................. O-43
- Low Pressure Washdown (Option) ............................. O-45
Deluge (Option) ..................................................O-46
Wandering Hose (Option) ..................................O-48

Maintenance
 Daily / Every Shift / Every 10 Hours..........M-1
 Every 50 Hours ................................................M-2
 Every 150 Hours .............................................M-3
 Every 500 Hours / 6 Months ...............M-3
 Every 1000 Hours / 1 Year ...................M-4

Service Procedures
 Towing ...........................................................SP-1
 Auxiliary Engine .........................................SP-2
 Air Cleaner ..................................................SP-2
 Auxiliary Engine Fluids .......................SP-5
 Draining Water From Fuel Filters ..........SP-6
 Changing the Fuel Filters .....................SP-7
 Bleeding Fuel System ............................SP-8
 Regenerative Air System .........................SP-8
 Correcting Air Leaks ...............................SP-10
 Correcting Obstruction .........................SP-11
 Fan Assembly .............................................SP-11
 Impeller Inspection .................................SP-11
 Impeller Cleaning .................................SP-12
 Fan Lubrication .......................................SP-12
 Seal Inspection .........................................SP-13
 Impeller Balance .................................SP-13
 Power Belt Adjustment .........................SP-14
 Pickup Head ............................................SP-15
 Standard Pickup Head .........................SP-17
 Front Curtain Replacement .................SP-17
 Rear Curtain Replacement .................SP-17
 Dirt Shoe Adjustment .........................SP-20
 Suspension Adjustment ....................SP-22
 Pressure Slot Width ..............................SP-24
 Replacing Optional Center Broom ..........SP-25
 FSX Pickup Head ................................SP-27
 Front Curtain Replacement .................SP-27
 Rear Curtain Replacement (FSX) ..........SP-28
 Slot Curtain Replacement ...............SP-29
 Dirt Shoe Adjustment (FSX) ...............SP-31
 Suspension Adjustment (FSX) ............SP-32
 “J” Plate Adjustment .........................SP-34
 Pressure Slot Width (FSX) .................SP-35
 Deflector Adjustment .....................SP-36
 Adjusting Optional Caster Wheels ....SP-38
 Brooms ......................................................SP-39
 Broom Patterns .................................SP-39
 Correcting Side Broom Pattern .........SP-41
Correcting Center Broom Pattern ..........SP-45
Changing the Side Broom .....................SP-46
Hopper ..................................................SP-46
Spray Water System .............................SP-48
Hydraulic System .................................SP-50
Oil Level ..............................................SP-50
Hydraulic Pumps ....................................SP-52
Hydraulic Oil Filter ...............................SP-53
Storage ...............................................SP-53
Winter Storage ....................................SP-53
Start-Up After Storage .........................SP-57
Fault Table ..........................................SP-59
Gauges, Instruments, And Menus ...........SP-66
Initial Tests .........................................SP-66
Indicator Lights And Icons ..................SP-67
LCD Screens ........................................SP-67

Troubleshooting

Glossary
SAFETY INFORMATION

RECOGNIZE SAFETY INFORMATION

⚠️ This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

UNDERSTAND SIGNAL WORDS

A signal word – DANGER, WARNING, or CAUTION – is used with the safety-alert symbol. DANGER identifies the most serious hazards.

This symbol and these signal words appear on the machine and in the operator’s manual. Read and understand the following definitions of the signal words before operating or working on the machine.

⚠️ DANGER DANGER is used to indicate the presence of a hazard which will cause severe personal injury, death, if the warning is ignored.

⚠️ WARNING WARNING is used to indicate the presence of a hazard which can cause severe personal injury or death, if the warning is ignored.

⚠️ CAUTION CAUTION is used to indicate the presence of a hazard which will or can cause minor personal injury, if the warning is ignored.

NOTICE NOTICE indicates installation, operation, or maintenance information which is important but not hazard-related.
CALIFORNIA PROPOSITION 65 WARNING

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

Please note this warning and remember:
• Always start and operate the engine in a well-ventilated area;
• If in an enclosed area, vent the exhaust to the outside;
• Do not modify or tamper with the exhaust system.

FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual and on your machine safety signs.

Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your Elgin Sweeper dealer.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate the machine without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your Elgin Sweeper dealer.
WEAR APPROPRIATE CLOTHING/PROTECTION

Wear close fitting clothing and safety equipment appropriate to the job. Exercise caution with anything that could be caught in the machinery, such as jewelry and long hair.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating the machine. Use caution while using a cellular telephone while operating the equipment.

Always wear appropriate protection to meet any applicable industry standard or regulations.

DRIVING THE SWEEPER

Operate the sweeper only when all guards are fitted and in their correct position.

Before moving the machine, check the immediate vicinity of the machine for bystanders. Use the horn as a warning immediately before moving the machine.

For speeds over 25 mph (40 km/h), the sweeper must be operated from the primary driving position (left-hand or right-hand) that is standard in the country where you are driving. Operating at these speeds from the other driving position can result in severe injury or property damage. While the driver is changing driving position, the sweeper must be stopped with the gearshift in neutral and the parking brake applied.

HANDLE FUEL SAFELY — AVOID FIRES

Handle fuel with care. It is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks.
Always stop the engines before refueling the machine. Fill the fuel tank outdoors.

Prevent fires by keeping the machine clean of trash, grease, and debris. Always clean up spilled fuel.

**AVOID CONTACT WITH MOVING PARTS**

Everyone must be clear of the sweeper before the engine is started and before the brooms are started.

Many moving parts, such as the side brooms, cannot be completely shielded, due to their function. Stay clear of these moving elements during operation.

Keep hands, feet, and clothing away from power driven parts.

**AVOID MACHINE INSTABILITY**

Parking brake must be set before raising or tilting the hopper.

If applicable, make sure the hopper door is open before the hopper is raised or tilted.

Raise or tilt the hopper only when the sweeper is parked on firm, level surfaces.

Lower the hopper to transport position before moving the machine.

**PARK SWEEPER SAFELY**

Set the parking brake, turn off the engine, and remove the keys.

Be sure the hopper is down before leaving the sweeper.
AVOID OVERLOADS

Observe the maximum permissible axle loads and total weights.

AVOID ELECTRICAL POWER LINES

Do not raise the hopper while under power lines.

Do not raise the hopper while under trees, bridges, etc.

Lower the hopper to transport position before moving the machine.

PRACTICE SAFE MAINTENANCE/REPAIRS

Keep the area clean and dry. Remove any build-up of grease, oil, or debris.

Never lubricate or service the machine while it is moving. Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts.

Make sure all maintenance and repairs are completed by qualified and authorized personnel. All applicable industry standards and practices and regulations must be followed during maintenance and repairs.

Make sure the parking brake is set, before you do any work on the sweeper.
PREVENT BATTERY EXPLOSIONS

Battery gas can explode. Keep sparks and flames away from batteries. If battery electrolyte level must be checked, use an electric light.

Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Always remove the grounded (−) battery cable first and connect it last.

Do not charge a frozen battery; it may explode. Warm the battery to 60°F (16°C).

AVOID OVERLOADING ELECTRICAL SYSTEM

Before modifying, adding, removing, etc. any electrical/electronic component(s), verify that the circuitry and components do not overload the electrical system.

Contact your Elgin Sweeper dealer, if you have any questions or need assistance.
AVOID HIGH PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin, causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other high pressure lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids. If accident occurs, seek immediate medical attention.

Keep hands and body away from pinholes and nozzles which eject fluids under high pressure.

USE PROPER TOOLS

Use tools appropriate to the work. Make-shift tools and procedures can create safety hazards.

Use power tools only to loosen threaded parts and fasteners.

For loosening and tightening hardware, use the correct size tools. DO NOT use U.S. measurement tools on metric fasteners, or vice versa. Avoid bodily injury caused by slipping wrenches.

Use only service parts meeting Elgin Sweeper specifications.
TIRES AND RIMS

An inflated tire and rim can be very dangerous if improperly used, serviced or maintained. To avoid serious injury, never attempt to re-inflate a tire which has been run flat or seriously underinflated without first breaking down the tire and wheel assembly for inspection. Do not attempt to add air to tires or replace tires or wheels without first taking precautions to protect persons and property. For details see the regulations of the Occupational Safety and Health Administration (OSHA).

Never use a ring or other rim parts of different manufacture or any different size or type than original rims.

OBSERVE ENVIRONMENTAL PROTECTION REGULATIONS

Be mindful of the environment and ecology.

Before draining any fluids, find out the correct way to dispose of them.

Observe the relevant environmental protection regulations when disposing of oil, fuel, coolant, brake fluid, filters, and batteries.
Safety decal locations - Right side of Crosswind J
Safety decal locations - Left side of Crosswind J
SAFETY

1. **WARNING**
   - **Moving Parts**
     - Contact can cause severe injury.
     - Do not attempt repairs or go underneath machine with engine(s) running. Use extreme care when making checks or adjustments that require the engine(s) to be running.

   - **Tilting Hopper**
     - Can cause severe injury.
     - Position safety bar in raised hopper position before going under hopper shell. Check hydraulic system per maintenance schedule.

   - **Raising Loaded Hopper with Hopper Door Closed**
     - Can cause severe injury or property damage.
     - Refer to maintenance chart for daily and scheduled servicing.

   - **Open hopper door before raising hopper to empty contents.**

   - **To avoid possible injury or property damage, read the operator's manual before using this machine.**

2. **CAUTION**
   - **Hinged Screen**
     - Unsecured hopper screen panel can cause injury.
     - Keep ends secured with provided fasteners. Stand clear of screen swing path and support unsecured end(s) during cleaning.

   - **To avoid possible injury or property damage, read the operator's manual before using this machine.**

   - **Maintenance and repairs must be done by authorized personnel only.**

3. **WARNING**
   - **Hinged Door**
     - Unlatched hopper door can cause injury.
     - Secure the hopper door in the latched position before moving behind or inside hopper.

   - **Open hopper door before raising hopper to empty contents.**

   - **To avoid possible injury or property damage, read the operator's manual before using this machine.**

   - **Maintenance and repairs must be done by authorized personnel only.**

4. **CAUTION**
   - **Rotating Broom**
     - Can cause personal injury.
     - Do not step on side broom while rotating or at rest.

5. **No Step**

6. **CAUTION**
   - **Moving Pickup Head**
     - Can cause personal injury.
     - Keep hands and feet away from pickup head.

7. **CAUTION**
   - **Rotating Broom**
     - Can cause personal injury.
     - Do not step on side broom while rotating or at rest.
SAFETY

8

WARNING

Before operating this machine, read the operator's manual. Also read the operator's instructions found on or behind the sun visor.

9

WARNING

Operating unit over 25 mph from right hand position can result in severe injury or property damage. Use normal left hand position for speeds above 25 mph. Refer to maintenance chart for daily and scheduled servicing.

10

WARNING


11

DANGER

Hazardous voltage. Machine contact with power lines will cause severe injury or death. Raise or dump hopper in areas free of power lines. See operator's manual.

12

WARNING


13

WARNING

Moving Parts. Contact can cause severe injury. Do not attempt repairs or go underneath machine with engine(s) running. Use extreme care when making checks or adjustments that require the engine(s) to be running. To avoid possible injury or property damage, read the operator's manual before using this machine. Maintenance and repairs must be done by authorized personnel only.
**SAFETY**

**CAUTION**

14

Moving Parts. Contact with impeller can cause severe injury.

Stop auxiliary engine before removing impeller cover.
Keep cover secured in place unless servicing.
Inspect impeller for wear weekly.

To avoid possible injury or property damage, read the operator's manual before using this machine.

Maintenance and repairs must be done by authorized personnel only.

15

CAUTION

Pressurized Hydraulic Reservoir. Opening fill cap before venting can cause personal injury.

Vent hydraulic reservoir pressure by depressing button on top of fill cap.

16

Door Prop

17

WARNING

Tilting hopper with engine side access doors open.
Can cause severe injury.
Make sure doors are properly latched before raising hopper.

18

CAUTION

(Only with deluge + inspection door)

Flushing Hopper With Inspection Doors Open Can Cause Personal Injury.

Make sure inspection doors are closed & latched before using hopper deluge system.
ELGIN CROSSWIND® Series J Recirculating Air Sweeper

efficiently cleans large, flat, paved areas such as streets, parking lots and runways. It has a side broom on one or both sides to increase total sweeping path. Side brooms also help to bring debris out of the gutter and into the path of the pickup head.
WHY SWEEP?

Street sweeping is an essential part of sanitation. In health, ecology and aesthetics, the community benefits from clean streets. Clean streets reduce dust and dust-borne contaminants, bacteria from decomposition of organic matter, pollutants entering storm water systems and accidents due to debris in the roadway. Community pride is enhanced by a clean environment. People are less likely to litter in a clean area. Tourists have a positive first impression of the community, which may encourage them to stay longer and return more often.

CROSSWIND RECIRCULATING AIR SWEEPER

The Crosswind J impeller moves air through the sweeper to form a continuous loop of air (Figure D-1). Air is blown down the pressure hose and through the pressure slot, creating turbulence across the pickup head, lifting the debris from the street. Air and debris are pulled up the suction hose and spun around in the hopper to separate the debris. The air stream travels into the impeller and is forced back down the pressure hose. By recirculating the air instead of venting it to the outside, a minimum of dust is returned to the environment.
WATER SPRAY

A water spray system controls dust during sweeping. Three nozzles spray water ahead of each side broom to moisten the dust being swept by the brooms. Seven more nozzles are located in the pick-up head, three in the suction tube, and five at the optional center broom.

The flow of water to the nozzles is started and stopped by switches at the control console. A standard 240-gallon (908 L) tank (Figure D-2) supplies the water, and one or two optional 140-gallon (530 L) tanks can be added.

BROOMS

Side brooms sweep the debris on the street into the path of the pickup head. These brooms are located on the right and left sides of the Crosswind in front of the head. For sweeping the brooms are lowered and rotated to move gutter debris to the head. The brooms can also be moved in during sweeping to scrub in front of the head or to avoid obstructions next to the sweeper.

The pattern that the brooms produce when the sweeper is stationary is a tool to evaluate the most efficient positioning of the brooms. The brooms can be adjusted to produce the best pattern.
An optional center broom (Figure D-3) can be mounted at the rear of and parallel to the pickup head. The center broom further assists in directing the debris into the pickup head and improves sweeping performance.

**PICKUP HEAD**

The pickup head removes debris from the pavement by action of the air stream. The head itself is adjusted to remain above the pavement, but pavement contact is maintained by rubber curtains in the front and rear of the pickup head and metal dirt shoes on the sides.

Debris moves across the pickup head, up the suction hose and into the hopper.

A rubber deflector called a centerboard is mounted under the Crosswind to keep debris swept by the side brooms in the path of the pickup head.

**HOPPER**

Debris is collected in the 8.0 cu. yd. (6.1 m³) hopper. Heavier debris falls into the hopper as the air circulates through the hopper. The air then goes through a screen and is deflected downward. Very light dust is separated by centrifugal force as the air flows through a centrifugal dust separator.
A door at the rear of the hopper opens to allow the debris to be dumped out of the hopper. The hopper is tilted toward the back to facilitate dumping. After dumping the hopper should be washed down for maximum efficiency and long life.

**CONTROLS**

All sweeping functions, including brooms and hopper, are powered by an auxiliary engine. This engine shares a fuel tank with the truck engine, but is otherwise independent of it. An optional auxiliary hydraulic lift system allows the hopper and pickup head to be raised and lowered, brooms rotated, and hopper door opened and closed without running the auxiliary engine.

Control of the sweeping components is accomplished at the control console (Figure D-4) in the cab. Indicator lights and gauges monitor the status of the auxiliary engine, fuel supply, electrical system, hopper, and spray water supply. Switches and knobs on the console control operation of the brooms, pickup head, lights, spray water system, hopper, and engines.

The auxiliary engine will automatically shut down, if engine temperature goes too high or oil pressure goes too low.

![Control Console](Figure D-4)
GENERAL SPECIFICATIONS
Sweeping Paths
  Pick-up Head Only ................. 90 in. (2286 mm)
  Pick-up Head & One Broom..... 117 in. (2971 mm)
  Pick-up Head & Two Brooms... 144 in. (3658 mm)
Travel Speed......................... Up to highway speed

BLOWER
Drive........................ Direct 5-groove banded power belt with adjustable idler pulley
Speed .............................................. 4000 RPM
Blower Rating..................... 20,000 CFM (567 m³/min)

PICK-UP HEAD
Length ........................................... 90 in. (2286 mm)
Hose Diameters
  Pressure ........................................ 14 in. (355 mm)
  Suction ...................................... 12 3/4 in. (324 mm)
Head Area .................. Approx. 2700 in² (17,420 cm²)

SIDE BROOM
Mounting.......................... Free floating trailing arm
Diameter................................. 42 in. (1067 mm)
Drive........................................... Hydraulic motor, protected by relief valve
Motion............................. Pneumatically raised/lowered, inward/outward
Speed .................................................. Constant
Digging .... Pressure/wear control pneumatic in cab
Sweep Position ................. Fully extended or in front of pick-up head
Type................................. Segment set disposable

DEBRIS HOPPER
Volumetric Capacity ..................... 8 yd³ (6 m³)
Effective Dump Angle .................. 50 degrees
Dust Separator .................. Centrifugal, self-cleaning
Lifting.................................... Hydraulic, 2-stage telescoping cylinder
HYDRAULIC SYSTEM
Pump Capacity .... 7.7 GPM (29 L/m) @ 2500 RPM
Pump Drive .................. Direct gear
Reservoir Capacity ........... 23 gal. (87 L)
Filter .......................... 10 micron, spin-on type

SPRAY WATER SYSTEM
Water Tank Construction .......... Polyethylene
Water Tank Capacity .............. 240 gal (908 L)
Optional Added ................ One or two 140 gal (530 L)
Maximum Total .................... 520 gal (1968 L)
Fill Hose ............................ 16 ft 8 in (5080 mm)
Filter ................................. 100 mesh, cleanable
Pump ............................... Diaphragm with run-dry capability and high or low selectable pump speed
Pump Pressure ..................... 40 PSI (2.7 bar)
Spray Nozzles ..................... Quick release brass
Standard .................................. 16
In Standard Pick-up Head ............. 7
In Suction Tube .................... 3
At Side Brooms ................... 6 (3 each)
With Optional Center Broom ............... 21
In Pick-up Head .................... 12
In Suction Tube .................... 3
At Side Brooms ................... 6 (3 each)

AUXILIARY ENGINE
Model .......................... John Deere 4045HF285
Type ............................. 4 cylinder, turbocharged diesel
Displacement ..................... 276 cu. in. (4.5 L)
Horsepower .................... 115 (86 kW) @ 2400 RPM
Torque ............................ 291 lb-ft (395 Nm) @ 1400 RPM
Oil Filter .......................... Spin-on full flow

ELECTRICAL SYSTEM
Voltage ............................. 12
Sweeper Battery Rating .......... 1000CCA
Sweeper Engine Alternator ......... 145 amperes
HIGH PRESSURE WASHDOWN SYSTEM (OPTIONAL)
Hand Lance ...................................... 24 in. (610 mm)
Hose ................................................. 30 ft. (9144 mm)

WANDERING HOSE (OPTIONAL)
Diameter ........................................... 8 in. (203 mm)
Length ........................................... 9.5 ft. (2591 mm) hose plus
5 ft (1524 mm) catch basin nozzle
Lift ......................................................... Hydraulic
CONTROL CONSOLE

The following list states the function of each instrument and control on the control console. Item numbers refer to Figure O-1, O-2, or O-3.

1 **SHUT DOWN OVERRIDE** switch provides a 30 sec delay in automatic shutdown. Automatic shutdown protects the engine if the oil pressure gets too low or the coolant temperature gets too high.

2 **COLD START** switch (optional) controls an ether injection system that assists starting in cold weather.

3 **AUXILIARY ENGINE IGNITION** key switch controls the electrical system of the sweeping engine.

4 **DRIVER CONTROL** switches control of steering between the left-hand and right-hand driving positions.

5 **LEFT SIDE CONTROLS — BROOM TILT** switch (optional) controls the side-to-side tilt of the left side broom. Pressing the control to the left (DOWN) tilts the broom out away from the sweeper. Pressing the control to the right (UP) tilts the broom in toward the sweeper.

6 **LEFT SIDE CONTROLS — BROOM POSITION** switch extends or retracts the left side broom sideways.

7 **LEFT SIDE CONTROLS — BROOM** switch makes the left side broom rotate and lowers it or makes the broom stop rotating and raises it.

8 For optional switch
Upper Panel Of Control Console (On Freightliner Chassis)
Figure O-1
Middle Panel Of Control Console
Figure O-2
9. Location of oil pressure indicator — Lights when engine oil pressure is less than 10 PSI. Pressure too low will result in automatic shut-down.

10. **OIL PRESS** gauge — Indicates oil pressure at the engine.

11. Location of fuel indicator — Lights when the level in the fuel tank is at or below 1/8 full.

12. **FUEL** gauge — Indicates the quantity of fuel remaining in the fuel tank.

13. Location of coolant temperature indicator — Lights when the temperature of the engine coolant is at or above 220°F. Temperature too high will result in automatic shutdown.

14. **COOLANT TEMP** gauge — Indicates the temperature of coolant at the engine.

15. Location of voltage indicator — Lights when voltage is below 9 or above 16.

16. **VOLTS** gauge — Indicates battery voltage.

17. **M** button — Allows the operator to toggle through screens in the LCD.

18. LCD — Displays sweeper and engine fault codes, status of sweeper components, and status and diagnostic information for the gauge system.

19. **RPM X 100** — Tachometer indicates operating speed of the auxiliary engine.

20. **T** button — Allows the operator to toggle through settings in LCD screens.

21. For optional switch

22. **RIGHT SIDE CONTROLS — BROOM** switch makes the right side broom rotate and lowers it or makes the broom stop rotating and raises it.
23 **RIGHT SIDE CONTROLS — BROOM POSITION** switch extends or retracts the right side broom sideways.

24 **RIGHT SIDE CONTROLS — BROOM TILT** switch (optional) controls the side-to-side tilt of the right side broom. Pressing the control to the left (**UP**) tilts the broom in toward the sweeper. Pressing the control to the right (**DOWN**) tilts the broom out away from the sweeper.

25 Engine failure/malfunction indicator shows that the engine needs service.

26 Engine run indicator shows that the auxiliary engine is running.

27 Air filter indicator (optional) shows that flow through the engine air filter is restricted.

28 Low water indicator warns that the spray water tank is almost empty.

29 Wandering hose indicator (optional) shows that the wandering hose switch is in the “on” position.

30 Full hopper indicator warns that the amount of material in the hopper has reached the maximum weight capacity.

31 Hydraulic filter indicator warns that flow through the hydraulic oil filter is restricted.

32 Door open indicator shows that the hopper door is open.

33 Raised hopper indicator shows that the hopper is in the tilted (dumping) position.

34 Fault warning indicator shows that a component of the sweeping system needs service.

35 **LEFT BROOM PRESSURE** regulator sets the down pressure applied by the left side broom. Pneumatic pressure is applied to counteract the weight of the broom. A higher
setting at this control results in less down pressure at the broom.

36 ENGINE SPEED regulator sets RPM for the auxiliary engine.

37 PICKUP HEAD CONTROLS — VACUUM ENHANCER switch opens or closes the vacuum enhancer.

38 PICKUP HEAD CONTROLS — CENTER BROOM switch (optional) makes the broom rotate and lowers it or makes the broom stop rotating and raises it.

39 PICKUP HEAD CONTROLS — PICKUP HEAD switch lowers or raises the pickup head.

40 RIGHT BROOM PRESSURE regulator sets the down pressure applied by the right side broom. Pneumatic pressure is applied to counteract the weight of the broom. A higher setting at this control results in less down pressure at the broom.

41 SWEEP MODE switch puts the sweeper in sweep mode in the ON position or transport mode in the OFF position. Switching this control from OFF to ON restores the previous settings for sweeping components.

42 HOPPER DUMP — DOOR switch opens or closes the hopper door.

43 HOPPER DUMP — HOPPER switch causes the hopper to tilt to dumping position or return to level position.

44 HOPPER DUMP — AUX PUMP switch (optional) activates or deactivates the auxiliary hydraulic pump.

45 WATER FLOW switch sets the rate of flow to the spray water nozzles.
Lower Panel Of Control Console
Figure O-3
46 Fuse panel provides receptacles for fuses to protect the electrical circuits of the sweeping components.

47 WATER — LEFT switch turns spray water on or off at left-hand side broom.

48 WATER — FRONT switch (optional) turns the water on or off at the front bumper spray bar.

49 WATER — CENTER switch turns the spray water on or off at the pickup head and center broom.

50 WATER — RIGHT switch turns the spray water on or off at the right-hand side broom.

51 LEFT BROOM SPEED knob (optional) adjusts speed of rotation at the left side broom.

52 RIGHT BROOM SPEED knob (optional) adjusts speed of rotation at the right side broom.

53 For optional switch

54 For optional switch

55 For optional switch

56 LIGHTS — BEACON switch (optional) turns the beacon on or off.

57 LIGHTS — AUX LIGHT 1 switch (optional) controls optional lights.

58 LIGHTS — LEFT BROOM switch turns the light at the left side broom on or off.

59 LIGHTS — REAR FLOOD switch (optional) turns the rear flood light on or off.

60 LIGHTS — RIGHT BROOM switch turns the light at the right side broom on or off.

START-UP CHECKLIST

Successful operation of the sweeper depends on the following standard daily procedures.
NOTICE
Some start-up checks need the auxiliary engine running or the hopper tilted. For instructions, see Operating The Auxiliary Engine and Raising Hopper.

TRUCK ENGINE
Follow all recommendations of the truck manufacturer.

- Check oil level.
- Check radiator coolant level.
- Check battery fluid level (if applicable).

NOTICE
Use #1 or #2 Diesel fuel only.

- Check fuel level. If necessary, fill the fuel tank (Figure O-4). Filling the tank at the end of the shift will prevent condensation in the tank as moist air cools.

AUXILIARY ENGINE
Follow all recommendations of the auxiliary engine manufacturer.

FUEL TANK FILL TUBE
Right Side Of Sweeper
Figure O-4
• Check oil level with the dipstick (Figure O-5).
• Check radiator coolant level.

**NOTICE**
*Use #1 or #2 Diesel fuel only.*

• If auxiliary engine has a separate fuel tank, check fuel tank. Fill, if necessary. Filling the tank at the end of the shift will prevent condensation in the tank as moist air cools.
• Drain fuel/water separators.

**NOTICE**
*If the truck engine and auxiliary engine share a fuel tank, the auxiliary engine will run out of fuel before the truck engine. If the sweeping components stop, check the fuel level.*

**LIGHTS, MIRRORS, AND TIRES**

• Make sure directional and safety lights are in proper working order.
• Check mirrors for visibility.
• Check tires for correct pressure, according to tire manufacturer.

**SWEEPING COMPONENTS**

**NOTICE**
*See Sweeping later in this section for sweeping component details. For more specific service information*
and step-by-step procedures, see the Service Procedures section.

- Check dirt shoes for wear and proper adjustment.
- Check pickup head pressure slot for debris or damage.
- Check all four curtains of pickup head.
- Check optional center broom.
- Check side brooms.
- Check position of centerboard.
- Check vacuum enhancer.

OTHER COMPONENTS

- Drain the sweeping system compressed air tank (Figure O-6).
- Check spray water filter.
- Fill water tank.
- Check fan housing and impeller for wear weekly.
- Check tension of the impeller power belt monthly.
- Check hydraulic oil level.
- Check seals on upper suction tube and impeller suction duct, and replace if damaged or missing.

- Check gaskets around hopper rear door and optional inspection door.
OPERATING TESTS

- Check sweeping pattern of side brooms and optional center broom.
- Check each water spray nozzle to verify that water flows freely through it.
  A standard dual sweeper has 16 spray nozzles:
  7 in the pickup head
  3 in suction tube
  3 at each side broom (6 total)
  If the sweeper is equipped with the optional center broom, there will be 5 nozzles at the center broom for a total of 21.
- If the indicator (Figure O-7 or 27, Figure O-2) shows that air flow through the engine air cleaner is restricted, replace the filter elements.
- Cycle all other sweeping functions.

Left Side Of Sweeper
Figure O-7
OPERATING THE AUXILIARY ENGINE

Starting Auxiliary Engine

⚠️ WARNING
Whenever possible, start and operate engines in a well-ventilated area. If in an enclosed area, vent the exhaust to the outside. DO NOT modify or tamper with the exhaust system.

NOTICE
If you must operate the sweeper in temperatures below 32°F (0°), see Cold Weather Starting.

NOTICE
Never operate the starter for more than 10 seconds. Longer operation will lead to discharge of the batteries or failure of the starter. Wait at least 30 seconds between attempts to start the engine.

1. Start the auxiliary engine by turning the AUXILIARY ENGINE IGNITION switch (3, Figure O-1) to the START position. Hold the switch in that position until the engine begins running, but no longer than 10 seconds. If the engine fails to start within 10 seconds, wait at least 30 seconds before trying again.

2. Allow the engine to warm up at normal idle speed of about 1000 RPM as indicated by the tachometer (19, Figure O-2). Use the ENGINE SPEED knob (36) to adjust speed of the engine.

3. Check that the following gauges and indicators are giving the desired indications.
   a. FUEL (12) should show a fuel tank level between midrange and full.
   b. VOLTS (16) should show a voltage of about 14.
   c. OIL PRESS (10) should show an auxiliary engine oil pressure near midrange.
d. After the auxiliary engine has warmed up, COOLANT TEMP (14) should show an engine coolant temperature near midrange.

e. Indicators for auxiliary engine malfunction (25), engine overheating (13), low engine oil pressure (9), and low voltage (15) should all be dark.

**NOTICE**
Avoid long periods of idling, which may harm the engine by letting combustion chamber temperatures drop. Under such conditions, incomplete burning of the fuel can produce carbon deposits, which may cause problems.

### Cold Weather Starting (Auxiliary Engine)

**NOTICE**
*If operating the sweeper in temperatures below 32°F (0°C), the auxiliary engine should be protected by using antifreeze as specified by the engine manufacturer.*

**NOTICE**
Never operate the starter for more than 10 seconds. Longer operation will lead to discharge of the batteries or failure of the starter. Wait at least 30 seconds between attempts to start the engine.

For cold weather starting of a sweeper that is not equipped with the cold weather starting kit, use the procedure under Starting Auxiliary Engine, and pay careful attention to warming up the engine.

**NOTICE**
*To avoid damaging the engine, the cold weather starting kit should not be used at temperatures above 40°F (4°C).*

If your sweeper is equipped with the cold weather starting kit, the kit may be used to help start the engine by the following procedure. The kit should be used **only when necessary.**

1. **Verify that an ether bottle is installed.**
2. **Turn the AUXILIARY ENGINE IGNITION switch** (3, Figure O-1) to the **START position.**
Hold the switch in that position until the engine starts, but no longer than 10 seconds. While holding the switch in the starting position, press the COLD START switch (2).

3. If the engine is “coughing” as it starts, you may press the COLD START switch a second time.

4. Allow sufficient time for the engine components to reach operating temperature before setting the engine to sweeping speed. Let the engine warm up at normal idle speed of about 1000 RPM as indicated by the tachometer (19, Figure O-2). Use the ENGINE SPEED knob (36) to adjust engine speed.

5. Check that the following gauges and lights are giving the desired indications.

   a. FUEL (12) should show a fuel tank level between midrange and full.

   b. VOLTS (16) should show an alternator output voltage of about 14.

   c. OIL PRESS (10) should show an engine oil pressure near midrange.

   d. After the auxiliary engine has warmed up, COOLANT TEMP (14) should show an engine coolant temperature near midrange.

   e. Indicators for auxiliary engine malfunction (25), engine overheating (13), low engine oil pressure (9), and low voltage (15) should all be dark.

**NOTICE**

Avoid long periods of idling, which may harm the engine by letting combustion chamber temperatures drop. Under such conditions, incomplete burning of the fuel can produce carbon deposits, which may cause problems.

**Shutting Down The Auxiliary Engine**

This procedure protects components from excessive stopping torque and allows lubricant and coolant to
carry heat away from the turbocharger and the power takeoff, bearings, etc.

**NOTICE**

*Engine must be idled (at about 1000 RPM) before shutdown, to prevent damage by stopping torque, and allowed to idle for at least 2 minutes, to cool hot engine parts.*

1. Using the ENGINE SPEED knob (36, Figure O-2), slow the engine to idle speed, about 1000 RPM as indicated on the tachometer (19).

2. Allow the engine to run for at least two minutes before shutdown.

3. Turn off ignition at the AUXILIARY ENGINE key switch on the upper panel of the control console.

**AUTOMATIC ENGINE SHUTDOWN**

The control system will automatically shut down the auxiliary engine, if it senses very low engine oil pressure or very high coolant temperature. If the oil pressure drops below 10 psi (69 kPa), and the condition does not correct itself within 15 seconds, the engine will shut down. If the coolant temperature rises above 220° F (104° C), and the condition does not correct itself within 15 seconds, the engine will shut down.

**RAISING HOPPER**

To gain access under the hopper, take the following precautions and steps.
⚠️ **DANGER**  
Raise or dump hopper in areas free of power lines. Before raising or tilting hopper, check for adequate overhead clearance. Raise hopper only in areas with minimum overhead clearance of 14 ft (4.3 m). Do not raise hopper while under trees, bridges, etc.

⚠️ **WARNING**  
Raise or dump hopper on firm, level surfaces only. Apply parking brake before raising or dumping hopper.

1. Set the parking brake.

2. If it is necessary to raise the hopper without running the auxiliary engine, and the sweeper is equipped with an auxiliary hydraulic pump, go to step 3. Otherwise go to step 4.

3. To start the optional auxiliary pump, take the following steps.
   a. To keep from draining the batteries during use of the auxiliary pump, the truck engine can be run where it is safe to do so.
   b. With the auxiliary engine stopped, turn the auxiliary engine key switch to the ON position.
   c. Press the AUX PUMP switch (44, Figure O-3).
   d. Go to step 5.

4. If the auxiliary engine is not running, start it.

⚠️ **WARNING**  
Raising loaded hopper with hopper door closed can cause severe injury or property damage. Open hopper door before raising hopper to empty contents.

5. If the hopper is empty, go to step 7.
If the hopper must be emptied, use the hopper door lift control (Figure O-8) or press the DOOR switch (42, Figure O-3) to open the hopper door. Continue operating the control until the door reaches its highest position. At this time the optional door open indicator (32, Figure O-2) will be lit.

⚠️ **CAUTION**

*To prevent serious injury, use door prop to secure opened hopper door before moving behind or inside hopper.*

6. If anyone will move under the raised hopper door, put the door prop (Figure O-9) in position to block the door from lowering.

⚠️ **WARNING**

*Tilting hopper can cause severe injury when dumping. Stand clear of hinged doors, travel of hopper and debris being dumped.*

7. To tilt the hopper, use the hopper lift control (Figure O-8) or press the HOPPER switch (43, Figure O-3).

⚠️ **WARNING**

*Tilting hopper can cause severe injury. Position safety bar in raised hopper position.*
before going under hopper shell. Check hydraulic system per maintenance schedule.

8. Put the hopper safety bar (Figure O-10) in the blocking position to keep the hopper from lowering.

When the hopper can be lowered, take the following steps.

1. Secure the hopper safety bar (Figure O-10) in storage position.
2. To lower the hopper, use the hopper lift control (Figure O-8) or press the HOPPER switch (43, Figure O-3). Continue to operate the control until the raised hopper indicator (33, Figure O-2) goes dark.

3. If the hopper door was opened, take the following steps.
   a. Secure the door prop (Figure O-9) in its storage position.
   b. To lower the door, use the hopper door lift control (Figure O-8) or press the DOOR switch (42, Figure O-3). Continue operating the control until the door is completely closed and locked. At this time the optional door open indicator (32, Figure O-2) will be dark.

**LCD SCREENS**

A graphical, backlit LCD (18, Figure O-2) displays information to the vehicle operator. The screens provide the operator with hours the components have worked, water level, and side broom tilt angle (if the sweeper has in-cab tilt). A variety of menus can be selected and displayed for diagnostic purposes. The LCD also displays fault codes as they are received.

After the ignition is switched on, a screen describing the software appears. Then the drive mode screens become available.

During normal operation, the LCD displays the last retained screen. To change the screen, press the M button once to highlight the current screen, then press the button again to select the next screen.

In drive mode, the engine hours screen appears after the software version screen. By repeatedly pressing the M button, the operator can view the broom hours screens. For more about the operating hours screens, see LCD Screens in the Service Procedures section.

After the broom hours screens, the next screen (Figure O-11) displays the spray water level in the
After the water level screen, the next screen (Figure O-12) displays the status of the vacuum enhancer. The screen shows the openness of the enhancer in percentage of the fully open position.

tank. This screen becomes available when spray water is selected with any of the spray water selection buttons on the cab control console. The screen can be accessed by pressing the M button until the screen displays. The screen shows the water level in percentage of full level.
Following the vacuum enhancer screen is a screen showing the tilt angle of the right side broom (Figure O-13). This screen becomes available when the broom tilt option is selected. The screen can be accessed by pressing the M button until the screen appears. The screen will also display for five seconds when a tilt switch is pressed.

Following the right side broom tilt screen is a screen showing the tilt angle of the left side broom (Figure O-14). This screen becomes available when the broom tilt option is selected. The screen can be accessed by pressing the M button until the screen appears. The screen will also display for five seconds when a tilt switch is pressed.
All fault messages (Figure O-15) are displayed as priority and use both lines of text. When multiple faults occur, the messages will be continually displayed for two seconds before displaying the next message.

Some messages can be acknowledged by pressing the M button while the message is being displayed. When acknowledged, these messages will stop displaying. Some acknowledged messages will re-display, if the fault condition is not corrected within a period of time, others will not reoccur until the ignition key is shut off and turned back on. See the Fault Codes table in the Service Procedures section for fault code listings, descriptions, alarm and display durations, and fault diagnosis.

INDICATOR LIGHTS AND ICONS

The indicator lights are light emitting diodes that illuminate icons alerting the operator to the operation of a component or a condition that may affect the sweeping operation. There are also switch indicator lights that alert the operator that the component is operating.

TRANSPORTING

⚠️ WARNING
*Operating unit over 25 mph from right hand position can result in severe injury or property damage. Use normal left hand position for speeds above 25 mph.*
⚠️ WARNING
With dual steering — Turning both steering wheels at the same time will cause unpredictable steering. To prevent serious injury or death, use only one steering wheel at a time to steer the sweeper.

⚠️ CAUTION
With dual steering — While the driver is changing driving position, the sweeper must be stopped with the gearshift in neutral and the parking brake applied.

NOTICE
The auxiliary engine should not be running while transporting the sweeper over a long distance; however, it may be left on at idle (1000 RPM) during transport over a short distance.

Avoid long periods of idling, which may harm the engine by letting combustion chamber temperatures drop. Under such conditions, incomplete burning of fuel can produce carbon deposits, which may cause problems.

1. Verify that the hopper is down and the hopper door is locked. If necessary, lower the hopper by using the hopper lift control (Figure O-8) or the HOPPER switch (43, Figure O-3) and lock the hopper door by using the hopper door lift control (Figure O-8) or the DOOR switch (42, Figure O-3).

2. If the machine has been sweeping, take the following steps.
   a. Shut off spray water for each component where the water has been flowing by using the WATER switches (47, 48, 49, 50).
   b. If the sweeper is equipped with a center broom, stop broom rotation and raise the broom by pressing the CENTER BROOM switch (38, Figure O-2).
   c. Raise the pickup head by pressing the PICKUP HEAD switch (39).
d. Raise the side broom or brooms by using the BROOM switch(es) (7, 22) and BROOM POSITION switch(es) (6, 23).

**NOTICE**

When a side broom with optional power tilt is moved from sweeping height to transport height, there is a short delay, while the tilt mechanism adjusts the broom to horizontal. Returning the sweeper to sweep mode will return the broom to the tilt it had previously.

3. Set the automatic transmission in the appropriate gear.

4. Obey all safety rules and rules of the road that apply to this vehicle.

**Sweeping**

**⚠️ WARNING**

*With dual steering — Turning both steering wheels at the same time will cause unpredictable steering. To prevent serious injury or death, use only one steering wheel at a time to steer the sweeper.*

**⚠️ CAUTION**

*With dual steering — While the driver is changing driving position, the sweeper must be stopped with the gearshift in neutral and the parking brake applied.*

**Preparation For Sweeping**

**NOTICE**

*If you must operate the sweeper in temperatures below 32°F (0°C), you should prevent the freezing of water anywhere in the sweeping system.*

1. If necessary, start and warm up the auxiliary engine by the procedure under Operating The Auxiliary Engine.

2. Check that the full hopper indicator (30, Figure O-2), raised hopper indicator (33), and the optional hopper door open (32) and low water (28) indicators are all dark.
3. If the full hopper indicator (30) is lit, the hopper must be dumped before sweeping begins. See Dumping The Hopper in this section.

4. If the hopper is up, verify that the parking brake is set. Then lower the hopper completely by using the hopper lift control (Figure O-8) or the HOPPER switch (43, Figure O-3).

5. If the hopper door is open, close and lock the hopper door by using the hopper door lift control (Figure O-8) or pressing the DOOR switch (42, Figure O-3).

6. If necessary, fill the fuel tank. Use only #1 or #2 Diesel fuel.

7. If necessary, fill the water tank by taking the following steps.
   a. If parking at freezing temperatures required emptying the spray water system, take the following steps.
      1) Install the water filter and close the shutoff valve.

2) Close the water tank drain, water fill tube, spray system valves, water pump drains, and drain of the optional high pressure wash pump.

3) Close the purge valve, if installed.

b. To fill the water tank, take the following steps.
   1) Connect the water fill hose (Figure O-16) to a fire hydrant.
   2) Flush the hose and hydrant until the water runs clear.
   3) Connect the hose to the water fill tube.
   4) Run water into the tank, until the tank overflows at the top.
   5) Close the hydrant slowly.
   6) Disconnect the hose from the hydrant and water fill tube, coil the hose, and return it to its storage location.

8. Make sure the spray water filter is clean by taking the following steps.
   a. Close the shutoff valve (Figure O-17) upstream from the filter.
b. Disassemble the filter by unscrewing the plastic shell from the filter head and removing the screen.

c. If the screen needs cleaning, flush the screen.

d. Assemble the filter.

e. Open the valve before trying to use the system.

9. If the sweeper is equipped with a warning light, press the BEACON switch (56, Figure O-17).
to switch it on. It is recommended that a strobe light or beacon be used to alert pedestrians and drivers of other vehicles during sweeping.

10. Lower the pickup head by pressing the PICKUP HEAD switch (39, Figure O-2), until the head appears completely lowered as viewed in the rear view mirrors.

**NOTICE**

*It may be necessary to use the PICKUP HEAD switch again after the sweeper is moving, if the stiff curtains held the head above its lowest position.*

11. If the pickup head is equipped with a center broom, start broom rotation and lower the broom by pressing the CENTER BROOM switch (38). Also start water spray at the broom by pressing the WATER — CENTER switch (49, Figure O-3).

12. Adjust down pressure on the optional center broom by using the pressure control knob (Figure O-18) on the left side of the sweeper near the fan.

13. Use a BROOM POSITION switch (6 or 23, Figure O-2) to extend the side broom and a
BROOM switch (7 or 22) to lower the broom and start it rotating.

14. To start the water spray at the side broom, use the WATER — LEFT switch (47, Figure O-3) or WATER — RIGHT switch (50).

NOTICE
Sweeping without water spray will cause excessive wear on the impeller, fan housing, and other components of the air flow system.

15. If the sweeper is equipped with the powered tilt feature, control the side-to-side tilt of the side broom by using a BROOM TILT switch (5 or 24, Figure O-2). Pressing the switch in the DOWN direction lowers the outer edge of the broom (tilts the broom away from the body of the sweeper). When this switch is used, the LCD (18) at the tachometer will briefly show the tilt angle. (For more on use of the LCD, see LCD Screens in this section.)

16. Use a BROOM PRESSURE regulator (35 or 40) to set the down pressure applied by a side broom. Pneumatic pressure is applied to counteract the weight of the broom. A higher setting at this control results in less down pressure at the broom.

17. If the sweeper is equipped with a front spray bar, press the WATER — FRONT switch (48, Figure O-3) to start spraying water.

18. If the vacuum enhancer will be used, open it with the PICKUP HEAD CONTROLS — VACUUM ENHANCER switch (37, Figure O-2). To see the extent of opening at the enhancer, repeatedly press the M button (17), until the percentage open is displayed on the LCD (18).

19. Use the ENGINE SPEED knob (36, Figure O-2) to bring the auxiliary engine up to the appropriate speed (Table O-1).

20. During sweeping, check the gauges and indicators often.
   - If the voltage indicator (15, Figure O-2) lights, shut down the auxiliary engine at the first
practical time, and correct the cause of the unacceptable voltage.

• If the engine failure/malfunction indicator (25) lights, have the auxiliary engine serviced at the first practical time.

• If the optional air filter indicator (27) lights, service the air cleaner as directed in Service Procedures at the first practical time.

• If the low water indicator (28) lights, fill the water tank at the first practical time.

• If the full hopper indicator (30) lights, stop sweeping immediately, and empty the hopper at an authorized dump site.

• If the hydraulic filter indicator (31) lights, replace the hydraulic filter as directed in Service Procedures at the first practical time.

• If the fault warning indicator (34) lights, note the message(s) in the LCD (18). Take the service action required to correct the problem(s) described in the Fault Codes table of the Service Procedures section.

• If the temperature of the hydraulic oil is above 180°F (80°C) but below 210°F (100°C), watch the temperature for the rest of the shift, and have the hydraulic system serviced at the first practical time.

### Table O-1
**General Sweeping Guidelines**

<table>
<thead>
<tr>
<th>Sweeping Conditions</th>
<th>Auxiliary Engine RPM</th>
<th>MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light sweeping</td>
<td>1500-1800</td>
<td>5-7 (8-11 km/h)</td>
</tr>
<tr>
<td>Medium sweeping</td>
<td>1800-2200</td>
<td>3-5 (5-8 km/h)</td>
</tr>
<tr>
<td>Heavy sweeping</td>
<td>2200-2400</td>
<td>2-4 (3-6 km/h)</td>
</tr>
</tbody>
</table>
practical time. If the temperature rises to 210°F or higher, shut down the system, and have the system serviced before further sweeping. Display of hydraulic oil temperature is brought onto the LCD (18) by repeatedly pressing the M button (17).

- To check the level of spray water in the tank, repeatedly press the M button (17), until the level is displayed on the LCD (18).

**Sweeping Path**

The Crosswind can produce sweeping paths of three different widths (Figure O-19).

- The pickup head alone will produce a path of 90" (229 cm).
- The pickup head with one side broom will produce a path of 117" (297 cm).
- The pickup head with both side brooms will produce a path of 144" (366 cm).
Refer to the Service Procedures section for instructions on proper adjustment of the pickup head and side brooms.

**Sweeping Tips**

To achieve thorough sweeping, the following items are extremely important.

- Dirt shoes on both sides of the pickup head should just make contact with the street during sweeping.

- Check the shape and size of the broom patterns (Figure O-19) by the procedure at Broom Patterns in the Service Procedures section.

- When using the side broom, keep the sweeper about 25 inches (65 cm) from the curb to allow room for the side brooms to go out to the curb.

- The side mirror must be properly adjusted to view broom operation and location.

A properly adjusted side broom will bring debris out of the gutter and into the path of the pickup head. If the broom is set too flat, debris will follow the broom around and be thrown behind the broom and back into the gutter. Too much down pressure on any broom will cause rapid wear.

If the sweeper is equipped with the electrically powered side broom tilt assembly, quick adjustments can be made to the angle of the broom to deal with unusual conditions. This feature is controlled by the BROOM TILT switch (5 or 24, Figure O-2). When this switch is used, the LCD display (18, Figure O-2) at the tachometer will briefly show the tilt angle.

Sweep heavy concentrations of sand or dirt at 2 to 4 MPH (3 to 6 km/h). Sweep lighter concentrations at 3 to 7 MPH (5 to 11 km/h). See Table O-1.

If large amounts of leaves will be swept, the following adjustments can improve efficiency:

- In the pickup head, increase the width of the pressure slot, and remove one of the front curtains.
• Open the vacuum enhancer completely.
• Run the auxiliary engine at medium speed (usually 1500 to 1600 RPM).

**Centerboard**

The centerboard (Figure O-20) is a central dirt deflector in front of the pickup head. This deflector keeps material from being thrown out by the side brooms beyond the path of the pickup head. The rubber part of the deflector touches the street when the pickup head is lowered. It is, therefore, subject to wear and should be checked periodically. The rear of the centerboard may be attached to the pickup head at three locations – left, central, or right. For most sweeping conditions, keep the centerboard in the central position. In areas with heavy accumulations of leaves or other debris in the gutter, offsetting the deflector to the position farthest from the gutter allows the material brought out of the gutter to spread more evenly across the total width of the pickup head.
⚠️ CAUTION

*Both truck and auxiliary engines must be off and the sweeper must be parked on a solid, level surface before the centerboard is adjusted.*

Where necessary, change the position of the centerboard as follows:

1. Shut down the truck and auxiliary engines.
2. Set the parking brake.
3. Remove the cotter pin from the back end of the centerboard.
4. Move the back end of the centerboard to the desired mounting position.
   a. For most sweeping conditions, use central position.
   b. For heavy sweeping on the right side of the street, place the rear of the deflector to the right.
5. Install the cotter pin.

If necessary, the height of the centerboard can be adjusted at the front by raising or lowering the chain.

**Vacuum Enhancer**

An electrically actuated deflector at the outlet of the blower housing (Figure O-21) can be opened to enhance vacuum in the pickup head. The enhancer allows some air to escape instead of passing down the pressure hose into the head. This component is controlled by the VACUUM ENHANCER switch (37, Figure O-2).

Closing the vacuum enhancer produces maximum air flow. Opening the enhancer reduces air flow and is done for sweeping leaves, litter, and other light material.
Large Pieces of Debris

The diameter of the suction hose is 12-3/4 inches (32 cm). This diameter limits the size of debris that can be swept up. To handle items that are too large for reliable sweeping, use the following procedure.

1. Park the sweeper.
2. Set the parking brake.
3. Remove large items from the sweeping path, or, if the hopper has the optional inspection door (Figure O-22), manually load the items through that door.

Optional Side Air Blast

If your sweeper has the optional side air blast feature, the cab will contain some or all of the following controls.

- SIDE AIR BLAST/PICKUP HEAD switch, which directs air flow from the fan to the side air blast, the pickup head, or both.
If the sweeper has the blast on only one side, it will have an AIR BLAST DOWN/UP switch, which lowers or raises the side air blast nozzle.

If the sweeper has dual blast, there will be separate switches to lower or raise the left-hand and right-hand nozzles.

There may be a control for rotation of the nozzle.

DUMPING THE HOPPER

⚠️ WARNING
Overloading the hopper will result in exceeding the rated G.V.W. and can cause severe injury or property damage. Discontinue hopper loading and dump hopper when the full hopper indicator is on.

⚠️ WARNING
Hopper loading changes the sweeper’s center of gravity and can tip the machine, resulting in severe injury or property damage. Do not overload the sweeper.

When the FULL HOPPER indicator (30, Figure O-2) lights to show a full hopper, or if sweeping per-
formance drops, or at the end of a shift, the hopper should be emptied.

To dump the hopper, use the following procedure.

1. At an approved dump site, park the sweeper on a solid, level surface away from power lines, trees, and other possible hazards.

2. For night operation, switch on the optional rear flood lights at the REAR FLOOD switch (59, Figure O-3).

3. Follow the precautions and applicable instructions at Raising Hopper in this section.

4. To dump the hopper, use the hopper lift control (Figure O-8) or press the HOPPER switch (43, Figure O-3).

   NOTICE
   If the hopper is lined with the optional LifeLiner™ coating, take extra care to avoid tearing the coating during cleaning.

5. If debris sticks in the hopper, remove it by using the scraper stored on the hopper door (Figure O-23).

   CAUTION
   Hinged screen. Unsecured hopper screen panel can cause injury. Keep ends secured with provided fasteners. Stand clear of screen swing path and support unsecured ends during cleaning.

   Scraper
   Figure O-23
6. Clean any debris off the hopper door seal and the hopper screen (Figure O-24) before closing the door. To lower the screen for cleaning, stand clear of the screen’s swing path, then release the detent and pull the latch toward the rear of the sweeper. After the screen is cleaned, latch it and secure the latch with the detent.

7. To lower the hopper, use the hopper lift control (Figure O-8) or press the HOPPER switch (43, Figure O-3). Continue to operate the control until the raised hopper indicator (33, Figure O-2) goes dark. The full hopper indicator (30) should now also be dark.

8. Secure the door prop (Figure O-25) in its storage position.

9. To lower the door, use the hopper door lift control (Figure O-8) or press the DOOR switch (42, Figure O-3). Continue operating the control until the door is completely closed and locked. At this time the optional door open indicator (32, Figure O-2) will be dark.

**AT END OF SHIFT**

To maintain sweeping efficiency and protect the sweeper while it is parked, the operator should include the following actions in routine shutdown.
- Fill the fuel tank to force most of the air out of the tank. This action will minimize the water condensation that can happen in the air space as the tank cools.

- Wash the sweeper by the procedure at Washdown.

- Put all brooms in storage position. If a broom is left resting on the parking surface, the bristles can take a “set” that will decrease the broom’s effectiveness.

- If parking can expose the sweeper to freezing temperatures, remove the water filter and empty the water system, paying particular attention to the pumps. If the air purge is installed, use it to remove all water.

WASHDOWN

Good sweeper operation includes a complete washdown after every sweeping shift. Best results are obtained by using water at high pressure, to break up large or packed accumulations of dirt, and at high volume, to wash the impeller and pickup head pressure slot thoroughly. A hose at the operator’s service facility is preferred. The sweeper’s optional low-pressure or high-pressure washdown system
can be used. If the sweeper is equipped with the high volume washout (deluge) option, that equipment can be used to assist the washing inside the hopper.

When operations have been completed for the shift, wash the sweeper by the following procedure.

1. If necessary, empty the hopper by the procedure under Dumping The Hopper in this section.

2. Park the sweeper away from power lines, trees, and other possible hazards on a solid, level surface that permits the wash water to drain or be recovered.

3. Set the parking brake.

4. Set the speed of the auxiliary engine at 1800 to 2000 RPM.

5. If an optional sweeper washdown system will be used, see the instructions under High Pressure Washdown (Option) or Low Pressure Washdown (Option).

6. Lower the pickup head.

7. With the water running at full flow rate, wash the inside of the suction hose by directing water on the floor or pavement to the suction side of the head.

8. To use the optional high volume washout (deluge), see the instructions under Deluge (Option).

9. If necessary, use the hopper door lift control (Figure O-8) or press the DOOR switch (42, Figure O-3) to open the hopper door. Continue operating the control until the door reaches its highest position.

⚠️ CAUTION

To prevent serious injury, use door prop to secure opened hopper door before moving behind or inside hopper.

10. Put the door prop (Figure O-25) in position to block the door from lowering.
⚠️ CAUTION
Hinged screen. Unsecured hopper screen panel can cause injury. Stand clear of screen swing path and support unsecured ends during cleaning.

11. For thorough washing of the hopper screens (Figure O-24), lower them. To lower a screen, stand clear of the screen's swing path, then release the detent and pull the latch toward the rear of the sweeper.

12. Direct a strong stream of water into the intake duct to wash out the duct and begin the cleaning of the impeller.

13. Tilt the hopper by using the hopper lift control (Figure O-8) or pressing the HOPPER switch (43, Figure O-3).

⚠️ WARNING
Tilting hopper can cause severe injury. Position safety bar in raised hopper position before going under hopper shell. Check hydraulic system per maintenance schedule.

14. Put the hopper safety bar (Figure O-26) in the blocking position to keep the hopper from lowering.

NOTICE
As you wash each part of the sweeper, clean the seals and make sure they are in good condition.

15. Wash all inside hopper surfaces, including the dust separator (Figure O-27) and the area behind the debris deflector.

NOTICE
To prevent serious damage, no water should be allowed to splash on an engine while it is hot.

NOTICE
To prevent accumulated dirt from causing damage or rapid wear by unbalancing the impeller, the impeller should be washed very thoroughly every day.
16. Direct a strong stream of water into the impeller long enough to clean the impeller and wash debris out of the pickup head.

17. Wash the fan housing, pressure and suction hoses, brooms, and the area under the hopper.

⚠️ CAUTION

*Hinged screen. Unsecured hopper screen panel can cause injury. Stand clear of screen swing path and support unsecured ends during cleaning.*
18. Raise and latch the hopper screen (Figure O-24), and secure the latch with the detent.

19. Secure the hopper safety bar (Figure O-26) in storage position.

20. Lower the hopper until the raised hopper indicator (33, Figure O-2) goes dark.

⚠️ **CAUTION**  
*Stay clear of the door prop swing path.*

21. Secure the door prop (Figure O-25) in its storage position.

22. Lower the hopper door, but leave the door slightly open to let the door seal return to its original shape.

23. Wash down the outer surfaces of the sweeper.

24. If an optional, on-board washdown hose was used, put the hose back into its storage position.

25. Remove debris like string, tape, etc. from the side brooms and optional center broom.

**NOTICE**  
*To avoid damage caused by stopping torque, engine speed must be reduced to idle (1000 RPM) before shutdown.*

26. Slow the auxiliary engine to idle (about 1000 RPM), and allow the engine to run for at least two minutes.

27. Shut off the engine.

**HIGH PRESSURE WASHDOWN (OPTION)**

If the sweeper’s optional high-pressure washdown system will be used, take the following steps.

1. Have the auxiliary engine running at about 2000 RPM.
2. Take the high pressure washdown hose (Figure O-28) from its storage position and connect it (Figure O-29) to the system.

⚠️ **CAUTION**

*Never point the high pressure nozzle at a person or at any object that could be damaged by the high pressure water spray.*

3. While pointing the nozzle away from people and easily-damaged objects, pull the trigger on
the nozzle and hold the high pressure water pump switch (Figure O-29) in the PRIME position until water comes out of the nozzle.

4. Release the switch. It will automatically move to the ON position.

5. Release the trigger.

6. The spray pattern (fan or solid stream) is controlled by a float ball in the spray head. To change the spray pattern, take the following steps.
   a. Release the trigger, and let the nozzle drain to relieve the water pressure, so the float ball can drop.
   b. Tap the spray head on the pavement or floor.
   c. Operate the hose to see if the spray pattern changed.
   d. If the pattern did not change, rotate the wand to change the orientation of the spray head, then repeat steps a to c.

LOW PRESSURE WASHDOWN (OPTION)

If the sweeper’s optional low-pressure washdown system will be used, take the following steps.

1. Have the Auxiliary Engine Ignition switch (3, Figure O-1) set at ON.

2. Connect the hose to the left-hand washdown outlet (Figure O-30) or the right-hand outlet (Figure O-31).
DELUGE (OPTION)

If the sweeper has the high volume washout (deluge) option (Figure O-32), use it by taking the following steps.

⚠️ CAUTION

*Flushing hopper with inspection door open can cause personal injury. Make sure inspect-
tion doors are closed & latched before using hopper deluge system.

1. Using the water fill hose and the quick-connect fitting provided, connect the high volume washout to a hydrant.

2. Use the hopper door lift control (Figure O-8) or DOOR switch (42, Figure O-3) to open the hopper door.

3. Using the hopper lift control (Figure O-8) or HOPPER switch (43, Figure O-3), raise the hopper completely.

4. Open the hydrant fully to get the greatest washing action.

5. As the water is flowing, use the hopper door lift control or optional in-cab DOOR switch to repeatedly close and open the hopper door, so all areas inside the hopper get a thorough washing.

6. Close the hydrant and disconnect the hose.

7. To prepare for the following steps in washdown, use the hopper control or the in-cab HOPPER switch to lower the hopper.
WANDERING HOSE (OPTION)

The optional wandering hose (Figure O-33) may be used to remove piles of debris or to clean catch basins.

To use the wandering hose, proceed as follows:

1. Position the sweeper where the wandering hose will be used.
2. Set the parking brake.
3. Set the Engine Speed control (36, Figure O-2) at a speed above idle to activate the engine controls at the wandering hose.
4. Set the Wandering Hose Switch (Figure O-34) to On.
5. Release the clamp (Figure O-35) that holds the end of the wandering hose on its rest.
6. Use the lift control buttons on the wandering hose to raise and lower the hose.

7. Remove the wandering hose nozzle from its support brackets.

8. Use the clamp to secure the nozzle on the hose.

9. Using the auxiliary engine controls (Figure O-36), increase engine speed until the suction is adequate to pick up debris.
10. At the valve on the wandering hose, turn on the spray water to suppress dust. If more water is needed to suppress dust, or if a high pressure stream is needed to break up hard-packed debris, the optional washdown hose may be used with the wandering hose.

11. When finished using the wandering hose, take the following steps.

   a. Turn off the water valve at the wandering hose.
   b. Slow the auxiliary engine to idle speed.
   c. Disconnect the nozzle from the hose.
   d. Secure the nozzle on the support brackets.
   e. Lower the boom into its rest.
   f. Clamp the end of the hose securely to its rest.
   g. Set the Wandering Hose Switch to Off.

**NOTICE**

*Machine cannot sweep while the Wandering Hose Switch is On.*
MAINTENANCE

Procedures for most maintenance functions may be found in the Service Section. The numbers on the following pages refer to the diagrams at the end of this section and on the Maintenance chart mounted on the sweeper.

Maintenance on engine components refers to the auxiliary engine.

Always follow all recommendations of the chassis and engine manufacturers.

**DAILY / EVERY SHIFT / EVERY 10 HOURS**

*The numbers correspond with the locations on Figures M-1 and M-2.*

Wash down the machine after every sweeping shift.

1. Check radiator coolant level.
2. Check Air Filter Restriction Indicator.
3. Drain water separator on fuel filter.
4. Check hydraulic oil level.
5. Inspect spray water nozzles.
6. Clean spray water filter.
7. Check pickup head pressure slot. Clean and adjust, if necessary.
8. Check auxiliary engine oil level.
9. Check battery.
10. Check broom patterns.
11. Inspect spray water level.
12. Check centerboard for position.
13. Check vacuum enhancer.
14. Check hopper door seal.
15. Check impeller seal.
16. Clean / wash down entire sweeper.
17. Check backup alarm for proper operation.

**EVERY 50 HOURS**

*The numbers correspond with the locations on Figures M-1 and M-2.*

18. Inspect impeller weldment.
19. Check side broom angle and adjust, if necessary.
20. Inspect spray water pumps.
22. Lubricate fan shaft bearings. *

* Use SHELL RETINAX LX2 grease, NLGI Grade 2. Use 13 cc (0.44 oz) every 50 hours.
EVERY 150 HOURS
The numbers correspond with the locations on Figures M-1 and M-2.

24. Change oil and oil filter for auxiliary engine. *
25. Inspect air intake system on auxiliary engine.
26. Rotate pressure and suction hoses on pickup head.
27. Inspect pickup head sealing curtains.
28. Inspect dirt shoes for wear.
29. Inspect deflectors on pickup head for wear.
30. Inspect impeller drive belt tension and wear.
31. Check and clean radiator.

EVERY 500 HOURS / 6 MONTHS

34. Check anti-freeze against engine manufacturer’s specifications.
35. Check side brooms and optional center broom for wear. If less than 1/2 of original length remains, replace brooms.
36. Check hydraulic oil filter. Replace, if necessary.
37. Check centerboard for wear. Replace, if necessary.
38. Check the pickup head suspension springs, and adjust, if necessary.
39. Replace fuel filter.

* Refer to engine manufacturer’s severe duty servicing requirements for engine oil change intervals and maintenance requirements.
EVERY 1000 HOURS / 1 YEAR

The numbers correspond with the locations on Figures M-1 and M-2.

42. Flush radiator. Add new coolant (ethylene glycol antifreeze) *.
43. Check turbocharger.
44. Check engine fan hub.
40. Adjust valve clearance. (Initial valve clearance adjustment should be performed by dealer after 400 hours of service. Thereafter, valve clearance should be adjusted every 2000 hours or 2 years.
41. Install a new reservoir breather. (Under conditions that soil the breather rapidly, it may need replacement more often.)
45. Drain hydraulic oil reservoir. Replace hydraulic filters and breather. Refill with SHELL TELLUS T-68 or equivalent hydraulic oil.

* Refer to engine manufacturer's severe duty servicing requirements for maintenance requirements.
TOWING

Elgin Sweeper Company recommends that all towing be performed by a dealership for the chassis of the sweeper to be towed or by a professional towing service.

In case the sweeper must be towed by other than a dealership or towing service, the following procedure is provided and must be followed. In all cases proper equipment must be used and all laws applying to vehicles in tow must be followed.

⚠️ CAUTION

*Never tow the sweeper faster than 55 mph (90 km/h).*

NOTICE

*To avoid damage when towing the vehicle, the towing instructions in the truck driver’s manual must be followed.*

1. Prepare the sweeper for towing as directed by the driver's manual from the chassis manufacturer.

2. Make sure that the side broom or brooms, the center broom, and the pickup head have all been raised to transport position.

3. Check all components for adequate road clearance, and chain them up, if necessary.
4. Follow the towing instructions in the driver’s manual from the chassis manufacturer.

5. Before returning the sweeper to service, release any chains used to support sweeping components during towing.

AUXILIARY ENGINE

⚠️ WARNING
To get access to the auxiliary engine air cleaner or fuel filters, take the precautions and steps stated at Raising Hopper in the Operation section.

The auxiliary engine provides the power to drive the impeller, the brooms and the hydraulic and water pumps. Standard engine accessories include a dual safety element dry-type air cleaner and restriction indicator, oil filter, fuel filter and water separator, and fuel lift pump. The sweeper has automatic high temperature/low oil pressure shutdown with alarm.

Refer to the operator’s manual from the engine manufacturer for additional information concerning the engine, its components, specifications and repair.

Air Cleaner

The auxiliary engine is equipped with a dual-element, dry-type air cleaner with an automatic rubber unloader (dump) valve (Figure SP-1).

NOTICE
Do not open the air cleaner unless the air filter gauge or the optional air filter indicator shows a restriction of the engine air supply.

If the air filter gauge (Figure SP-2) or the optional air filter indicator at the control console shows that air flow to the engine is restricted, the air cleaner needs servicing.

To service the air cleaner, use the following procedure:

1. Remove the cover from the filter canister.
2. Remove and discard the outer element (Figure SP-3).

**NOTICE**

A dirty element should always be discarded, not cleaned for further use. Cleaning an element voids the warranty and makes the element less effective.
3. Visually check the rubber unloader valve, and pinch the lips of the valve to remove any accumulation of debris. If the valve is damaged, install a new valve.

4. Clean the inside of the air cleaner canister with a damp, lint-free cloth.

5. Install a new outer element.

6. Securely fasten the cover on the filter canister with the unloader at the bottom.

7. With the engine operating, check the air filter gauge or the optional air filter indicator. If there is no indication of air flow restriction, air cleaner service is complete. If there is still restriction, go to step 8.

8. With the engine shut down, open the air cleaner.

9. Remove and save the outer element, taking care to keep the element clean and to avoid any damage to the element.

**NOTICE**

A damaged outer element, or one with a loose, damaged, or missing seal, will allow dust to clog the inner element.
10. Remove and discard the inner element (Figure SP-4).

11. Install a new inner element and the saved outer element, making sure they are correctly seated.

NOTICE
To prevent damage, the elements must be completely seated before the canister cover is installed.

12. Securely fasten the cover on the filter canister with the unloader at the bottom.

13. Check the whole air intake system for leaks.

**Auxiliary Engine Fluids**

Refer to the operator’s manual from the engine manufacturer for recommendations about engine oil and coolant fluid.

The fuel lift pump (C, Figure SP-5) draws fuel from the fuel tank (K) and pushes it through the fuel filter (G) to the injection pump (A). The injection pump forces fuel through the injectors (E), which atomize the fuel and spray it into the combustion chamber of each cylinder. The low pressure leak-off return line (H) from the injection pump passes through each injector and returns to the fuel tank.
DRAINING WATER FROM FUEL FILTERS

Both fuel filters should be checked daily and drained if any water is visible in the transparent separator at the bottom of the first filter.

To remove water and other contaminants from the filters, use the following procedure, first taking steps 1 to 5 at each filter.

1. Loosen the air bleed plug (Figure SP-6).
2. Open the drain at the separator about two turns.
3. Allow the water and any contaminated fuel to drain into a container.

NOTICE

The presence of a large amount of water in the filter may indicate that water should be drained from the fuel tank. If so, the cause of the water build-up should be found.
4. When fuel free of contamination begins to flow from the filter, close the drain. The drain must always be closed before starting the engine.

5. Tighten the air bleed plug.

6. After both filters have been drained, bleed all air from the fuel system by the procedure in the operator’s manual from the engine manufacturer.

7. Start the engine, then make sure that no fuel is leaking from either filter.

**CHANGING FUEL FILTERS**

Filter elements should be changed in both filters at the same time. To change the fuel filter, use the following procedure, first taking steps 1 to 6 at each filter.

1. Remove the threaded ring (Figure SP-6) from the filter.

2. Remove the filter element by pulling the element down from the filter head.
3. Inspect the element for water build-up before discarding it.

**NOTICE**
*The presence of a large amount of water in the filter may indicate that water should be drained from the fuel tank. If so, the cause of the water build-up should be found.*

4. Clean the sealing surface of the filter head.

5. Apply a light coat of engine oil to the sealing surface of the new filter element.

6. Position the new element on the filter head and secure it with the threaded ring.

7. After both new elements have been installed, bleed all air from the fuel system by the procedure in the operator’s manual from the engine manufacturer.

8. Start the engine, then make sure that no fuel is leaking from either filter.

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### Bleeding Fuel System

Air must be removed from the fuel system after the system has been opened or the engine has run out of fuel.

To bleed air from the fuel system, follow the directions in the operator’s manual supplied by the engine manufacturer.

### REGENERATIVE AIR SYSTEM

The sweeper recirculates air (Figure SP-7). The impeller moves air through the sweeper to form a continuous loop of air. That air stream creates turbulence across the pickup head, lifting the debris from the street and into a collection hopper.

Air is blown down the pressure hose and across the pickup head. The air is then pulled up the suction hose and is spun around in the hopper to separate the debris. Heavy material drops into the hopper, while lighter material is deflected by the upper
Regenerative Air Flow
Figure SP-7
screen. Air circulates within the hopper to release all solids except the fine dust. Dust is removed from the air in the centrifugal dust separator, before the air returns to the impeller intake and is forced back down the pressure hose.

By recirculating air, not venting it to the outside, minimum dust is returned to the environment.

⚠️ WARNING
_to correct some air leaks or obstructions, the hopper or hopper door must be raised by taking the precautions and steps stated at Raising Hopper in the Operation section._

**Correcting Air Leaks**

If you suspect there is a vacuum or pressure leak in the regenerative air system, take as many of the following steps as are needed to restore normal performance.

1. Confirm that the dirt shoes ride correctly on the pavement during sweeping.
2. Check that all pickup head curtains and the pressure slot rubber are tightly mounted and in good condition.

⚠️ WARNING
_to avoid severe injury or death when you tilt the hopper or work under a tilted hopper, carefully note the precautions and follow the instructions under Dumping The Hopper in the Operation section of this manual._

3. Check that seals are in good condition at the hopper door, fan intake, make/break tube, vacuum enhancer, options including the inspection door, hopper drain, and wandering hose.
4. Check for damage or a loose fitting that could cause air leakage at the quick disconnect, suction hose, pressure hose.
Correcting Obstruction

If decreased sweeping performance makes you suspect there is obstruction in the air system, check for and remove obstructions in the following places, as necessary.

- Hopper screen
- Dust separator box
- Fan inlet
- Suction hose (seen from upper end)
- Suction hose and pickup head (seen from quick disconnect)
- Pickup head pressure slot
- Fan outlet and pressure hose

FAN ASSEMBLY

⚠️ WARNING
To get complete access to the fan assembly, the hopper must be raised by taking the precautions and steps stated at Raising Hopper in the Operation section.

Impeller Inspection

An impeller in good condition is both safe and efficient. Inspect the impeller weldment for unusual wear.

⚠️ CAUTION
Moving parts. Contact with impeller can cause severe injury. Stop auxiliary engine before removing impeller cover. Keep cover secured in place unless servicing. Inspect impeller for wear weekly.

1. Open the fan inspection door (Figure SP-8).
2. Check the impeller weldment for build-up of foreign material and, if necessary, clean it.
3. Note the condition of the weld points and vanes and the overall condition of the impeller. New vanes are 1/4 inch (6 mm) thick. When the vanes have worn down to a “knife edge” condition, replace the impeller with a new one.
4. Close and secure the inspection door.

**Impeller Cleaning**

Debris build-up on the impeller weldment can cause the impeller to become unbalanced. The impeller **must** be cleaned thoroughly during each **daily** washdown. See Washdown in the Operation section of this manual.

**Fan Lubrication**

**NOTICE**

To prevent damage to seals, lubricate a sealed bearing by slowly applying a small amount of grease. After every 50 hours of operation, lubricate the impeller shaft bearings with 0.44 oz (13 mL) of NLGI Grade 2 high temperature grease. Refer to the maintenance instructions mounted on the left side of the sweeper under the hopper and also shown in the Maintenance section of this manual.

If the sweeper is equipped with the optional automatic lubrication system, the system and bearings
it serves should be inspected at the intervals specified by the manufacturer of the system.

**Seal Inspection**

Inspect the fan intake seal (Figure SP-9) and the inspection door gasket for wear or damage. If necessary, install new parts.

**Impeller Balance**

If the impeller weldment becomes unbalanced, wash it thoroughly as instructed under Washdown in the Operation section. If necessary, open the fan inspection door and use a tool to remove debris.
stuck on the impeller. If the cleaned impeller is still unbalanced, have a new impeller installed.

**Power Belt Adjustment**

⚠️ **WARNING**

*Moving parts. Contact can cause severe injury. Do not attempt repairs or adjustments or go underneath machine with engines running.*

**NOTICE**

*Condition and tension of all belts should be checked every month.*

While the power belt is warm, check its condition and tension. If the belt is damaged or badly worn, replace it with a new one.

If belt tension needs adjustment, take the following steps.

1. Loosen the lower clamping bolts and locknuts.
2. With a torque wrench, tighten the idler pulley adjusting screw (Figure SP-10) to between 50 and 60 lb-ft (70 and 80 Nm).
3. Tighten the clamping hardware.
4. Check the alignment of the pulley.

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ADJUSTING SCREW

Fan Drive Assembly
Figure SP-10
NOTICE
If a new belt is being broken in, it should be adjusted to the proper tension at the beginning of operation, then checked after 1 hour of operation and again after 40 hours.

PICKUP HEAD

⚠️ CAUTION
Before performing any service (other than suspension adjustment) on the pickup head, the sweeper must be parked on a level surface, the parking brake must be set, and both the truck and auxiliary engines must be shut down.

The Crosswind may have the standard pickup head for general sweeping or the FSX head for high speed sweeping. Service procedures for these components are organized under text headings that indicate whether the information applies to the standard head or the FSX head.

The fan directs air down through the pressure hose to the left side of the pickup head (Figure SP-11).

This pressurized air is forced downward through a pressure slot in the rear of the pickup head. Air leaving the slot lifts debris from the pavement and...
moves it to the right side of the head by the suction hose.

The fan creates a vacuum in the hopper. This vacuum generates a strong suction air stream which picks up the dirt on the right side of the pickup head and moves it up through the suction hose into the hopper.

Adjustable springs (Figure SP-11) on both sides of the pickup head support the weight of the head. During sweeping, lowered air pressure in the pickup head causes the head to be pulled down onto the pavement. The head is then sealed to the pavement by rubber curtains in front and back and metal dirt shoes on the sides.

Spray water to the pickup head can be turned on or off using the cutoff valve (Figure SP-12).
An optional center broom located at the back of the standard pickup head flicks debris forward toward the pressure slot.

Standard Pickup Head

FRONT CURTAIN REPLACEMENT

To replace a worn or damaged front curtain in a standard pickup head, proceed as follows:

1. Remove the four screws and washers on the top front of the pickup head (Figure SP-13), and lower the front curtain assembly to separate it from the pickup head.

2. As needed, remove the used curtain(s) from the assembly and install new one(s).

3. Position the assembly in the pickup head, and secure the assembly with the four screws and washers.

REAR CURTAIN REPLACEMENT

A standard pickup head without an optional center broom will have two rear curtains and one pressure
To replace a worn or damaged curtain, proceed as follows:

1. Remove the four locknuts and washers at the rear of the pickup head (Figure SP-14), and lower the rear curtain assembly.

2. As needed, remove the used curtain(s) from the assembly and install new one(s).

3. Position the assembly in the pickup head, and secure the assembly with the four locknuts and washers.

A standard pickup head with an optional center broom will have one rear curtain and one pressure slot curtain.

To replace a worn or damaged rear curtain on a head with an optional center broom, proceed as follows:

1. Remove eleven screws and washers (Figure SP-15).

2. Remove the used curtain from the cover weldment.

3. Assemble a new curtain to the cover weldment, and secure the curtain with the eleven screws and washers.
To replace a worn or damaged pressure slot curtain on a pickup head with an optional center broom, proceed as follows:

1. Remove four screws, lock washers, and washers (Figure SP-16). The pressure slot assembly will drop out of the head.

2. Remove eight locknuts and washers from the pressure slot assembly.

3. Remove the pressure slot curtain.

4. Assemble a new curtain with the pressure slot weldment and mounting angle, then secure them with the eight washers and locknuts.

5. Position the assembly in the pickup head, and secure it with the four screws, lock washers, and washers.

6. Adjust the pressure slot opening by the procedure at Pressure Slot Width.
DIRT SHOE ADJUSTMENT

Dirt shoe position on a standard pickup head is set at the factory, but the position may require adjustment due to local conditions. Each dirt shoe must just touch the pavement along the whole length of the shoe at all times during sweeping to make a good air seal.

Adjustment of the dirt shoes determines the clearance between the pressure slot curtain (rubber) and the swept surface, since lowering the dirt shoes causes the slot to ride higher above the surface. The clearance has two effects. It determines the height of obstacles (for example, manholes) that the pickup head can safely sweep over. It also affects the efficiency of sweeping. Increasing the clearance (by lowering the dirt shoes) to protect the pickup head will decrease the head’s efficiency in picking up debris. Decreasing the clearance (by raising the
dirt shoes) to increase sweeping efficiency will increase the chance that the head will strike an obstacle.

To adjust a dirt shoe on a standard pickup head, proceed as follows:

1. Using a 3/4-inch wrench, loosen the four retaining bolts on the side of the pickup head (Figure SP-17).

2. If any bolts are corroded or seriously damaged, replace them.

3. For ideal conditions, adjust the position of the dirt shoe so the bottom of the pressure slot curtain is 1 to 1-1/2 inches (25 to 38 mm) above the bottom of the dirt shoe (Figure SP-18). This adjustment causes the curtain to ride the same distance above the pavement. For extremely crowned roads, elevated manholes, etc., this dimension may be increased.

4. Tighten the retaining bolts.

5. If necessary, adjust the other dirt shoe in the same way.
The dirt shoes and curtains are designed to operate in contact with the pavement. Suspension springs are used to prolong the life of the shoes and curtains by controlling their pressure on the pavement.

To check the ground clearance and adjust the suspension of a standard pickup head, use the following procedure.

1. Park the sweeper on a flat, level surface.
2. Set the parking brake.

⚠️ WARNING
Whenever possible, start and operate engines in a well-ventilated area. If in an enclosed area, vent the exhaust to the outside. DO NOT modify or tamper with the exhaust system.

NOTICE
Never operate the starter for more than 10 seconds. Longer operation will lead to an overdischarge of the batteries and seizure of the starter. Wait at least 30 seconds between attempts to start the engine.

3. Start the auxiliary engine and let it idle (1000 RPM).
4. Lower the pickup head. The pickup head may not lower completely, because it is supported by the stiff rubber curtains.

5. Move the machine forward about 2 yards (2 m) while pressing the PICKUP HEAD DOWN/UP switch, to complete lowering and allow the curtains to curve into operational position.

6. Check the pavement clearance. The pickup head should be free-floating, and the bottom of the dirt shoes should be 1/4 to 1/2 inch (6 to 13 mm) off the pavement at all four corners.

7. Increase engine speed to 2200 RPM and drive forward a short distance.

8. Check the position of the pickup head. The head should be pulled flat against the pavement. When the sweeper is driven forward, the head should not leave a significant mark on the pavement.

9. Decrease engine speed to idle and confirm that the dirt shoes return to between 1/4 and 1/2 inch (6 and 13 mm) clearance. If they do, the suspension is properly adjusted. If they do not, continue to Step 10.

10. To adjust head suspension, proceed as follows:

   a. Raise the pickup head to transport position.

   b. Change the attachment of one or more suspension chains (Figure SP-19) by one link. On some sweepers, it may be necessary to carefully stretch a suspension spring with a long pry bar, so the chain can be detached from its hanger.

   c. Repeat steps 4 through 9 as many times as necessary to get the correct clearance at all four corners of the head.
PRESSURE SLOT WIDTH

For general sweeping conditions, the pressure slot of a standard pickup head (Figure SP-20) is set at 1/2 inch (13 mm).

If the material to be swept is very coarse or bulky, like cans or leaves, the operator should widen the slot to get more air flowing through the head. If the material to be swept is fine and dense, like sand, the operator should narrow the slot to speed up airflow through the head.

To adjust slot width in a standard pickup head, take the following steps.
1. Loosen the four nuts on the rear of the head (Figure SP-21).

2. Slide the rear curtain assembly to the position that makes the slot width correct.

3. Tighten the four nuts.

**REPLACING OPTIONAL CENTER BROOM**

The optional center broom in a standard pickup head is located at the rear of the head. To change the broom, use the following procedure.

1. Have the center broom raised.

2. Release the latches on top of the center broom covers (7 and 8, Figure SP-22), and remove the covers.

3. Remove three screws, washers, and lockwashers that fasten the shaft & flange weldment (12) to the broom (11).

4. Loosen two set screws on the bearing (13).

5. Push the weldment (12) out of the broom and into the bearing. This will cause the broom to drop.
Center Broom Assembly
Figure SP-22
6. Loosen the set screw in the broom drive bushing (9).

7. Pull the broom off the bushing and out from under the sweeper.

8. Fit the new broom loosely onto the bushing.

9. Align the broom with the shaft and flange weldment (12), and secure the weldment to the broom with the three screws, lockwashers, and washers.

10. Push the broom as far onto the drive bushing (9) as the broom will go.

**NOTICE**

*To prevent damage to the broom, the broom must rest against the limit pin on the drive bushing.*

11. Tighten the set screw in the bushing.

12. Tighten the two set screws on the bearing (13).

13. Install and securely latch the center broom covers.

**FSX Pickup Head**

**FRONT CURTAIN REPLACEMENT**

To replace a worn or damaged front curtain on an FSX (high speed) pickup head, proceed as follows.

1. Remove four screws, lock washers, and washers from the top front of the pickup head (Figure SP-23), and lower the front curtain assembly to separate it from the head.

2. Remove the used curtain(s) from the assembly and install new one(s).
3. Replace the assembly and tighten the nuts.

**REAR CURTAIN REPLACEMENT (FSX)**

To replace a worn or damaged rear curtain on an FSX (high speed) pickup head, proceed as follows.

1. Remove six screws, six lock washers, and twelve plain washers at the rear of the pickup head (Figure SP-24), and lower the rear curtain assembly.

2. Remove the used curtain(s) from the assembly and install new one(s).

3. Install the assembly, and secure it with the screws, lock washers, and plain washers.
PRESSURE SLOT CURTAIN REPLACEMENT

To replace a worn or damaged pressure slot curtain on an FSX (high speed) pickup head, proceed as follows.

1. Remove eight elastic locknuts and washers (2 and 3, Figure SP-25) from the angle (35).

2. Separate and discard the pressure slot curtain (30).

3. Assemble a new curtain with the angle and the slot rear weldment (26).

4. Secure the assembly with the eight locknuts and washers.
FSX Pickup Head
Figure SP-25
DIRT SHOE ADJUSTMENT (FSX)

Dirt shoe position on an FSX (high speed) pickup head is set at the factory, but may require adjustment due to local conditions. If the optional caster wheels are not being used, each dirt shoe should just touch the pavement along the whole length of the shoe during sweeping to make a good air seal.

Adjustment of the dirt shoes determines the clearance between the pressure slot curtain (rubber) and the swept surface, since lowering the dirt shoes causes the slot to ride higher above the surface. The clearance has two effects. It determines the height of obstacles (for example, manholes) that the pickup head can safely sweep over. It also affects the efficiency of sweeping. Increasing the clearance (by lowering the dirt shoes) to protect the pickup head will decrease the head's efficiency in picking up debris. Decreasing the clearance (by raising the dirt shoes) to increase sweeping efficiency will increase the chance that the head will strike an obstacle.

To adjust a dirt shoe on an FSX pickup head, proceed as follows:

1. Using a 3/4-inch wrench, loosen the four retaining screws on the side of the pickup head (Figure SP-26).
2. If any bolts are corroded or seriously damaged, replace them.

3. Move the dirt shoe vertically (keeping the top of the dirt shoe parallel with the top of the pickup head) to get the desired clearance between the pressure slot curtain and the swept surface. It is helpful to hold a spacer of the desired thickness against the curtain, then set the shoe so the lower surface of the spacer is even with the bottom of the shoe.

For ideal conditions, adjust so the bottom of the pressure slot curtain is about 1/4 inch (6 mm) above the bottom of the dirt shoe (A, Figure SP-27) on both sides of the pickup head. For extremely crowned roads, elevated manholes, etc., this dimension may be increased.

4. Tighten the retaining bolts.

5. If necessary, adjust the other dirt shoe in the same way.

**FSX Pickup Head Adjustments**

**Figure SP-27**

**PICKUP HEAD SUSPENSION ADJUSTMENT (FSX)**

The dirt shoes and curtains are designed to operate in contact with the pavement. Suspension springs are used to prolong the life of the shoes and curtains by controlling their pressure on the pavement.
To check the ground clearance and adjust the suspension of the FSX (high speed) pickup head, use the following procedure.

1. Park the sweeper on a flat, level surface.

2. Set the parking brake.

⚠️ **WARNING**
*Whenever possible, start and operate engines in a well-ventilated area. If in an enclosed area, vent the exhaust to the outside. DO NOT modify or tamper with the exhaust system.*

**NOTICE**
*Never operate the starter for more than 10 seconds. Longer operation will lead to an overdischarge of the batteries and seizure of the starter. Wait at least 30 seconds between attempts to start the engine.*

3. Start the auxiliary engine and let it idle (1000 RPM).

4. Lower the pickup head. The pickup head may not lower completely, because it is supported by the stiff rubber curtains.

5. Move the machine forward about 2 yards (2 m) while pressing the PICKUP HEAD DOWN/UP switch, to complete lowering and allow the curtains to curve into operational position.

6. Check the pavement clearance. The pickup head should be free-floating, and the bottom of the dirt shoes should be 1/4 to 1/2 inch (6 to 13 mm) off the pavement at all four corners (D, Figure SP-27).

7. Increase engine speed to 2200 RPM and drive forward. The head should be pulled flat against the pavement, and the head should not leave a significant mark on the pavement.

8. Decrease engine speed to idle and confirm that the dirt shoes return to between 1/4 and 1/2
inch (6 and 13 mm) clearance. If they do, the suspension is properly adjusted. If they do not, continue to Step 9.

9. To adjust pavement clearance, proceed as follows:

   a. Raise the pickup head to transport position.

   b. Change the attachment of one or more suspension chains by one link (Figure SP-28). On some sweepers, it may be necessary to carefully stretch a suspension spring with a long pry bar, so the chain can be detached from its hanger.

   c. Repeat steps 4 through 8 as many times as necessary to get the correct clearance at all four corners of the head.

**“J” PLATE ADJUSTMENT**

The height of the “J” plate (front pressure slot weldment) in an FSX pickup head affects the force and angle at which air strikes the pavement. The plate must be kept high enough to keep it from hitting obstacles like manholes.
To adjust the “J” plate, take the following steps.

1. Loosen the six screws, lock washers, and washers across the front vertical surface of the pick-up head (Figure SP-29).

2. Move the plate to the lowest position that will give the required clearance from the swept surface.

   If the distance between the pressure slot curtain and the bottom of the dirt shoe (A, Figure SP-27) is at its minimum (1/4 inch or 6 mm), the bottom of the “J” plate should be at a height (B) of about 3/8 inch (9 mm) above the bottom of the shoe.

3. Tighten the six screws.

**PRESSURE SLOT WIDTH (FSX)**

For normal sweeping conditions, the pressure slot width in an FSX head (C, Figure SP-27) is set at 3/8 inch (10 mm) on the right side and 3/4 inch (20 mm) on the left side. The FSX slot is tapered to create a constant air speed across the width of the head.

If the material to be swept is very coarse or bulky, like cans or leaves, the operator should widen the slot to get a more air flowing through the head. If
the material to be swept is fine and dense, like sand, the operator should narrow the slot to speed up air flow through the head. The taper of the slot can also be varied to improve sweeping.

To adjust slot width in an FSX pickup head, take the following steps.

1. Loosen six elastic locknuts (1, Figure SP-25).

2. Use two adjusting screws on the back of the head (Figure SP-30) to move the rear pressure slot weldment.

3. Tighten the six locknuts.

**DEFLECTOR ADJUSTMENT**

The deflector in an FSX pickup head directs the flow of air up the suction tube and prevents
accumulation of dirt at the end of the pickup head. The deflector should be set to ride lightly on the swept surface when the head is in sweeping position.

To adjust the deflector, use the following procedure.

1. Detach the suspension chains (Figure SP-28) from the chassis hooks.
2. Lower the pickup head.
3. Set the speed of the auxiliary engine at about 1200 RPM.
4. Drive the sweeper forward about 2 yards (2 m) to curve the curtains back and let the head drop fully. The dirt shoes should now touch the pavement.
5. Use a 9/16-inch wrench to loosen the two smaller screws at the right-hand shoe (Figure SP-31).
6. Tap the heads of the bolts lightly to relieve paint adhesion and let the deflector drop to the pavement.
7. Tighten the two bolts.
8. Raise the pickup head.

9. Attach the suspension chains to the chassis hooks.

10. Confirm that the ground clearance of the pickup head is correct by following the procedure at Pickup Head Suspension Adjustment.

**ADJUSTING OPTIONAL CASTER WHEELS**

Optional caster wheels (Figure SP-32) raise the dirt shoes of an FSX pickup head above the pavement to prevent sparks or marks on the pavement and to slow wear of the dirt shoes. Use of the wheels unavoidably decreases sweeping efficiency by letting air move under the shoes. To maximize efficiency while using the wheels, the wheels at both the front and the back of the pickup head should be adjusted to barely break the contact of the shoes with the pavement during sweeping.

To adjust the caster wheels, take the following steps.

1. Using 1-1/16 inch and 1-1/8 inch wrenches, adjust the rear wheels downward.
2. Operate the fan to draw the pickup head down fully, and confirm that the rear of the pickup head is supported only slightly above the pavement.

3. If necessary, repeat the adjustment.

**BROOMS**

A side broom should sweep debris out of the gutter and into the path of the pickup head. If the broom is set too flat, debris will follow the broom around and be thrown back into the gutter behind the broom. If the broom is tilted too much, the area it sweeps may not overlap the area swept by the pickup head, leaving dirt to trail between the broom and the head. The shape of the side broom pattern is used as an indication of the correct degree of tilt.

Down pressure on the side broom should be adjusted so that the side broom can dig out hard-packed dirt. Excessive down pressure will, however, cause the bristles to wear down too fast. Down pressure too low will cause incomplete sweeping. The size of the side broom pattern is used as an indication of whether the down pressure is correct.

**Broom Patterns**

Broom patterns (contact areas) should be checked on a regular basis, as well as after changing the side broom segments or the optional center broom.

To check broom adjustments, use the following procedure to produce broom patterns.

1. Park the sweeper on a level, paved surface.
2. Start the auxiliary engine by following the instructions in the Operation section of this manual.
3. At both the LEFT and RIGHT SIDE BROOM controls press the OUT/IN and ON/OFF switches to lower the side brooms and start them rotating.
4. If the sweeper has the optional center broom, at the PICK-UP HEAD CONTROLS press the
5. Increase auxiliary engine speed to 1500 RPM using the ENGINE SPEED knob.

6. Let the brooms turn in place for 15-30 seconds.

7. At both the LEFT and RIGHT SIDE BROOM controls, press the ON/OFF and OUT/IN switches to raise the side brooms and stop broom rotation.

8. If applicable, press the CENTER BROOM ON/OFF switch to stop rotation of the center broom and raise it.

9. Slow the auxiliary engine to idle speed (1000 RPM).

10. Move the sweeper ahead to expose the broom patterns on the pavement.

11. Examine the broom patterns.

The side broom pattern(s) made by bristle contact with the pavement should be crescent shaped. The inside tip of the crescent must extend into the path of the pickup head (Figure SP-33). A side broom pattern that has the wrong shape or wrong location indicates that the side broom is not tilted properly.

A side broom pattern larger than that shown in the illustration indicates that too much down pressure is being applied. A smaller pattern indicates too little down pressure.

If a side broom pattern has the wrong shape or location or size, adjustment should be made by the procedure under Correcting Side Broom Pattern.

The pattern from the optional center broom should be about 1 inch (2.5 cm) wide and the same width from end to end. If the pattern is different from
Correcting Side Broom Pattern

Adjusting the down pressure on a side broom will correct the size of the contact area. To correct the size of the broom pattern, adjust the LEFT BROOM PRESSURE or RIGHT BROOM PRESSURE knob on the middle panel of the control console, then check the broom pattern again.

Adjusting the tilt of the side brooms forward or outward will change the shape of the broom pattern. To adjust the tilt for normal sweeping conditions, proceed as follows:
1. Park the sweeper on a level, paved surface and shut down both engines.

⚠️ CAUTION
To prevent injury, the operator must make sure that the broom cannot rotate during tilt measurement or manual adjustment.

2. With the auxiliary engine ignition switch in the on position, use the OUT/IN and ON/OFF switches to put the side broom into sweeping position.

3. Check the forward (front-to-back) angle of the broom by placing a protractor on top of the broom plate in line with the sweeper chassis (Figure SP-35). For the usual sweeping conditions, the angle should be 5°.

4. If the angle is not correct, take the following steps.
   a. Loosen the turnbuckle jam nut (Figure SP-36) on the upper broom suspension arm.
b. Turn the turnbuckle as necessary to obtain the proper angle.

c. Tighten the jam nut.

5. If the broom has power tilt, go to step 6. Otherwise, go to step 7.

6. Take the following steps.
a. Lightly tap the BROOM TILT switch to get display of the broom tilt angle in the LCD at the tachometer.

b. If the angle is not correct, use the BROOM TILT switch to adjust the angle.

c. Go to step 9.

7. Check the outward (side-to-side) angle of the side broom by placing a protractor on top of the side broom plate at a right angle to the sweeper (Figure SP-37). For the usual sweeping conditions, the angle should be 5°.

8. If the angle is not correct, take the following steps.

   a. Loosen the nuts at the mounting bracket (Figure SP-38).
   
   b. Tilt the broom to the correct angle.

   c. Tighten the nuts.

9. Confirm that the broom pattern is correct.
Correcting Center Broom Pattern

The pattern from the optional center broom should be about 1 inch (2.5 cm) wide and should not taper from end to end. If the center broom pattern is different from this, check the bearings and shaft for debris that could hamper movement or cause uneven weight from one side to the other. Clean and grease as necessary.

Hours of operation for the center broom can be displayed on the LCD at the tachometer, as explained at LCD Screens in this section. If the broom must be replaced, the broom hour display should be reset to zero as directed in the Service Manual.
Changing The Side Broom

Each side broom contains five segments of wires. The segments should be replaced when 1/2 or less of the original wire length remains. Replacement segments are available. To install them, remove the two bolts holding each segment in place and secure the new segment with the two bolts.

The side brooms must have even weight distribution; therefore, all five segments should be replaced at the same time.

Hours of operation for each side broom can be displayed on the LCD at the tachometer, as explained at LCD Screens in this section. When broom segments are replaced, the broom hour display should be reset to zero as directed in the Service Manual.

HOPPER

The sweeper recirculates air (Figure SP-39). The impeller moves air through the sweeper to form a continuous loop of air. That air stream creates turbulence across the pickup head, lifting the debris from the street and into a collection hopper.

Air is blown down the pressure hose and across the pickup head. The air is then pulled up the suction hose and is spun around in the hopper to separate the debris. Heavy material drops into the hopper, while lighter material is deflected by the upper screen. Air circulates within the hopper to release all solids except the fine dust. Dust is removed from the air in the centrifugal dust separator, before the air returns to the impeller intake and is forced back down the pressure hose.

By recirculating the air instead of venting it to the outside, a minimum of dust is returned to the environment.

The hopper must be emptied whenever the FULL HOPPER indicator lights and at the end of each shift. To empty the hopper, take all the precautions and follow the instructions under Dumping The Hopper in the Operation section of this manual.
Crosswind Air Flow
Figure SP-39
The FULL HOPPER indicator is activated by the full load limit switch located on the right side of the rear axle (Figure SP-40).

To adjust the full load limit switch, use the following procedure.

1. Loosen two screws that hold the switch to its mounting plate.

2. Turn the switch to the desired position.

3. While holding the switch in position, tighten the two screws.

Seals at the hopper door and the doors of the dust separator (Figure SP-41) should be checked for wear and damage each time the hopper is cleaned.

**SPRAY WATER SYSTEM**

Water is utilized during the sweeping operation to reduce the amount of dust. Water sprayed at the side brooms reduces the dust stirred up into the air. Water sprayed in the hopper helps moisten the debris so that it will settle out of the air flow into the hopper.

Water passes from the tank through a filter and then through an electrically driven water pump.
If a spray nozzle does not produce a good spraying pattern, take the following steps.

1. Remove the nozzle tip.
2. Dislodge dirt from the tip with a small wire.
3. Rinse the tip clean.
4. Install the tip.

HYDRAULIC SYSTEM

⚠️ WARNING
To get access to some components of the hydraulic system, the hopper must be raised by taking the precautions and steps stated at Raising Hopper in the Operation section.

Oil Level
To check and correct the oil level in the hydraulic reservoir, take the following steps.

1. Check oil level when the oil has not been heated by operation of the hydraulic system.
2. With the hopper down, check the oil level indicated on the oil level gauge (Figure SP-43).

NOTICE
Elgin Sweeper Company recommends Shell Tellus T

Hydraulic Tank
Figure SP-43
68 or equivalent hydraulic oil for use in the sweeper hydraulic system. Use of any fluid not approved by Elgin Sweeper Company can void all hydraulic component warranties.

⚠️ CAUTION
Pressurized hydraulic reservoir. Opening fill cap before venting can cause personal injury. Vent hydraulic reservoir pressure by depressing button on top of fill cap.

3. If the oil is below the "Add Oil" level, take the following steps.
   a. Press the red button on the fill port cap (Figure SP-44) to release the air pressure in the reservoir.
   b. Open the fill port.
   c. Add enough clean, unused hydraulic oil of an approved type to raise the oil level in the gauge to the “Full (Cold)” point.
   d. Immediately close the fill port.
Hydraulic Pumps

The sweeper can have two sources of hydraulic power, one driven by the auxiliary engine and the other driven by an electric motor.

The double-cavity hydraulic pump (Figure SP-45) is gear driven from the auxiliary engine. This pump supplies oil flow to all hydraulic components.

Also offered as an option is an auxiliary hydraulic pump, an electrically powered gear pump, which can be operated without use of the auxiliary engine. This pump provides enough oil flow to drive the lifting components, such as the hopper raising mechanism, but it cannot power the hydraulic motors that drive the brooms.

The auxiliary hydraulic pump is activated by pressing the AUX PUMP ON/OFF switch at the IN-CAB HOPPER DUMP controls. The pump cannot be activated while the auxiliary engine is running.

**NOTICE**

*The auxiliary hydraulic pump is controlled by the sweeper electrical system but powered by the truck electrical system. The truck battery can be discharged by excessive use of the electric pump without using the truck engine.*
These hydraulic pumps cannot be repaired. If damaged, they must be replaced. The procedure for replacement of the hydraulic pumps is found in the Service Manual for the sweeper.

**Hydraulic Oil Filter**

To replace the hydraulic oil filter (Figure SP-44), use a strap wrench to remove the filter element from the filter head, then install a new element.

**STORAGE**

To prepare the sweeper for extended parking, use the following procedure.

1. Empty the hopper and clean the sweeper as instructed under Daily Washdown.
2. Fill the fuel tank to prevent condensation.
3. Put all brooms into storage position to keep them from taking a “set”.
4. If the sweeper will be parked for more than one month, or if the sweeper may be exposed to temperatures below the freezing point, take the applicable steps stated under Winter Storage.

**WINTER STORAGE**

If the sweeper must be kept where temperatures may drop below the freezing point, or if the sweeper will be put into seasonal storage, take the following steps to prevent damage.

⚠️ **WARNING**

*To get complete access for winter storage preparations, the hopper must be raised by taking the precautions and steps stated at Raising Hopper in the Operation section.*

1. Take the steps stated under Storage.
2. Remove the plug from the water tank drain (Figure SP-46).
3. Remove the water filter housing (Figure SP-47) and clean the screen. Leave the shutoff valve open, and store the housing and screen.
4. Drain the low-pressure water pump (Figure SP-48).

5. Remove the cap from the water fill tube (Figure SP-49).
6. Open all spray system valves. If the sweeper is equipped with the air purge feature, use it to blow water out of the lines.

7. Drain any accumulated water out of both fuel filters (Figure SP-50).

⚠️ **CAUTION**

*Battery gas can explode. Keep sparks and flames away from batteries. If the battery electrolyte level must be checked, use an electric light. Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer. Always remove the grounded (—) battery cable first and connect it last.*

8. Remove and clean the battery. Store it in a cool, dry place, and keep it fully charged.

9. Loosen or remove all belts.

10. If water is being used instead of solvent in the windshield washer, drain the washer solvent bottle.

11. Drain the optional high pressure washdown pump (Figure SP-51).
12. Touch up all damaged areas on painted surfaces.

13. Coat all exposed metal surfaces with grease or corrosion inhibitor.

14. Follow all recommendations of the engine manufacturer for cold weather storage.

**START-UP AFTER STORAGE**

1. Follow all directions of the engine manufacturers and chassis manufacturer for start-up after extended or cold weather storage.

2. Close the drain on the optional high-pressure washdown pump (Figure SP-51).

3. If necessary, fill the solvent bottle for the windshield washer.

4. Inspect all belts, and replace them if they show cracks, stretching, or fraying.

5. Install any removed belts, and adjust all belts to their proper tension.
⚠️ **CAUTION**

Battery gas can explode. Keep sparks and flames away from batteries. If the battery electrolyte level must be checked, use an electric light. Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer. Always remove the grounded (—) battery cable first and connect it last.

6. Install a fully-charged battery and connect the cables.

7. Make sure the optional air purge valve is closed.

8. Cap the water fill tube (Figure SP-49).

9. Close the drain on the low-pressure water pump (Figure SP-48).

10. Install the water filter housing with screen (Figure SP-47).

11. Close the water tank drain (Figure SP-46).

12. Make sure all spray system valves are closed.

13. Follow all instructions in the Start-up Checklist at the beginning of this section.
# Fault Table

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<td>2 seconds / 5 minutes or until cleared</td>
<td>Front spray water spray solenoid open circuit</td>
</tr>
<tr>
<td>9041</td>
<td>Fuel level sensor</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Fuel level sensor &lt; x volts</td>
</tr>
<tr>
<td>9045</td>
<td>Back-up alarm</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Back-up alarm open circuit</td>
</tr>
<tr>
<td>9047</td>
<td>RT broom rotate sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>RT broom rotate solenoid open circuit</td>
</tr>
<tr>
<td>9051</td>
<td>LT broom rotate sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>LT broom rotate solenoid open circuit</td>
</tr>
<tr>
<td>9065</td>
<td>RT broom lower sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>RT broom lower solenoid open circuit</td>
</tr>
<tr>
<td>9067</td>
<td>LT broom lower sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>LT broom lower solenoid open circuit</td>
</tr>
<tr>
<td>Line 1</td>
<td>Line 2</td>
<td>Audible Alarm Duration / Display Duration</td>
<td>Fault Diagnosis</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------</td>
<td>-------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>9071</td>
<td>Common sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Common solenoid open circuit</td>
</tr>
<tr>
<td>9073</td>
<td>CB lower sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>CB lower solenoid open circuit</td>
</tr>
<tr>
<td>9075</td>
<td>CB rotate sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>CB rotate solenoid open circuit</td>
</tr>
<tr>
<td>9077</td>
<td>LT broom water sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>LT broom water solenoid open circuit</td>
</tr>
<tr>
<td>9081</td>
<td>RT broom water sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>RT broom water solenoid open circuit</td>
</tr>
<tr>
<td>9083</td>
<td>LT broom out sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>LT broom out solenoid open circuit</td>
</tr>
<tr>
<td>9085</td>
<td>RT broom out sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>RT broom out solenoid open circuit</td>
</tr>
<tr>
<td>Line 1</td>
<td>Line 2</td>
<td>Audible Alarm Duration / Display Duration</td>
<td>Fault Diagnosis</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------</td>
<td>------------------------------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>9211</td>
<td>Water LVL sensor</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Water level sensor &lt; x volts</td>
</tr>
<tr>
<td>9213</td>
<td>RT tilt sensor</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>RT tilt sensor &lt; x volts</td>
</tr>
<tr>
<td>9215</td>
<td>LT tilt sensor</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>LT tilt sensor &lt; x volts</td>
</tr>
<tr>
<td>9217</td>
<td>Vacuum sensor</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Vacuum sensor &lt; x volts</td>
</tr>
<tr>
<td>9225</td>
<td>LT broom speed pot</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>4.7 volts &lt; LT broom speed pot or LT broom speed pot &lt; 0.3 volts</td>
</tr>
<tr>
<td>9227</td>
<td>RT broom speed pot</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>4.7 volts &lt; RT broom speed pot or RT broom speed pot &lt; 0.3 volts</td>
</tr>
<tr>
<td>9231</td>
<td>CB speed pot</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>4.7 volts &lt; CB speed pot or CB speed pot &lt; 0.3 volts</td>
</tr>
<tr>
<td>Line 1</td>
<td>Line 2</td>
<td>Audible Alarm Duration / Display Duration</td>
<td>Fault Diagnosis</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------</td>
<td>---------------------------------------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>9233</td>
<td>High press wash sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>High pressure wash solenoid open circuit</td>
</tr>
<tr>
<td>9237</td>
<td>PH lower sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>PH lower solenoid open circuit</td>
</tr>
<tr>
<td>9241</td>
<td>PH raise sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>PH raise solenoid open circuit</td>
</tr>
<tr>
<td>9243</td>
<td>PH water sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>PH water solenoid open circuit</td>
</tr>
<tr>
<td>9245</td>
<td>W hose lower sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Wander hose lower solenoid open circuit</td>
</tr>
<tr>
<td>9247</td>
<td>W hose raise sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Wander hose raise solenoid open circuit</td>
</tr>
<tr>
<td>9251</td>
<td>Hopper close sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Hopper door close solenoid open circuit</td>
</tr>
<tr>
<td>Line 1</td>
<td>Line 2</td>
<td>Audible Alarm Duration / Display Duration</td>
<td>Fault Diagnosis</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------</td>
<td>------------------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>9253</td>
<td>Hopper open sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Hopper door open solenoid open circuit</td>
</tr>
<tr>
<td>9255</td>
<td>Hopper lower sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Hopper lower solenoid open circuit</td>
</tr>
<tr>
<td>9257</td>
<td>Hopper raise sol</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Hopper raise solenoid open circuit</td>
</tr>
<tr>
<td>Status: 9261</td>
<td>Hopper door open</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Hopper door is open while in transport mode</td>
</tr>
<tr>
<td>Status: 9263</td>
<td>Hopper up</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Hopper is up while in transport mode</td>
</tr>
<tr>
<td>9271</td>
<td>Left nozzle lower</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Left nozzle lower solenoid open circuit</td>
</tr>
<tr>
<td>9273</td>
<td>Left nozzle shutter</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Left nozzle shutter solenoid open circuit</td>
</tr>
<tr>
<td>Line 1</td>
<td>Line 2</td>
<td>Audible Alarm Duration / Display Duration</td>
<td>Fault Diagnosis</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------</td>
<td>------------------------------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>9275</td>
<td>Left nozzle water</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Left nozzle water solenoid open circuit</td>
</tr>
<tr>
<td>9277</td>
<td>Left gate valve</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Left gate valve solenoid open circuit</td>
</tr>
<tr>
<td>9281</td>
<td>Right nozzle lower</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Right nozzle lower solenoid open circuit</td>
</tr>
<tr>
<td>9283</td>
<td>Right nozzle shutter</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Right nozzle shutter solenoid open circuit</td>
</tr>
<tr>
<td>9285</td>
<td>Right nozzle water</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Right nozzle water solenoid open circuit</td>
</tr>
<tr>
<td>9287</td>
<td>Right gate valve</td>
<td>2 seconds / 5 minutes or until cleared</td>
<td>Right gate valve solenoid open circuit</td>
</tr>
</tbody>
</table>
GAUGES, INSTRUMENTS, AND MENUS

Initial Tests

When the ignition switch is placed in the ON position, the start-up tests provide a way for the operator to check instrument and gauge communication.

The LCD (Figure SP-52) turns on all segments for one second, then off for one second, and displays the ELGIN logo followed by the software version and revision level (Figure SP-53) in use.

In another test, the gauges sweep from 0% to 50% to 100% and back to 0%.

NOTICE

On start-up, if the gauges continue to sweep after initial test, system communication is not available.
and the system must be checked for communication malfunctions.

The warning lamps (icons) illuminate for five seconds. Any active icons illuminate after start-up mode is completed.

The tachometer checks which data buses are connected and devices are present. An error message will display on the LCD if a data bus or device is missing.

Indicator Lights And Icons

The indicator lights are light emitting diodes that illuminate icons alerting the operator to the operation of a component or a condition that may affect the sweeping operation. There are also switch indicator lights that alert the operator that the component is operating.

LCD SCREENS

A graphical, backlit LCD (Figure SP-52) at the tachometer displays information to the vehicle operator. The screens provide the operator with hours and/or miles the components have worked, water level, hydraulic oil temperature, and side broom tilt, if activated. A variety of menus can be selected and displayed for diagnostic purposes. The LCD also displays fault codes as they are received.

After the ignition is switched on, a screen describing the software appears. Then the drive mode screens become available.
During normal operation, the LCD displays the last retained screen.

**NOTICE**

To change the screen, press the M button (Figure SP-52) once to highlight the current screen, then press the button again to select the next screen.

In drive mode, the default screen is engine hours (Figure SP-54). This appears after the software version screen. The hours displayed have accrued since the last time the hours were reset.

The engine hours start accumulating when the engine speed is greater than 400 rpm.

Display the next screen (Right Side Broom Hours) by pressing the M button to highlight the screen and then pressing the button again to check RSB hours/miles.

The RSB Hours screen (Figure SP-55) displays the hours of usage since the RSB hours were last reset.

The RSB Hours start accumulating when the engine speed is greater than 400 RPM and the right side broom is selected.
Display the next screen (Left Side Broom Hours) by pressing the M button twice.

The LSB Hours screen (Figure SP-56) displays the hours of usage since the LSB Hours were last reset.

Display the next screen (Left Side Broom Hours / Miles Screen) by pressing the M button twice.

The LSB Hours start accumulating when the engine speed is greater than 400 rpm and the left side broom is selected.

Display the next screen (Center Broom Hours) by pressing the M button twice.
The CB Hours screen (Figure SP-57) displays the hours of usage since the CB Hours were last reset.

The CB Hours start accumulating when the engine speed is greater than 400 rpm and the center broom is selected.

Additional screens show side broom tilt angles, vacuum enhancer opening, and spray water level. For more about those screens, see LCD Screens in the Operation section.

All fault messages (Figure SP-58) are displayed as priority and use both lines of text. When multiple faults occur, the messages will be continually displayed for two seconds before displaying the next message.

Some messages can be acknowledged by pressing the M button while the message is being displayed. When acknowledged, these messages will stop displaying. Some acknowledged messages will redisplay, if the fault condition is not corrected within a
period of time. Others will not reoccur until the ignition key is shut off and turned back on. See the Fault Codes table in this section for fault code listings, descriptions, alarm and display durations, and fault diagnosis.

Messages about engine faults may also appear. For the diagnosis of these messages, see the operator’s manual from the engine manufacturer.
## TROUBLESHOOTING

### DECLINE IN PERFORMANCE

A decline in sweeping performance may be caused by the following problems.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hopper full</td>
<td>Empty hopper.</td>
</tr>
<tr>
<td>Pickup head or suction hose clogged</td>
<td>Remove clog.</td>
</tr>
<tr>
<td>Pickup head not in contact with pavement</td>
<td>Adjust dirt shoes.</td>
</tr>
<tr>
<td>Pressure slot not properly adjusted</td>
<td>Adjust pressure slot.</td>
</tr>
<tr>
<td>Worn or damaged pickup head curtains</td>
<td>Repair or replace curtains.</td>
</tr>
<tr>
<td>Loose impeller fan belt</td>
<td>Adjust belt tension.</td>
</tr>
<tr>
<td>Optional center broom not sweeping cleanly</td>
<td>Make sure broom is lowered.</td>
</tr>
<tr>
<td></td>
<td>Remove any mechanical blockage of lowering or rotation.</td>
</tr>
<tr>
<td></td>
<td>Increase down pressure on broom.</td>
</tr>
</tbody>
</table>

### SWEEPING FUNCTIONS

If sweeping functions stop, check the fuel level. Auxiliary engine will run out of fuel before truck engine.
### DEBRIS
Problems with debris may be solved as follows.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debris scatters</td>
<td>Slow down auxiliary engine.</td>
</tr>
<tr>
<td>Debris thrown back into gutter</td>
<td>Increase angle of side broom.</td>
</tr>
<tr>
<td>Excessive dust</td>
<td>Increase spray water. Check spray nozzles for clogs and clean, if necessary. Check water tank and fill, if necessary.</td>
</tr>
</tbody>
</table>

### SIDE BROOM
Side broom problems may be solved as follows.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wearing too rapidly</td>
<td>Decrease down pressure</td>
</tr>
<tr>
<td>Rotates too slowly</td>
<td>Decrease down pressure</td>
</tr>
<tr>
<td>Will not rise</td>
<td>Remove any mechanical blockage.</td>
</tr>
</tbody>
</table>
**PICKUP HEAD**

Pickup head problems may be solved as follows.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot spots on dirt shoes</td>
<td>Adjust dirt shoes higher.</td>
</tr>
<tr>
<td>Head will not rise.</td>
<td>Remove any mechanical blockage.</td>
</tr>
<tr>
<td>Head will not lower.</td>
<td>Remove any mechanical blockage.</td>
</tr>
</tbody>
</table>

**HOPPER**

Hopper problems may be solved as follows.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hopper will not rise.</td>
<td>Set parking brake.</td>
</tr>
<tr>
<td>Hopper will not lower.</td>
<td>Secure hopper support bar in storage position.</td>
</tr>
<tr>
<td></td>
<td>Remove any mechanical blockage.</td>
</tr>
<tr>
<td>Hopper door will not lower.</td>
<td>Secure hopper door prop in storage position.</td>
</tr>
<tr>
<td></td>
<td>Remove any mechanical blockage.</td>
</tr>
</tbody>
</table>
TROUBLESHOOTING — Electrical System

- Battery
- Alternator
- Ignition Switch
- Relay
- Relay
- Starter Motor
- Circuit Breaker
- Control Switch
- Component (Load)
- Chassis Ground
GLOSSARY

**auxiliary engine**  Engine other than the truck engine used to power the sweeping components.

**auxiliary hydraulic pump**  Optional pump used to power hydraulic lift functions, such as dumping the hopper, without running the auxiliary engine. The pump can be operated only when the auxiliary engine is not running.

**centerboard**  Rubber deflector used to direct debris from the side brooms to the pickup head. It runs from the midline of the back of the cab to the front of the pickup head. Its position at the pickup head is adjustable - left, center or right.

**center broom**  Optional broom positioned at the back of and parallel to the pickup head, used to direct debris into the pickup head.

**curtains**  Rubber devices in front and rear of the pickup head, used to seal the pickup head to the pavement, thereby improving suction.

**dirt shoes**  Carbide-imbedded metal devices located on the right and left sides of the pickup head, used to seal the pickup head to the pavement, thereby improving suction.
**dust separator**  A device in the hopper that causes air to flow in an S-shaped path in order to remove dust from the airstream by centrifugal force.

**fan**  Assembly that houses the impeller.

**front spray bar**  Optional series of spray nozzles mounted under the front bumper of the truck, used to control dust in heavy dust areas.

**hopper**  An on-board tank for holding debris that has been swept up.

**hopper door**  A large door at the rear of the sweeper that is opened to allow debris to be emptied from the hopper.

**hopper inspection door**  A small door on the side of the sweeper that can be opened to allow the inside of the hopper to be viewed and to allow large debris items to be loaded into the hopper without being swept.

**hopper screen**  Device in the hopper that deflects lighter objects, causing them to drop into the hopper before the air is returned to the fan.

**impeller**  Fan weldment used to pull air out of the hopper and push air down into the pickup head under pressure.

**pressure slot**  Gap at the rear of the pickup head through which air is forced downward to the pavement.
**pickup head**  Device used to move debris from the pavement to the suction hose.

**pressure hose**  Hose through which air is directed downward through the left side of the pickup head. This hose connects the outlet of the fan to the pickup head.

**recirculating air**  Contained air flow system that reuses the same air rather than venting the air to the outside.

**side broom**  Horizontally rotating broom used to direct debris from the gutter to the pickup head.

**spray water**  Water sprayed on debris being picked up by the sweeper and in the hopper. This water reduces the amount of dust and protects the air flow system from abrasion.

**suction hose**  Hose used to pull air and debris up through the right side of the pickup head. This hose connects the pickup head to the hopper.

**vacuum enhancer**  Electrically controlled device used to control the amount of air passing down the pressure hose into the pickup head. Decreasing the amount of air in the pickup head increases the vacuum.

**wandering hose**  Optional hose connected to the back of the sweeper that is used to clean catch basins and piles of debris.

**washdown, high pressure**  Optional system that uses high pressure pump to supply water to wash interior of hopper.