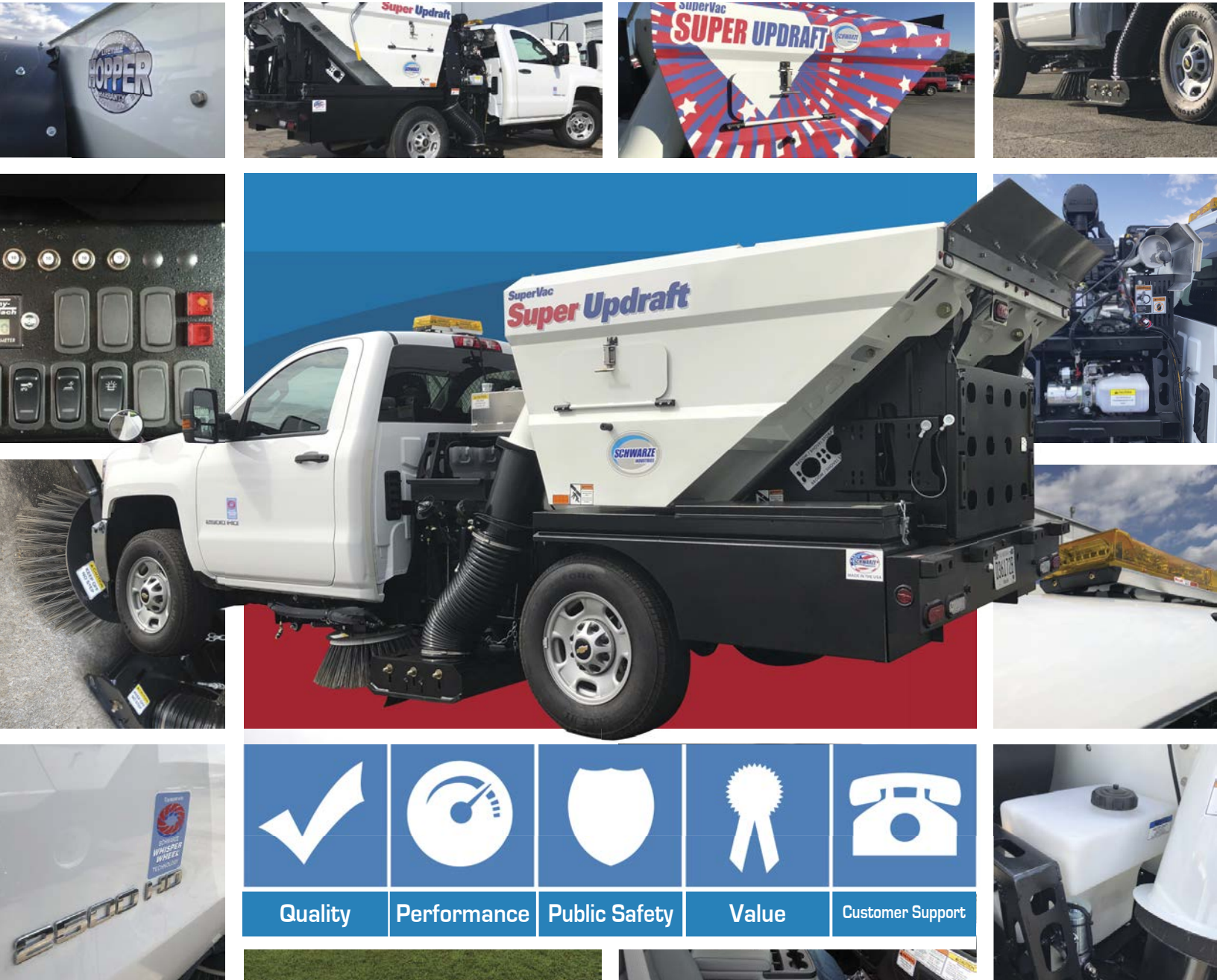


Schwarze Industries, Inc.

# ***SUPERVAC SUPER UPDRAFT***



## **Product Manual**



Quality



Performance



Public Safety



Value



Customer Support

Schwarze Industries, Inc.

# ***SUPERVAC SUPER UPDRAFT***



## **Product Manual**

# Foreword

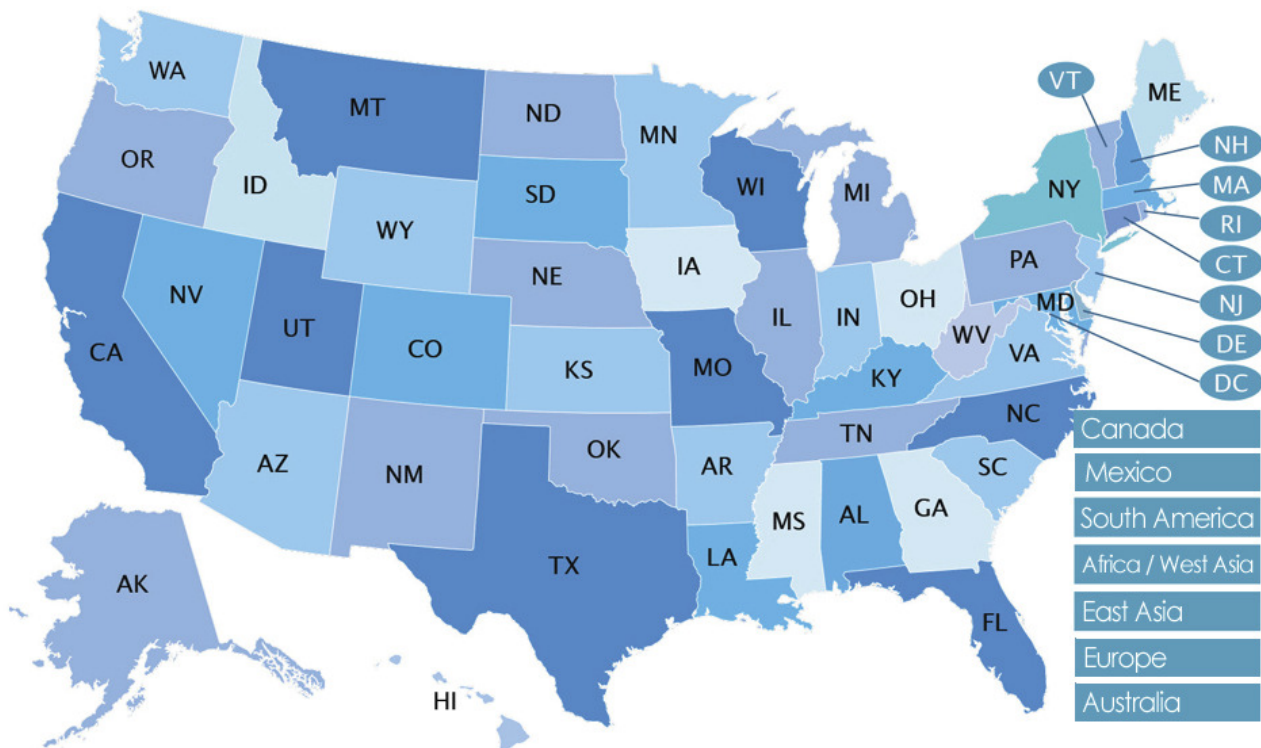
Dear customer,

We are pleased to have you as a Schwarze customer. Your new sweeper has been carefully designed to give maximum service with minimum downtime.

This manual is provided to give you the necessary operating and maintenance instructions for keeping your sweeper in top operating condition. Careful use and timely service save extensive repairs and costly downtime losses. Make sure to read this manual thoroughly and understand what each control is for and how to use it.

Safety is of primary importance to the owner/operator and the manufacturer. Observe all safety precautions decals on the machine and noted throughout the manual for safe operation. If any assistance or additional information is needed, contact your authorized Schwarze dealer.

In addition to having many Authorized Dealers located throughout the country, Schwarze Industries also maintains a fully stocked factory service center in Huntsville, Alabama. In the event you need parts or service, call your nearest Authorized Dealer. Their name and number can be found on the Sweeper Information Sheet, located in the front of this manual. In the unlikely event that your local dealer is unable to provide the assistance you require, call us at our home office in Huntsville, Alabama. We have a state-of-the-art fabrication and production facility and a complete service and refurbishing center with an inventory of over \$500,000 in spare parts. In most cases, same day shipping and overnight delivery are available.



Schwarze dealer locator: <http://www.schwarze.com/locator>

Schwarze website: <http://www.schwarze.com>

Schwarze Customer Service: 1.800.879.7934

## In This Manual

Foreword .....	4
<b>1 Safety .....</b>	<b>7</b>
1.14 Safety Decals Locations .....	39
<b>2 Technical Data .....</b>	<b>43</b>
<b>3 Operations .....</b>	<b>45</b>
3.1 Start-Up Checklist for Daily Maintenance .....	46
3.2 Console Controls .....	49
3.3 Sweeping Head and Hopper Operation .....	49
3.4 Gutter Broom Operation .....	50
3.5 Light/Heavy Operation .....	50
3.6 Lights and Flashers Operation .....	51
3.7 Dust Suppression System Operation .....	51
3.8 Sweeping .....	51
3.9 Dumping the Hopper .....	52
3.10 Quick Reference Operating Guideline .....	52
<b>4 Service .....</b>	<b>53</b>
4.1 Maintenance Logs .....	54
4.2 Maintenance Schedules .....	55
4.3 Cleaning .....	56
4.4 Hydraulic System .....	56
4.5 Lubrication Schedule .....	57
4.6 Filters .....	57
Hydraulic Tank Filters .....	57
Dust Suppression System Filter .....	57
4.7 Seals .....	57
Replacement .....	58
4.8 Hopper .....	58
4.9 Drive Belt .....	58
Adjustment .....	58
Replacement .....	59
4.10 Fan Housing .....	60
Fan Housing Check .....	60
Fan Housing Replacement .....	60
Fan Housing Liner Replacement .....	62
4.11 Sweeping Head .....	62
Checking Head Flaps for Wear .....	63
Flap Replacement .....	63
4.12 Gutter Broom .....	65
Gutter Broom Pattern Check .....	65
Gutter Broom Down-Pressure Adjustment .....	66

# Foreword

Gutter Broom Angle Adjustment . . . . .	66
Gutter Broom Spring Adjustment . . . . .	66
Gutter Broom Bristle Replacement . . . . .	67
4.13 Hydraulic System Maintenance . . . . .	67
Hydraulic Tank Fill-Up . . . . .	67
Draining the Hydraulic Tank . . . . .	68
Hydraulic Fluid Change . . . . .	68
Hydraulic Filters . . . . .	69
Directional Valve Override . . . . .	69
4.14 Dust Suppression System Maintenance . . . . .	70
Water Filter Cleaning . . . . .	70
Water Nozzle Cleaning/Replacment . . . . .	70
Dust Suppression System Winterizing . . . . .	71
<b>5 Troubleshooting . . . . .</b>	<b>73</b>
5.1 Sweeper . . . . .	74
5.2 Dust Suppression System . . . . .	75
5.3 Hydraulic System . . . . .	75
5.4 Gutter Brooms . . . . .	76

# Section 1 - Safety

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1

# Section 1 - Safety

## GENERAL SAFETY INSTRUCTIONS AND PRACTICES

A careful operator is the best operator. Safety is of primary importance to the manufacturer and should be to the owner/operator. Most accidents can be avoided by being aware of your equipment, your surroundings, and observing certain precautions. The first section of this manual includes a list of Safety Messages that, if followed, will help protect the operator and bystanders from injury or death. Read and understand these safety messages before assembling, operating, or servicing this equipment. This equipment should only be operated by those persons who have read the manual, who are responsible and trained, and who know how to do so responsibly.



The Safety Alert Symbol combined with a Signal Word, as seen below, is used throughout this manual and on decals which are attached to the equipment. The Safety Alert Symbol means: **“ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!”** The Symbol and Signal Word are intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this equipment.

**Practice all usual and customary safe working precautions** and above all remember safety is up to **you**. Only **you** can prevent serious injury or death from unsafe practices.



### DANGER

Indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.



### WARNING

Indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.



### CAUTION

Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury and property damage. It may also be used to alert against unsafe practices.

### NOTICE

Indicates a potentially hazardous situation which, if not avoided, **MAY** result in property damage. It may also be used to alert against unsafe practices.

### NOTE

*Identifies points of particular interest for more efficient and convenient operation or repair.*



**READ, UNDERSTAND, and FOLLOW** the following **Safety Messages**.

Serious injury or death may occur unless care is taken to follow the warnings and instructions stated in this manual and in the Safety Messages on the equipment. Always follow the instruction in this manual and use common sense to avoid hazards.



## VISUAL ATTENTION SAFETY

Pictographs are used throughout this manual to help bring your visual attention to safety issues.

SAFETY HAZARD	SAFETY AVOIDANCE	SAFETY PREVENTION
<p>Pictograph surrounded by a triangle indicates a Safety Hazard that must be avoided.</p> <p><i>Example:</i></p>  <p>Equipment contacting overhead electrical lines</p>	<p>Pictograph by itself or inside a box indicates an avoidance procedure that should be followed to prevent injuries.</p> <p><i>Example:</i></p>  <p>Always shut off engine and remove key before working on equipment.</p>	<p>A circle with a slash through it indicates an action that is prohibited.</p> <p><i>Example:</i></p>  <p>No Smoking</p>

**Figure 1-1**

### NOTE

*If you want a translation of this safety section in Spanish or French, please contact:*

***Translation — Safety Section  
(Company Contact Information)***



# Section 1 - Safety

## PERSONAL PROTECTION EQUIPMENT (PPE)

					
Wear Safety Glasses	Wear Hard Hat	Wear Safety Shoes	Wear Hearing Protection	Wear Protective Gloves	Wear Safety Reflective Vest

Figure 1-2

Always wear protective clothing and personal safety devices issued to you or required by job conditions.

This should always include:

- Hard hat
- Safety shoes
- Safety glasses, goggles, or face shield
- Heavy gloves (chemical resistant)
- Hearing protection
- Reflective clothing



### WARNING

Never wear loose clothing or jewelry that can catch on controls or other parts of the machine. Loose clothing can be drawn into the suction hose or rotating components. Never wear a wristwatch or finger rings when working on or around equipment.

### WHEN USING PRESSURIZED AIR OR WATER





			
Wear Face Protection Shield	Wear Protective Suit	Wear Waterproof Gloves and Safety Shoes	Wear Respirator

Figure 1-3

When using pressurized air or water for cleaning you should use the following:

- Face Shield
- Wet Weather Protective Suit
- Waterproof Gloves
- Respirator
- Safety Boots with Metatarsal Guard

# Section 1 - Safety

## GENERAL HAZARDS AND PREVENTION SAFETY



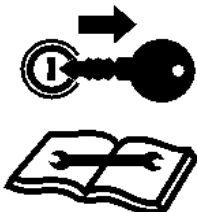


				
Read and Understand Operator's Manual	DO NOT USE DRUGS or ALCOHOL before or while operating equipment	Always shut off engine and remove key before working on equipment	Always install Debris Body and debris door props before working under equipment	Always wear your seatbelt

Figure 1-4


**WARNING**

**To avoid serious injury or death, do the following:**

- Read, understand, and follow the operator's manual instructions, warnings, and safety messages.
- Do not allow untrained or unauthorized persons to operate equipment.
- Do not allow untrained coworkers to operate or assist in operating equipment.
- Do not allow bystanders near equipment or work area.
- Do not allow anyone to operate equipment while under the influence of drugs or alcohol.
- Consult medical professional for medication impairment side effects.
- Wear appropriate safety personal protective equipment (PPE).
- Wear appropriate breathing respirator and protective suit when operating with hazardous or unknown substances.
- Do not wear loose clothing or jewelry to avoid injury from entanglement in rotating parts.
- Keep body and limbs away from suction inlets.
- Do not open or close the debris door or raise or lower the body unless the area is clear of people and obstructions.
- Never put any part of your body under an open debris door unless it is sufficiently supported by prop.
- Never operate the vacuum pump unless you are certain the suction hose is clear of people and obstructions.
- Do not enter the debris body if hazardous materials are suspected inside the debris body. Take the unit to a certified tank cleaning facility.

- **Always shut off the engine**, remove the key, and set the parking brake before working on the truck or equipment.
- Stay alert. Prolonged operation can cause fatigue. Stop and rest.

Keep away from ROTATING ELEMENTS like gutter brooms and sweeping head.

- Do not operate sweeper if excessive vibration or noise exists.
- Never operate the sweeper if it becomes entangled with wire, rope, cable or chain. These items can cause mechanical damage or injure the operator or passerby.
- Keep away from suction elements such as suction head and suction hoses to prevent from being drawn into sweeper head, this could cause serious injury or death.

### GROUND SPEED WHEN SWEEPING:

- Normal Speed range is 1 to 5 mph for curb line and 0 - 15 mph in open lot.
- DO NOT exceed rated operating speed for Truck and Auxiliary Engine.
- Never Sweep debris that is too large for sweeper to pick up.
- Use Right side steering for sweeping, and never while exceeding 15 mph. Sweeper must be driven from left side unless sweeper is only equipped with right side steering and controls.
- REDUCE sweeping SPEED when near steep slopes, ditches, drop-offs, overhead obstructions, and power lines.
- Stop sweeping if anyone comes within 25 feet of sweeper.
- Sweeper brooms are capable of propelling objects up to 25 feet

## GENERAL HAZARDS AND PREVENTION SAFETY — CONTINUED





			
Use adequate lighting for proper vision	Do not touch hot surface. Keep hands and limbs away from hot surfaces	Tanks can be under pressure. Relieve pressure before opening	Use three-point contact when climbing on equipment

Figure 1-5

### Visibility Conditions When Operating

- **Operate in daylight** or with lights that give at least 50 yards clear visibility.
- **Be able to see** and identify passersby, steep slopes, ditches, drop-offs, overhead obstructions, power lines, debris, and foreign objects.
- **Use extreme care** when backing up. Vision may be limited. Severe damage or injury can occur.
- **Do not run engines** in enclosed building without adequate exhaust ventilation.

### Safety Signs

- **Replace** missing, damaged, or unreadable safety signs immediately!

### Equipment Guards

- Do NOT operate machine if equipment guards are damaged or missing.
- **Replace** missing or damaged guards immediately!

### Mounting and Dismounting Truck or Equipment



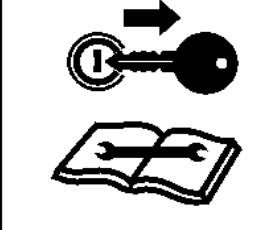


- **Only** mount or dismount when truck and moving parts are stopped.
- Never jump when exiting the machine. Never mount or dismount a moving machine.
- **Always use three-point contact** when climbing on or dismounting equipment.
- **Walkways, steps, and handrails** should be checked before use to ensure a proper non-slip surface. Replace or repair damaged components immediately.
- Use Steps Hand holds correctly
- Prevent falls by facing the machine when getting on and off. Maintain 3-point contact with steps, handholds, and hand rails.
- Use extra care when mud, snow or moisture present slippery conditions. Keep steps clean and free of grease and mud.
- Walkways, steps, and handrails should be checked before use to ensure a proper non-slip surface.
- Replace or repair damaged component immediately.

### Hot Surface

- Stay clear of hot surfaces such as mufflers, hydraulic pumps, valves, and tanks.
- Relieve pressure from tank, reservoirs, valves, and hoses before servicing or opening.

# Section 1 - Safety

## ENTANGLEMENT AND ENTRAPMENT HAZARDS DE-ENERGIZE PROCEDURES

				
Brush or Convey Entanglement Hazard	Crushing Hazard	Remove key and read service/maintenance manual/handbook before servicing	Wait until all moving parts have stopped completely	Lock-Out



### WARNING

**Before attempting to remove a system blockage ALWAYS SHUT DOWN ALL ENGINES AND DE-ENERGIZE THE MACHINE. Serious injury or death can result from entanglement from reaching in or under moving or lifted components of the machine.**



### WARNING

**Before loosening or removing hydraulic hoses or fittings ALWAYS SHUT DOWN ALL ENGINES AND DE-ENERGIZE THE MACHINE. Serious Injury or Death can result from falling boom, debris hopper, conveyor or raised components**

To properly de-energize this equipment:

1. Lower the debris body and debris door to the lowered transport position or onto the mechanical props to support the component.
2. Lower the boom (if equipped) to the storage position or to the lowest or ground position.
3. Place the transmission in the park position or neutral if not equipped with park position.
4. Set the parking brake.
5. Turn off the engine and remove the keys.
6. Switch the battery power off if the truck has a battery disconnect switch, or disconnect the battery ground cables.

7. Lock the truck doors and securely store the truck keys.
8. Securely install transport locks and block up any raised components to prevent inadvertent movement or falling.








### DANGER

**KEEP AWAY FROM ROTATING BLADES, BELTS AND PULLEYS TO AVOID SERIOUS INJURY OR DEATH FROM BLADE CONTACT:**

- STAY AWAY and KEEP HANDS, FEET and BODY AWAY from rotating blades and parts until all moving elements have stopped.
- DO NOT put hands or feet under sweeper shielding.
- STOP rotating FAN BLADES disengage power and wait for blade to stop rotating before adjusting shields or components.
- STOP LOOK and LISTEN before approaching the sweeper to make sure all rotating motion has stopped.

## VACUUM BLOCKAGE REMOVAL HAZARDS

				
Never go under raised Debris Body until Prop is installed	Install Body Prop	Do not reach into vacuum hoses or tubes	Do not reach into fan or fan housing	Shut off Engine and wait until all motion has stopped



### DANGER

Removing blockage for the vacuum suction line can be extremely dangerous and result in serious bodily injury or death. Never attempt to clear the blockage unless the body props are in place and the engine(s) are shut off.

- Start sweeper vacuum system and make sure blockage has been cleared.
- If blockage remains take the unit to a service center to have the blockage removed.



### DANGER

Never attempt to clear the blockage unless the body props are in place and the engine(s) are shut off.

Before attempting to remove blockage:

- Engage the truck parking brake
- Raise the debris body and install debris body and install hopper chock
- Raise the vacuum head chock
- Raise the vacuum head off the ground and securely block it up to prevent it from falling
- Shut off the truck engine and any auxiliary engines, and wait for all motion to stop.

Never use hands or arms to reach under or into equipment to remove blockage

- Never place your hand or arms underneath the vacuum head. Use a reach tool to remove any debris blockage from under the Vacuum head:
- Only use a reach tool to remove blockage from vacuum hoses.
- Only use a reach tool to remove blockage from vacuum fan, fan housing or vacuum hose. Never use your hands to reach into the fan or fan housing.

After Blockage has been removed.

- Remove blocks from vacuum head and lower head to operating position.
- Remove debris body props
- Make sure no bystanders or coworkers are within 25 feet of the sweeper before starting the engine(s)
- Ensure no one is under or near debris body and lower debris body down vacuum head into operating position.

# Section 1 - Safety

## CRUSHING HAZARDS AND PREVENTION SAFETY







				
Never go under raised Debris Body until prop is installed	Never go under raised debris door until prop is installed	Truck can tip over while dumping debris on un-level surface	Slow down on curves, High Center of Gravity	Truck can tip over when truck wheels are on unstable ground

Figure 1-6

### Debris Body Prop Support

**WARNING**

Never go under raised debris body until prop is installed. Failure to do so could result in personal injury or death.

1. Raise body sufficiently to allow body prop support to be swung into position.
2. Slowly lower body until body contacts body prop support.
  - To remove body prop support, reverse above procedure.

### Debris Door Prop Support

**WARNING**

Always position debris door prop in proper position before entering any areas beneath debris door or entering body. Failure to do so could result in serious injury or death.

1. Raise debris door sufficiently to allow debris door prop support to be swung into position.
2. Slowly lower debris body until door contacts door prop support.
  - To remove debris door prop support, reverse above procedure.

### Truck Tip Over

**WARNING**

Always wear seat belt while seated in truck to prevent injury.

- Truck driver must have valid applicable license and appropriate training before transporting liquids on public roads.
- Slow down on curves to prevent truck from tipping over.
- Always ensure unit is on firm and level ground before operating the dump system. When dumping, raise the body in steps, allowing the material to dump out in a steady flow.
- Do not allow people and/or vehicles beside debris body while dumping.
- Never drive truck with raised debris body.
- Keep truck away from drop-offs and soft soil ground where truck could tip over.



### TRIP AND FALL PREVENTION SAFETY

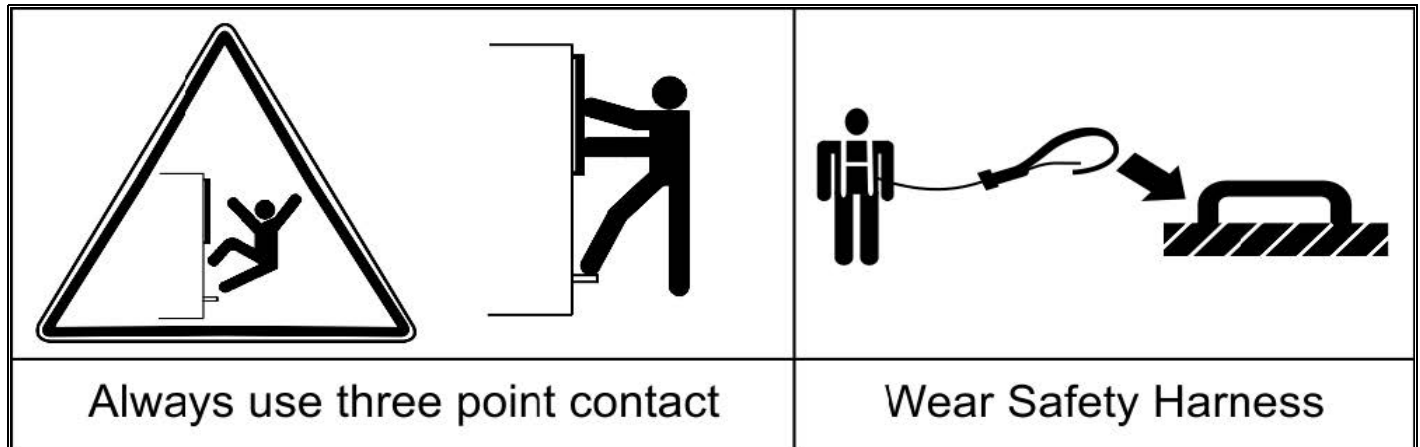


Figure 1-7

- **Always maintain** three-point contact with the machine, using two hands and one foot, or two feet and one hand, at all times during entry and exit. Never grab control levers or steering wheel when mounting or dismounting machine.
- **Walkways and steps** should be checked monthly to ensure a proper non-slip surface. Repair or replace damaged walkway or steps.
- **Keep** grab handles, steps, and walkways free of mud, oil, grease, and other foreign material. Clean non-skid surface material as required.
- **Ground level personnel** must be present whenever climbing onto unit to protect against inadvertent operation.
- **When servicing or working above ground**, occupants on elevated equipment surfaces must wear a full body harness with a lanyard attached to an authorized lanyard anchorage point. Attach only one lanyard per lanyard anchorage point.
- **Face the machine** when entering or leaving the elevated equipment surfaces.

# Section 1 - Safety

## HIGH-PRESSURE FLUID LEAK HAZARDS





			
High pressure oil penetrating skin	High pressure oil eroding skin	Using cardboard to check for oil leaks	Tank contents under pressure. Allow oil to cool before slowly removing cap

Figure 1-8

 **DANGER**

**To avoid serious injury or death from high-pressure hydraulic oil leaks penetrating skin, follow these rules:**

- Do not operate equipment with oil or fuel leaks.
- Keep all hydraulic hoses, lines, and connections tight and in good condition before applying pressure to the system.
- Relieve hydraulic pressure before servicing the hydraulic system.
- Remove and replace or test hydraulic hoses if a leak is suspected. Have a qualified service facility perform the test.

 **DANGER**


**High-pressure fluid leaks can be invisible. When checking for hydraulic leaks and working around hydraulic systems, follow these rules:**

- Always wear safety glasses and impenetrable gloves.
- Use paper or cardboard to search for leaks.
- Do not use hands or body parts to search for leak.
- Keep hands and body away from pin holes and nozzles ejecting hydraulic fluid.

 **CAUTION**

**Use caution when removing hydraulic tank cap. Contents may be under pressure.**

- **Allow oil to cool** before removing cap slowly.
- **Relieve** oil pressure before removing cap slowly.
- **Stay away** from hot oil that may spray from tank or hoses.

 **DANGER**

**High-pressure hydraulic oil can puncture skin. If injured, seek immediate medical attention and inform the physician of the cause of the injury. Surgery is required to remove the fluid from the body. Failure to seek proper medical attention will result in serious injury or death.**



Figure 1-9

### POWER LINES/STATIC ELECTRICAL HAZARD WARNINGS

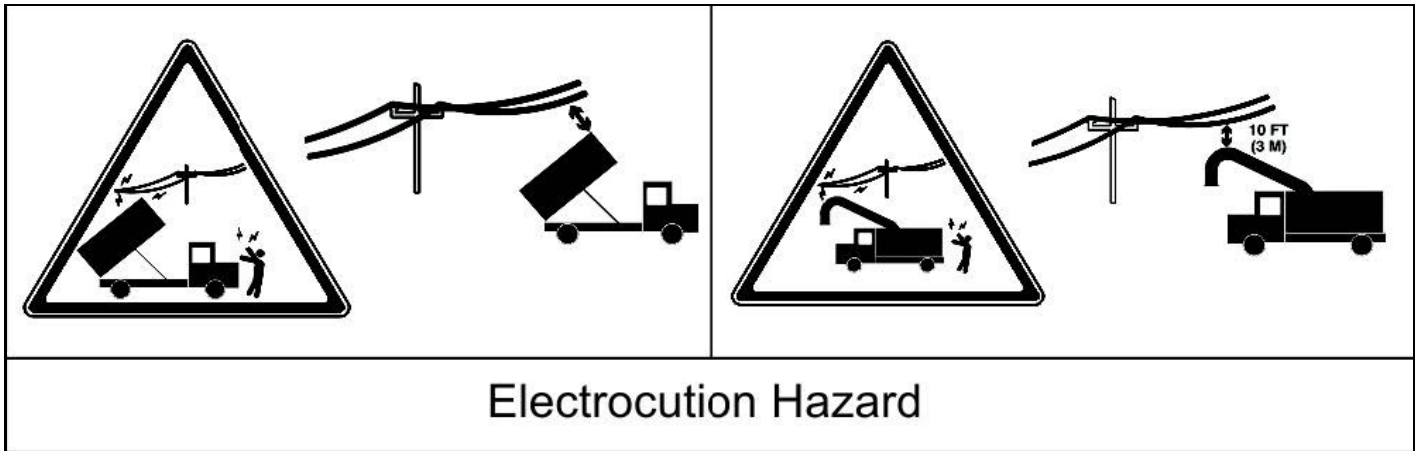


Figure 1-10



#### DANGER

This machine is not insulated and does not provide protection from contact or being near electrical current.

- **Never** operate the unit in an area where overhead power lines, overhead or underground cables, or other power sources may exist without ensuring that the appropriate power or utility company has de-energized the lines.
- **Always** check for power lines before raising boom or debris body.

Follow all requirements for using mobile equipment when working around power lines. The Occupational Safety and Health Administration (OSHA) requirements apply to most workers. The following information is from OSHA. Additional information can be obtained from [www.osha.gov](http://www.osha.gov).

### Overhead Power Line Tips for Construction Workers Before You Begin Construction Work

- Survey the site for overhead power lines.

#### NOTE

*Never get within 10 feet of an overhead power line!*

- Consider all overhead lines as energized until the electric utility indicates otherwise or an electrician verifies that the line is not energized and has been grounded.
-


# Section 1 - Safety

## CHEMICAL AND BIOLOGICAL HAZARD SAFETY



Figure 1-11

### Chemicals and Diesel Engine Exhaust

 **WARNING**

Operating, servicing and maintaining this equipment can expose you to chemicals including gasoline, diesel fuel, lubricants, petroleum products, engine exhaust, carbon monoxide, and phthalates, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov). This website, operated by California's Office of Environmental Health Hazard Assessment, provides information about these chemicals and how individuals may be exposed to them.

 **WARNING**

Always read carefully and comply fully with the manufacturer's instructions when handling fuels, oils, solvents, cleansers, and any other chemical agent.

### Chemical Waste Hazard

- Storm drains, catch basins, and sewers may contain harmful chemicals. To prevent contamination and injury.
- Seek immediate medical attention if exposure or contamination is suspected.

### Biological Hazards

- Germs and other biological hazards are common in sewers, drains, and catch basins. Use appropriate personal protective equipment to avoid injury and contamination. Get medical attention for injuries associated with cleaning sewers, drains, and catch basins if biological contamination is suspected.

### Dust Hazard

- Repeated or substantial breathing of hazardous dusts, including crystalline silica, could cause fatal or serious respiratory disease including silicosis. Concrete, masonry, many types of rock, and various other materials contain silica sand. California lists repairable crystalline silica as a substance known to cause cancer. Operation of this equipment under certain conditions may generate airborne dust particles that could contain crystalline silica. In those conditions personal protective equipment including an appropriate respirator must be used. If excessive dust is generated, a dust collection or suppression system should also be used during operation.
- Wear appropriate Personal Protective Equipment not limited to chemical resistant gloves, safety glasses, face shield and appropriate clothing.

## TRANSPORT SAFETY AND HAZARDS WARNINGS

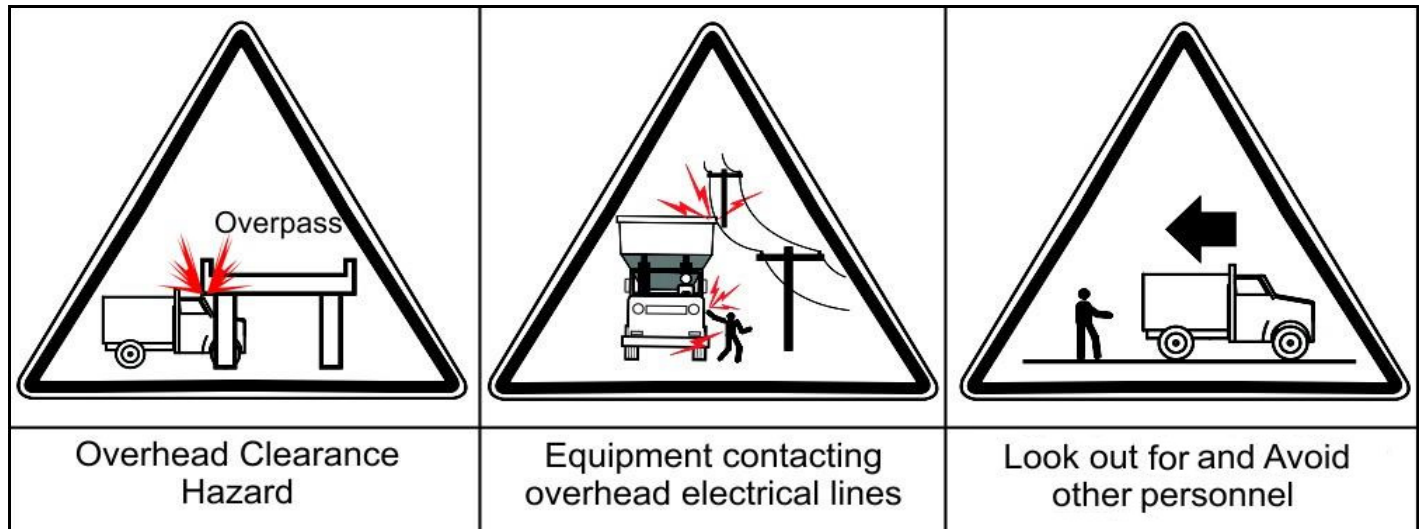


Figure 1-12

**WARNING**

**Follow all steps before moving truck when towing or transporting equipment to avoid serious injury or death:**

### Never Exceed your Gross Vehicle Weight Rating (GVWR)

- In operation on public highways, the combined weight of the chassis, body, and payload must not exceed the gross vehicle weight rating of the chassis as rated by the chassis manufacturer.

### Before Transporting Truck Inspection

- Ensure unit is road worthy by performing a pre-trip inspection before driving to and from job site.
- Check that debris door is closed and properly locked.
- Ensure all equipment is properly secured and positioned for maximum visibility and adequate clearances.
  - Close all water drain valves and install all plugs and strainers previously removed.
  - Check that boom (if equipped) is in transport position and properly secured.
  - Check that all tools, accessories, and work tubes/hoses are properly secured.
  - Check that cabinet doors and access panels are closed and properly secured.
  - Check that all clean-out doors are closed and latched shut.
  - Check that the dust chute and debris door are closed and latched shut.
- Always measure overhead clearance height of truck and equipment.
- Check for low hanging electric or telephone wires and power cables on the ground.
- Look out for and avoid other personnel, machinery and vehicles in the area. Use a spotter if you **do not** have clear view.

### Pedestrian Safety

- Conduct a visual check and warning (honk horn) before starting or moving the truck to ensure the safety of people on the ground and other equipment in the area.
- Be aware of all personnel who are working on the ground.
- Look out for and avoid other personnel, machinery and vehicles in the area. Use a spotter if you **do not** have clear view.

## Section 1 - Safety

### TRANSPORT SAFETY AND HAZARDS WARNINGS — CONTINUED

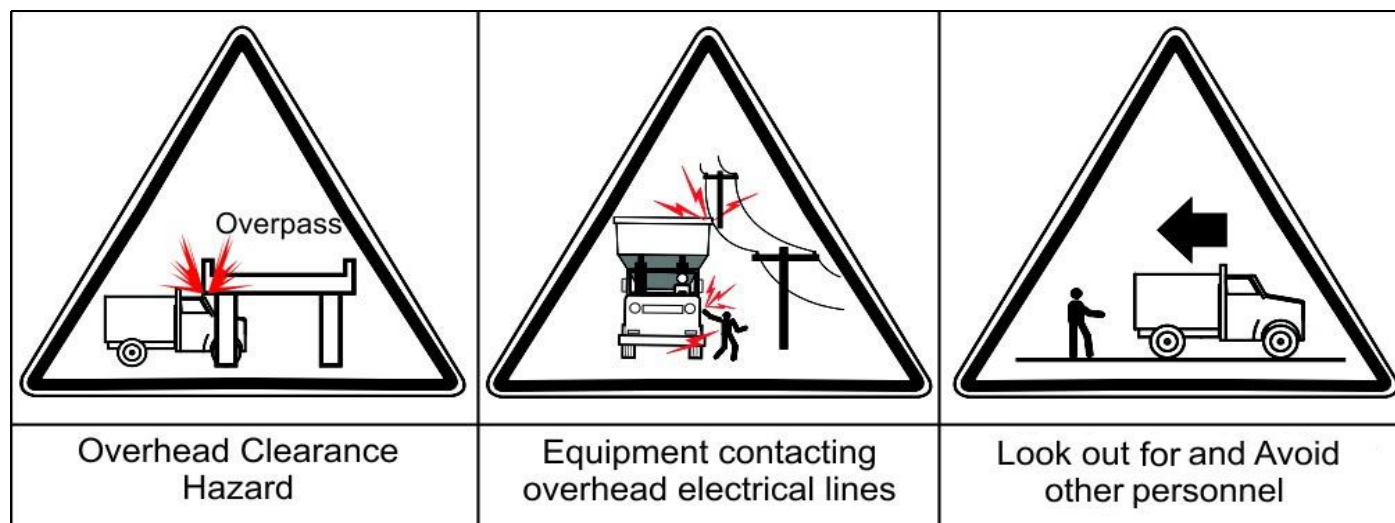


Figure 1-13

#### Determine Stopping Characteristics of Truck for Transport Braking

- Determine safe braking distances by performing braking tests in a safe location.
- Stopping distance with loaded debris body will be greater than empty truck.
- Reduce travel speed on wet or icy roads; stopping distances increase.

#### Determine Maximum Turning Speed Before Operating on Roads or Uneven Ground

- **Test** equipment by slowly increasing speed on turns to determine if it can be operated at higher speeds.
- **Use reduced** turning speeds on sharp turns to avoid equipment turning over.
- Truck has a high center of gravity when carrying a loaded debris body. Use extreme caution when transporting at highway speeds. Slow down for sharp corners to avoid tipping or turning over.


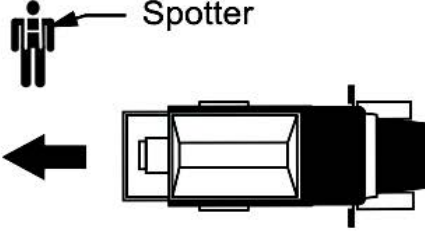
#### When Transporting Equipment

- **Do not move** truck unless debris body is fully lowered in the horizontal storage position.
- **Always** wear seat belt when operating truck.
- **Follow** all local traffic regulations.

- **Use** low speeds to avoid overturn when debris body is filled.
- Slow down and consider effects of water sloshing or debris movement.
- **Use** low speeds and gradual steering on curves, hills, rough or uneven surfaces, and wet roads.
- **Turn on** truck flashing warning lights when driving slower than traffic.
- Transport the truck only at safe speeds that allow for proper control of the truck while driving and stopping.



## BACK OVER RUN-OVER HAZARDS

		
<p>Equipment contacting overhead electrical lines</p>	<p>Look out for and Avoid other personnel</p>	<p>Always use a spotter when possible</p>

This machine is equipped with a rear view camera to assist the driver in avoiding backing into objects or co-workers and bystanders. This rear-view camera is not a substitute for the machine's rear view mirrors or spotter.

- Always clean the rear-view mirrors and the rear-view camera and inspect daily before operating the machine.
- Check the rear view monitor at the beginning of each shift to ensure you can see clearly to the rear of the machine including the rear bumper. If the rear bumper is not visible in the monitor adjust the camera to ensure you can see the edge of your rear bumper. That way there will be no space between the rear bumper and camera viewing area that cannot be seen.

### When backing following these best safety practices.

- Park and back defensively to prevent having to back up and possibly hitting co-workers, passersby, or objects.
- Always use a spotter when possible.
- Avoid backing whenever possible; Don't back up if you don't have to.
- When in doubt, don't back up.
- If turning in reverse, turn toward driver side if possible.
- Get out and look prior to backing.
- Check for all types of obstacles, including overhead.
- Back immediately after checking.
- Continually check mirrors on both sides of the machine while backing.
- Eliminate noise and other distractions before backing.
- Open your window so you can hear outside noises.
- Back slowly, in the lowest gear possible.



### WARNING

Use care when backing. Never try to back using the rear-view camera and monitor only! Use side rear view mirrors to aid vision as normal and use the rear-view monitor as you would a rear-view mirror on your automobile to watch for obstacles.



### WARNING

Make sure no bystanders, animals, or obstruction such as a vehicle, building, or street sign are behind the machine when backing up. The design of the machine impairs operator rear vision when backing. Use extreme caution to ensure that the machine is not backed into the path of pedestrian or vehicle traffic. If you cannot see to back clearly, stop the machine and examine the area. Serious injury or death and property damage could result from running into, being crushed by, or run over by a machine .



### WARNING

You will always have blind spots. Know their location, and try to minimize them. If you cannot see clearly request assistance to guide you while backing the machine .



## Section 1 - Safety

### SWEEPER & VACUUM EQUIPMENT HAZARD WARNINGS

		
Do not put fingers in rotating components.	Do not put foot underneath sweeper.	Stop machine, Remove Key, Read Manual





#### **DANGER**

**KEEP AWAY FROM ROTATING BLADES, BELTS AND PULLEYS TO AVOID SERIOUS INJURY OR DEATH FROM BLADE CONTACT:**

- STAY AWAY and KEEP HANDS, FEET and BODY AWAY from rotating blades and parts until all moving elements have stopped.
- DO NOT put hands or feet under sweeper shielding.
- STOP rotating FAN BLADES disengage power and wait for blade to stop rotating before adjusting sweeper shields.
- STOP LOOK and LISTEN before approaching the sweeper to make sure all rotating motion has stopped.

## THROWN OBJECT HAZARDS

	
<p>Thrown Objects Hazard</p>	<p>Inspect Area Remove large objects that could cause blockage in suction line.</p>

 **DANGER**

**SWEEPER CAN THROW OBJECTS 25 FEET OR MORE.**

### TO AVOID SERIOUS INJURY TO OPERATOR OR PASSERBYS FROM THROWN OBJECTS:

- KEEP bystanders 25 feet away
- DO NOT operate if sweeper broom cover is open or missing. Broom can throw objects and result in serious injury or death.
- DO NOT operate if fan exhaust hose is removed. Fan can throw objects resulting in serious injury or death.

### STOP SWEEPER IF PASSERSBYS ARE WITHIN 25 FEET UNLESS:

- All THROWN OBJECT SHIELDING including, Steel Guards, and Bands, are in place and in good condition while operating.

### SWEEPER THROWN OBJECT SHIELDING:

- KEEP all thrown object shielding including Steel Guards, Bands, and Side Skirts in place and in good condition when operating.
- DO NOT OPERATE with any thrown object shielding missing, damaged or removed.
- DO NOT try to sweep large debris that could cause suction line blockage.
- Remove material before sweeping.

# Section 1 - Safety

## VACUUM EQUIPMENT OPERATION SAFETY AND HAZARD WARNINGS



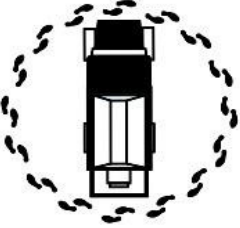
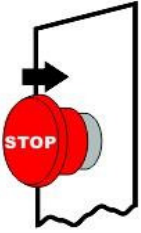
			
Read and Understand Operator's Manual.	Ensure truck parking brakes are set.	Inspect equipment before operation. Ensure all components are operating properly.	Emergency Stop Button.

Figure 1-14

It is the operator's responsibility to be knowledgeable of all potential operating hazards and to take every reasonable precaution to ensure that oneself, others, animals, and property are not injured or damaged by the operation of this equipment. Do not operate the equipment if passersby or untrained persons are within the active job site. Never operate this equipment if a shield or guard is missing or in poor operational condition.

### NOTE

*Read and understand all operating instructions and the entire safety section of this manual and the truck manual before attempting to operate any equipment.*

If you do not understand any of the instructions, contact your nearest authorized dealer for a full explanation. Pay close attention to all safety signs and safety messages contained in this manual and those affixed to the unit.

**WARNING**

**READ, UNDERSTAND, and FOLLOW the following Safety Messages. Serious injury or death may occur unless care is taken to follow the warnings and instructions stated in the Safety Messages. Always use common sense to avoid hazards.**

**WARNING**

**Always set the truck parking brakes and if on unlevel surfaces chock the wheels. Unexpected truck movement can cause serious injuries.**

Before operating the equipment, conduct a walk-around inspection of the equipment for proper operation. Repair any improperly functioning, broken, or damaged equipment before operating. Inspect the job site for unsafe conditions and identify any potential hazards for operators and bystanders. Do not operate equipment if unsafe conditions cannot be controlled.

### Emergency Stop Button Function

This equipment may be equipped with an emergency stop button that can be activated at any time during operation to disconnect the power and shut down the sweeping and dump operations.

Pressing the emergency stop button while the machine is in operation has the following results:

- All functions that are stopped will remain inactive

## VACUUM EQUIPMENT OPERATION SAFETY AND HAZARD WARNINGS — CONTINUED



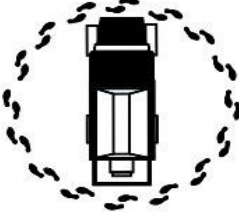
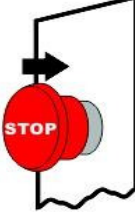

			
Read and Understand Operator's Manual.	Ensure truck parking brakes are set.	Inspect equipment before operation. Ensure all components are operating properly.	Emergency Stop Button.

Figure 1-15


**WARNING**

**Make sure no one is near the end of the vacuum hose before engaging the vacuum pump. Failure to do so could cause personal injury.**

- Keep vacuum tools and hoses away from face and body. An injury caused by vacuum can be serious. The vacuum must be stopped as quickly as possible at any sign of danger. Seek medical attention immediately.
- Do not attach hose, pipe, or accessories with the vacuum on. The vacuum can trap fingers, hands, and feet with enough force to crush or cut.
- Make sure vacuum extension tubes are securely connected before engaging vacuum pump. Tube could fall and expose suction line.

# Section 1 - Safety

## VACUUM EQUIPMENT OPERATION SAFETY AND HAZARD WARNINGS — CONTINUED



### CAUTION

**Failure to engage parking brakes and/or position wheel chocks could result in unexpected chassis movement, which could cause bodily injury or property damage.**

### Prepare the job site

- Be aware of traffic and pedestrians on the job site. Use extreme caution while moving around the vehicle to avoid contact with other moving vehicles. Before stowing the boom or moving the vehicle, make sure pedestrians are clear of the area.

### Arrange for Traffic Control

- If working near a road or other traffic area, contact local authorities about safety procedures and regulations.
- Always activate beacons and flashers before job setup.
- Always use safety cones.
- If working on a roadway, follow required temporary traffic control measures.
- Use job site controls, such as cones and barricade tape, to prevent bystanders from entering potentially hazardous areas.

### Pre-Start Checklist

- Ensure operator and co-workers have read and understood the safety instructions in the Operator's Manual.
- Prior to use ensure that all required maintenance has been performed.
- Park truck on level ground and set parking brakes.
- Ensure cleanout doors and debris door are closed and latched shut.
- Attach suction hose and tubing as required, including relief valve.

### Plan for Emergency Services

Make sure you have the telephone numbers for local emergency and medical facilities on hand, and access to a telephone.

### Vacuum Operation

- Operating the unit inside a building or confined areas can create additional risks to the unit, operators, and building occupants. Engine exhaust gas can reach deadly levels. Heat buildup from the engine and blower discharge can overheat equipment.
- Never use an air mover machine for vacuuming hydrocarbon or flammable materials.



### DANGER

**Never operate engines where there are or can be combustible vapors. Vapors pulled into an engine air intake can cause engine acceleration and overspeeding. This can result in death, injury, and property damage.**

- The use of this equipment in the removal or handling of any regulated substance or material must be performed in strict accordance with all applicable federal, state, and local laws and regulations. Approved safety and personal protection equipment and clothing must be used and worn at all times.

### DUST HAZARD AND EXPLOSION PREVENTION SAFETY



Figure 1-16





In a confined area, certain concentrations of dust in an otherwise normal atmosphere can explode when spark occurs. This phenomenon is known as a dust explosion. It has been known to occur in grain elevators, underground mines, flour mills, crushers, etc. The dust itself need not be an explosive or flammable substance.

The safe operation of transferring potentially explosive dust should be addressed by the following:

- Static charge dissipation
- Spark prevention

# Section 1 - Safety

## OPERATOR SAFETY

			
Wear Gloves when refueling unit.	No smoking or open flames while refueling	Shut off Engine before refueling	Handle Fuel with care.



### WARNING

to avoid Serious Injury or Death follow these instructions

- READ, UNDERSTAND and FOLLOW Operator's Manual instructions, Warnings and Safety Messages.
- WEAR safety gloves when handling fuel, oils, lubricants and chemicals to prevent injury.

### HANDLE FUEL SAFETY-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 engine before refueling machine. Fill fuel tank outdoors.
- Prevent fires by keeping machine clean of accumulated trash, grease, and debris. Always clean up spilled fuel.
- Use only an approved fuel container for transporting flammable liquids.
- Touch fuel container with fuel dispenser nozzle before removing can lid.
- Keep fuel dispenser nozzle in contact with fuel container inlet when filling.
- Always replace fuel tank cap after refueling and tighten securely.

### Avoid Static Electricity Risk when Refueling




- Ultra-Low Sulfur Diesel (ULSD) fuel increase its ability to store a static charge. Static Charges can build up in ULSD fuel while it is flowing through the delivery hose. Static electric discharge when combustible fuel vapors are present can result in a fire or explosion.
- Therefore it is important to ensure the entire system (fuel supply, transfer pump, hoses, filters and nozzles) used to refuel your machine is properly grounded and bonded.

### Handle Starter Fluid Safely

- Starter Fluid is highly flammable.
- Keep all sparks and flames away. Keep starting fluid away from batteries and cables
- Do not use starting fluid on an engine equipped with glow plugs or an intake heater.



## FIRE HAZARDS

		
<p>In Case Of Fire</p>	<p>Stop the unit immediately. Move safely away from unit and fire.</p>	<p>Use Fire Extinguisher only for small fire.</p>

### IN CASE OF FIRE:

- Stop machine immediately at the first sign of fire. Fire may be identified by the smell of smoke or sight of flames. Because fire grows and spreads rapidly, get off the machine immediately and move safely away from the fire. Do not return to the machine. The number one priority is your safety.
- Call the fire department.
- Equip machine with a properly charged fire extinguisher
- A portable fire extinguisher can put out a small fire or contain it until the fire department arrives, but portable extinguishers have limitations. Always put the safety of the operator and bystanders first. If attempting to extinguish a fire, keep your back to the wind with an unobstructed escape path so you can move away quickly if the fire cannot be extinguished.
- Read the fire extinguisher instructions and become familiar with their location, parts, and operation before a fire starts.

# Section 1 - Safety

## DEBRIS BODY DUMPING SAFETY AND HAZARD WARNINGS

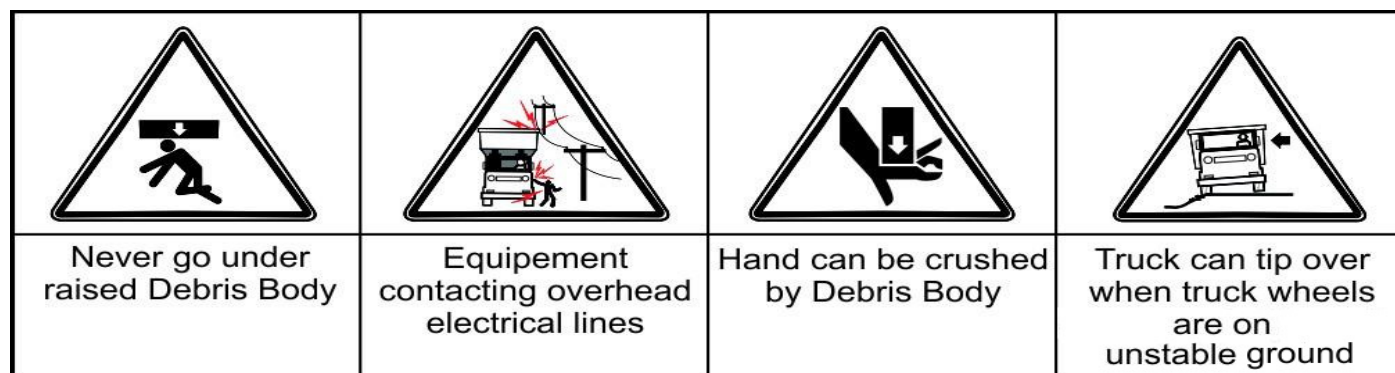




Figure 1-17

 **WARNING**


**NEVER** leave body raised or partly raised while vehicle is unattended or while performing maintenance or service under body unless body is propped to prevent accidental lowering. The debris body **MUST BE** empty for service work.

- **Never** attempt to prop a raised loaded debris body.
- **Never** attempt to raise body when vehicle is on unlevel ground.

 **WARNING**

**Never go under a raised loaded debris body. Never go under a raised body without securely propping it. Body must be empty.**

- **Immediately** report any damage or malfunction of the unit or components to your employer.
- **Make sure** that all individuals and obstructions are clear of the hoist and body before operating the controls, and be ready to stop operation at any time that a hazardous condition might occur.

 **WARNING**

**Use extreme caution when dumping contents of the debris body. Ensure all personnel are at least 20 feet away from truck. Select a dump site that is on level ground and is clear of overhead obstructions. Serious injury or death to the operator and/or bystanders could occur if precautions are not taken when dumping the contents of the debris body.**

- When positioning the truck at the dump station, choose an accessible location on level ground. Raising the debris body on unlevel ground increases the possibility of tipping.
- **Make sure** the area is clear of ground and overhead obstructions.
- **Never** raise the debris body unless you can clearly see all overhead structures. Stay clear of all utility lines.
- **Do not** dump the debris body over a pit area where the ground may cave in or is unstable.
- **Use care** when positioning the debris body at the dump station. Your vision, especially to the side and rear of the debris body, may be reduced by the size of the debris body. Use mirrors to aid vision. If you cannot see the dump site clearly, stop the truck and examine the area. If necessary, request assistance to guide you while backing the truck into position.
- **Never** drive with the debris body in the raised position. Traveling with the debris body in the raised position increases the chances of colliding with overhead obstructions. In addition, the center of gravity of the debris body is higher with a raised debris body, making the unit more prone to tipping over.

## CONFINED SPACE HAZARD WARNINGS

			
Explosion Hazard	Chemical, Dust and Fumes Inhalation Hazard	Wear Respirator when around hazardous fumes	Never have an open flame

Figure 1-18

## Confined Space Hazard

Follow all requirements for confined space when servicing. Debris body can be entered and are to be considered permit-required confined space as defined by the Occupational Safety and Health Administration (OSHA). The following information is from OSHA 3138-01R 2004. The full document can be obtained from [www.osha.gov](http://www.osha.gov).

Many workplaces contain spaces that are considered to be “confined” because their configurations hinder the activities of employees who must enter into, work in, or exit from them. In many instances, employees who work in confined spaces also face increased risk of exposure to serious physical injury from hazards such as entrapment, engulfment, and hazardous atmospheric conditions. Confinement itself may pose entrapment hazards, and working in confined spaces may keep employees closer to hazards such as machinery components than they would be otherwise. For example, confinement, limited access, and restricted airflow can result in hazardous conditions that would not normally arise in an open workplace.

The terms “permit-required confined space” and “permit space” refer to spaces that meet OSHA’s definition of a “confined space” and contain health or safety hazards. For this reason, OSHA requires workers to have a permit to enter these spaces.

By definition, a confined space:

- Is large enough for an employee to enter fully and perform assigned work.
- Is not designed for continuous occupancy by the employee.
- Has a limited or restricted means of entry or exit.

These spaces may include underground vaults, bodies, storage bins, pits and diked areas, vessels, and silos.

# Section 1 - Safety

## DE-ENERGIZE AND LOCKOUT PROCEDURES



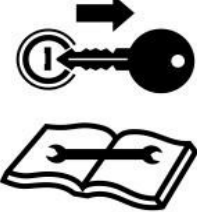


				
Electrical Wire Hazard	Hand Crushing Hazard	Remove key and read service/maintenance manual/handbook before servicing	Wait until all moving parts have stopped completely	Lock-Out

Figure 1-19


**WARNING**

Workers can be seriously or fatally injured if machinery they service or maintain unexpectedly energizes, starts up, or releases stored energy. Always de-energize equipment before working on or service machine.

### NOTE

*Follow all requirements for PPE when servicing equipment.*

De-energization and lockout refer to specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment or from the release of hazardous energy during service or maintenance activities.

De-energization requires the authorized employee to turn off and disconnect the machinery or equipment from its energy source(s) before performing service or maintenance and to either lock out or isolate the equipment/components to prevent the release of hazardous energy (e.g., electricity, compressed air, high pressure fluid, etc.).

Lockout devices hold energy-isolation devices in a safe or "off" position. They provide protection by preventing machines or equipment from becoming energized because they are positive restraints that no one can remove without a key or other unlocking mechanism or through extraordinary means, such as bolt cutters.

To properly de-energize this equipment:

1. Lower the debris body and debris door to the lowered transport position or onto the mechanical props to support the component.
2. Lower the boom (if equipped) to the storage position or to the lowest position.
3. Place the transmission in the park position.
4. Set the parking brake.
5. Turn off the engine and remove the keys.
6. Switch the battery power off if the truck has a battery disconnect switch, or disconnect the battery ground cables.
7. Lock the truck doors and securely store the truck keys.

## HAZARDS WITH EQUIPMENT MAINTENANCE



### WARNING

**Avoid serious injury or death from component failure by keeping sweeper in good operating condition by performing proper service, repairs, and maintenance.**

### Before Performing Service, Repairs, and Maintenance on the Equipment

- Stop all engines, engage parking brake, lower sweeping gear, allow all moving parts to stop, and remove key before dismounting from truck.
- Place debris body, debris door, and boom in lowered position or securely block up with support props.
- Wear safety glasses, protective gloves and follow safety procedures when performing service, repairs and maintenance on the equipment.
- Allow components to cool before servicing or performing maintenance.
- Avoid contact with hot hydraulic oil tanks, pumps, motors, valves and hose connection surfaces.
- Securely support or block up raised framework and lifted components before working underneath equipment.
- Follow instructions in maintenance section when replacing hydraulic cylinders to prevent component from falling.
- Stop and shut off truck engine before doing any work procedures.
- Use ladder or raised stands to reach areas inaccessible from ground.
- Ensure good footing by standing on solid flat surfaces when getting on equipment to perform work.
- Follow manufacturer's instructions in handling oils, solvents, cleansers, and other chemical agents.
- Do not change any factory-set hydraulic calibrations to avoid component or equipment failures.
- Do not modify or alter equipment, functions, or components.
- DO NOT WELD or repair rotating components. These may cause vibrations and component failure being thrown from sweeper.

### Performing Service, Repairs, Lubrication, and Maintenance

- Inspect for loose fasteners, worn or broken parts, leaky or loose fittings, missing or broken cotter keys, washers on pins, and all moving parts for wear.
- Replace any worn or broken parts with authorized service parts.
- Lubricate unit as specified by lubrication schedule.
- Never lubricate, adjust, or remove material while it is running or in motion.
- Torque all bolts and nuts as specified.

### Safety Shields, Guards, and Safety Devices Inspection

- **Replace** any missing, broken, or worn safety shields, guards, and safety devices.
- **Replace** any damaged or worn safety warning decals. Damaged or worn decals need to be replaced with new ones.

### PERFORM SERVICE, REPAIRS, LUBRICATION AND MAINTENANCE OUTLINED IN SWEEPER MAINTENANCE

#### SECTION:

- **INSPECT** before each use for loose fasteners, worn or broken parts, leaky or loose fittings, missing or broken cotter keys and washers on pins, and all moving parts for wear.
- **REPLACE** any worn or broken parts with authorized service parts.
- **LUBRICATE** unit as specified by lubrication schedule
- **NEVER** lubricate, adjust or remove material while it is running or in motion.
- **TORQUE** all bolts and nuts as specified.

# Section 1 - Safety

## HAZARD WITH MAINTANENCE OF SWEEPER

		
Risk of Battery Explosion Service Batteries Safely	Do Not attempt to remove the radiator cap. Only a trained mechanic should service the radiator.	Explosive separation of a tire and rim parts can cause serious injury



### WARNING

**Avoid serious injury or death from component failure by keeping sweeper in good operating condition by performing proper service, repairs, and maintenance.**

#### BATTERIES:

- Maintenance work on the batteries requires sufficient knowledge and the availability of proper tools.
- Keep naked flames, burning matches and spark sources clear of the battery; Risk of explosion.
- Never check the charging level of the battery by connecting the two poles with a metal object. Use an acid tester or voltmeter.
- Do not charge a frozen battery; Risk of explosion! Warm the battery to 16 °C beforehand.
- Battery acid can cause severe injuries by burning your skin and eyes. For this reason, wear suitable protective clothing.

#### COOLING SYSTEM:

- The engine cooling system is pressurized - use caution when removing radiator cap, the fluid may be under pressure.

Risk of burns! - For this reason, only remove the radiator cap with the engine switched off and after the engine has been able to cool.

#### TIRES:

- When working on the tires, make sure that the vehicle is secured against rolling, use parking brake and wheel chocks.
- Installing wheels and tires requires adequate knowledge and suitable tools.

- Repair work on the tires and wheels should be done by specially trained personnel using appropriate installation tools only.
- Check tire pressure regularly. Inflate the tires to the recommended pressures.
- Check the wheel nuts periodically. Missing wheel nuts can result in a wheel falling off and loss of control.

#### SERVICE TIRES SAFELY:

- Explosive separation of a tire and rim parts can cause serious injury or death.
- Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.
- Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion.
- Welding can structurally weaken or deform the wheel.
- When inflating tires, use a clip-on chuck and extension long enough to allow you to stand to one side and not in front of or over the tire assembly. Use a safety cage if available.
- Check wheels for low pressure, cuts, bubbles, damaged rims, or missing lug bolts and nuts. Remove and replace damaged tires.
- Wheels and tires are heavy, when handling wheels and tires use a safe lifting device or get an assistant to help lift, install, or remove.



## HAZARD WITH MAINTENANCE OF SWEEPER

		
<p>Risk of Battery Explosion Service Batteries Safely</p>	<p>Do Not attempt to remove the radiator cap. Only a trained mechanic should service the radiator.</p>	<p>Explosive separation of a tire and rim parts can cause serious injury</p>



### WARNING

Operating, servicing and maintaining this equipment can expose you to chemicals including gasoline, diesel fuel, lubricants, petroleum products, engine exhaust, carbon monoxide, and phthalates, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov). This website, operated by California's Office of Environmental Health Hazard Assessment, provides information about these chemicals and how individuals may be exposed to them



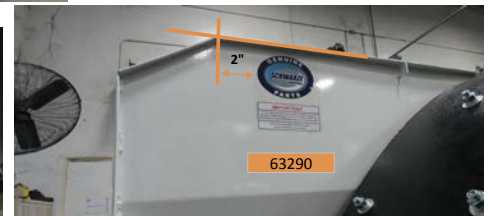
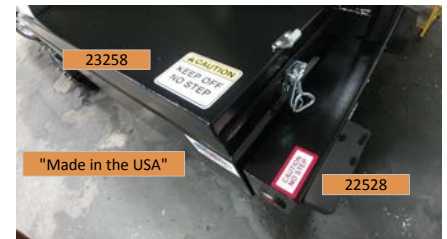
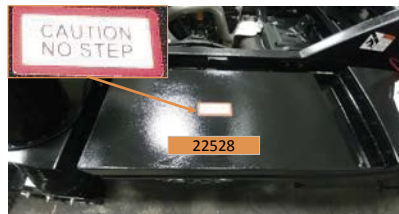
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# Section 1 - Safety

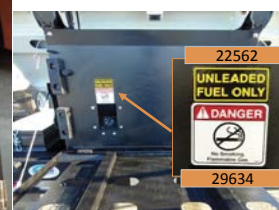
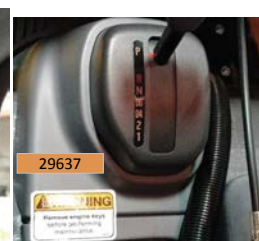
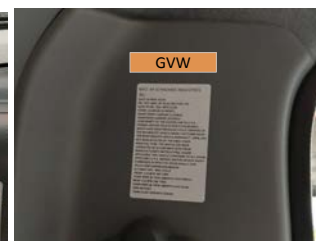
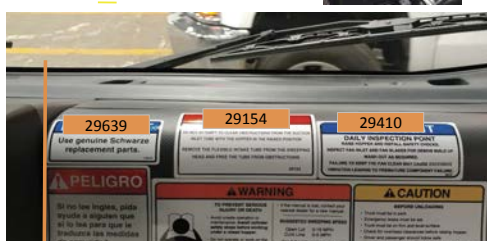
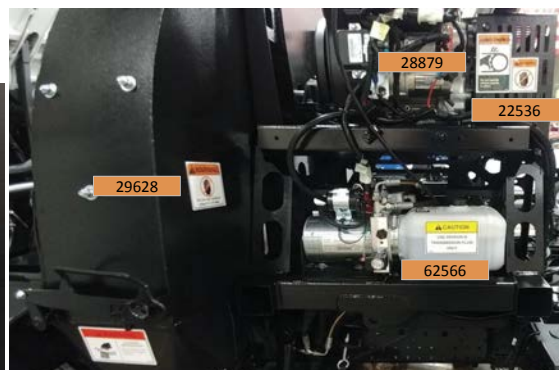
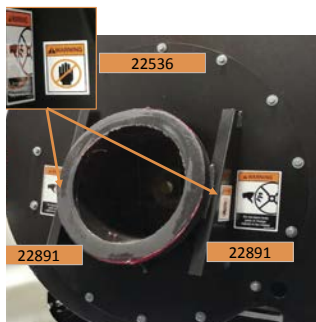
## 1.14 Safety Decals Locations

### NOTE

Schwarze supplies safety decals on this product to promote safe operation. Damage to the decals may occur while in shipping, use, or reconditioning. Schwarze cares about the safety of its customers, operators, and bystanders, and will replace the safety decals on this product in the field, free of charge (Some shipping and handling charges may apply). Contact your Schwarze dealer to order replacement decals.



# Section 1 - Safety



# Section 1 - Safety





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## Section 2 - Technical Data

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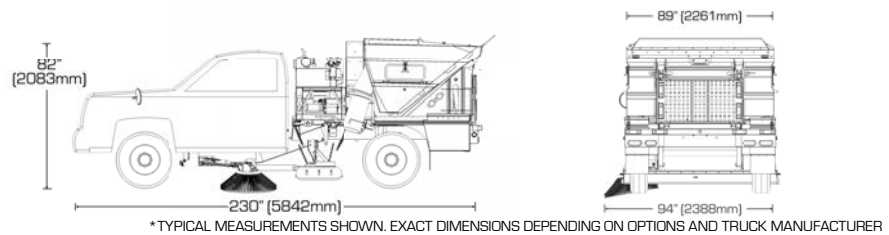
# 2

### In this Section

Technical Drawings

Sweeper Specifications

## Section 2 - Technical Data



### GENERAL SPECIFICATIONS:

Wheelbase	133 in (3378 mm)
Sweeping width	81 in (2057 mm)
With one gutter broom option	94 in (2388 mm)
Turning radius	274 in (6960 mm)
Overall length	230 in (5842 mm)
Overall height (without beacon)	82 in (2083 mm)
Overall width	89 in (2261 mm)

### AUXILIARY ENGINE:

Manufacturer	B&G Vanguard Big Block
Horse power	25
Type	Air cooled gasoline
Air cleaner	Centrifugal multi-stage
Cylinder	Cast iron cylinder sleeve
Warranty	3 year

### DEBRIS HOPPER:

Volumetric capacity	3.0 cu yd (2.3 cu m)
Dumping	Hydraulic high dump
Material	Stainless steel
Dump height	69 in (1753 mm)
Dumping tilt angle	88°
Inspection doors	1 on left side 1 on right side
Controls	Electric; in-cab
Paint	Imron Elite®

### ELECTRICAL SYSTEM:

Battery	1 @ 12 V, 750 cca each
Controls	Electric; in-cab
Circuit protection	Resettable circuit breakers
Rear view camera	Color; dash mounted

### FAN SYSTEM:

Type	Whisper wheel turbine
Drive	Belt driven
Number of blades	10
Diameter	24 in (610 mm)
Construction	Welded abrasion-resistant steel
Housing liner	Bolt-in corded rubber
Mounting	Pillow block bearings
Vacuum enhancer	For heavy/light material

### PICKUP HEAD:

Type	Debris-moving blast and suction
Operating direction	Forward and reverse
Suspension	2 trailing arms; 4 springs balanced
Length	80 in (2032 mm)
Pressure hose diameter	10 in (254 mm)
Suction hose diameter	10 in (254 mm)
Flap design	3 flaps
Controls	Hydraulic raise and lower
Skids	Tungsten carbide

### OPTIONAL WATER SYSTEM:

Type	Diaphragm
Tank capacity	25 gal (96 l)
Construction	Polyethylene
Pump	Electric 12 V dc
Controls	Electric; in-cab
Filter	100 mesh screen
Mounting	Removable
Fill diameter	3 in (76.2 mm)
Nozzles	2 on broom; 2 inside hopper
Optional	Front spray bar

### SIDE BROOM:

Type	Vertical digger
Bristle	Wire or poly
Diameter	26 in (660 mm)
Drive	Hydraulic torque motor
Speed	Variable
Mounting	Trailing arm design
Location	Left hand side
Suspension	Free floating
Wear adjustment	Automatic
Impact protection	Spring
Tilt angle adjustment	Manual; at broom

### HYDRAULIC SYSTEM:

Type	Belt driven gear pump
Fluid capacity	3 gal (11.4 l)
Purpose	Power gutter broom
Dump system hydraulics	12 V power unit, 1 gal (3.8 l)

### OPTIONAL EQUIPMENT:

Polyethylene tool box  
Rear trash bag rack  
Cab mounted strobe  
Extra flood light  
Curb blower.

Note: design and specifications subject to change without notice.



## Section 3 - Operations

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3

## ***Section 3 - Operations***

Before operating the Schwarze SuperVac Updraft, ensure the unit's equipment is working properly and that you are prepared for sweeping operations by (1) completing the Start-Up Checklist and (2) testing sweeper operations.

### **3.1 Start-Up Checklist for Daily Maintenance**

The following PRE-OPERATION Inspection sheet names specific items and areas deserving special attention when you inspect the sweeper. It is not a complete list however, so you should always complete a PRE-TRIP inspection as required by U.S. Department of Transportation (DOT) regulations.

We suggest that you remove the master copy from this manual and make copies that can be used for regular inspections, and the completed forms can be compiled in a notebook to give you a comprehensive inspection record of your sweeper.

## Section 3 - Operations

### SWEEPER PRE-OPERATION Inspection



Sweeper ID#: \_\_\_\_\_ Make: \_\_\_\_\_

Date: \_\_\_\_\_ Shift: \_\_\_\_\_



Before conducting the inspection, make sure the truck engine is off, all movement has stopped and the truck is in park with the parking brake engaged. Make sure the Truck is parked on level ground and all movement of sweeper has stopped

Item	Condition at Start of Shift	Specific Comments if not O.K.
Visually inspect for general condition		
Check the auxiliary engine's oil level		
Check the auxiliary engine's radiator fluid level		
Check the hydraulic tank fluid level and fill as needed		
Inspect the hydraulic system for leaks and faulty lines		
Check the water reservoir's water level and fill as needed		
Clean the 'Y' strainer		
Check the sweeping head's flaps for wear		
Check the gutter broom pattern		
Review daily maintenance records		
Be sure all lubrication schedules are current		
Check the operation of the dust suppression system		

Operator's Signature: \_\_\_\_\_

**DO NOT OPERATE an UNSAFE SWEEPER**

## Section 3 - Operations

### TRUCK PRE-OPERATION Inspection



Truck ID#: \_\_\_\_\_ Make: \_\_\_\_\_

Date: \_\_\_\_\_ Shift: \_\_\_\_\_



Before conducting the inspection, make sure the truck engine is off, all movement has stopped and the truck is in park with the parking brake engaged. Make sure the Truck is parked on level ground.

Item	Condition at Start of Shift	Specific Comments if not O.K.
Inspect the rims and wheel nuts		
Check the tires for wear, damage, and pressure		
Inspect and check the braking system		
Inspect and check the steering system		
Inspect the suspension system		
Inspect the exhaust system		
Check the fuel level		
Check the chassis engine oil and radiator fluid levels		
Inspect the engine air cleaners		
Check the transmission fluid level		
Check the battery		
Inspect all engine drive belts for wear		
Check the windshield washer fluid level		
Check operation of all lights and beacons		
Adjust the mirrors		
Verify that all emergency equipment is present		

Operator's Signature: \_\_\_\_\_

**DO NOT OPERATE an UNSAFE SWEEPER**

## Section 3 - Operations

After you perform a thorough inspection of the sweeper, always test the following components and adjust as needed:

- Sweeping Head
- Gutter Brooms
- Magnet (if equipped)

By locating any problems before traveling to the job site, you'll save unnecessary travel time and will be able to make repairs more easily with the proper tools close by.



Never run the Sweeper in a closed building or without adequate ventilation. The exhaust fumes can be hazardous to your health.

### 3.2 Console Controls

Sweeping operations are controlled from the cab console control panel. Switches toggle differently depending upon what sweeper devices they control.

Most sweeper devices requiring simple activation and deactivation are operated with 2-position ON and OFF switches. These devices perform the following functions:

- Safety Features (Warning Lights and Safety Flashers)
- Dust Suppression

Other devices require a 3-position switch. These switches are used for components which employ extension and retraction or direction reversal. In many instances, one or both of the activation positions are momentary ON, meaning the switch will stay in that position only as long as it is manually held there. When released, the switch will automatically return to the OFF position.

### 3.3 Sweeping Head and Hopper Operation

#### Sweeping Head

The standard sweeping head is controlled by a control panel switch on the cab console. The switch is identified by the legend symbol shown.

Lowering and raising the pick-up head and hopper is controlled by a single switch and is a simple, two-step operation. The head will always lower before the hopper raises, and the hopper will always lower completely before the head rises.



#### Debris Hopper

Dump the hopper when it is full, or after you have finished sweeping for the day. Always dump on level ground and never attempt to dump over an open pit or dock. Back the sweeper up to a landfill, dumpster or other suitable dumping area. Before raising the hopper, check for overhead clearance restrictions, put the truck in 'PARK' and engage the emergency brake.

## Section 3 - Operations

The hopper may be raised and lowered by a control panel switch located on the cab console. The switch is identified by the legend symbol shown.

1. Push the cab console panel dump switch to the UP position. After a momentary pause the door will open and then the hopper will begin to raise. Continue to hold the switch in the UP position until the hopper has been raised. When the switch is released, it will return to the center neutral position.

**NOTE:** If the safety prop has been put into place, it must be removed before attempting to lower the hopper.

2. To lower the hopper, push the cab console panel switch in the DOWN position. Continue to hold the switch to the DOWN position until the hopper has firmly seated itself against the intake and fan seals.



### 3.4 Gutter Broom Operation

The gutter brooms are activated by a control panel switch located on the cab console. The switch is identified by the corresponding legend symbol shown.

Use the following procedure to operate the gutter broom under normal conditions in which street gutters are accessible. The gutter brooms are designed to be full-floating. If you encounter an obstruction on the surface, the broom automatically lifts to go over it. As broom bristles wear away, the broom lowers to maintain contact with the surface.

Set the power setting to 90-100 and turn the broom on by pushing the 'Broom On' toggle. The broom will extend and begin spinning clockwise. To stop the broom, simply push and hold the 'Broom In' toggle until the curb broom is fully retracted.



### 3.5 Light/Heavy Operation

The bleeder door is used to direct all of the airflow down the pressure hose and into the head, or to divert a portion of the airflow to an exhaust location. Only in instances of light debris or leaves is the bleeder door opened.

For sweeping of curb and gutter streets, the damper door should be in the 'heavy' or just slightly open position. This directs all or most of the airflow to the sweeping head, producing maximum blast in the sweeping head's blast orifice.

When sweeping leaves or other light material, the damper door should be in the 'light' position, allowing some of the airflow through the blast orifice, reducing the air pressure exerted against the rear of the front curtain and permits debris to pass beneath the front curtain more easily.

### 3.6 Lights and Flashers Operation

1. Locate the labeled beacon switch on the cab console control panel.
2. Toggle the switch to 'ON'.
3. Complete the sweeping operation.
4. On the cab console control panel, toggle the warning light and/or flasher switch to 'OFF'.

### 3.7 Dust Suppression System Operation

The dust suppression system is controlled by a control panel switch located on the cab console. The switch is identified by the legend symbol shown.

The control panel switch will operate the following nozzle locations for the dust suppression system:

- Intake tube of the hopper
- Sweeping head (Gravity fed, in line ball valve must be opened)
- A dual-body spray nozzle on each gutter broom



Depending upon where dust suppression is needed during a sweeping operation, the operator can close or open the ball valves to the gutter broom and sweeping head.

### 3.8 Sweeping

To begin sweeping, turn ignition switch clockwise one position to power console. Turn on all warning lights, strobe lights and work lights that will be used while sweeping. Turn on the switch that controls the desired dust suppression.

Locate the switch on the control console that operates the sweeping head's hydraulic lift cylinders. This switch has three positions: 'MOMENTARY ON/OFF/ MOMENTARY ON'. To lower the sweeping head, push the switch into the 'UP' position and hold it until the sweeping head is lowered. Release the switch when the sweep head is down and before the hopper raises. If the hopper raises simply bump the switch in the down position until the hopper lowers back onto its seal. This switch uses a spring-loaded momentary contact which will return to the 'OFF' position when released.

Next start auxiliary engine by turning the ignition switch clockwise. Move throttle lever to increase RPM to desired speed. Always use the lowest possible RPM to accomplish a desired sweeping task.

Drive the sweeper in first gear from 1 to 15 mph depending on maneuverability and the amount of debris to be picked up. Avoid sweeping over large sticks, pieces of cardboard or wood. These could clog inside the intake tube or damage the intake hose.

When using the gutter broom, watch for wire, string or items that may become tangled in the broom or around the broom motor shaft. Such objects should be picked up by hand and placed into the hopper through the side inspection doors. Beware of sweeping too closely to a curb-line or catching the sweeping head's runners in large holes. Catching a runner may twist, warp or otherwise damage the pickup head, which is an expensive replacement item.

To raise the sweeping head, hold the switch in the 'DOWN' position. The sweeping head must be fully raised to provide maximum ground clearance before traveling and the ignition switch should be in the off position. Always check to ensure that the sweeping head is completely raised.



## Section 3 - Operations

### 3.9 Dumping the Hopper

Dump the hopper when it is full, or after you have finished sweeping for the day. Always dump on level ground and never attempt to dump over an open pit or dock. Before raising the hopper, check for overhead clearance restrictions, put the truck in 'PARK' and engage the emergency brake.

Back the sweeper up to dumpster or other suitable dumping area.

The hopper dump control switch is located on the console. It is also the same switch used to raise and lower the head. It is a 'MOMENTARY ON/OFF / MOMENTARY ON' switch. To raise the hopper, turn ignition switch on, push the switch into the 'UP' position, and hold it until the hopper is completely raised. The hopper dump door will swing open and any debris will be dumped behind the sweeper. If equipped, the dump door can be raised using the manual lift lever located on the right hand side of the hopper.

Before lowering the hopper remove the safety chocks, if used, and make certain the area under the hopper is clear. Hold the dump switch in the 'DOWN' position to lower the hopper. This switch uses a spring-loaded momentary contact which will return to the 'OFF' position when released.

### 3.10 Quick Reference Operating Guideline

1. Check the truck engine and sweeper engine for the correct crankcase oil and coolant levels.
2. Fill the water storage tank.
3. Start the truck engine and check the control panel for the correct switch settings.
4. Insert the key, start the auxiliary engine and allow to warm up.
5. Before sweeping, let the hydraulic oil warm-up to operating temperature.
6. Turn on the water flow valves.
7. Turn 'ON' all warning lights and flashers.
8. Lower the sweeping head to the pavement.
9. Activate the dust suppression system.
10. Turn 'ON' the gutter broom as needed to transfer debris from the gutter to under the sweeping head.

## **Section 4 - Service**

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4

## Section 4 - Service

In this part of the Schwarze SuperVac Super Updraft manual, we include checking, adjusting and/or replacement procedures of all major sweep systems and devices.

For some systems and devices, such as daily examination of the water system's 'Y' strainer, maintenance should be regular and ongoing. For others, we include a beginning statement to tell you when adjustment or replacement is necessary. For example, when water flow is restricted at the gutter broom, the dust suppression system nozzles should be cleaned and replaced.

For many components, we also include a table of maintenance task and identify the section(s) of the manual to access for related procedures.

### 4.1 Maintenance Logs

To help you keep your Schwarze SuperVac Super Updraft in top operating condition, we have provided Sweeper and Truck Pre-Operation Inspection Sheets to be used before every sweeper operation. These forms can be found in the beginning of the Operation Section of this Operator's Manual. Please make copies and store them in a file to keep them accessible and clean.

You complete each form by:

- Recording the sweeper identification number
- Recording the date
- Checking off inspection/maintenance tasks
- Signing your name

Additionally, each form has a Comments Section for:

- Providing detailed information on a listed item
- Noting information about items not listed
- Noting additional concerns
- Specifying a needed replacement part
- Recording the date a replacement part is ordered

The completed forms can be compiled in a notebook. Over time this will come to represent a comprehensive inspection maintenance record for your sweeper.

### 4.2 Maintenance Schedules

#### DAILY MAINTENANCE (EVERY 8 HOURS)

The following table tells you where to look in the manual to find procedures for specific daily maintenance tasks:

Component	Maintenance
Truck	<p>Check the air filter. Repair as needed.</p> <p>Check the engine oil and fill to proper level. Refer to truck owner's manual for correct oil weight and change frequency.</p> <p>Check the fan belts for tension and wear.</p> <p>Check the gutter broom pump drive belt for tension and wear.</p> <p>Fill the fuel tank as needed. Keep track of gallons of fuel used each day.</p> <p>Check radiator coolant and fill to level.</p> <p>Check the radiator hoses for cracks.</p> <p>Always mix antifreeze per antifreeze manufacturer's instructions prior to filling.</p> <p>Check tires and fill to proper pressure. Inspect for excessive wear.</p> <p>Check the transmission fluid with engine running and fill to the correct level.</p>
Sweeper Head	<p>Check for holes, tears or uneven ground contact when head is down. Adjust the chain length or replace.</p> <p>Check drag arm bolts for wear. If worn into bolt shoulder, replace with common grade of same size. Check for tightness.</p> <p>Check intake and exhaust hoses for wear and replace if holes or tears are present. Temporary repairs can be made with duct tape.</p> <p>Check runners for wear and replace when worn 80% of the way through.</p>
Hopper Screen	Rinse out with water
Fan and Intake Tube Seals	Lubricate with petroleum jelly or equivalent. Check for wear and tears. Replace if they are not sealing properly.
Hydraulic Pump Belt	Tension belt or replace if needed.
Water System	<p>Fill water reservoir</p> <p>Visually inspect all water nozzles for proper operation. If not operating, disassemble and clean or replace filters.</p>
Hydraulic	Fill hydraulic reservoir as needed.
Gutter Broom Disc Angle	Adjust as needed to compensate for wear.

## Section 4 - Service

### WEEKLY MAINTENANCE (EVERY 40 HOURS)

The following table tells you where to look in the manual to find procedures for specific occasional maintenance tasks:

Component	Maintenance
Fan Housing Liner	Check for wear and fill holes or cuts with RTV silicone rubber or place as needed.
Fan Housing Liner Bolts	Check heads for wear and replace as needed.
Fan	Check for wear and replace if blades are worn through
Water system	Drain water reservoir during freezing temperatures. Remove and clean water filter. Remove and clean nozzle tips and tip filters.

### 4.3 Cleaning

Daily cleaning of the sweeper is a major factor in keeping it operating at its peak performance level. Dirt and grime are always easier to remove before they have a chance to build up and bond to the sweeper surfaces. When the components on the sweeper are not cleaned regularly, debris collects and adheres rapidly. This decreases the air flow, blocks the water nozzles and causes unnecessary wear. Component life will be maximized by cleaning the sweeper as often as possible.

Spray wash the outside and underside of the sweeper and truck cab to remove rust causing road grime that is harmful to the painted surfaces. Clean out the truck cab and remove any objects not required during sweeping operations. Also make sure that windows and mirrors are clean for maximum visibility.

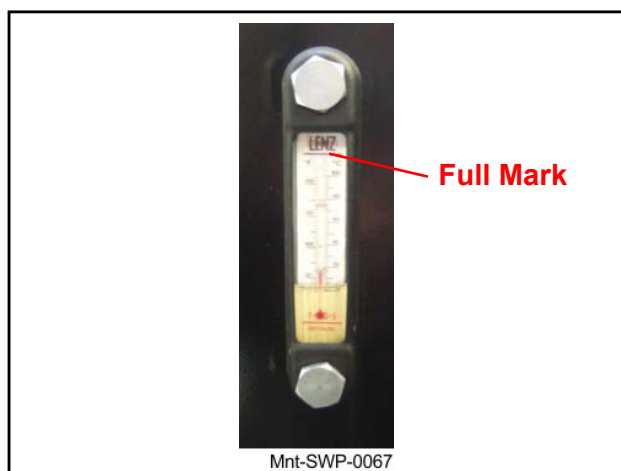
At the end of each work shift, dump the hopper and wash it out. This will prevent corrosive road salts and organic acids contained in debris from prematurely rusting the inside of the hopper. Raise the hopper an inch or two so the pressure against the fan and intake seals has been relieved and they may regain their shapes.

### 4.4 Hydraulic System

The hydraulic oil level should be maintained such that it is kept at the full mark as measured with the hopper down. Check by using the sight level gauge, which is located on the left side of the reservoir. Change the hydraulic oil and filter after the first 500 hours of operation, then every 2000 hours thereafter.

If the hydraulic fluid becomes cloudy, water has contaminated the system and the hydraulic fluid needs to be changed (after determining the source of the water contamination and correcting it). If the sweeping unit is operated in particularly dusty conditions, the hydraulic filters will need to be changed more often.

The sweeper comes with an oil additive to aid in detection of leaks. This additive can be easily seen with the use of an UV light.



### 4.5 Lubrication Schedule

Refer to the following table for correct sweeper lubrication.

Item	Frequency	Lubricant
1. Truck chassis and engine	Refer to truck owner's manual	Refer to truck owner's manual
2. Fan and Intake Seals	As required	Lubricate with a rubber protectant, petroleum jelly or grease to prevent drying and loss of resilience
3. Dump Door Hinges	Monthly	Grease with lithium-based grease
4. Gutter Broom Arm U-Joint	Every 120 hours of Operation	Grease with lithium-based grease
5. Fan Bearings	Every 250 hours of Operation	Lithium-based grease

### 4.6 Filters

Because of the dusty conditions under which a sweeper operates, filters are considered a priority maintenance item. Failure to properly follow filter change schedules may result in poor performance or costly component replacement.

#### Hydraulic Tank Filters

The hydraulic tank has a single in-line return filter, to remove foreign particles from the hydraulic oil that might cause failure in the hydraulic system's components.

#### Dust Suppression System Filter

Water filter maintenance is an important part in keeping the sweeper's water system functioning properly. The strainer should be emptied and its strainer screen flushed and cleaned daily. However, the frequency of filter cleaning varies and largely depends on the purity of the fill source's water.

### 4.7 Seals

It is important that the sweeper's seals on the fan housing be kept in the best condition possible. These include the seals on the suction hose inlet, around the hopper's inspection door opening and on the rear door. Pickup power is vacuum-dependent, so a tight seal can make a significant difference in pickup ability. Maintain resilience by keeping the seals well lubricated with a good grade of petroleum-based jelly or grease.

It is not necessary to lubricate the side inspection door seals, dump door and roof access door.

For longer seal life, when the sweeper is parked for an extended period of time, leave the hopper raised several inches so the fan and intake seals can regain their shape.

Eventually the seals will become worn or non-resilient and must be replaced. When this occurs, a loss of vacuum power results. To maintain sweeping efficiency, replace these seals periodically.

## Section 4 - Service

### Replacement

1. Use a gasket scraper, putty knife or screwdriver to remove the seal from its sweeper component. Get the metal surface as clean as possible. Be sure it is free of all dirt, old glue, and seal material.
2. Liberally apply a coat of weather-strip-type adhesive onto the new seal and body component. Allow the adhesive to set up for several minutes (follow the adhesive manufacturer's instructions) and then put the new seal in place.

### 4.8 Hopper

The hopper is one of the central components of the SuperVac Updraft sweeper. To ensure the longest possible useful lifetime, it is extremely important to clean it after each shift and to let it air dry with the hopper up whenever possible.

### 4.9 Drive Belt

On the rear of the auxiliary engine is the belt which drives the fan shaft. Check the belt tension periodically. This is accomplished by pressing down on the belt halfway between the two pulleys. With 30 lbs of pressure (the approximate equivalent of very firm pressure from on it from your thumb), the belt should deflect about 1/2". An average belt, over the course of its life, will stretch slightly and the belt will need adjustment. This will be especially true during the first 30-75 hours of operation.

### Adjustment

The auxiliary engine, along with its engine skid, can be moved in the direction of the fan shaft (to loosen or remove the belt) or away from the fan shaft (to tighten the belt).

1. Remove the belt guard.
2. Loosen (do not remove) the bolt which holds each of the four outer corners of the engine skid to the top of the power module platform.
3. Locate the threaded rods known as jack screws.

**NOTE:** Before adjusting the jackscrews, it is always a good idea to mark the present position of the engine skid, both at the front and rear, on the power module platform. This will allow you to determine how far the engine skid has been moved and whether the center line of the auxiliary engine is still parallel with the fan shaft.

**NOTE:** Once the four tie-down bolts have been tightened, release the tension on the jackscrews.

4. Loosen the jackscrews' jam nuts.
5. By running the adjustment nuts in or out, the engine skid may be moved toward or away from the shaft. Alternate adjusting the jackscrew nuts front to rear so that movement of the engine skid is even and the engine skid does not become misaligned. If you turn the front jackscrew three revolutions, then turn the rear jackscrew three revolutions.
6. When proper belt tension is achieved, re-thread the loose adjustment nuts tightly against their power module platform tabs. (If you're adjusting the engine away from the fan shaft, these would be the inner adjustment nuts; toward the fan shaft, these would be the outer adjustment nuts.) Tighten any loose jam nuts back against their respective adjustment nuts.
7. Tighten the four tie-down bolts at the corners of the engine skid.



8. Start the sweeper engine. Squealing or abnormal vibrations indicate low belt drive tension. Adjust as needed.
9. Re-bolt the belt guard back into position.

### Replacement

With normal use, the drive belt will become worn. It is advisable to replace the drive belt when it shows signs of wear, rather than waiting for it to break. This practice will help to ensure optimum sweeper performance and avoid downtime.

To replace the drive belt, reposition the sweeper engine. This can be accomplished by loosening the mounting bolts and jackscrews attached to the engine skid, as described in 'DRIVE BELT.' Be sure to read the 'DRIVE BELT' section before following the removal/replacement outline in this section.

Before installing a new drive belt, always inspect the belt pulleys for nicks, burrs or excessive wear. Replace the pulleys if such irregularities are found.

### Removal:

1. Remove the sweeper engine's keys and/or disconnect the battery cable to prevent the sweeper engine from being started accidentally.
2. Follow the procedures outlined in steps 1-4 in 'DRIVE BELT.'
3. Turn the jackscrew nuts so the engine skid is pushed toward the fan shaft.
4. As the engine skid moves toward the fan shaft, the drive belt will become loose enough to be slipped from its pulleys.

### Replacement:

1. Inspect the pulley grooves for burrs and other irregularities that may cause abnormal belt wear. Correct as required.
2. Slip the replacement belt into position.
3. Tighten the jackscrew nuts so the engine skid is pulled away from the fan shaft.
4. Continue to tighten until the belt has 1/2" deflection between the pulleys using 30 lbs. of pressure (roughly the equivalent of pressing down on the belt with your thumb.)
5. Check the alignment of the pulleys, using a string or straight edge, from the face of one pulley to the face of the other. This will allow you to determine whether the pulleys are in line with each other.

**NOTE:** For slight misalignment, the pulleys may be repositioned on their respective shafts. If greater adjustment is needed than pulley repositioning can achieve, the entire engine / engine skid assembly must be moved to obtain alignment. The slotted tie-down holes of the engine skid allow a limited amount of forward-back movement.

6. Once proper pulley alignment is achieved, run the jam nuts back against their respective jackscrew nuts.
7. Tighten the four tie-down bolts at the corners of the engine skid.

**NOTE:** Once the four tie-down bolts have been tightened, release the tension on the jackscrews.

8. Start the sweeper engine. Squealing or abnormal vibrations indicate low belt drive tension. Adjust as needed.
9. Re-bolt the belt guard back into position.

## Section 4 - Service

### 4.10 Fan Housing

The fan housing directs the flow of air from the fan to the sweeping head. To provide the maximum performance from the fan, the fan housing and drive components should be checked for wear regularly. When signs of wear occur on a component, replace it as soon as possible.

#### Fan Housing Check

When air is drawn from the hopper into the fan housing, a small amount of fine dust is also pulled into the fan chamber. This fine dust wears the fan blades, fan housing liner and the heads of the fan housing liner bolts. Over a period of time, the sandblasting effect of this dust will cause enough wear to these components that they must be replaced. Failure to replace them is dangerous and can be very costly, since a worn fan blade can break and damage the inside of the fan housing. Worn liner bolts may allow the fan housing liner to sag and cause damage to the fan as well as to its shaft and bearings. A worn liner permits the abrasive effect of the airstream to reach the walls of the fan housing, which is an expensive replacement item.

#### Inspection:

1. Raise the hopper and insert the safety props into position.
2. Remove the keys from the ignition and disconnect the battery cable to prevent the engine from accidentally starting.
3. Remove the back plate.
4. Using a flashlight, inspect the fan blades, fan bushing, fan housing liner bolts and the fan housing liner for wear.
5. If no excess wear or abnormal wear is evident, replace the back plate, remove safety props and reconnect the battery cables.

#### Fan Housing Replacement

If a worn fan is causing reduced sweeping efficiency, it should be replaced promptly. The fan shaft bearings have a life expectancy of roughly 2500 hours. When a fan replacement becomes necessary near the end of the bearing's life expectancy, the bearings should likewise be replaced. Replacing both components will eliminate the need to perform two, identical labor operations, and avoid downtime in close succession.

Exceptions to fan/bearing replacement:

- If you sweep in extremely sandy conditions, or do not use the sweeper's water system, you may have to replace fans more often than bearings.
- If the proper bearing lubrication procedures aren't followed, you may have to replace bearings more often than fans. However, in most cases, we recommend that the fan and bearings be replaced at the same time.

### Disassembly:

1. Raise the hopper and place the safety stops over the dump cylinders.
2. Remove the engine's keys and disconnect the battery cables to prevent the engine from being accidentally started.
3. Remove the 3/8" lock nuts and washers from around the back cover plate and lift it off.
4. Remove the 3/8" bolts and lock washers from the fan's bushing.
5. Reinsert two 3/8" bolts into the tapped holes of the bushing. Tighten these bolts evenly. This will push the fan off the bushing.
6. Use a gear puller to remove the bushing from the fan shaft.
7. Remove the fan from the fan shaft and fan housing.
8. While the fan is out, check the rubber liner inside the fan housing. If signs of excessive wear are apparent, replace the liner. Failure to replace the relatively inexpensive liner could result in having to replace the more expensive fan housing later.

### Replacement:

1. Inspect the end of the fan shaft. Remove any burrs or rust from the shaft end with sandpaper.
2. Place the fan on the fan shaft and push it back into the fan housing.
3. Inspect the bushing. If the bushing is not cracked or otherwise damaged, the original bushing may be reused.
4. Apply an anti-seize agent to the tapered area of the bushing.
5. Slip the key into the bushing/fan shaft keyway.
6. Position the fan bushing onto the fan shaft while aligning it with the shaft key as well as the fan. Spread the bushing apart if necessary - remember, it will crack if it is overspread.
7. Drive the fan bushing onto the fan shaft until approximately 1/4" of the shaft extends from the face of the bushing. (Use a rubber hammer or a wooden block and metal hammer to drive the bushing on.)
8. Insert the three 3/8" bolts with lock washers through the untapped bushing holes and into the tapped holes of the fan. Finger tighten the bolts. Do not tighten the bolts so as to secure the fan to the fan shaft.
9. Apply strip caulk, or a similar sealing agent, to the face of the fan housing.
10. Install the back cover plate (it may be necessary to move the fan and its bushing further into the fan housing before the back cover plate can be mounted). Tighten the cover plate bolts.
11. Move the fan back onto the fan shaft. Center the fan between the front and back of the fan housing.
12. Position the fan on the fan shaft, taking into consideration that, as the fan is tightened onto its bushing, it will travel roughly 1/4" toward the cover plate's orifice.
13. While holding the fan in position on the fan shaft, tap the fan bushing along the fan shaft and into the fan's hub.
14. When the fan bushing is snug inside the fan's hub, insert the 3/8" bolts and tighten the fan onto the fan bushing. As the bolts are tightened and the fan is drawn onto the bushing, the fan should move 1/4" toward the cover plate.
15. Turn the fan to determine if it rubs the fan housing as it rotates. If the fan touches the fan housing, mark the bushing's present position on the fan shaft (so it may later be used as a reference point). Remove the fan from its bushing and follow steps 12-16 to remount the fan further into the fan house. If the fan and fan housing do not touch, proceed on to Step 16.
16. When the fan is properly mounted, swing the hopper safety prop into its stowed position and lower the hopper. Start the auxiliary engine, and again, listen for sounds of contact between the cover plate orifice and fan orifice. If none are audible, the unit is ready to sweep. If, however, sounds are detected, the hopper should be raised and the fan readjusted.

## Section 4 - Service

### Fan Housing Liner Replacement

To prevent damage due to air-blast from the fan, a rubber liner is attached to the inside of the fan housing. Check the liner regularly for holes, tears or pitted areas, as well as for worn liner bolts. If the fan housing is exposed to direct wear because of a worn liner, the liner should be replaced. The rubber liner is relatively inexpensive compared to replacing the fan housing.

#### Disassembly:

1. Follow Steps 1-7 of 'Disassembly' in Section 'Fan Replacement.'
2. Unscrew the 3/8" nuts from around the outside of the fan housing and remove the elevator bolts holding the rubber liner in place. Note the condition of the fan housing liner bolts. Worn bolts should be discarded and replacements used upon reinstallation.
3. Remove the worn liner in one piece if possible. Save it to use as a template to mark the new liner's hole pattern.

#### Replacement:

1. Place the old liner on top of the replacement liner material and mark the length and hole pattern with spray paint.
2. Cut the liner material to length and use a hole punch or drill to make the holes.
3. Notice that the replacement liner hole pattern is different at each end. Be sure you position the liner so that its holes match the hole pattern of the fan housing.
4. Start by installing the elevator bolts which hold the rubber liner to the top of the fan housing, and then continue installing the remainder of the elevator bolts, working out and down from the top of the fan housing.
5. Apply silicone to the outer edges of the liner and to the heads of the elevator bolts to prevent premature wear and extend the life of the bolts and fan housing.
6. Check the fan blades for wear and replace the fan if needed. To replace fan, follow Steps 1-16 in 'Replacement' of the preceding Section 'Fan Housing Replacement'.

### 4.11 Sweeping Head

The sweeping head is dependent upon forced air and vacuum to achieve debris pickup. Without proper maintenance and replacement of parts due to normal wear, the sweeping head cannot provide the desired sweeping results.

The Schwarze SuperVac Updraft is equipped with a sweeping head. Many of the maintenance procedures outlined in the following sections apply to the sweeping head.

### Checking Head Flaps for Wear

The pick-up head flaps are in need of adjustment when there is a 1/4" gap between the pavement and the bottom of the flaps. Your Schwarze SuperVac Updraft is designed to make flap height adjustment quick and easy. As the flaps wear and a gap appears between the ground and flaps, simply remove one of the skid spacers from each side of the head to allow the flaps to come in contact with the ground.

To adjust the angle of the skid, loosen the three Nylock nuts that hold the skid plate to the head, place the skid at the desired angle and re-torque.



### Flap Replacement

When a 1/4" gap appears between the rubber flaps and the pavement and there are no more spacers to remove, it is time to change the flaps. In order to change the flaps, the pick-up head must be removed from under the truck.

1. Remove the chains from the cylinders, the bolts that connect the drag bars to the head, the head springs, and the 10" hoses.



2. Slide the head out from under the truck on the driver's side and turn the head upside down.



## Section 4 - Service

3. Note that most of the bolts face toward the back of the truck. Also take note of which bolts face different directions.
4. To prevent confusion, remove, mark and replace only one flap at a time, taking note of which side of the metal strips the flap is on.
5. Fasten the flaps with 1/4" x 1" bolts and nylock nuts. Install 1/4" washers anywhere the flap meets a nut or bolt.
6. Reinstall rubber skid spacers making sure there are four on each side.
7. Reinstall head making sure that all chains are at the proper length and the springs are set to the proper tension.

	91" Pick-up Head	81" Pick-up Head
Thin Flap	91" X 9" 1/8" SBR	81" X 9" 1/8" SBR
Front Flap	8" X 72" 1/8" X 1/16" 3-Ply Belting 6" X 86"	8" X 62" 1/8" X 1/16" 3-Ply Belting 6" X 76"
Center Flap	1/8" X 1/16" 3-Ply Belting	1/8" X 1/16" 3-Ply Belting
Rear Flap (Both 12" and 10" Flaps are cut from this flap)	7" X 136" 1/8" X 1/16" 3-Ply Belting	7" X 126" 1/8" X 1/16" 3-Ply Belting



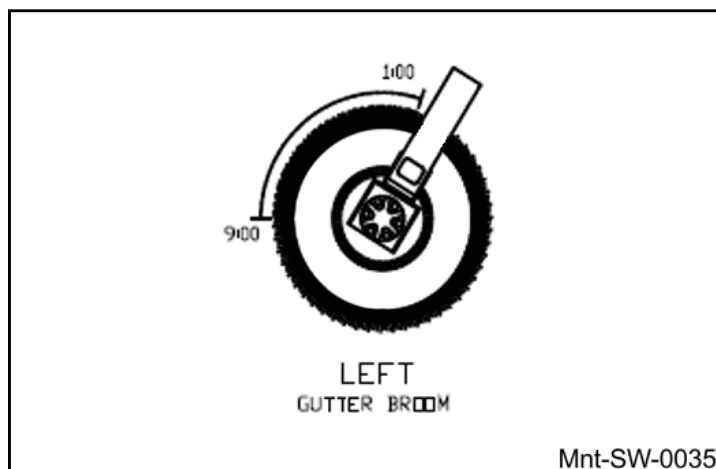
### 4.12 Gutter Broom

The following sections deal with adjustments and replacement of mechanical portions of the gutter broom. For the gutter broom hydraulic system maintenance, follow the procedures outlined for the gutter broom in Section 'Maintenance Schedules' and in Section 'Sweeper Fluid Maintenance.'

#### Gutter Broom Pattern Check

A broom pattern is the pattern of marks left on a sweeping surface after the sweeper has passed over it. You should check this pattern to verify the following conditions:

- That the broom is reaching the sweeping surface
- That the left-broom pattern is a 9-to-1 o'clock contact



#### Inspection:

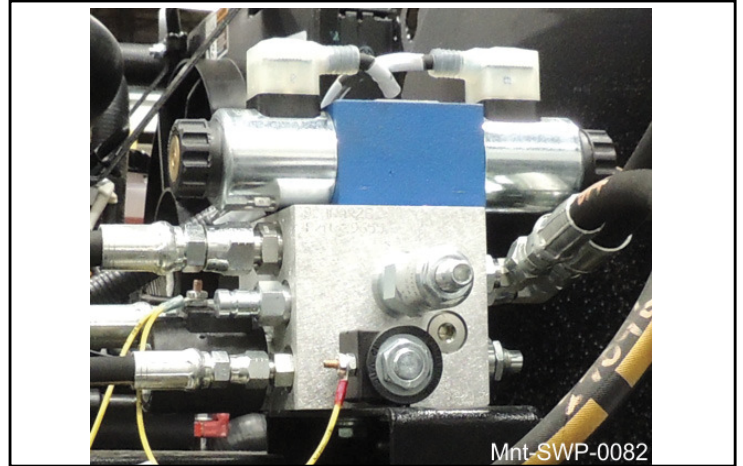
1. Move the sweeper to a flat asphalt or concrete sweeping surface and start the auxiliary engine.
2. On the cab console control panel, toggle the gutter broom switch to ON.
3. Allow the broom to run in contact with the sweeping surface for a minute or so.
4. On the cab console control panel, toggle the gutter broom switch to RETRACT.
5. Reverse the sweeper several feet to expose the surface just swept.
6. Turn off the truck engine and set the parking brake.
7. Get out of the cab and inspect the broom pattern (the worn area on the sweeping surface). If either pattern is irregular, the corresponding gutter broom needs adjustment. Follow the procedures outlined in this section to make corrections.



## Section 4 - Service

### Gutter Broom Down-Pressure Adjustment

Curb broom models are equipped with manual override button on each valve. In case of an electric failure, push in the override button located on the ends of the directional valves for the function you wish to operate.



### Gutter Broom Angle Adjustment

A gutter may be so deep that the broom cannot reach the surface. In this case, broom-to-surface contact can be improved by adjusting the angle.

If the gutter broom is not throwing debris into the sweeping head path, broom pattern can be improved with some adjustment.

A hydraulic cylinder located along the truck frame operates the broom arm. The broom follows a fixed axis. Adjust the tilt of the broom by loosening the nut, which attaches the motor mount hinge to the curb broom arm. The pitch of the broom is adjusted by loosening the motor mount hinge.



### Gutter Broom Spring Adjustment

The curb broom spring is located on the curb broom arm. It is attached to the frame mount on one side, and an eyebolt on the other side. To adjust the spring tension, simply loosen the jam nut on the eyebolt and tighten the tension nut for more tension or loosen for less tension.



### Gutter Broom Bristle Replacement

Gutter broom bristles should be replaced when they are worn to approximately 6 inches in length. When gutter broom bristles are allowed to wear shorter than 8 inches, the bristles gradually become too stiff and lose their ability to flick debris.

The gutter broom uses two poly wafer disks that are drawn into the broom head forming a cone shape. Do not over tighten, only a slight cone is required.

1. Place the gutter broom in the raised position.
2. Remove the three bolts that hold the gutter broom bristle segment to the gutter broom disc, and set them aside.
3. Place new wafers under broom head with mounting plate under wafers. Mount with three bolts and tighten evenly until a slight cone is formed.
4. Verify that broom angle is set correctly, touching the ground at the outside 9:00 position and the forward 1:00 position.
5. Start rear engine and rotate broom. Raise and lower broom to check operation.
6. Check broom pattern and make adjustments as needed.

### 4.13 Hydraulic System Maintenance

The hydraulic system is important to the daily operation of the sweeper and should be treated as a maintenance priority. Check the hydraulic oil daily. The hydraulic oil level should be maintained at the 80% mark on the sight gauge located on the back of the reservoir. Check daily for leaks in hydraulic hoses and fittings. If a leak is detected, repair it as quickly as possible. Leaks allow hydraulic fluid out and are points where dirt may enter the system.

#### Hydraulic Tank Fill-Up

##### Fill-Up:

1. Locate the hydraulic tank on the left side of the sweeper.
2. Examine the hydraulic fluid sight-level gauge located on the back of the tank. The hydraulic fluid within the glass face of the gauge allows you to determine whether the tank needs filling.

**NOTE:** The fluid level should register at or about the high mark.

3. If the tank needs filling, locate the fill opening on top of the hydraulic tank.
4. Remove the cap.
5. Use a funnel to fill the hydraulic reservoir to the desired level with one of the following:
  - Shell Tellus 68 hydraulic fluid
  - Citgo 68 hydraulic fluid
  - An equivalent 22-weight (SAE) fluid

**NOTE:** 30-weight (SAE) fluid is required for any system operating with an ambient fluid temperature greater than 100°F.

6. Replace the cap.

## Section 4 - Service

### Draining the Hydraulic Tank

#### Tank Draining:

1. Locate the drain plug attached to the bottom of the hydraulic tank.
2. Place a 5 gallon capacity container on the ground, positioning it below the drain.
3. Remove the plug from the bottom of the hydraulic tank.
4. Allow the fluid to drain.
5. Reattach the plug to the bottom of the hydraulic tank.

### Hydraulic Fluid Change

#### Hydraulic Fluid Should Be Changed When:

- Maintenance records show that the new sweeper has completed its first 500 hours of operation
- Thereafter, maintenance records should show that the sweeper has been operated 2,000 hours since its last hydraulic fluid change.
- If the hydraulic fluid becomes cloudy, water has contaminated the system. It should be changed and flushed.

**NOTE:** *If the hydraulic oil contains water, be sure to determine the source of the water contamination before changing and flushing the hydraulic oil.*

#### Fluid Change:

1. Drain the hydraulic tank by following the procedures outlined in Section, 'Draining the Hydraulic Tank.'
2. Refill the hydraulic tank with one of the following;
  - Shell Tellus 68 hydraulic fluid
  - Citgo 68 hydraulic fluid
  - An equivalent 20-weight (SAE) fluid.

**NOTE:** *30-weight (SAE) fluid is required for any system operating with an ambient fluid temperature greater than 100°F.*

3. Choose one:
  - If you intend to reuse the hydraulic fluid just drained, filter it.
  - If you do not intend to reuse the hydraulic fluid just drained, transfer it to a closed container approved by local, state and federal environmental agencies and deliver it to the appropriate disposal site.

### Hydraulic Filters

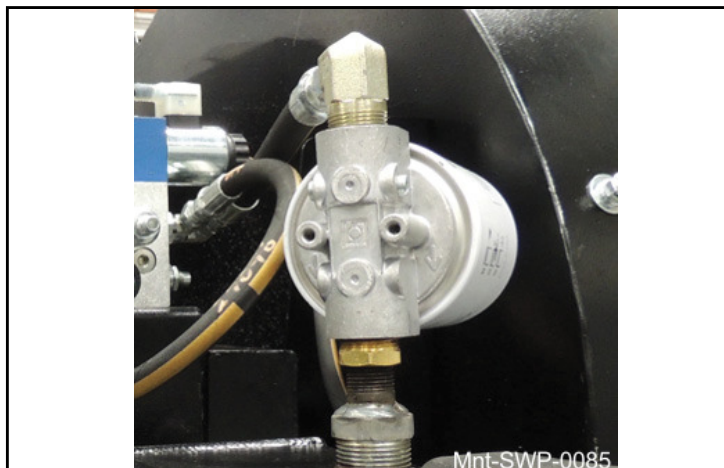
**NOTE:** Replace or clean the suction filter after the first 500 hours of operation, then every 2000 hours thereafter.

#### Replacement:

1. Place a small tray or oil rag under filter before removing.
2. Remove filter by rotating canister counter clockwise.
3. Install new filter. Be sure to apply a small amount of oil onto the filter gasket before installation.

**NOTE:** Change the return filter after the first 500 hours of operation, then every 2000 hours thereafter.

4. Remove the lower housing of the Pressure Filter.



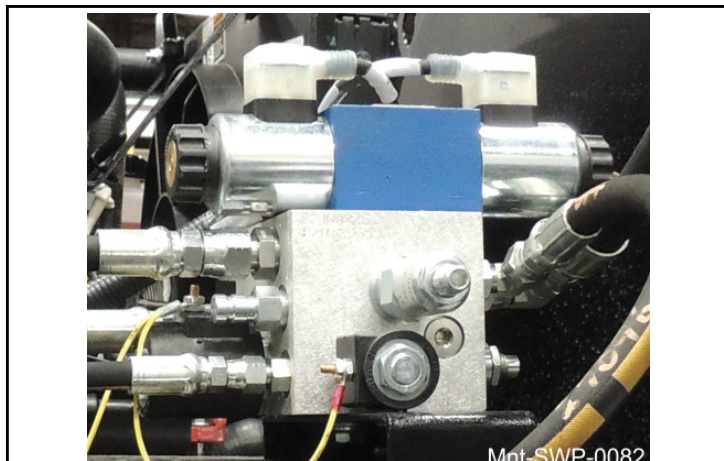
5. Fill the hydraulic tank following the procedures outlined in 'Hydraulic Tank Fill-up'.
6. Start the auxiliary engine and allow the fluid to re-circulate through the system.
7. If needed, refill the reservoir to the full mark of the site gauge.



### Directional Valve Override

Your unit is equipped with manual overrides, which can be used at any time if you blow a fuse or have any other electrical problem. The overrides control the gutter broom only.

The gutter broom override is located at the center of each coil of the gutter broom valve. To manually override the valve, use a small screw driver or round pin to depress to center pin to shift valve. One side of the valve lowers and the other side lifts.



## Section 4 - Service

### 4.14 Dust Suppression System Maintenance

The standard water system consists of a gravity-feed water line to the sweeping head and a flowjet water pump for the hopper, gutter broom spray nozzle dust suppression. The water line for the head needs little in the way of maintenance except the occasional check beneath the sweeping head to be sure that its outlet has not become clogged. However, the water strainer should be cleaned daily and the water nozzles checked for operation and cleaned as needed. When freezing temperatures are expected, the water reservoir should be drained or an environmentally safe anti-freeze added to the water per the anti-freeze manufacturer's instructions.

#### Water Filter Cleaning

The plastic strainer, located beneath the left water reservoir, is positioned in-line between the water reservoir and the water pump. Its purpose is to remove particles from the water that might cause failure of the spray tips of the dust suppression system. The cap spins off for easy daily flushing of these trapped particles. Generally speaking, once a week, the reservoir should be drained, the bottom of the strainer unscrewed, and the cylindrical screen within the strainer removed and cleaned. Of course, the frequency of the need to clean this screen will vary depending upon the purity of the water from the fill source.

#### Cleaning:

1. Drain the reservoir.
2. Unscrew the bottom of the strainer. Remove and clean its screen.
3. Reassemble the strainer.



**Y STRAINER DISASSEMBLY**

#### Water Nozzle Cleaning/Replacement

A dust suppression system nozzle needs cleaning when it is clogged and water flow is restricted.

Due to dusty conditions encountered during sweeping operations, dirt and debris particles entering the dust suppression system are sometimes small enough to pass through the 'Y' strainer. These particles can build up within a nozzle's openings, restricting water flow. When this occurs, the nozzle must be cleaned or replaced.



### Cleaning/Replacement:

1. Unscrew the nozzle retainer cap and set it aside.
2. Remove the spray tip and strainer.
3. Wash the strainer and examine it.
4. Choose one:
  - If washing the strainer has removed all particles or debris, set aside the (now clean) strainer.
  - If the strainer can no longer be thoroughly cleaned, it needs to be replaced.
5. Wash the spray tip and examine it.
6. Choose one:
  - If the spray-tip opening is clogged, insert a small-gauge wire into the spray-tip opening to clear any debris lodged inside.
  - If the spray tip is damaged, it needs to be replaced.
7. Reassemble the nozzle, replacing any damaged parts as necessary.
8. Unscrew the bottom of the 'Y' strainer housing to drain the water reservoir(s).
9. After the water flow stops, reassemble the 'Y' strainer housing.



**WATER NOZZLE DISASSEMBLY**

### Dust Suppression System Winterizing

You must winterize whether or not you will use your sweeper during freezing temperatures. In either case, winterizing your Schwarze Updraft will help keep it in top operating condition, extending its length of service.



Failure to winterize the dust suppression system could result in damage to your sweeper.

Choose one:

- If your sweeper's dust suppression system will be operated during freezing temperatures, complete the first procedure.
- If your sweeper's dust suppression system will NOT be operated for several weeks when freezing temperatures are expected, complete the second procedure.

### System Winterization:



If antifreeze is to be used to protect the sweeper's water system, it is imperative that it be an environmentally safe antifreeze. Common non-biodegradable antifreeze should NEVER be used in the water system.

1. Following the antifreeze manufacturer's instructions, add environmentally safe antifreeze to the water by pouring it through the air-gap opening in the top of the reservoir.
2. Turn Auxiliary Engine key switch to the 'ON' position. (Starting the engine is not required.)
3. Turn ON the Water pump.
4. Turn ON all cab console control panel switches controlling water manifold solenoids.

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## **Section 5 - Troubleshooting**

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# 5

## Section 5 - Troubleshooting

### 5.1 Sweeper

Problem	Possible Cause	Remedy
Loss of Vacuum- Sweeper Not Picking Up	Sweeping too fast Fan not located properly within fan housing Head not fully lowered Worn flaps or skid plates out of adjustment Faulty seal (fan, intake or door) Torn hose(s) Bent or uneven drag arms Blocked intake inlet  Blocked screen Loose drive belt Worn Fan Holes in hopper or fan housing Bent sweeping head	Slow down Adjust fan closer to back plate  Lower head completely a. Adjust side plate b. Replace flaps Replace Seals Replace hose(s) Straighten or replace drag arm Remove hose and clean debris from intake inlet Remove blockage Tighten belt Replace fan Repair holes Replace sweeping head
Excessive Runner Wear- Head Not Gliding Properly	Improper head spring tension Bent or uneven drag arms Improper side plate adjustment Bent head channel	Adjust head spring tension Straighten or replace drag arms Adjust side plates Straighten or replace head channel
Head Drifting Down	Leaking sweeping head cylinder seal P. O. check valve stuck open	Rework seals Replace or clean
Unusual Noise or Vibration	Worn bearings Fan out of balance  Fan shifted within housing Loose drive belt Loose bolts Fan blades worn or broken Loose shaft bearing bolts	Replace bearing(s) Clean debris, rebalance or replace fan  Reposition fan Tighten drive belt Tighten bolts Replace fan Tighten bolts

## Section 5 - Troubleshooting

### 5.2 Dust Suppression System

No Water Exiting Pump	Out of water Suction line clogged Air leak in line Pump shaft not running	Refill tank Clean 'Y' strainer Tighten plumbing Check motor and electric circuit
One Spray Nozzle Not Working	Clogged strainer at nozzle Crimped or clogged water line Nozzle valve not on	Clean or replace nozzle strainer Uncrimp or unclog line Switch nozzle valve on
Only One Nozzle Will Come On	Clogged strainer at nozzle  No water Wiring on solenoid  Bad solenoid	Clean strainer and then clean or replace nozzle strainer Refill water system Check power wire and ground, repair as needed Replace solenoid
Low Pressure	Worn nozzle Air leak in inlet plumbing	Replace with nozzle of proper size Disassemble, reseal and reassemble

### 5.3 Hydraulic System

Extreme Heat, Unusual Noise, Poor Performance from Pump	Reservoir cap is not vented  Dirty Hydraulic oil  Low oil level Bad pump Bad hydraulic motor Hydraulic pump belt noise Mechanical pump not being powered Directional valve faulty or has poor ground Major leak in hydraulic system Hydraulic pump pressure too low	Replace cap with vented equivalent Remove filters and clean or replace; change oil Check oil and fill as needed. Repair or replace pump Rebuild or replace motor Belt is worn Determine reason pump is not being driven and repair accordingly Check electrical components or replace valve Repair leak Adjust pump pressure (relief valve in manifold)
Hydraulic System Will Not Operate	Leaking cylinders seals Head/Hopper will not raise or lower	Replace seals or seek service a. Increase power level b. Hopper overloaded c. Pick-up chain broken d. Check console switches e. Blown fuse(s)-replace fuse(s) f. Adjust relief valve

## Section 5 - Troubleshooting

### 5.4 Gutter Brooms

Broom Disc Spins too Slow	Engine RPM too low Fluid viscosity is too high for operating temperature Outside temperature low Broom hydraulic motor is bad	Raise power level to appropriate setting Replace with lighter weight oil Run fan longer before using gutter broom to warm up hydraulic oil Rebuild or replace motor
Broom Hits Frame	Inner broom cylinder stroke is too short Spring tension too light	Screw rod end on cylinder to lengthen stroke Adjust spring tension
Debris Trails Between Broom Disc and Side of Sweeping Head	Improper broom head adjustment Broom bristles worn	Adjust broom head tilt Replace Bristles
Broom Disc Stalls in Heavy Debris	Pressure to broom motor too low Motor or pump seal leaking Too much down pressure	Adjust relief pressure Seek service Adjust
Broom Flings Debris Across Street	Tilt angle of broom head too great	Adjust broom head
Broom Spins But Will Not Extend/Retract	The inside of the cylinder's hydraulic hose or fitting is blocked Directional valve malfunctioning	Clear blockage Check directional valve. Replace if needed.
Broom Operates But Will Not Lift	Switch or directional valve wire loose or bad connection Block solenoid valve Leaking cylinder seals (fluid loss out of port) Mechanical bind	Check wiring Replace valve Replace seals Check broom hardware for binds
Broom Spins But Will Not Lower	Solenoid valve's electrical circuit incomplete Bad solenoid valve cartridge Mechanical bind	Complete circuit Replace cartridge Check broom hardware for binds
Broom Raises But Leaks Down Immediately	Solenoid valve stuck open Leaking cylinder seals (fluid loss out of port vent)	Clean valve or replace Replace seals

## Section 5 - Troubleshooting

Broom Operates But Disc Does Not Spin	Bad broom motor	Service or replace motor
Broom Drops But Will Not Otherwise Operate	Directional valve's electrical circuit is incomplete Directional valve ports blocked Bad pump or motor	Complete circuit Seek service Service or replace pump or motor
Broom Will Not Drop or Otherwise Operate	Tripped circuit breaker Bad Switch Directional valve wiring bad	Reset circuit breaker Replace switch Check directional valve wiring circuit

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Schwarze is different. Our machines are designed, built and supported in a different way. That difference comes from an engineering heritage. A heritage of thinking first about the people who actually use the machines. About how to help them be safer, more comfortable, more productive. About the environment we all share. The result of that thinking is a growing range of machines and a global support network dedicated to helping you do more. People around the world are proud to use Schwarze.

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Under our policy of continuous improvement, we reserve the right to change specifications and design without prior notice. Illustrations do not necessarily show the standard version of the machine.

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