

# Safety Manual

**VACTOR®**  
*Subsidiary of Federal Signal Corporation*

**GUZZLER®**  
*Subsidiary of Federal Signal Corporation*

877-342-5374. Outside the USA or Canada call 847-741-4330.



# Vector • Guzzler

## FORWARD

## SAFETY

Welcome to the our growing family of Vector and Guzzler customers. The current series of units reflect the latest developments from the continuous research program of our engineering staff. Our research brings you the latest and most efficient pneumatic cleaning and jet-rodding equipment available in the world today.

This Safety Manual contains information on all aspects of the safe operation of a Vector/Guzzler unit. We describe uses of the product to assist with the many unique jobs you will encounter. We also include representative samples of typically used safety and instruction decals. Because all Vector/Guzzler units are custom, decals may vary. A guide listing decals is available for each specific model. We encourage you to replace decals when they become worn or illegible.

Proper operation and maintenance of your unit is critical to protect the safety of operators and others, and to maximize performance and product life. Each person should familiarize himself with this manual as well as proper operating procedures before operating unit or maintaining the unit.

The information, specifications, illustrations and parts numbers in these publications are based on the information in effect at the time of approval for publication. We are constantly improving our products and, therefore, reserve the right to make changes at any time without notice.

If a question arises concerning your Vector product or this publication, please contact your Vector® Manufacturing, Inc. distributor.

This manual is for use only with units meeting Vector/Guzzler Mfg., standards. If your unit does not meet these standards, contact your Vector/Guzzler representative to have your unit retrofit to meet these standards.



Scan the QR Code  
with your mobile  
device or visit:  
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application safety information.

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Corporation*

**Please keep Vector/Guzzler Mfg. Informed of any change of vehicle ownership or address.**

This operator's manual should be considered a permanent part of the your unit and should be with the vehicle at all times for ready reference.

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# Vactor • Guzzler

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### IMPORTANT MEDICAL INFORMATION

**An injury caused by high pressure waterjets can be serious. In the event of any waterjet injury:**

- Seek medical attention immediately. Do not delay!
- Inform the doctor of the cause of the injury.
- Tell the physician what type of waterjet project was being performed at the time of the accident and the source of the water.

## Medical Alert Note Physician

This patient may be suffering from a waterjet injury. Evaluation and management should parallel that of a gunshot injury. The external manifestations of the injury cannot be used to predict the extent of internal damage. Initial management should include stabilization and a thorough neurovascular examination. X-rays can be used to assess subcutaneous air and foreign bodies distant from the site of injury. Injuries to the extremities can involve extensive nerve, muscle, vessel damage, as well as cause a distal compartment syndrome. Injuries to the torso can involve internal organ damage. Surgical consultation should be obtained. Aggressive irrigation and debridement is recommended. Surgical decompression and exploration may also be necessary. Angiographic studies are recommended pre-operatively if arterial injury is suspected. Bandages with a hygroscopic solution (MgSO<sub>4</sub>) and hyperbaric oxygen treatment have been used as adjunctive therapy to decrease pain, edema and subcutaneous emphysema. Unusual infections with uncommon organisms in immunocompetent patients have been seen; the source of the water is important in deciding on initial, empiric antibiotic treatment, and broad-spectrum intravenous antibiotic treatment, and broad-spectrum intravenous antibiotics should be administered. Cultures should be obtained.

Operators using or working around high pressure water systems need to take additional precautions including specialized personal protection equipment. Additional information on high pressure water safety and this information is provided by and available as a wallet card from:



**Also available from the WJTA-IMCA:**

*Recommended Practices for the Use of High Pressure Waterjetting Equipment*

*Recommended Practices for the Use of Industrial Vacuum Equipment*

**WJTA-IMCA**

906 Olive Street, Suite 1200  
Saint Louis, MO 63101

(314) 241-1445  
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website: [www.wjta.org](http://www.wjta.org)

# Vactor • Guzzler

SERVICE HOTLINE

SAFETY

The Vactor/Guzzler Service Team provides assistance to all Vactor/Guzzler dealers and customers via remote (telephone, e-mail, fax, etc.) and on-site (dealer/customer visits, field training, etc.) support operations.

## Toll-Free Telephone

**1-877-DIAL ESG**

**(877) 342-5374**

Fax (815) 673-1621 • Website [www.vactor.com](http://www.vactor.com)

Outside the USA or Canada call 01-847-741-4330

## ***Technical Support • 24 hours/Day, 7 Days/Week!***

You will be asked for specific information pertaining to the type of unit you are calling about, Vactor, Elgin, Guzzler, etc. You will be asked for the zip code you are calling from. Your call will then automatically be transferred to the Vactor dealer closest to you. If it is after normal business hours and the closest dealer to you does not have a 24-hour line, your call will be transferred to a factory service technician.

When the dealer or the technician answers, you will be asked for the model and serial number of the Vactor unit you are working on. Please have that number available. It will definitely help to expedite our being able to help you with any questions or problems you have. Our plan is to service our customers to the best of our ability 24 hours a day, seven days a week, no matter where you are in the world!



Vactor/Guzzler could not possibly, know, evaluate, and advise the service trade of all conceivable ways in which operation or service might be done or the possible hazardous consequences of each way. Anyone who uses operational procedures, service procedures, or tools, whether recommended by Vactor/Guzzler or not, must first satisfy himself thoroughly that neither his safety nor the product safety will be jeopardized by the methods he shall select.

Vactor/Guzzler vacuum systems are designed to user specifications. The owner/operator/user is responsible for the safe use and application of this equipment and proper waste disposal. Transportation and disposal of waste may be subject to local, state or federal laws.

Read and follow the safety practices described in this manual and in the common industry references that are also provided to help in the decision making process.

### General Safety Procedures

1. Perform all operations with at least two operators.
2. Only trained personnel should operate, perform maintenance, or repair the unit.
3. Work area must be clear and clean for good visibility and footing.
4. All operators must wear safety apparel: hard hat, visor and / or goggles, ear protection, rain suit, safety-toe shoes or boots with non skid soles and water proof gloves are recommended.
5. Never alter system components or reprogram. System components must be used only as intended.
6. If a malfunction occurs, immediately stop and follow repair instructions.
7. In case of freezing conditions, drain water from all components.
8. The unit must be thoroughly cleaned between jobs to prevent cross contamination or chemical reactions.
9. Never use this unit in any type of rescue operation where the vacuum is used for the rescue.
10. 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 build up from the engine and blower discharge can overheat people and equipment.
11. Never use an air mover machine for vacuuming hydrocarbon or flammable materials unless the flash point of the material is 140° (F) or higher. Pressurized or pump off loading is not permitted unless the flash point of the material is 140° (F) or higher unless nitrogen is present.
12. Never operate engines where there are or can be combustible vapors. Vapors pulled in to an engine air intake can cause engine acceleration and over-speeding. This can result in death, injury and property damage.
13. Reference to OSHA regulations are for informational purposes only and not intended as legal advice.
14. 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, and approved safety and personal protection equipment and clothing must be used and worn at all times.
15. Never use an air mover machine to vacuum dusty materials until the Safety Data Sheet(s) (SDS) have been consulted to determine if the dust(s) has an explosive potential (Combustible Dusts). Only air mover units that are part of a verified assured grounding system that have bags, doors and any other non-welded debris body components grounded to the debris body can be used if the materials contain combustible dusts.



## NOTICE

Everyone associated in any way with a Vactor® Mfg. product must thoroughly understand and apply the contents of this manual. It is the responsibility of the owner to train his employees in the operation and safety procedures while operating or repairing this equipment.

No one shall operate or service this Vactor Equipment until they have read and understand the operating manual. Additional copies of the manuals may be obtained from your Vactor distributor or by contacting the factory.

Please specify model and serial no(s).

## NOTICE

**Jump Starting Or Welding Can Damage Electrical System**

To avoid damage:

- Disconnect ECU, control modules and batteries before welding on unit.
- Disconnect control modules before jump starting. Consult chassis service manual for details on jump starting.
- Never use a test light when troubleshooting. Only use digital multimeter on all circuits. Test lights and older analog meters can damage the electronic systems.
- Set all ignition switches to OFF before testing CANbus system.



## NOTICE

**Custom Machine Parameters**

Reprogramming the chassis or engine controls will result in problems ranging from improper operation to complete loss of service. Follow chassis manufacturer's procedures when reprogramming to avoid the loss of the custom machine parameters.



## NOTICE

Consult OEM chassis and engine operation and maintenance manuals for complete details on operation.



## WARNING

**California Proposition 65**

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

### Know Your Units' Capacity and Rules of Operation

NEVER exceed your Gross Vehicle Weight (G.V.W.). It is possible to overload the unit capacity just as well as the family car or pick-up truck.

Know your Gross Vehicle Weight Rating (G.V.W.R.). Know your axle capacities. The following procedures should be adhered to.

1. Load your vehicle to stay within the G.V.W.R. while traveling on the highway.
2. Load your water supply at or near the job site.
3. Regulate your work to maintain minimum water storage when leaving the work location.
4. If in off-road applications and industrial usage the G.V.W. is exceeded, operate the unit at 15mph or less. Speed limits are estimates and conditions such as rough terrain may require much lower speeds.
5. Maintain proper brake adjustment at all times. Check brakes daily.

**Note:** 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.

These standards apply to the operation and maintenance of Vactor® Mfg. equipment, both old and new units.

The following definitions apply to all terms used throughout this manual unless otherwise stated.

**DISTRIBUTOR:** A person that distributes Vactor® equipment to a person or employer.

**EMPLOYER:** A person that hires one or more persons to work in the business of maintaining or operating equipment.

**HAZARD:** Description of a physical or environmental condition that creates the potential for injury.

**MAINTENANCE PERSON:** A person who cares for, inspects, cleans, maintains and repairs Vactor® Mfg. equipment.

**OPERATOR:** A person who controls the use and operation of Vactor® Mfg. equipment other than in the course of servicing or repair.

**PERSON:** An individual, corporation, partnership, legal entity or business.



### Crushing Hazard

**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. [Always disengage PTO when hoist is not in use or when moving vehicle.] The debris body **MUST BE** empty for service work.

**NEVER** attempt to raise body when vehicle is on unlevel ground.

Rear door controls **MUST BE** released before the front of the body is 2 feet above the chassis frame. Operator must remain at controls during all operations.



### OPERATION

**It shall be the responsibility of the Employer to:**

- INSTRUCT EMPLOYEES NEVER TO GO UNDER A RAISED LOADED BODY.
- INSTRUCT EMPLOYEES NEVER TO GO UNDER A RAISED BODY WITHOUT SECURELY PROPPING IT. BODY MUST BE EMPTY.

- INSTRUCT EMPLOYEES NEVER TO USE ACCESS LADDERS OR GO ON THE UNIT WHILE THE UNIT IS RUNNING. THE UNIT MUST BE SHUT DOWN.
- Provide properly maintained equipment that meets all applicable codes, local, state and federal ordinances and safety standards
- Instruct and train operator in safe and correct methods of operation before assigning any person to operate unit. Such instructions and training shall include all operational and safety data furnished by the manufacturer.
- Prohibit operator from operating unit unless trained and qualified. All employees should be properly trained.
- All personnel operating or in the vicinity of the equipment need to be trained on the hazards and precautions of vacuum, high pressure water and compressed air.
- All decals are in place and legible.
- Be sure the in-line vacuum relief safety is properly installed.

**It shall be the responsibility of the Employee to:**

- NEVER GO UNDER A RAISED LOADED BODY.
- NEVER GO UNDER A RAISED BODY WITHOUT SECURELY PROPPING IT. BODY MUST BE EMPTY.
- Use all safety features provided on the unit and abide by all safety instructions.
- Operate unit only after being instructed and trained in accordance with instructions given in (Employer Responsibility).
- Report any damage or malfunction of the unit or components to your employer, either at occurrence or at end of working day, depending on the extent of damage or malfunction.
- NEVER ride, or let any other person ride on ANY part of the vehicle other than in the cab when the vehicle or hoist is in motion.
- Be certain that all individuals and obstructions are clear to the hoist and body before operating the controls and be ready to stop operation at any time that a hazardous condition might occur.
- NEVER leave raised or partly raised body while vehicle is unattended or while performing maintenance or service under the body unless body is propped to prevent accidental lowering.

Shut off chassis engine and remove ignition keys under the above conditions.

- Jewelry should not be worn during operation and maintenance of the vehicle. This includes, but is not limited to, watches, rings, ear rings and necklaces.
- Be sure the in-line vacuum relief safety is properly installed.
- All personnel operating or in the vicinity of the equipment need to be trained on the hazards and precautions of vacuum, high pressure water and compressed air.

### MAINTENANCE

**It shall be the responsibility of the Employer to instruct maintenance personnel:**

- NEVER GO UNDER A RAISED LOADED BODY.
- NEVER GO UNDER A RAISED BODY WITHOUT SECURELY PROPPING IT. BODY MUST BE EMPTY.
- Ensure adequate care for, cleaning, inspecting and maintaining the entire unit.
- Establish and follow a program of regular maintenance to ensure that the complete unit is in a safe operating condition and in accordance with the manufacturer's recommended specifications. A record of these inspections and of any maintenance work shall be kept.
- See that all maintenance personnel are competent personnel, trained for this purpose.
- Provide an adequate and safe work area for the maintenance personnel to maintain the unit. Complete area to be free from all hazards.
- Establish procedures for mandatory use of safety equipment when working.
- Establish a procedure wherein the engine will be shut off, the ignition key removed, and a sign stating "UNIT UNDER REPAIR - DO NOT OPERATE" be displayed on the steering wheel, during repairs to unit, except during maintenance testing.

**It shall be the responsibility of the Maintenance Personnel to:**

- NEVER GO UNDER A RAISED LOADED BODY.
- NEVER GO UNDER A RAISED BODY WITHOUT SECURELY PROPPING IT. BODY MUST BE EMPTY.
- Follow all of the employer's programs and use all the safety procedures established by the employer and manufacturer.
- Make all repairs in accordance with all applicable codes, local state and federal ordinances and according to the design specifications as recommended by the manufacturer.



### Part Failure Hazard

**To avoid serious injury or death use only Vactor® Manufacturing supplied replacement parts. Use only Vactor® Mfg. supplied hose, fittings, and tools to repair or replace high pressure hose.**

### RECONSTRUCTIONS OR MODIFICATIONS

- Any reconstruction or modification to this Vactor® equipment shall be the responsibility of the person making these reconstructions or modifications.
- Any person reconstructing or modifying this Vactor® equipment must furnish instructions with the reconstruction or modification. These instructions shall include operating, maintenance and safety precautions associated with the reconstruction or modification.

Vector uses several different types of warning decals on their units. These decals come in a variety of colors, shapes and sizes. Not all decals are used different Vector models. Each unit will have it's own set of warning decals. Each warning decal has a number located in the lower right corner. Contact the factory with that particular number for replacement decals. Even though Vector uses many different decals on their units, the decals fall into five (5) different categories, danger, warning, caution, machine caution, and notice.

Machine caution is being phased out and replaced with notice due to updates to industry decal standards.

### NOTICE

Check unit daily making certain all decals are in place and readable. Replace as needed.

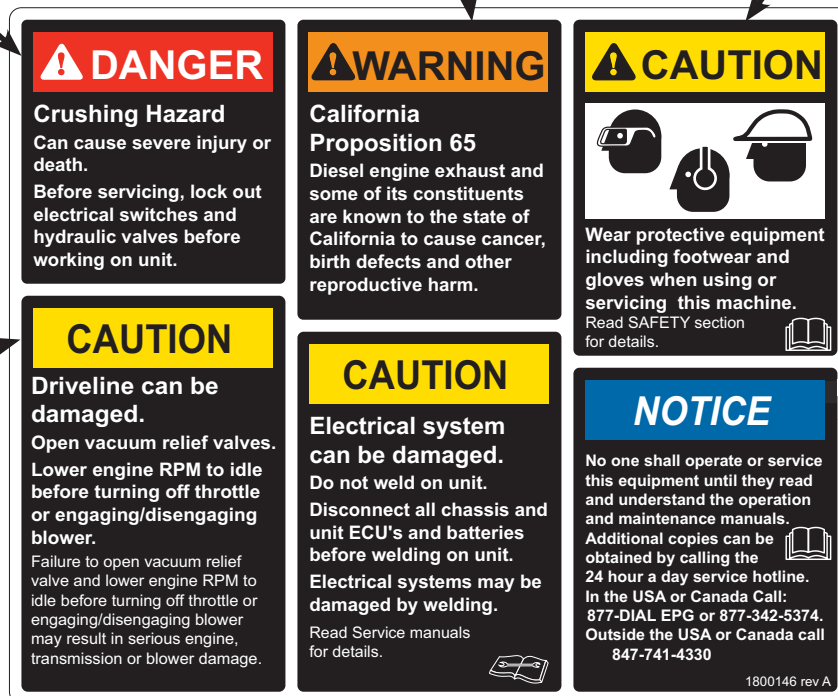
**DANGER Decal** - These warn the operator of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING Decal** - These warn the operator of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION Decal** - These indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices, which could cause damage to the equipment.

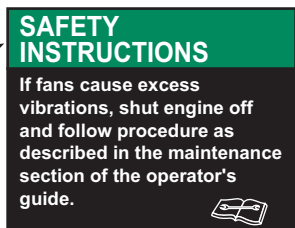
**MACHINE CAUTION Decal** - CAUTION without the safety alert symbol indicates a POTENTIALLY hazardous situation which, if not avoided, may result in equipment or property damage.

**Note:** MACHINE CAUTION is being phased out and replaced with NOTICE per changes in the ANSI Z535 industry standard.



**NOTICE Decal** - These indicate information considered important, but not hazard-related (e.g. messages relating to property damage).

**SAFETY INSTRUCTIONS Decal** - These indicate specific safety-related instructions or procedures



# Vactor • Guzzler

## GENERAL

## SAFETY

Safety is the primary concern in all operations and is everybody's responsibility. All vacuum truck operations must be performed with at least two operators. The operators of any equipment must always be aware and alert to any potentially unsafe condition due to its size, weight, operating capabilities or maneuverability. If a question or concern in this regard exists, the matter should be discussed with the supervisor before operating the machine.

Remember safety first and always, is a good motto. Constantly evaluate the safety concerns as you go. Short cuts, bypassing safety devices for the sake of production, jeopardize everyone's safety and should not be done. Doing a job well is doing it in a safe, efficient, timely and economical manner. Safety of the operator and other personnel involved is of the primary concern and overrides everything else.

Safe operation requires well maintained equipment. Constantly monitor the condition of your equipment, not only before operating it but also during and after the end of operations.

**Before Operation** - inspect the equipment prior to using it. Check the operating locale for overhead or surrounding obstructions. Is there any other equipment or personnel working in the vicinity of your loader which might interfere in your safe operation or theirs?

**During Operations** - constantly look out for any situation that may develop during operations which might compromise the safety of men and machine. Train your eyes and ears to the sights and sounds of the equipment - learn to distinguish between the normal and abnormal sounds of the unit in operation. Look for any movement in an area where none is expected.

**After Operation** - Make sure that the equipment is properly shut down and everything is properly stowed and secured. Any unintended movement of the machine should be blocked and all switches turned off.

### General Safety Procedures

Inspect the cab for warning tags indicating a possible problem with the equipment. If warning tags are present, equipment must not be operated under any circumstances.

Always operate equipment with lights on.

Never wear loose clothing or jewelry that can catch on controls or other parts of the machine. The wearing of finger rings is prohibited.



Ensure that all protective guards and covers are in place.

Keep the machine, especially the walkways and steps, free of foreign materials. Loose items such as lunch boxes and tools must be secured. The operator compartment must be kept clean.

Keep windows clean for good visibility.

Know hand signals and who is to give them. Accept signals from only one person with the exception of the STOP signal, which must be accepted from anyone.

Never put maintenance fluids in glass containers. Only properly labelled and approved containers should be used.

Pressurized air can cause personal injury. When using pressurized air for cleaning, wear a protective face shield and protective clothing.

Approved ANSI Z89 standard hard hats, ANSI Z87 standard safety glasses with permanent side shields and approved hearing protection.

Protective boots or shoes should be worn at all times. OSHA says

protective footwear must comply with the ASTM standards F2412-05 and F2413-05 (*American Society for Testing and Materials*). Formerly was ANSI Z41, *American National Standard Institute* standard for Personal Protection - Protective Footwear). A hazard assessment should be made to determine the correct level of footwear safety protection.



### Recommended Safety Apparel

A	ANSI Z89 Hard Hat
B	Hearing protection
C	ANSI Z87 Safety Glasses w/ Side Shields
D	One-piece Protective Suit
E	Protective Handwear
F	Protective Footwear



### Crushing and Cutting Prevention

Unless otherwise specified, never make adjustments while the machine is moving, the blower is engaged or the engine is running.



Equipment and components and attachments should be properly supported when working beneath them.

Any attachment can fall if a control is moved, or if a hydraulic line fails.

Everyone must be clear of the unit before any engine is started.

Stay clear of all rotating and moving parts.

Be aware of pinch points. Where there are attachment linkages or articulating equipment, the clearance in the linkage area will increase or decrease with movement of the attachment or articulation. Never be on the rear door platform while the rear door is being operated.

Keep objects away from moving fan blades. Tools or other objects which fall into moving blades might be thrown out, possibly causing injury to you or anyone nearby. All fans should be properly guarded.

Never use kinked or broken wire rope cable. Always wear gloves when handling any wire rope cable.

Striking retaining pins with force can cause them to fly out and injure you or persons nearby. Always wear protective glasses when striking a retainer pin, chisel or drift pin. Pieces of metal could fly off possibly causing an eye injury or enter your body causing internal injury.

Stay clear of turning drive-lines, belts or chains. All such components are clearly marked with decals on your units. If the decals are damaged, peeling or missing, replace them.

No modifications should be made without contacting the manufacturer. Contact factory service before making any modifications to ensure that such changes do not compromise the safety or void the warranty of the equipment.

### Burn Prevention

Engine coolant is hot and under pressure at operating temperature. The radiator and all lines to heaters or the engine contain hot water or steam and any contact could cause severe burns.

Check coolant level before heating occurs, and if necessary, only after the engine has been stopped and the filler cap is cool enough to remove with your bare hand. Remove filler cap slowly to relieve

pressure.

Cooling system conditioner contains alkali that can cause personal injury. Avoid contact with the skin and eyes.

Allow cooling system components to cool before draining. Do not allow hot oil or components to contact skin as they can cause personal injury.

At operating temperature the oil in the hydraulic tank is hot and can be under pressure. Remove the filler cap only after the engine has been stopped and the filler cap is cool enough to remove with your bare hand. Remove slowly to relieve pressure.

Relieve all pressure in air, oil, fuel or cooling systems before any lines, fittings or related items are disconnected or removed.

Battery electrolyte contains acid that can cause injury. Avoid contact with skin and eyes.

### Fire and Explosion Prevention

All fuels, most lubricants and some coolant mixtures are flammable. Never smoking in fueling and lubricating areas or where batteries are charged, or where other flammable materials are stored.



Batteries in series may be located in separate compartments.

When using jumper cables, always connect positive (+) cable to positive terminal of battery connected to starter solenoid and negative (-) cable from external source to starter negative terminal. (Connect to the block if there is no starter negative terminal.) Always wear eye protection when working with batteries.

Battery electrolyte contains acid that could produce an explosion and possibly cause injury.

Clean and tighten all electrical connections. Check for frayed or loose electrical wires daily and have them repaired or tightened if needed.

Keep all fuels and lubricants stored in properly marked containers and away from unauthorized personnel. Store oily rags and other flammable material in a protective container. Ether is flammable. Never smoke when using ether and use only in well ventilated areas.

A suitable working fire extinguisher must be with the unit at all times.



### Lines, Tubes And Hoses

Never bend or strike high-pressure lines.

Report loose or damaged fuel or oil lines, tubes or hoses to mechanics so repairs can be made. Leaks can cause fires.

Replace if any of the following exist:

1. Damaged, displaced or leaking end fittings.
2. Outer hose covering rubbed through or cut and wire reinforcement exposed.
3. Outer hose covering ballooning.
4. Flexible part of the hose kinked or crushed.
5. Armoring embedded in the outer hose cover.

Make sure that all clamps, guards and heat shields are installed correctly to prevent vibration, rubbing against other parts and excessive heat during operation.

Stay clear of the vacuum hose openings. The suction is high enough to suck in a limb and cause serious bodily injury.

Never use a bare open hose end for vacuuming. A variety of hose end attachments are available to keep the operator clear of the hose opening.

Never try to open any hatches or doors while the unit is still pressurized, doors could fly open and cause injury or death. Release pressure before attempting to open any door or hatch. Merely shutting off the pressurizing pump or the power source, does not relieve the pressure, it has to be released manually.

### High Voltage Electrical Hazards

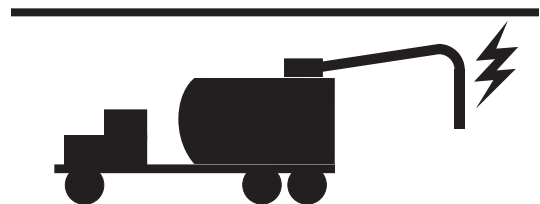
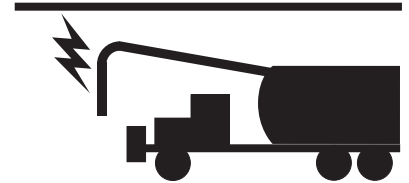
A potential electrical shock hazard exists with the operation of mobile equipment near high voltage power lines. Follow all OSHA and site rules and regulations.

Equipment includes radio antennas, crane booms and masts, and load heights.



Never dump under power lines. End dumps with raised beds will violate the 10' rule. Dump the load to the side and let a dozer push it into place.

Contact the local electrical utilities for identification of the power rating and proper procedures for working near the lines.



### High Voltage Power Line

Exceptions are permitted for travel under or work near a power line only if:

- (1) The electrical department is notified for a qualified electrical person to de-energize the power line and implement their Tag-Lock-Try procedures. Or,
- (2) An electrician properly grounds the mobile equipment.

### High Voltage Trailing Cables

Electrical equipment near mining pits is supplied power by trailing cables. In most cases the cables run along the service roads. If a trailing cable blocks your desired route, go back to the main road and find another route to your destination.

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).

### NOTICE

Reference to OSHA regulations are for informational purposes only and not intended as legal advice.

#### OVERHEAD POWER LINE TIPS FOR CONSTRUCTION WORKERS

##### BEFORE YOU BEGIN CONSTRUCTION WORK

- Survey the site for overhead power lines. **LOOK UP!**
- **BEST SAFETY PRACTICE: NEVER GET CLOSER THAN 10 FEET TO 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.
- In construction work, an overhead power line safety component should be part of your employer's overall safety and health program and safety training.
- If overhead lines are present, call the utility company and find out what voltage is on the lines. Ask if the utility company can shut off the lines while you are working near them.
- If overhead lines cannot be shut down, ask the utility company if they can install insulation over the lines during the time you will be working near them.

##### WORKING WITH TOOLS & EQUIPMENT

- If the lines cannot be shut down and/or insulation applied, a minimum safe distance of 10 feet must be established. Have a brief job site meeting to discuss the planned work as it relates to the power lines. Discuss topics such as the use of long-handled tools, and equipment (raised dump trucks, back hoes, etc.) that could come in contact with the lines. Consider the need for a designated person to monitor activities around the lines.
- Only use nonconductive ladders when working on or near overhead power lines.
- Employees shall not be permitted to approach or carry any conductive object closer than 10 feet to an energized line. The only exception is for trained and qualified employees using insulated tools designed for high voltage lines.

(OVER)

Occupational Safety and Health Administration  
Region VII  
(5/99)

#### OVERHEAD POWER LINE TIPS FOR CONSTRUCTION WORKERS

##### CRANES/EQUIPMENT

- If using a crane/equipment near lines rated at 50,000 volts (50 kv) or less, minimum distance between the energized lines and any part of the crane (boom, load line, etc.) shall be at least 10 feet.
- If using a crane/equipment near energized lines rated at 50,000 volts (50 kv) or more, minimum distance between the energized lines and any part of the crane shall be at least 10 feet plus 0.4 inch for each 1,000 volts over 50,000 volts.
- Where it is difficult for the operator to maintain the desired clearance by visible means, an employee shall be designated to observe the distance between the crane/equipment and the line so as to give timely warning to the operator. This should be the **ONLY** job the monitor is performing when this hazardous condition is present.

##### FOR FURTHER INFORMATION

- The safety tips on this card are not intended to be all-inclusive; they are simply a starting point to help prevent electrocutions from overhead power lines.
- For further information, please refer to the Code of Federal Regulations (CFR), Part 1926. You may also contact your local OSHA Area Office at:

##### Kansas Toll-Free

1-800-362-2896 (KS only)

##### Nebraska Toll-Free

1-800-642-8963 (NE only)

##### Western Missouri Toll-Free

1-800-892-2674 (MO only)

##### Eastern Missouri Toll-Free

1-800-392-7743 (MO only)

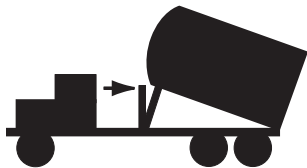
Occupational Safety and Health Administration  
(OSHA)  
Region VII  
(5/99)



Several safety systems featured in the units. They are in place for the safety and protection of the operator. These systems are to be used when needed.

### Body Support

When any maintenance is performed that requires working under a raised body (for however short a duration), the raised EMPTY body should be supported by the safety stand. The safety stand is not a lifting device and must be used in conjunction with the hoist cylinder. Never raise a loaded body unless you intend emptying it. Never support a loaded body with the safety stand. Never remove a hoist cylinder, leaving it supported by the safety stand. To use the safety stand, a) Raise EMPTY body high enough to clear the safety stand in its support position. b) Raise the safety stand. c) Slowly lower the body so that the safety stand rests in the receptacle for it under the body.



### Rear Door Support

Always use the rear door support working inside a body or on or near an open rear door. Your unit has either a safety pin or a safety prop.



Remove and store the safety prop before closing the rear door. Closing the rear door with the prop still in place can cause extensive damage to the rear door.

### Drive-line guard

If a removable drive-line guard is provided to cover the upper drive-line from the transfer case to the blower it is to remain in place unless it is necessary to service the drive-line. If a latched, hinged door, is provided for easy access to the drive-line for greasing it must be closed and latched when the blower is running.



### Safety Decals

Safety caution and warning decals are located at various points, which require attention while in the close proximity of the unit. These should be noted and heeded for safety. Never by-pass any safety device.

### Prevent battery explosions

Batteries can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level



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

Always remove the grounded (-) battery cable first and replace it last.

Never charge a frozen battery; it may explode. Warm the battery to 60° F (16° C).

### Vacuum and pressure relief valves

All units have safety relief valves, some operate automatically under various conditions and some are operated manually. These are provided for personnel safety and safety of the equipment. Keep all relief valves in good working condition.



Relieve all system pressures before service work.

A variety of air and hydraulic actuated butterfly, knife gate and other style valves from a number of different manufacturers are used. A butterfly valve, shown at right, rotates a disc in the material flow to open and closed positions (shown in closed position). A knife gate valve pushes or pulls a sliding gate in the material flow to open and closed positions. When the gate is retracted the valve is open and material can flow.

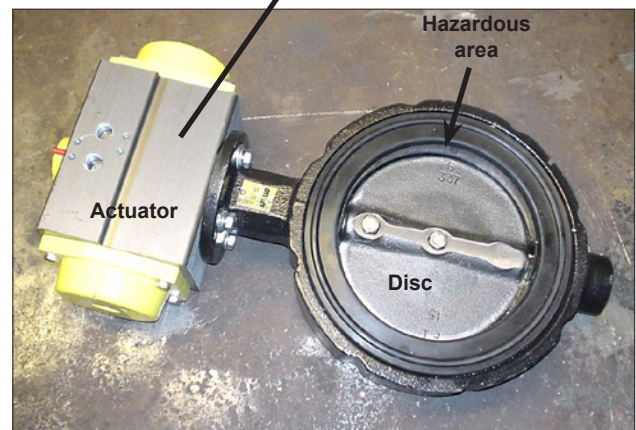
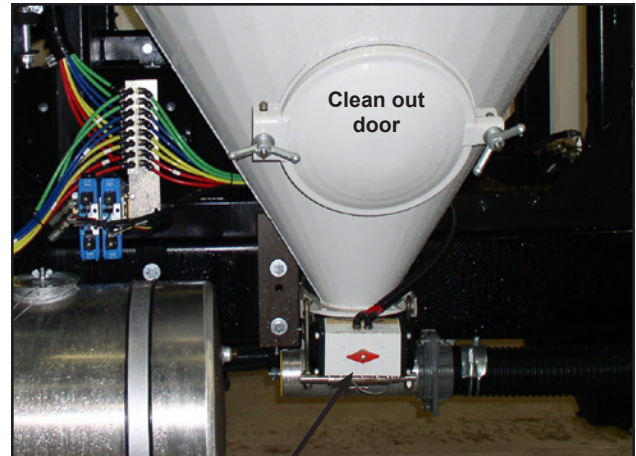
The valves are normally actuated by switches or automatically by the system controls. During servicing or use an inadvertent actuation could result in an injury from the moving parts. For example the butterfly valve at the cone bottom, shown at right, may automatically actuate while someone is unplugging the cone through the clean out door. The valves can still remain active when not installed unless the air or hydraulic lines are disconnected and all safety precautions followed.



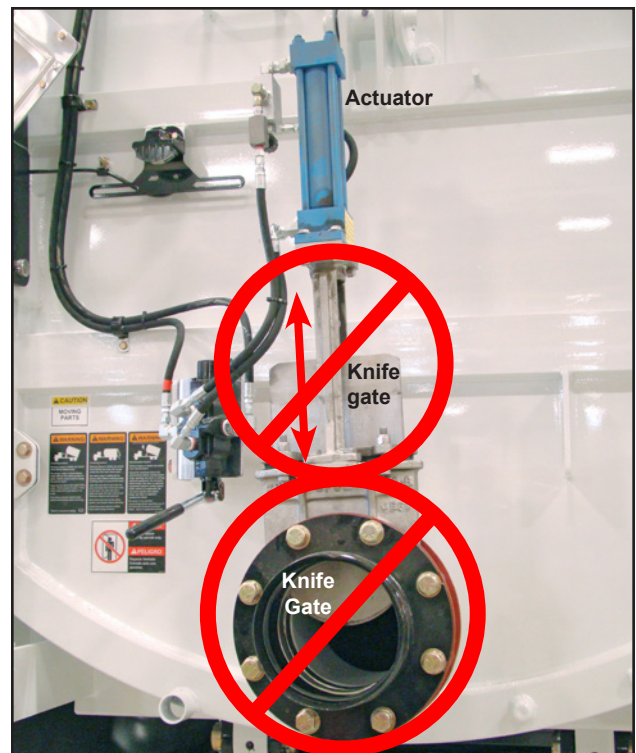
Knife gate valves have external pinch points during operation as the gate is moving. Additionally, inside the material flow path the gate acts as a guillotine when closing.

Never allow tools, arm, hands etc. in the gate or butterfly areas as serious injury may occur. Shut down all systems and de-energize or disconnect the air or hydraulic system to the valve before servicing.

Knife gate valve



Butterfly Valve



### **WARNING**

#### **Crushing / Tipping Hazard**

To avoid injury or death:

- **Position unit on level stable ground.**
- **Open rear door before dumping.**
- **NEVER move the unit with the debris body in the up or raised position.**



#### **Starting The Truck Engine**

Never Start the truck engine with the accelerator pedal depressed; always start the engine at low idling speed. These trucks have no oil at the center bearing for a short period of time and starting at high idle could cause bearing failure.

- Be sure that the warning lights for low engine oil pressure and battery charge go off.
- Check to make sure all gauges come up into operating range as truck engine warms up.
- Let the air pressure build up to its maximum, usually 120 psi.

#### **Remember**

**Never crank the engine more than 30 seconds. Allow the starter to cool for 2 minutes between attempts. Excessive starting fluid use will burn pistons and lock up engines. Use only small amounts of starting fluid when absolutely necessary and you are directed to do so by a supervisor.**

#### **Before moving the truck**

1. Adjust mirrors
2. Clean windows
3. Check for low hanging electric or telephone wires and power cables on the ground.
4. Recheck gauges and warning lights
5. A visual check and warning honk of horn should be performed before moving to ensure safety of people on the ground, and other equipment in use in the area. Operator should have sight of all work area ground personnel before moving. A spotter should be normally used to assist the driver backing up.
6. NEVER release the parking brake until the air pressure comes up to operating range on the two brake system gauges and the (Red) warning lights go off.
7. Select a gear position
8. Operate the truck at low RPM, until proper temperature is reached on the gauges.

#### **Pedestrian Safety**

Conduct a visual check and warning (honk of horn) before moving the truck to ensure the safety of people on the ground, and other equipment in the area.

Be aware of surveyors, supervisors, laborers, etc., who are working on the ground.

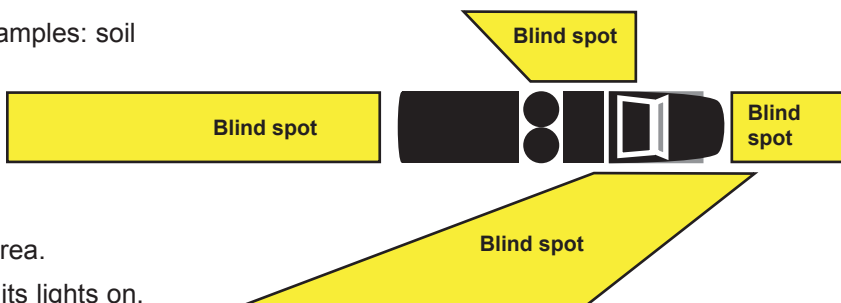
To avoid tipping hazards while dumping, park on firm and level ground and open the rear door before raising the body so that the unit does not become top heavy. Clear the area of all pedestrians and equipment before raising the body. Raise the body in steps, allowing material to dump out in a steady flow.

### Proper operation

Besides being knowledgeable of the truck's controls, the operator must always be alert when traveling at high speeds, steering and dumping. Remember this truck is very heavy and will not stop in a short distance. Tipping can occur because of improper steering or dumping.

Below are some important operational techniques.

- Task train all employees before allowing them to operate the equipment.
- Equipment cabs must be kept neat and clean, free of loose objects and trash.
- Equipment operators must obey all traffic safety regulations and operate equipment at a safe speed according to the various road and field conditions.
- Operators must assess the field conditions and recognize the capability of the equipment and determine the safest, most efficient operating manner.
- Apply parking brake before operating unit and use wheel chocks.
- Before starting the operation of equipment, be aware of existing work conditions:
  1. Where fellow employees are located.
  2. Degree of slopes
  3. Field and road conditions (examples: soil stability, slick, muddy, or dusty)
  4. Sump holes in work areas
  5. Traffic patterns of your equipment as well as other equipment working in the area.
- Always operate the equipment with its lights on.
- Never drive over power trailing cables. Follow the requirements for operating near electrical power lines. (Example: raising dump bed near overhead power cables.)
- Never operate equipment under the influence of alcohol or illegal drugs. If you are taking prescription drugs, know the side effects.
- When stopping, feather the brake pedal to keep from having brakes fade because of heat.
- If a dashboard warning light comes on, stop and determine the cause. Operating a truck with a warning light on can compromise the safe operation of the truck.
- Maintain a safe distance (approximately four truck lengths) between all vehicles and/or equipment to insure a safe stop in the event of an emergency. Distance should be increased when road becomes wet (braking distance lengthens).
- Dusty conditions
  1. When following another truck, remain far enough back so you have enough time to react to an adverse condition.
  2. In the loading area, when the excavator creates a dusty condition, stay back until it is your turn to get loaded to keep from drawing dust into the engine air system. Be sure you are aware of other operators' locations.
  3. Contact your supervisor about dust control.
- Making a sharp turn too fast can result in a tip over. Always use caution when making turns.
- Use an observer for blind spots when maneuvering the unit.



### **! WARNING**

#### Collision Avoidance

**To avoid serious injury or death wear a safety vest with the appropriate safety symbols when working on job sites in traffic areas. Many accidents occur due to inattentive drivers and collision with cars and trucks.**



An injury caused by vacuum can be serious. The vacuum action must be stopped as quickly as possible. Seconds matter when the body is subjected to the forces of vacuum. The inline vacuum relief valve must always be used when operating near end of the hose or pipe. In the event of any vacuum injury:

- Seek medical attention immediately. Never delay!
- Tell the physician of the cause of the injury.
- Tell the physician what type of material was being vacuumed at the time of the accident as material may have entered the wound.

Vacuum hazards to avoid when operating include:

- Rupture - keep vacuum tools and hoses away from face and body. Concentrated vacuum on the body, such as through a hose end in full contact can result in evisceration of organs or the avulsion of limbs. Serious injury or death will result from vacuum.
- Suffocation - keep vacuum tools and hoses away from face and body. Serious injury or death will result from vacuum suffocation.
- Crushing and cutting - never attach hose, pipe or accessories with the vacuum on. Forces from the vacuum can trap fingers, hands and feet in the joint with enough force or impact to crush and cut. Material flow in system will increase the severity of the injury by physical damage and contamination of the wound.



### Vacuum Hazard

**NEVER** operate the vacuum system without the Vacuum Relief Valve being installed. Failure to install and operate the Vacuum Relief Valve properly may result in serious injury and / or death.

**The INLINE VACUUM RELIEF VALVE must be INLINE within 50 feet from the end of the hose or pipe for proper operation.**



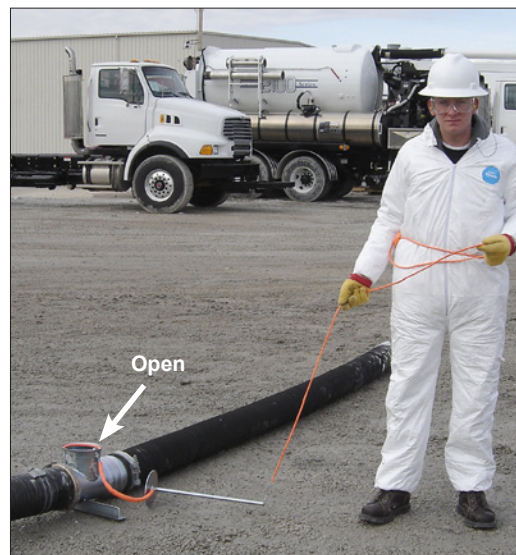
Place the IN-LINE VACUUM RELIEF VALVE (also referred to as a safety Tee) as close as possible to the working end of the vacuum hose whenever the hose is manipulated by hand. Use the appropriate size Tee for the size hose or pipe being used.

The vacuum relief valve is designed to open the vacuum hose in the case of an emergency. When opened, it creates an immediate vacuum loss at the end of the vacuum hose. It is simple to operate but does require proper installation and testing in order to be effective in the system.

**⚠ The in-line vacuum relief valve must be tested before each use. Shut down the vacuum system when assembling or moving the piping system.**

### Installation Instructions

1. Install the valve on level ground between two sections of hard pipe or vacuum hose close to the vacuum nozzle. Be sure to use the proper size Tee for the hose or have the proper adapters if the pipe being used is different than the Tee size.
2. Connect the lanyard to the operator's person. This can be attached to the operator's wrist or to a belt loop. Never place lanyard on the ground or tied to the pipe.
3. Adjust the lanyard to a proper length to allow freedom of movement but still allow for easy tripping of the relief valve.



### Testing Instructions

1. Install the vacuum relief valve as described above
2. Start the vacuum truck and engage the blower. Be sure to follow the proper engagement instructions for the particular unit being used.
3. With the vacuum hoses in place, and the vacuum relief valve installed, adjust the engine speed to a mid range RPM.
4. Allow the nozzle inlet to become attached to a solid surface such as the ground, asphalt or cement.
5. Pull the lanyard to verify that the top plug of the valve will unseat.
6. Once you have verified that the valve will unseat properly, shut the vacuum system down and reset the vacuum relief valve. Now you are ready to go to work.

**⚠ DANGER**

### Vacuum Hazard

**NEVER operate the vacuum system without the Vacuum Relief Valve being installed. Failure to install and operate the Vacuum Relief Valve properly may result in serious injury and / or death.**

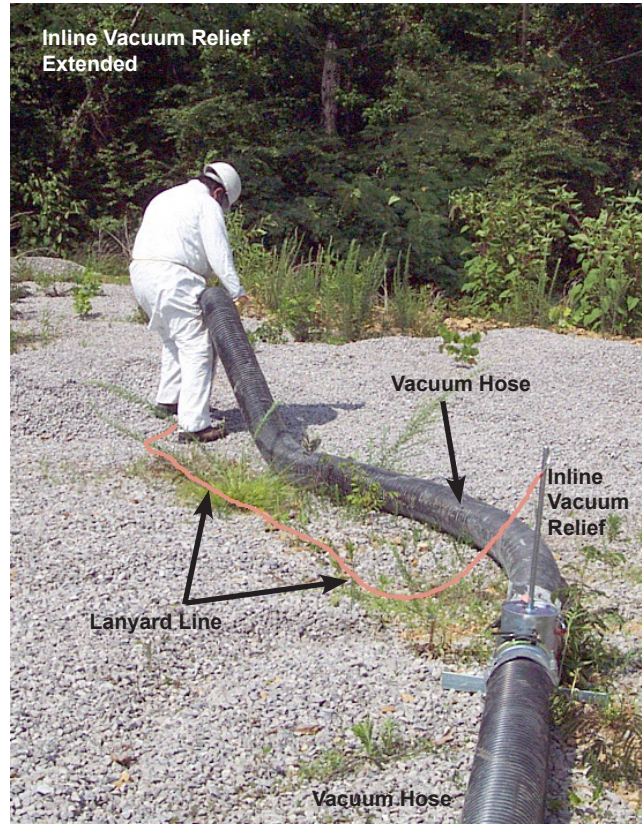
**The INLINE VACUUM RELIEF VALVE must be INLINE within 50 feet from the end of the hose or pipe for proper operation.**

### Operating Instructions

Never use a bare open hose end for vacuuming. A variety of hose end attachments are available to keep the operator clear of the hose opening.

- Perform all operations with at least two operators.
- Install and test the inline vacuum relief valve as previously described.
- Should a problem arise with the suction end of the hose, such as a foreign object blocking the end of the hose, give a quick jerk of the lanyard. This will pull the top plug from its seat, which will relieve the vacuum at the end of the hose or nozzle.
- Clear the obstruction from the end of the hose or nozzle.
- Turn off the vacuum system and verify that all objects and personnel are clear before resetting the vacuum relief valve and turning on the vacuum system.
- Once you are certain that the hose or nozzle is clear reset the vacuum relief valve top plug and engage the blower and return to work.

The pendant is a remote control device used for activating the vacuum release valve. It is also used to control booms and other options installed on the unit. Optional wireless pendants are also available.



Pendant  
(Varies with options)



### DANGER

#### Vacuum Hazard

**NEVER** operate the vacuum system without the Vacuum Relief Valve being installed. Failure to install and operate the Vacuum Relief Valve properly may result in serious injury and / or death.

The **INLINE VACUUM RELIEF VALVE** must be **INLINE** within 50 feet from the end of the hose or pipe for proper operation.

### SAFETY INSTRUCTIONS

Unit operator must hold the pendant/remote during vacuum operations and stay within line of sight of the hose end operation. In an emergency, use the pendant/remote to disable the vacuum. Maintain clear access to all E-stops and place an operator near one.

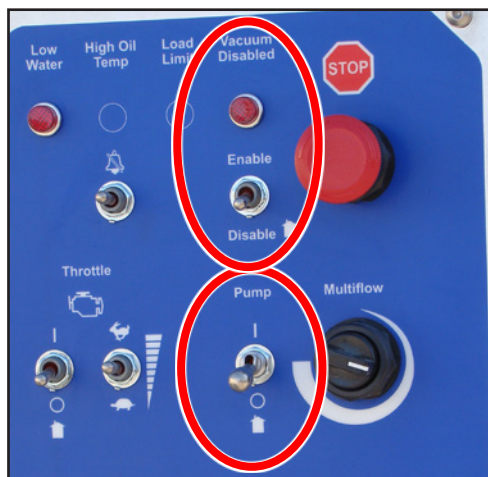


# Vactor • Guzzler

## EMERGENCY SHUTDOWN

## SAFETY

Refer to the Operations section of the manual for specific details on the unit. This material is intended as an overall guide for Vactor / Guzzler trucks in general.



### SAFETY INSTRUCTIONS

**In an EMERGENCY the VACUUM and WATER must be stopped**

**Activate the E-Stop** 

**To shut down the system:**

- Stop vacuuming.
- Enable vacuum relief valves.
- Reduce engine/blower/fan RPM.
- If required, shut down the engine.

### Vactor unit emergency stop procedures

Know the procedures for shutting down the various components and options available on the unit. During rodding operations, placing the RODDER PUMP switch in the OFF position can immediately stop propulsion of a nozzle. As a safety feature, the switch must be pulled forward and forced up to engage the rodder pump. This feature prevents accidental engagement of the pump. However, the switch can be placed in the OFF position by simply pushing down on the toggle lever. In an emergency, slap or place the switch in the OFF position, the rodder pump will stop immediately.

The VACUUM RELIEF switch can be used to vent the vacuum system and immediately stop airflow at the end of the vacuum tube. Place the switch in the



ON position to stop airflow and in the OFF position to resume air flow. Some units are equipped with an emergency stop switch that will open the vacuum relief and lower the engine to idle. Actual functions will vary with the model.

Get to know the throttle controls associated with the vehicle! In many situations, disengaging the throttle may prevent an accident or damage to the vehicle. Study this manual for information related to equipment operation and safety procedures.

### Guzzler unit emergency stop procedures

Know the procedures for shutting down the various components and options available on the unit.

The VACUUM RELIEF switch can be used to vent the vacuum system and immediately stop airflow at the end of the vacuum hose. Some units are equipped with an emergency stop switch that will open the vacuum relief and lower the engine to idle. Actual functions will vary with the model.

Get to know the throttle controls associated with the vehicle! In many situations, disengaging the throttle may prevent an accident or damage to the vehicle. Study this manual for information related to equipment operation and safety procedures.

The in-line vacuum relief valve is the primary safety to relieve vacuum at the hose end and must be used in all operations (see Vacuum Relief Valve in this section).

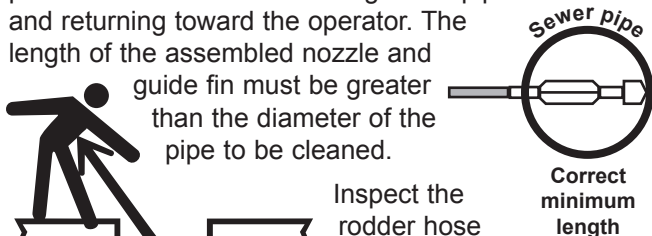


# Vactor • Guzzler

## HIGH PRESSURE WATER

## SAFETY

When setting up for rodding operations use the appropriate guide fin and hose guard (tiger tail) to prevent the nozzle from turning in the pipe and returning toward the operator. The length of the assembled nozzle and guide fin must be greater than the diameter of the pipe to be cleaned.



Inspect the rodder hose often for indications of damage or wear. Check the hose before each use for movement in hose fittings, exposed hose reinforcement, kinking or collapsing, blisters or bubbles and fittings that are improperly installed or cutting into the hose.



When splicing hoses read the maintenance section of the manual for instructions on hose repair. All hose manufacturers have instituted a color code system for identification of the hose, fittings and tools. When repairing a rodder hose the inside color of the hose, the color of the fitting

and the die colors must match. Fittings from one manufacturer will not properly crimp onto hose from another manufacturer. The outside color of rodder hose indicates the pressure rating of the hose and



must match during splicing operations. Be aware of the operating pressures associated with the vehicle and the proper hose specifications for safe operation. Waste Equipment Technology Association publishes a variety of industry related recommended practice guides. It is recommended that owners and operators obtain *Specification and repair/inspection procedures for high-pressure hose used in connection with sewer/catch basin cleaning equipment*.

### Waste Equipment Technology Association

4301 Connecticut Avenue, NW  
Suite 300

Washington, DC 20008-2304

(Phone) (202) 244-4700

(Fax) (202) 966-4824

(E-mail) [wastecinfo@WASTEC.org](mailto:wastecinfo@WASTEC.org)

(Web) <http://www.wastec.org>

### ⚠ WARNING

Out of control hose can cause severe injury or death.

The rodder hose creates tremendous pressure and must not be fitted with a reducer or hand held nozzle, or operated outside of the sewer pipe. The back pressure created by such action will cause loss of control and violent movement of the hose and fittings, and the release of high pressure water.

Never use improper fittings or use out of sewer pipe. Refer to manual for details.



### ⚠ WARNING

High pressure water

High pressure water can cause serious injury or death.

The handgun operates under high pressure. Never point the handgun at another individual. Severe injury can result from the high-pressure water.

Special safety equipment is required when operating the high-pressure handgun. Always wear safety toe shoes or boots (waterproof shoes or boots preferred), coveralls, face shield and safety goggles and gloves (waterproof gloves preferred).



### **WARNING**

#### Sewer gas hazard.

Sewer lines often contain poisonous or explosive gas such as methane. **NEVER** enter or bend over a sewer without proper ventilation and personal protective equipment. If another person needs help in a sewer, immediately call for emergency assistance. **NEVER** enter the sewer to help unless you have been trained to do so and have proper personal protective equipment.

**NEVER** smoke in or around sewer lines, drains, or catch basins.

Failure to follow these instructions may result in death or serious injury.



### **WARNING**

#### Chemical waste hazard

Many chemicals are illegally dumped in storm drains, catch basins and sewers. To prevent contamination and injury wear chemical resistant gloves, long sleeves, trousers and safety glasses or face shields. Seek immediate medical attention if exposure or contamination is suspected.



#### Observe environmental protection regulations

Be mindful of the environment and ecology.

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

Observe the relevant environmental protection regulations when disposing of oil, fuel, coolant, brake fluid, filters, and batteries.



### **WARNING**

#### Biological hazards

Germs and other biological hazards are common in sewers. Use goggles, face shield, gloves, long sleeves and long pants to prevent injury and contamination. Immediately treat all abrasions, cuts and nicks for contamination. Get medical attention for injuries associated with cleaning sewers, drains and catch basins if biological contamination is suspected. Serious illness may result if this procedure is not followed.



### **WARNING**

#### Trip, fall and other hazards

Open manholes and other access openings create risks of trips and falls. Be aware of such locations and do not step in or over them. Ensure that manhole cover and other covers are in place when job is completed. Failing to follow these precautions may cause serious injury or death.

Be aware of traffic and pedestrians on the job site. Use extreme caution while moving around the vehicle to avoid contact with moving vehicles. When moving the boom or vehicle make sure pedestrians are clear of the area. Use orange safety cones to mark the work area.



The glycol recovery vehicle is designed for vacuuming glycol deicing fluid after it has been used on airplanes. Special air separators are located at the top of a holding tank to separate the glycol from the air stream. The Environmental Protection Agency (EPA) and the Federal Aviation Administration (FAA) regulate the use and recovery of deicing fluids. All glycol recovery vehicle operators must follow site regulations for the safe handling and transportation of deicing fluids.

Additional information on deicing fluids can be obtained from the manufacturer. Hazards from deicing fluids can include eye irritation and serious illness or death from ingestion. Prolonged breathing of fluid vapors is also harmful, and fumes may also be flammable. Consult the manufacturers Material Safety Data Sheet for more specific information.

For additional information refer to:

EPA at: [www.epa.gov](http://www.epa.gov)

FAA at: [www.faa.gov](http://www.faa.gov)

The owner, operator and user are responsible for determining if static grounding is required and what level of protection is required for the specific job. Due to the possibility of static electricity build up in the system we recommend grounding the unit in all applications.

Additional copies available from API Publications and Distribution:  
(202) 682-8375

Information about API Publications, Programs and Services is available on the World Wide Web at: <http://www.api.org>

### Safe Operation of Vacuum Trucks in Petroleum Service

API RECOMMENDED PRACTICE 2219  
THIRD EDITION, NOVEMBER 2005



**American Petroleum Institute**

1220 L Street, Northwest  
Washington, D.C. 20005-4070  
202-682-8000



Typical static grounding reel



The American Petroleum Institute provides additional resources and programs to industry which are based on API Standards. For more information, contact:

- |   |                                       |
|---|---------------------------------------|
| • Training/Workshops                              | Ph: 202-682-8490<br>Fax: 202-682-8222 |
| • Inspector Certification Programs                | Ph: 202-682-8161<br>Fax: 202-962-4739 |
| • American Petroleum Institute Quality Registrar  | Ph: 202-682-8130<br>Fax: 202-682-8070 |
| • Monogram Program                                | Ph: 202-962-4791<br>Fax: 202-682-8070 |
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| • Petroleum Test Laboratory Accreditation Program | Ph: 202-682-8129<br>Fax: 202-682-8070 |

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Done Right.™

### Available from the WJTA-IMCA:

*Recommended Practices for the Use of Industrial Vacuum Equipment.* Familiarize yourself with the Recommended Practices, particularly Section 2.0 Accidents & Section 5.5 Grounding/Bonding.

In addition, NFPA 77 Recommended Practice on Static Electricity provides more detailed grounding methods. This can be obtained from the National Fire Protection Association at [www.NFPA.org](http://www.NFPA.org) (800-344-3555).

These three references are recommended to help in making good decisions in the proper use of vacuum truck technology. Other references are also available.

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3 Park Avenue  
New York, New York 10016-5901

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### Avoiding Static Ignition Hazards in Chemical Operations

A CCPS CONCEPT BOOK

LAURENCE G. BRITTON



AMERICAN INSTITUTE OF  
CHEMICAL ENGINEERS



CENTER FOR CHEMICAL PROCESS SAFETY  
of the

American Institute of Chemical Engineers  
3 Park Avenue, New York, New York 10016-5901 USA

Materials that are, or could produce, combustible dusts must be handled in such a way as to prevent combustible dust explosions and deflagrations (fires).

Combustible dusts consist of the following dust types as per NFPA 70: National Electrical Code 2014 Edition

- Group E - Metallic Dusts
- Group F - Carbonaceous Dusts
- Group G - Organic Dusts

It is the responsibility of the owner to insure that all of the following steps are taken before using any air mover unit on combustible dust materials.

1. All employees involved in handling combustible dusts must be trained as to the combustible dust hazards as part of their HAZCOM training. See: OSHA 3371-08 2009 - Hazard Communication Guidance for Combustible Dusts
2. Consult the SDS(s) of the material(s) for the recommended Safe Handling Procedures and Fire and Explosion potentials.
3. Dry materials and low relative humidity increase the dangers of handling combustible dusts.
4. Never dry sweep or *Blow Down* the dusts with compressed air to form piles for easier vacuum removal. Both of these methods can create conditions for a dust explosion to occur.
5. Position the air mover so that the top baghouse doors, which are the emergency relief vent in the event of an explosion, do not create a greater hazard should an explosion occur within the unit. Keep all personnel clear of the baghouse and cyclone clean out doors which may also vent should an explosion occur.
6. The air mover itself contains many possible exterior ignition sources (electrical and heat). Never operate the unit in an area containing airborne combustible dust.
7. Insure the grounding reel on the unit is properly mounted, bare metal bottom of the grounding reel to bare metal mounting surface on either the frame or bed of the unit, and that the grounding reel and clamp are in good condition.
8. Ground the unit to an approved grounding point or grounding rod. If using a grounding rod, it must be designed for grounding and driven firmly into the soil, 4 - 6 feet. The grounding point should be wire brushed to remove oxidation or other materials that might prevent the free flow of electricity.
9. For rear loading air movers, a rubber baffle placed over the diverter plate is strongly recommended to prevent any potential metal to metal contact during vacuuming. This is essential when vacuuming metal combustible dusts.
10. All components of the vacuum line must be bondable. This includes: nozzle, hoses, pipes, fittings, safety tee, trunk hose.
11. Never use any non-conductive materials in any part of the vacuum line (PVC Pipe or Plastic Hose).
12. Never use bare copper wire inside or outside of the vacuum line as a jumper across non-conductive components.
13. Rubber hoses must include a continuous wire helical stiffener. The wire should be stripped 4-6" on each end of the hose, the bared wire pushed into the hose opening and then the metal hose shanks pressed in to the hoses and clamped together.
14. All bonds and grounds must be tested with a suitable Ohm meter to prove the bond and or ground. There should be zero Ohms of resistance across a valid bond/ground.
15. Always use maximum air flow to the unit to prevent overheating of the blower. Restricting the air flow could cause the blower to become an ignition source for dusts. Use multiple smaller hoses if a larger hose is not practical.
16. Run the unit at the lowest RPM that moves the material. Excess RPM's create excess heat in the blower.
17. If the unit begins to blow dust from the discharge silencer, immediately shut the unit down, disconnect the vacuum line, repair any broken or unseated bags in the bag house, rinse any dust out of the silencer, clean or purge any dust remaining in the unit between the top of the bag house and the blower and finally reconnect the vacuum line and resume work. Failure to do so could result in a dust explosion.
18. Upon completion of the job, insure the air mover has been cleaned of any combustible dust residue.



Vactor/Guzzler could not possibly, know, evaluate, and advise the service trade of all conceivable ways in which operation or service might be done or the possible hazardous consequences of each way. Anyone who uses operational procedures, service procedures, or tools, whether recommended by Vactor/Guzzler or not, must first satisfy himself thoroughly that neither his safety nor the product safety will be jeopardized by the methods he shall select.

Vactor/Guzzler vacuum systems are designed to user specifications. The owner/operator/user is responsible for the safe use and application of this equipment and proper waste disposal. Transportation and disposal of waste may be subject to local, state or federal laws.

There is an increased risk of fire and/or explosion from combustible dust. The following section provides resources will assist in solving those issues.

### General Information

FM Global, "Prevention and Mitigation of Combustible Dust Explosions and Fire", Data Sheet No. 7-76, January 2005.

Eckhoff, Rolf K. "Dust Explosions in the Process Industries," 3rd Edition, Gulf Professional Publishing, 2003.

Bartknecht, W. "Dust Explosions: Course, Prevention, and Protection," Springer- Verlag, 1989.

Hatwig, M., and Steen, H. (eds.), "Handbook of Explosion Prevention and Protection," Wiley-VCH, 2004.

Frank, Walter. "Dust Explosion Prevention and the Critical Importance of Housekeeping," Process Safety Progress, vol. 23, no. 3, September 2004, pp. 175-184.

Amyotte, P., Kahn, F., and Dastidar, A. "Reduce Dust Explosions the Inherently Safer Way," Chemical Engineering Progress, vol. 99, no. 10, October 2003, pp. 36-43.

Ebidat, Vahid. "Is Your Dust Collection System an Explosion Hazard?" Chemical Engineering Progress, vol. 99, no. 10, October 2003, pp. 44-49.

Center for Chemical Process Safety (CCPS). "Guidelines for Safe Handling of Powders and Bulk Solids." CCPS, American Institute for Chemical Process Safety, New York, New York, January 2005.

### Code of Federal Regulations (CFR) [Standards]

U.S. Government Printing Office  
732 N. Capitol Street, NW Washington, DC 20401  
Telephone: 1-866-512-1800 (toll-free)  
OSHA Standards, Interpretations, and Publications  
U.S. Department of Labor/OSHA OSHA Publications Office  
200 Constitution Ave., NW, N-3101  
Washington, DC 20210  
Telephone: (202) 693-1888  
or by Fax: (202) 693-2498

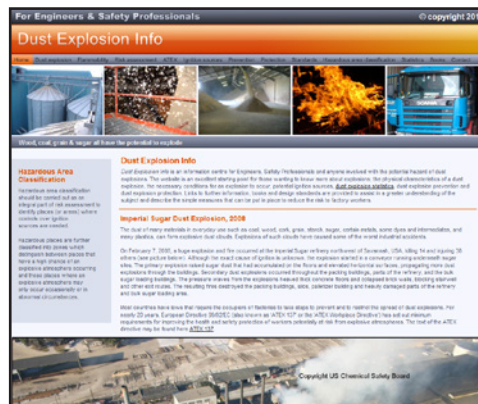
### Related OSHA standards found in 29 CFR:

1910.22 - General Requirements: Housekeeping

1910.94 - Ventilation

1910.107 - Spray Finishing Using Flammable and Combustible Materials

<http://www.dustexplosion.info/>



An online refresher course, OSHA's Combustible Dust National Compliance Directive, is available through Federal Signal. The course can be accessed at the following web address:

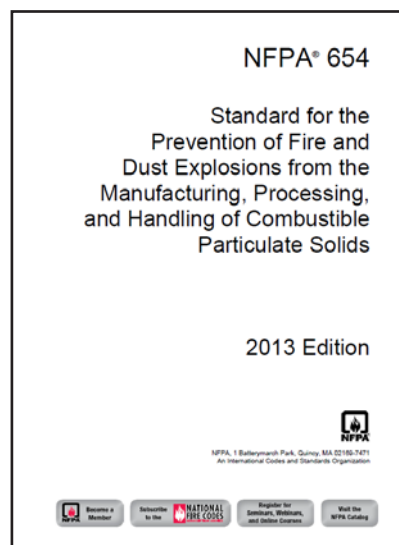
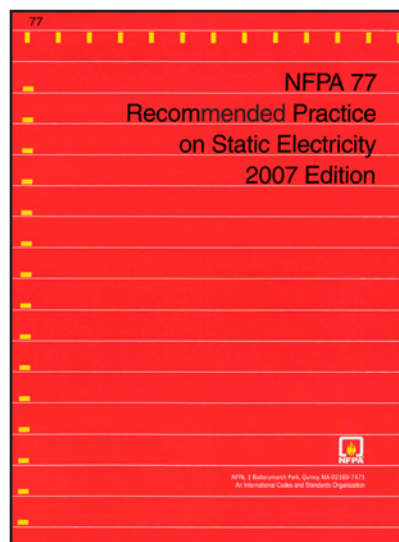
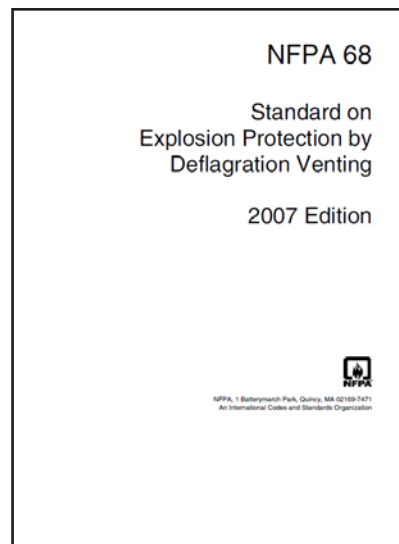
[www.fssolutionsgroup.com/Training/OnlineCourses/tabid/115/Default.aspx](http://www.fssolutionsgroup.com/Training/OnlineCourses/tabid/115/Default.aspx)

### National Fire Protection Association (NFPA)

1 Batterymarch Park  
Quincy, MA 02169-7471  
Telephone: (800) 344-3555

Related NFPA Standards:

- NFPA 61, Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities
- NFPA 68, Guide for Venting of Deflagrations
- NFPA 69, Standard on Explosion Prevention Systems
- NFPA 70, National Electrical Code 2014 Edition
- NFPA 91, Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids
- NFPA 120, Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities
- NFPA 432, Code for the Storage of Organic Peroxide Formulations
- NFPA 480, Standard for the Storage, Handling, and Processing of Magnesium Solids and Powders
- NFPA 481, Standard for the Production, Processing, Handling, and Storage of Titanium
- NFPA 482, Standard for the Production, Processing, Handling, and Storage of Zirconium
- NFPA 484, Standard for Combustible Metals, Metal Powders, and Metal Dusts
- NFPA 485, Standard for the Storage, Handling, Processing, and Use of Lithium Metal
- NFPA 495, Explosive Materials Code
- NFPA 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
- NFPA 505, Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operation
- NFPA 560, Standard for the Storage, Handling, and Use of Ethylene Oxide for Sterilization and Fumigat
- NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
- NFPA 655, Standard for Prevention of Sulfur Fires and Explosions
- NFPA 664, Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities
- NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles
- NFPA 1125, Code for the Manufacture of Model Rocket and High Power Rocket Motors



# OSHA<sup>®</sup> FactSheet

## Hazard Alert: Combustible Dust Explosions

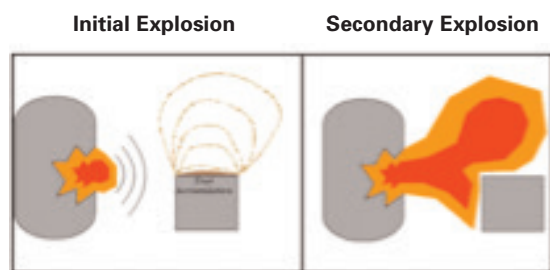
Combustible dusts are fine particles that present an explosion hazard when suspended in air in certain conditions. A dust explosion can be catastrophic and cause employee deaths, injuries, and destruction of entire buildings. In many combustible dust accidents, employers and employees were unaware that a hazard even existed. It is important to determine if your company has this hazard, and if you do, you must take action now to prevent tragic consequences.

### How Dust Explosions Occur

In addition to the familiar fire triangle of oxygen, heat, and fuel (the dust), dispersion of dust particles in sufficient quantity and concentration can cause rapid combustion known as a deflagration. If the event is confined by an enclosure such as a building, room, vessel, or process equipment, the resulting pressure rise may cause an explosion. These five factors (oxygen, heat, fuel, dispersion, and confinement) are known as the "Dust Explosion Pentagon". If one element of the pentagon is missing, an explosion cannot occur.

### Catastrophic Secondary Explosions

An initial (primary) explosion in processing equipment or in an area where fugitive dust has accumulated may dislodge more accumulated dust into the air, or damage a containment system (such as a duct, vessel, or collector). As a result, if ignited, the additional dust dispersed into the air may cause one or more secondary explosions. These can be far more destructive than a primary explosion due to the increased quantity and concentration of dispersed combustible dust. Many deaths in past accidents, as well as other damage, have been caused by secondary explosions.



A pharmaceutical plant after a dust explosion.

### Industries at Risk

Combustible dust explosion hazards exist in a variety of industries, including: agriculture, chemicals, food (e.g., candy, sugar, spice, starch, flour, feed), grain, fertilizer, tobacco, plastics, wood, forest, paper, pulp, rubber, furniture, textiles, pesticides, pharmaceuticals, tire and rubber manufacturing, dyes, coal, metal processing (e.g., aluminum, chromium, iron, magnesium, and zinc), recycling operations, and fossil fuel power generation (coal).

### Prevention of Dust Explosions

To identify factors that may contribute to a explosion, OSHA recommends a thorough hazard assessment of:

- All materials handled;
- All operations conducted, including by-products;
- All spaces (including hidden ones); and
- All potential ignition sources.



**Dust Control Recommendations**

- Implement a hazardous dust inspection, testing, housekeeping, and control program;
- Use proper dust collection systems and filters;
- Minimize the escape of dust from process equipment or ventilation systems;
- Use surfaces that minimize dust accumulation and facilitate cleaning;
- Provide access to all hidden areas to permit inspection;
- Inspect for dust residues in open and hidden areas at regular intervals;
- If ignition sources are present, use cleaning methods that do not generate dust clouds;
- Use only vacuum cleaners approved for dust collection; and
- Locate relief valves away from dust deposits.

**Ignition Control Recommendations**

- Use appropriate electrical equipment and wiring methods;
- Control static electricity, including bonding of equipment to ground;
- Control smoking, open flames, and sparks;
- Control mechanical sparks and friction;
- Use separator devices to remove foreign materials capable of igniting combustibles from process materials;
- Separate heated surfaces from dusts;
- Separate heating systems from dusts;
- Select and use industrial trucks properly;
- Use cartridge activated tools properly; and
- Use an equipment preventive maintenance program.

**Injury and Damage Control Methods**

- Separation of the hazard (isolate with distance);
- Segregation of the hazard (isolate with a barrier);
- Deflagration isolation/venting;
- Pressure relief venting for equipment;
- Direct vents away from work areas;
- Specialized fire suppression systems;
- Explosion protection systems;

**This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.**

- Spark/ember detection for suppression activation;
- Develop an emergency action plan; and
- Maintain emergency exit routes.

**Applicable OSHA Requirements Include:**

- § 1910.22 Housekeeping
- § 1910.307 Hazardous Locations
- § 1910.1200 Hazard Communication
- § 1910.269 Electric Power Generation, Transmission and Distribution (coal handling)
- § 1910.272 Grain Handling Facilities
- General Duty Clause, Section 5(a)(1) of the *Occupational Safety and Health Act* (Employers must keep workplaces free from recognized hazards likely to cause death or serious physical harm).

**Resources**

Readily available from [www.osha.gov](http://www.osha.gov) are:

- Combustible Dust National Emphasis Program
- Safety and Health Information Bulletin (SHIB) (07-31-2005) *Combustible Dust in Industry: Preventing and Mitigating the Effects of Fires and Explosions*

See the SHIB or [www.osha.gov](http://www.osha.gov) for other applicable standards.

The primary National Fire Protection Association (NFPA) consensus standards related to this hazard are:

- NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
- NFPA 61, Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities
- NFPA 484, Standard for Combustible Metals
- NFPA 664, Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities
- NFPA 655, Standard for the Prevention of Sulfur Fires and Explosions
- See [www.nfpa.org](http://www.nfpa.org) to view NFPA standards.

For more complete information:



U.S. Department of Labor

[www.osha.gov](http://www.osha.gov)

(800) 321-OSHA

DSG 3/2008

Follow all requirements for confined space when servicing. All debris body, large waterbodies and vessels that can be entered 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 work 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.*

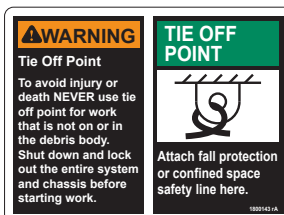
*The terms “permit-required confined space” and “permit space” refer to spaces that meet OSHA’s definition of a “confined space” and contain health or safety hazards. For this reason, OSHA requires workers to have a permit to enter these spaces. Throughout this publication, the term “permit space” will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

### Definitions

*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; and*
- *Has a limited or restricted means of entry or exit.*

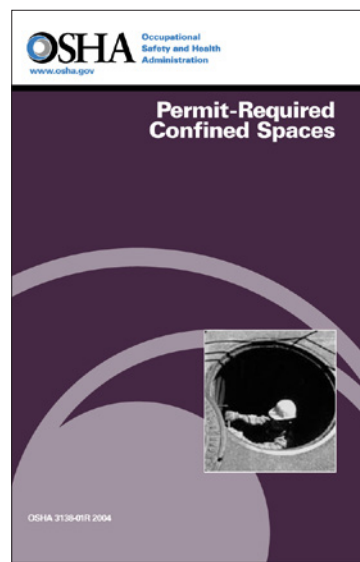
*These spaces may include underground vaults, bodys, storage bins, pits and diked areas, vessels, silos and other similar areas.*



All units are equipped with a tie off point for entering the debris body. It is normally located on the driver side next to the rear door.

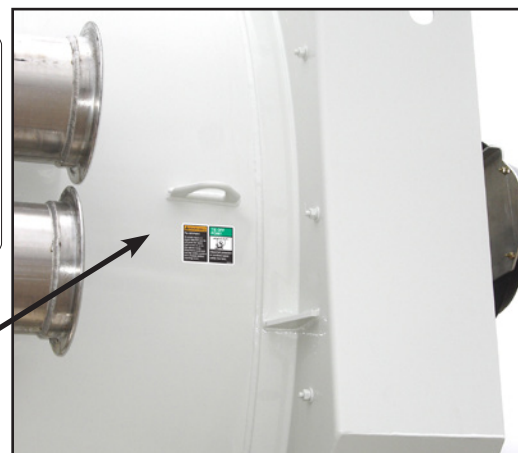
## NOTICE

**Reference to OSHA regulations are for informational purposes only and not intended as legal advice.**




*By definition, a permit-required confined space has one or more of these characteristics:*

- *Contains or has the potential to contain a hazardous atmosphere;*
- *Contains a material with the potential to engulf someone who enters the space;*
- *Has an internal configuration that might cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section; and/or*
- *Contains any other recognized serious safety or health hazards.*




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DIG**



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Visit [call811.com](http://call811.com) for more information.





TRAVELERS  
Common Ground Alliance



**Know what's below.  
Call before you dig.**



## Do Not Enter an Unprotected Trench!



### For your safety:

- Slope or bench trench walls, or
- Shore trench walls with supports, or
- Shield trench walls with trench boxes.
- Provide safe access through the use of ladders, ramps or stairways.
- Keep heavy equipment away from trench edges.
- Know where underground utilities are prior to digging.
- Keep excavated or other materials at least 2 feet back from the edge of trench.

OSHA's role is to assure the safety and health of workers by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual improvement in workplace safety and health.

**OSHA** Occupational  
Safety and Health  
Administration  
U.S. Department of Labor

To get more information, report an emergency or contact your local office:  
[www.osha.gov](http://www.osha.gov) • (800) 321-OSHA • TTY (877) 889-5627

OSHA 3215-04N-05



### Safety Tips

#### Working safely in trenches

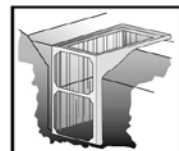
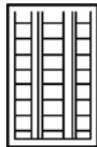
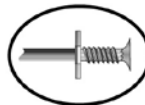


Do **NOT** enter an unprotected trench!

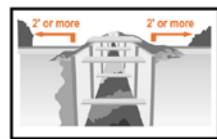
Each employee in a trench shall be protected from a cave-in by an adequate protective system.

Some of the protective systems for trenches are:

- Sloped for stability; or
- Cut to create stepped benched grades; or
- Supported by a system made with posts, beams, shores or planking and hydraulic jacks; or
- Supported by a trench box to protect workers in a trench.



Additionally, excavated or other materials must be at least 2 feet back from the edge of a trench; and



A safe means of egress shall be provided within 25 feet of workers in a trench.



For more complete information:  
**OSHA** Occupational Safety and Health Administration  
 U.S. Department of Labor  
[www.osha.gov](http://www.osha.gov) (800) 321-OSHA  
 TTY (877) 889-5627

OSHA 3243-03R-05

### NOTICE

Reference to OSHA regulations are for informational purposes only and not intended as legal advice.

#### Excavations

OSHA 2226  
2002 (Revised)



**OSHA** Occupational Safety and Health Administration  
 U.S. Department of Labor



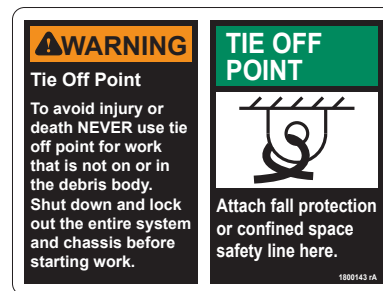
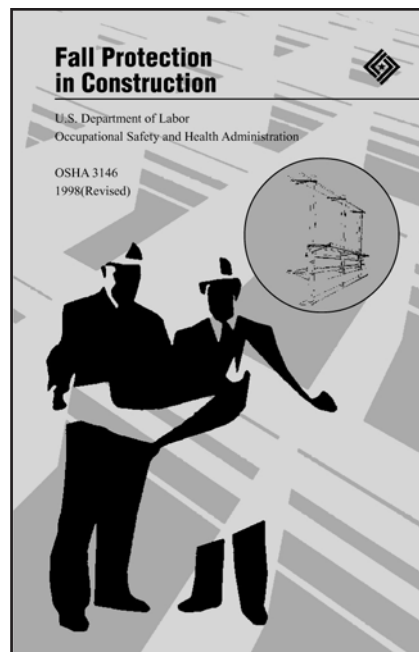
Some service steps require being on top of the unit. Follow all requirements for fall protection when working around mobile equipment. The Occupational Safety and Health Administration (OSHA) requirements apply to most workers. The following information is from OSHA 3146 1998 (revised). The full document can be obtained from [www.osha.gov](http://www.osha.gov).

*In the construction industry in the U.S., falls are the leading cause of worker fatalities. Each year, on average, between 150 and 200 workers are killed and more than 100,000 are injured as a result of falls at construction sites. OSHA recognizes that accidents involving falls are generally complex events frequently involving a variety of factors. Consequently, the standard for fall protection deals with both the human and equipment-related issues in protecting workers from fall hazards. For example, employers and employees need to do the following:*

- *Where protection is required, select fall protection systems appropriate for given situations.*
- *Use proper construction and installation of safety systems.*
- *Supervise employees properly.*
- *Use safe work procedures.*
- *Train workers in the proper selection, use, and maintenance of fall protection systems.*

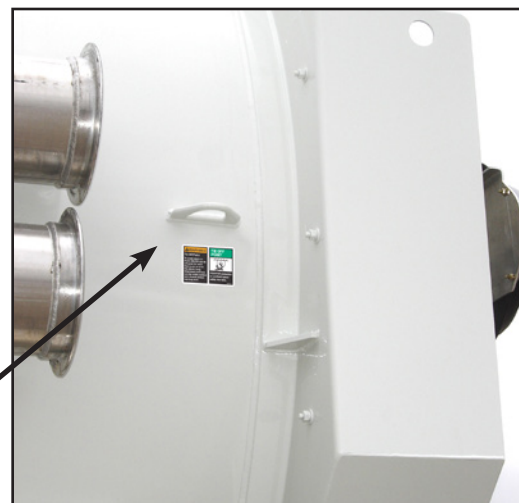
### NOTICE

Reference to OSHA regulations are for informational purposes only and not intended as legal advice.



All units are equipped with a tie off point for entering the debris body.

Where needed units are equipped with additional designated tie off points. Only use these tie off points for fall protection. If no tie off point is marked as shown then an independent tie off system must be used.



Follow all requirements for lockout/tagout when servicing. The Occupational Safety and Health Administration (OSHA) requirements apply to most workers. The following information is from OSHA 3120 2002 (revised). The full document can be obtained from [www.osha.gov](http://www.osha.gov).

*“Lockout/tagout” refers to specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities.<sup>1</sup> This requires, in part, that a designated individual turns off and disconnects the machinery or equipment from its energy source(s) before performing service or maintenance and that the authorized employee(s) either lock or tag the energy-isolating device(s) prevent the release of hazardous energy and take steps to verify that the energy has been isolated effectively. If the potential exists for the release of hazardous stored energy or for the reaccumulation of stored energy to a hazardous level, the employer must ensure that the employee(s) take steps to prevent injury that may result from the release of the stored energy.*

*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. Tagout devices, by contrast, are prominent warning devices that an authorized employee fastens to energy-isolating devices to warn employees not to reenergize the machine while he or she services or maintains it. Tagout devices are easier to remove and, by themselves, provide employees with less protection than do lockout devices.*

*Why do I need to be concerned about lockout/tagout?*

*Employees can be seriously or fatally injured if machinery they service or maintain unexpectedly energizes, starts up, or releases stored energy. OSHA’s standard on the Control of Hazardous Energy (Lockout/Tagout), found in Title 29 of the Code of Federal Regulations (CFR) Part 1910.147, spells out the steps employers must take to prevent accidents associated with hazardous energy. The standard addresses practices and procedures necessary to disable machinery and prevent the release of potentially hazardous energy while maintenance or servicing activities are performed.*

### NOTICE

**Reference to OSHA regulations are for informational purposes only and not intended as legal advice.**



# Vactor • Guzzler

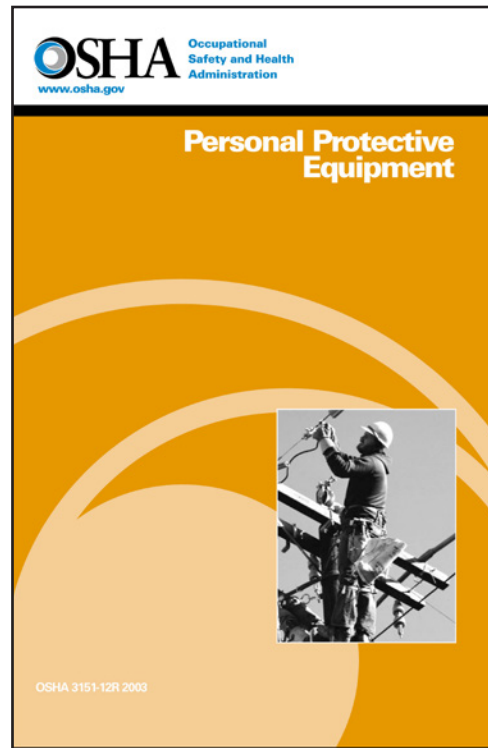
## PERSONAL PROTECTION EQUIPMENT - PPE

## SAFETY

Follow all requirements for PPE when operating and servicing. The Occupational Safety and Health Administration (OSHA) requirements apply to most workers. The following information is from OSHA 3151-12R 2003. The full document can be obtained from [www.osha.gov](http://www.osha.gov).

### NOTICE

Reference to OSHA regulations are for informational purposes only and not intended as legal advice.



# Vector • Guzzler

## SYMBOLS

## OPERATION

Shown are common industry standard symbols used on the various controls. Actual symbols used will vary with options.



Refer to manual



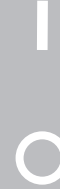
Refer to Service manual



Emergency Stop



Operator Alert



On  
Off



Lock  
Unlock



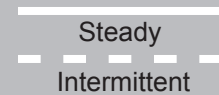
**Adjustment Range**  
Max. to Min.



Alarm On / Off



**Audible Alert**  
On / Off



Steady  
Intermittent



Remote Control



Counter



Timer



Hour meter



Battery power  
Disconnect



Battery charging  
and/or volts



Plug Connection  
or Socket



Scale



Slower / Faster



Increase  
Decrease



Pressure



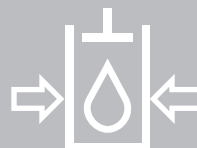
Oil



Oil  
Temperature



Hydraulic  
Oil



Hydraulic  
Oil Pressure



Hydraulic  
Oil Temperature



Temperature  
Low/Normal  
Range/High



Switch Home  
Position



Hot Water



Spray



Water



Water Level  
Indicator



# Vactor • Guzzler

## SYMBOLS

## OPERATION

Shown are common industry standard symbols used on the various controls. Actual symbols used will vary with options.



**Worklights**  
Front - Side - Rear



Water  
Recirculation



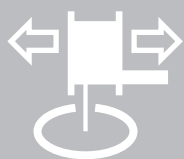
Vibrator



**Valve**  
Open  
Closed



Heater or  
Cabinet heater



Hose reel  
IN/OUT



Hose reel  
Speed



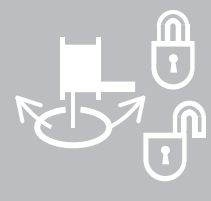
Hose reel  
PAY IN/PAY OUT



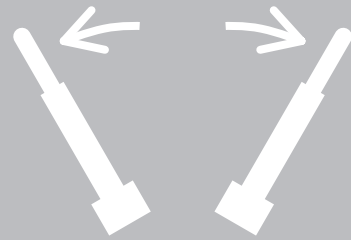
Hose reel  
IN/OUT



Hose reel pinch  
roller lock



Hose reel lock  
(swivel)



Boom rotate  
CCW or CW



Strobe/Beacon/  
Revolving Light



Mirror Strobe



Boom retract



Boom extend



Boom down



Boom up



Debris Body Up/DOWN



High Rail UP/DOWN



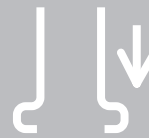
Rear Door OPEN/CLOSE



ENGAGE/DISENGAGE



Vacuum ENABLE / DISABLE



Suction pick up head UP/DOWN

# Vactor • Guzzler

## SYMBOLS

## OPERATION

Shown are common industry standard symbols used on the various controls. Actual symbols used will vary with options.



Transmission or  
Transfer Case  
Oil Pressure



Transmission or  
Transfer Case  
Oil



Transmission or  
Transfer Case



Clutch



Engine Run



Engine Start



Engine Stop

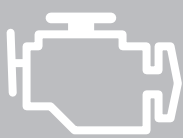


n/min

Engine RPM



Power Take Off  
(PTO)



Engine



Fan



Park Brake



Road Mode



n/min

Blower or  
Compressor  
RPM



Blower or  
Compressor



Rotary Compressor,  
Liquid Ring or  
Vacuum Pump



Water Pump



Liquid Pump



Centrifugal  
Pump



Engine  
REGEN



Emergency  
Stop

E-Stop - normally disables vacuum and water pressure. Refer to the controls section for each model for the additional functions controlled by the E-Stop.



Red indicator light - activated when a condition requires immediate attention or the function has been activated.



Hydraulic  
Oil Temperature



Red indicator light - normally activated when condition requires immediate attention.



Oil  
Temperature



Red indicator light - normally activated when condition requires immediate attention.



Vacuum ENABLE / DISABLE



Red indicator light - normally activated when vacuum relief valve is set for vacuuming. The vacuum relief valve works differently on PD and fan machines. Refer to the control pages for details.



**Note** - on many older units (pre-2011) this indicator was used for the vacuum relief valve open/closed position. Refer to the unit's manual for details.

**Note** - Other colors of lights may be used on water level indicators and vendor supplied components like lighting, cameras, scales, etc.



Displays use a variety of colors and message boxes to indicate function status and alerts. Refer to the display information in the unit manual for the specific use when equipped.

# Vactor • Guzzler

## DECALS - COMMON

## SAFETY

Typical labels and decals found on units. Actual decals used will vary with options.

**NOTICE**

Hydraulic System can be damaged. Loose hydraulic couplings prevent oil flow. Hydraulic quick couplings must be fully tightened to avoid hydraulic system damage.

Refer to manual for details. 507018 r0



**WARNING**

**Tie Off Point**

To avoid injury or death NEVER use tie off point for work that is not on or in the debris body. Shut down and lock out the entire system and chassis before starting work.

**TIE OFF POINT**

Attach fall protection or confined space safety line here.

1800143 1A

**FSESG**

Scan the QR Code with your mobile device or visit: <http://www.fsessgsafety.com> for the latest FSESG product and application safety information.

507046 r0

**NOTICE**

Cabinet Heater System

When temperatures are 32° F and below, units equipped with cabinet heaters are required to use winter fronts in order to maintain the proper chassis engine operating temperature.

Refer to manual for details. 507044 r0

**DANGER**

**Rotating Driveline Hazard**

Contact with driveline may cause severe personal injury or death. Never operate with covers removed. Stay clear when operating.

1321054 1A

**NOTICE**

Custom Machine Parameters

Reprogramming the chassis or engine controls will result in problems ranging from improper operation to complete loss of service. Follow chassis manufacturer's procedures when reprogramming to avoid the loss of the custom machine parameters.

Refer to manual for details. 507047 r0

**NOTICE**

**Service Access**

Never use access ladders or platforms with the unit running. Shut down and lock out the unit before all service to avoid injury. Refer to the unit manual and safety manual for details.

507592 r0

**CAUTION**

Noise outside cab can cause permanent hearing loss. Always wear approved hearing protection when operating equipment.

**ATENCIÓN**

Se puede perder el poder de audición. Protección de oídos se requiere cuando este equipo está en uso para evitar pérdida de audición.

1800173

**WARNING**

**Explosion and fire hazard**

Static electricity build up can result in electrical shocks, fire and/or an explosion when vacuuming dry and/or combustible materials. A static electricity charge may build up as material moves through the vacuum system. Grounding and/or bonding the unit may be required. Follow site procedures for static electricity.

Refer to manual for details. 1800170

**CAUTION**

**Fire hazard**

Do not use water heater when unit is in motion.

For proper combustion air flow and to avoid fuel build up the unit must be stationary and the cabinet door must be open during operation.

Refer to manual for details. 47954KP rA

**CAUTION**

**Parts in debris box.**

Unload parts in debris box before using vacuum system. Machine and parts can be damaged if parts are not removed before using.

**ATENCIÓN**

**Repuestos dentro de la caja.**

Quite los repuestos dentro de la caja antes de prender el sistema de vacío. La máquina y las piezas pueden ser dañadas si no las quitan antes de usar.

61724

**WARNING**

**Explosion and fire hazard**

To avoid severe injury or death never use an air mover to move hydrocarbon or other materials with a flashpoint below 140° (F). Vacuuming, or pump or pressurized off-loading is not permitted unless the flashpoint of the material is 140° (F) or higher.

Refer to manual for details. 1800180 r0

# Vactor • Guzzler

## DECALS - COMMON

## SAFETY

Typical labels and decals found on units. Actual decals used will vary with options.

**CAUTION**



**Hot!**

**Hydraulic oil only.**  
Read manual for fluid details.

1800145

**CAUTION**

Driveline can be damaged.  
Open vacuum relief valve.  
Lower engine RPM to idle before turning off throttle or engaging/disengaging blower.

Failure to open vacuum relief valve and lower engine RPM to idle before turning off throttle or engaging/disengaging blower may result in serious engine, transmission or blower damage.

1800121A


**WARNING**



**Cutting and crushing hazard**  
Moving parts can crush and cut.  
Keep clear when valve or mechanism is operating.

1800169

**Blower Oil Service**



Check blower oil daily or the start of each shift.

All vacuum blowers are equipped with at least one sight glass at each end of the blower. Depending on blower configuration the sight glasses may be located on either side or the end of the blower at each end, and there may also be upper and lower sight glasses. The oil level must be checked at both ends of the blower while the unit is off and on level ground.

Refer to the maintenance section in the manual and the blower manufacturer's manual.

1800167


**DANGER**



**Confined space**  
Enter by permit only.

1800148A

**WARNING**



**Vacuum hazard**  
Never operate at the hose end without a properly installed safety relief valve.  
Failure to do so could result in serious injury or death.

Safety relief valve must be installed within 50 feet of hose length of the working end. Relief valve tether line must be within line of sight of valve and attached to operator. Adjust tether line to have minimal slack so the relief valve can readily be opened.

Consult the OPERATOR's manual for complete details.

1800132 rev A

**WARNING**

**Vacuum Hazard**  
Cutting, crushing, suffocation or body rupture from the forces of vacuum could result in serious injury or death.  
Stay clear of the suction hose inlet end.  
Turn vacuum off before attaching hose, pipe or accessories.  
Keep suction hose inlet end near ground level when vacuum is operating.

Refer to SAFETY manual for details.

1800174


**ADVERTENCIA**

**Riesgo Por Altorvacio**  
Trituración, asfixia, amputación o desgarro corporal por las fuerzas altorvacio pudieran resultar en lesiones serias o mortales.  
Manténgase lejos de la boquilla de la manguera de succión.  
Apague el compresor de altorvacio antes de conectar la manguera, tubos o accesorios.  
Mantenga el extremo de la manguera de succión cerca del nivel del suelo cuando este funcionando el compresor de altorvacio.

Refiérase a la sección de SEGURIDAD en el manual para detalles.

1800174

**WARNING**




**Crushing hazard.**  
Serious injury or death can result from falling debris body.  
Never go under a raised debris body without the safety prop(s) in place. Debris body must be clean and empty for service work.  
On firm level ground raise the body above the height of the props. Tilt the prop(s) in place. Lower debris body until it just rests on the prop(s). Use all props.  
Shut down and lock out the entire system and chassis before servicing.  
Unload any items stored in debris body before using machine.

Refer to manual for details.

1800174


**WARNING**



**Crushing hazard.**  
Serious injury or death can result from falling rear door. Never go under the rear door when open.  
Use door prop(s) or safety pin(s) to secure door before entering body, working under or around the door.  
Open the rear door to just clear the prop(s) and lower door until it just rests on the prop(s). On units that use a safety pin(s) open the door until the pin holes are aligned and insert pin. Use all props or pins.  
Shut down and lock out the entire system and chassis before servicing.  
Unload any items stored in debris body before using machine.

1800174

**WARNING**



**Electrocution hazard.**  
Serious injury or death can result from electrocution.  
Check for overhead wires and obstructions before raising debris body, opening rear door or raising optional equipment. Never leave debris body, rear door or optional equipment raised or partly raised while vehicle is unattended. Never move vehicle with debris body, rear door or optional equipment raised.  
Be aware of the vehicle's surroundings before operating any of the hydraulic functions to prevent death, injury or equipment damage.

1800128 rE



# Vactor • Guzzler

## DECALS - INDUSTRIAL UNITS

## SAFETY

Typical labels and decals found on units. Actual decals used will vary with options.

**NOTICE**

**Rear Door Can Be Damaged**  
Remove safety support(s) before closing door to avoid damage.

89384CA rev C

**⚠ DANGER**

**Crushing Hazard**  
Can cause severe injury or death.  
Before servicing, lock out electrical switches and hydraulic valves before working on unit.

**⚠ WARNING**

**California Proposition 65**  
Diesel engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects and other reproductive harm.

**⚠ CAUTION**



Wear protective equipment including footwear and gloves when using or servicing this machine. Read SAFETY section for details.

**CAUTION**

**Driveline can be damaged.**  
Open vacuum relief valves. Lower engine RPM to idle before turning off throttle or engaging/disengaging blower.  
Failure to open vacuum relief valve and lower engine RPM to idle before turning off throttle or engaging/disengaging blower may result in serious engine, transmission or blower damage.

**CAUTION**


**Electrical system can be damaged.**  
Do not weld on unit. Disconnect all chassis and unit ECU's and batteries before welding on unit. Electrical systems may be damaged by welding.  
Read Service manuals for details.

**NOTICE**

No one shall operate or service this equipment until they read and understand the operation and maintenance manuals. Additional copies can be obtained by calling the 24 hour a day service hotline. In the USA or Canada Call: 877-DIAL EPG or 877-342-5374. Outside the USA or Canada call 847-741-4330

1800146 rev A

**⚠ DANGER**



High pressure.  
Can cause severe injury or death.  
Relieve tank pressure before opening any covers or unlocking the rear door.  
This truck is equipped with a tank pressurization system. Untrained operators shall not operate.

**⚠ DANGER**

High pressure.  
Can cause severe injury or death.  
Failure to follow will lead to explosion.  
Do not pressurize with inlet hose connected.  
Remove inlet hose and install camlock cap before pressurizing.


1800144

**CAUTION**

Overheating water tank can damage tank insulation. Water must not be heated above 100° (F). Consult the factory for additional information.

49857 rA

**⚠ WARNING**



**Explosion and fire hazard**  
NEVER operate an engine where there are combustible vapors. Combustible vapor can enter air intake system and cause the engine to over-speed. This can result in extensive engine damage, flying parts, and severe injury or death.  
Refer to manual for details

KH0028E r0

**CAUTION**

Water Pump can be damaged. Charge Pump PTO MUST be ON when using water pump  
Refer to manual for details.

49936 r0

**⚠ WARNING**



**Fall Hazard**  
Do not stand or ride on cyclone.

1321111 rev A

Liquid vacuum units only.

**NOTICE**

**Seatbelt use required**

1800168

**NOTICE**

**Rear Bumper Extension Can Be Damaged**  
Rear door attachments can damage the rear bumper extension. Fully open the rear door or remove the rear bumper extension before raising the debris body to avoid damage.

506187 r0

**⚠ CAUTION**



**Flying Debris**  
Debris may be expelled when door is open and air cannon activates. To avoid injury shut down unit and lock out. Stand to the side when opening the door to avoid any debris that may fall out.  
Refer to manual for details.

507585 r0


Water Tank

# Water ONLY

Drain and flush daily. Never allow to freeze. Fully drain and purge. Do not store water in tank(s).

Refer to manual for details. 1800179 rev 0

**⚠ WARNING**



**Electrocution hazard**  
Serious injury or death can result from electrocution.  
Check for overhead wires and obstructions before raising or moving boom. Do not leave boom raised while vehicle is unattended. Do not move vehicle unless boom is in travel mode. Do not allow boom to contact the vehicle or any obstruction.  
Be aware of the vehicle's surroundings before operating any of the boom functions to prevent death, injury or equipment damage.  
Refer to SAFETY section in manual.

1800149A rev A


# Vactor • Guzzler

## DECALS - SEWER UNITS

## SAFETY

Typical labels and decals found on units. Actual decals used will vary with options.

**⚠ WARNING**




**Electrocution hazard**  
**Serious injury or death can result from electrocution.**

Check for overhead wires and obstructions before raising or moving boom. Do not leave boom raised while vehicle is unattended. Do not move vehicle unless boom is in travel mode. Do not allow boom to contact the vehicle or any obstruction.

Be aware of the vehicle's surroundings before operating any of the boom functions to prevent death, injury or equipment damage.

Refer to SAFETY section in manual.



1800149 rev A

**⚠ WARNING**


**High pressure water.**

Serious injury or death can result from sudden release of high pressure water. The hose end and water discharge direction may become uncontrolled.

One pressure side water valve must be open prior to operating rodder pump.

The rodder hose must be properly in place before running rodder pump.

Refer to manual for details.



1800151

**⚠ CAUTION**

**Open accumulator ball valve PRIOR to removing accumulator ball valve drain plug.**

L-773



**⚠ WARNING**

**Do not run engine with inspection cover removed.**

**⚠ ADVERTENCIA**

**No poner el motor en marcha con la cubierta de inspección retirada.**



**SAFETY INSTRUCTIONS**

If fans cause excess vibrations, shut engine off and follow procedure as described in the maintenance section of the operator's guide.



1800150


**INSTRUCCIONES DE SEGURIDAD**

Si los ventiladores causan vibraciones excesivas, apagar el motor y seguir los procedimientos descritos en la sección de mantenimiento de la guía del operador.



1800150

**⚠ WARNING**




**Do not operate jet-rodder with damaged rodder hose or rodder hose that is not authorized by Vactor Mfg., Inc.**

Serious injury or death can result from rodder hose or fittings failing.

Frequently inspect hoses and fittings. Install fittings properly.

Vactor Mfg., Inc. accepts no responsibility for this equipment while operated with any other hose than that hose furnished by Vactor Mfg., Inc.

**⚠ WARNING**




**Loose hose/nozzle**

Serious injury or death can result from high pressure water or impact from hose/nozzle.

Use rigid nozzle support/guard of proper length.

Refer to SAFETY section in manual for details.

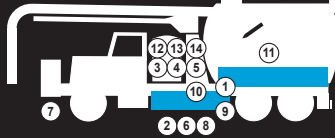


1800152

**2100 Series • Freezing Weather Drain Procedure**

Drain Checklist	Purge System
1. Empty all water tanks	1. Open handgun and rodder ball valves.
2. Remove all Y-strainers at fill, water pump & other options	2. REMOVE rodder nozzle and SECURE hose end to an adjacent hose loop so reel can rotate. Point the hose end towards the ground as ice and water may be ejected while running rodder pump.
3. Remove handgun outlet(s), recirc & HXX drain plugs	3. Start engine and engage water pump for two minutes at slow speed to expel any water.
4. Remove accumulator valve drain plug	4. Turn OFF water pump.
5. Drain water guns	5. Remove drain plugs from water pump or open optional drain valves and engage water pump for one minute at slow speed to expel any water.
6. Remove optional debris body washout system plug	6. Turn OFF water pump.
7. Remove plug from under the front hose reel	7. Rotate hose reel in a clockwise direction to expel any water in hose.
8. Open optional water valve to rodder pump	
9. Open heat exchanger(s) drain(s)	
10. Remove plug to water pump manifold (2100Plus)	
11. Open all cyclones and allow to drain	
12. PD units - Open microtrainer housing drains	
13. PD units - Open silencer drain	
14. Fan units - Open the fan housing(s) drain	

Leave all drains open until next use




**⚠ WARNING**

**High pressure water.**

Serious injury or death can result from sudden release of high pressure water. Remove the rodder hose nozzle and secure the hose end to an adjacent hose loop so reel can rotate. Point the hose end towards the ground as ice may be ejected while running rodder pump.

Both pressure side water valves must be open prior to operating rodder pump.

Refer to manual for details.



53695A-PC


**⚠ WARNING**

**Out of control hose can cause severe injury or death.**

The rodder hose creates tremendous pressure and must not be fitted with a reducer or hand held nozzle, or operated outside of the sewer pipe. The back pressure created by such action will cause loss of control and violent movement of the hose and fittings, and the release of high pressure water.

Do not use improper fittings or use out of sewer pipe. Refer to manual for details.

Refer to manual for details.



49074

**CAUTION**

**Driveline can be damaged.**

**Open vacuum relief valve.**

**Lower engine RPM to idle before turning off throttle or engaging/disengaging blower.**

Failure to open vacuum relief valve and lower engine RPM to idle before turning off throttle or engaging/disengaging blower may result in serious engine, transmission or blower damage.

1800121A

# Vactor • Guzzler

## DECALS - SEWER UNITS

## SAFETY

Typical labels and decals found on units. Actual decals used will vary with options.

### Jetter units

**⚠ DANGER**

**Crushing hazard**  
Can cause severe injury or death.  
Before servicing lock out electrical switches and hydraulic valves before working on unit.

**⚠ WARNING**

**California Proposition 65**  
Diesel engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects and other reproductive harm.

**⚠ CAUTION**

Wear protective equipment including footwear and gloves when using or servicing this machine. Read SAFETY section for details.

**⚠ WARNING**

**High pressure water**  
Serious injury or death can result from sudden release of high pressure water. The hose end and water discharge direction may become uncontrolled.  
One pressure side water valve must be open prior to operating rodger pump.  
The rodger hose must be properly in place before running rodger pump.  
Refer to manual for details.

**CAUTION**

**Electrical system can be damaged.**  
Do not weld on unit.  
Disconnect all chassis and unit ECU's and batteries before welding on unit.  
Electrical systems may be damaged by welding.  
Read Service manuals for details.

**NOTICE**

No one shall operate or service this equipment until they read and understand the operation and maintenance manuals. Additional copies can be obtained by calling the 24 hour a day service hotline. In the USA or Canada Call: 877-DIAL EPG or 877-342-5374. Outside the USA or Canada call 847-741-4330

### Combination units

**⚠ DANGER**

**Crushing hazard**  
Can cause severe injury or death.  
Before servicing lock out electrical switches and hydraulic valves before working on unit.

**⚠ WARNING**

**California Proposition 65**  
Diesel engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects and other reproductive harm.

**⚠ CAUTION**

Wear protective equipment including footwear and gloves when using or servicing this machine. Read SAFETY section for details.

**⚠ WARNING**

**Vacuum hazard**  
Stay clear of the suction hose inlet end.  
Failure to do so could result in serious injury or death.  
Keep fingers clear when attaching pipes and closing clamps.  
Keep suction hose inlet end near ground level.  
Read SAFETY section for details.

**CAUTION**

**Electrical system can be damaged.**  
Do not weld on unit.  
Disconnect all chassis and unit ECU's and batteries before welding on unit.  
Electrical systems may be damaged by welding.  
Read Service manuals for details.

**NOTICE**

No one shall operate or service this equipment until they read and understand the operation and maintenance manuals. Additional copies can be obtained by calling the 24 hour a day service hotline. In the USA or Canada Call: 877-DIAL EPG or 877-342-5374. Outside the USA or Canada call 847-741-4330

**⚠ WARNING**

**Entanglement Hazard.**

**Rotating hose reel can cause severe injury.**  
Engage hose reel safety latch before servicing.

47047KW

**VACTOR**

Part No.

<b>1st letter</b>	<b>2nd letter</b>
<b>Hose dia. (in)</b>	<b>Flow (GPM)</b>
A = 1-1/4	A = 35
B = 1	B = 40
C = 3/4	C = 45
D = 1-1/2	D = 50
	E = 55
	F = 60
<b>3rd letter</b>	<b>G = 65</b>
<b>Pressure (psi)</b>	<b>H = 70</b>
A = 1850	I = 75
B = 2000	J = 80
C = 2500	K = 90
D = 3000	L = 100
<b>Made in USA</b>	<b>M = 120</b>

**⚠ WARNING**

**High pressure**  
Operating tool outside of sewer line may result in serious injury or death. Sewer maintenance tools operate at high pressure. Position tool two feet into sewer line before operating. Build pressure slowly to ensure tool is positioned correctly. Turn off pressure source before removing tool from sewer line.

48902

**Reel Speed**

48969

**Reel Control**

48969

**⚠ ADVERTENCIA**

**Agua a presión alta**  
El escape de agua a presión alta puede causar lesiones graves o mortales. Al utilizar la pistola:

- Accione la bomba en MODO DE PRESIÓN BAJA (si lo tiene) o con el motor a una aceleración que no exceda la capacidad nominal de la pistola
- Nunca ajuste la(s) válvula(s) de alivio
- Nunca exceda la capacidad de presión nominal de la pistola
- Nunca lave usando más de 600 psi y 20 gal/min

**⚠ WARNING**

**High Pressure Water**  
Serious injury or death can result from release of high pressure water. When using handgun:

- Operate pump at LOW MODE setting (if equipped) or at engine RPM that does not exceed the handgun rating
- Never adjust relief valve(s)
- Never exceed pressure rating of handgun
- Never wash down above 600psi & 20gpm

47047HC (A)

**CAUTION**

**Door lock mechanism can be damaged**  
Completely lock or unlock rear door locks prior to reversal or damage can result.

48944

Neutral

Detent

Valve Operation

Use detent when in WORK/ROAD mode

**Rear Door**

**Debris Body**





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