VACALL

Operator & Safety Manual

Keep this manual with machine at all times.

AllExcavate

VA0000S4787

Original Issue,
June 7th, 2011

CALIFORNIA PROPOSITION 65

BATTERY WARNING

Battery posts, terminals and related accessories contain lead and lead compounds, chemical known to the State of California to cause cancer and reproductive harm.

WASH HANDS AFTER HANDLING!

CALIFORNIA PROPOSITION 65

EXHAUST WARNING

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

REVISION LOG

June 7, 2011 - A - Original issue of manual

This manual is a very important tool! Keep it with the machine at all times.

The purpose of this manual is to provide owners, users, operators, lessors, and lessees with the precautions and operating procedures essential for the safe and proper machine operation for its intended purpose.

Due to continuous product improvements, Gradall Industries, Inc. reserves the right to make specification changes without prior notification. Contact Gradall Industries, Inc. for updated information.

Operator Qualifications

The operator of the machine must not operate the machine until this manual has been read, training is accomplished and operation of the machine has been completed under the supervision of an experienced and qualified instructor.

Operators of this equipment must possess a valid, applicable driver's license, be in good physical and mental condition. Operator must not be using medication which could impair abilities nor be under the influence of alcohol or any other intoxicant during the work shift.

In addition, the operator must read, understand and comply with instructions contained in the following material furnished with the Vacall.

- This Operator & Safety Manual
- All instructional decals and plates
- AEM Vacuum Excavator Safety Manual
- Any optional equipment instructions furnished

The operator must also read, understand and comply with all applicable Employer, Industry and Governmental rules, standards and regulations.

If any manual is missing or illegible, get a replacement from your employer, distributor, or from Gradall Industries, Inc.

Modifications

Any modification to VacAll products must be approved by Gradall Industries, Inc.

This product must comply with all safety related bulletins. Contact Gradall Industries, Inc. or the local authorized VacAll representative for information regarding safety-related bulletins which may have been issued for this product.

Gradall Industries, Inc. sends safety related bulletins to the owner of record of this machine. Contact Gradall Industries, Inc. to ensure that the current owner records are updated and accurate.

Gradall Industries, Inc. must be notified immediately in all instances where VacAll products have been involved in an accident involving bodily injury or death of personnel or when damage has occurred to personal property or the VacAll product.

FOR:

- Accident Reporting and Product Safety Publications
- Current Owner Updates
- Questions Regarding Product Applications and Safety
- Standards and Regulations Compliance Information
- Questions Regarding Product Modifications

CONTACT:

Product Safety and Reliability Department
Gradall Industries, Inc.
406 Mill Avenue
New Philadelphia, OH 44663
Phone: 330-339-2211
Toll-Free: 1-800-445-4752

Other Publications Available

Parts Manual VA0000S4788

Service Manual VA0000S4789

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SECTION 1 - GENERAL SAFETY PRACTICES

1.1 HAZARD CLASSIFICATION SYSTEM

Safety Alert System and Safety Signal Words

OW00101

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

OW0021

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

OW0031

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

OAN0340

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in property damage.

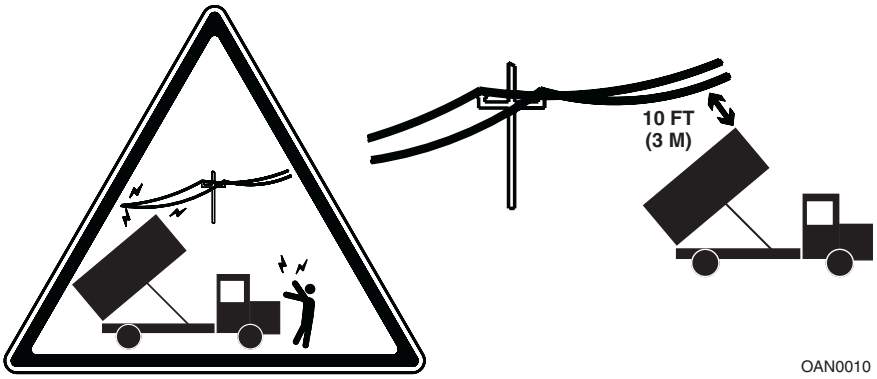
1.2 GENERAL PRECAUTIONS

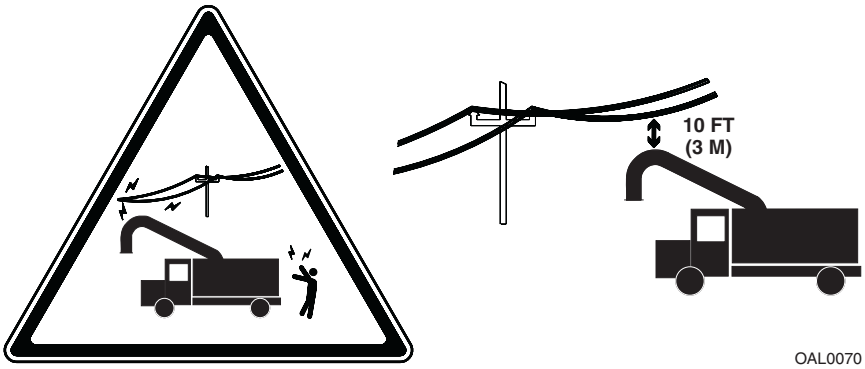
OW0021

Before operation, read & understand this manual. Failure to comply with the information in this manual could result in machine damage, property damage, personal injury or death.

1.3 OPERATION SAFETY

Electrical Hazards





- This machine is not insulated and does not provide protection from contact or being near electrical current.
- **NEVER** operate the unit in an area where overhead power lines, overhead or underground cables, or other power sources may exist without ensuring the appropriate power or utility company de-energizes the lines.
- Always check for power lines before raising boom or debris body.

Fire/Explosion Hazards


OW0300


OAN0020

- **DO NOT** fill the fuel tank or service the fuel system near an open flame, sparks, smoking materials, or with engine running. Engine fuel is flammable and can cause a fire and/or explosion.

Burn Hazards

OAN0030

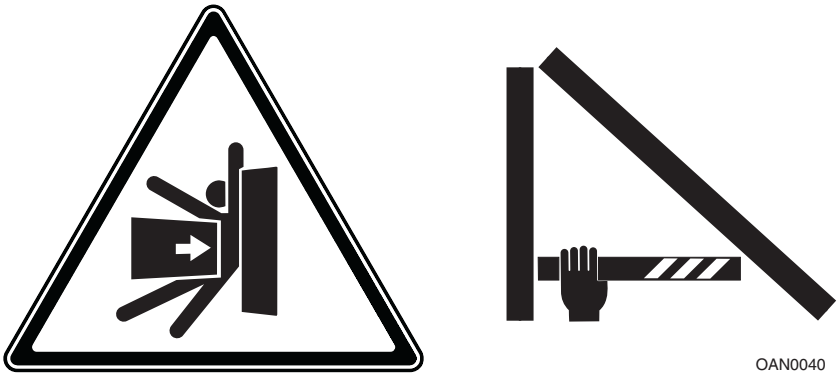
- Never touch the blower casing or associated piping/accessories after operation.
- Engine coolant is hot and under pressure at operating temperature. The radiator and all lines to heaters of the engine contain hot water or steam and any contact could cause severe burns.
- Check coolant level before 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.
- Allow components to cool before draining. Do not allow hot oil, coolant or components to contact skin.
- 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 eye.

Crush Hazards

Debris Body

- Never leave body raised while vehicle is unattended or while performing maintenance on unit.
- Never work under or near the raised debris body without first securing the prop in the support receptacle located on the underside of the body. (See page 1-16 for details).
- Ensure the debris body is empty before using the prop to support the debris body.

Tailgate



- Never enter the debris body or stand beneath the raised tailgate without first securing the tailgate in the open position with the prop. (See page 1-17 for details).
- Ensure there are no personnel at the rear of the unit when operating the dump system.

General

OAC1250

- Do not operate belt driven components with the shroud doors open or belt guards removed. Cover all external moving parts with adequate guards.
- Stay clear of moving parts while engine is running.
- Do engage the PTO or other driven equipment from underneath the vehicle while engine is running.
- Never attempt to stop, stall or slow moving components with hands, feet, or any other portion of your body.

OAL0080

- Stay clear of rotating parts while engine is running.
- Stop the engine and remove the key before going under the chassis.
- Do not engage the PTO or other driven equipment from underneath the vehicle while engine is running.
- Never attempt to stop, stall or slow rotating components with hands, feet, or any other portion of your body.

Slip and Fall Hazard

- Always maintain 3-point contact using proper hand holds and steps provided when mounting or dismounting. Never grab control levers or steering wheel when mounting or dismounting machine.
- Repair or replace damaged steps and grab handles.
- Keep grab handles, steps, and walkways free of mud, oil, grease and other foreign material. Replace non-skid surface material as required.

Tip Over Hazard

- Always ensure unit is on firm and level ground before operating the dump system. When dumping, raise the body in steps, allowing the material to dump out in a steady flow.
- **DO NOT ALLOW** people and/or vehicles beside debris body while dumping.

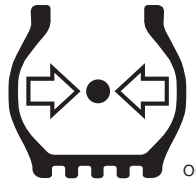
Job-Site Hazards

- Always use safety cones.
- Always activate beacons and flashers before job set-up.
- 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 manhole covers and other covers are in place prior to leaving the jobsite.
- Be aware of traffic and pedestrians on the job site. Use extreme caution while moving around the vehicle to avoid contact with other moving vehicles. Before stowing the boom or moving the vehicle, be sure pedestrians are clear of the area.

Travel Hazards

- Ensure unit is road worthy by performing a pre-trip inspection before driving to and from jobsite.
- Look out for and avoid other personnel, machinery and vehicles in the area. Use a spotter if you **do not** have a clear view.
- **Before moving** be sure of a clear path and **sound horn.**
- When machine is operating or driving on public roadways, **comply with all local, state and federal restrictions.**
- **When driving**, ensure all equipment is properly secured and positioned for maximum visibility and adequate clearances. Know the overall height of the machine.
- **Always check overhead and side clearances** carefully before driving.


OH20911


OH2291

- Always wear seat belt.
- **Maintain proper tire pressure** at all times.

High Pressure Hazards

- Release pressure before attempting to open any door, hatch, hose or tube.
- Do not bend or strike high pressure lines.
- Report any loose or damaged tubes or hoses to mechanics so repairs can be made prior to continued use.

Water Pressure

OW0021

WATER PRESSURE INJURY. In the event of any waterjet injury:

•Seek medical attention immediately!

•Inform the physician of the cause of the injury.

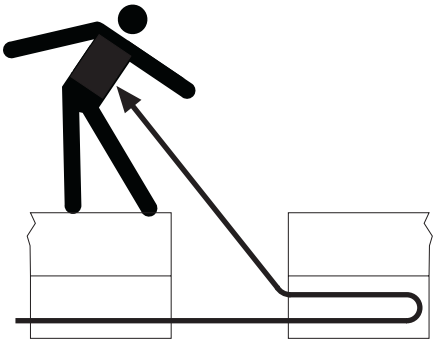
•Tell the physician what type of waterjet project was being performed at the time of the accident and the source of the water.

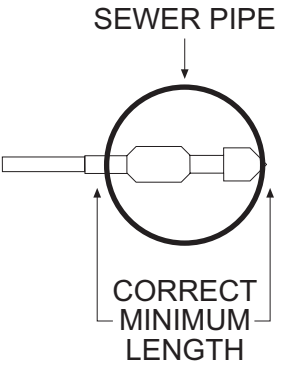
Operators using or working around high pressure water systems need to take additional precautions including specialized personal protection equipment. Additional information on high pressure water safety and this information is provided by and available as a wallet card from:

WaterJet Technology Association
906 Olive Street, Suite 1200
St Louis, MO 63101-1419
(314) 241-1445
fax (314) 241-1449
e-mail: wjta@wjta.org
website: www.wjta.org

- Use the handgun wash-down system for final equipment and job-site clean-ups or cleaning debris build-ups on the inside of body.
- The water handgun operates at high pressure. Never point the water handgun at yourself or others.
- Always bleed pressure from the water handgun before disconnection from high pressure connection.

When setting up for rodding operations, use the appropriate guide fin and hose guard (tiger tail) to prevent the nozzle form 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





OAL0630

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.

⚠ WARNING

OW0021

Out of control hose.

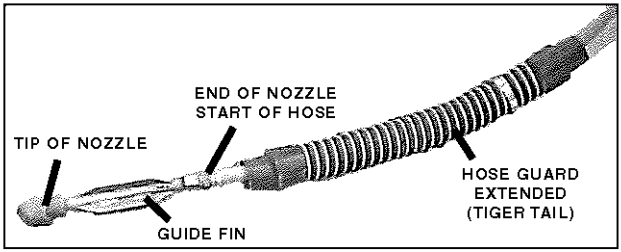
Use of improper fittings or use out of sewer pipe can cause violent loss of control of rodder hose.

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 of the hose, and violent movement of the hose and fittings or high pressure can cause severe injury or death.

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 industrial 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
(Web) http://www.wastec.org



OAL0640

⚠ WARNING

OW0021

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 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).

Vacuum

An injury caused by vacuum can be serious. The vacuum must be stopped as quickly as possible at any sign of danger. Seek medical attention immediately.

- Keep vacuum tools and hoses away from face and body. Concentrated vacuum on the body, such as through a hose end, can result in serious injury or death.
- Do not attach hose, pipe or accessories with the vacuum on. The vacuum can trap fingers, hands and feet with enough force and impact to crush or cut.
- Do not use a bare open hose end for vacuuming. A variety of hose and attachments are available to keep the operator clear of the hose opening.

Chemical Hazards

Hydraulic Fluid

OW0950

- **DO NOT** use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks. Wear appropriate equipment to protect yourself from spraying fluid. If fluid is injected into the skin seek medical attention immediately.
- Stop engine, let the hydraulic oil cool, and relieve trapped pressure before loosening any hydraulic fitting. Hydraulic oil is under enough pressure that it can penetrate the skin.
- **DO NOT** attempt to repair or tighten any hydraulic hoses or fittings while the engine is running or when the hydraulic system is pressurized.

Sewer Gas Hazard

- Do not smoke or have lighted materials in or around sewer lines, drains or catch basins.

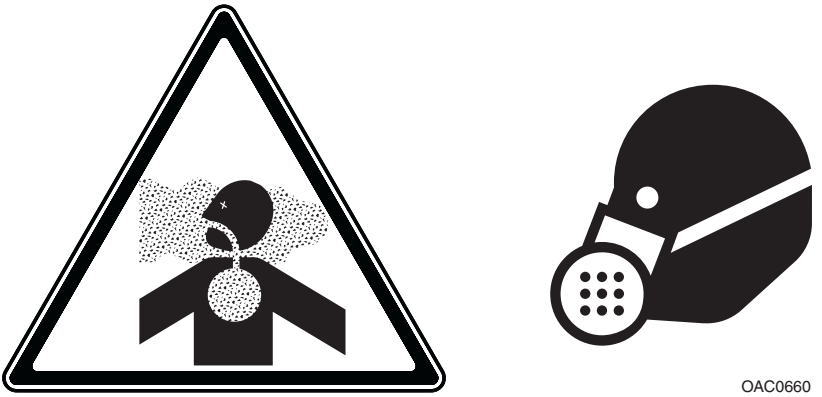
Chemical Waste Hazard

- Storm drains, catch basins and sewers may contain harmful chemicals. 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.

Biological Hazards

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

Dust Hazard



OAC0660

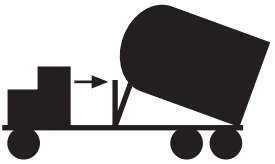
- Repeated or substantial breathing of hazardous dusts, including crystalline silica, could cause fatal or serious respiratory disease including silicosis. Concrete, masonry, many types of rock, and various other materials contain silica sand. California lists respirable crystalline silica as a substance known to cause cancer. Operation of this equipment under certain conditions may generate airborne dust particles that could contain crystalline silica. In those conditions personal protective equipment including an appropriate respirator must be used. If excessive dust is generated, a dust collection or suppression system should also be used during operation.

Confined Spaces Hazard

Follow all requirements for confined space when servicing. All debris body, large water body and vessals 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.

1.4 SUPPORT SYSTEMS

Body Support



OAN0070

When maintenance is performed that requires working under a raised body, the raised EMPTY body must be supported by the body support stands provided. These are supports only; not lifting devices. They must be used in conjunction with the hoist cylinder, not in place of.

Never support a loaded body with the body supports. Never try to remove a hoist cylinder, leaving the body supported by the stands. To use the body support stands:

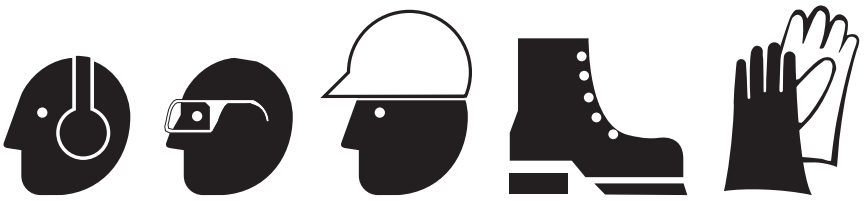
1. Raise the debris body until there is enough room for the support stands to be turned into place. See page 2-15 for details.
2. Turn the handle of the body support stand counterclockwise until it is in the fully upright position.
3. Lower the debris body until the support stands slide into the support receptacle.

Rear Door Support

When maintenance or cleaning is to be done inside a body or on the rear door that requires it to remain open, use the rear door support provided.

1. Open tailgate. See page 2-15 for details.
2. Unpin the support and let it fall into place.
3. Lower the tailgate until the support slides into the tailgate support receptacle.

1.5 PERSONAL PROTECTION EQUIPMENT



OAL0560

Wear all the protective clothing and personal safety devices issued to you or called for by job conditions. You may need:

- Hard hat
- Safety shoes
- Safety glasses, goggles or face shield
- Heavy gloves (chemical resistant)
- Hearing protection
- Reflective clothing
- Wet weather gear
- Respirator or filter mask

Wear adequate clothing for the job conditions.

Always know where to get assistance in case of an emergency. Know where to find and how to use a first aid kit and fire extinguisher/fire suppression system.

SECTION 2 - PRE-OPERATION AND CONTROLS

2.1 PRE-OPERATION CHECKS & INSPECTION

Note: *Complete all required maintenance before operating unit.*

OW0021

FALL HAZARD: Use extreme caution when checking items beyond your normal reach. Use an approved ladder. Failure to comply could result in death or serious injury.

Pre-operation checks & inspections must be performed at beginning of each work shift or at each change of operator. **Contact your local Division of Motor Vehicles for a list of Pre-trip inspections that are recommended in the Commercial Driver's License (CDL) Manual. These inspections should be performed before the inspections on the following pages.**

1. Ensure all Safety decals are legible and in place. Clean or replace as required.
2. Before removing filler caps or fill plugs, wipe all dirt and grease away from the ports. If dirt enters these ports, it can severely reduce component life.
3. Check all fluid levels and refill as needed.

If service or repairs are required, place "Do Not Operate" tag on cab control box ignition, auxiliary engine control panel and steering wheel of vehicle and remove keys.

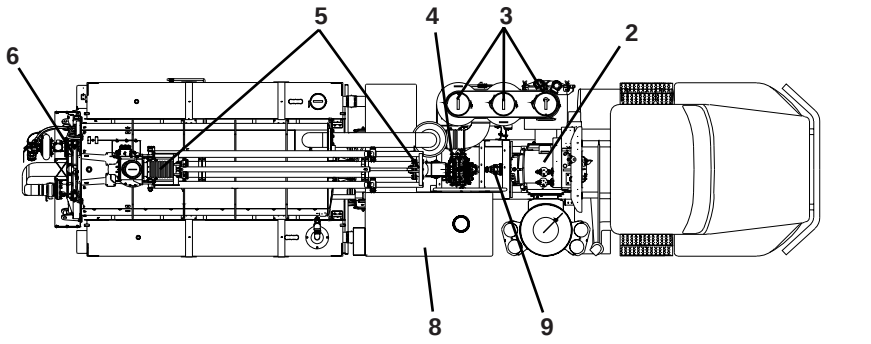
2.2 WALK-AROUND INSPECTION

Note: *Complete all required maintenance before operating unit.*

OW0021

FALL HAZARD: Use extreme caution when checking items beyond your normal reach. Use an approved ladder. Failure to comply could result in death or serious injury.

Walk around inspection must be performed at beginning of each work shift or at each change of operator.



Begin your walk-around inspection at item 1 as noted below. Continue to your right, checking each item in sequence. **Be sure to check all steps below while parked on level ground with all cylinders in their retracted position.**

INSPECTION NOTE: In addition to any other criteria mentioned, on all components:

- Ensure that there are no loose or missing parts and that all parts are securely fastened.
- Check for visible leaks and excessive wear.
- Inspect all structural members for cracks, excessive corrosion and other damage.

1. Hose Reel - (front or rear mounted if equipped) **NOT SHOWN**

- Check hose reel gear box oil level.
- Grease hose reel lube points.
- Check conditions of pins and clamps. Ensure clamps are tight and pins are in good condition.

2. Blower -

- Check blower oil level. Be sure to check the level on all sight glasses.

3. Cyclonic Separator - (Air/Water Separator)

- Check top bins and side bins for debris build-up and clean.

4. Transfer Case -

- Check transfer case oil level. Be sure to check level on sight glass.

5. Boom - (front or rear mounted)

- Grease boom lube points.

6. Tailgate -

- Grease tailgate lube points.

7. Hydraulic Power Pack - (front or rear mounted if equipped) **NOT SHOWN**

- Check oil level on hose reel hydraulic power pack.

8. Water Pump -

- Check water pump oil level.
- Check water pump screen for build-up and clean or replace as required.

9. Blower Driveline -

- Grease blower shaft lube points.

10. Hydraulic Tank -

- Check hydraulic tank oil level. Tank sight glass should be half full when cold.

11. Hosing - (not shown)

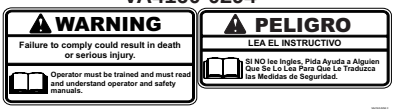
- Check all hydraulic and water hosing for leaks.

2.3 SAFETY DECALS

Ensure all **DANGER**, **WARNING**, **CAUTION** and instructional decals are legible and in place. Clean and replace as required.

Decals

VA4160-0294



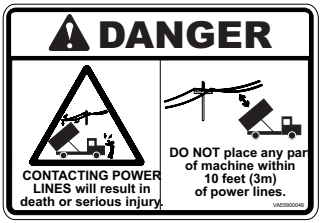
VA55900056

VA55900063

8050-9013

VA4160-0298A

VA55900046



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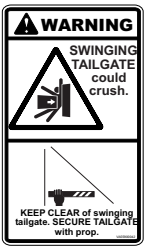

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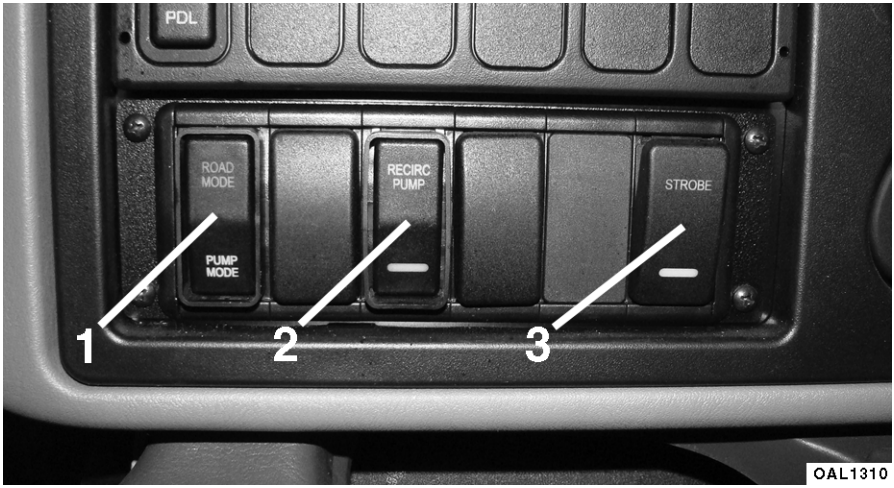
2.4 CONTROLS & INDICATORS

Cab Control Box

With Digital Controls

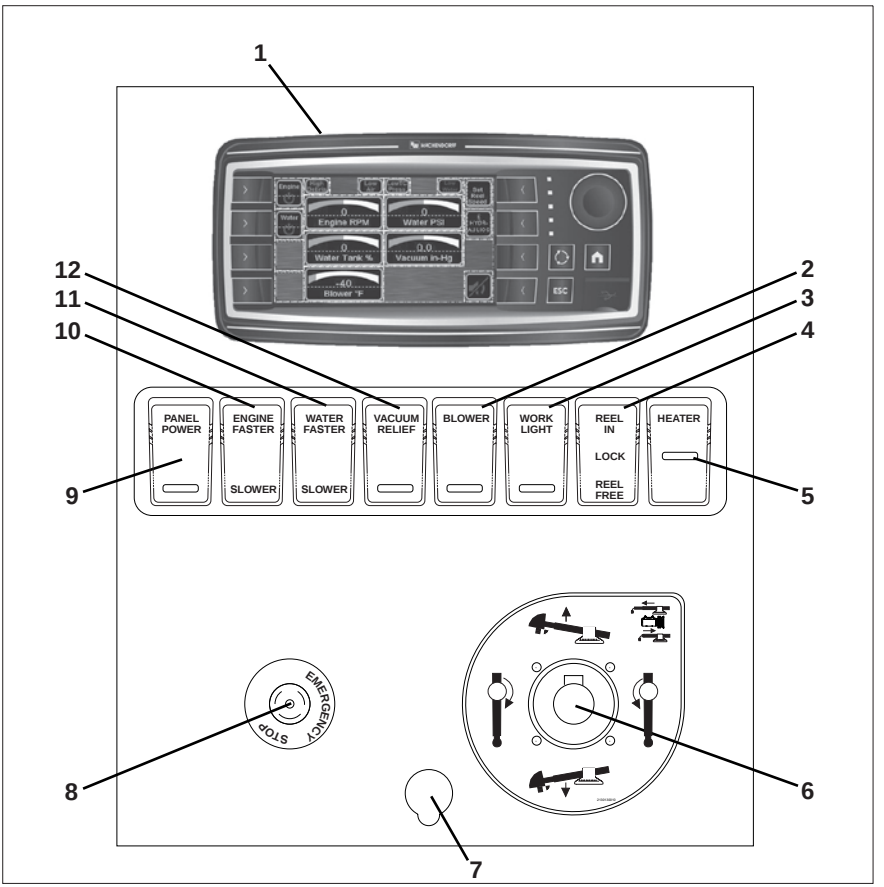


NOTE: *Some controls may be optional. Check to see which controls your unit is equipped with.*

1. Pump/Road Mode Switch: Selects either pump mode or road mode. To select “PUMP MODE”, press the bottom of switch. To select “ROAD MODE”, press the top of switch.
2. Cold Weather Recirculation Switch: Activates/deactivates the cold weather recirculation system. To activate the cold weather recirculation system, press the top of switch. The recirc pump indicator light on the bottom of the switch will illuminate indicating that the system is active. To deactivate the cold weather recirculation system, press the bottom of switch.
3. Strobe Switch: Activates/deactivates the strobe light system. To activate the strobe light system, press the top of switch. The strobe indicator light on the bottom of the switch will illuminate indicating that the system is active. To deactivate the strobe light system, press the bottom of switch.

Hose Reel Controls

Main Digital Controls



OAR0790

NOTE: *Some controls may be optional. Check to see which controls your unit is equipped with.*

1. Electronic Hose Reel Control Box: Activates various functions for the hose reel and boom. See Page 2-8.

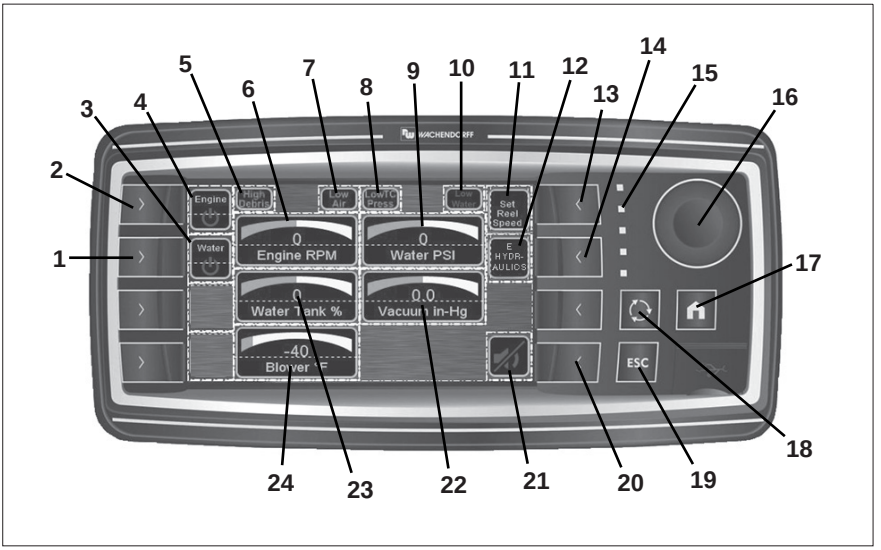
2. Blower Mode Selector Switch: Engages/disengages blower. To engage blower, press top of switch. The blower indicator light on the bottom of the switch will illuminate indicating that the power is on.To disengage blower, press top of switch.

3. Work Light Switch: Activates/deactivates work lights. To activate work lights, press top of switch. The work light indicator light on the bottom of the switch will

illuminate indicating that the lights are active.To deactivate work lights, press bottom of switch.

4. Reel In/Lock/Free Switch: Switch used to reel in/out and lock the hose reel. Press top of switch to pay in. Press bottom of switch to free the hose reel in order to manually pay out. Press switch to neutral position to lock the hose reel.
5. Heater Switch: Activates/deactivates cabinet heating system. To activate heating system, press top of switch. The heat system indicator light in the middle of the switch will illuminate indicating that the heat system is active.To deactivate heat system, press bottom of switch.
6. Boom Joystick: Controls boom functions. See Page 2-10.
7. Pendant Plug-In: Receptacle for plugging in the pendant used as a alternative to the joysticks.
8. Emergency Stop Return to Idle Button: Button controlling the stop of all functions of the unit and to bring the engine to idle. Push button to deactivate all functions. Twist button to reset emergency stop button to reactivate functions. Button may be located on another part of the control box. Check to see which controls your unit is equipped with.
9. Panel Power Switch: Activates/deactivates power to panel. To activate panel, press top of switch. The panel power indicator light on the bottom of the switch will illuminate indicating that the power is on.To deactivate panel, press bottom of switch.
10. Engine Faster/Slower: Switch for controlling the increase/decrease of the engine throttle. Press and hold top of switch to slowly increase the engine rpm's. Press and hold bottom of switch to slowly decrease the engine rpm's.
11. Water Faster/Slower: Switch for controlling the increase/decrease of the water pump rpm's and water pressure. Press and hold top of switch to slowly increase the water pump rpm's and water pressure. Press and hold bottom of switch to slowly decrease the water pump rpm's and water pressure.
12. Vacuum Relief Switch: Open/Closed switch for the vacuum relief function. Press top of switch to activate vacuum relief. Press top of switch to deactivate vacuum relief.

Digital Hose Reel Control Box



OAR0800

NOTE: *Some controls may be optional. Check to see which controls your unit is equipped with.*

1. Water Pump Push-button: Activates/deactivates the water pump controls. Press Push-button to activate the water pump controls. Water indicator light **(5)** will illuminate indicating the system is active. Press push-button to deactivate the water pump.
2. Engine Push-button: Activates/deactivates engine controls. Press Push-button to activate the engine controls. Engine indicator light **(6)** will illuminate indicating the engine controls are active. Press push-button to bring engine to idle.
3. Water Indicator: Indicator light will illuminate when water system is activated.
4. Engine Indicator: Indicator light will illuminate when engine controls are activated.
5. High Debris Indicator: Indicator light will illuminate when debris tank needs emptied.
6. Tachometer: Indicates engine rpm.
7. Low Air Indicator: Indicator light will illuminate when air system is low.
8. Low TC Pressure Indicator: Indicator light will illuminate when transfer case pressure is low.
9. Water Pressure Gauge: Indicates water pressure psi.
10. Low Water Indicator: Indicator light will illuminate when water level in tanks fall below preset level.

11. Set Reel Speed Indicator: Label for indication of set reel speed Push-button position.

12. Emergency Hydraulics Indicator: Label for indication of emergency hydraulics Push-button position.

13. Set Reel Speed Push-button: Activates the set reel speed screen. Press Push-button to open the set reel speed screen. Use Rheostat Knob **(16)** to increase/ decrease speed in small increments. Press Rheostat Knob to make the set reel speed screen go away.

14. Emergency Hydraulics Push-button: Activates the emergency hydraulic system. Press Push-button to activate the emergency hydraulics. Emergency hydraulics indicator light **(12)** will illuminate indicating the hydraulics are active. Press push-button to deactivate the emergency hydraulics.

15. Status Light Bar: Indicator lights used to show status of operations. First light indicates light sensor for dimming and brightening of screen. Second light indicates power to display. Third light indicates usb has been connected and is reading info. USB port is located on the back of the control box. Fourth light is not used. Fifth light flashes red when any of the alerts **(7, 9, 10 & 12)** are active.

16. Rheostat Knob: Rheostat dial for increasing/decreasing engine rpm's, water pump rpm's, water pressure and vacuum level in small increments. Turn the rheostat clockwise to increase. Turn switch counterclockwise to decrease. Press Rheostat Knob to make the control screens go away.

17. Home Push-button: Returns screen from any position to the home screen **(screen displayed on previous page)**. Press Push-button to return to the home screen.

18. Function Push-button: Accesses the optional function screen.

19. Escape Push-button: Closes any screen that may be open to what was previously displayed. Press Push-button to escape the currently opened screen.

20. Audio Alarm Push-button: Mute/un-mute the audio alarm system. Press Push-button to mute the audio alarm system. Audio alarm indicator light **(21)** will illuminate indicating the system is muted. Press push-button to un-mute the audio alarm system.

21. Audio Alarm Indicator: Indicator light will illuminate when audio alarm system is muted.

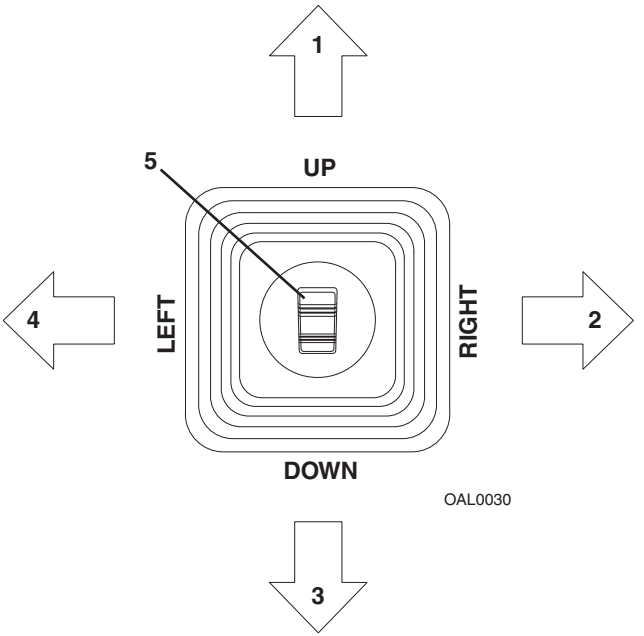
22. Vacuum Gauge: Indicates vacuum (negative pressure) level.

23. Water Tank Level Gauge: Indicates water tank percentage level.

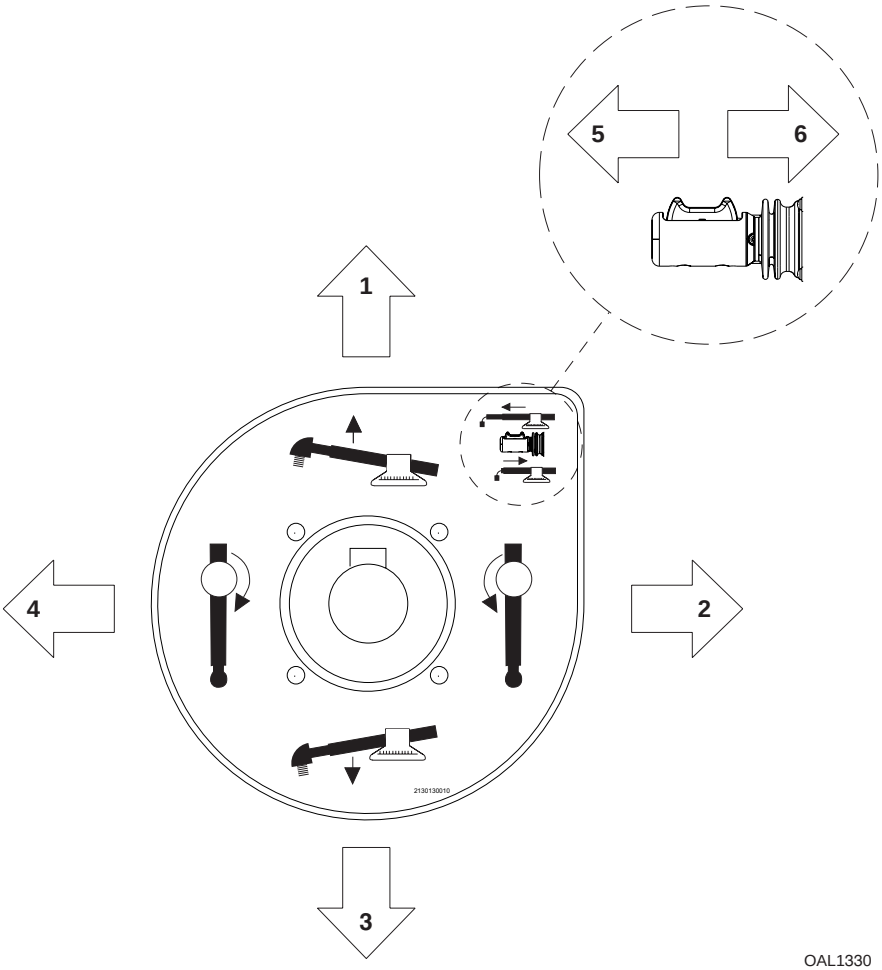
24. Blower Temperature Gauge: Indicates blower temperature. If your unit is equipped with the Vacuum Relief option, it will activate if blower temperature rises above factory preset temperature if unit is equipped with the option.

Boom Joysticks

NOTE: *There are multiple joysticks available for the AllExcavate units. Check to see which controls your unit is equipped with.*



1. Raise Boom: Move joystick up to raise boom.
2. Boom Right: Move joystick right to swing boom right.
3. Lower Boom: Move joystick down to lower boom.
4. Boom Left: Move joystick left to swing boom left.
5. Boom Extend/Retract: Press and hold button either up or down to extend/retract boom.

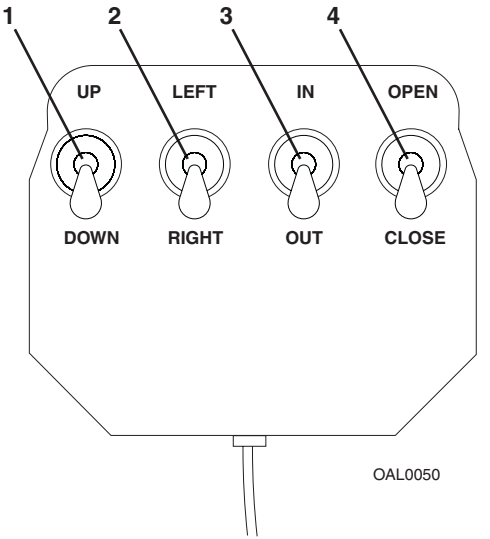


OAL1330

1. Raise Boom: Move joystick up to raise boom. This is a proportional function.
2. Boom Right: Move joystick right to swing boom right. This is a proportional function.
3. Lower Boom: Move joystick down to lower boom. This is a proportional function.
4. Boom Left: Move joystick left to swing boom left. This is a proportional function.
5. Boom Extend: Press and hold button closest to you to extend boom. This is a proportional function.
6. Boom Retract: Press and hold button furthest from you to retract boom. This is a proportional function.

Boom Pendants

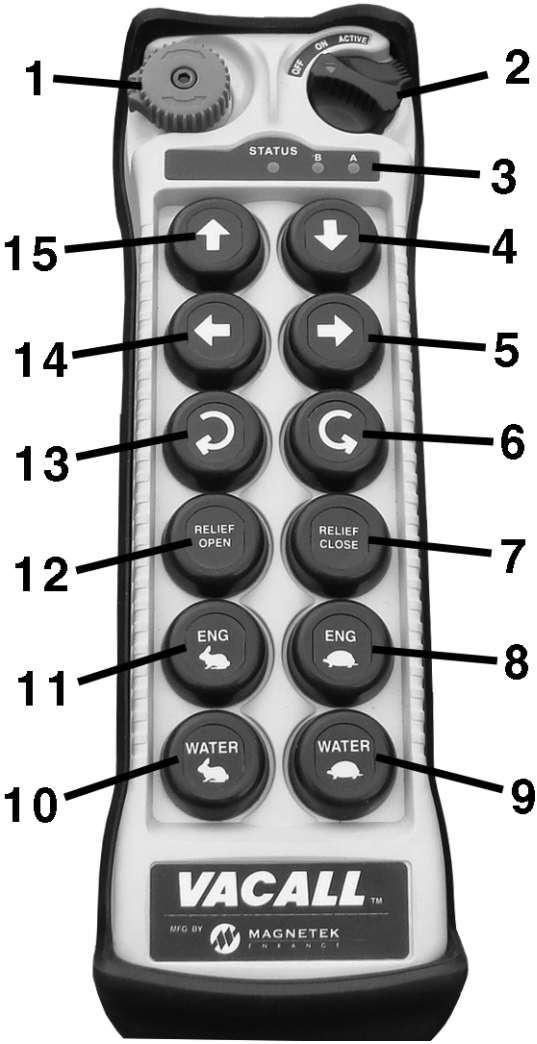
NOTE: *There are multiple pendants available for the AllExcavate units. Check to see which controls your unit is equipped with.*



1. Boom Up/Down Switch: Switch for raising/lowering the boom. Press and hold switch up to the “UP” position to raise the boom. Press and hold switch down in the “DOWN” position to lower the boom.
2. Boom Left/Right Switch: Switch for swinging the boom right/left. Press and hold switch up in the “LEFT” position to swing the boom left. Press and hold switch down in the “RIGHT” position to swing the boom right.
3. Boom In/Out Switch: Switch for extending/retracting the boom. Press and hold switch up to the “IN” position to retract the boom. Press and hold switch down to the “OUT” position to extend the boom.
4. Open/Close Switch: Switch for opening/closing the vacuum relief. Press switch up to the “OPEN” position to open the vacuum relief. Press switch down to the “CLOSE” position to close the vacuum relief.

CAUTION
OAN0340

Make sure to release boom pendant switches once the boom has been raised, lowered or swayed to it’s limits. Failure to do so may cause damage to the unit.



OAL1350

Note: If this pendant becomes disconnected, loses the signal or turns off, the emergency stop function on the hose reel control box will need to be reset before any operations continue.

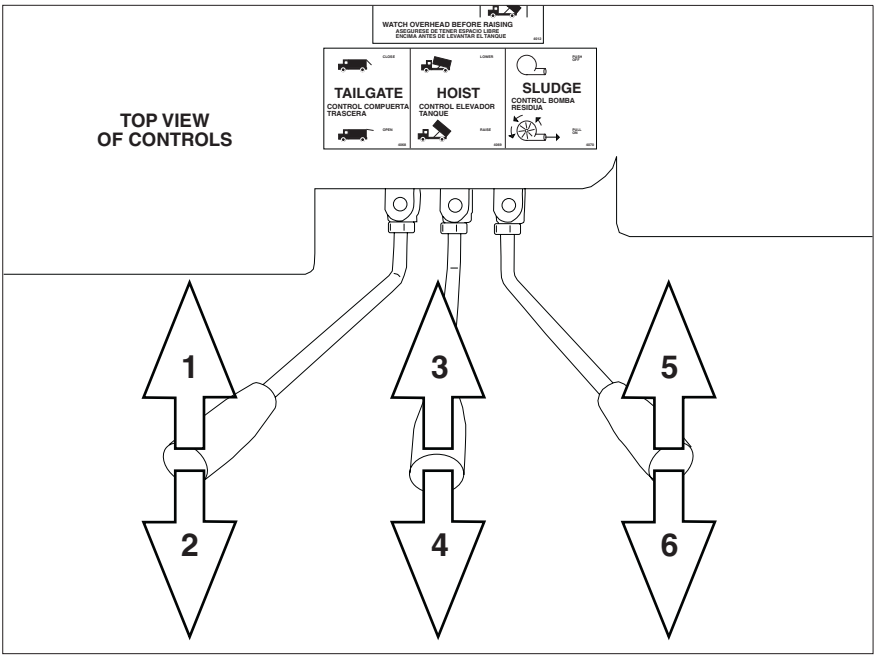
1. Emergency Stop Switch: Button for stopping all functions. Push button down to stop all functions. Twist button to reset emergency stop button to reactivate functions.
2. Power On/Off Switch: Button for powering up pendant. First, emergency stop switch **(1)** must be out. Turn switch to the “ON” position to power up the pendant. Turn to “ACTIVE” position to activate the position. Indicator light “A or B” must be illuminated for pendant to function.

3. Status Bar: Indicator lights for pendant status. Status indicator light will illuminate when power is on. A or B indicator light will illuminate when pendant is activated.
4. Boom Down Button: Button for lowering the boom. Press and hold button down to lower the boom. This button is proportional.
5. Boom Retract Button: Button for retracting the boom. Press and hold button down to retract the boom. This button is proportional.
6. Boom Right Button: Button for swinging the boom right. Press and hold button down to swing the boom right. This button is proportional.
7. Relief Close Switch: Button for closing the vacuum relief. Press and hold button down to close the vacuum relief.
8. Engine Throttle Decrease: Button for controlling the decrease of the throttle. Press and hold button down to slowly decrease the engine's rpms.
9. Water Pump Throttle Decrease: Button for controlling the decrease of the water pump rpm's and water pressure. Press and hold button down to slowly decrease the water pump rpm's and water pressure.
10. Water Pump Throttle Increase: Button for controlling the increase of the water pump rpm's and water pressure. Press and hold button down to slowly increase the water pump rpm's and water pressure.
11. Engine Throttle Increase: Button for controlling the increase of the throttle. Press and hold button down to slowly increase the engine's rpms.
12. Relief Open Switch: Button for opening the vacuum relief. Press and hold button down to open the vacuum relief.
13. Boom Left Button: Button for swinging the boom left. Press and hold button down to swing the boom left. This button is proportional.
14. Boom Extend Button: Button for extending the boom. Press and hold button down to extend the boom. This button is proportional.
15. Boom Up Button: Button for raising the boom. Press and hold button down to raise the boom. T This button is proportional.

CAUTION
OAN0340

Make sure to release boom pendant switches once the boom has been raised, lowered or swayed to it's limits. Failure to do so may cause damage to the unit.

Body Controls



OAL0060

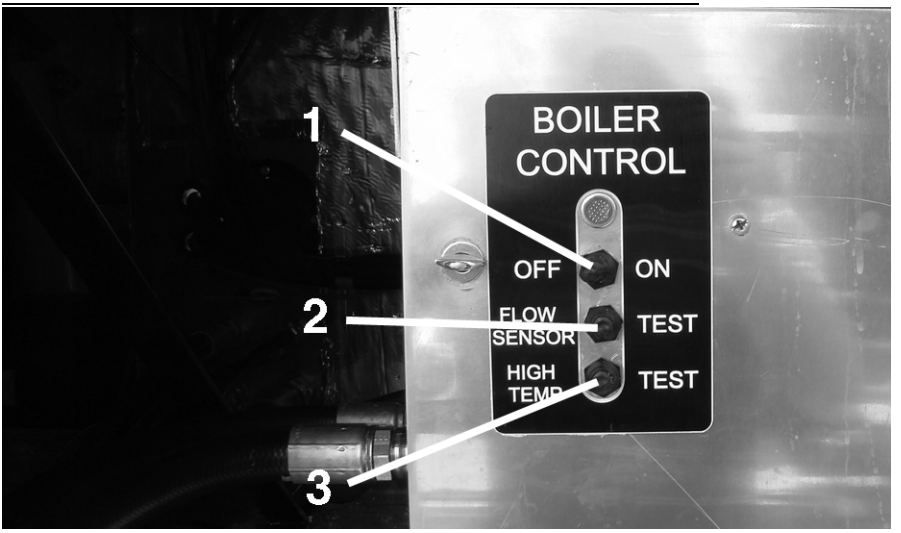
1. Tailgate Close: Push and hold lever in to lower the tailgate.
2. Tailgate Open: Pull and hold lever to open the tailgate.
3. Body Lower: Push and hold lever in to lower the body.
4. Body Raise: Pull and hold lever to raise the body.
5. Sludge Pump/Body Vibrator Off: Push lever in to deactivate the sludge pump/ body vibrator. This Control is optional and may not be available on all units.
6. Sludge Pump/Body Vibrator On: Pull lever to activate the sludge pump/body vibrator.

CAUTION

OAN0340

Make sure to release tailgate/body levers once they have been raised or lowered to their limits. Failure to do so may cause damage to the unit.

Boiler Controls & Operation



1. Boiler On/Off Switch: Controls the activation of the boiler. Press switch to the right to activate the boiler system. Press switch to the left to deactivate the boiler system.
2. Flow Sensor Switch: Diagnostic tool for overriding the flow sensor. If the boiler does not come on when water is flowing through the system, press switch to "TEST" to try to override the flow sensor. If the boiler begins operating, then the flow sensor needs replaced.
3. High Temp Switch: Diagnostic tool for overriding the high temp sensor. If the boiler does not come on when water is flowing through the system, press switch to "TEST" to try to override the high temp sensor. If the boiler begins operating, then the high temp sensor needs replaced.

Notes:

1. Truck must be running when boiler is turned on.
2. The boiler will only activate/operate if the water temperature is under 180°F (82°C).
3. The boiler only activates when there is water flow.
4. If equipped with cold weather recirculation system, boiler will manitain 45°F (7°C) water temperature.

CAUTION

OAN0340

Do not use flow sensor switch or high temp switch for normal operations. These are diagnostic tools for testing the sensors only. Failure to do so may cause damage to the unit.

SECTION 3 - OPERATION

3.1 ROAD MODE TO BLOWER/PUMP MODE

These are general instructions for each unit. See the placard inside the cab of your unit for details.

Automatic Transmission Shift Procedures

With Digital Controls

CAUTION

OAN0340

Read instructions before operating. Failure to follow shifting procedure may cause transfer case damage.

To begin operation.

1. Shift transmission into neutral.
2. Set parking brake.
3. Build air pressure to 100+ psi.
4. Idle engine.
5. Locate “ROAD/PUMP MODE” switch inside the cab and turn to “PUMP MODE”.
6. DO NOT engage the blower without first opening the vacuum relief. This will allow free air passage.
7. Place the transmission in drive.
8. Select engine speed with throttle control at panel.

Manual Transmission Shift Procedures

With Digital Controls

CAUTION

OAN0340

Read instructions before operating. Failure to follow shifting procedure may cause transfer case damage.

To begin operation.

1. Shift transmission into neutral.
2. Set parking brake.
3. Build air pressure to 100+ psi.
4. Idle engine.
5. Locate “ROAD/PUMP MODE” switch inside the cab and turn to “PUMP MODE”.
6. DO NOT engage the blower without first opening the vacuum relief. This will allow free air passage.
7. Place the transmission in drive.
8. Select engine speed with throttle control at panel.

3.2 WATER SYSTEM

Drain Valves

The following drain valves are located on the AllExcavate unit.

- At Water Tanks (on each tank at the bottom backside).
- At Sludge Pump if so equipped.
- At the Water Pump Cabinet (1 high pressure, 1 low pressure, 1extra).
- At the rear of unit near tailgate, (2 under tailgate).

Ball Valves

The following ball valves are located on the AllExcavate unit.

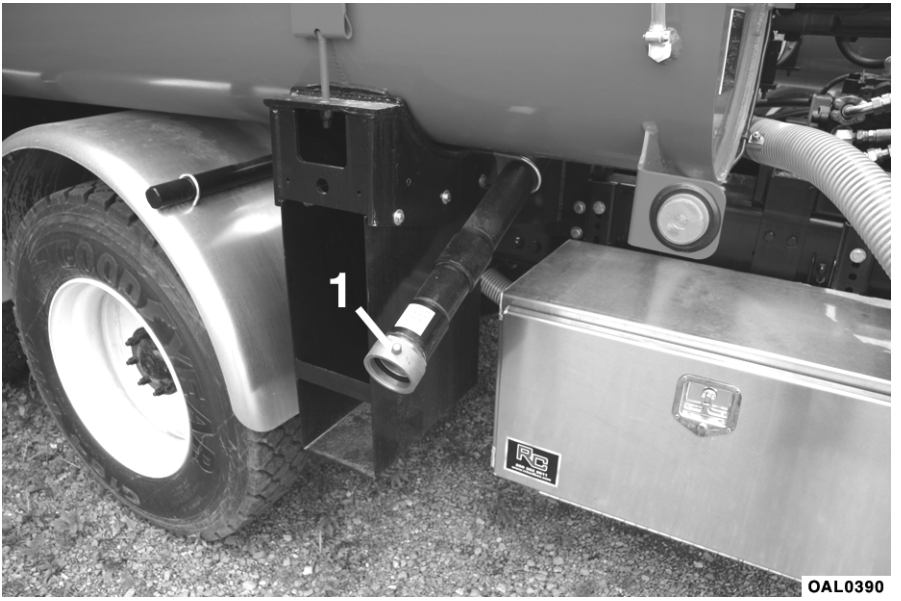
- At Water Supply Cross-Over Tube Assembly (on the right side, for pump/tank flush selection)
- At Water Supply Cross-Over Tube Assembly (on the right side, for water supply)
- At Hydro-Excavator Hose Reel, (on side, for vent/hydro-excavate selection)
- At Water Pump Cabinet, (for air purge)

AllExcavate Water System

The water is supplied to the hydro-excavation handgun from the jetting pump. Tips on the end of the handgun hose use water to excavate, clean etc.

3.3 FILLING THE WATER TANKS

Steps for filling the water tanks:



1. If your unit has a “Y” strainer at the end of the fill tube, remove the plug from the back of the “Y” strainer and remove the screen that is inside the chamber. Clean the screen monthly. Re-insert or replace the screen and reinstall the plug.
2. Connect the water tank fill tube **(1)** to a clean source of pressurized water using the supplied fill hose. If your unit is equipped with a “Y” strainer on the fill tube, turn the ball valve to the “CLOSED” position.

Note: *AllExcavate units are all equipped with a four inch air gap on top of the water tank (fill side) which is required when filling out of hydrants. If a fire hydrant is to be used as a water source, flush the hydrant until the water is visibly clear before filling.*

CAUTION
OAN0340

Some water systems operate at high pressures. Over-pressurizing the fill hose may cause it to rupture.

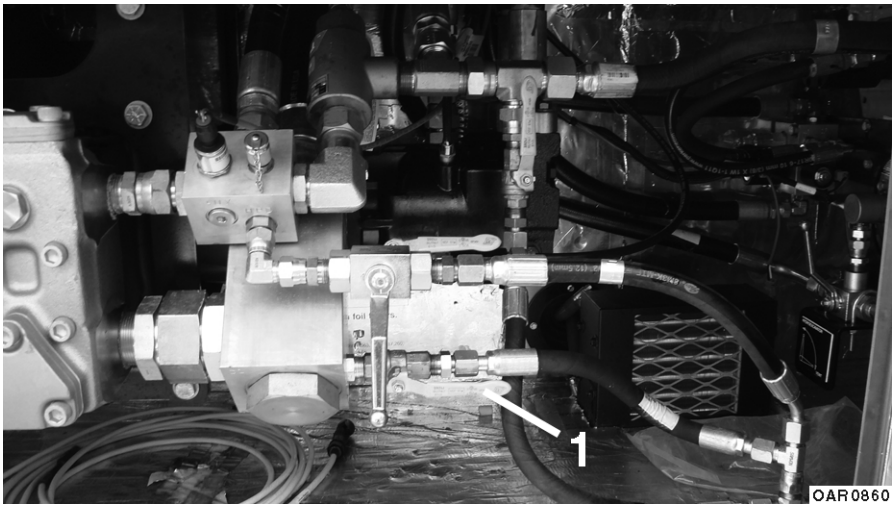
3. Slowly open the source’s valve and begin filling. Continue filling tanks until water reaches the desired level, close the water source’s valve and remove and store fill hose.**Note:** *Overfilling will not cause damage to the unit.*

CAUTION
OAN0340

Do not fill water tank or store water in the tank if the ambient outside temperature is below 32° F (0° C) unless the unit is equipped with a cold weather recirculation system. Water tank or other component damage may occur.

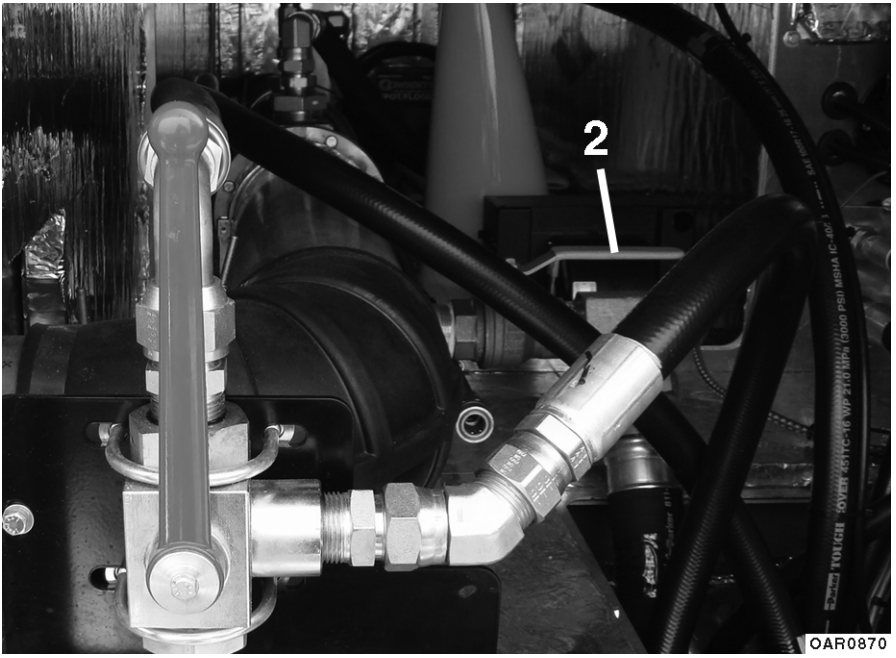
3.4 PRIMING THE JETTING PUMPS

The jetting pumps must be primed with water before activated in order to decrease the chance of damage to the jetting pumps. Make sure that the water tanks are filled before attempting this procedure.



THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

1. Turn the low pressure Jetting Pump drain valve **(1)** to the “OPEN” positions.



THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

2. Turn the main water supply ball valve **(2)** to the “OPEN” position.
3. After water runs from the low pressure Jetting Pump drain valve, turn the low pressure Jetting Pump drain valve **(1)** to the “CLOSED” position.
4. Priming is complete.

CAUTION
OAN0340

Do not activate pump until finished priming. Activation of pump before finished may cause damage to the unit and/or components.

CAUTION
OAN0340

Water system operates at high pressures.

3.5 COLD WEATHER RECIRCULATION

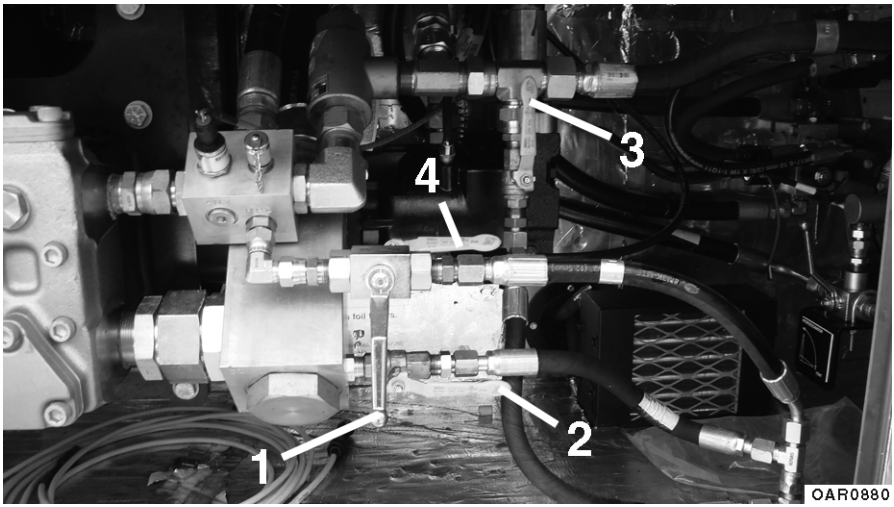
With Digital Controls

The cold weather recirculation option is used when travelling in cold weather conditions. It is used to keep the water from freezing in the water system. This system can be run from either “ROAD MODE” or “PUMP MODE”.

Activating the Cold Weather Recirculation:

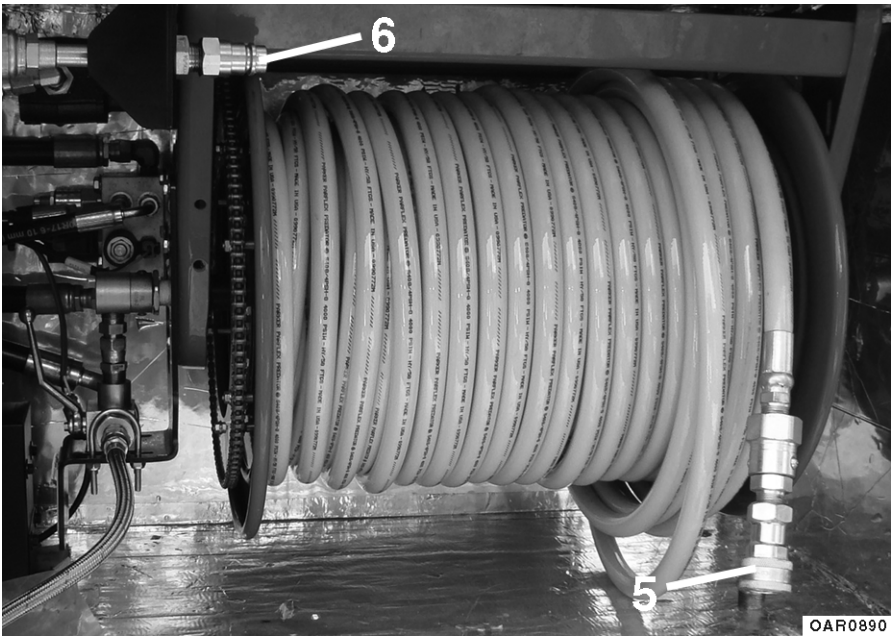
The following steps may contain optional equipment. If your unit is not equipped with those features no additional action is required.

1. Ensure the water tanks are at least half full, hose reel is in travel position and the handgun and tank flusher circuitry is entirely air purged.



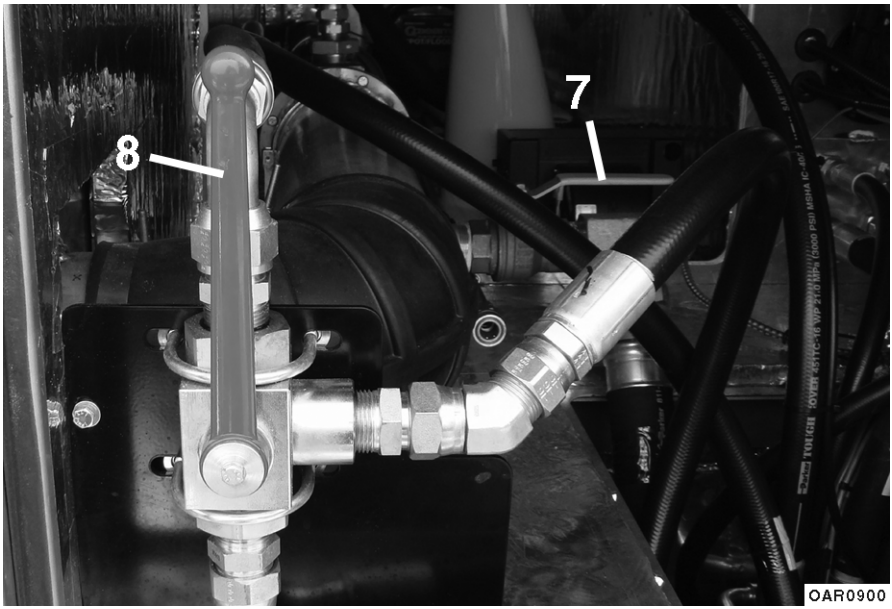
THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

2. Turn the drain valves **(1, 2 & 3)** to the “CLOSED” positions and the Air Purge ball valve **(4)** to the “CLOSED” position.



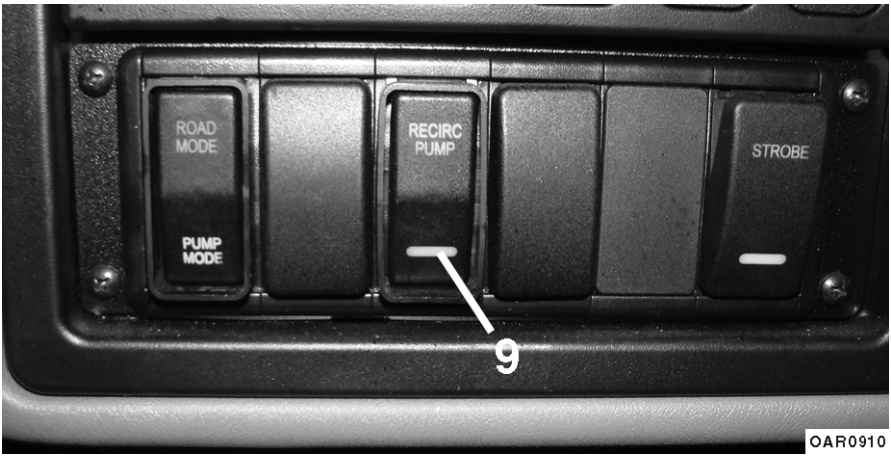
THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

3. Connect the hydro-excavator hose **(5)** to the recirculation quick disconnect **(6)**. Secure the hose and close any panels or doors.



THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

4. Make sure the Main Water Supply ball valve **(7)** is in the “OPEN” position and turn the Pump/Tank Flush ball valve **(8)** to the “PUMP” position.
5. Start the engine.



THE CAB CONTROL PANEL ON YOUR UNIT MAY NOT MATCH THE ONE PICTURED ABOVE. CHECK SECTION 2 TO SEE WHICH CAB CONTROL PANEL YOUR UNIT IS EQUIPPED WITH.

6. Inside the cab, press the top of the recirculation pump switch **(9)** up to activate the water pump. The cold weather re-circulation indicator light on the bottom of the switch will illuminate indicating that the system is active.
7. If the water needs to be at least 45°F (7°C), activate the boiler. See Page 2-16 for details.
8. The unit is now ready for travel.7

Deactivating the Cold Weather Recirculation:

1. Inside the cab, press the bottom recirculation pump switch **(9)** down to deactivate the water pump. The cold weather re-circulation indicator light on the bottom of the switch will not illuminate indicating that the system is inactive.
2. Deactivate the boiler. See Page 2-16 for details.
3. Stop the engine.
4. Disconnect the hydro-excavator hose **(5)** from the recirculation quick disconnect **(6)**.
5. Drain the water from the recirculation system by leaving the Low Pressure drain valve **(2)** and hydro-excavator hose **(5)** open for a few minutes.
6. Turn the Low Pressure drain valve **(2)** to the “CLOSED” position.

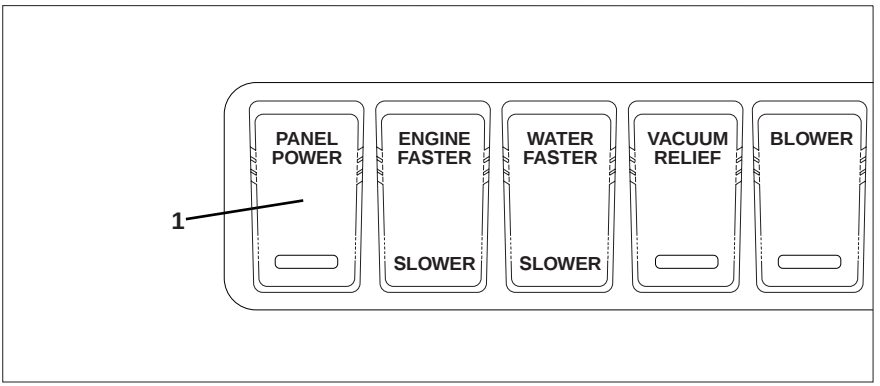
3.6 HYDRO-EXCAVATOR OPERATION

Hydro-excavation is usually used in conjunction with vacuum operations to dig while reducing the possibility of damaging sewer pipes, gas lines, etc. that may be buried under the work site.

With Digital Controls

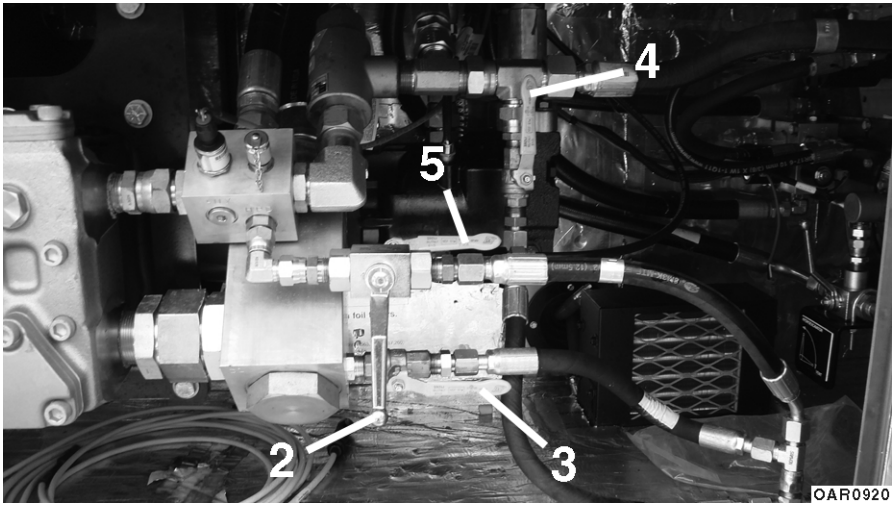
To activate the Hydro-Excavation system and operate:

1. Position the unit and hose reel for excavating operation.
2. Install the proper tip to the end of the handgun.



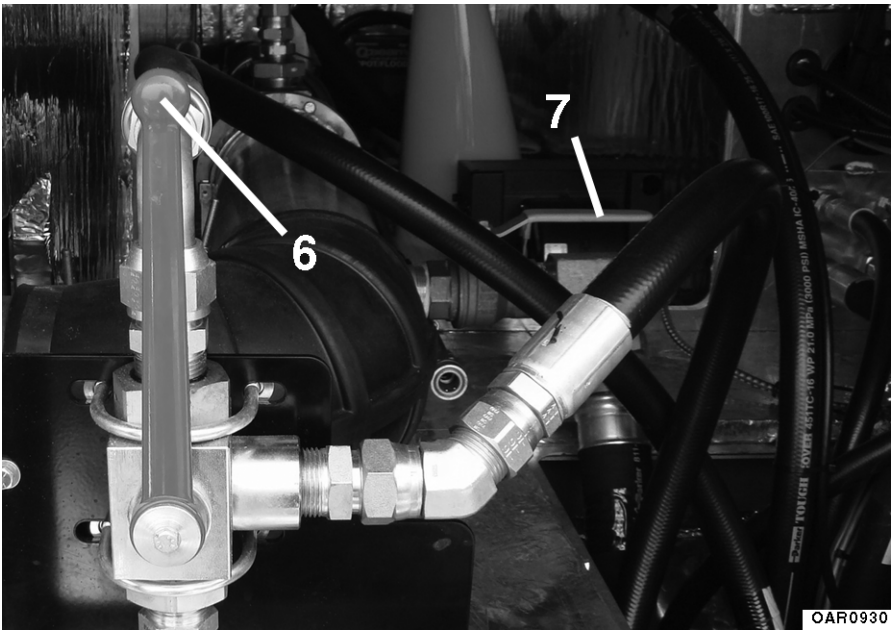
OAL1380

3. Press the top of the Power On/Off switch **(1)** up to activate the digital controls. The panel power indicator light on the bottom of the switch will illuminate indicating that the power is on.



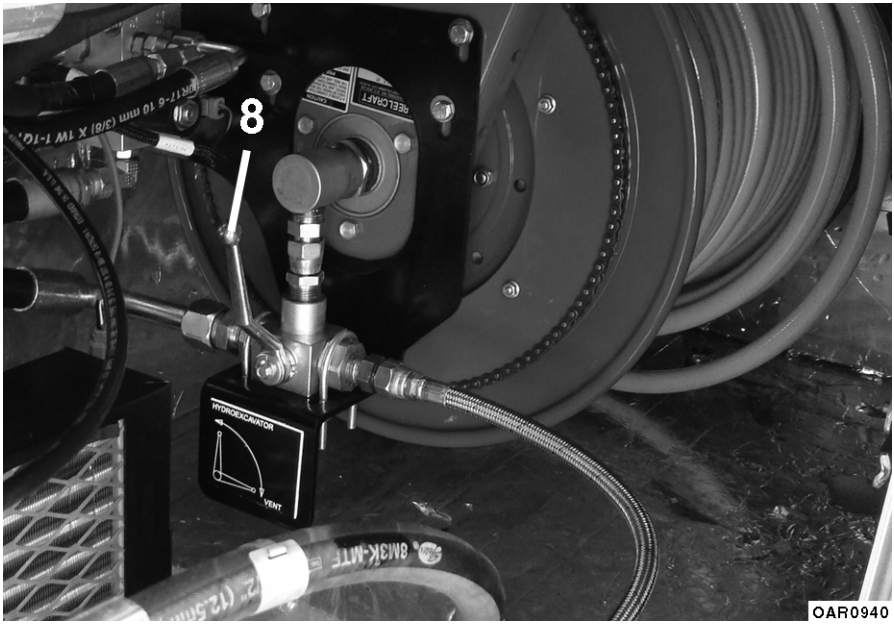
THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

4. Turn the drain valves **(2, 3 & 4)** to the “CLOSED” positions and the Air Purge ball valve **(5)** to the “CLOSED” position.



THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

5. Make sure the Main Water Supply ball valve **(6)** is in the “OPEN” position and turn the Pump/Tank Flush ball valve **(7)** to the “PUMP” position.

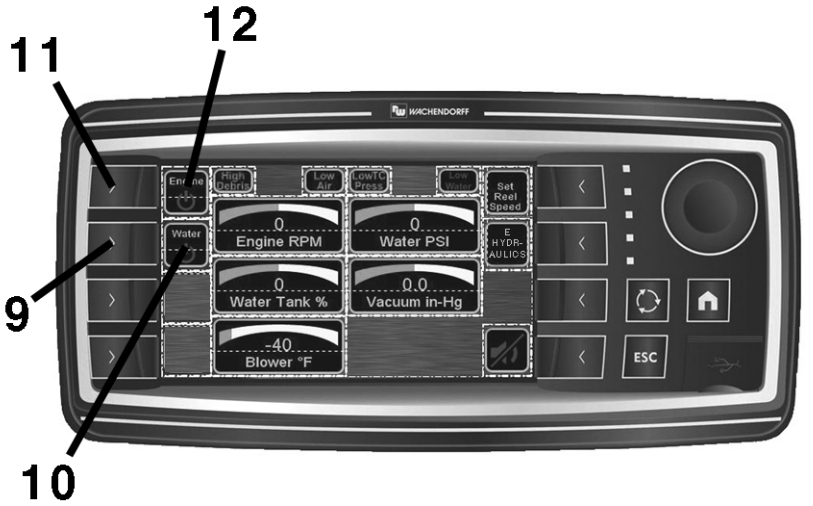


THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

6. Turn the Hydro-Excavator/Vent ball valve **(8)** to the “VENT” position in order to connect the hydro-excavator handgun. Be sure to look at the tags attached to the frame of your unit near the hydro-excavator assembly for detailed instructions.

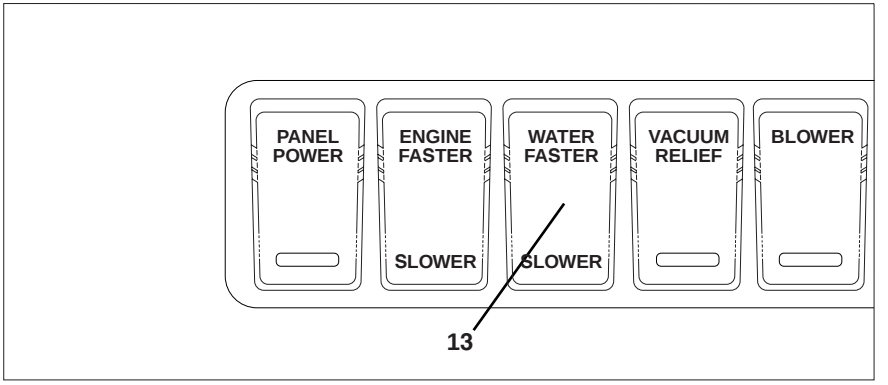
Note: Be sure to use the hydro-excavation handgun and not the regular hand gun. Hydro-excavation handguns are rated for 2000 psi while regular hand guns are only rated for 800 psi.

7. Connect the hydro-excavator handgun to the hose reel.
8. Turn the Hydro-Excavator/Vent ball valve **(8)** to the “HYDRO-EXCAVATOR” position.



OAR0950

9. Press the Water Push-button **(9)** to activate the water system. The Water Indicator **(10)** will illuminate when the systems are activated and engaged. Then, press the Engine Push-button **(11)** to activate the engine throttle controls. The Engine Indicator **(12)** will illuminate when the engine throttle controls are ready to be increased/decreased.

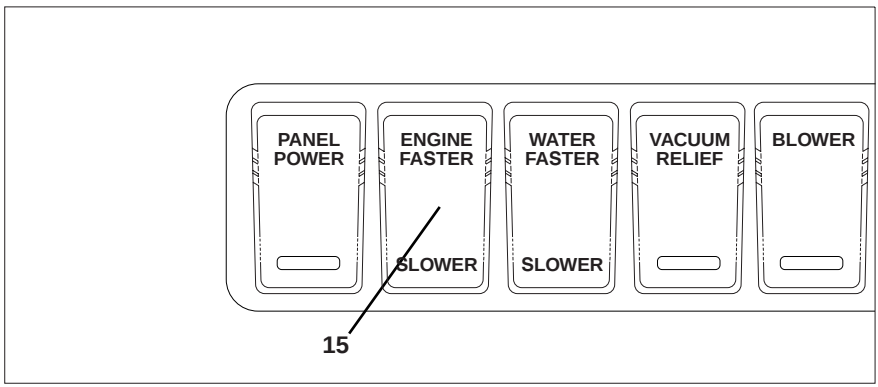


OAR0960

10. Increase the water flow coming from the jetting pump by pressing and holding the top of the Water Faster/Slower Switch **(13)** to the “FASTER” position until desired flow is reached. This will increase the water flow in increments of ten, or higher if button is held down.

OAR0970

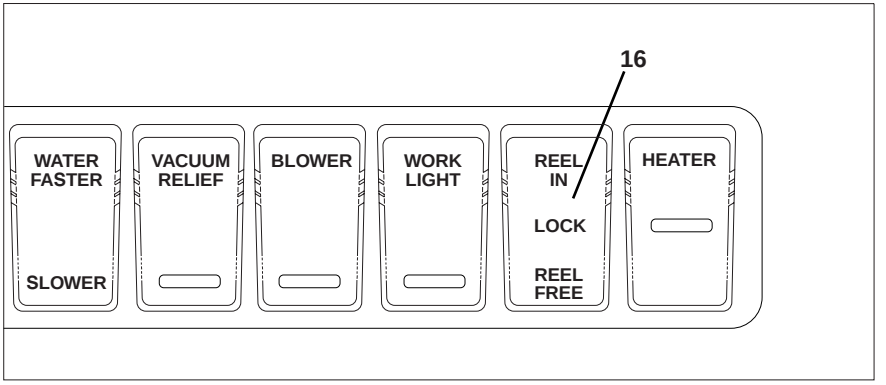
11. You can also increase the water flow coming from the jetting pump by pressing and holding the top of the Water Faster/Slower switch **(13)** to the “FASTER” position until desired flow is close and then fine tune the pressure in small increments by turning the Rheostat Knob **(14)** either clockwise or counterclockwise while the Water Pressure Screen is active on the display screen. This will increase the water flow in increments of one.



OAR0980

12. With the engine running, press and hold the top of the Engine Faster /Slower switch **(15)** to the “FAST” position to increase engine rpm’s to desired level.

13. You can also increase the engine rpm's by pressing and holding the top of the Engine Faster /Slower switch **(15)** to the "FAST" position until desired rpm level is close and then fine tune the rpm's in small increments by turning the Rheostat Knob **(14)** either clockwise or counterclockwise while the Engine RPM Screen is active on the display screen. This will increase the rpm level in increments of one.

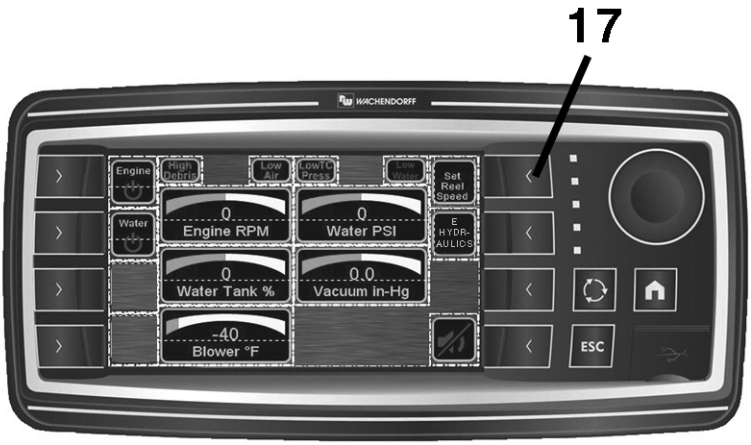


OAR0990

14. Press the bottom of the Reel In/Lock/Free switch **(16)** to the "REEL FREE" position to unlock the hose reel so that it can be manually paid out. Once the length required has been paid out, you can lock the reel from paying in or out further by pressing the switch back to the neutral or "LOCK" position.
15. If the water needs to be at least 45°F (7°C), activate the boiler. See Page 2-16 for details.

To deactivate the jetting system:

1. Press the Engine Push-button **(11)** to deactivate the engine throttle controls. This will bring the engine down to idle. The Engine Indicator **(12)** will not illuminate when the engine throttle controls are deactivated.
2. Deactivate the boiler. See Page 2-16 for details.
3. Press the Water Push-button **(9)** to disengage the water pump. The Water Indicator **(10)** will not illuminate indicating the system is inactive and disengaged.



OAR1000

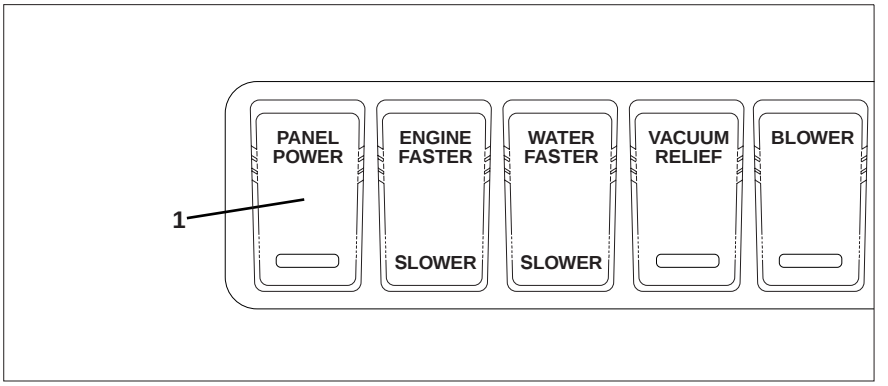
4. Set the reel speed pay in by pressing the Set Reel Speed Push-button **(17)** to access the set reel speed display. With display active, turn the Rheostat Knob **(14)** either clockwise or counterclockwise to increase or decrease the reel pay in speed.
5. Press the top of the Reel In/Lock/Free switch **(16)** to the “REEL IN” position to pay the hose in. Once the hose has been paid in, you can lock the reel from paying in or out further by pressing the switch back to the neutral or “LOCK” position.

3.7 VACUUMING

Vacuuming is usually done in conjunction with jetting.

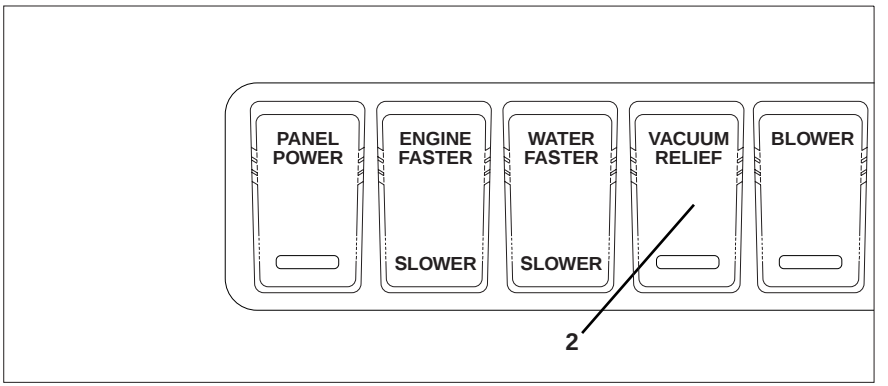
With Digital Controls

To activate and operate:



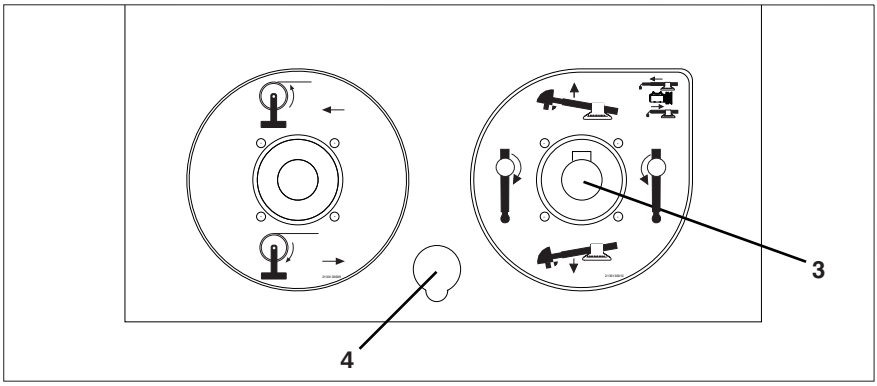
OAL1380

1. Press the top of the Power On/Off switch **(1)** up to activate the hose reel controls. The panel power indicator light on the bottom of the switch will illuminate indicating that the power is on.



OAL1440

2. Open the Vacuum Relief valve by pressing the top of the Vacuum Relief switch **(2)** up. The vacuum relief indicator light on the bottom of the switch will illuminate indicating that the relief is open.

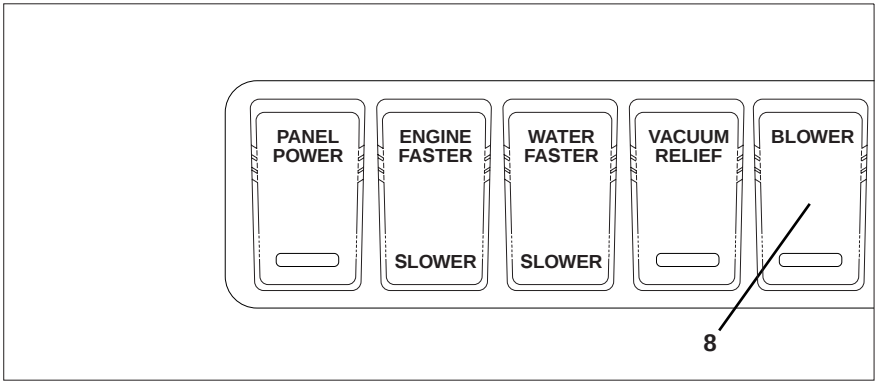


OAL1450

3. Position the boom into the sewer by using either the boom joystick **(3)** on the bottom of the hose reel control box or using the boom pendant connected to the Boom Pendant Plug-In **(4)**. See Page 2-12.

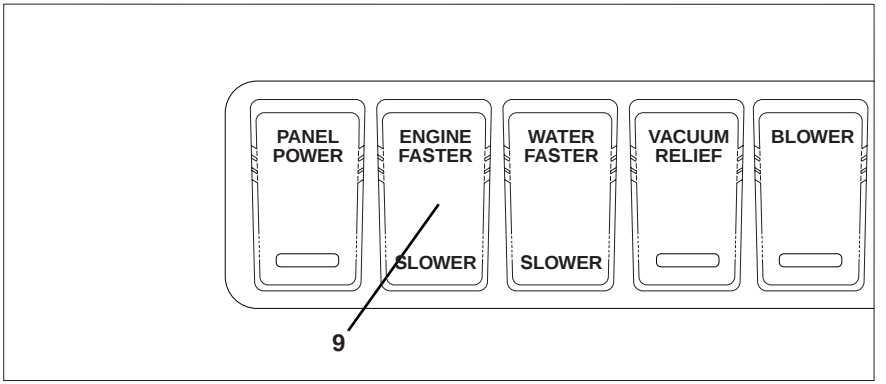
OAR1010

4. Press the Engine Push-button **(6)** to activate the engine throttle controls. The Engine Indicator **(7)** will illuminate when the engine throttle controls are ready to be increased/decreased.



OAL1560

5. Press the top of the Blower switch **(8)** up to engage the blower. The blower indicator light on the bottom of the switch will illuminate indicating that the blower is engaged.



OAL1570

With the engine running, press and hold the top of the Engine Faster /Slower switch **(9)** to the “FASTER” position to increase engine rpm’s to desired level. This increases the amount of vacuum.

OAR1020

6. You can also increase the engine rpm's by pressing and holding the top of the Engine Faster /Slower switch **(9)** to the "FASTER" position until desired rpm level is close and then fine tune the rpm's in small increments by turning the Rheostat Knob **(10)** either clockwise or counterclockwise while the engine rpm screen is active on the display screen. This will increase the rpm level in increments of one.
7. Close the Vacuum Relief valve by pressing the top of the Vacuum Relief switch **(2)** up. The vacuum relief indicator light on the bottom of the switch will not illuminate indicating that the relief is closed.
8. If something becomes lodged or can't make it through the boom intake tubes, press the top of the Vacuum Relief switch **(2)** up to activate the relief function. This can be used for emergencies pertaining to the boom as well.

To deactivate:

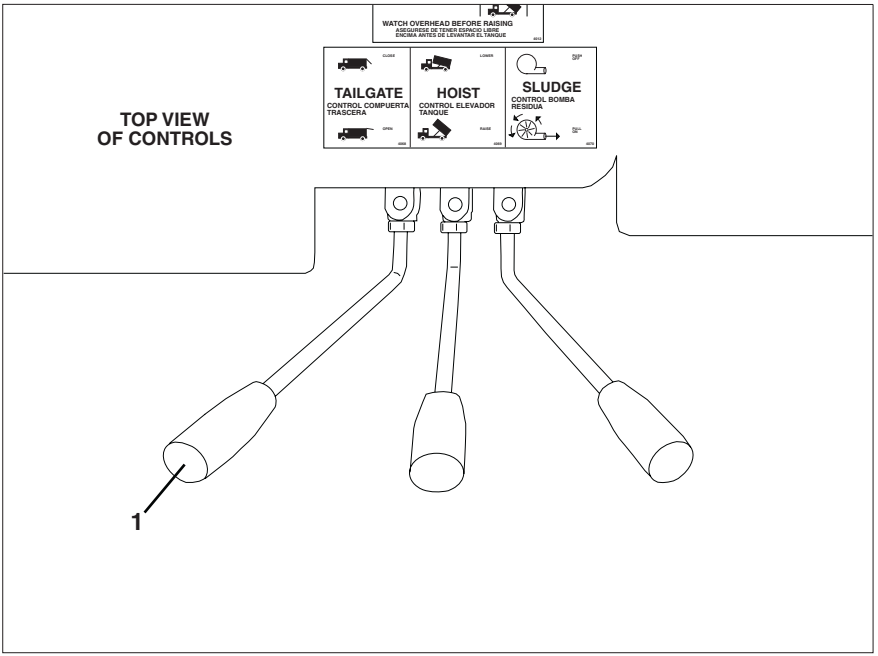
1. Press the top of the Vacuum Relief switch **(2)** up to open the relief.
2. Press the top of the Blower switch **(8)** up to disengage the blower. The blower indicator light on the bottom of the switch will not illuminate indicating that the blower is disengaged.
3. Press the Engine Push-button **(6)** to deactivate the engine throttle controls. This will bring the engine to idle. The Engine Indicator **(7)** will not illuminate when the engine throttle controls are deactivated.
4. Move the boom out of the sewer by using either the boom joystick **(3)** on the front of the hose reel control box or using the boom pendant connected to the Boom Pendant Plug-In **(4)**. See Page 2-12.
5. Press the bottom of the Power On/Off switch **(1)** down to deactivate the hose reel controls. The panel power indicator light on the bottom of the switch will not illuminate indicating that the power is off.

3.8 TANK FLUSH

The tank flush system is an option used for cleaning the debris tank. The system sprays pressurized water from the jetting pump, covering the majority of the tank, pushing most of the debris out of the open tailgate.

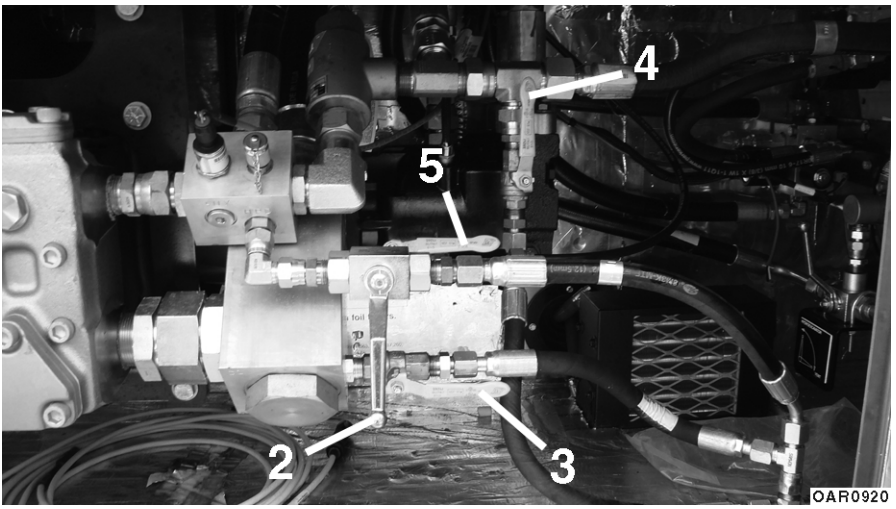
With Digital Controls

To engage the tank flush system:



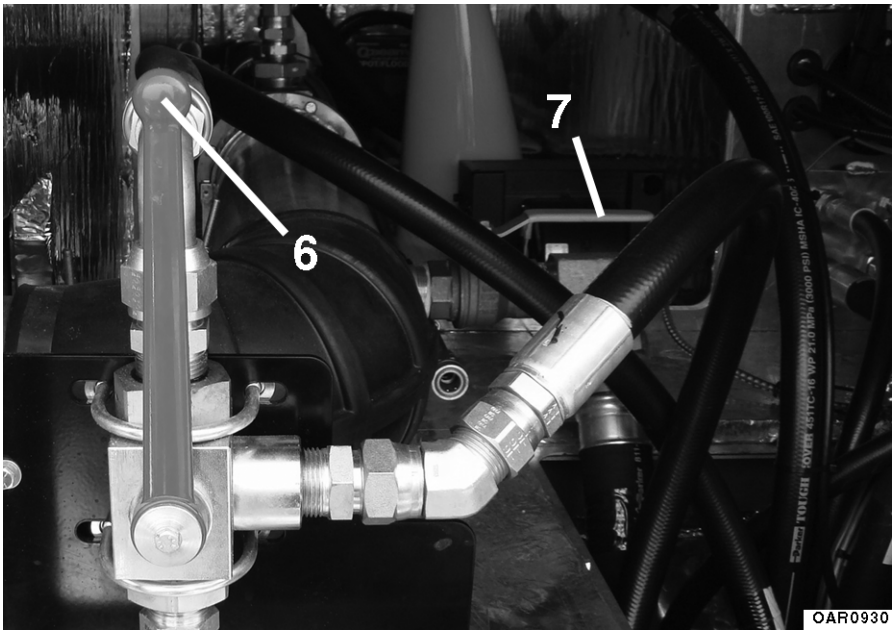
OAL0290

1. Pull and hold the Tailgate lever **(1)** “DOWN” to open the tailgate completely.
2. Secure the tailgate using the tailgate props. See Page 1-17.



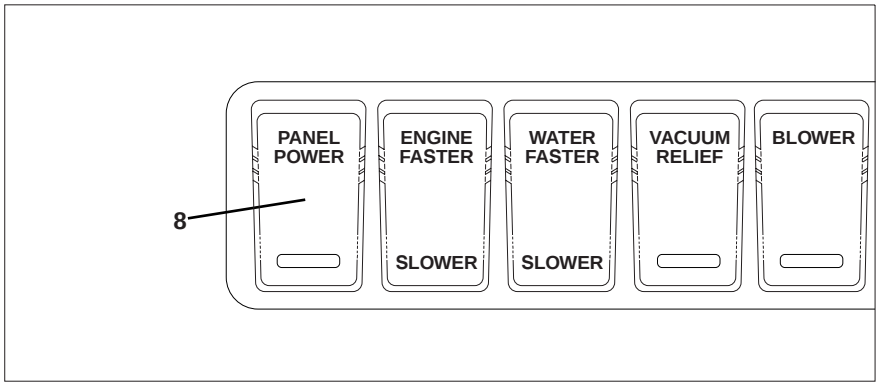
THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

3. Turn the drain valves **(2, 3 & 4)** to the “CLOSED” positions and the Air Purge ball valve **(5)** to the “CLOSED” position.

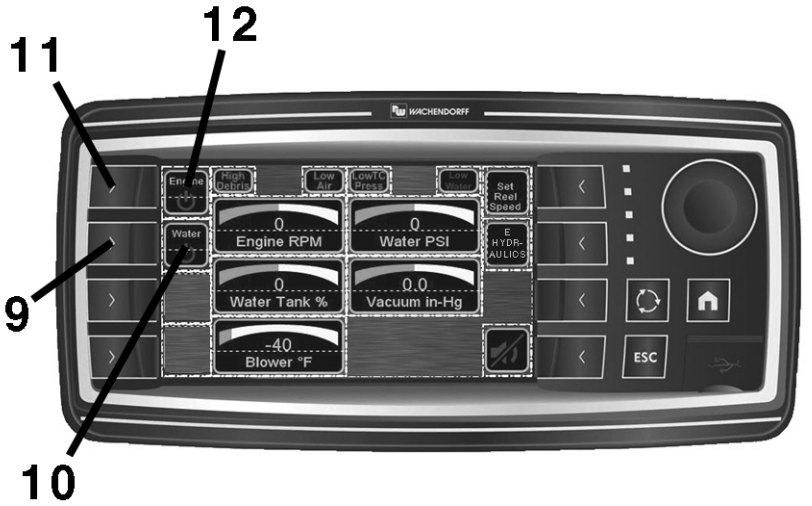


THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

4. Make sure the Main Water Supply ball valve **(6)** is in the “OPEN” position and turn the Pump/Tank Flush ball valve **(7)** to the “TANK FLUSH” position.

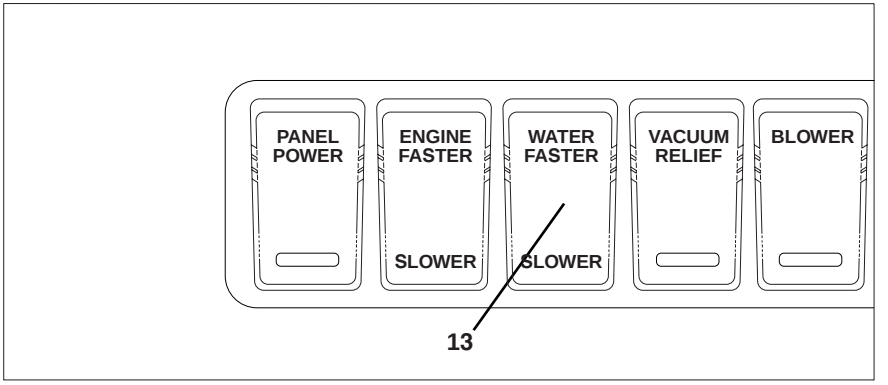


5. Press the top of the Power On/Off switch **(8)** up to activate the digital controls. The panel power indicator light on the bottom of the switch will illuminate indicating that the power is on.



OAR0950

6. Press the Water Push-button **(9)** to activate the water system. The Water Indicator **(10)** will illuminate when the systems are activated and engaged. Then, press the Engine Push-button **(11)** to activate the engine throttle controls. The Engine Indicator **(12)** will illuminate when the engine throttle controls are ready to be increased/decreased.

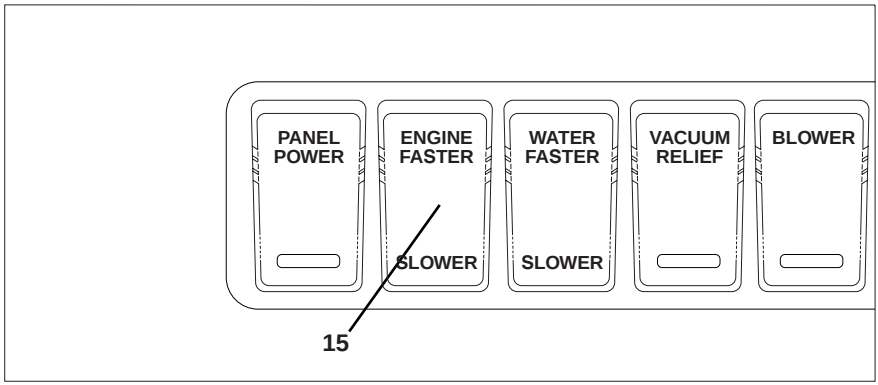


OAR0960

7. Increase the water flow coming from the jetting pump by pressing and holding the top of the Water Faster/Slower Switch **(13)** to the “FASTER” position until desired flow is reached. This will increase the water flow in increments of ten, or higher if button is held down.

OAR0970

8. You can also increase the water flow coming from the jetting pump by pressing and holding the top of the Water Faster/Slower switch **(13)** to the “FASTER” position until desired flow is close and then fine tune the pressure in small increments by turning the Rheostat Knob **(14)** either clockwise or counterclockwise while the Water Pressure Screen is active on the display screen. This will increase the water flow in increments of one.



OAR0980

9. With the engine running, press and hold the top of the Engine Faster /Slower switch **(15)** to the “FAST” position to increase engine rpm’s to desired level.

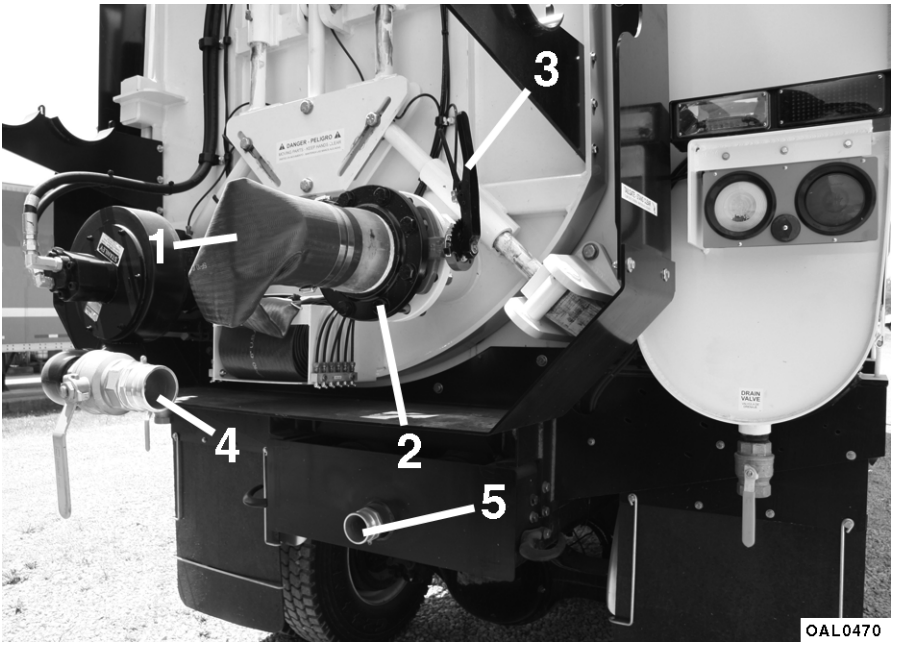
10. You can also increase the engine rpm's by pressing and holding the top of the Engine Faster /Slower switch **(15)** to the "FAST" position until desired rpm level is close and then fine tune the rpm's in small increments by turning the Rheostat Knob **(14)** either clockwise or counterclockwise while the Engine RPM Screen is active on the display screen. This will increase the rpm level in increments of one.
11. If the water needs to be at least 45°F (7°C), activate the boiler. See Page 2-16 for details.

To disengage the tank flush system:

1. Press the Engine Push-button **(11)** to deactivate the engine throttle controls. The Engine Indicator **(12)** will illuminate when the engine throttle controls are ready to be increased/decreased.
2. Deactivate the boiler. See Page 2-16 for details.
3. Press the Water Push-button **(9)** to disengage the water pump. The Water Indicator **(10)** will not illuminate when the system is deactivated and disengaged.
4. Press the bottom of the Power On/Off switch **(8)** down to deactivate the digital controls. The panel power indicator light on the bottom of the switch will not illuminate indicating that the power is off.
5. Push and hold the Tailgate lever **(1)** “UP” to close the tailgate completely.

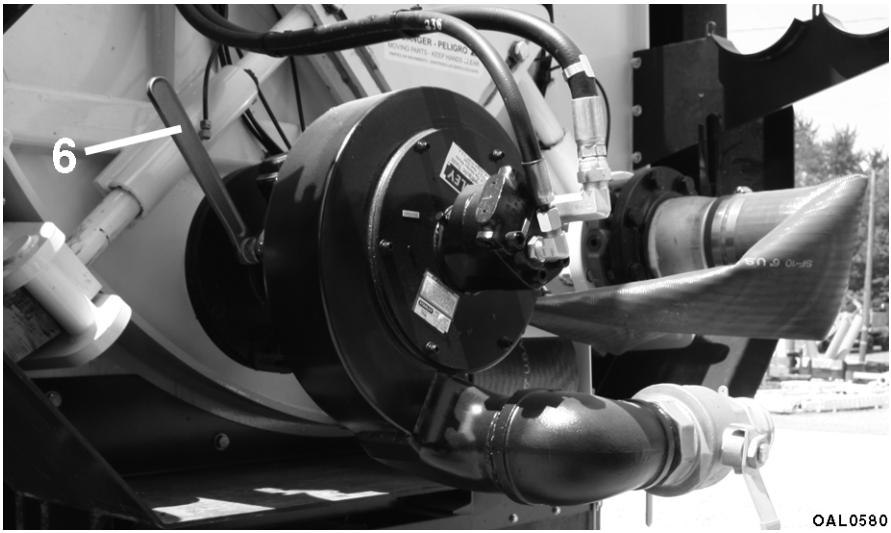
3.9 DECANTING

This function is used to drain excess water from the debris body to make more room for solid waste materials. The All usually takes in more water than solid material when vacuuming which causes the debris body to fill up before all of the material has been picked up. This function is used at the job site so that the operator doesn't have to drive to the dump site and come back for more vacuuming.

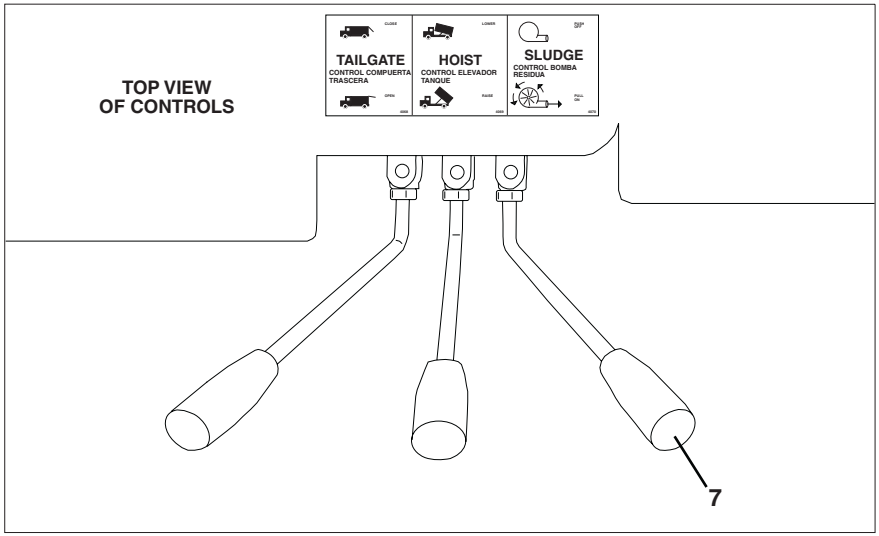


Rear Decant Steps:

1. Position the unit on flat level ground with the tailgate near the location that was vacuumed.
2. Unroll the decant lay-flat hose **(1)** on the tailgate and connect with band clamps to the port **(2)** on the right side of the tailgate. Make sure the other end is going into the same location that was vacuumed.
3. Open the butterfly valve **(3)** on the tailgate and leave open until all the water has been drained from the debris body.
4. Close the butterfly valve **(3)** and disconnect the decant lay-flat hose **(1)** from the port.
5. Connect the decant lay-flat hose **(1)** with band clamps to the ball valve **(4)** at the discharge end of the sludge pump on the left side of the tailgate if your unit is equipped with one.Make sure the other end is going into the same location that was vacuumed.



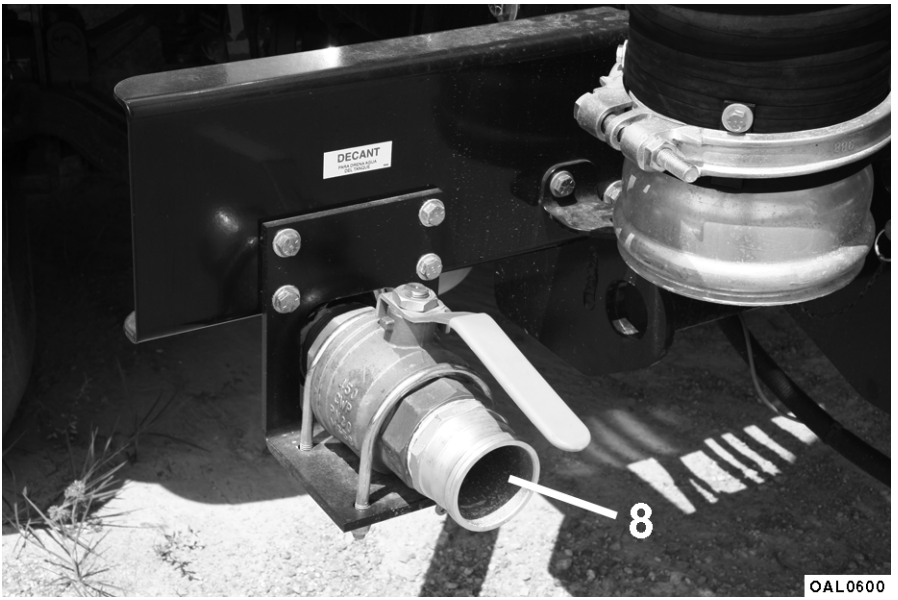
6. Open the Sludge Pump shut-off valve **(6)** on the side of the sludge pump.
7. Open the ball valve **(4)** at the discharge end of the sludge pump.



8. Activate the sludge pump by pulling the Sludge Pump lever **(7)**. When liquid has stopped flowing from the sludge pump, push the Sludge pump lever **(7)** to deactivate the sludge pump.

9. Close the Sludge Pump shut-off valve **(6)** on the side of the sludge pump.
10. Close the ball valve **(4)** at the discharge end of the sludge pump.
11. Roll up and stow the decant lay-flat hose **(1)**.
12. Continue vacuuming and repeat if necessary.

Front Decant Option Steps:



1. Position the unit on flat level ground with the decant ball valve **(8)** on the front bumper near the location that was vacuumed.
2. Connect the decant lay-flat hose **(1)** with band clamps to the ball valve **(4)** at the discharge end of the sludge pump on the left side of the tailgate. Connect the other end of the decant lay-flat to the decant port **(5)** under the tailgate.
3. Open the Sludge Pump shut-off valve **(6)** on the side of the sludge pump.
4. Open the ball valve **(4)** at the discharge end of the sludge pump.
5. Open the decant ball valve **(8)** on the front bumper.
6. Activate the sludge pump by pulling the Sludge Pump lever **(7)**. When liquid has stopped flowing from the sludge pump, push the Sludge pump lever **(7)** to deactivate the sludge pump.
7. Close the Sludge Pump shut-off valve **(6)** on the side of the sludge pump.
8. Close the ball valve **(4)** at the discharge end of the sludge pump.
9. Close the decant ball valve **(8)** on the front bumper.

10. Roll up and stow the decant lay-flat hose **(1)**.
11. Continue vacuuming and repeat if necessary.

3.10 UNLOADING PROCEDURE

Dumping Load/Raising Debris Body

The AllExcavate is designed to dump material collected in the debris body similar to a traditional dump truck.

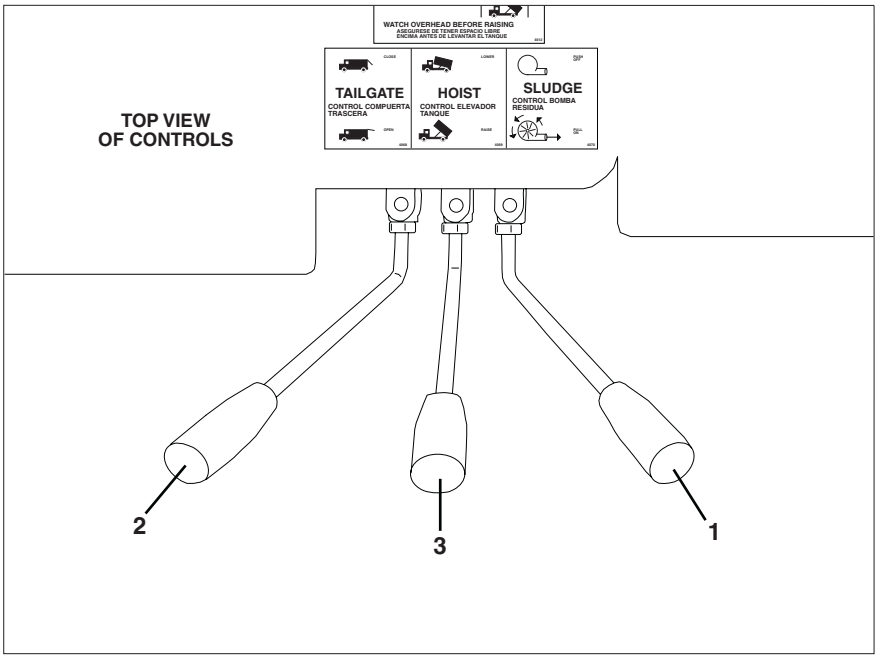
The unit must be positioned on a solid, level surface able to support the machine.

⚠ DANGER

OW00101

Be sure the unit is on a solid, level surface and that there is sufficient overhead clearance before the debris body is raised.

1. Fill the water tanks (if needed). See Page 3-4.
2. Position the unit so the material being unloaded will not flow back under the unit when the tailgate is opened and the debris body is raised.
3. Start the unit and bring the engine to approximately 1200 rpm.



OAL0280

4. Decant the debris body, see page 3-32.
5. Open the tailgate by pulling and holding the Tailgate lever **(2)**.
6. Raise the body by pulling the Hoist lever **(3)**. You may have to rock the debris body by alternating pulling and pushing the lever back and forth. This may help remove debris that has become stuck.

CAUTION
OAN0340

Make sure to release tailgate/body levers once they have been raised or lowered to their limits. Failure to do so may cause damage to the unit.

7. Raise the body support safety stands. See Page 1-16.
8. Secure the tailgate using the tailgate props. See Page 1-17.
9. Clean the debris body. See below.

Cleaning the Debris Body

1. Make sure that the tailgate is secured using the tailgate props. See Page 1-17.
2. With the body in the raised position, wash out the entire debris body with the water hand gun. Start at the upper front corner and work downward and toward the rear of the body. Change sides and repeat the procedure. ***Note:*** *If the unit is to be used immediately after dumping, then it is necessary to clean only the tailgate seal area.*
3. Wash out the sludge pump attached to the tailgate if equipped.
4. Raise the tailgate to remove the tailgate props and lower the tailgate by pushing the Tailgate lever **(2)**.
5. Raise the debris body enough to release/store the body support safety stands.

CAUTION
OAN0340

Attempting to lower the debris body without releasing/storing the body support safety stands first will cause serious machine damage.

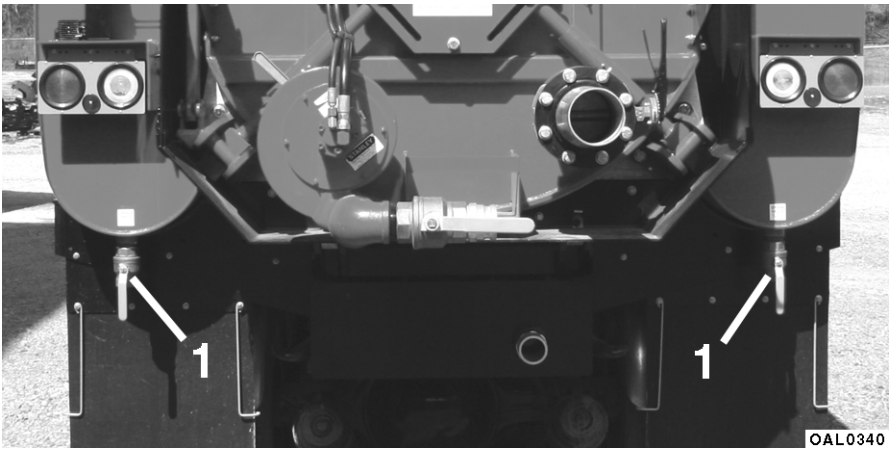
6. Lower the body by pushing the Hoist lever **(3)** until the body is in the fully lowered position.

CAUTION
OAN0340

When the debris body reaches the fully lowered position, IMMEDIATELY release Hoist lever. Failure to do so can cause machine damage.

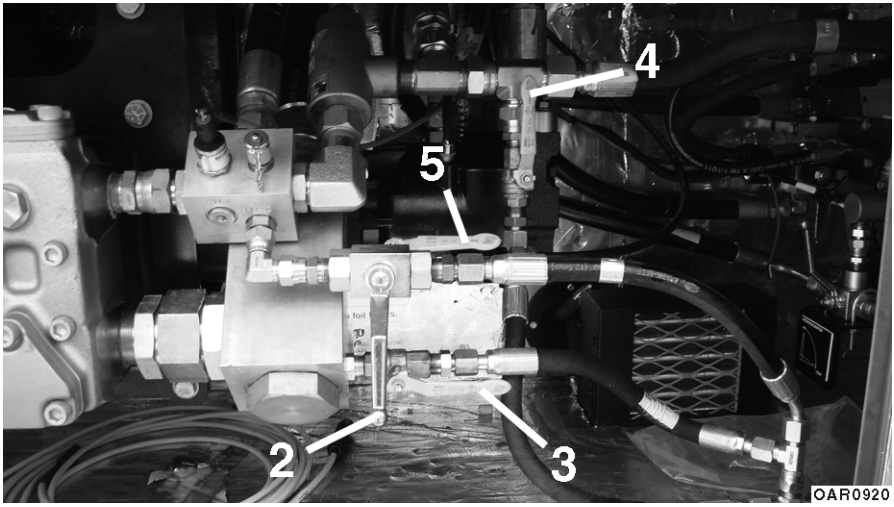
7. Disconnect and store the hand gun.

3.11 PURGING THE SYSTEM



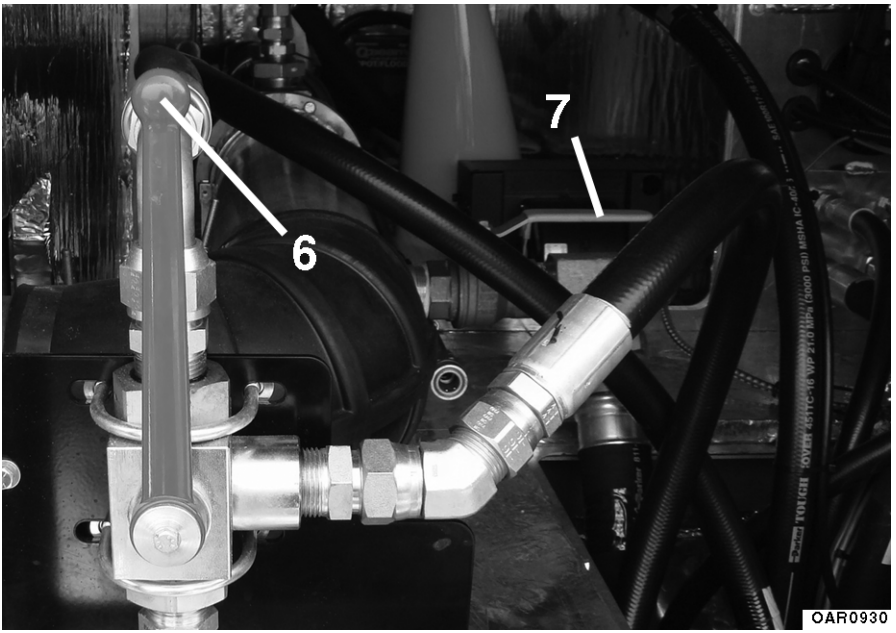
THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

1. Turn the Water Tank drain valves **(1)** at the rear of the unit to the “OPEN” position. Let all of the water drain from the water tanks and leave the Water Tank drain valves in the “OPEN” position.



THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

2. Turn the drain valves **(2, 3 & 4)** to the “CLOSED” positions and the Air Purge ball valve **(5)** to the “CLOSED” position.



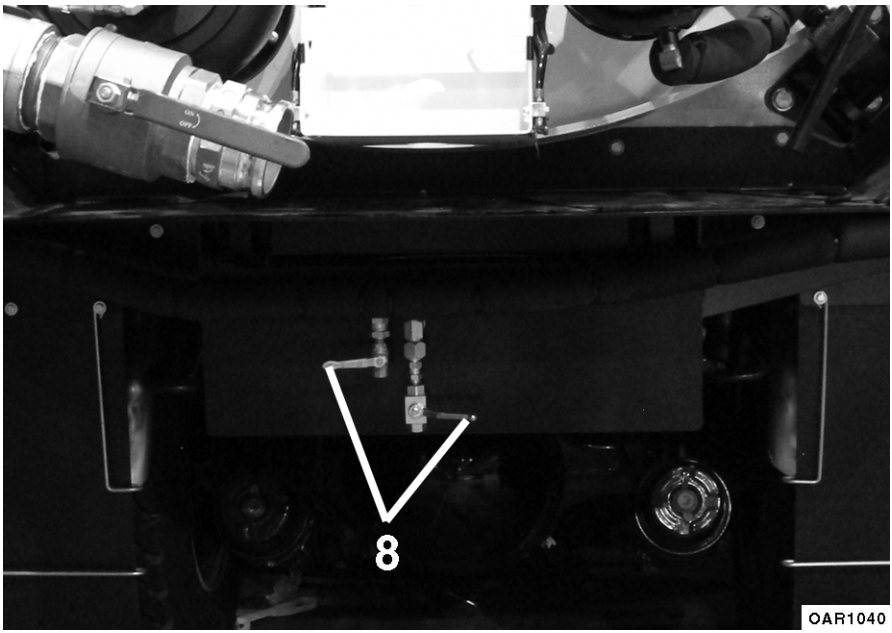
THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

3. Make sure the Main Water Supply ball valve **(6)** is in the “CLOSED” position and turn the Pump/Tank Flush ball valve **(7)** to the “TANK FLUSH” position.
4. Turn the Air Purge ball valve **(5)** to the “OPEN” position. This will blow the water out of the tank flush circuit.

CAUTION
OAN0340

Water is coming out under pressure.

5. Once the water is out of the tank flush circuit, turn the Air Purge ball valve **(5)** to the “CLOSED” position. Let the air pressure build up for a few minutes.
6. Turn the drain valves **(2, 3 & 4)** to the “CLOSED” position.
7. Turn the Pump/Tank Flush ball valve **(7)** to the “PUMP” position.
8. With the handgun connected to the hydro-excavator hose and the trigger depressed, turn the Air Purge ball valve **(5)** to the “OPEN” position. This will blow the water out of the pump circuit.
9. Once the water is out of the pump circuit, turn the Air Purge ball valve **(5)** to the “CLOSED” position.
10. Turn the drain valves **(2, 3 & 4)** to the “OPEN” position.



THIS ILLUSTRATION IDENTIFIES VALVE LOCATION ONLY. REFER TO INSTRUCTIONS FOR PROPER VALVE POSITIONING.

11. Turn the two drain valves **(8)** on the rear of the unit near the tailgate to the “OPEN” positions.
12. Purging the system is now complete.

3.12 BLOWER/PUMP MODE TO ROAD MODE

These are general instructions for each unit. See the placard inside the cab of your unit for details.

Automatic Transmission Shift Procedures

With Digital Controls

To end operation.

1. Adjust engine rpm throttle control to idle.
2. Shift transmission into neutral.

CAUTION
OAN0340

Before shifting from blower mode to road mode, disengage the transmission and allow one (1) minute for the drivelines to stop turning. Failure to do so will CAUSE TRANSFER CASE DAMAGE.

3. Locate “ROAD/PUMP MODE” switch inside the cab and turn to “ROAD MODE”.

Manual Transmission Shift Procedures

With Digital Controls

To end operation.

1. Adjust engine rpm throttle control to idle.
2. Shift transmission into neutral.

CAUTION
OAN0340

Before shifting from blower mode to road mode, disengage the transmission and allow one (1) minute for the drivelines to stop turning. Failure to do so will CAUSE TRANSFER CASE DAMAGE.

3. Locate “ROAD/PUMP MODE” switch inside the cab and turn to “ROAD MODE”.

3.13 END OF SHIFT SHUTDOWN

Shutting down the unit at the end of a shift consists of completely draining the water system and opening the debris body to allow air to circulate through it.

1. Be sure the unit is thoroughly cleaned as described on Page 3-36.
2. Open all water system drain valves.
3. If the unit is to be stored longer than overnight, the tailgate should be propped open with the rear door support and the debris body partially raised and blocked.
4. Perform suggested maintenance as described in the service manual.

Winterizing Procedure

It is important that the water system and debris body be free of water when the AllExcavate is to be stored in an area where the ambient air temperature may fall below 32° F (0° C). Failure to do so may result in shortened component life or component failure.

1. Clean and dry the debris body.
2. Drain the water system. See page 3-38.
3. Check all fluid levels and lubricate the unit.

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SECTION 4 - LUBRICATION & MAINTENANCE

4.1 GENERAL

Careful attention to proper preventative maintenance as described in this section will insure and extend trouble free operation of the unit. Particular attention to correct lubrication of the unit, routine cleaning, and maintenance of the hydraulic system are the most vital areas of preventative maintenance required. The objective of preventative maintenance is to anticipate and prevent operation difficulties before they require extended down time for costly repairs.

Prepare and adhere to a maintenance schedule. Keep detailed records of all maintenance performed. Regularly inspect operating and maintenance records for deviations from normal operating conditions. Analyze the records for indications of potential trouble.

Note: *This section provides general operator lubrication and maintenance information. Refer to Service Manual for detailed maintenance, lubrication and service information.*

4.2 DAILY PREVENTATIVE MAINTENANCE

Each day perform the following maintenance:

OW0021

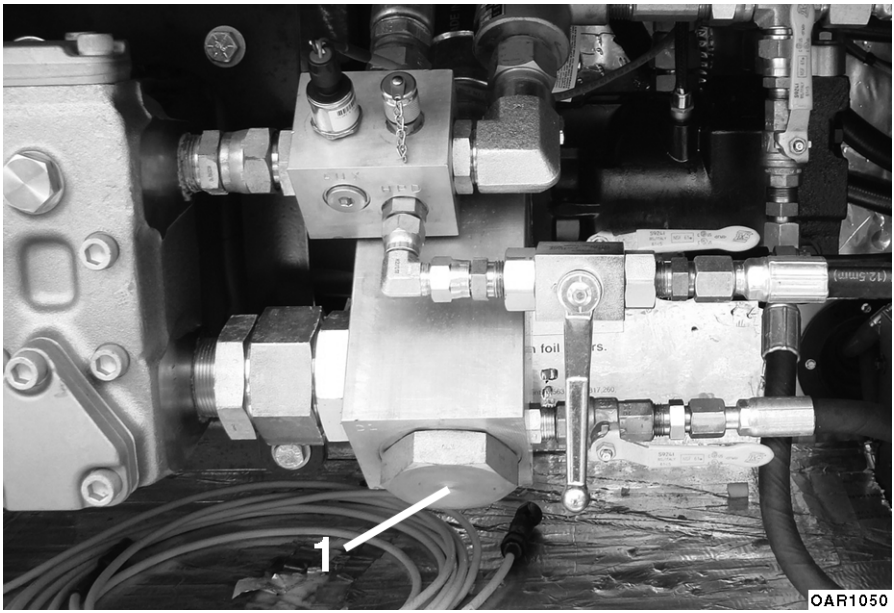
Never enter the AllExcavate body until the blower is disengaged and the truck is off with the keys removed and “Do Not Operate” tags are on the unit. Before entering the body, secure tailgate prop in locked position.

1. **Inspection**

Perform the pre-operational inspection described in the Operator & Safety manual.

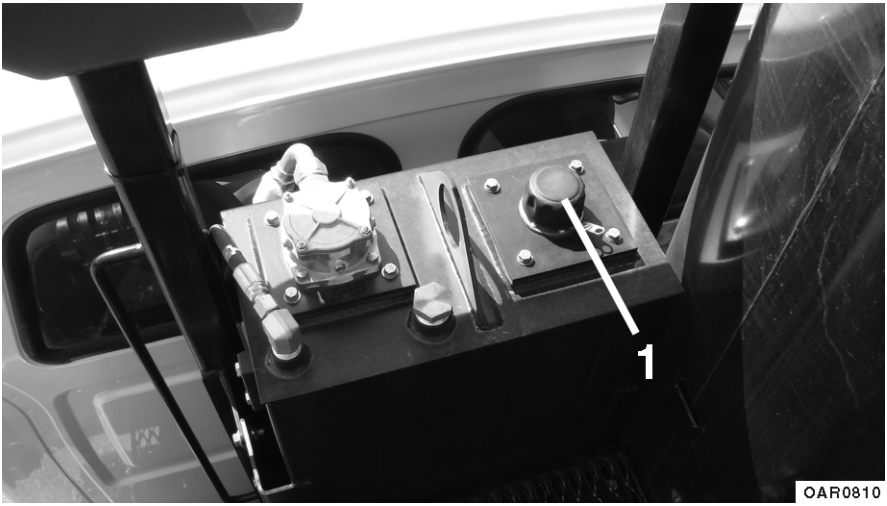
2. **Daily Cleaning**:
   a. Raise the tailgate and secure with prop.
   b. Raise the debris body and secure with prop.
   c. Clean the inside of the debris body.
   d. Check to make sure the debris body float ball is clear of debris.
   e. Leave the debris body and tailgate raised and open to displace the leftover moisture.
   f. Drain water from hose on tailgate sump.
   g. After the cleaning is completed, start the engine, engage the blower fan and run the unit for a short time to remove moisture from the body. Note: Drain water tank when the ambient temperature is below 32°F (0°C).

3. **Checking Fluid Level (Daily)** – When checking the fluid level in the hydraulic tank and the blower insure that all cylinders are in their retracted position. The fluid level sight glasses should be half covered. If low, fill the hydraulic tank with hydraulic fluid or the blower with oil as specified in Specifications section. After greasing the blower drive line ensure it rotates freely. Note: When checking the fluid level note any frequent or sudden loss of fluid. This could indicate leakage, which must be traced and corrected to avert equipment failure and possible damage to components.



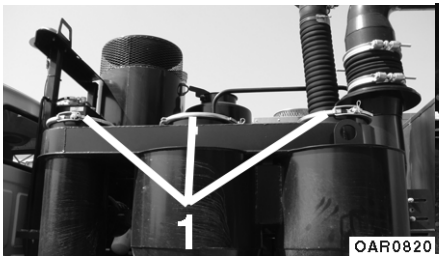
4. **Water Pump Strainer** – Remove the filter basket located in the “Y” strainer **(1)** of the water pump feed; clean, and reinstall.

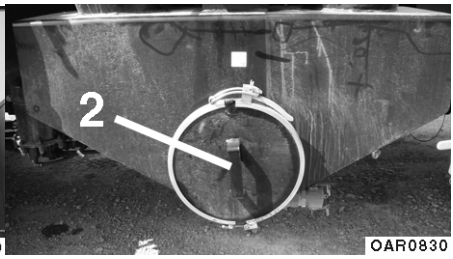
4.3 WEEKLY PREVENTATIVE MAINTENANCE



1. **Clean Hydraulic Tank Breather** – Clean the air breather **(1)** every week. Replace as required.

4. Cyclone Inspection





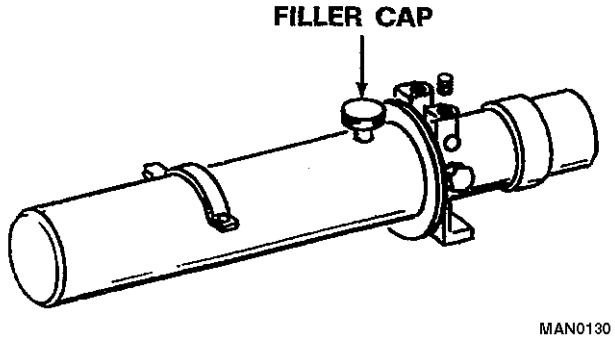
a. Pull upper plates **(1)**, check the screen and clean. Check for abundance of liquid or debris.

b. Pull lower plate **(2)** and clean.

c. Check plug on bottom for debris (if equipped).

2. Check Air Access Areas – Check all intake hoses, nozzles, and deflectors for wear. Check the boom closure seals for dirt. Wipe away any dirt and apply a light coating of grease on the inside edges. Also check for tight connections between intake couplers, nozzles, ball joints, etc. Air leaks will reduce the efficiency of the blower.

4.4 MONTHLY PREVENTATIVE MAINTENANCE



3. **Power Pack Fluid Level** – Check hydraulic fluid level in the hose reel tilt cylinder hydraulic circuit. The fluid level should be within one (1) inch of the filler cap. Cylinder must be fully retracted for accurate reading. ***Note:*** *This electric over hydraulic package is located above the blower.*

4. **Electrical System**– Check electrical wiring and insulation for frays, breaks, corrosion, and loose connections.

5. **Body Hoist**

   a. Inspect upper and lower trunnion ends of cylinder, at cylinder and lifting lever cross shafts, at frame, at valve and at pump.

   b. Inspect all hose lines for damage and hose ends for tightness

   c. Check valve control for proper shifting.

   d. Check cylinder packing (a light film of fluid on the piston rod is acceptable)

   e. Check the mounting bolts for loosening.

   f. Check the pins for holes and/or wear.

6. **Intake Hose**

Intake hoses are made of rubber and fabric and wear should be expected. This wear can be kept to a minimum by employing a few good operation and maintenance practices.

   a. Inspect the hose frequently to determine where the most wear is occurring.

   b. Rotate the hose periodically to reduce the wear in one spot. Rotating the hose 180 degrees, 90 degrees, and end over end periodically will improve the life.

   c. Minor cracks, punctures, and other leaks should be repaired as soon as they are detected to prevent enlarging to a point where they cannot be repaired.

7. Hydraulic System Service

Contamination

Many hydraulic problems may be traced directly to the fluid. It is important that all foreign matter be kept from the hydraulic fluid. Invisible quantities of abrasive type contamination may cause serious pump wear, malfunctioning of pumps and valves, and sludge accumulations within the system in relatively short periods of time. It is also essential that moisture and water be kept from the hydraulic fluids and system.

Commercial Hydraulic Fluid Testing

Hydraulic fluid samples should be taken periodically for laboratory analysis. The actual sampling method is critical. It should be done based on ANSI Standard B93.19M(R1980). This standard is available from the National Fluid Power Association, 3333 N. Mayfair Rd, Milwaukee, WI 53222

Samples should be taken from the center of the reservoir when the fluid is at operating temperature and placed in a clean, dry, glass bottle with a non-shedding, screw-on cap. The bottle should be labeled with the date, type of fluid, and model and serial number of the machine.

Two identical samples should be taken. One for laboratory analysis and one for your own preliminary analysis while you are waiting for the lab report.

We recommend the use of commercial laboratory services for analysis of routine fluid samples taken on a regularly scheduled basis. The most important analysis are particle count, Spectro-chemical analysis, water content, and viscosity.

In House Hydraulic Fluid Testing

After your sample has been allowed to stand for 20 to 30 minutes to eliminate all air bubbles, hold the bottle up to the light to check for debris in the fluid and also check whether the fluid is clear or cloudy.

Any visible debris is an indication of a severe solid contamination problem, the source of which must be located and corrected immediately. Common sources of this kind of contamination may be component wear, unsealed reservoir cover, or dirty air breather filters.

If the sample is the least bit “cloudy” it may be an indication of water contamination, the source of which must be located and corrected immediately. Common sources are inadequate outdoor storage, unsealed reservoir covers or condensation.

A “Blotter Spot Test” may also be performed to test for oxidation. Place a drop of fluid on a piece of white blotter paper (National Fluid Power Association P/N 102480).

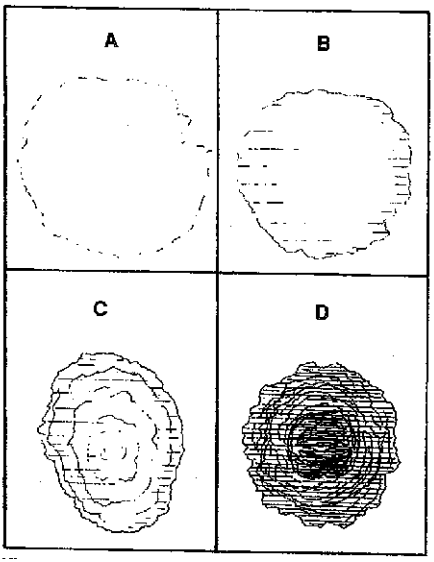
Note: *The blotter test will provide an indication that a more complete test may be necessary.*

a. If the blotter remains colorless or develops only a light yellow ring, oxidation is under control.

b. If color develops but is uniform throughout, the fluid is still serviceable but should be checked for correct additive content.

c. If the sample shows distinct rings, the fluid should be changed.

d. If a distinct dark spot remains in the middle, but a lighter color fluid migrates outward in the blotter paper the fluid is about to dump sludge or other by-products into the system. The time for replacement of this fluid has already passed.



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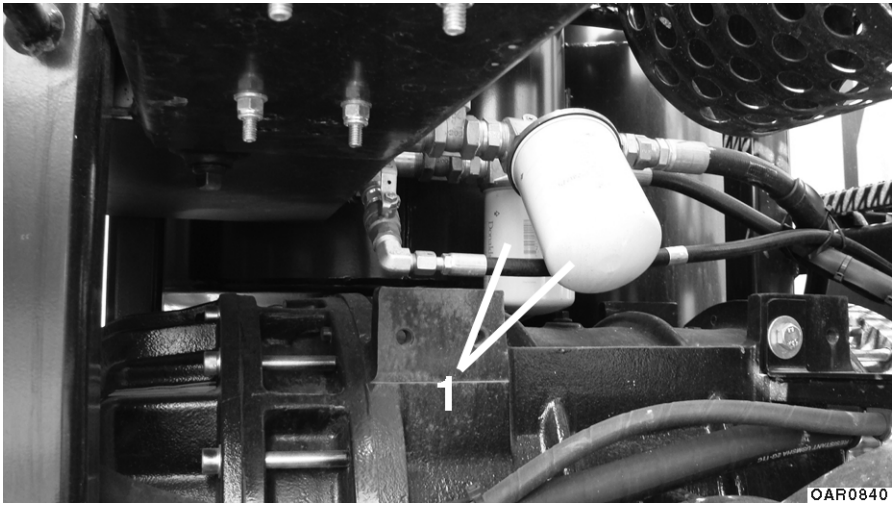
4.5 SEMI-YEARLY PREVENTATIVE MAINTENANCE



1. **Hydraulic Filters** –Change the hydraulic filters **(1)**.

To remove the filter elements, unscrew the filters from the filter assemblies' head and remove the filter element. Throw out the old filters and refill new filters with new hydraulic oil and screw back on. ***Note:*** *Do not over tighten.*

4.6 YEARLY PREVENTATIVE MAINTENANCE

1. Flushing Hydraulic System

a. Annually drain all fluid from the hydraulic tank. Drain the hydraulic fluid reservoir by removing the drain plug.

b. Fill the hydraulic tank with fresh fluid as specified in the Specifications section.

c. Start the Vacall engine and operate all the hydraulic functions as described in the Operator's Manual. Leave all the hydraulic cylinders in the retracted position and shut down the unit.

d. Recheck the fluid level and add fluid as necessary to bring the level to half way in the sight gauge.

e. Replace the hydraulic tank air breather.

2. Seasonal Storage

If the Vacall is going to be inactive for long periods of time, or stored, take the following steps to avoid corrosion in the body and air chamber.

a. Steam clean the inside of the body.

b. Repaint with a good primer such as Rustoleum to prevent any corrosive action due to moisture.

c. Rotate the blower monthly by hand if needed.

4.7 LUBRICATION POINTS

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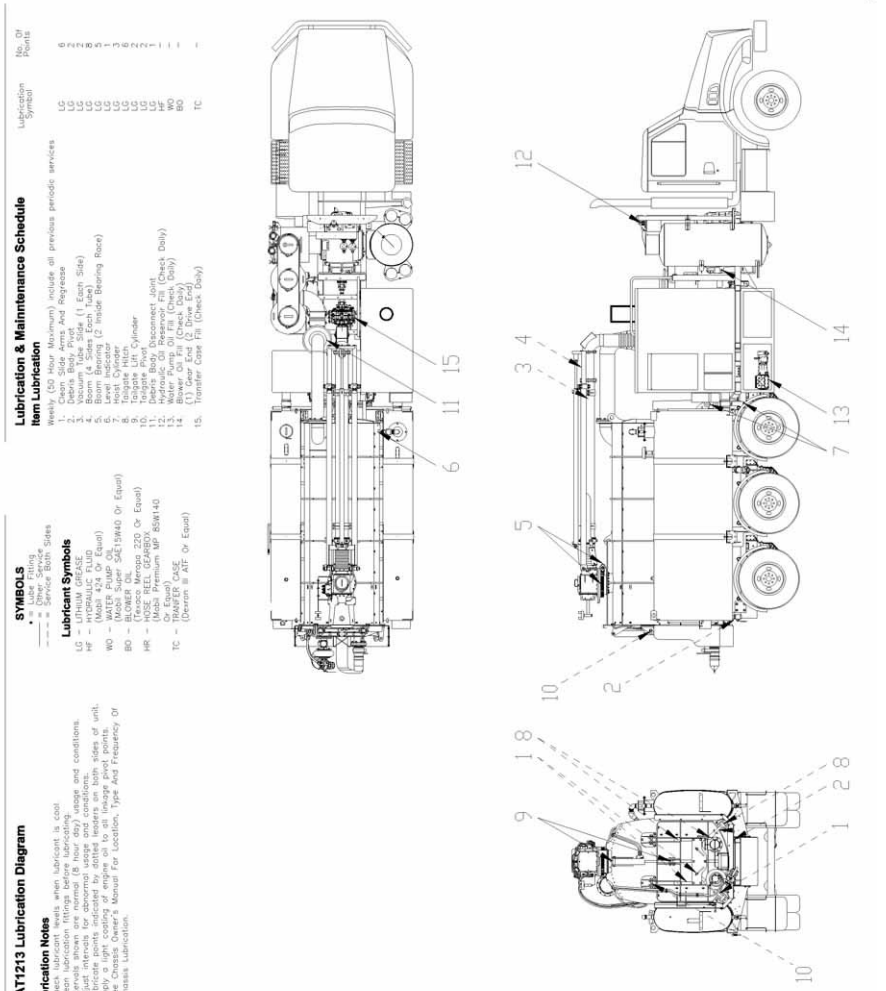

Note: *Note: Refer to Engine and Clutch Manual for remainder of lubrication instructions.*

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SECTION 5 - SPECIFICATIONS

5.1 PRODUCT SPECIFICATIONS

Lubricants

Grease.....Multiservice Lithium Based (quantity grade)

Hydraulic System

(Approximate capacity)

Entire System.....45 gallons (170.34 liters)

Main Reservoir.....31 gallons (117.35 liters)

Oil.....Mobil 424 or equivalent

System pressure settings.....Main Valve - 2000 psi

Filtration.....Suction and return line disposable filter element(s)

Water Pump

General MSS 55

Type..... 80gpm (302.83 liters) @ 1800 rpm, 2000psi.

Capacity.....10.5 quarts (9.94 liters)

Type of Oil .....Texaco Meropa 220 or equal

Grease..... Silicone Based (Vacall p/n VA39010010A)

Myers DP-65

Type..... 65gpm (246.05 liters) @ 1800 rpm, 2000psi.

Capacity .....4.5 quarts (4.26 liters)

Type of Oil .....Texaco Meropa 220 or equal

Myers DP-80

Type..... 80gpm (302.83 liters) @ 1800 rpm, 2000psi.

Capacity .....4.5 quarts (4.26 liters)

Type of Oil .....Texaco Meropa 220 or equal

Transfer Case

Omsi PFT-PCV3000

Capacity..... See Transfer Case Owner's Manual

Type of Oil..... Dexron III or equal

Blower

Gear Box Capacity .....See Blower Owner's Manual

Drive End Capacity.....See Blower Owner's Manual

Type of Oil..... Texaco Meropa 220 or equal

*Check sight glass after filling. Oil should be at half level on sight glass.

Hydraulic Power Pack

Capacity..... Fill to 1 inch below fill cap.

Type of Oil.....Mobil 424 or equivalent

CAUTION
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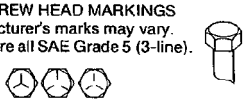
Do not use engine oil, automatic transmission fluid (ATF), or add diesel fuel or kerosene to the hydraulic fluid. The service life of all hydraulic system components may be adversely affected.

Capscrew Marking and Torque Values

Usage	Much Used	Much Used	Used at Times	Used at Times
Capscrew Diameter & Minimum Tensile Strength PSI	To 1/2-69,000 To 3/4-64,000 To 1-55,000	To 3/4-120,000 To 1-115,000	To 5/8-140,000 To 3/4-133,000	150,000
Quality of Mat'l	Indeterminate	Min. Commercial	Med. Commercial	Best Commercial
SAE Grade Number	1 or 2	5	6 or 7	8
CAPSCREW HEAD MARKINGS Manufacturer's marks may vary. These are all SAE Grade 5 (3-line).				

Capscrew Body Size (Inches) - (Thread)	Torque Ft-Lb (kg m)	Torque Ft-Lb (kg m)	Torque Ft-Lb (kg m)	Torque Ft-Lb (kg m)
1/4 - 20	5 (0.69)	8 (1.11)	10 (1.38)	12 (1.66)
- 28	(0.83)	10 (1.38)		14 (1.94)
5/16 - 18	11 (1.52)	17 (2.35)	19 (2.63)	24 (3.32)
- 24	13 (1.80)	19 (2.63)		27 (3.73)
3/8 - 16	18 (2.49)	31 (4.29)	34 (4.70)	44 (6.09)
- 24	20 (2.77)	35 (4.84)		49 (6.78)
7/16 - 14	28 (3.81)	49 (6.78)	55 (7.61)	70 (9.68)
- 20	30 (4.15)	55 (7.61)		78 (10.79)
1/2 - 13	39 (5.39)	75 (10.37)	85 (11.76)	105 (14.52)
- 20	41 (5.67)	85 (11.76)		120 (16.60)
9/16 - 12	51 (7.05)	110 (15.21)	120 (16.60)	155 (21.44)
- 18	55 (7.60)	120 (16.60)		170 (23.51)
5/8 - 11	83 (11.48)	150 (20.75)	167 (23.10)	210 (29.04)
- 18	95 (13.14)	170 (23.51)		240 (33.19)
3/4 - 10	105 (14.52)	270 (37.34)	280 (38.72)	375 (51.86)
- 16	115 (15.90)	295 (40.80)		420 (58.09)
7/8 - 9	160 (22.13)	395 (54.63)	440 (60.85)	605 (83.67)
- 14	175 (24.20)	435 (60.16)		675 (93.35)
1 - 8	235 (32.50)	590 (81.60)	660 (91.28)	910 (125.85)
- 14	250 (34.58)	660 (91.28)		990 (136.92)

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Notes:

1. Always use the torque values listed above when specific torque values are not available.
2. The above is based on use of clean, dry threads.
3. Reduce torque by 10% when engine oil is used as a lubricant.
4. Reduce torque by 20% if new plated capscrews are used.

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VACALL

Gradall Industries, Inc.
406 Mill Ave SW
New Philadelphia OH. 44663
USA
Phone: (330) 339-2211
Customer Support Toll Free: (800) 445-4752
Fax: (330) 339-3579