
X15-SERIES



•

OPERATION

SERVICE

& PARTS

•

M A N U A L

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As Shown

NOTE: *The descriptions and instructions in this manual cover the standard design of the equipment and any common deviations when possible. This manual does not cover all design details and variations nor does it provide for every possible contingency which may be encountered. When information cannot be found in this manual, contact your nearest AQUATECH Parts and Service Center.*

**When ordering parts always specify unit serial number.*



New Machine Pre-Delivery Inspection Checklist

Machine Model _____	Dealer Name _____
Machine Serial Number _____	Dealer Location _____
Hour Meter Reading _____	Inspected By _____
Inspection Date _____	Customer Name _____

Check each item below. Refer to Owners' Manual for specific information regarding safety, operation, and maintenance of the unit. Indicate in the appropriate space as each item has been performed. If the item is found to be not acceptable, describe each discrepancy in the comments space at the bottom of the form. Immediate action must be taken to correct all discrepancies. The machine is not to be placed into service until all discrepancies have been corrected.

Y=Passed N=Failed C=Corrected NA=Not Applicable	Y	N	C	NA
General				
Operation Manual (paper & electronic) with unit				
Unit conforms with customer specs				
Engine & Chassis				
Engine oil and coolant levels are correct				
Inspect drive lines, tighten bolts if necessary				
Tire pressure is correct				
General condition/appearance of chassis				
Electrical System				
Inspect control panels for loose wires/connectors				
Test throttle control at control panels				
Test wireless remote controls				
Test all lights, strobes, arrow boards, etc.				
Engage PTO into work mode				
Engage water pump				
Engage blower				
Hydraulic System				
Hydraulic oil level is correct				
Check cylinders, hoses, valves for oil leaks				
Boom functions properly				
Rear door opens and closes and door locks function				
Hose reel swings and pays in and out correctly				
Debris tank raises and lowers properly				
PTO oil level is correct				

Return completed form to Hi-Vac Warranty Coordinator - customerservice@hi-vac.com

Y=Passed N=Failed C=Corrected NA=Not Applicable	Y	N	C	NA
Water System				
Install Y-Strainer and cap on suction line				
Fill water tanks and check for any leaks				
Water pump operates correctly				
Water pressure is correct				
Inspect water tanks for damage				
Hose Reel				
Inspect drive chain tension on sewer hose reel				
Inspect hydro-excavating/wash-down reels				
Test speed control on sewer hose reel pay in/out				
Inspect sewer hose and hydro-excavation hoses				
Debris Body & Enclosure				
Inspect rear door seal				
Inspect & test enclosure heaters				
Inspect & test water heater				
Vacuum tubes are correct type and sizes				
Decant valve works properly				
Check toolboxes/enclosure for packaged accessories				
Accessories/Other				
All options/accessories are correct				
All options/accessories operate correctly				
Comments				



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CUSTOMER TRAINING FORM/DELIVERLY CHECKLIST (Page 1 of 2)

*Operator and Service Personnel must be thoroughly instructed of the following:
(Please initial on lines provided)*

Power Take off (PTO)

- Maximum operating speed _____
- How to engage and disengage _____
- Drive train service and lubrication _____
- Hydraulic pump location and alignment _____
- PTO oil level _____

Hydraulic system

- Oil level inspection and time interval _____
- Location of filters and service _____
- Manual over-ride operations _____
- Location of flow control valves and explanation of adjustments _____
- Location of hydraulic pressure gauge _____
- Boom system operation _____

Pneumatic system

- Air reservoir regulator, filter and service _____
- Operation of PTO _____

Water system

- Water tank inspection and repair _____
- Drain valves _____
- Water pump drive system _____
- Oil level inspection, time interval _____
- Packing lubrication, time interval _____
- Water "on/off" controls _____
- Pressure relief valve and operation _____
- Return line ball valve setting and service _____
- Handgun operation _____
- Winter recirculation _____
- Cold weather storage _____
- Water pressure operation _____
- Removal of ice from system _____
- Suction line strainer _____
- Water pump service oil level _____



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CUSTOMER TRAINING FORM/DELIVERY CHECKLIST (Page 2 of 2)

Operator and Service Personnel must be thoroughly instructed of the following:

(Please initial on lines provided)

Vacuum system and debris tank

- Debris tank inspection _____
- Door gasket cleaning _____
- Exhauster lubrication oil level _____
- Primary safety cut-off operation, service _____
- Vacuum gauge _____
- Vacuum breaker _____
- Exhauster drive system and controls _____
- Centrifugal scrubber and clean out screen _____
- Rear door operation and controls _____
- Tank tipping operation, controls, lubrication _____
- Tank prop _____
- Hydraulic door locks _____
- With separator open - explain cleaning and un-clogging _____
- With final filter door open - explain final filter cleaning _____
- Water draining system _____
- Cold weather operation _____
- Storage - draining all water from systems _____

Accessories supplied with unit

- Handgun assembly _____

Options

- Water heater _____
- Equipment compartment heater _____
- Antifreeze system _____

THIS INSPECTION WAS PERFORMED BY:

Unit Serial Number:

Signature:

Title:

Date:

INTRODUCTION



MESSAGE TO NEW OWNER

Thank you for purchasing your X-VAC Hydro Excavator unit, the most advanced American-made hydro excavation machine. Our quality of design and manufacture will assure you the greatest return on your equipment investment.

Please consult this owner's manual as the first step to resolving questions you may have about the operation or service of your machine. If you are not able to find the answers, then consult with your selling dealer. Finally, we at the factory will be happy to provide operating or service information that this manual or your dealer are unable to provide.

Our warranty spells out all your rights and expectations with regard to this equipment. Please consult it for a full definition of what is covered.

Thank you again for selecting the equipment preferred by industry professionals throughout the world.

Your new X-VAC Hydro Excavator unit incorporates the very latest in hydro excavation technology. The soil cutting action results from water traveling from the storage tank into the high efficiency water pump and being pumped to the hose reel and nozzle at high pressure and low volume. As a result, the machine will excavate and operate in a far superior manner than previously available.

The vacuum system provided is superior to any other available. It is capable of both wet and dry operation, as well as operation under water.

To achieve maximum results, the operators must become thoroughly familiar with the operation of the machine and completely understand correct nozzle selection and cleaning accessory use.

We are a company that is committed to continually striving to build an even better product. Many ideas for improvements in previous models have come from users in the field.

WARNINGS



X-VAC HYDRO EXCAVATOR MACHINES

X-VAC Hydro Excavator machines are designed to remove material in an underground environment. These systems operate under high pressure conditions with low water flow. Therefore, operators of these systems must be aware of possible hazards. This is not a complete list of all possible hazards, but represents typical hazards and types of hazards. At all times, the operator is responsible for the proper use of the machine.

Operators of X-VAC Hydro Excavator machines should be aware of the following safety warnings:

- Using this machine for purposes other than hydro excavation is not recommended.
- Water hose that is damaged into the braided lining must be repaired or replaced.
- Fittings used on water hose must be of a type and installed in a manner that is approved by the hose manufacturer.
- The handgun is designed to shut off automatically when the actuator handle is released. Never use a forward jet nozzle that will not turn off when released.
- The handgun remains pressurized after use. After shutting off water supply, squeeze actuator handle to relieve pressure before storing or before disconnecting the handgun from hose.
- Never operate the water system with the relief valves removed, or improperly adjusted. The main relief valve is set at 3500 psi. Do not operate at pressure readings higher than these unless the manual specifically states that the system has been designed for higher pressures.
- Never walk under raised components such as hydraulically actuated tanks, doors, etc. Whenever these components are raised, props must be used to protect workers who must work under them.
- Never operate the machine in a stationary position without first setting the brakes, and shifting the rear axle out of the drive line. Always use wheel chocks.
- Never move the vehicle with the boom in a raised or otherwise unsecured position.
- Always turn off unit power when moving the vehicle.
- Always check for overhead obstructions before operating boom.

YOUR LIFE COULD DEPEND ON IT!!!

PRINCIPLES OF OPERATION



POSITIVE DISPLACEMENT EXHAUSTER AND WATER PUMP UNITS

This machine is a combination vacuum and high pressure water unit for excavation of soil.

The vacuum pump is a rotary lobe, positive displacement exhauster. During operation of the vacuum system, material is picked up at the end of the suction line and pneumatically conveyed through the intake tubes, the boom hose, and to the debris tank. As the material enters the larger area of the debris tank the velocity of the air flow is reduced and the material drops out of the air stream, settling at the bottom of the tank. The spent air flows through the ball check valve, and through a metal screen in the centrifugal scrubber externally located at the front of the body and through a final screen at the blower inlet. At this point the filtered air flow enters the exhauster and is expelled through a silencer/muffler to the atmosphere.

A positive displacement triplex plunger water pump provides the water pressure and water flow to the hydro excavation nozzle attached to the end of the handgun or lance.

In the water system, the water flows from the water tanks, mounted outboard of the debris tank, through a crossover manifold, through the water pump feed line, into the suction side of the pump. The pressurized water is then pumped forward to the water control valve and routed, depending on the position of the valve, either to the hose reel for hydro excavation, or by return lines to the water tank. The vacuum and water system can be used simultaneously when excavating soil. This allows conveyance of flushed out materials and water into the debris tank.

CONTROLS AND GAUGES

It is important for the operator to fully familiarize him/herself with the location, appearance and function of the various controls and gauges on any new X-VAC Hydro Excavator. Please read this section carefully, and refer to it whenever any section of the manual describes a control which you cannot identify.

Several controls are mounted in the chassis cab itself. These controls allow the operator to engage and disengage the water pump, exhauster, and hydraulic system. In addition, a main power indicator light and switch, and a low water warning light and switch are among the standard controls in the chassis cab. The water pump and exhauster are engaged and disengaged by electro-pneumatic solenoid valves. These solenoids are operated by electric toggle switches in the cab. Because each manufacturer will have a different cab layout, even among models of the same manufacturer, our description of their location is general. In addition there is a switch that controls the "ON/OFF" function of the water heater and compartment heater.

POWER DECK SYSTEMS ENGAGEMENT

Before engaging any of the power systems on this vehicle, you must first determine that there is at least 120 psi in the air brake system. Check the air pressure gauges on the dashboard to confirm this. The PTO is actuated by means of electro-pneumatic solenoid valves. While engaging PTO systems using the switches described in the following paragraphs, the vehicle transmission must be put into neutral and the parking brakes set. For vehicles with standard transmissions, the clutch must be depressed as well.

Caution! **The transmission should never be operated in a gear range greater than indicated on either the dashboard label or unit identification sheet.**

Failure to heed this caution may result in severe damage to the water pump or exhauster.

Please consult with the factory if the vehicle gear range is not specified.

PRINCIPLES OF OPERATION



UNIT POWER

The unit power switch supplies power to all the other switches and mounted equipment. When turning unit off, this switch must be the last one turned off. Push up to turn on the unit power switch and push down to turn it off. A red light glows inside the switch to indicate that the unit power is on. Without turning this switch on, nothing will function. The unit power switch should be turned off when transporting the unit unless using cold weather recirculation.

PTO

In order to keep the truck stationary while operating the water pump, exhauster or both, the rear axle must be disengaged. This can be done by moving the switch marked PTO to the “Up” or “On” position. This will cause the PTO to internally shift positions and disengage the rear drive train of the vehicle. This also engages the hydraulic pumps for system operations of all hydraulic functions (water pump, boom, tailgate, and tube rack).

ENGAGING THE EXHAUSTER

The same procedure using the switch marked (exhauster) will allow you to engage the vacuum system. Both power systems can be run simultaneously if desired. When the procedure for engaging the desired systems is complete, select the gear range referred to on the dashboard label, or the unit identification section of this manual. Release the clutch.

LOW WATER WARNING AND COLD WEATHER CONDITIONS

The low water control is the center switch on the dashboard. On units equipped with the low water warning system, a red light will glow in the switch in the event that the water level is depleted to a pre-determined level. A white light remains on during normal operations. Pushing the switch up turns on the “winter” low water warning. Pushing the switch down turns on the “summer” low water warning. The low water switch is labeled “winter” and “summer”. During cold weather, 32o F (0o C) or below freezing, this switch should be set to the “winter” position. This will cause the low water warning light to illuminate with more water left in the water tank. This allows more water to remain in the tank to help prevent possible freezing. During warm weather, the switch can be set to the “summer” position, this allows more water to deplete from the tanks before the low water warning light glows.

HYDRAULICS

The main tower PTO incorporates two additional outputs for the installation of the hydraulic pump to supply power to all hydraulic functions and the drive system on the water pump. These pumps are close coupled to the PTO. These drives are automatically engaged whenever the PTO switch is activated in order to disengage the main drive to the differential of the vehicle. When the PTO switch is positioned in the “Off” position for drive mode, the hydraulic pump drives are disengaged.

PRINCIPLES OF OPERATION



DASHBOARD and CONTROL PANEL CONTROLS

Several controls are mounted in the Chassis Cab as well as at the Side Control Panel. These controls allow the operator to engage and disengage the water pump, exhauster, hydraulic system, and a vacuum breaker. The water pump, exhauster, hydraulic system, and vacuum breaker are engaged and disengaged by **Electro-Pneumatic Solenoid Valves**. These solenoids are operated by electric toggle switches. Because each manufacturer will have a different cab layout, even among models of the same manufacturer, locations of controls & switches will vary from unit to unit.

Electro-Pneumatic Solenoid Valves



PRINCIPLES OF OPERATION



SIDE OPERATOR'S STATION

There is an operator's station at the passenger side of the unit to allow the operator to control vacuuming, pumping, and tank dumping operations. The control panel contains switches for for the various operations and an emergency stop button (not shown). The engine throttle control at this station allows the operator to control engine speed, and therefore hydraulic pressure. Operate engine at 1500 rpm during tank dumping and lock operating functions. Plastic labels at each switch indicate the correct manipulation of the switch for the function it performs. Consult the labeling to be sure you are operating the controls correctly. If the labels become unreadable or are inadvertently removed, consult the information in the electrical section for switch operation.

PRINCIPLES OF OPERATION



AIR PURGE PUMP PRIME & COLD WEATHER BLOWOUT SYSTEM (Page 1 of 2)

AIR PURGE PUMP PRIME

Air Purge Pump Prime “Valve #1” (see next page) is provided to assist the purge of air trapped inside the suction section of the water pump. There should be sufficient head pressure from the water in the water tanks to expell any air trapped on the suction side of the pump. Close **Air Purge Pump Prime “Valve #1”** (see next page) when a solid water stream runs from the overflow tube.

Air Purge Pump Prime “Valve #2” (see next page) is provided to assist the purge of air trapped inside the discharge section of the water pump. Any trapped air acts as a spring cushion for the compressed water and causes the water to “bounce back” against the cushion of air. This can cause a loud knocking noise from the pump area and severe pulsating of the sewer hose. This is called “cavitation”. If the air is not expelled, severe damage can occur in the pump. Open the valve to allow air trapped inside the pump to be expelled. Water will also be expelled at the same time. Run the pump at an idle speed for several minutes until all air is expelled, then slowly increase pump speed. As the pump develops greater pressure, the water discharged from the valve will become very intense. When it is clear that all air has been expelled, close the **Air Purge Pump Prime “Valve #2”** (see next page) and increase pump speed. The knocking sound should disappear, and the pulsating of the hose will be very mild. This is normal for a triplex water pump. At this point it is safe to operate the jetting, hydro or handgun operation. This procedure is usually only necessary when all water has been previously purged from the system, the suction line strainer has been removed for cleaning, or the pump has been run out of water.

Note: If you have constant problems with cavitation, it is likely that air is being sucked into the pump somehow, or one or more valve springs have broken. If you experience repeated cavitation, even though the pump has not been run out of water, you should request an inspection of the water system to determine the cause.

COLD WEATHER BLOWOUT

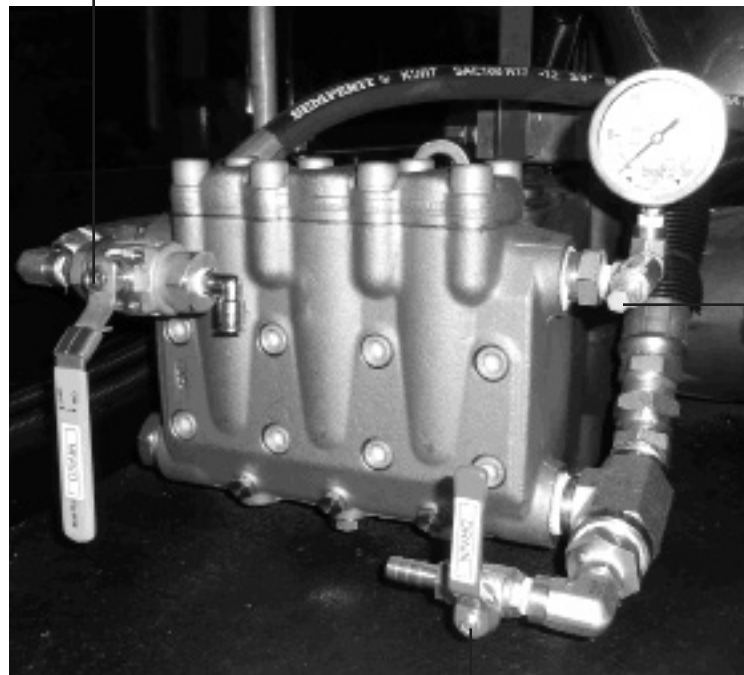
The **Schrader Air Valve** (see next page) located on the top of the water pump, is used to purge the pump and water piping of any trapped water and return it to the water suction line. By connecting the purge coiled hose assembly (not shown) to the **Forced Air Disconnnet** (see next page), and the **Schrader Air Valve**, air is then introduced at the valve and water is blown back to the water tank. The **Blowout Valve** (see next page) must be open prior to applying air to the **Schrader Air Valve**.

PRINCIPLES OF OPERATION



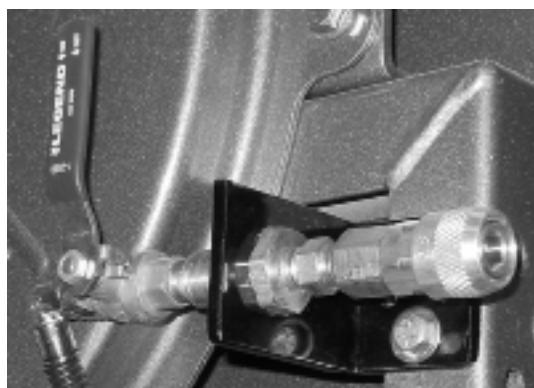
AIR PURGE PUMP PRIME & COLD WEATHER BLOWOUT SYSTEM (Page 2 of 2)

Air Purge Pump Prime "Valve #2"



Schrader
Air Valve

Air Purge Pump Prime "Valve #1"



Forced Air
Disconnect

PRINCIPLES OF OPERATION



COLD WEATHER RECIRCULATION

Side Operator's Area:

1. Assure hose reel hose is inserted into the **Qucik Connect**.

Quick Connect



Hose Reel Hose

Truck Cab:

1. Turn on **Unit Power Switch** and **Recirculation Switch** in the cab.
2. Unit can now be driven. As unit moves, the water pump will circulate water throughout the system and back to the tank.

Caution! The pump systems should never be operated in a gear range greater than indicated on the dashboard and truck labeling. Failure to heed this caution may result in severe damage to the water pump or exhauster. Please consult with the factory if the vehicle gear range is not specified.

Suggestion: Always carry the handgun and nozzles in the heated cab of the truck when not in use to prevent freezing.

Note: All units supplied with cold weather recirculation are equipped with two low water warning sensors controlled by the "Winter/Summer" Switch in the cab. In cold weather the switch should be in the "Winter" position. This allows more water to remain in the tank to accommodate recirculation. During warmer weather, the switch should be in the "Summer" position, providing more water for hydro excavation operations.



AARCOMM WIRELESS REMOTE OPTION



For directions on how to enable all functions, refer to the manufacturer’s manual located in the “Controls” section of this manual.

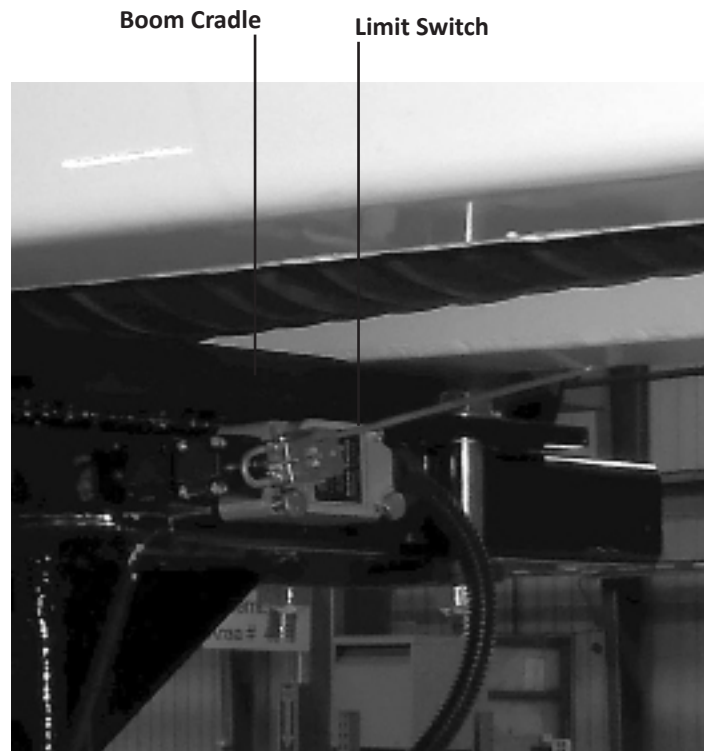
PRINCIPLES OF OPERATION



BOOM UP SAFETY ALARM

This unit has been equipped with a **“Boom Up” Safety Alarm**. The **Limit Switch**, located near the **Boom Cradle**, activates an alarm that alerts the operator in the event the boom has not been returned and seated properly on the **Boom Cradle**.

If the boom is not properly seated, the **“Boom Up” Light** will illuminate and the **“Boom Up” Alarm** will sound when the **Parking Brake** is released.



PRINCIPLES OF OPERATION

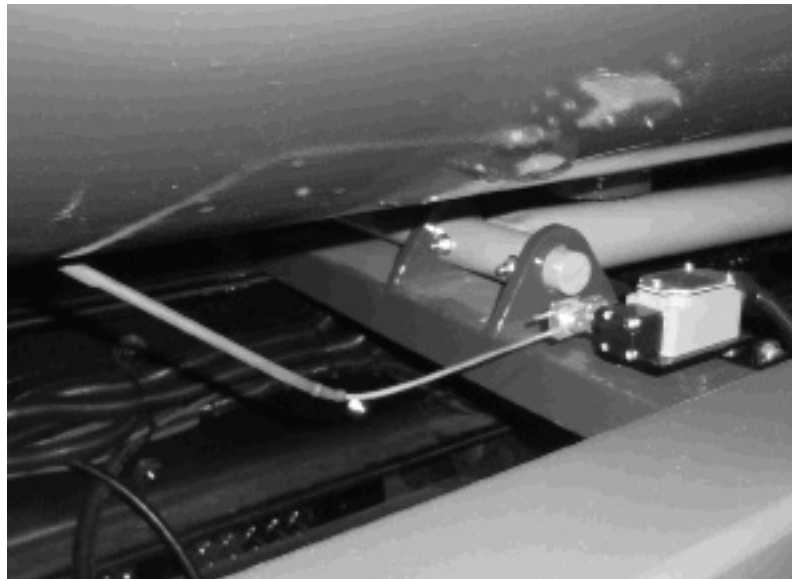


TANK UP SAFETY ALARM OPTION

This unit has been equipped with a **“Tank Up” Safety Alarm**. The **Limit Switch**, located under the **Debris Tank**, activates an alarm that alerts the operator in the event the **Debris Tank** has not been returned to its proper position.

If the **Debris Tank** has not been properly lowered, the **“Tank Up” Light** will illuminate and the **“Tank Up” Alarm** will sound when the **Parking Brake** is released.

Debris Tank



Limit Switch



PRINCIPLES OF OPERATION



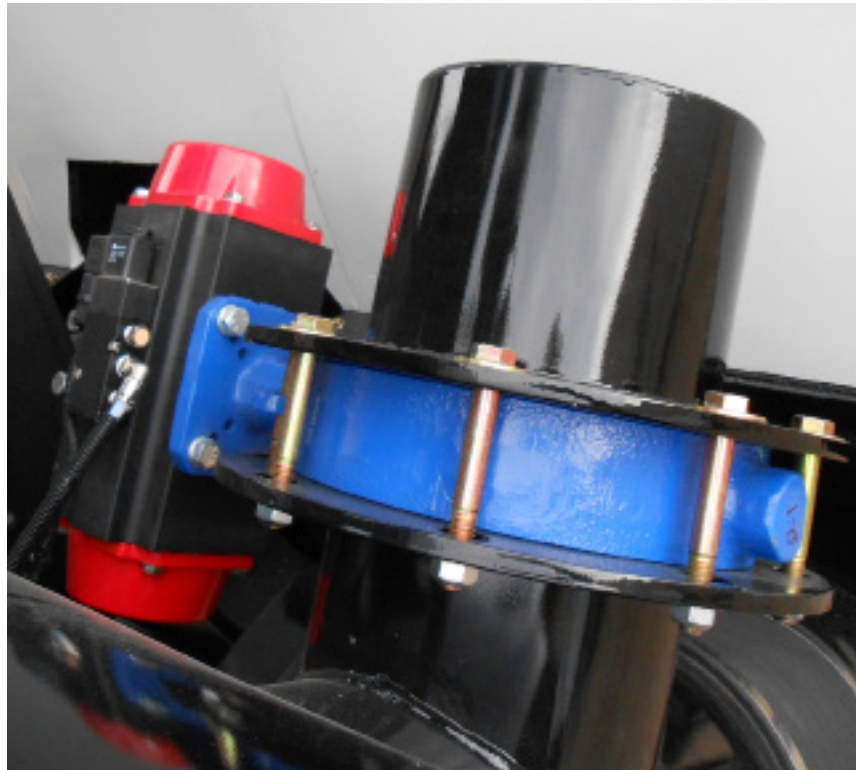
LOW WATER WARNING (LIGHT & ALARM)

On units equipped with the low water warning system, a red light located on the Side Operator's Panel will glow, giving a visual signal to the operator when the water level has been depleted to a pre-determined level.

An alarm, located near the Side Operator's Panel has also been included, giving the operator an audible signal when the water level has been depleted to a pre-determined level. This alarm can be turned off by using the toggle switch provide on the Side Operator's Panel.



VACUUM BREAKER



The Vacuum Breaker System utilizes the stored air on the truck chassis to control an air actuated butterfly valve. The butterfly valve opens when the amount of vacuum in the system needs to be reduced.

The vacuum breaker can be controlled from a switch on the Side Operator's Panel, a rotary switch on the Remote Pendant (if installed), and from the Wireless Remote.

Once the Vacuum Breaker is opened at one location, it must then be closed by the same switch. Example: If the vacuum breaker is opened using the rotary switch on the Remote Pendant, it can only be closed using the same switch on the Remote Pendant.

There is a light on the Side Operator's Panel to indicate the vacuum breaker has been closed. There is no light indication on the Remote Pendant.

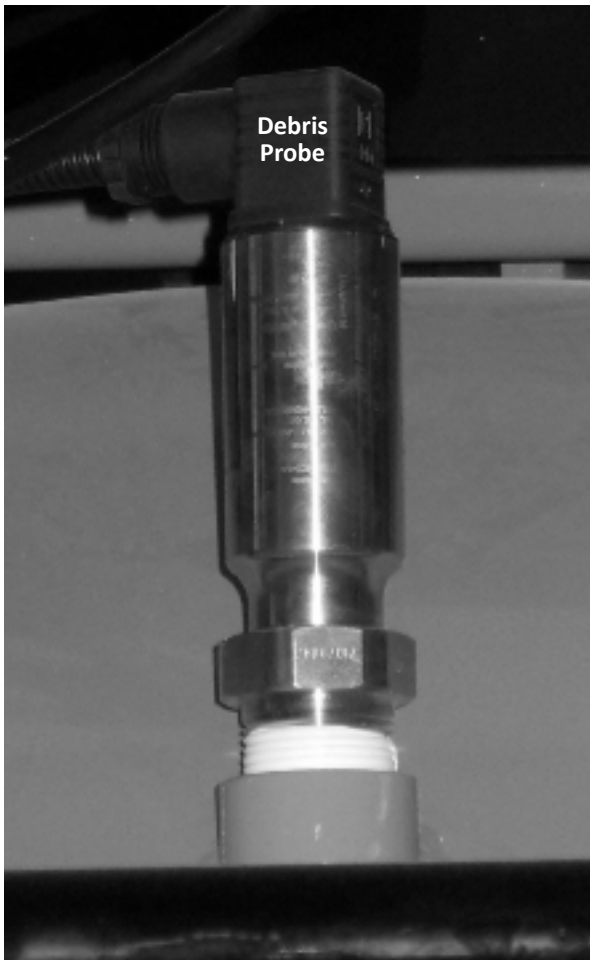
PRINCIPLES OF OPERATION



DEBRIS PROBE OPTION

The **Debris Probe** is used to set off an alarm and illuminate a warning light when a predetermined level has been reached in the Debris Tank. When this occurs, the operator can turn off the alarm by using the toggle switch.

The operator should then follow the instructions for **“Dumping The Debris Tank”**, outlined in the **“Principles of Operation”** section of this manual.



Note: For information on this option, refer to the vendor literature (if included as an option) located in the **“Controls”** section and on the Digital Copy supplied with this unit.

PRINCIPLES OF OPERATION



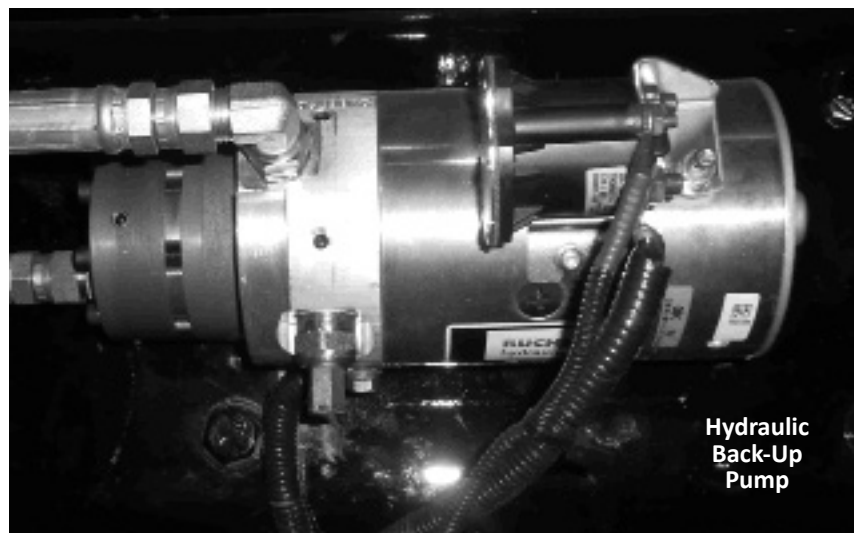
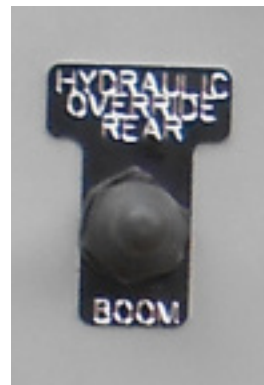
HYDRAULIC BACK-UP SYSTEM OPTION

This unit has been equipped with a **Hydraulic Back-Up System**. In the event of a Main Hydraulic Pump failure, this system can be used to complete tasks such as: stowing the boom, raising/lowering the Debris Tank, and locking/unlocking the Debris Tank Door.

To engage the **Hydraulic Back-Up System**:

1. Turn the **“Unit Power” Switch** in the cab to the **“On”** position.
2. Go to the **Operator’s Panel** and press & hold the **“Hydraulic Override”** switch to operate the **“Boom”** functions or the **“Rear”** functions.

Caution! The Hydraulic Pump Motor installed on this system is an **intermittent duty motor**. It cannot be run continuously for more than 5 minutes @ 1600psi. After 5 minutes the motor must rest for 4.5 minutes before the system can be restarted. Serious damage to the motor could occur if these steps are not followed.



PRINCIPLES OF OPERATION



COMPARTMENT HEATER

The **Compartment Heater** is used to heat the equipment compartment during cold weather operations when the unit is in use. It is connected to the chassis water system by valves mounted on the unit. These valves must be opened to allow the hot engine water to flow to the compartment heater. They should be closed when the heater is no longer used.

The flow of water to the **Compartment Heater** is controlled by a **Push/Pull Cable** located on the passenger side of the enclosure near the Hydro-X Hose Reel. Pushed all the way in, the flow of hot water is closed off to the heater. Pulled, the hot water is allowed to flow to the heater.

The **Compartment Heater** fan is controlled by a **Thermostat** located near the Water Pump.

There is an “On/Off” switch for the **Compartment Heater** located in the cab.



PRINCIPLES OF OPERATION



WATER HEATER OPTION

The diesel fired boiler is used to heat the water during cold weather operation. It is connected into the water system and water always runs through it.

To utilize the boiler:

- a) Set "**Thermostat**" to desired temperature.
- b) Place the **Switch** to the "**On**" position from unit itself.
- b) Engage the Water Pump from the Cab, Control Panel, or Wireless Remote.
- c) The boiler will start heating when it senses water flow.

Note: For information on this option, refer to the vendor literature (if included as an option) located in the "Water" section and on the Digital Copy supplied with this unit.

PRINCIPLES OF OPERATION



HOW TO USE YOUR HYDRO EXCAVATOR UNIT

IMPORTANT SAFEGUARDS:

1. When entering any excavation, proceed as recommended in the APWA handbook on safety. Follow all state and federal regulations.
2. Use only genuine Hi-Vac hose and repair parts.
3. Use Cold Weather Recirculation in temperatures below 32° F.
4. Check hose and water network for weak, worn or leaking places. Repair or replace if necessary.
5. Check for overhead lines that could come in contact with the boom.

Before proceeding with the following instructions make certain that there is at least 120 psi of air pressure in the chassis air reservoir or damage to the PTO may result.

BEFORE GOING TO THE WORK-SITE:

1. Perform required maintenance as specified in the maintenance schedule.
2. Perform required maintenance on truck chassis as specified in truck chassis manual.
3. Check to see that the boom is secure in the boom rest and the boom pendant control secure in a tool box or in the cab.
4. Check to assure that all tools are secured, and that all cabinet doors are closed and latched.
5. Fill the water tank. Please refer to one or more of the following water level indicators.
 - a. The sight tubes located on the rear of the water tanks shows the direct water level in all tanks.
 - b. Low water warning light in the cab indicates low water.
6. Inspect and clean water suction line strainer and exhauster final filter.

Before proceeding to drive this vehicle, special attention must be given to assure that the boom is resting properly in the travel position. Also, to avoid damage, be sure that the pendant control is properly wound and placed in a tool box or truck cab.

HYDRO EXCAVATING AT THE WORK-SITE:

1. Position the unit as close to the work location as possible. Set the parking brake and block the wheels.
2. Open the water pump supply valve completely.
3. Disengage the rear axle by shifting the main drive of the tower PTO. The transmission must be in neutral. On units with standard transmissions it is also advisable to depress the clutch pedal to the floor during this operation.
4. Engage water pump. Refer to the dashboard and truck labeling for the correct gear range in which to operate your Hydro Excavator machine. Select the correct gear range and proceed to the side operator's station to operate the unit. Your Hydro Excavator machine must never be run at speeds higher than specified on the dashboard and truck labeling. Running the engine at a higher rpm may be unsafe and result in personal injury and damage. Upon such use, the warranty becomes null and void. If you cannot locate this information, please call your selling dealer, or the Hi-Vac Corporation direct at (740) 374 -2306.
5. At the side operator's station, move throttle control lever up momentarily to increase engine speed, down to decrease. The needle on the tachometer indicates the engine speed.

Cold weather precautions: If the unit is subjected to freezing temperatures, ice will probably form in the hydro excavation hose and must be ejected for proper operation. Leave the hose in its traveling position, the engine at idle speed, and run water through the hose for at least one minute or until all ice is ejected. If pressure starts to rise, the hose is plugged.

PRINCIPLES OF OPERATION



VACUUMING AT WORK SITE:

1. Be sure that the unit operator is completely familiar with the wireless remote.
2. Place a sufficient number of intake and/or extension tubes on the boom hose to reach the desired working depth.
3. Engage exhauster. To increase the exhauster speed, increase engine RPM to working speed, not to exceed maximum RPM and gear as noted on the dashboard and truck labeling.
4. Begin vacuuming debris and water. The vacuum tube can be positioned by use of the boom up/down control, and by physically moving the tube around inside the hole to reach all areas where debris has collected.
5. When vacuuming, the intake tube may be positioned just above the water level in the hole allowing a mixture of air, water, and debris to enter. When required, the unit is capable of removing debris from below water level with the intake tube completely submerged.
6. If during the vacuuming process, the debris tank becomes full, the ball check valve will close which is indicated by loss of vacuum at the intake tube. The vacuum breaker will also "whistle." When the debris tank is full, follow the instructions for disengaging the exhauster PTO.

Caution!

To avoid overloading of the truck chassis, the debris tank and the water tanks must never be simultaneously loaded to full capacity. When traveling to the dump site with a fully loaded debris tank, a maximum of 1/4 tank of fresh water should be carried. This is sufficient to wash down the debris tank.

Do not operate the unit for long periods of time when the debris tank is full. It is extremely important to always remove as much water as possible from the debris tank before driving the vehicle. This will help eliminate overloaded conditions.

7. Excess water may be removed from the debris tank by opening the drain valve at the rear of the unit and allow the water to drain. Ensure the exhauster is not engaged.

PRINCIPLES OF OPERATION



LEAVING THE WORK SITE:

1. Before leaving the worksite for the dumpsite, assure the boom is in its travel position and properly latched.
2. Proceed to dumpsite.

DUMPING THE DEBRIS TANK:

Caution!

When dumping this vehicle, always seek firm, level terrain on which to park the vehicle when setting up to dump. Never lift the tank when the unit is parked on a grade, or when the underlying ground is soft or unstable. Failure to follow these guidelines may result in a catastrophic accident in which the vehicle may tip over or the tank may shear from its mounting supports.

Do not attempt to raise the tank until the door has been opened to allow the debris to empty. Never drive this vehicle with the tank raised or the tank door opened.

Be sure the area above the vehicle is free of electrical lines or any other obstructions.

1. Position the truck at the dump site, set the parking brake, and block the wheels.
2. Procedure for opening the rear door and raising the tank:

Note: Maximum operating speed for opening the rear door is 1500 RPM.

- a. Disengage the rear axles.
- b. Rotate the boom to the rear.
- c. Your unit is equipped with hydraulic door locks, push and hold the toggle switch marked LOCKS upward to unlock the hydraulic door locks.
- d. Raise the door with the toggle switch marked DOOR located on the side control panel. Push the switch up and hold until the door is completely open.
- e. Push the switch up and hold to raise the debris tank as needed to allow the debris to completely dump out of the tank.
- f. After dumping is complete, push the switch and hold down until the tank is completely down on the sub frame.
- g. Close the door by pushing the toggle switch marked DOOR. If your unit is equipped with hydraulic door locks, lock the door by pushing the toggle switch marked LOCKS and holding until the locks are completely closed.
- h. Next, open the gate valve located at the bottom of the hopper mounted below the cyclone separator. Allow debris to drain. Close the gate valve.
- i. Open and clean the exhaust final filter.

Note: Make sure that the door is completely closed prior to closing the hydraulic locks.

PRINCIPLES OF OPERATION



CLEANING THE DEBRIS TANK:

Connect the handgun to the quick disconnect at the 1/2" hose reel. Engage the water pump. Increase the engine RPM with the throttle until the water pressure reaches 800 PSI on the pressure gauge. Do not exceed this pressure setting when operating. The handgun should also be used to flush the cyclone and hopper.

HELPFUL HINTS FOR USING YOUR HYDROEXCAVATION UNIT

WATER LEVEL INDICATORS:

It is important to pay attention to the amount of water remaining in the fresh water tanks when using the hose reel. There are two ways of determining the amount of water remaining:

1. The sight level tube located on the water tanks which shows water level in both tanks.
2. Low water warning light, will come on when there is approximately 3 minutes of operation time remaining. (Optional)

COLD WEATHER STORAGE:

The following procedure is required to prevent damage to the water pump and water system during cold weather conditions.

1. Open the drain in the water tank cross-over line, under truck chassis, behind the rear axle. Leave the drain cap off until the machine is ready to be used.
2. Drain water from tanks by tipping the tank slightly. Once the water is removed, lower the tank.
3. Remove the suction line filter, gasket and cover.
4. Turn the 3 way ball valve at rear reel water manifold to the "Hose Reel" position.
5. Engage water pump in accordance with normal procedure and run pump approximately 15 seconds.
6. Apply 75 to 100 PSI of air pressure, from an external source, to the air valve on the water pump to force the water from the water pump and hose reel. Do this until a solid stream of water no longer comes out of hose.
7. Tie or wire the sewer cleaning hose end securely to reel and rotate clock-wise as if retrieving the hose from sewer. Make certain the nozzle is removed. Rotate until water no longer comes out.
8. Open valve for handgun and push ball on male quick connect.
9. If equipped with cold weather recirculation option, open the ball valve to drain the water from the return line. Leave this valve open until ready to use again.

Caution! The implementation of this procedure must be performed immediately after hydro excavating operation or cold weather recirculation operation.

Caution! If general circumstances lead to the interruption of the procedure and there is a presumption of ice formation in the system, move to the unit to a heated garage immediately, let thaw out, and then proceed with the above steps.

CUSTOMER SERVICE AND PARTS ORDERS:

Hi-Vac Corporation is committed to customer satisfaction. In addition to our Authorized Dealer network throughout the world, we maintain a full stock of parts and accessories at our factory in Marietta, Ohio. In the event you need parts or service, first call your nearest Authorized Dealer. Their name and number should be shown on the unit information sheet located at the front of this manual.

To assure prompt delivery and processing of your parts orders, please have the following information available, when you place your order:

1. Type and serial numbers for the unit and chassis. This information is also located on the Identification Sheet.
2. The part number(s) of the required items, along with the quantity desired.
3. SHIPPING INSTRUCTIONS, whether your parts are to be shipped next day air, second day air, truck, ocean freight, etc. When left unspecified, orders are shipped UPS, or truck freight if necessary due to weight restrictions. We must have your street address: we cannot ship to P.O. Box numbers.
4. When placing orders - FIRST: Contact your nearest Authorized Hi-Vac Dealer. If they are unable to assist you, contact the Parts or Customer Service Departments at Hi-Vac:
Phone: **740-374-2306**

Every effort is made to ship all in-stock parts on the same day the order is received, when the order is placed before noon, Eastern Time. Orders received after noon are shipped the next business day.

SALES TERMS:

The descriptions and instructions included in this manual cover the standard design of the equipment and any common deviations when possible. This manual does not cover all design details and variations nor does it provide for every possible contingency which may be encountered.

When information cannot be found in this manual, contact your nearest Aquatech, Inc. Parts and Service Center, or phone the Hi-Vac Service Department.

All specifications given have been calculated at sea level. All designs and specifications are subject to change without notice.

No material returns will be accepted unless accompanied by our **Material Return Authorization form**. A restocking charge of 20% applies to all Return Goods. Minimum billing of \$100.00 applies to all orders.

CLAIMS PROCEDURE:

Warranty claims against the Company shall be made by the delivering dealer in accordance with the terms set forth in the "Warranty Request Claim" policy statement as set forth at the latest effective date.

All parts are supplied F.O.B. by the factory in Marietta, Ohio. No freight allowances are made. No travel time allowances are made. The purchaser shall agree to these terms by virtue of acceptance of the machine or purchased part.

REPLACEMENT PART WARRANTY:

Parts replaced during the warranty period will be warranted only during the term of the original warranty. No extension of warranty is made by installation of the new part.

Replacement parts purchased after the warranty period will carry a thirty (30) day warranty against defects in material or workmanship, or whatever warranty shall be offered and be enforceable upon the original manufacturer, whichever is longer. Labor costs incurred to replace defective parts are specifically excluded from this warranty.

The purchaser shall be responsible for payment of the replacement part until such time as the original manufacturer shall offer warranty replacement to the Company, at which time credit will be issued to the purchaser. **All such defective parts must be returned to the factory, freight pre-paid, for evaluation and determination of warranty by the original manufacturer.** Requests for return will be made at the discretion of the Company. No part shall have been previously disassembled or tampered with in any way so as to void the manufacturer's warranty.

The Company's sole responsibility under these terms shall be the timely return of the defective part to the original manufacturer for warranty consideration, and for such reasonable follow-up action as may be necessary to expedite the claim. The original manufacturer's decision shall be final and binding on both purchaser and the Company.

LIMITED WARRANTY

Hi-Vac® Corporation (the "Company") hereby warrants to that each new X-VAC® Hydro Excavator (the "Unit") will be free of defects in material and workmanship. This Limited Warranty applies to the original end user and any transferee during the applicable time period, subject to the following terms and conditions:

1. Time Periods:

- The "Standard Warranty Period" is 12 months from date of delivery to the original end user or 2,000 operating hours, whichever occurs first. Any Unit which has been used as a demonstration unit will, upon sale and delivery to the end user, have the same Limited Warranty as provided for herein.
- Special Extended Warranties and Extended Time Periods:
 - (a) Poly-graphite Tanks Warranty: 10 years against any factory defect in material or workmanship and LIFETIME against leakage from corrosion or rust through.
 - (b) Debris Tanks Warranty: 10 years against any factory defect in material and LIFETIME against leaks due to corrosion or rust through.
 - (c) Water Pump Warranty: 5 years against water pump failure and/or factory defect in material or workmanship.
 - (d) Drive System: 5 years against drive system failure and/or any factory defect in material or workmanship. The Drive System warranty is non-transferrable

2. Exclusive Remedy: The exclusive remedy for any covered warranty claims is that Company shall repair or replace, or in lieu thereof may refund the purchase price, at its sole discretion, such defects of such Unit that the Company's examination discloses to be defective in material or factory workmanship, at Company's sole discretion. Any repairs or replacements are to be made at a location approved by Company (i.e. a selling distributor's location or the Company's facility) to assure the Unit performs according to its published specifications.

3. The Following Limitations Apply:

- (a) This Limited Warranty applies only to the original end user during the applicable warranty time periods.
- (b) Only a Unit which has been subjected to normal use and preventative maintenance per original Manufacturer recommendations contained in the Operator's Manual delivered with the Unit is covered by this Limited Warranty.
- (c) This Limited Warranty shall not apply to (and the Company shall not be responsible for) any of the following:
 - items or parts of the Unit that are subject to misuse, negligence, accident or improper maintenance by end user.
 - normal maintenance and service adjustments, including, but not limited to engine valve adjustments, fuel, air and hydraulic system cleaning, engine tune-up, clutch inspection and adjustment, etc.
 - standard consumables and preventative maintenance items or normal wear parts such as, but not limited to: oils, fluids, lubricants, hoses, gaskets, fuses, light bulbs, tires, batteries, belts, etc.
 - operation of the Unit in a manner or for a purpose not specifically recommended in writing by the Company.
 - repairs, modifications or alterations without the express written consent of the Company, which in the Company's sole judgment, have adversely affected the Unit's operation, stability, or functionality as originally designed and manufactured by Company.
- (d) The Unit and supporting equipment may incorporate many component parts manufactured by companies other than Manufacturer; including, but not limited to the following: the truck chassis, engines, compressors, water pump, exhaust/vacuum pump, high pressure water hose, hydraulic pumps, motors and valves, batteries, drive belts, power take-off, axels, tires, electrical components and other specialized equipment. This Limited Warranty does not apply to such component parts or sub-systems. For equipment and components mentioned in this section, the end user will address warranty service and support

direct with the original manufacturer or nearest authorized servicing distributor for such component parts or sub-systems. While this Limited Warranty does not cover component parts and sub-systems manufactured by third parties, Company shall pass-through to end user any warranties (if any) from such component or sub-system manufacturer to the extent permitted and simply as a matter of customer service shall make good faith efforts to provide any relevant information or reasonable assistance to end user/purchaser related to contacting such third party vendors regarding their warranties.

- (e) Any repair or replacement made to replace any defects in material or workmanship of the Unit is warranted solely for the duration of the unexpired Warranty Period. No extension of warranty is made by installation of the new part.
- (f) Company reserves the right to request the return of failed or defective parts or components to Company's factory origin for evaluation subject to Company's return authorization process and procedure.
- (g) Company will not be responsible or liable for defects, losses, damages or failures caused by end user's (or any third party's) unauthorized alternations, use of non-approved parts, unreasonable use, neglect, abuse, accident, negligent repair or failure to perform proper maintenance.
- (h) It is the responsibility of the end user to report warranty claims in a timely manner. Damages resulting from failure to report such claims promptly are not covered under this warranty.
- (i) The term "LIFETIME" means and applies to the original end user only and covers only the original end user's ownership period.

4. No Other Warranties. There are no other warranties made by company with respect to the Units, expressed or implied, other than the limited warranty as set forth above. This limited warranty supersedes any other warranty, promises or representations previously made or issued by company. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND COMPANY HEREBY EXCLUDES ALL SUCH WARRANTIES WHICH MIGHT OTHERWISE BE IMPLIED BY LAW, ALL OF WHICH ARE HEREBY DISCLAIMED. The Company makes no representation that the Unit has the capacity to perform any functions other than as contained in the Company's written literature, specifications or Owner's Manual accompanying delivery of the Unit. No person, affiliated company or distributor of Company's products, is authorized to alter the terms of this warranty, to give any other warranties or to assume any other liability on behalf of the Company in connection with the sale, servicing or repair of any Unit manufactured by the Company.

5. Design Changes/Product Improvements. The Company reserves the right to make design changes or improvements in its products from time to time without any obligation to change or improve any previously manufactured Units.

6. Limitation of Liability. Company's liability for breach of this Limited Warranty, whether a claim or lawsuit is brought in contract, tort, or strict liability, will be limited exclusively to repair or replacement of defects covered by the terms of this Limited Warranty. Company will not be liable for any direct or indirect, incidental, consequential, special or punitive damages of any kind which may result from defects in its Units, products, services, or from breach of this Limited Warranty, nor will Company be liable for any damages resulting from the end user's loss of use of the Unit and/or its supporting equipment.

GENERAL MAINTENANCE SCHEDULE

(DAILY)

1. Inspect all high pressure water lines and hydro excavation hose for cuts and/or leaks.
2. Inspect all oil lines and connections for cuts and/or leaks.
3. Inspect all valves, linkages, and controls for operation and position.
4. Inspect nozzles for excessive wear or obstructed orifices.
5. Inspect water pump suction line strainer, clean if necessary.
6. Remove and clean exhauster strainer and clean housing.

(WEEKLY)

1. Inspect water pump and exhauster for loose mounting bolts and proper alignment.
2. Inspect drive train and PTO shafts, universal joints, and bearings.
3. Remove and clean exhauster strainer and clean housing.
4. Inspect hydraulic system filter and clean or replace if necessary.

(BI-WEEKLY)

1. Inspect water pump for excessive or abnormal wear. Remove any foreign material, dirt or rust.

(EVERY 6 MONTHS)

1. Inspect the valves and springs in the water pump.
2. Inspect debris tank coating and re-coat as necessary.
3. Inspect PTO and drive shafts for loose and/or worn belts and bearings.
4. Inspect the exhaust system for leaks or heating problems.

TROUBLESHOOTING COMMON PROBLEMS

The following is a list of possible problems which may be encountered during the life of this machine. Probable causes are listed in this section together with recommended solutions to these problems. If the resolution of these problems or any other problems are not readily apparent, contact your local authorized X-Vac dealer.

CONDITION: LOSS OF WATER PRESSURE	
PROBABLE CAUSES	REMEDIES
Worn nozzle orifices.	Replace orifice or nozzle.
Wrong nozzle.	Change to correct nozzle.
Inadequate engine speed.	Adjust throttle cable and consult engine manual. Check for correct gear.
Gate valve in suction line partly closed.	Open valve.
Leaks in the high pressure water system.	Locate and eliminate as required.
Water control valve leakage bypassing or recirculating water back to the water tank.	Clean, or replace seals.
Relief valve leaks or otherwise malfunctions.	Replace. Note: Valves are set at the factory and adjustment by inexperienced people could result in damage to equipment or possible injury to personnel.
Pump starved for water.	Clean suction line and hose of obstructions, replace suction hose if it leaks or is collapsed. Clean suction line strainer. Open gate valve.
Transmission slipping.	Adjust, consult chassis manual, check automatic transmission fluid level.
Gauge is inaccurate.	Replace gauge.
Worn valves or valve components.	Replace components as required.
CONDITION: WATER PRESSURE TOO HIGH	
PROBABLE CAUSES	REMEDIES
Clogged nozzle.	Clean jets.
Incorrect nozzle.	Replace with correct nozzle.
Incorrect gear.	Shift to proper gear.
Overspeeding engine.	Reduce speed.
CONDITION: HAMMERING NOISE IN WATER PUMP	
PROBABLE CAUSES	REMEDIES
Pump starved for water.	Clean suction line and hose obstructions, replace suction hose if it leaks or is collapsed. Clean suction line strainer. Open gate valve.
Valve stuck open with debris.	Disassemble and remove debris.
Worn valves or seals.	Inspect and replace as required.
Low oil level in water pump.	Check oil level and fill to proper level. If pump has been operating with inadequate lubrication, inspect bearings.
Air in pump.	Bleed off air through blowout valves. Remove nozzle from hose, pump water through until it flows at a smooth steady stream.

TROUBLESHOOTING COMMON PROBLEMS

The following is a list of possible problems which may be encountered during the life of this machine. Probable causes are listed in this section together with recommended solutions to these problems. If the resolution of these problems or any other problems are not readily apparent, contact your local authorized X-Vac dealer.

CONDITION: LOSS OF VACUUM	
PROBABLE CAUSES	REMEDIES
Debris tank is full and check ball is closed.	Drain or recycle water in debris tank. Dump debris tank.
Boom turret plugged.	Remove turret and clear blockage.
Vacuum system leak.	Inspect vacuum system for leaks, normally a high pitched sound is heard. Some areas to check first are: Rear door seal, tank closure seal, intake tube O-rings, portal gasket. Check to see that gate valves are closed, such as rear drain, and valves on the recycling system.
Blockage in the intake hose.	Disengage exhauster pump and evacuate the vacuum from the tank. Inspect intake tubes. Remove the primary check valve cover and inspect the ball check. Lower the boom all the way to allow material to drop out through the hose. Pressure discharge through boom hose.
Inadequate engine speed.	Check engine tachometer, adjust throttle cable, consult engine manual. Check for correct gear.
Loose exhauster pump drive belt.	Tighten.
Faulty vacuum reading.	Replace gauge.
Exhauster pump malfunction.	Consult exhauster pump manual.
Sticking vacuum relief valves.	Check to determine if they open at 15" Hg., Clean/lubricate/replace if necessary.

TROUBLESHOOTING COMMON PROBLEMS

The following is a list of possible problems which may be encountered during the life of this machine. Probable causes are listed in this section together with recommended solutions to these problems. If the resolution of these problems or any other problems are not readily apparent, contact your local authorized X-Vac dealer.

ELECTRICAL SYSTEM

IMPORTANT!

Do not attempt to remedy any electrical problems without first examining the schematic wiring diagram and control wiring circuit drawing (see Electrical Section). Check truck chassis battery and cell condition. Use proper instrumentation for current and continuity test results.

(A) Continuity- Use OHM scale recorder or battery powered continuity test light.

(B) Current- The circuit must be opened to obtain current reading with the volt- meter; therefore, it is more convenient to use a 12 VDC test light.

CONDITION	PROBABLE CAUSES	REMEDIES
NO POWER	Ignition/unit power switch not "on".	Turn ignition/unit power switch "on".
BOOM VALVE NOT WORKING	Faulty solenoid valve.	Check for voltage at solenoid. Replace.
FUSE BLOWN (#1 TERMINAL BLOCK, #2 AMP REPLACEMENT).	1. Frayed or broken harness wire. 2. Short circuit in solenoid(s) wiring connection. 3. Switch terminal arcing within housing.	1. Repair or replace. 2. Check for pinched or bare wire connections. 3. Secure terminal to post connections on switch.
PTO WON'T RE-ENGAGE DRIVE AXLE.	Switches turned off in wrong sequence.	Unit power must be last switch turned off.
PTO DOES NOT DISENGAGE DRIVE AXLE.	Faulty solenoid valve	Check for voltage at solenoid. Replace
PENDANT BOOM SWITCHES FUNCTION ERRATICALLY.	1. Push button, switch terminals loose or disconnected. 2. Push button switch contacts burned or disconnected. 3. Water in pendant	1. Tighten or reconnect. 2. Replace switch unit. 3. Dry out pendant control and seal leaks.
FLAPPER VALVE INTAKE CYLINDER ON BOOM INOPERATIVE.	1. Pneumatic valve solenoid coil burned out. 2. Valve spool stuck or unsealed. 3. Wiring from valve to control box broken or disconnected.	1. Test and replace if necessary. 2. Disassemble, clean, or replace. 3. Repair and replace.

Alloy Cap Screws 1018 ft. lbs.

CAP SCREW DIAMETER	YIELD STRENGTH PSI MIN.	RECOMMENDED TORQUE	
		UNC	UNF
¼	58000	11	13
5/16	58000	21	23
3/8	58000	38	40
7/16	58000	55	60
½	58000	85	95
9/16	55000	125	140
5/8	55000	175	210
¾	55000	300	330
7/8	55000	450	490
1	50000	680	715
1-1/8	50000	885	990
1-1/4	40000	1255	1380
1-3/8	40000	1635	1875
1-1/2	40000	2180	2430

Heat Treated 1038 Hexagon Head Cap Screws, SAE Grade 5 ft. lbs.

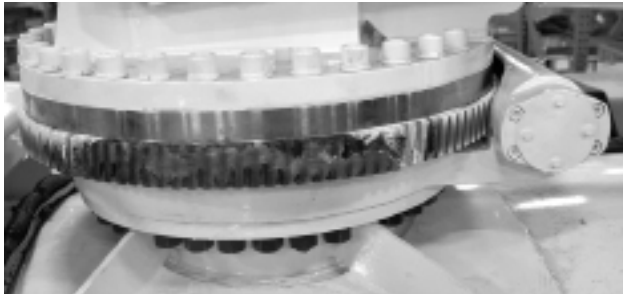
CAP SCREW DIAMETER	YIELD STRENGTH PSI MIN.	TENSILE STRENGTH PSI MIN.	RECOMMENDED TORQUE	
			UNC	UNF
¼	90000	120000	11	13
5/16	90000	120000	21	23
3/8	90000	120000	38	40
7/16	90000	120000	55	60
½	90000	120000	85	95
9/16	90000	120000	125	140
5/8	90000	120000	175	210
¾	90000	120000	300	330
7/8	81000	115000	450	490
1	77000	115000	680	715
1-1/8	77000	105000	885	990
1-1/4	77000	105000	1255	1380
1-3/8	77000	105000	1635	1875
1-1/2	77000	105000	2180	2430

Alloy Hexagon Head Cap Screws, SAE Grade 8 ft. lbs.

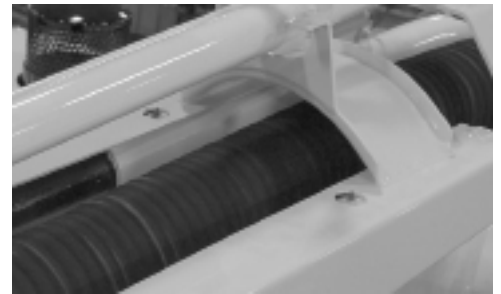
CAP SCREW DIAMETER	YIELD STRENGTH PSI MIN.	TENSILE STRENGTH PSI MIN.	RECOMMENDED TORQUE	
			UNC	UNF
¼	130000	150000	12	15
5/16	130000	150000	25	30
3/8	130000	150000	50	60
7/16	130000	150000	85	95
½	130000	150000	125	140
9/16	130000	150000	175	195
5/8	130000	150000	245	270
¾	130000	150000	425	460
7/8	130000	150000	660	700
1	130000	150000	990	1050
1-1/8	130000	150000	1470	1655
1-1/4	130000	150000	2100	2310
1-3/8	130000	150000	2750	3110
1-1/2	130000	150000	3640	4100

X-VAC LUBRICATION POINTS

Note: For item descriptions and lubrication intervals, refer to the “X-Vac Standard Unit Lubrication Points Intervals” located within the “Service” section of this manual.



1 - BOOM WORM GEAR BEARINGS
2 - BOOM TURRET GEAR



3 - BOOM EXTENSION TUBES



4 - REAR DOOR HINGE PINS
5 - REAR DOOR CYLINDER PINS



6 - BOOM EXTENSION CYLINDER



7 - BOOM PIVOT PINS



8 - VACUUM TUBE O-RING

SERVICE



X-VAC LUBRICATION POINTS

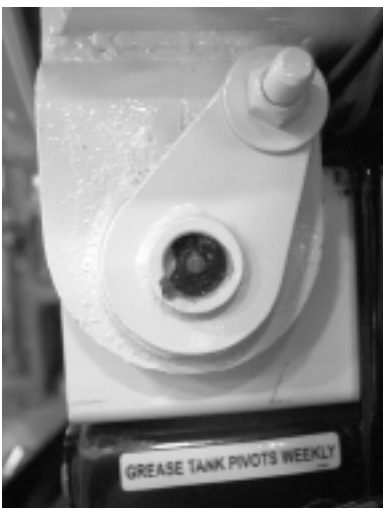
Note: For item descriptions and lubrication intervals, refer to the “X-Vac Standard Unit Lubrication Points Intervals” located within the “Service” section of this manual.



9 - BOOM LIFT CYLINDER



10 - TIPPING CYLINDER PINS



11 - DEBRIS TANK PIVOT PINS



12 - REAR DOOR LOCK WEDGE



13 - HOSE REEL SWIVEL

X-VAC STANDARD UNIT LUBRICATION POINTS INTERVALS



LUBRICATION CHART

Revised 3/1/2019

ITEM	CAPACITY	OIL RECOMMENDATION	AMBIENT TEMP.	INTERVAL
Aquatech Water Pump Gear Reduction Boxes **	2.5 Quarts	SAE 90 EP		
Aquatech "Fab" Water Pump model 012 **	no record	SAE 60 EP SAE 90 EP	Winter Summer	1000 hrs
Cummins A1700 37hp	5 Quarts			
Cummins A2300 50hp	7.5 Quarts	SAE 5W-30 - API Spec CH4 & up.....	Below 20°F	500 hrs or 6 mo. □
Cummins B3.3 65hp & 85hp	8 qts. (9 w/turbo)	SAE 10W30 - API Spec CH4 & up.....	-25°F to 20°F	
Cummins B3.9 116hp & 125hp	?	SAE 15W40 - API Spec CH4 & up.....	Above -10°F	
Cummins B5.9 160hp	?			
Gasol 3364 Series Water Pumps **	2 Gallons	ISO VG100 EP3 Non-Corrosive ISO VG220 EP5 Non-Corrosive	Below 32°F (0°C) Above 32°F (0°C)	
General PN3 Regulating Valve	15.2 Ounces	ISO VG46	All	
General PN4 Regulating Valve	8.5 Ounces			
General HF Series Water Pumps - Crankcase	2.13 Quarts	ISO VG220 R&O	32° to 113°F	1000 hrs or 12 mo. □
General MH Series Water Pumps - Crankcase	14.8 Quarts			
General MK Series Water Pumps - Crankcase	14.25 Quarts			
General MWR Series Water Pumps - Crankcase	9.5 Quarts			
General KL Series Water Pumps - Crankcase	3.75 Quarts			
General MS Series Water Pumps - Crankcase	10.57 Quarts			
General MS Series Water Pumps - Packings	1 squirt each zerk			
General EZ Series Water Pumps - Crankcase	14 oz.	ISO VG100 (SAE30 ND)		
Giant Water Pumps - GP & LP Series	see manual	80W90		
Giant Water Pumps - P200, P300 & P400 series	see manual	20W50 Synthetic (Giant p/n 01153)		
Hibon Blower model SIAV840 (vertical gears)	.52 Gal. Drive End .45 Gal. Non D. E.	Mobil SHC-630 (ISO VG220 Synthetic)	Winter & Summer	12 mo.
Hibon Blower model SIAV8702 (vertical gears)	.79 Gal. Drive End .59 Gal. Non D. E.			
Hibon Blower model TS56MV18	.5 Gal. Drive End 1.11 Gal. Gear End			
Hibon Blower models VTB810H & VTB820H (vert.)	1.23 pt. ea. end			
Hi-Vac Bag Shaker Motor Gear Reducer	8 oz.	Mobil SHC-634 (ISO 460 PAG)	-10°F to 120°F	Top Off
Hydraulic System (for all product lines)	see manual	AW46 (Formerly AW68 *)	All	
MD Pneumatic Blower **	see manual	ISO VG220 EP5		
Myers C Series Pumps **	2 Quarts	SAE 30 Gear Oil	All	300 hrs
Myers D Series Pumps **	see manual	Mobilgear 630 (ISO VG220 EP5)	All	300 hrs
OMSI Direct/Mechanical Driven Units	see manual	SAE 80W90 (Moderate Duty Cycle) SAE 75W90 GL-5EP (Heavy/Severe)	All	1000 hrs
OMSI PC4-3000 PowerClutch™ Driven Units	8 Quarts	Mobil Delvac No. 1	All	500 hrs
Robuschi Blower **	see manual	ISO VG220 EP5		
Roots 624 Blower (vertical gears)	32 oz. Drive End 64 oz. Gear End	ISO 100 (AGMA 3EP).....	Below 0°F (-18°C)	500 hrs
Roots 624 Blower (horizontal gears)	64 oz. Drive End 96 oz. Gear End	ISO 150 (AGMA 4EP)..... ISO 220 (AGMA 5EP).....	0° to 32°F (-18° to 0°C) 32° to 90°F (0° to 32°C)	
Roots 824 Blower (vertical gears)	8 oz. Drive End 2 pt. Gear End	ISO 320 (AGMA 6EP).....	Above 90°F (32°C)	
Sutorbilt Blower	see manual	Note: synthetic has been recommended since 2005 ISO VG220 EP5	0°C to 90°C	
Uraca KD716GS Water Pump	see manual	SAE 75W90 GL5 Synthetic	Above 80°C use Full Synthetic	12 Mo.
Uraca P3-45 Water Pump	see manual	ISO VG220 EP5 or SAE 85W90		
Uraca MSSV Safety & Unloading Valve	.5 L	ISO VG46	All	Keep Full
Uraca MSUV Safety & Unloading Valve	.5 L	ISO VG5		








* Was changed in 2009 to accommodate the use of the Pall filters. ** Used pre Hi-Vac □ Whichever occurs first

(VG) Viscosity Grade: a commercial rating of industrial lubricants. The grade numbers are approximately equal to the kinematic viscosity of the lubricant in centistokes. A table is provided showing the range of viscosities acceptable for each grade under the current standard of the International Organization for Standardization (ISO).



SERVICE



	FILTER	BREAK-IN FILTER CHANGE	1st YEAR	CHANGE INTERVAL AFTER THE FIRST YEAR	A381152-B10-S-KIT (Even Anniversary Kit)	A381152-B10-P-KIT (Odd Anniversary Kit)
	A110516 Hydraulic Spin-On	After the first 50 Hours	✓	Every Year (Even & Odd Anniversary)	✓	✓
	A110000-3 Hydraulic Reservoir	After the first 50 Hours	✓	Every Year (Even & Odd Anniversary)	✓	✓
	A383754-E Pall HP Element (to March 2018)	After the first 50 Hours	✓	Every Year (Even & Odd Anniversary) or when the change indicator light stays solidly on, whichever would occur first. NOTE: the light will flicker occasionally during normal operation.	✓	✓
	121005071 A Parker HP Element (Mar 2018 on)				Not available in a kit at this time.	
	A383767 Last Chance Hydraulic		✓	Every 2 Years (Odd Anniversary)		✓
	A383736-E Pneumatic Oil Separator		✓	Every 2 Years (Odd Anniversary)		✓
	A383737-E Pneumatic Water Separator		✓	Every 2 Years (Odd Anniversary)		✓



FILTER REPLACEMENT SCHEDULE			
ITEM DETAIL	INSPECT	SCHEDULE	PART No.
BLOWER INLET FILTER CARTRIDGE	CHECK DAILY OR EACH TIME UNIT IS DUMPED	CLEAN AND REINSTALL, REPLACE IF DAMAGED	A383165-M849

BOOM HOSE



BOOM HOSE MAINTENANCE AND CARE:

1. Excessive end pull or twisting can damage or weaken end construction.
2. Never drag large hoses. Dollies or a sling should be used during transfer.
3. Inspect hose regularly. A light tap of a hammer will detect weak or soft areas badly worn from the inside.
4. Rotation of the hose distributes wear and maximizes service life. Different coloured axial paint strips at 90° or 180° near the hose ends will assist maintenance crew.

Note: The space of time elapsing between each rotation of the hose varies individually between different applications, depending on such factors as the type of material, flow rate, quantity of material handled, etc. By measuring the wear in the hose on a number of occasions at identical intervals, wear intensity can be determined and suitable times for rotation can be planned.



Catalog provided on Digital Copy

RECOMMENDED SPARE PARTS LIST

PART #	DESCRIPTION
A110516	FILTER ELEMENT,HYDRAULIC (FOR A110515)
A383754-E	FILTER ELEMENT,HYDRAULIC (FOR A383754)
A304482-E	FILTER ELEMENT,HYDRAULIC (FOR A384096)
A120866	SWITCH,TOGGLE,SPST,OFF-ON,LIGHTED
A120867	SWITCH,TOGGLE,SPDT,ON-OFF-ON,LIGHTED
A121735	BOOT,TOGGLE SWITCH
13-0100	SWITCH,VACUUM,0-30" HG
A131765	GAUGE,VACUUM/PRESSURE,FLANGE MOUNT,STAB
A131786	GAUGE,PRESSURE,0-5K PSI, W/FLANGE,STAB
A191100-NH	GASKET,REAR DOOR,18'-6",W/O HOLE
A381701	DOOR SEAL
A381048-29	PLUNGER,FOR HES25 GENERAL PUMP
A381048-48	VALVE ASSEMBLY,SUCTION/DISCHARGE
A381048-51	VALVE GUIDE, HE SERIES
A381048-52	SPRING, HE SERIES
A381048-53	VALVE POPPET,HE SERIES
A381048-F1269	KIT,REPACKING,HE25 GENERAL PUMP
A381048-F1274	KIT,REBUILD,HE25 SERIES
A130571-42	ELBOW,90D,SUPER SWIV,1/2",MxF,BP,REEL

CONTROLS



SIDE OPERATOR'S PANEL



ITEM	PART #	DESCRIPTION	QTY
1	A383409	TACHOMETER,MURPHY,11-28VDC,7-21PUL/REV	1
2	A131765	GAUGE,VACUUM/PRESSURE,FLANGE MOUNT,STAB	1
3	A120040	HOURMETER,12/24V,	1

PENDANT CONTROL ASSEMBLY (OPTIONAL)
PART #A383921



CONTROLS



Bulletin No. AQPB-173

Issued: 09/12/14 by RR

Subject: New Style B-Series Pendant Controls

File In Pendant Control Section

CURRENT PENDANT CONTROL

This is an informational bulletin listing the components of our A122170 and A122171 boom pendant Controls. See parts bulletin AQPB-106 for information on the cable & connector plug.

	PART NUMBER	DESCRIPTION	QTY.	
	A122170-HS	Pendant Housing - 5 Hole	1	
	A122170-RS	Rubber Sleeve (Cable Dust Boot)	1	
	A122170-LM	LED Lamp Module	1	
	A122170-PL	Pilot Light	1	
	A122170-PLL	Laser Engraved Pilot Light Diffuser	1	
	A122170-BT	Push Button Extended Cap 22mm, "CLOSE"	1	
	A122170-CB	N/O Contact Block	7	
	A122170-PB	Blank Black Push Button	1	
	A122170-DPB	2 Pos Multi Push Button	3	
	A122170-OL	Operator Latch	4	
	A122170-DB	Dual Boot	3	
	A122170-FB	Flush Boot	1	
Picture N/A	TBA	Engraved Left Button Label - Down, In, Left (specify)	3	Picture N/A
	TBA	Engraved RH Button Label - Up, Out, Right (specify)	3	

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THROTTLE CONTROLS

This is an informational bulletin listing the various throttle controls found on the rear control panel of our B-Series jet-vac units.

AIR VALVE	TOGGLE SWITCH	POTENTIOMETER	TOGGLE SWITCH
 <p>A111215 Used on older models with pneumatic throttle control. Used in conjunction with the Air Throttle Actuator pictured below.</p>	 <p><i>Mom. On - Off - Mom. On</i> A120855 <i>DPDT, 6 Blade Terminals</i></p>	 <p><i>(Early Version)</i> A247069 Used on units with Cummins ISC & ISM, Mercedes, Detroit w/DDEC and some early International T444E & DT466E engines.</p>	 <p><i>Mom. On - Off - Mom. On</i> A120861-2 <i>SPDT, 3 Screw Terminals</i></p>
 <p>A111217</p>	<p><i>DPDT, 6 Screw Terminals</i> Used on export and older domestic models with a linear throttle actuator. Used in conjunction with one of the Electric Throttle Actuators pictured below.</p>  <p>A120724 (12V)</p>  <p>A120724-1 (12V) A120724-24 (24V)</p>	<p>A120861-2 Used on late model units with onboard computers commonly referred to as an Electronic Control Module (ECM), Engine Control Unit (ECU) or Central Control Module (CCM).</p> <p>PLEASE NOTE: This throttle control has been replaced by p/n A383925 (pictured below), but please refer to Parts Bulletin AQPB-160 before ordering.</p>  <p>A383925</p>	

Bulletin No. AQPB-100
Issued: 07/19/05 by RR - Revised 04/14/14
Subject: Emergency Stop Switches
File In Gauges/Controls Section

E-STOP SWITCHES





The emergency stop switches listed in many Aquatech owners manuals, are not correct for the application. Please use the information below to insure that you are ordering the correct switch.

 <p>OPERATOR & SWITCHES A120183 (2) A120184 Three piece design</p> <p>1-3/8" Dia. Solid Red Knob Knurled Outer Shank Twist lock body w/set screws Dual Switch: (2) NO</p>	 <p>ASSEMBLY A120183-1 (NC) A120183-2 (NO) One piece design</p> <p>1-5/16" Dia. Solid Red Knob Black Hexagon Threaded Bezel Fastened to panel by Bezel Single Switch Fits 22mm hole</p> <p><u>REPLACEMENT KNOB</u> A120183-3</p>	 <p>ASSEMBLY A380131 Three piece design</p> <p>1-9/16"OD Red Semi-Translucent Knob Yellow "Emergency Stop" Plate Twist lock body w/set screws Dual Switch: (1) NC & (1) NO</p> <p><u>REPLACEMENT SWITCHES</u> for old design* A120065 - N/O (marked ZB2-BE101) A120066 - N/C (marked ZB2-BE102) for new design* A380131-NOCB - N/O (marked ZBE101) A380131-NCCB - N/C (marked ZBE102)</p> <p><u>REPLACEMENT OPERATOR</u> A380131-OP - for old design* (NLA) A380131-NOP - for new design*</p>
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** In late 2007 there was a running change in the design from our vendor.*

B-SERIES TACHOMETERS

The tachometer (tach) pre-supplied in the rear control panel by our panel maker is by default an alternator pulse type. Occasionally we find that the alternator on the truck chassis does not have a tach signal terminal. In these cases the tach in the panel has to be swapped out with a flywheel magnetic pulse (mag-pulse) type tach. A mag-pulse tach utilizes a sensor (sending unit) mounted over the flywheel ring gear. This swap is not reflected in the owners manuals or the unit's BOM (Bill of Material). Please use the information below to insure you are ordering the correct tach.

ALTERNATOR PULSE TACHOMETERS		FLYWHEEL MAG-PULSE TACHOMETERS	
Older Models	Current Models	Older Models	Current Models
 <p>A121790 (NLA) Datcon 0 to 4000 RPM range 12V or 24V White lettering Chrome Bezel Light Blue Plastic housing Label Markings: 103733 127A40HDP</p> <p>Replaced by A383409</p>	 <p>A383409 Murphy 0 to 4000 RPM range 11 - 28VDC White lettering Chrome Bezel White Plastic housing Label Markings: ATA-40 20700134</p> <p><i>Note: This tach was formerly a 0 to 3000 RPM range tach which Murphy discontinued in circa 2011. Here is the former tag info...</i> ATA-30-12 20700175 (12V)</p>	 <p>A249256 (NLA) Stewart Warner 0 to 3500 RPM range 12V White & green lettering Black Bezel Shiny metal housing Label Markings: 82644</p> <p>Sender: A249257</p> <p>Replaced by A383216</p>	 <p>A383216 (Kit) Murphy 0 to 4000 RPM range 11 - 28VDC White lettering Chrome Bezel White Plastic housing Label Markings: ATS-40 20700227</p> <p>Tach Only: A383216-TACH Sender Only: TBA</p> <p><i>Note: This tach was formerly a 0 to 3000 RPM range tach which Murphy discontinued in circa 2011. Here is the former tag info...</i> ATS-30-12 20700188 (12V)</p>

Bulletin No. AQPB-106

Issued: 10/21/05 by RR - Revised 05/13/14

Subject: Pendant Quick Disconnect

File In Pendant Section

DEUTSCH™ CONNECTORS & ASSEMBLIES

This is an informational bulletin listing the components of the quick connector used on the B-Series pendant controls. Please note that special tools are required to service these connectors. If the plug on the end of the pendant cable is damaged, it is advisable to send the entire pendant to us for repair. Also shown below is our part number A380300 prewired panel socket assembly. In most cases this is what should be ordered if the panel connector is damaged.



ITEM	PART NO.	DESCRIPTION
1	A152164-3	Dust cover for A152177 panel socket
2	A152176-6	Connector pin for A152177 panel socket (9 used)
3	A152177	Panel socket
4	A152167-1	Lock washer for A152177 panel socket
5	A152166-1	Retainer nut for A152177 panel socket
6	A152176-5	Connector pin for A152164-2 plug (9 used)
7	A152164-2	Plug, pendant cable end
1 to 5	A380300	Prewired Panel Socket Assembly

Below	A380343	35' replacement pendant cable with prewired A152164-2 plug
Below	A249279	50' replacement pendant cable with prewired A152164-2 plug



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AARCOMM WIRELESS REMOTE (OPTIONAL)
PART# 121001268



PTO-OMSI,10810113-04,TOWER,1:1
PART #121000546



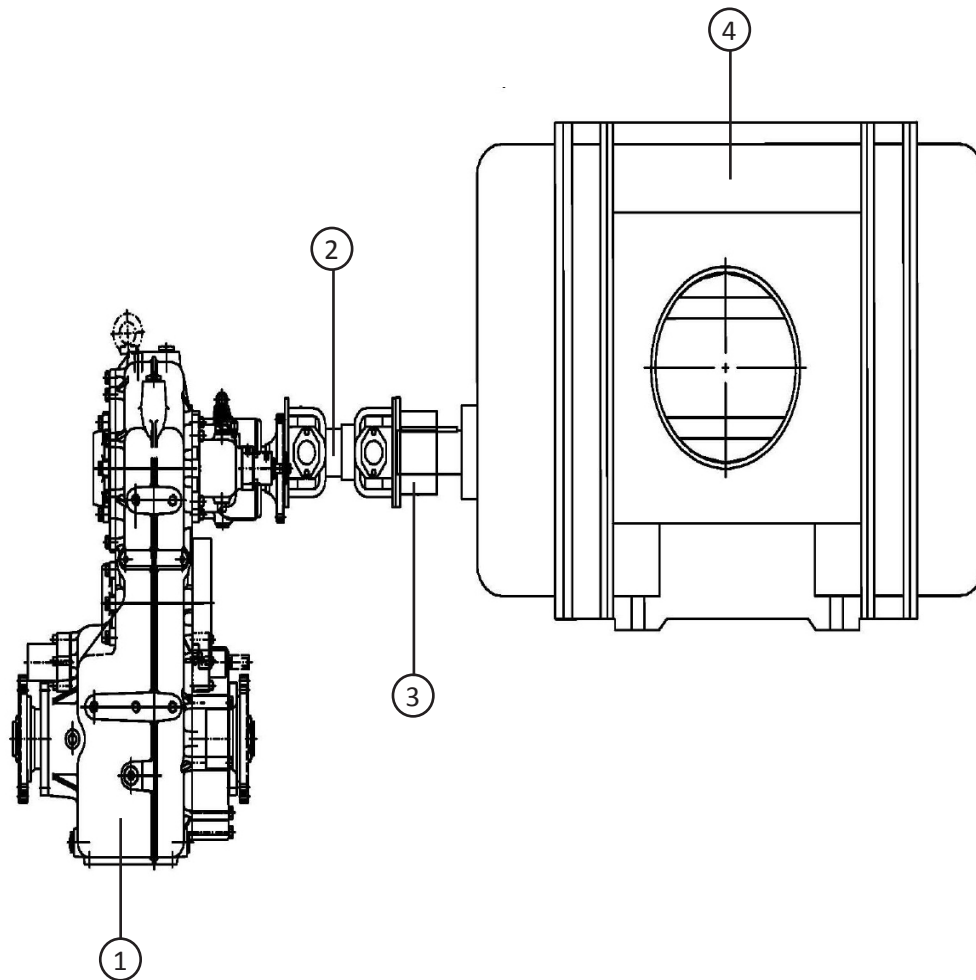
KIT,REMOTE OIL LEVEL INSP/FILLING STATION
PART #A249437-2



Note:

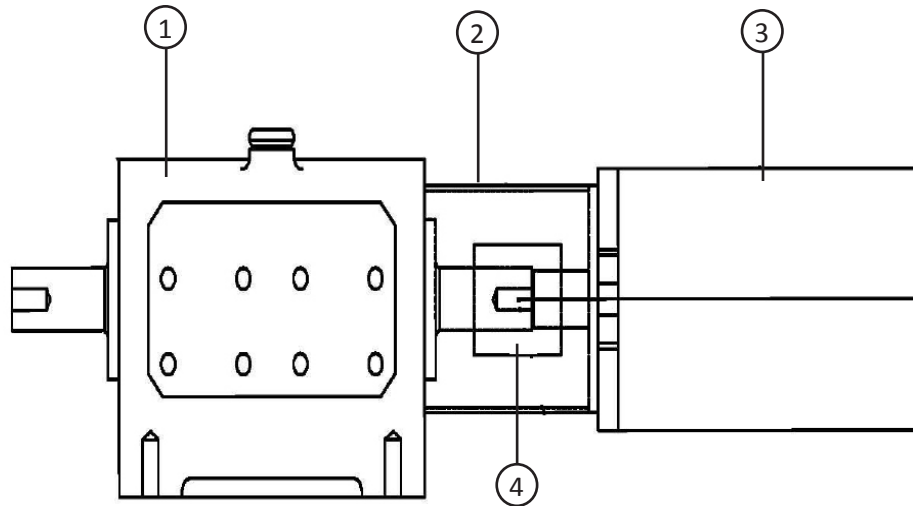
For units equipped with the optional PTO Remote Fill, the total fluid requirement is slightly more than what is specified for the PTO itself. Refer to the "X-VAC STANDARD UNIT WATER PUMP, EXHAUSTER, PTO, and HYDRAULIC SYSTEM LUBRICATION INTERVALS" section in this manual for PTO capacity.

BLOWER DRIVE SYSTEM



ITEM	PART #	DESCRIPTION	QTY
1	121000546	PTO-OMSI,10810113-04,TOWER,1:1	1
2	U3308-0269	DRIVESHAFT,HIBON 8702	1
3	U3308-0270	COMPANION FLANGE,BLOWER,HIBON 8702	1
4	A382758	BLOWER,HIBON 8702,BH-CCW	1

WATER PUMP DRIVE SYSTEM

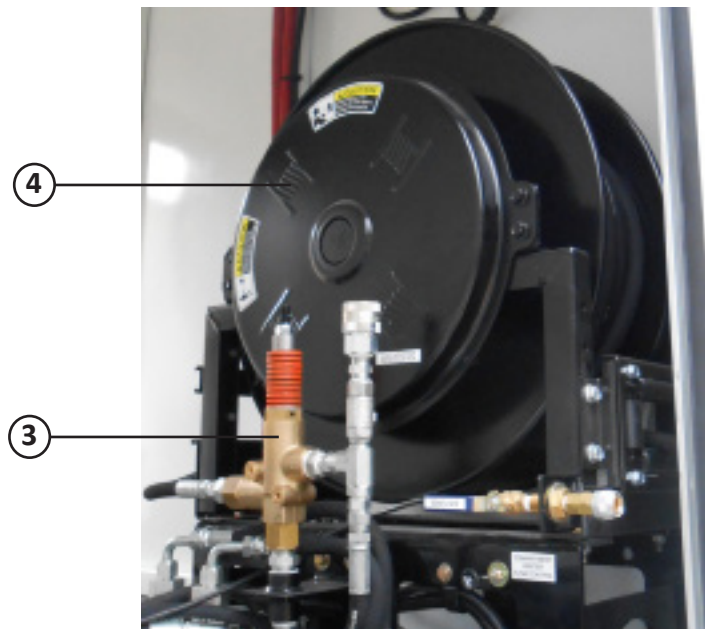


ITEM	PART #	DESCRIPTION	QTY
1	A381048	PUMP,WATER,GENERAL HF25A	1
2	A383725	HYDRAULIC FLANGE-PUMP,GENERAL	1
3	A384018	MOTOR, HYDRAULIC-LINDE	1
4	A383726	COUPLER,SHAFT	1

WATER SYSTEM

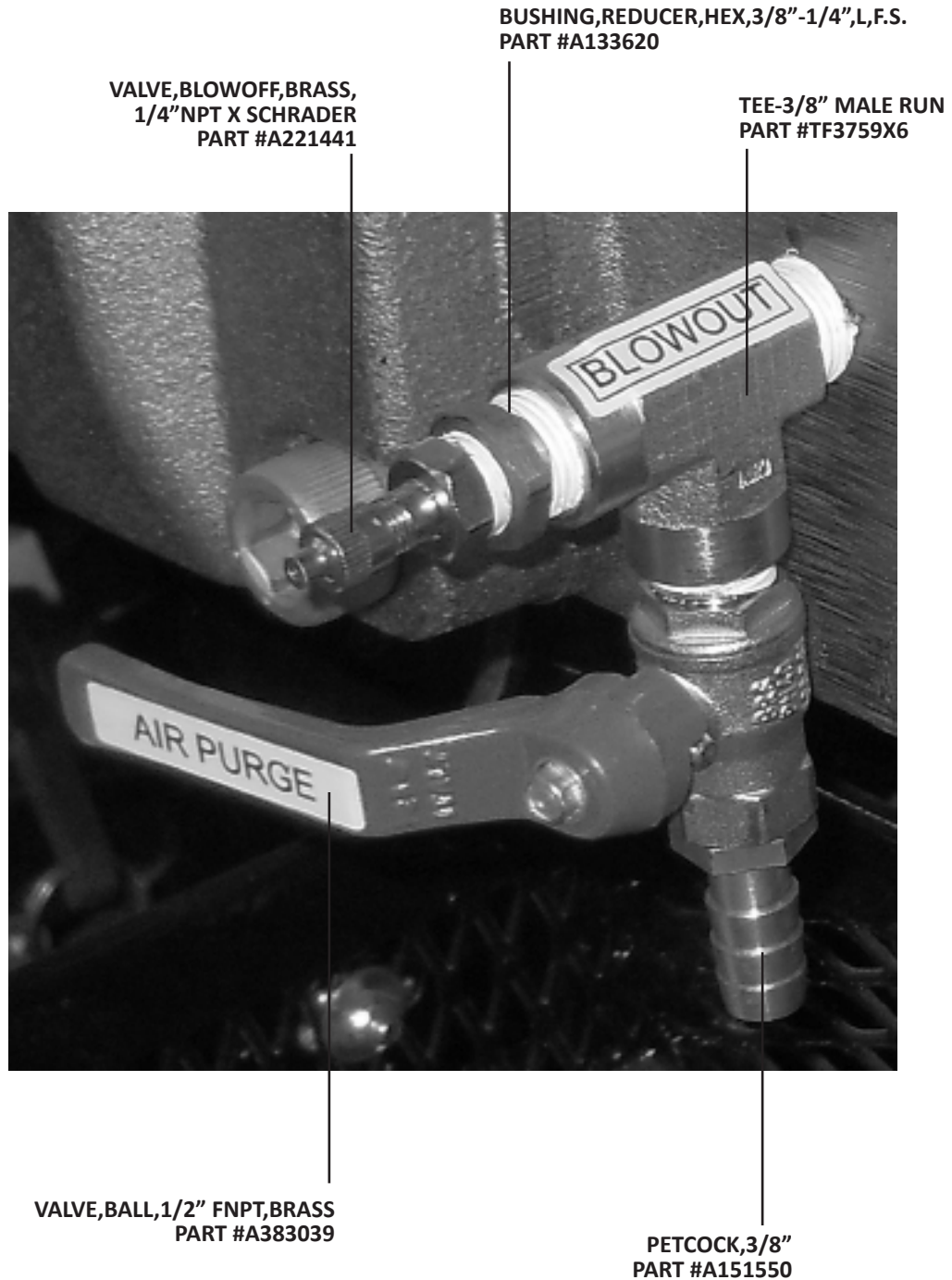


WATER PUMP AREA



ITEM	PART #	DESCRIPTION	QTY
1	A381048	PUMP,WATER,GENERAL HF25A	1
2	A131787	GAUGE,PRESSURE,0-5K PSI	1
3	22973C	VALVE,UNLOADER,3/4",26.4GPM/4060PSI MAX	1
4	A383075	REEL,HOSE	2

KIT, PUMP PRIMING PART #A304060

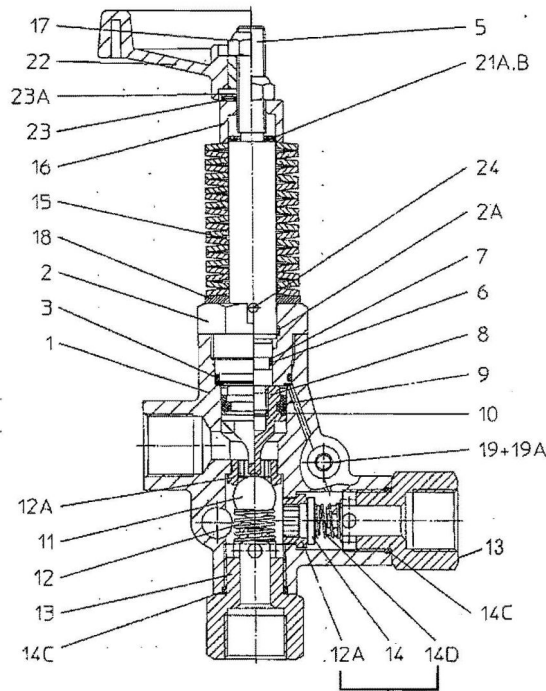


WATER SYSTEM



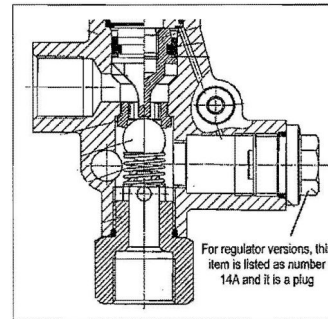
VALVE, UNLOADER, 3/4", 26.4GPM/4060PSI MAX PART #22973C

Models Unloader/Regulator 22971C/22971CR/22973C/22973CR/ 22974/22974R



22971C/22973C/22974 = Unloader
22971CR/22973CR/22974R = Regulator

When ordering handwheel versions add "H" to model number



For regulator versions, this item is listed as number 14A and it is a plug

Not present in 22971CR and 22973CR

Item	Part #	Description	Qty.	Item	Part #	Description	Qty.
1	12232	Valve Body	1	14C	07035	O-Ring	2
2	12240	Guide Plug	1	14D	06017-0100	Spring, Outlet Valve (unloader versions)	1
2A	12241	Guide Ring	1	15	12218	Spring, Yellow (22971C)	21
3	12057	O-Ring	1	15	12220	Spring, Orange (22973C)	19
5	12242	Piston Rod	1	15	04284	Spring, Silver (22974)	23
6	12204	O-Ring, Valve Stem	1	16	12245	Spacer Sleeve	1
7	12205	Backup Ring, Valve Stem	1	17	12246	Self-Locking Hexagon Nut	1
8	12206	Piston	1	18	12223	Washer, Spring	1
9	05005	Cup, 28mm	1	19	06685	Plug	4
10	05015	Backup ring, 28mm	1	19A	12017	O-Ring, Plug	4
11	12207	Ball	1	21A	06821	Spacer Disc, 0.5 mm	1
12	12216	Valve Spring	1	21B	06822	Spacer Disc, 1.0 mm	3
12A	12208	Seat, Inlet	1	22	06774	Spoked Handwheel ("H" versions)	1
13	12243	Valve Plug (unloader versions)	2	23	06775	Axial Needle Bearing ("H" versions)	1
13	12423	Valve Plug (regulator versions)	1	23A	06776	Disc ("H" versions)	1
14	12244	Valve Plate (unloader versions)	1	24	12247	Serrated Pin	1
14A	06820	Discharge Plug (only regulator versions)	1				

WATER SYSTEM



Repair Kit: Part Number 09461 Parts Included: 2A, 3, 6, 7, 9, 10, 11, 12, 12A, 14, 14C, 14D, 19A **NOTE:** This kit includes both o-ring part numbers 12057 and 07332 (item #3). Discard unused o-ring.

Part Substitutions: Unloaders manufactured prior to May, 1985 use Valve Body #12201
Unloaders manufactured between May, 1985 and July 1989 use Valve Body #12230
Unloaders manufactured prior to July, 1989 use Valve Cap #12202
Unloaders manufactured prior to July, 1989 use O-Ring #07332
Unloaders manufactured prior to May, 1985 use Valve Retainer #12211

SPECIFICATIONS:

Pressure Range: (22971C/22971CR): 580-1740 PSI (40-120 Bar) (22973C/22973CR): 580-4060 PSI (40-280 Bar) (22974/22974R): 362-580 PSI (25-40 Bar)	Minimum Flow: 2.1 GPM (8 LPM) Maximum Temp.: 158 °F (70 °F) Inlet Port: 3/4" FNPT Outlet Port: 3/4" FNPT Bypass: 3/4" BSP
Maximum Flow: 35.7 GPM (135 LPM) (22971C/22971CR/22974/2297R) 26.4 GPM (99 LPM) (22973C/22973CR)	

INSTALLATION OF 22971C(R), 22973C(R), AND 22974(R) UNLOADERS/REGULATORS

- 1) The unloader is to be positioned on the discharge side of the pumping unit.
- 2) The bottom port (inlet) receives the pump discharge.
- 3) The side port (outlet) is the pressure outlet. Make sure all side ports are tightened securely.
- 4) The backside port (bypass) redirects the pumped media when the pressure outlet is closed.
- 5) The proper sized bypass line can be directed to a holding tank, to atmosphere, or back to the pump inlet.

NOTE: Bypass lines returning to the pump inlet should be equipped with a thermal relief valve to prevent excessive heat buildup in the bypass line that can damage the pumping system during periods of prolonged bypass.

- 6) If a pulsation dampener (accumulator) is used in your pumping system, the pulsation dampener (accumulator) must be positioned on the downstream side of the unloader. **REMEMBER:** IMPROPER PLACEMENT OF THE PULSATION DAMPENER (ACCUMULATOR) CAN AFFECT THE UNLOAD CAPACITY OF THE UNLOADER AND CAN LEAD TO SEVERE SYSTEM DAMAGE AND POSSIBLE BODILY INJURY.

CAUTION: A properly sized pressure gauge must be used when attempting to adjust the unloader to its pressure setting. Position the gauge between the pump and the unloader.

- 7) Select the proper spring assembly for your unloader. All spring ratings are based on the maximum operating pressure of the unloaders.

Silver Springs: 22974/22974R
Yellow Springs: 22971C/22971CR
Orange Springs 22973C/22973CR

NOTE: Cracking pressures at which the unloader is activated can rise 300-400 PSI over the rated operating pressures depending on your system.

- 8) Always adjust the unloader springs to the system pressure with the system open. Before adjusting, be sure that the spray nozzle orifice is properly sized for the volume and pressure you desire and then fine tune the unloader.

CAUTION: NEVER USE THE UNLOADER TO COMPENSATE FOR A WORN NOZZLE AS YOU RISK BOTTOMING-OUT THE UNLOADER, WHICH CAN CAUSE THE UNLOADER TO MALFUNCTION AND LEAD TO SEVERE SYSTEM DAMAGE AND POSSIBLE BODILY INJURY.

- 9) Giant Industries, Inc. strongly recommends the use of a pop-off valve positioned downstream of the unloader as a safety backup in case of unloader malfunction.

GIANT
Performance Under Pressure

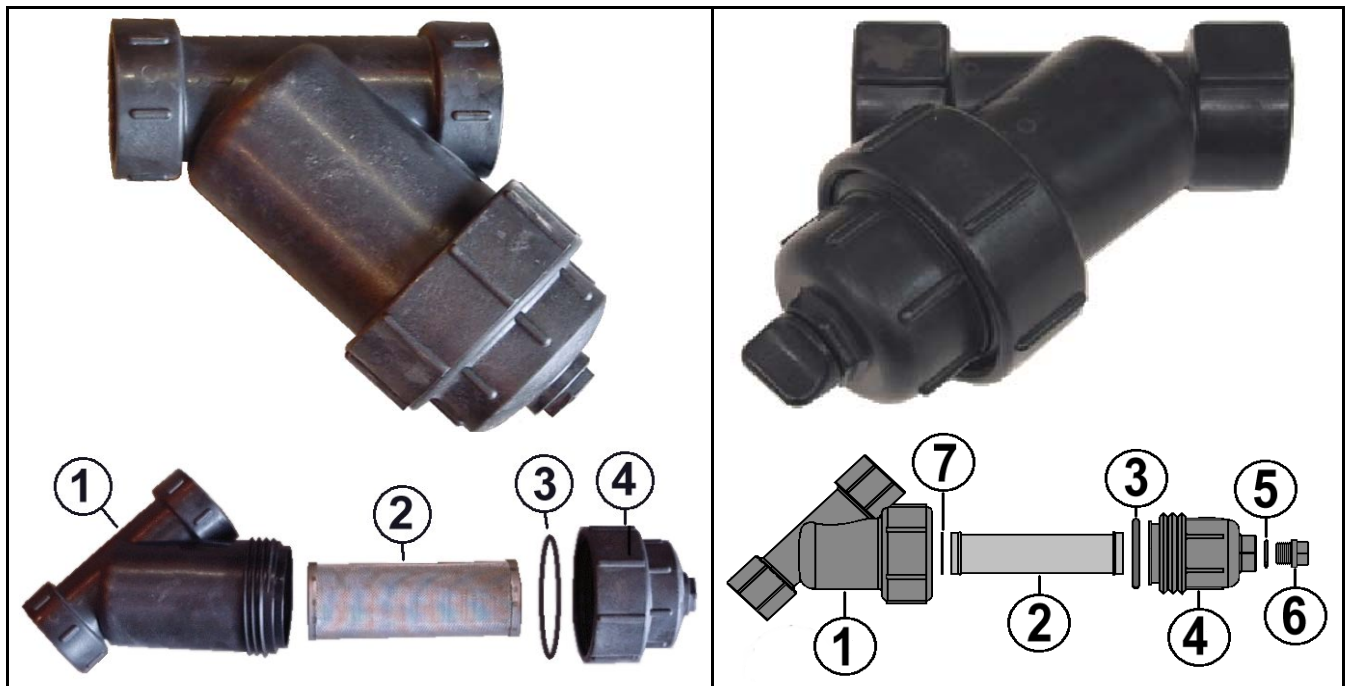
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01/14 22971_3_4C.indd

2" Y-STRAINER

Effective October 1, 2014 the A240029 2" Y-Strainer has been replaced by part number A384053. For your convenience, here is a component listing for both strainers. The main tell-tale difference in appearance is the cap. The A240029 cap has internal threads versus the external threads on the cap for the A384053. The 2" Y-Strainer is found on B-3, SJ-600P and JVLT water suction lines and is also used on the water fill pipe with strainer option on the B-Series.



ITEM	DESCRIPTION	PART NUMBER	PART NUMBER
ASSY	2" Y-Strainer Assembly	A240029 (NLA)	A384053
1	Replacement Body	NSS	A384053-6
2	Replacement Screen	A240029-1	A384053-5
3	Replacement Gasket	A240029-2	A384053-2
4	Replacement Cap	A240029-3	A384053-1
5	Replacement Drain Plug Gasket	--	A384053-4
6	Replacement Drain Plug	--	A384053-3
7	Replacement Screen Gasket	--	No longer Used*

* This is the comment we received from the manufacturer, "The o-ring never really mattered so we went ahead and changed the screen a little to remove the o-ring completely. The o-ring was really a perception thing more than a seal."

VERTICAL HYDRO-EXCAVATION GUN & LANCES



Ergonomic vertical design minimizes arm fatigue – ideal for hydro-excavation. Gun has ½”FNPT inlet and outlet fittings.



ITEM	DESCRIPTION	PART NO.
1	Vertical Spray Gun – 32 GPM Max, 4000 PSI Max, 320°F Max	A255080
2	½”NPT Nipple (used to attach male & female couplers to gun)	A131830
3	½” Female Coupler with ½”FNPT threads	A383062
4	½” Male Coupler with ½”FNPT threads	A383063
5	½” NPT X 36” 304SS Lance	A255099
	½” NPT X 48” 304SS Lance	A255100
	½” NPT X 60” 304SS Lance	A255101
	½” NPT X 72” 304SS Lance	A255102
inset	½”NPT Coupler (use to join lances together if male & female couplers are not desired)	C3309X8

Spray Nozzle Options...

6	Adapter, ¼”FNPT X ½”FNPT for installing following tips	A255103
	Spray Tip, ¼”MNPT, #30 Orifice - Solid Stream Pattern	A249490
	Spray Tip, ¼”MNPT, #30 Orifice - 15° Delta Pattern	A249489-2
	Spray Tip, ¼”MNPT, #30 Orifice - 50° Delta Pattern	A249489-1
	Spray Tip, ¼”MNPT, #30 Orifice - 95° Delta Pattern	A249489

See separate flyers for other optional nozzle attachments.

ROTATING HYDRO-EXCAVATION NOZZLE

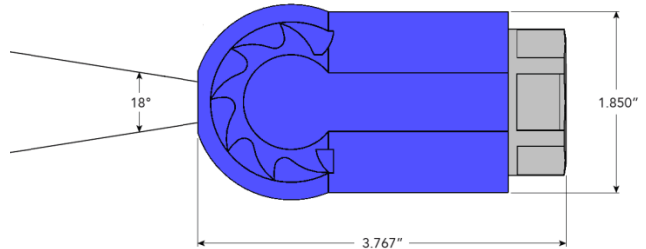


SPECIFICATIONS

- Minimum Inlet Pressure: 1000 PSI (69 bar)
- Maximum Inlet Pressure: 3200 PSI (220 Bar)
- Maximum Water Temperature: 180°F (82°C)
- Housing Material: Stainless Steel
- Coating Material: Urethane
- Nozzle Tip Material: Tungsten Carbide
- Inlet Connection Thread: ½" FNPT



REPAIR KIT



DIMENSIONS

NOZZLE SIZE	NOZZLE PART NUMBER	REPAIR KIT PART NUMBER	FLOW RATE		
			@ 2000 PSI	@ 2500 PSI	@ 3000 PSI
3.0	A255200-3	A255200-3-RK	2.1 GPM	2.4 GPM	2.6 GPM
4.0	A255200-4	A255200-4-RK	2.8 GPM	3.2 GPM	3.5 GPM
5.0	A255200-5	A255200-5-RK	3.5 GPM	4.0 GPM	4.3 GPM
6.0	A255200-6	A255200-6-RK	4.2 GPM	4.7 GPM	5.2 GPM
8.0	A255200-8	A255200-8-RK	5.7 GPM	6.3 GPM	6.9 GPM
10.0	A255200-10	A255200-10-RK	7.1 GPM	7.9 GPM	8.7 GPM
12.0	A255200-12	A255200-12-RK	8.5 GPM	9.5 GPM	10.4 GPM

LINEAR HYDRO-EXCAVATION NOZZLE



SPECIFICATIONS:

- Maximum Inlet Pressure: 3200 PSI (220 Bar)
- Maximum Water Temperature: 180°F (82°C)
- Housing Material: Stainless Steel
- Coating Material: Urethane
- Nozzle Tip Material: Tungsten Carbide
- Nozzle Dimensions: 3.376”L x 3.390”W
- 1/2” NPT Inlet with 30 Mesh Screen
- Four 1/8” NPT Nozzle Pill Ports

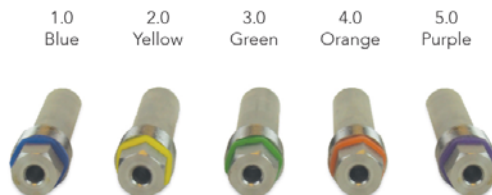
NOZZLE KITS

PART NUMBER	DESCRIPTION	NOZZLE FLOW RATE		
		@ 2000 PSI	@ 2500 PSI	@ 3000 PSI
A255201-7.2	A255201 Body with four A255201-2 Nozzle Pills	5.7 GPM	6.3 GPM	6.9 GPM
A255201-8.9	A255201 Body with two A255201-2 and two A255201-3 Nozzle Pills	7.1 GPM	7.9 GPM	8.7 GPM
A255201-12.5	A255201 Body with two A255201-3 and two A255201-4 Nozzle Pills	9.9 GPM	11.1 GPM	12.1 GPM

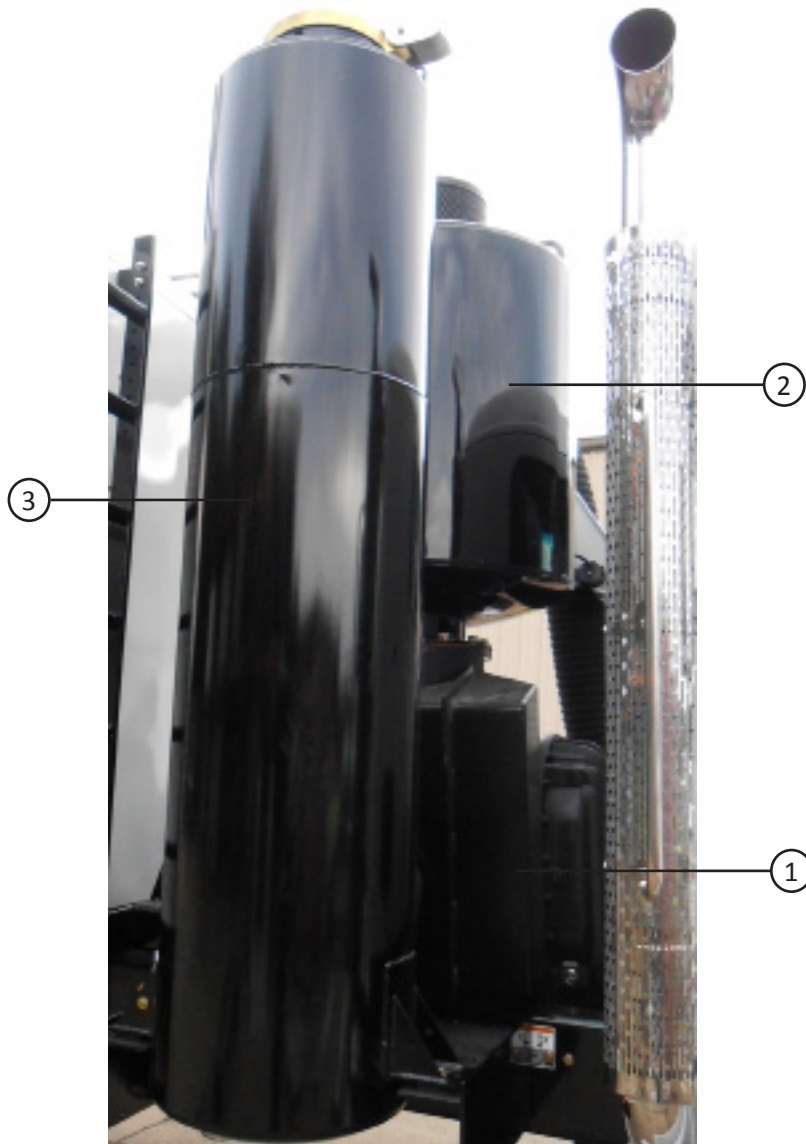
OR ASSEMBLE YOUR OWN CONFIGURATION

Start with the A255201 body and then select 4 nozzle pills or plugs. Total flow equals the sum of the flows of the individual nozzle pills.

PART NUMBER	DESCRIPTION	COLOR	PILL FLOW RATE		
			@ 2000 PSI	@ 2500 PSI	@ 3000 PSI
A255201-1	1.0 Nozzle Pill, 1/8”NPT	Blue	.7 GPM	.8 GPM	.9 GPM
A255201-2	2.0 Nozzle Pill, 1/8”NPT	Yellow	1.4 GPM	1.6 GPM	1.7 GPM
A255201-3	3.0 Nozzle Pill, 1/8”NPT	Green	2.1 GPM	2.4 GPM	2.6 GPM
A255201-4	4.0 Nozzle Pill, 1/8”NPT	Orange	2.8 GPM	3.2 GPM	3.5 GPM
A255201-5	5.0 Nozzle Pill, 1/8”NPT	Purple	3.5 GPM	4.0 GPM	4.3 GPM
A255201-PLUG	SST Plug	-	0	0	0

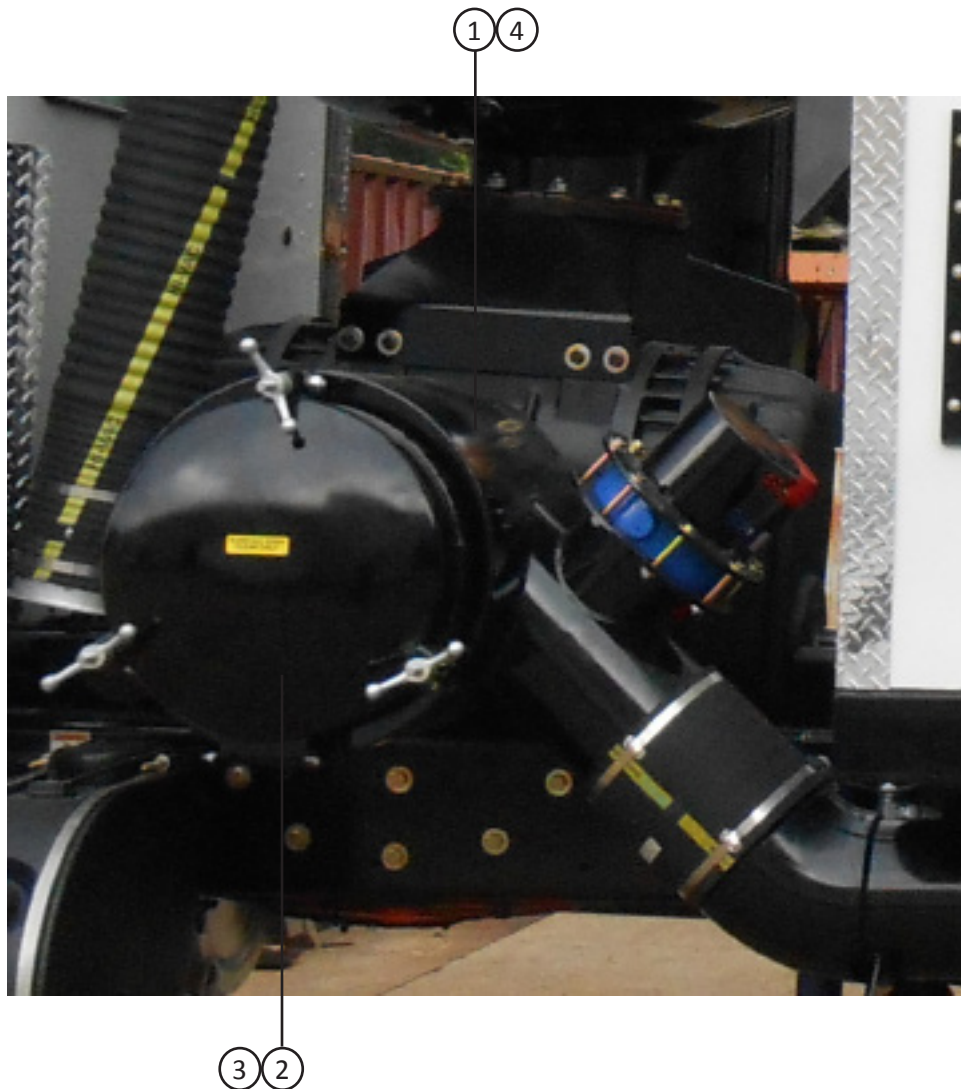


BLOWER & SILENCERS



ITEM	PART #	DESCRIPTION	QTY
1	A382758	BLOWER,HIBON SIAV-8702	1
2	A381606M	SILENCER,INLET	1
3	A381985	SILENCER,EXHAUST	1

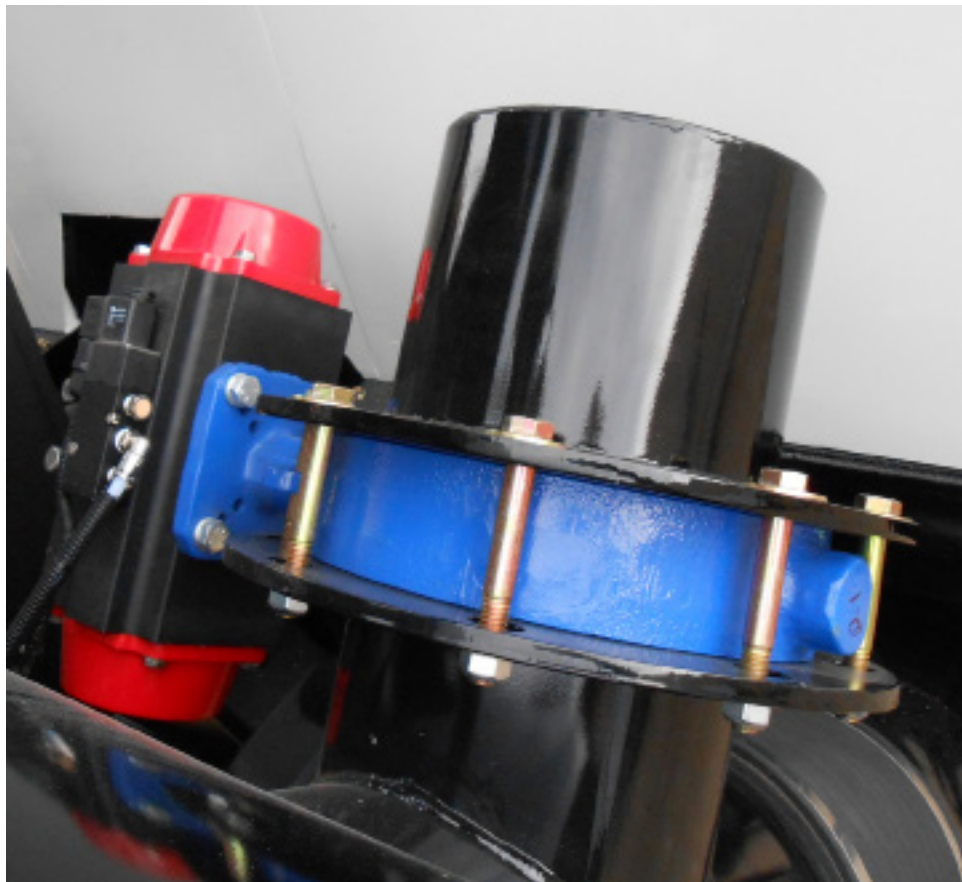
FINAL FILTER ASSEMBLY



* ITEM 3 AND 4 NOT VISIBLE

ITEM	PART #	DESCRIPTION	QTY
1	121002936	FILTER HOUSING	1
2	121000613	DOOR, FILTER HOUSING	1
3	A381701	DOOR SEAL, FINAL FILTER	1
4	A383165-M849	CARTRIDGE, FILTER	1

VACUUM BREAKER BUTTERFLY VALVE PART #U4307-0013



HYDRAULIC SYSTEM



HYDRAULIC TANK & HEAT EXCHANGER

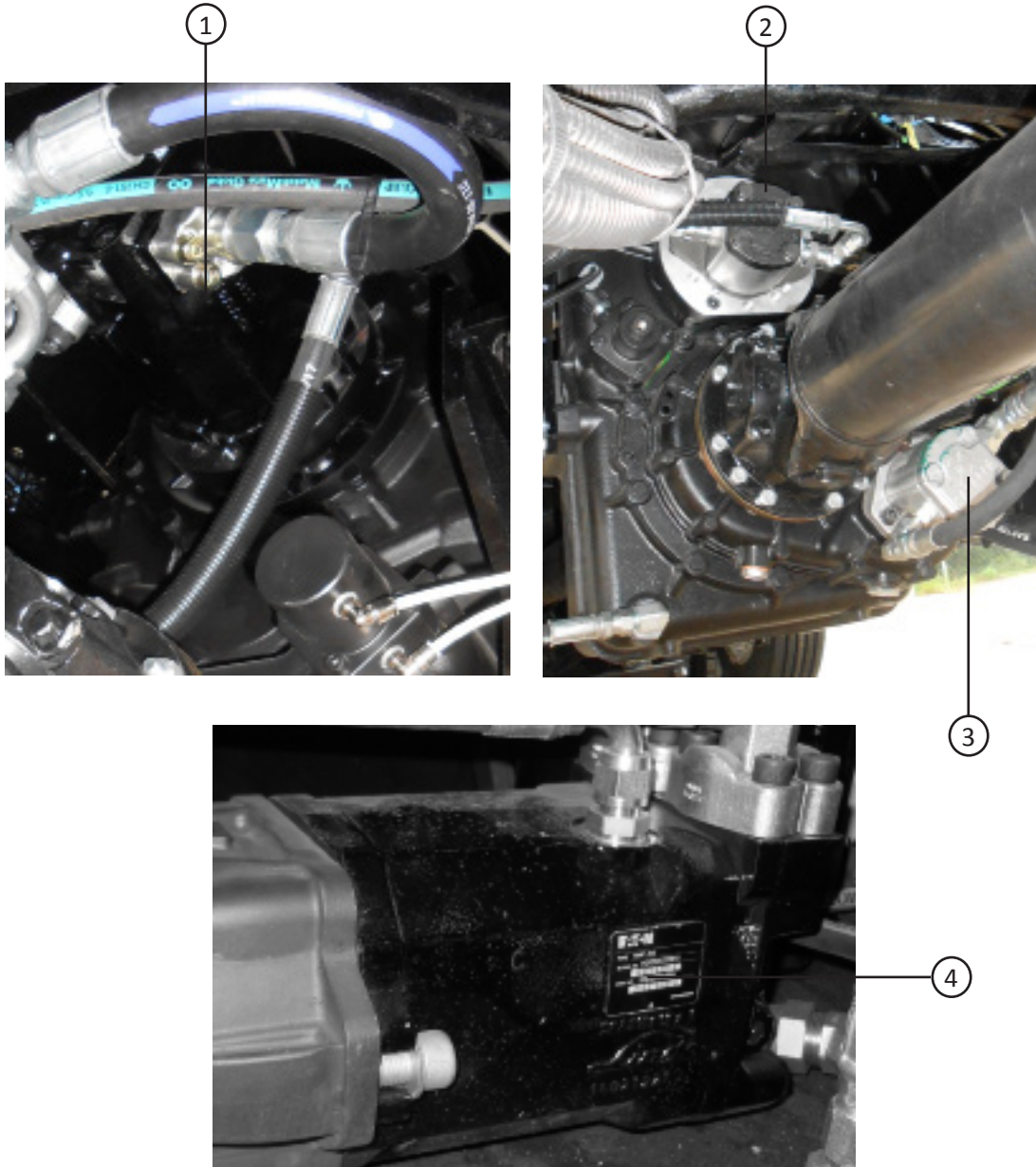


ITEM	PART #	DESCRIPTION	QTY
1	U3907-0031	TANK, HYD, 30 GAL, HVV	1
2	A383197	HEAT EXCHANGER, 55,000 BTU/HR, 12V	1

HYDRAULIC SYSTEM

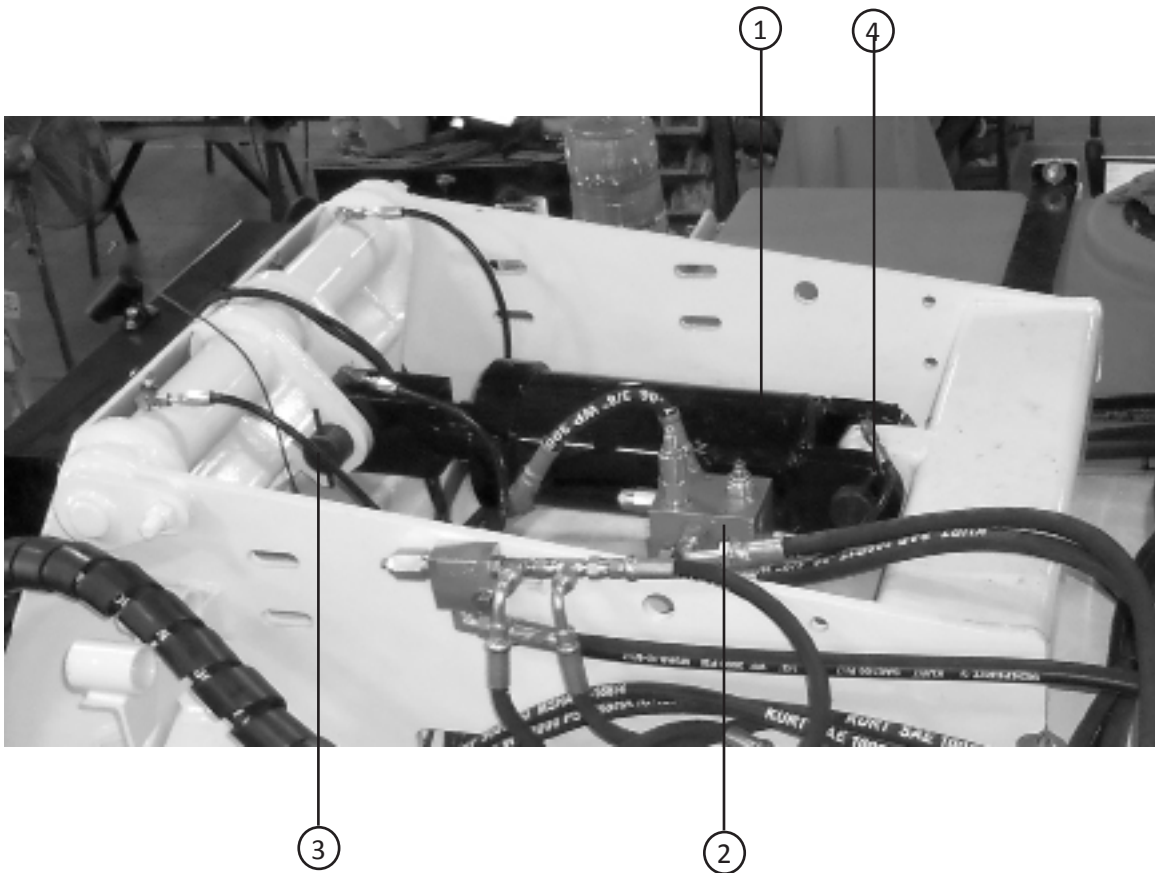


HYDRAULIC PUMPS/MOTOR



ITEM	PART #	DESCRIPTION	QTY
1	A384015	PUMP,HYD,LOAD SENSE,CPAD,CSPL	1
2	A249456	PUMP,HYD	1
3	A381664	PUMP, HYDRAULIC	1
4	A384018	MOTOR, HYDRAULIC-LINDE	1

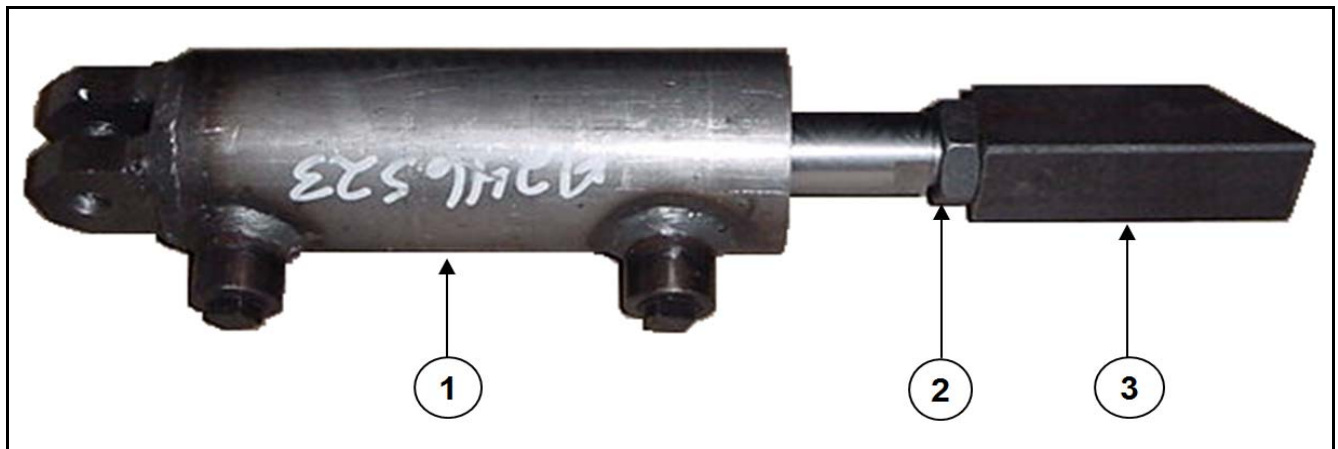
REAR DOOR CYLINDER



ITEM	PART #	DESCRIPTION	QTY
1	A110015-1-RJ	CYLINDER, HYDRAULIC, TANK DOOR, 5" X 6.75'	1
2	A110019	VALVE, CHECK/RELIEF, INTEGRATED ASSEMBLY	1
3	A246183	PIN, PIVOT, REAR DOOR CYLINDER	2
4	08-0020	PIN, SPRING, 1/4" DIA X 3-1/2" LG, PLN STL	4

HYDRAULIC DOOR LOCK

For your convenience, here is information on the rear door lock cylinder use on the B and SJR series Aquatechs. Because the manufacturer is supplying the cylinders with the door lock wedge, the cylinder only is not available separately as it was in the past.



ASSEMBLY PART NO. A246523-P

(Replaces A110065 & A110067)

Assembly consists of the following items:

- 1.) Cylinder - *Not Sold Separately*
- 2.) A107179 1"-12 Jam Nut
- 3.) A246121 Door Lock Wedge

Please use the information below when ordering a seal kit.

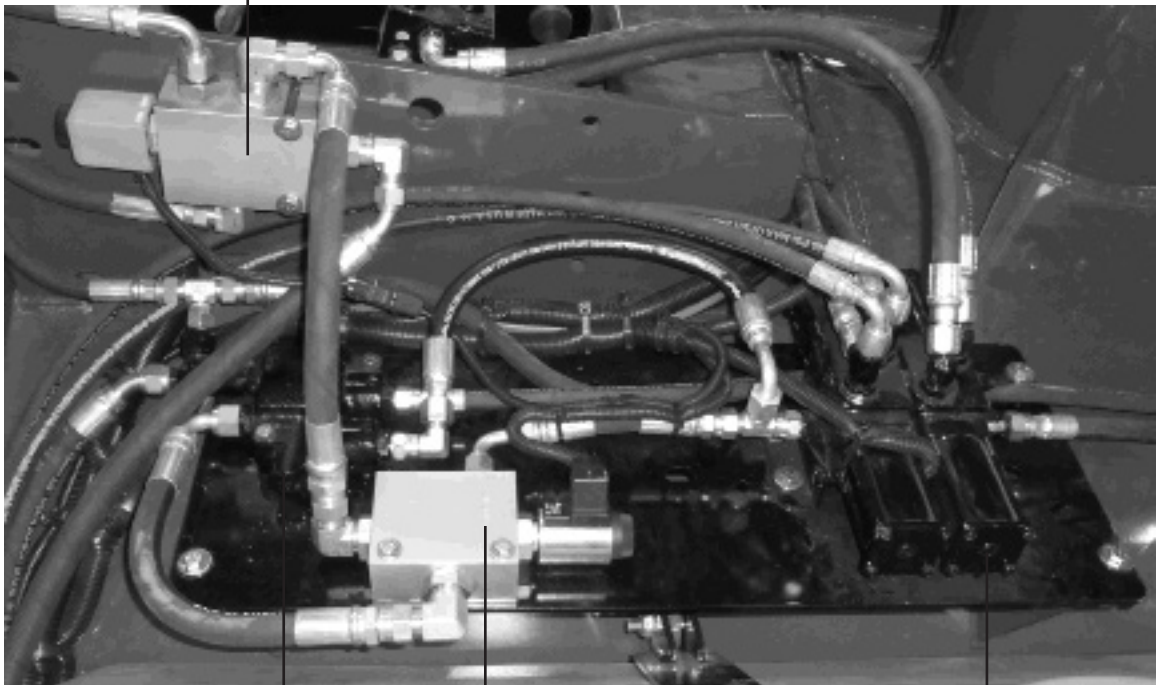
CYLINDER PART NO.	STAMPING NO.	SEAL KIT PART NO.
A111065 <i>NLA*</i>	500-2600 or 70718300	<i>NLA*</i>
A111067 <i>NLA*</i>	HV2.504 or HV2504	A111068
A246523-P	SP-1526-000-00 or SI <i>MM-DD-YYYY-XXX</i>	A111068-SI

NOTE: If no stamping numbers can be found, replace complete cylinder.

* Replace with the current part no. A246523-P Assembly

HYDRAULIC VALVES

VALVE, HYDRAULIC-4 WAY, 2 POSITION
A110428

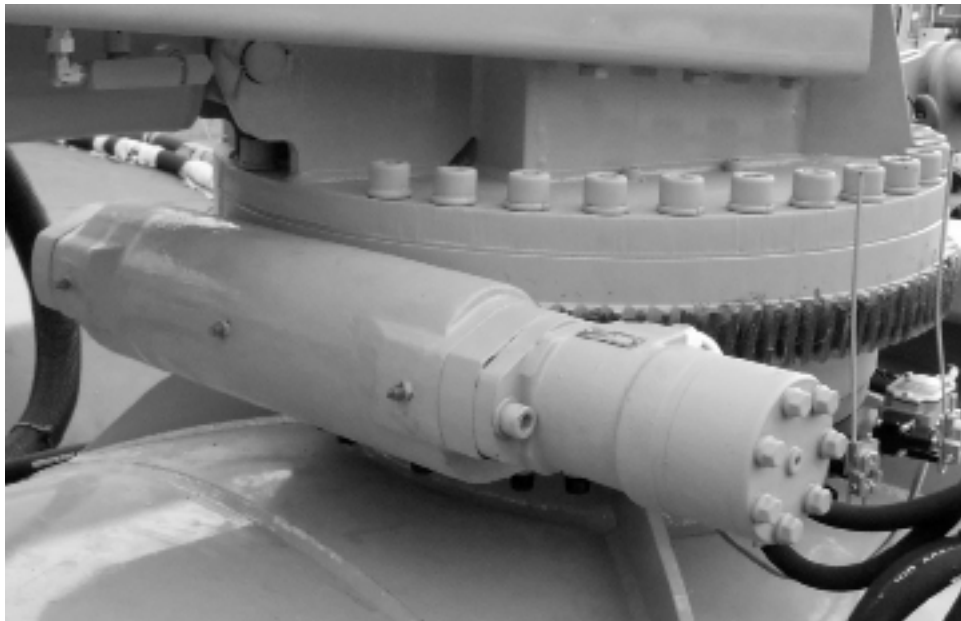


VALVE, HYD, 3-WAY, 12VDC
121003356

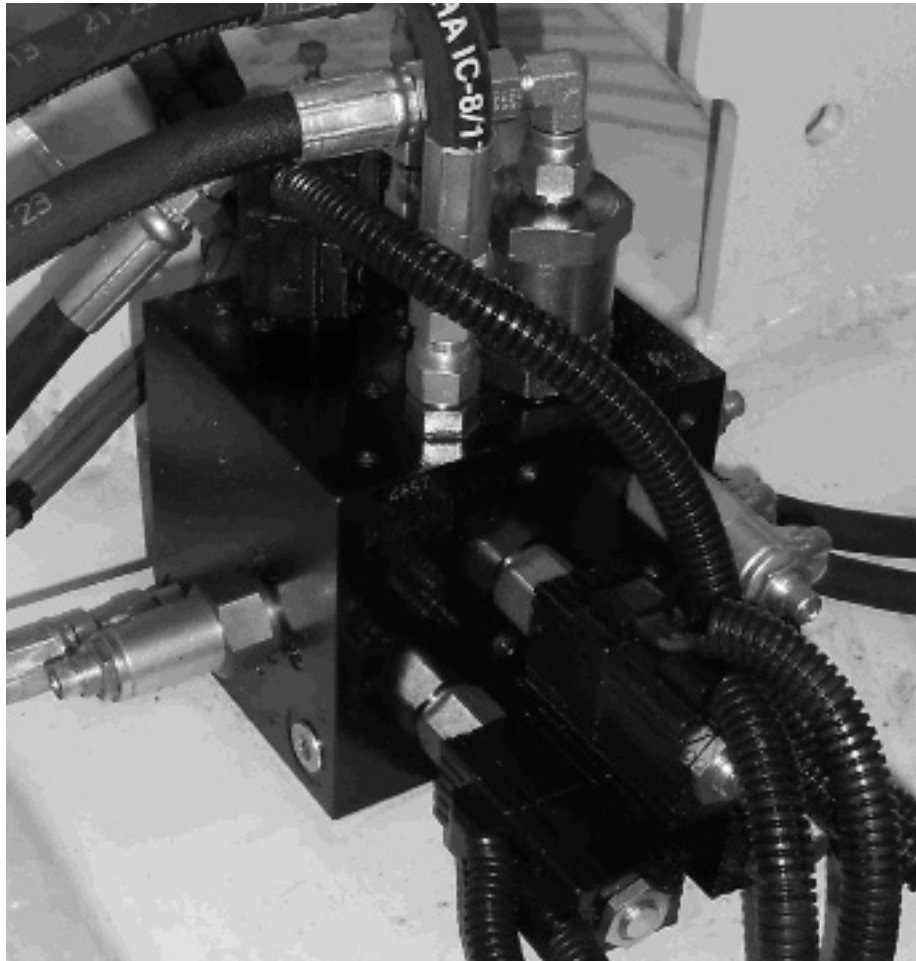
VALVE, FLOW CONTROL-PRIORITY, 3GPM
PART #A110292-3

VALVE, HYDRAULIC-2 SPOOL, 12V
PART #A110503-1

MOTOR, HYDRAULIC-SLEW MASTER
PART #A304676



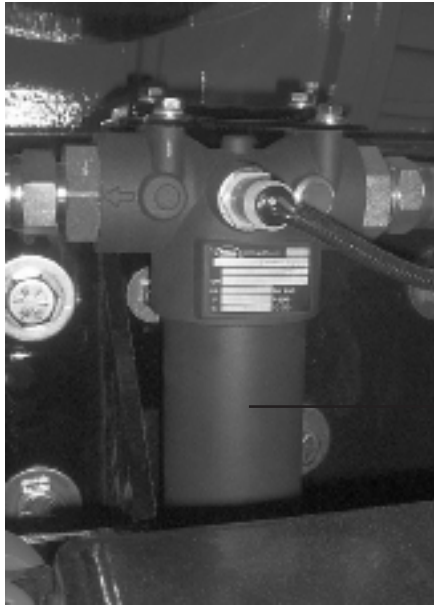
VALVE ASSEMBLY, BOOM CONTROL, 4-SPOOL, 12 VOLT
PART # A246521



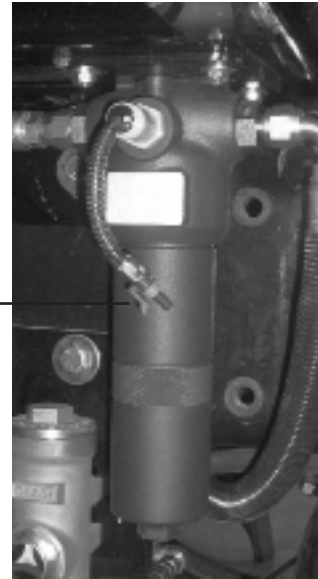
HYDRAULIC SYSTEM



HYDRAULIC FILTERS



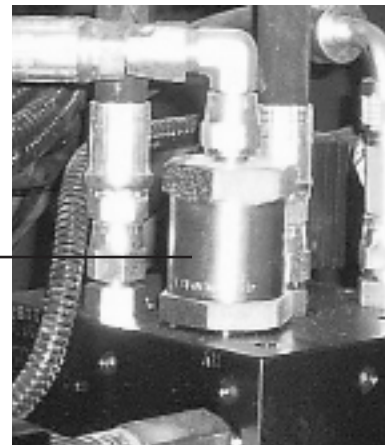
2



1



3



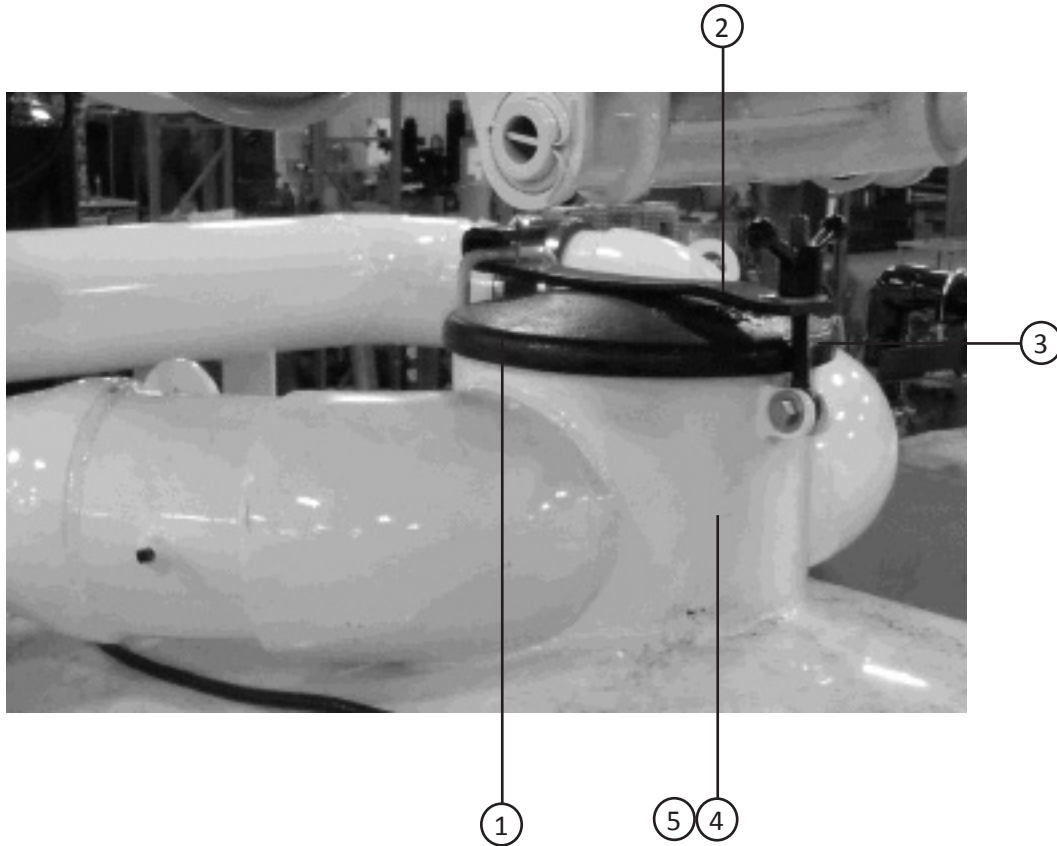
4

ITEM	PART #	DESCRIPTION	QTY
1	A304482-E	FILTER ELEMENT,6 MICRON,13"	1
2	A383754-E	FILTER ELEMENT,HYDRAULIC	1
3	A110516	FILTER,HYDRAULIC,SPIN ON-25 MICRON	1
4	A383767	FILTER,HYD., "LAST CHANCE" INLINE,120M	1

HYDRAULIC VIBRATOR
PART #U3917-0007



AIR PORT TUBE,WEIGHTED BALL
PART #A387389-3



* ITEM 3, 4, AND 5 NOT VISIBLE

ITEM	PART #	DESCRIPTION	QTY
1	A154080	COVER,PORTAL,12"	1
2	A154090	BAR,PORTAL	1
3	A190230	GASKET,PORTAL,12"	1
4	A222005	BALL,FLOAT,10" DIA.	1
5	A243860	BASKET ASSY,CHECK BALL	1

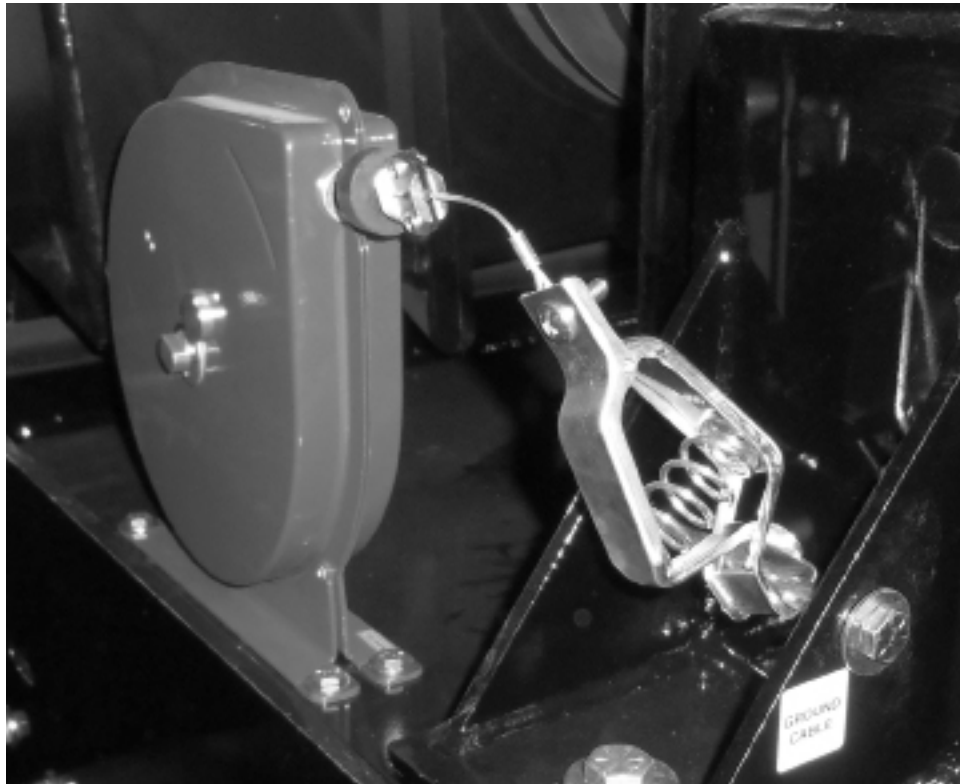
CYCLONE, REAR, DUAL SIDE MOUNT
PART #121000196



COMPARTMENT HEATER
PART #A381247



GROUND CABLE OPTION,50'REEL
PART #OPTION 240



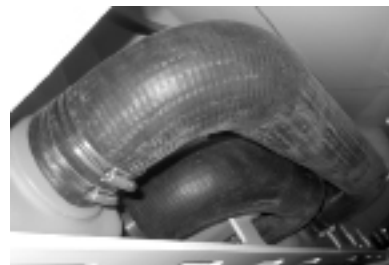
POLYTANK INSTALLATION INSTRUCTIONS (New Style)

1. Place left rear and right rear water tanks onto tank frame assembly.
2. Attach hoses and suction tee weldment.
3. Place left front and right front water tanks onto tank frame assembly.
4. Attach short and long inter connect hoses between front and rear tanks.
5. Attach caps on front water tanks.
6. Install retaining straps.

Note: For a detailed listing of parts, refer to drawing A385300_T.



**Hoses
and
Suction Tee Weldment**



**Front and Rear Water Tank
Inter Connect Hoses**



Front Water Tank Caps

POLYTANK REPAIR

General Information

Repairs to polyethylene tanks can be performed easily with a minimum of training. Repair technicians must exercise prudent caution against melting completely through the poly material, but extreme caution is generally not necessary. What this means is that the technician must realize that dire consequences are possible but not likely if he/she is reasonably careful.

Typical repairs will involve repair of two basic types of damage: blemishes to the surface, and cracks or holes through the material. A different repair approach will be appropriate for each type of damage.

Blemish Repairs

Blemishes to the surface of the poly tank can usually be repaired by first cleaning the area to remove any grease, oil or dirt. Then apply heat using an electric heat gun. Such guns, in the range of 1000 to 1300 watts allow the application of heat in controllable amounts to avoid quick burn through which is possible with a flame such as from a propane torch. Aquatech does not recommend the use of a torch to repair poly tanks.

Using the heat gun, and varying the distance of the gun from the surface of the material, work the heat

in a circular motion around the blemished area until the surface begins to become shiny. At this point the technician should become very careful as the poly material is beginning to liquefy and will begin to flow. By allowing just enough flow to fill any surrounding blemishes, and using a smooth metal object such as a spoon or spatula, the material can be manipulated and be made smooth. In cases where the material may have been heavily gouged, and some material has been lost, the use of a stick of polyethylene material melted into the affected area can help fill it, then the tool can restore the smooth surface.

Cracks and Holes

When a crack or hole has developed in the polyethylene material another approach is advisable. Cleaning the affected area is very important. It may be necessary to scrape away some of the material if it is badly contaminated with grease, oil or dirt. The repair is best done when it can be approached from both sides, although there are cases where this will clearly be impossible.

Using an electric soldering gun with a wide, flat tip suitable for working with plastics, dip the hot tip into granulated polyethylene (provided by Aquatech) and work small amounts into the crack or hole. Repeat as many times as necessary to build the affected area up to the surrounding surface. Repeat the procedure on the opposite side if possible.

Use a smooth metal tool such as a spoon or spatula to work the material to conform with the surrounding surface. A heat gun may be used as a final step to completely smooth the area, but is not required.


Areas repaired with either technique will have all the qualities and properties of strength and stability as the original area. Repaired sections can be put into service immediately upon cooling.

Recommended Tools

Tools recommended are a heat gun, 1000-1300 watts. Several manufacturers offer such a gun in the price range of US\$60.00 to US\$ 150.00. Some manufacturers include Master, Weller and Ideal. These heat guns are also excellent tools for thin wall shrink tubing and special solder/shrink electrical terminals. A soldering gun capable of accepting alternate tips is also recommended. Such soldering guns can be purchased at electronic supply houses such as Radio Shack, or at common retail outlets such as Sears. Weller is a respected manufacturer of good soldering tools. Forming tools which are metal and smooth can be made from common items such as kitchen utensils, or purchased from body shop suppliers. Since many different applications are possible, experience is the best judge of which particular tool to obtain.

POLY TANK REPAIR ITEMS

The following products are available for repairing cracks and holes in our polyethylene water tanks.

ILLUSTRATION	HI-VAC NO.	DESCRIPTION
	A385008	Black Epoxy Adhesive (includes two mixer tips)
	A385009	Automix Applicator Gun
	A385010	Mixer Tip = Bag of 6 (order only if extras are required)
	A385011	Patching Screen
	A385012	Aerosol Gray Primer (for hiding black adhesive on gray tanks)
Picture not available	APOLY-001	Gray Polyethylene Patching Material (for used with soldering iron and heat gun)