

Waubashene Machine & Welding

Troubleshooting Guide for Pumpout Models AVR20, AVR60 & AVR125 with Toggle Switch Operation

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Please store the instructions or a copy for future reference!

WARNINGS:

- **Never open any fittings on pump with pressure present in pump tank. Sewage may be pushed out.**
- **Some copper pipes on top of the pump may be very hot.**
- **Always disconnect pump from power supply before beginning any service.**

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Introduction

It is very difficult to write a troubleshooting guide to cover every situation. Before you call us, you can check out the most common reasons which could make you machine stop. A brief explanation on how the pump works will help you to understand what you are looking for. Please have the model and serial number of the pumpout system on hand when you call us. They can be found on the front panel of the machine or on the first page of the "User Guide".

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How the Pump works

The Waubaushene Pump Out System consists of 4 main parts: the pump tank, the motor/vacuum pump unit (rotary vane pump), the air reverse valve, and the electric/electronic control panel.

For the vacuum cycle, the vacuum pump evacuates the pump tank. The suction side of the pump is connected to the tank by shifting the air reverse valve to the upper position. The pump tank acts as a large vacuum cleaner and sucks in whatever is at the nozzle of the intake hose. A check valve right at the entrance to the tank prevents any material sucked in, to flow out the wrong way. During the vacuum cycle, the "VACUUM SUCTION" light is on.

When the pump tank is filled up to the maximum level, sewage will connect the high probe to ground and the air reverse valve will shift to the lower position.

NOTE: Low **AND** high probe need to be connected to ground to make the control switch to the discharging cycle!

Now the pressure side of the vacuum pump is connected to the tank. Thus, the tank is pressurized and will empty. The intake side of the vacuum pump is now connected to the air filter. All air sucked in to pressurize the tank has to pass this filter. Keep the filter clean. Wash it in gasoline or paint thinner 1 x per boating season or replace it if necessary. See also item 4.

When the tank is full the "DISCHARGING" light will come on.

NOTE for all pumps equipped with the circuit board PCVERS 17 (or higher):

The "DISCHARGING" light will stay on solid as long as sewage touches the high probe. The "DISCHARGING" light will start to flash as soon as the high probe is cleared when the pump is in the discharge cycle. The light functions as a combined discharging cycle / tank full indicator. If the "DISCHARGING" light stays on solid even when the pump is in the vacuum cycle, then there is a ground fault on the high probe and the probe needs to be cleaned. Please refer to item 9 for probe cleaning instructions.

When the tank is empty, sewage clears the low probe. Thus the ground contact of the low probe is interrupted and the control shifts the air reverse valve to the vacuum position again. The "PUMP TANK EMPTY" light and the "VACUUM SUCTION" light will come on.

Why the Pump needs Oil

Waubaushene Pumpout Systems operate with vacuum pumps/compressors of the rotary vane type. The vanes need oil for sealing and lubrication because they move in two directions: first they rotate inside the pump housing - in order to minimize friction and wear of the vanes, there has to be an oil film on the inner surface of the pump housing. Second, they slide in the slots of the eccentric rotor - they are pushed in when their rotor slot comes closer to the housing and they slide out only by centrifugal forces when their rotor slot withdraws from the housing.

Running the pump without enough oil means higher wear of the vanes than necessary and can cause the vanes to jam in the rotor slots. The vanes once jammed in the slots will not come out again even if you put in gallons of oil - the vanes can't seal anymore and thus, there is no suction to get the oil into the pump compartment. You have to open the back side of the pump, clean and lubricate the vanes manually. Therefore, check the function of the lubricator regularly and adjust it if necessary as explained in the "Lubrication Oil" paragraph in the "User Guide".

IMPORTANT: Never pour large amounts of oil into the suction opening of the vacuum pump! The vanes are designed to pump air - not liquids. They will break

and jam the pump and can cause the rotor to break!

When the Pump does not run anymore. . .

1. When absolutely nothing happens

a) Check the breaker of the power outlet and make sure that the pump is plugged in properly.

b) Check the fuses inside the control panel and replace them if necessary. Disconnect the pump from the power supply (unplug it) before opening the control panel (just turning the key switch to OFF does NOT disconnect all components inside the panel!). Always take the fuse out of the fuse holder and check the continuity with an ohmmeter. Some fuses will not show visual damage. Do NOT place the fuse on a conductive surface (metall work bench etc.) when checking the continuity. Always replace broken fuse with fuse of the same type and rating.

The following fuses can be found:

- 1x 2 Amp.: for 120V / 230V circuit
- 2x 2 Amp.: for 12V & 24V circuit
- 3x 3/4 Amp.: for probes (low, high & ultra high)
- 1x 2/10 Amp.: for air reverse valve (needs to be a time delay / slow blow fuse)
- 1x Motor Fuse (needs to be a time delay / slow blow fuse)

NOTE:

Older pumps may not have all the mentioned fuses or fuses with a different rating are used. The fuses are located on the back wall of older control panels. The hood has to be taken off in order to see them.

If the new fuse(s) blow immediately, remove the master circuit board (installed to the left wall of the control panel), replace the fuse(s) once more and turn the power on. If the fuse(s) blow again, you have a short circuit in the control box. Any good electrician will find it and repair it for you. Please do not let the electrician rewire the control panel. If the fuse(s) do not blow again, there might be a problem with the master board. Please call us for support.

See also item 5.

2. The Motor does not run

a) Make sure that the fuses are okay (see item 1).

b) After a long period of not using the pump (winter time), the vanes of the vacuum pump can stick to the housing or by lack of oil, the housing started to rust and doesn't allow the vanes to move. The starting torque of the electric motor is not strong enough to overcome this force. You will hear the motor starter (relay) clicking and the motor humming but that's all.

To clean the vanes and the inner housing of the vacuum pump, you have to open the rear end plate of the pump. First take off the lubricator and the hood. Then remove the rear vent screen. Loosen the brass fittings of the copper pipes at the end plate (an adjustable wrench is recommended) and remove the 6 bolts of the end plate with a 3/8" socket or 3/8" wrench.

When the end plate is off, you must be able to turn the rotor by hand. If the inside is rusty, use WD40 or other spray oil. Remove the vanes and clean them with oil. Never let the motor run with the end plate off and the vanes in the rotor. There is a high risk of damaging the vanes. Let the motor run when the vanes are removed. Reinstall the vanes correctly. There is only one correct position for the vanes to go into the rotor! (Inclined side outwards and flush with the rotor) When reinstalling the back plate, do not tighten the bolts too much. Use a wrench of regular length and tighten with a medium torque.

NOTE: The motor has a built in overload protection. The motor will reset itself automatically after it cooled down.

C) Turning the toggle switch you can't hear the relay clicking, the indicator lights don't come on but the fuses are okay.

Over-tensions due to a lightening storm may have damaged the master board. Remove the master board (on the left wall of the electric panel) and order a new board.

d) If a valve is installed in the discharge line between the pump and the sewer, the valve must be open when the pump is run. These pumps expel waste air down the discharge line when they are pumping. If you block this air flow the overload protection of the motor will be activated when the pump is in the vacuum cycle.

3. The Motor runs, but You can't get any Suction

a) The intake hose or intake pipe is leaking.

There is only one way to check a leaking intake. Remove the intake hose or intake pipe completely from the pump (at the swing check valve on the intake side). Start the pump in "VACUUM SUCTION" and put your hand over the intake opening to seal it (If your intake line is equipped with a ball valve directly at the pump, simply close this valve and regard the gauge).

If the pump works correctly, you should sense the creating of vacuum. Without any danger, you can let the vacuum rise (fall) up (down) to 20" Hg. As soon as you remove your hand from the opening (or open the ball valve) you will hear the typical sound of sucked in air. In this case, your intake line or the hand valve at the line end is leaking. To locate the leak, connect a water hose to the disconnected intake line and fill it with water. Make sure, that the hand valve at the other hose end is closed. The leak should become visible due to the water pressure.

IMPORTANT: Never attempt to fill the pump with an outside water source. It will flood the vacuum pump and valve system and may damage it. Always disconnect the intake line from the pump before pressurizing the line.

b) The motorized ball valve in the discharge line is leaking.

Close the hand valve in the discharge line and start the pump in "Vacuum Suction". If it creates vacuum now, the motorized ball valve is leaking. To adjust the closed position of the valve open the hood of the actuator. There is a shaft with 2 cams and micro switches on it. Adjust the cams to proper position. To make the actuator travelling you have to shift from discharge to vacuum back and forth (When you adjust an actuator for the first time it will happen that you turn the cams the wrong way, but with a little patience you will find the right setting).

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NOTE: If the pump is not equipped with a motorized ball valve, it will have a swing check valve instead. The swing check valve can be checked for leaks the same way by closing the hand valve.

C) The air reverse valve does not switch (=solenoid operated valve located under the hood)
 → Although the pump is switched to “VACUUM SUCTION”, the gauge shows pressure.
 Check the fuse which is located in the top right hand corner inside the control box.
 Always check the continuity with an ohmmeter. This fuse will NOT show visual damage! Do NOT place the fuse on a conductive surface (metall work bench etc.) when checking the continuity. Replace the broken fuse only with a fuse Type MDL-2/10 (even if the original fuse was Type MDL-1/10). Some spare fuses were included in the manual envelope.

A blown fuse indicates that the air reverse valve is jammed. The solenoid that shifts the valve will draw a high current and the fuse will blow to protect the solenoid from burning out. Thus, the air reverse valve has to be cleaned BEFORE the pump can be operated, otherwise the new fuse will blow again.

NOTE: Pumps that were built before July 2001 do not have the fuse to protect the solenoid. Follow the instructions to clean the valve and check the resistance of the solenoid. It is recommended to retrofit the fuse, which can be done easily.

Pumps that were built before 2007 have the fuse located under the hood. It is in one of the wires coming out of the air reverse valve (close to the air reverse valve manufactured by Numatics). Disconnect the pump from main power before you open the inline fuse holder.

To check / clean the valve, open the three bolts with an allen key and unplug the valve actuator (green-black) from the manifold (=base). There shouldn't be any solid particles or liquid in the valve or manifold, only an oil flim may cover the surface. The valve actuator unit can be disassembled completely by taking out the screws on both ends. Clean the valve actuator and the manifold as good as possible. Sometimes it is necessary to push the stainless steel sleeve out of the actuator housing for proper cleaning. Use the plastic end of a screw driver to push it out. Do NOT use any sand paper or emery cloth to clean the stainless steel sleeve and spool. They are precisely machined parts.

NOTE: It is possible that the fuse will blow again after the valve has been cleaned. This usually occurs after the pump has been used for a couple cycles. The reason is that some pieces of dirt were missed when the valve was cleaned. When the pump was used the pieces just moved to a spot where they jam the valve again.

The big black square block is the solenoid that operates the valve (part# 228-690B or 228-691B). The T-shaped metall part should be able to slide freely in the rectangle hole of the solenoid. The resistance of the solenoid can be measured with an ohmmeter. Connect the leads of the ohmmeter to the two pins on the opposite site of the rectangle hole. The resistance should be the following:

Part# 228-690B:	approx. 110 Ohms
Part# 228-691B:	approx. 440 Ohms

A significantly lower or higher value indicates, that the solenoid is partly or completely burned out and has to be replaced.

NOTE:

Older pumps have an air reverse valve manufactured by Norgren instead of Numatics. The solenoid that operates the valve is a separate unit and connected to the valve with a linkage. There is no fuse to protect the solenoid. It is easy to verify if the solenoid is working correctly. The solenoid should be engaged (pulling) in the “VACUUM SUCTION” cycle and released

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(expanded) in the “DISCHARGING” cycle. The solenoid is either not getting power or burned out, if it is released all the time. The air reverse valve should be cleaned before a burned out solenoid is replaced.

d) The vanes of the vacuum pump stick to the rotor.

With insufficient lubrication (wrong oil, defective lubricator, or lubricator not adjusted properly) the vanes will stick to the rotor. The centrifugal force is not enough to free the vanes. So the motor rotates but the vacuum pump does not create any suction or pressure. Open the two brass fittings at the end plate of the vacuum pump (IN and OUT port). There should be suction on the one port and pressure on the other port when the motor is running. Proceed as described in item 2b if the suction / pressure seems to be too weak.

4. The Pump does not discharge

When the pump works in “VACUUM SUCTION” without problems but does not discharge or needs a noticeably longer time to discharge than normal, check the brass air filter that is in one of the ports of the air reverse valve (=solenoid operated valve located under the hood). The pump can't suck enough air through the filter to create the pressure in the tank if the air filter is plugged. For test purposes, you can unscrew the air filter and run the pump without it. Wash the filter in gasoline or paint thinner if it is dirty or replace it. Do not run the pump over a long period of time without the air filter! Inner parts of the vacuum pump may get damaged and the vanes wear out faster.

NOTE: Older pumps have the air filter screwed into the lubricator port instead of the air reverse valve.

Refer to item 3c and 3d if cleaning of the air filter doesn't solve the problem.

5. The Fuses keep blowing

a) Pumps with remote stands have additional trouble potential in the remote wire. Usually, the wires are installed underground or pass partially through water. Unfortunately, "injuries" of these wires are quite common. If the fuses of your pump keep blowing, disconnect the complete remote wire at the pump. Replace the fuses once more and try to start the pump from the pump control panel. If the fuses do not blow there is a short circuit in the remote wire. The wire has to be checked with an ohmmeter and to be repaired or replaced.

b) The master board in the electric panel is displaced by mechanical forces within the card edge connector and connects incompatible lines. Remove the board and reinstall it correctly in the card edge connector. If the hole for the fastening screw does not line up with the nut behind it, adjust the little legs under the card edge connector with a pair of pliers until they line up. Fasten the board again. Disconnect the pump from the power supply (unplug it) before working inside the control panel (just turning the key switch to OFF does NOT disconnect all components inside the panel!)

6. The Pump stops after 12-15 Minutes

This is not a mistake. The pump has a built in timer on the circuit board. The motor will stop automatically after about 15 minutes if the toggle switch is left turned ON (either left or right

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hand position). To reset the pump, turn the toggle switch OFF and then turn it ON again, the pump will restart. The timer will not reset until all toggle switches on pump and remote stands are turned to OFF. Therefore only one toggle switch should be used at a time to control the pump.

This timer feature is intended to protect the pump from abuse. It was introduced because a few pumps with remote stands were left running for weeks because no one could hear them. In other cases people left the pump on and the hose valve open or in the water and the pump flooded septic and lift systems. Please call us for information about turning the feature on/off or for changing the time setting.

7. The Pump changes to Discharge although the Tank is not full

This indicates a ground fault on the high probe and it needs to be cleaned. It is recommended to clean ALL probes, not just the high probe. Please refer to item 9 for cleaning instructions.

8. The Pump will not stop discharging

a) Turn the toggle switch to the OFF position and then to “ON AUTO CYCLING” again. If the pump starts in “VACUUM SUCTION” mode, then the low probe has a ground fault and needs to be cleaned. It is recommended to clean ALL probes, not just the low probe. Please refer to the cleaning instructions of item 9.

If the pump starts in “DISCHARGING” mode again, clean all probes as described in item 9. Refer to item 4 if this does not solve the problem → the pump does not seem to discharge and the pump tank stays full.

b) If the pump is always in the “DISCHARGING” mode and a remote stand is connected to the pump, then follow these steps:

- ▶ Turn off the main power
- ▶ Disconnect the brown wire and the white wire that are going to the remote stand from the terminal strip at the back side of the control box.
- ▶ Turn on main power and use the toggle switch on the pump control panel to test the pump. If the problem is fixed, then the remote wire is damaged and needs to be repaired or replaced. There is a short circuit between the brown and the white wire.

NOTE: Make sure that only one toggle switch is used at a time to control the pump. A toggle switch that is left in the “DISCHARGING” position will override all other toggle switches. The pump will only work in the “DISCHARGING” mode.

9. The “Probe Error” light comes on

Most pumps are equipped with a third level sensor, called the “ERROR PROBE” or “ULTRA HIGH PROBE” (U-H Probe). It reacts when the sewage level rises above the normal high level due to a failure and shuts the pump down immediately to prevent the pump tank from overflowing. The “PROBE ERROR” light on the control panel will come on to indicate that

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there is a problem.

NOTE: This probe is located under the hood.

Please follow these steps if a probe error occurs:

- ▶ Turn toggle switches on all remote stands and on the pump to the OFF position.
- ▶ Use the toggle switch on the pump to manually discharge the pump tank contents into the sewer. Never use a toggle switch on a remote in this situation. Watch the vacuum gauge on the pump carefully. The vacuum should decrease and it should start building pressure. Some older pumps may not start in the discharge cycle unless the probe wire is disconnected from the ULTRA HIGH PROBE.
IMPORTANT: Turn the pump OFF immediately, if it keeps building vacuum and call us for support.
Turn the toggle switch to OFF when the “PUMP TANK EMPTY” light comes on.

NOTE for pumps built in 2002 or newer:

The “PROBE ERROR” light is reset and will go out as soon as the toggle switch on the pump is turned to the “DISCHARGE ONLY” position or when the “ULTRA HIGH PROBE” is cleared. On most older pumps the main power needs to be turned off to reset the light.

Cleaning instructions:

- ▶ Turn the power key switch to OFF and unplug the unit.
- ▶ Pull all three level probes (stainless steel rods) and clean them with water and a rag. You may use cleaning detergent or even emery cloth for the metal part of the probe, but make sure that the black insulation is not damaged. Do not use any oil or grease. Take apart, clean and dry the fitting that holds the probe. Make sure that there is no dirt stuck in the fitting part that remains on the tank. Clean with a screw driver and a rag if necessary. Pull one probe at a time to make sure that the wires don't get switched.
- ▶ Make sure that the plug snaps onto the probe end and makes a good electrical contact when reinstalling probe wires.
- ▶ Turn on main power. The “PROBE ERROR” light should stay out. If it comes on again call us for support.
- ▶ Turn the toggle switch to “ON AUTO CYCLING”. The “VACUUM SUCTION” light should come on and the pump should start to create vacuum, indicated by vacuum gauge. The pump is back to normal operation.

10. The Air Reverse Valve Fuse is blown

Please refer to item 3c.

Please store the instructions or a copy where they can be found by the persons who use this pump.

Any questions? Please call or fax us.

Phone: (705) 538-1459 or 1-800-663-1624, FAX: (705) 538-1776