Attention Well Owners!

22 Simple and Easy Steps to Prevent

Expensive and Unnecessary Wear & Tear on Your Water Pump & Pressure Tank System

Well contractor reports show that **80%** of no-water calls involve improper volume of air in the pressure tank.

The most common mis-understanding about a pressure tank is that a pressure tank gives water pressure. Not true. The correct answer is the water pump gives water pressure. The water pipes gives water flow. The pressure tank has nothing to do with water pressure or water flow, it simply prevents the water pump from short-cycling. If a pressure tank was called a "Battery Tank" it would be easier to visualize. A battery absorbs and releases energy. A pressure tank absorbs and releases the pumps energy.

The main purpose of the pressure tank is to increase the life of your submersible pump, pump wires, capacitor, pressure switch and a small benefit of keeping your electrical bill lower. The pressure tank does this by preventing the pump from turning **ON & OFF** too often also known as short-cycling. Pump manufacturers recommend a minimum run time of 1 minute.

Step 1

Make sure your water pressure gauge located close to your pressure tank is accurate. Locate the valve stem on the pressure tank; it looks similar as a tire valve stem. Using a tire pressure gauge measure the air pressure in the pressure tank, it should read the same as the water pressure gauge. The water pressure gauge could have iron/sediment built up inside of it causing an inaccurate reading. Replace if necessary.

Step 2

Determine what style of pressure tank you have. It will be either a galvanized, steel tank or a diaphragm tank. The galvanized tank is a simple empty tank where the air comes in direct contact with the water -see Step 3. A diaphragm tank is a more common type of tank normally painted steel and sometimes gray fiberglass –see Step 11.

Step 3

Put the softener or any water treatment device in the bypass position. This will prevent dirty water from damaging it.

Step 4

Turn off the power to the pump.

Step 5

Turn on the laundry faucet or a high flow faucet with-out a screen.

Step 6

With an air compressor fill the galvanized tank, through the valve stem, until the air blows out of the laundry faucet.

Step 7

Stop filling tank with compressed air, wait until all of the extra air releases from the laundry faucet, than close the laundry faucet.

Step 8

Turn the power to the pump back on.

Step 9

Wait till the pressure switch turns the pump off, than open the laundry faucet. Be careful – you will get shots of air. Flush the air and dirty water from the faucet. Once the water is clean, than close the faucet.

Step 10

Put the softener or any water treatment device from the bypass position back to the service position. Your galvanized pressure tank is now recharged with air. Typically this should be done every 3 months.

If you are wondering where the air disappears to and why it has to be recharged every 3 months, it is because the oxygen in the air oxidizes the impurities of the water. So over time the air volume decreases, the ON & OFF cycle time decreases and the pump life decreases. One way to prevent the decrease of air is by separating them with a diaphragm.

Step 11 (diaphragm tank from step 1)

Find out what the pressure switch's cut-in and cut-out psi is. To do this simply turn on a faucet inside the house and make a note at what psi the pressure switch turns on. Turn off the faucet and make a note what psi the pressure switch turns off. Most pressure switches are pre-set for a cut-in of 40psi and a cut-out of 60psi. This information will be needed in Step 15

Step 12

Put the softener or any water treatment device in the bypass position. This will prevent dirty water from damaging it.

Step 13

Turn off the power to the pump.

Step 14

Turn on the laundry faucet or a high flow faucet with-out a screen.

Step 15

After the water stops flowing from the laundry faucet, the water tank should be 100% full of air and very lightweight. You can do a quick test by grabbing the top of the tank and lean it side to side. If the tank feels heavy or if you hear water swooshing back and forth inside the tank, than the tank is low on air or the internal diaphragm could be ruptured.

Step 16

Measure the pre-charge air pressure inside the diaphragm pressure tank using a tire pressure gauge on the valve stem. It should be 2psi less than the cut-in psi. Example if the cut-in psi is 40psi, than the pre-charge psi should be 38psi. If the pre-charge pressure is correct, than you can jump to Step 18.

Step 17

If the pre-charge pressure is low, than with an air compressor fill the diaphragm tank with air until the pre-charge pressure reads 2psi below the cut-in pressure. If the tank will not hold air pressure, than the diaphragm is ruptured and the tank needs to be replaced.

Step 18

Once the tank pre-charge pressure is set, double check that the pressure tank is 100% air and very lightweight. This can be done by grabbing the top of the pressure tank and lean it side to side. At this point if the tank feels heavy or if you hear water swooshing back and forth inside the tank, than the diaphragm is ruptured and the tank needs to be replaced.

Step 19

If the tank feels very lightweight than close the laundry faucet.

Step 20

Turn the power to the pump back on.

Step 21

Wait till the pressure switch turns the pump off, than open the laundry faucet. Flush the dirty water from the faucet. When the water is clean, than close the faucet.

Step 22

Put the softener or any water treatment device from the bypass position back to the service position. Double check to make sure pressure tank is sized correctly, it should run for a minimum of 1 minute between pump cycle ON & OFF.

Congratulations! You have just saved your water system from unnecessary wear and tear. Now if your water pump burns out you know it's because of old age, not a pre-mature burn-out.

Quick Pro-Version - Diaphragm Tanks

Maximizing the air volume of the pressure tank with the smallest amount of water in the tank just before cut-in. When this procedure is done a few times can be completed in a fraction of the time.

Step 1

Understanding the pressure switch springs. On the pressure switch there is two 3/8" nuts with springs underneath them. The bigger, centre spring raises or lowers both cut-in and cut-out pressure - clock-wise or tighten raises both pressures. Normally the difference between cut-in and cut-out pressure is 20 psi. The smaller, side spring adjusts the difference between cut-in and cut-out pressure. Counter clock-wise or loosening the smaller spring makes the pressure difference less - example 15psi. Clock-wise or tightening this spring will cause the pressure difference to increase - example 30psi.

Step 2

Find out if the well / pump system is a high or low yielding system. If a 1-hour pump test is yielding 5 GPM or more it would be considered a high yielding well. If a 1-hour pump test is yielding 3GPM or less it would be considered a low yielding well. This is a guideline, you are welcome to change these numbers with different areas. Note this only applies to drilled wells, which are based off of well yield. Dug wells are based off of storage as opposed to well yields. When setting up a pressure switch / pressure tank with a dug well they are all set up as a high yield system. If a low yielding system –see Step 8.

High yielding system

Step 3

First set the pressure switch to your desired settings, test it with the water on. Cut-in 40psi and cut-out 60psi is normal and ideal.

Step 4

Filling the tank with air. Example the switch was set for cut-in 52psi and cut-out 68psi. Turn the pump off and drain all the water. Pump approximately 5 psi more air than the cut-in pressure. In this case 57psi. In step 3 case 45psi.

Step 4

Filling the tank with minimal amount of water to maximize the air volume of the pressure tank. Close the outlet on the pressure tank, turn the power on to the pump for 2 seconds. You now have 2 seconds worth of water in the pressure tank. Note:

you can adjust this if you wish. Going higher than 2 seconds you are loosing air volume. Going lower than 2 seconds you risk having the tank diaphragm "bottoming out" and causing an extreme drop in water pressure for a short 1-second period of time. This can be extremely puzzling when taking a shower, noticing the pressure randomly drop off with short bursts. We see this happen with some homeowners who put too much air in the pressure tank. If you have a delayed pump start (3" Grundfos SQE) then turn the pump on for 4 seconds. Manually open the pressure switch. It will open, because the pre-charge pressure is too high.

Step 7

Turn on the power to the pump, pump will not turn on because the pressure switch is open. Release air from the pressure tank until the pressure switch closes. Put the air cap on and you are done.

Low yielding system

Step 8

First set the pressure switch to your desired settings, test it with the water on. With a low-yielding well / pump the cut-in and cut-out pressure is always wanted to be as close together as possible (small spring turned fully counter clock-wise so the spring is loose). Short-cycling is never an issue with low-yielding systems because the volume of water coming in is so slow it takes a long time to build water pressure. Cut-in 55psi and cut-out 70psi is normal and ideal.

Step 9

Understanding low water yield and high water pressure. Your well produces water yield with 0psi. Your pump produces 0 water yield with ###psi. The amount of psi depend on the horsepower of your pump. So if you have a 1HP pump sitting 100' below the surface and the well produces 1GPM. If the pump-end is sized appropriate this low yielding well / pump could produce 1GPM with 90psi. Combine this with a 119 gallon pressure tank with correct pre-charge air pressure, the average homeowner would think they have a very strong yielding well.

Step 10

Filling the tank with air. With a low yielding well / pump a rule of thumb is put 20psi of air into the tank. The idea is after the pressure switch turns on, in this case 55psi, then lots of water is still stored in the pressure tank. The homeowner can still use water below 55psi because there are two sources of water - the pump and - the pressure tank. Both are giving water at the same time to the home. If you put less than 20psi of water into the tank than you will have more water stored, but the water pressure will be so low at that point it would be considered none-usable. If you put more than 20psi of air into the tank than less water stored and the tank will run out of water sooner. If this is an issue multiple tanks are also an option.