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Episode 26 Trouble in the Basement! Trouble Shooting Residential Water Filters

This is a continuation of the troubleshooting series. Be sure to start with the water softener troubleshooting podcast as many of the tips can be universally applied.

Filter issues almost always start with improper sizing or lack of backwash water. It's a more delicate process, not as straightforward as putting salt in a brine tank.

Before Arrival

- What information is available before you go on the job?
 - System size and brand.
 - System age
 - Was the customer able to check the bypass to make sure it wasn't left open?
 - Did customer service ask the customer to go down in their basement and check for an open bypass? It saves them a service call.

Upon Arrival

- Gather or confirm equipment information (brand, age, etc.).
- What is the problem?
- When did the problem start? How long has it been problematic?
 - Leaking
 - Brown, cloudy water, sediment-filled water: constant or occasional?
 - Poor water pressure
 - Odd noises – banging, whistling
 - Unusual taste or odor
- Test the water and compare to original water test if available.

Filter Inspection

- Look around.
 - Water on the floor
 - Dripping, running water
 - Mold
 - Condensation on the tank
- Check for an open bypass
- Check valve for power and error codes
- Most importantly – check the drain. If the drain is clogged or constantly running there may be a piston problem, or an internal valve repair required.



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- **To operate properly, most filters beds require expansion of at least 40%.** Unlike a water softener, filtration is a mechanical process. The contaminant or crud builds up in the bed. Check the manufacturer's specifications to confirm the backwash rate requirements. As the bed gets dirtier it will require more backwash water.
 - If the drain is clogged or restricted the backwash rate won't be sufficient.
 - Is there enough water volume to lift the bed?
 - A typical filter backwashes at a rate of 7-10 gpm for 20 minutes, every three days.
 - Will it maintain the flow rate for 20 minutes? 10 gpm for 20 minutes is 200 gallons. Well water is under pressure; the initial flow is like a dam break – strong and fast. Once relieved of pressure it's working on water pump power.
 - Do a bucket test. How long does it take to fill a 5-gallon bucket? Or check with a flow test kit.
 - Is the raw water intake pressure strong enough to backwash the filter?
 - Is the well tank waterlogged?
 - Is the pump in good shape and powerful enough to maintain pressure?
 - Jet pumps can't do the job.
 - Water temperature
 - Because water temperature varies manufacturers recommend a backwash range. Cold water is denser than warm water so backwash rates will be lower. The warmer the water, the higher the backwash rate.
 - Check the raw water quality with a fast-running outdoor hose if possible.
 - Wells can pulse with crud. The water is clean for a couple minutes and then a slug of dirty water appears. This may be caused by crud weakening and coming off the well casing or from different streams of water pouring into the well. This is tough to observe unless you use a clean white 5-gallon bucket.
- If the raw water is silty or cloudy it's difficult to effectively backwash and purge accumulated crud from the filter. Dirty water on bottom, dirty water on top. The rinse cycle might take care of whatever accumulated at the tank bottom after the backwash but not if the well water is too dirty.
- Filter design
 - Is the system correctly sized with the proper drain?
 - Does the system have the correct valve?
 - Softener valves don't work on filters. A valve with a 3/8" or 1/2" drain port can't push enough backwash water up and through the bed. It will work for 6 months, maybe a year, then the bed will get impacted. Filtration will last for maybe a day before breakthrough.
 - Are there error codes or timer issues?



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- Twin Tanks – consider the options
 - Twin tank systems have a clean water backwash function. The system “borrows” clean water from one tank to backwash the other. Using clean water to backwash will prolong the life of the media.
 - Alternating twins – one is on standby; one is in service; one cleans the other
 - Twin parallel – both tanks are on-line together. This is best for low yielding wells. One cleans the other. Rather than using one fat tank, use two skinny tanks!
- Water Chemistry
 - Is the pH too high or too low?
 - Oxidation happens the best at 7 pH or higher. Contaminants stay dissolved in lower pH water. At higher pH they precipitate easily which benefits the oxidation reduction process.
- Is there fuel in the tank?
 - Oxidation requires fuel – peroxide, chlorine, permanganate, oxygen. A catalyst is required to enhance and perpetuate the oxidation/reduction cycle. As you oxidize and reduce, an oxygen molecule comes off the media. It is replaced during backwash with the catalyst rich water.
 - Is the chemical feed pump working correctly?
 - Is there chemical in the solution tank?
 - Is the air induction or ozone induction system clogged?

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