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## Episode 25 Trouble in the Basement! Trouble Shooting Residential Water Softeners

In this podcast Michael discusses how to trouble shoot residential water softeners. Listen to this podcast and use show notes to refresh your memory or to train new water treatment technicians.

### 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
  - Poor water pressure
  - Odd noises – banging, whistling
  - Taste, feel of water
- Test the water
  - Every technician should have a basic water test kit.

### Water Softener Inspection

- Look around.
  - Water on the floor
  - Dripping, running water
  - Mold
  - Condensation on the tank
- Check for an open bypass
- Do you hear water running to drain?
  - Is the drain in good shape and to code, and where is the drain?
  - How far away is it from the softener?
  - Is it installed correctly? Air gap?
  - Is water dripping from the drain?
  - Is the drain clogged? It won't draw brine if it's clogged.



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- **Check the water pressure.**
  - Well pressure tank
    - Is it in good shape and not waterlogged?
      - To tell if it's waterlogged get your wrench, tap on it and you'll hear either a ring or a dull thud. It's waterlogged if it's a dull thud. So, you'll need to replace the tank!
      - Press the Schrader regulator valve on top and if water comes out, it's waterlogged. Otherwise, you're not regulating the water pressure going through the water softener. This creates problems with brine draw.
      - When you run some water, did the pump cycle properly? Is the pump in the well cycling properly- not over or under pressurizing?
  - City or municipal water
    - Having low pressure, below 20 psi is problematic because you don't have enough pressure to create the vacuum to pull the brine.
  
- **Brine Tank - Open the lid, is there a lid?**
  - Is the brine tank full of water?
  - Is there salt in the brine tank?
  - Is it up to the float check?
    - A float check prevents it from overflowing assuming you don't have the brine tank pumped to drain.
    - Add a float check if not already there. This is different from a toilet float which is used to shut off the water.
  - A typical brine tank should contain no more than 5 gallons of water.
  - Does the brine look dirty, muddy, slimy? Hose it out. Brine draw is a delicate process and won't operate properly if clogged with mud or debris.
  - What type of salt is being used?
    - Solar salt
    - Salt pellets
  - Is there a salt bridge? The salt may have impurities that can cause a bridging or cementing effect. The bridge creates a cavern, so salt never falls to the bottom of the tank to make the brine required for regeneration.
    - Use a PVC pipe, not copper, to determine if there is a salt bridge. Or mule kick the brine tank. If you hear "kerplunk" chances are there is salt bridging.
    - This problem may be caused by poor quality pellet salt or if the system isn't regenerated for long periods of time such as vacation homes.
    - In cases where the system sits for long periods of time, if available- set the valve to fill the brine tank before the regeneration cycle rather than at the end of the cycle. Keep in mind it may delay the regeneration a couple hours for brine make up. Does not apply to commercial systems!

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- Check the “suck”.
  - Cycle the softener to the brine draw.
  - Pull the brine line off. Is it sucking air? If you place the brine line on a solid surface, then remove it you will hear a pop which indicates that it is sucking air. Water softeners draw brine on a vacuum. If you have a clogged drain, you’re not going to pull the vacuum you need to pull (or suck) the brine out of the brine tank.
- Check the injectors, replace rather than clean.
- Clean the injector screens.
- Check the drain for clogging in. Is it calcified?
- Is the drain line too long? We suggest 6 feet above and no longer than 25 feet.
- **Control Valve**
  - Are the electronics lit?
  - Are their error codes?
  - Does the outlet have power and is it wired correctly? (Not to the basement light!)
  - Analog valves
    - Is the timer motor hot or cold? Is the armature going around - visible on Fleck 5600 or 3200 timers?
    - Can you manually cycle the valve without binding?
  - Look at the back of the of the valve.
    - Is brine dripping or are there salt stains because of a loose connection?
    - Fleck uses an external brine valve which can leak. Change the brine valve rather than fixing.
  - Go through the cycle times –
    - Is your backwash flowing or does it die off? This is a drain or brine draw problem.
    - Cycle to brine draw – test it for vacuum or suction (suck!)
    - Cycle to refill – is it drawing enough water?
- **Fiberglass tank**
  - Is it frayed or in good condition?
    - We’ve had cases where homeowners use commercial pressure washers and suck the mineral tank flat. When it pops the fiberglass frays. The internal polyethylene liner can prevent leaks.
  - If you can shine a flashlight on the tank is the resin cycle the valve to backwash. You should see the resin flowing and dancing as it fully expands to almost 50%. If the bed isn’t expanding the valve o-ring may be blown out, water isn’t forced down the distributor tube and up through the resin.

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