

## HOME WORK

## Hydrogen gas can build up in unused hot water systems

## APPLIANCE DOCTOR



JOE GAGNON

The article was titled "The Dishwasher Exploded." That's the call a fire department received last winter from a base-housing inspector who conducted normal bi-monthly

checks of vacant units. As part of that check, the inspector ran the cold water in the kitchen sink, activated the dishwasher, then went upstairs to flush the commode and run the water in that bathroom. About three minutes after she started the dishwasher, it exploded. The blast propelled the dishwasher out from under a kitchen counter, across the kitchen, which damaged the cabinets, plumbing and walls. The explosion splintered the face of the rear door to the housing unit and blew it open, destroying the lock. Pieces of the dishwasher and cabinets scattered over 50 feet. The blast dislodged an access panel to the attic on the second floor and blew open a front door.

## Tests conducted

At first, investigators thought water in the "S" trap evaporated and allowed sewer gas to seep into the dishwasher and explode. The next day, Navy Occupational Safety and Health technicians tested all kitchen-sink drains in vacant units for signs of sewer gas, but results were negative.

During the investigation, a maintenance worker in the housing department pointed out a paragraph in the dishwasher owner's manual to the specialist. It stated that under certain conditions, hydrogen gas may be produced in a hot water system that has not been used for two weeks or more. The manual advised that if the hot water system was not used for such a period before using the dish-

washer, turn on all hot-water faucets and let the water flow.

The safety specialist returned to three vacant housing units and ran the hot water to test for emissions of hydrogen gas. Meter readings went off scale in these units. Then he ran hot water in three occupied units and got zero readings. When he ran hot water in an upstairs bathroom in the unit where the dishwasher exploded, he got an extremely high reading.

After NAVOSH personnel made several calls to Frigidair about the incident, a person from their legal department returned a call and told him that Frigidair was sending two engineers to investigate the exploding dishwasher. The engineers and NAVOSH personnel tested

hot water in two vacant units.

Testers placed clear garbage bags over the faucets to sample for gas contents. The first test resulted in the bag filling with about one to two quarts of water and a cubic foot of gas. They suspected the bulk of the gas was a combination of hydrogen and oxygen, which was generated by electrolysis in the hot-water heating systems.

One of the engineers explained that there is no way to stop hydrogen gas from forming in hot-water heaters because of the metals used in constructing the tanks. Hydrogen gas isn't soluble in water, so it remains in the water-heater plumbing system as a gas under pressure.

In most homes, the gas migrates to the upper levels of

the house, where it harmlessly expels from water faucets there. Occasionally, it can end up trapped in the plumbing lines. In that case, when a lower level faucet (or dishwasher) is turned on, the gas is pushed through the outlet rather than finding its way to the upper level.

Next week: How homeowners can prevent similar dangers in their homes.

Joe Gagnon can be heard on *Newstalk 760, WR-AM, every Saturday and Sunday mornings. He is a past president of The Society of Consumer Professionals. His second book, "The Words and Wisdom of The Appliance Doctor" is available in book stores. His phone number is (313) 873-9789.*

## Change water valves to stop dripping

## ASK DAD



HARRY JACHYM

I got a call from my wife's friend, Sue, about the constant "drip, drip, drip" from the faucet in her bathtub. This problem seldom requires calling a plumber.

It's usually as simple as changing the valve washer and sometimes, as in Sue's case, resurfacing the valve seat.

We'll look at how to resurface the seat and replace a washer on a typical compression faucet. Compression faucets have separate stem valves for hot and cold.

out as you progress.

## The fix

Obviously you'll need to shut off the water supply to the fixture. If you are lucky, there will be independent shutoffs near the fixture. If not, you may need to turn off the house water.

Since every faucet is different, it's difficult to say exactly how to disassemble the valves.

Start by carefully removing the faucet handles and any trim. In most cases, the handles are held in place with screws that are often beneath a decorative cap. Before prying or using pliers on decorative pieces, check for set screws and remove them. If a trim piece needs to be unscrewed and won't budge by hand, cover it with one or two layers of duct tape before putting pliers on it.

Once the decorative pieces are removed, you should see the head of the stem valve. Unscrew it with an adjustable wrench or deep well socket wrench. Be certain to use the appropriate sized wrench and watch for corrosion-stuck parts — otherwise the soft brass parts may be damaged beyond repair.

Bath tub faucets are usually set behind the wall, which requires a deep well socket or plumbing hexagon wrench (usually inexpensive and found at a hardware store) to remove the stem. You may also need to care-



Plumbing parts: A stem valve washer and screw can be disassembled.

fully chip some of the wall tile to access it, but be careful so you don't have to replace tile, too.

Stem valves have a neoprene washer which seals against a "seat" (a metal surface inside the faucet that meets the washer when closed). As these seats corrode, they become rough and quickly wear the washers.

Once the stem is removed, feel or look at the seat and check for roughness. If it is rough, it will need to be replaced or resurfaced.

A square or hexagonal hole in the seat indicates you should be able to replace it. (This square or hexagon shape may merely be indentations in a round hole. A round hole, with no indentations, means the seat is probably not replaceable.)

To remove replaceable seats, you will need a seat wrench. This inexpensive tool is an "L"-shaped steel rod with a tapered hex on one end and a tapered square on the other. Insert the proper end into the seat and carefully turn counter-clockwise to remove the seat. Again, watch for corrosion stuck parts.

Remove the screw holding the washer in place. Take the washer and old seat with you to a hardware store for a proper match up when purchasing the new parts.

Replace the washers and clean all threads before putting everything back together in the reverse order. Be careful with reassembly. Brass threads are easily damaged.

If you find a non-replaceable seat after removing the valve stem, it will need to be resurfaced rather than replaced, using a fairly inexpensive tool called a seat dresser, available at most hardware stores. Follow the instructions that come with the tool. Reassemble the faucet as above.

Harry Jachym, a licensed builder, lives in Plymouth.

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