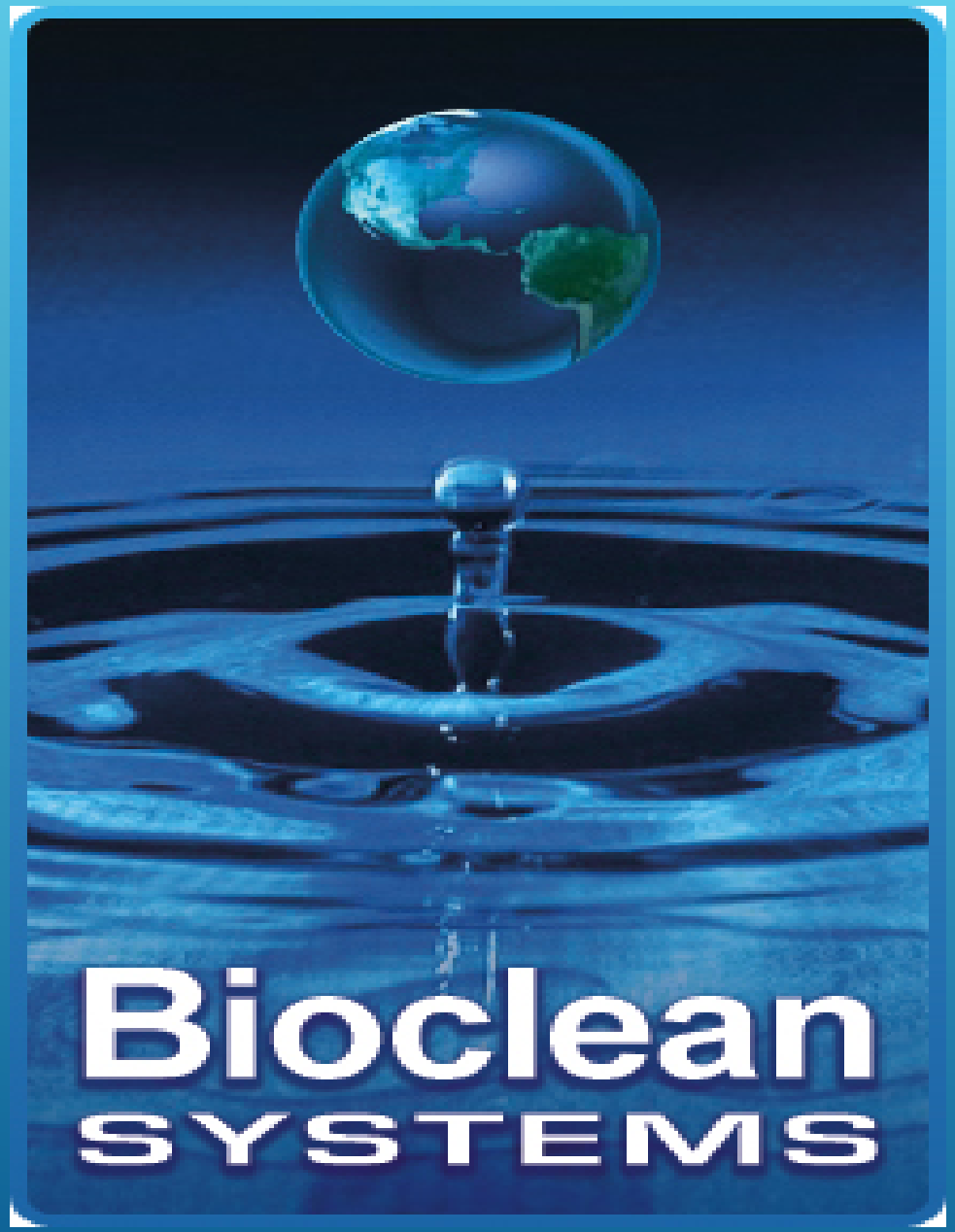


BIOCLEAN ACADEMY

2015

WATER HEATER AND CONTROLS

Some of you never have to worry about this subject.

Many of us that live here up north unfortunately have to worry about heating our wash water.

Let’s cover the equipment and see what makes them work.

Why propane? Cleaner, simpler

Deserving of respect-more dangerous

Propane Tank-Enters as a liquid, then changes to a gas to be used by the water heater.

QUIZ: What position regenerates gas the quickest? Horizontal or Vertical?

Tank needle valve-should be turned to the “closed” position every night. Especially when your equipment is parked indoors!

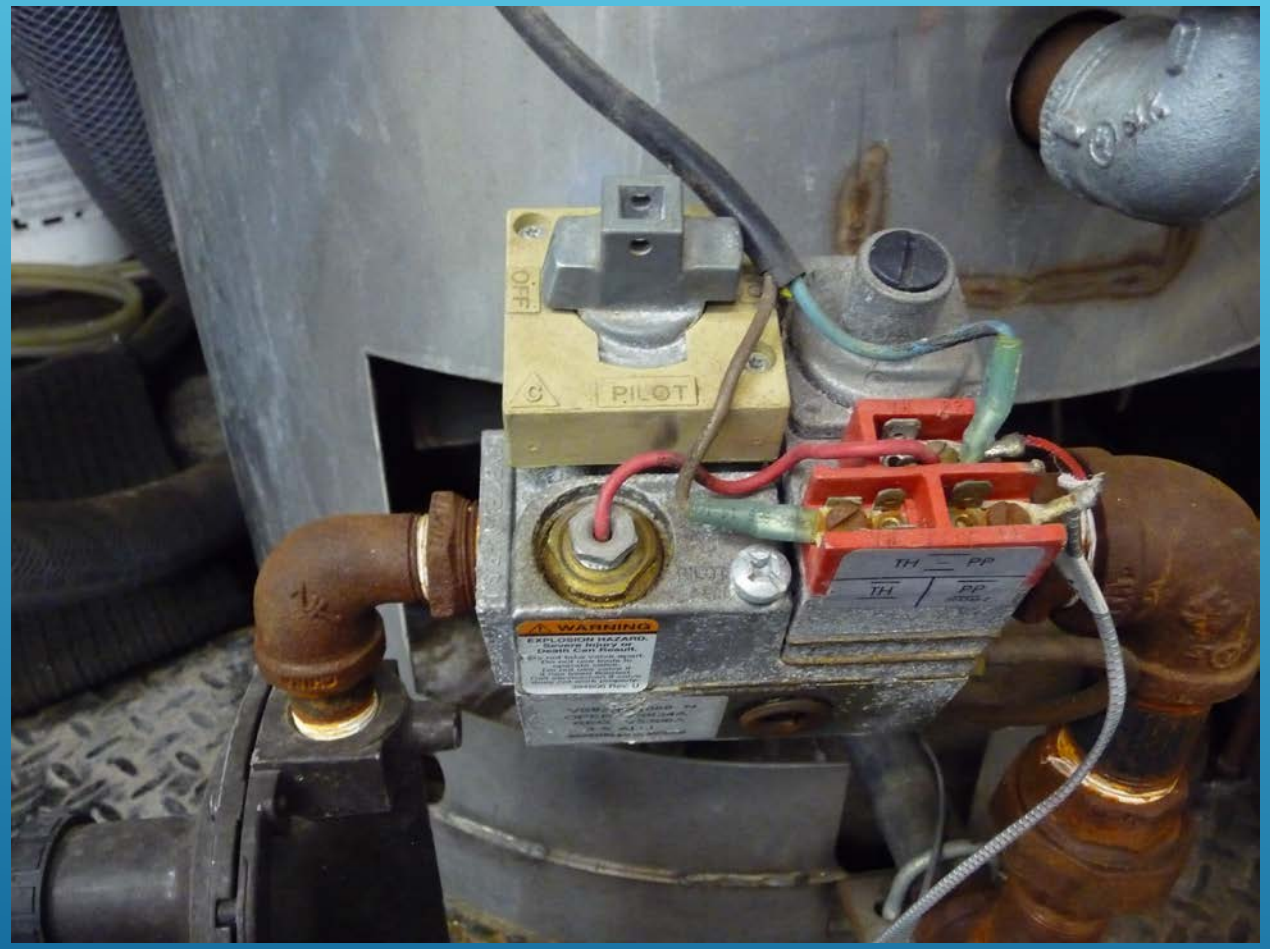
Tank regulator-Do not allow free air access point to be blocked or plugged. This can cause the regulator to fail and not properly control gas pressure.

Brown water heater “pancake” regulator-controls gas pressure before it enters the gas valve.

Free air access point-keep free of obstruction!

Propane inlet-Do not confuse pressure line with gas line-gas line is a steel braided line

Why do we have two regulators regulating the propane supply to the gas valve?



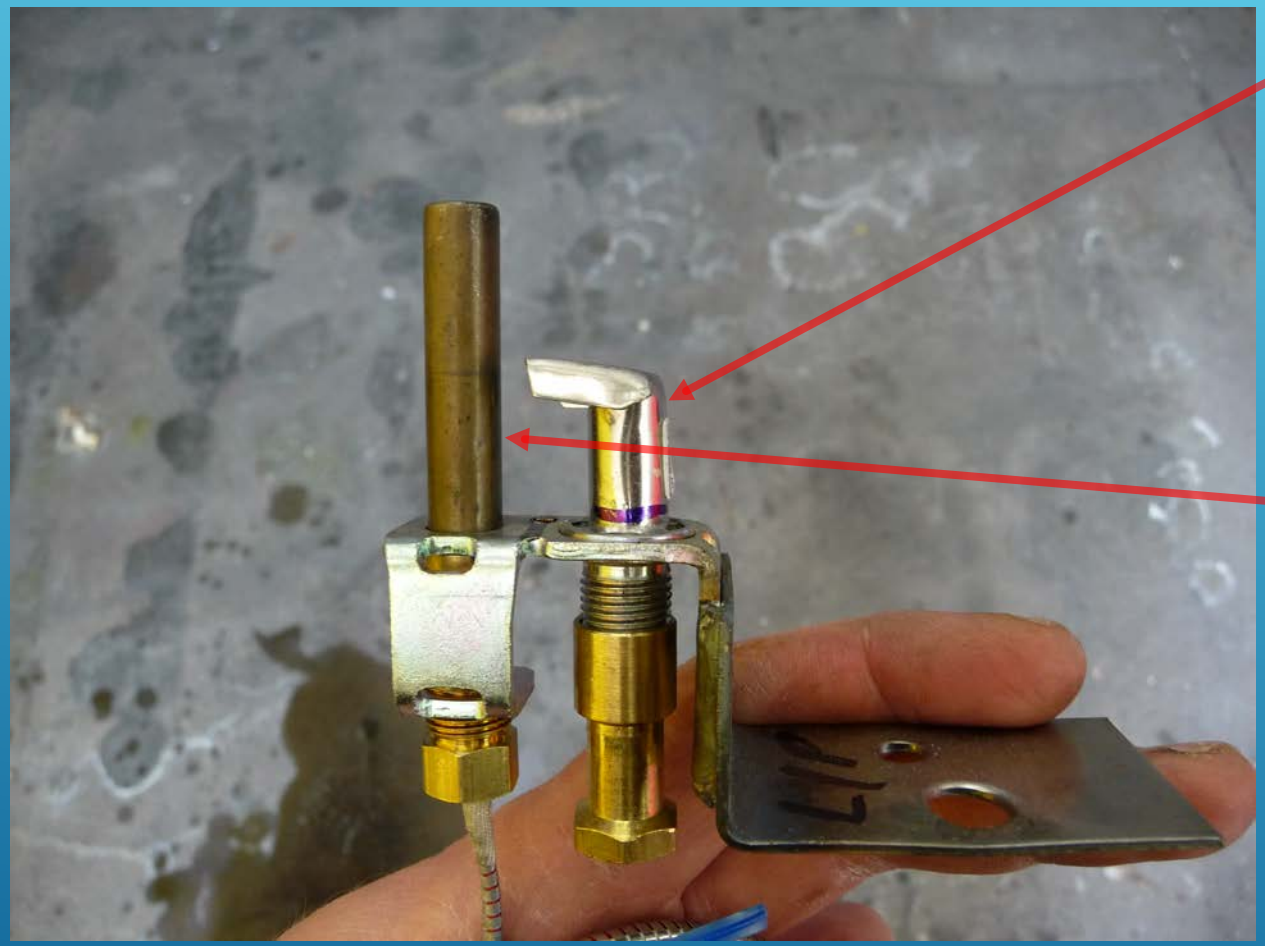
Gas Valve-Opens to let propane in to burner assembly(a.k.a. fire ring) once the pilot assembly and flow switch give the OK

Flow switch-closes when flow through the switch is detected.

Inlet water pushes the switch magnetic poppet “up”. This is read by the reed (brass tube with the cable attached) which closes the switch and sends the signal to the gas valve.

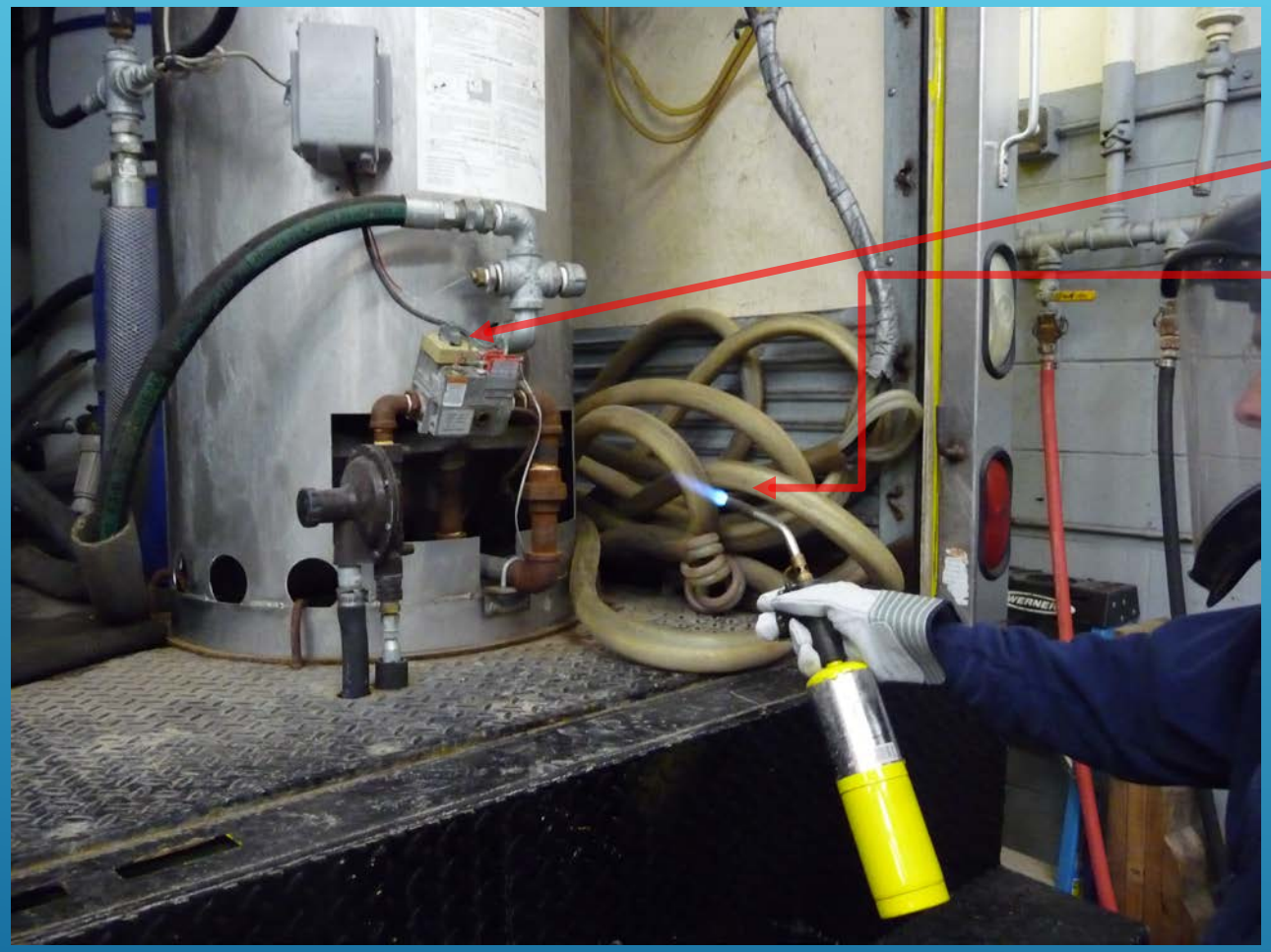
Burner Assembly and gas jets- made out of special materials to minimize corrosion

Distributes the flame evenly across the width of the water heater coil to heat the wash water efficiently



Pilot Assembly-directs a small flame to heat up the pilot generator and also ignite the burner ring assembly

Pilot generator- when heated to acceptable temperature it creates a small electrical current to hold the gas valve in the “open” position and operate burner ring assembly.

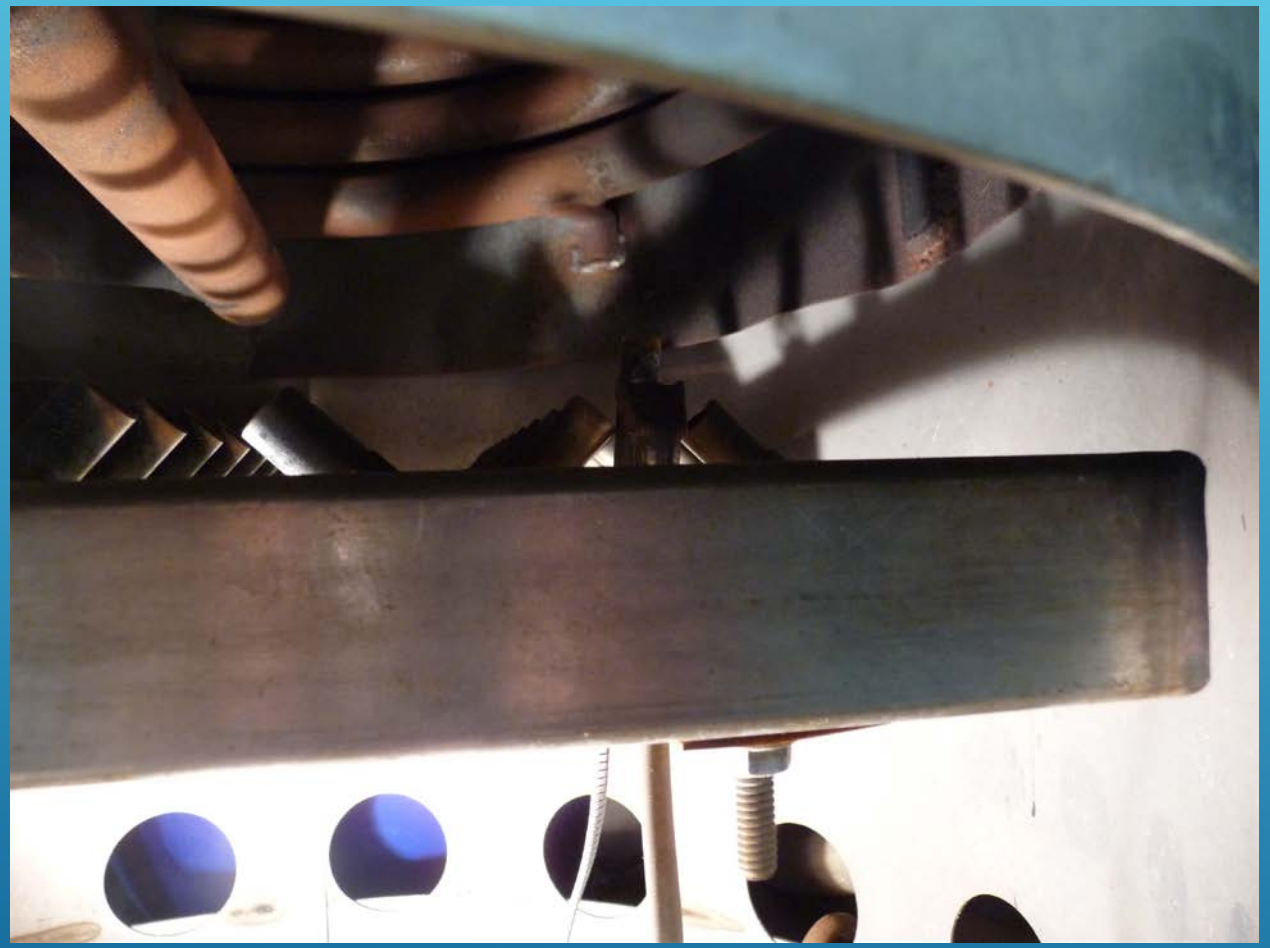


Lighting Procedure:

Turn gas valve to pilot.

Light torch 2 feet away from water heater. This reduces the danger of “blowback” if gas has become trapped within water heater.

Notice safety equipment in place-gloves, long sleeves, and face shield.

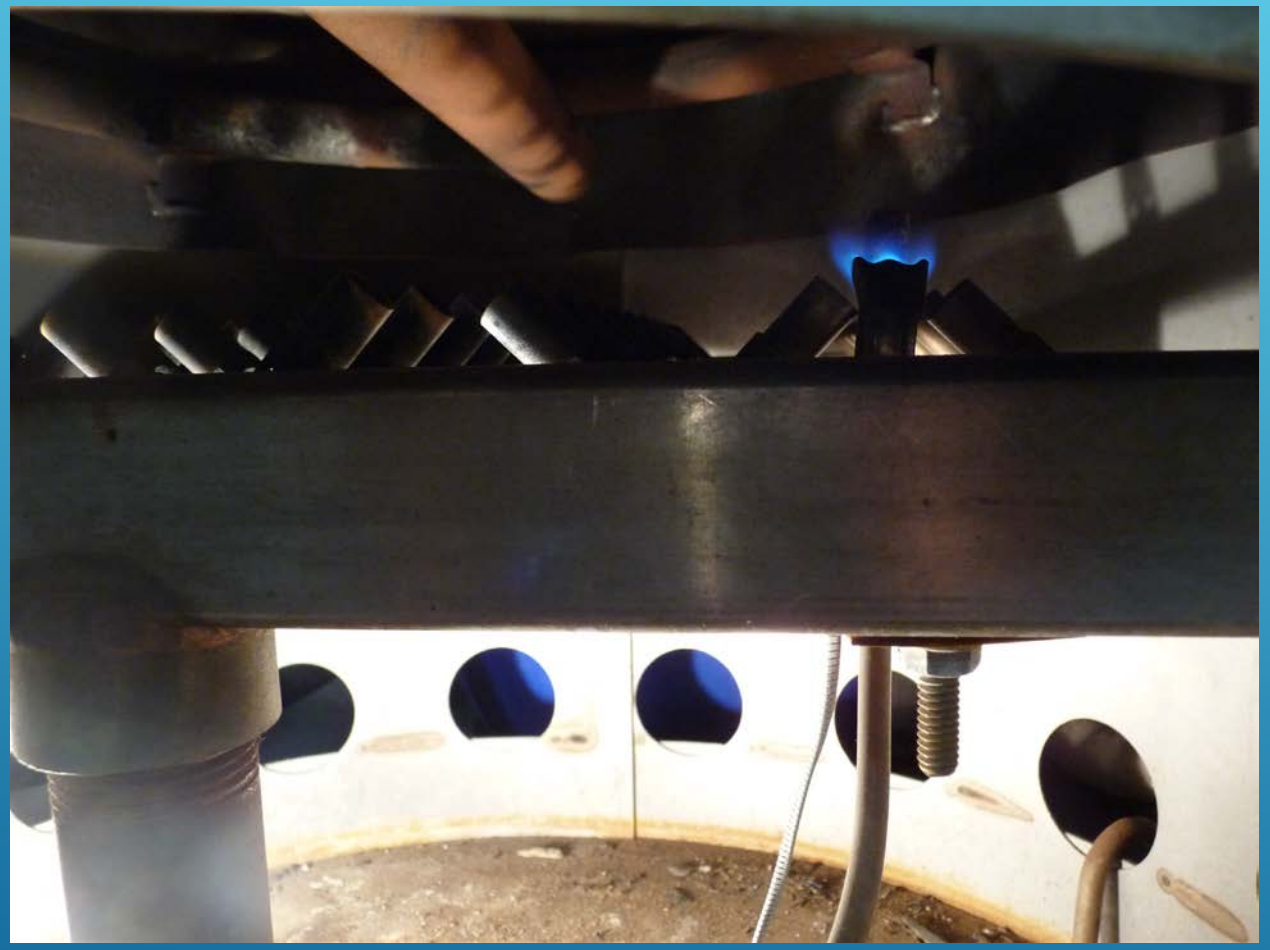


Identify the pilot location on the fire ring. The small copper line comes from the gas valve and connects to it. You will also notice the electrical cable coming from the pilot generator.

Pressing the knob down in the pilot position, move torch into the pilot area and wait for flame to light. This may take more than a minute.

Once lit, continue to hold down the knob on the gas valve which keeps the pilot lit. This heats up the pilot generator and eventually sends an electrical charge to the gas valve.

Although difficult to see in the photo, the flame should be around 2 inches in length and wrap around the pilot generator.



If the flame height is less than this, either clean out the thimble hole of the pilot assembly or replace the thimble altogether.

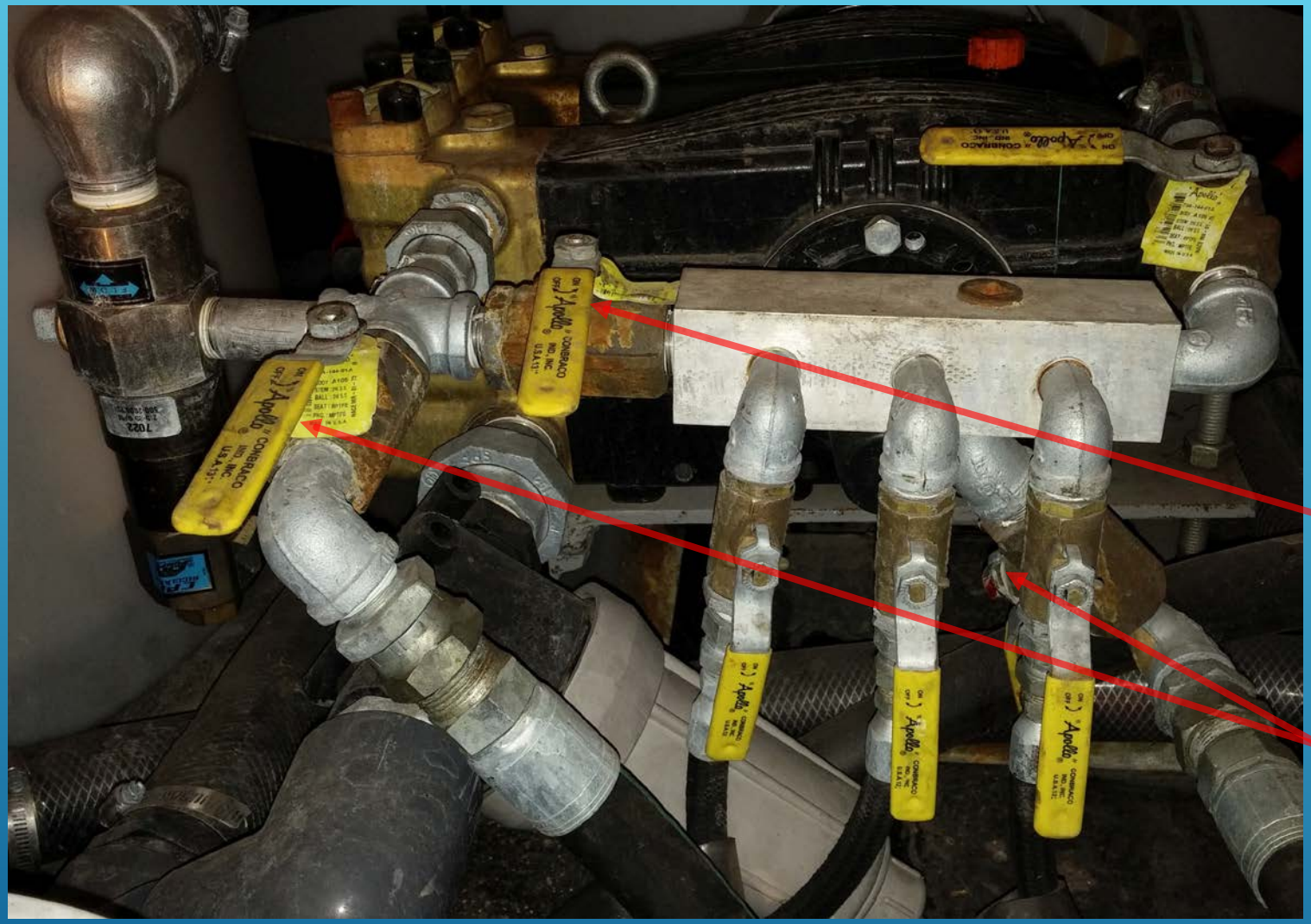
Failure to do so may result in a severely dangerous “blowback” condition!!

The poppet goes inside the pilot assembly and is easily removed. As you can see, the hole is very small and only a sewing needle should be used to clean the poppet out. Bioclean recommends replacing the poppet altogether.

WATER HEATER OPERATION:

STEP 1:

You are ready to start washing and the pilot is lit.



STEP 2:

Confirm that the ball valves are in the correct position to feed water into the water heater.

Ball valve feeding the manifold should be closed.

Ball valves feeding the water heater should be open.

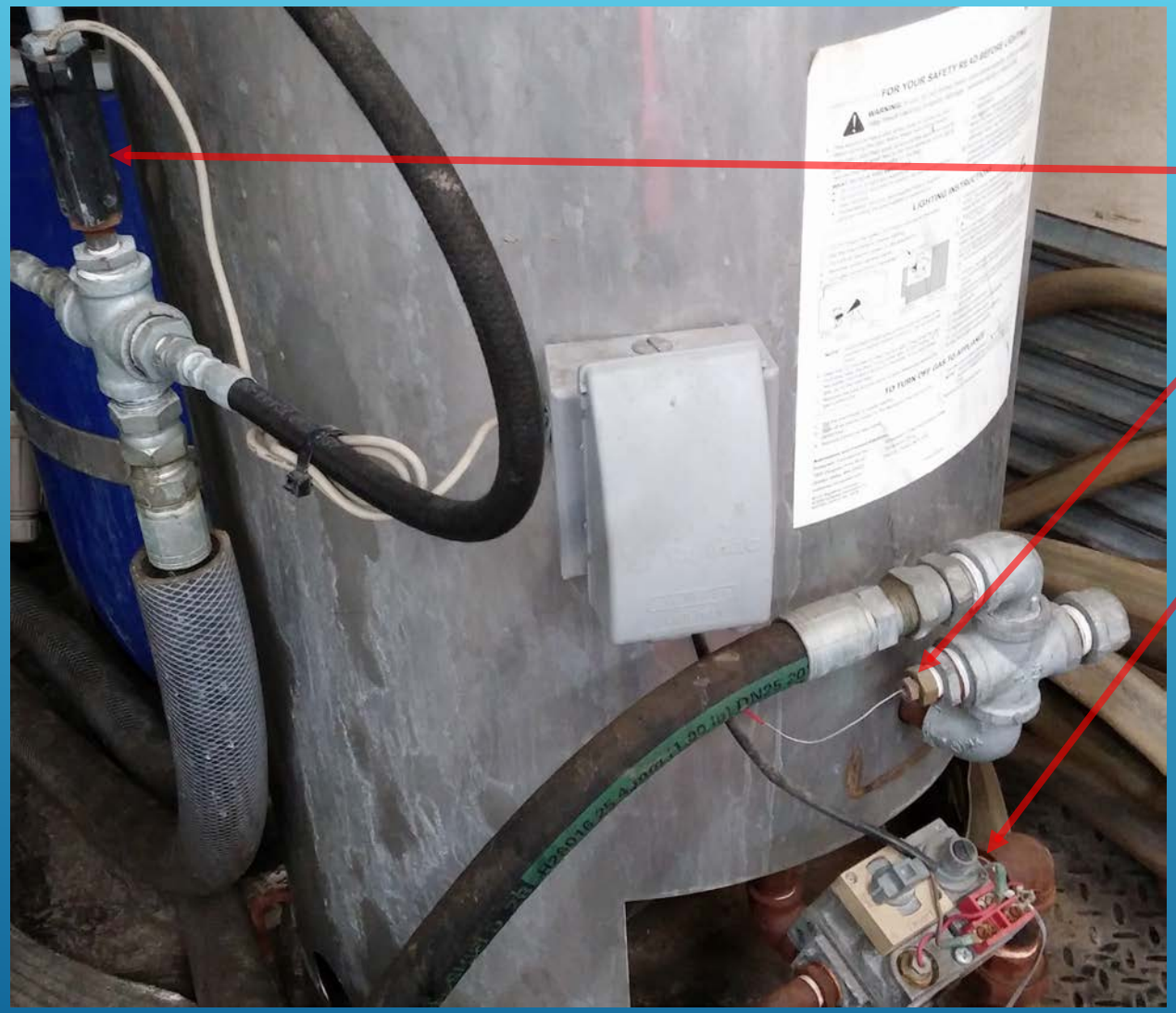
QUIZ:

Will the water heater fire, and why or why not?

STEP 3:

Adjust thermal switch to desired temperature.

Note: Your wash hoses are only rated for 145 degrees. Do not set the thermal switch above that temperature!



STEP 4:

Once flow is detected through the flow switch,

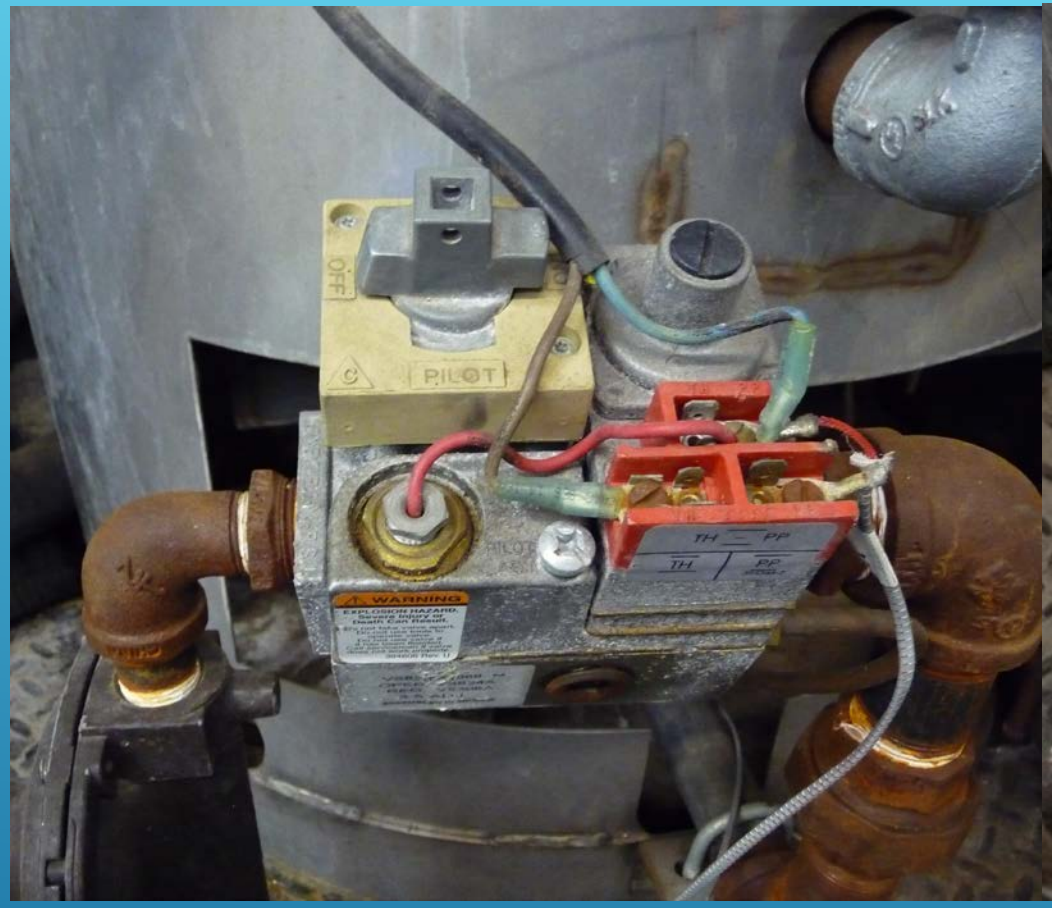
And the sensor probe is calling for heat,

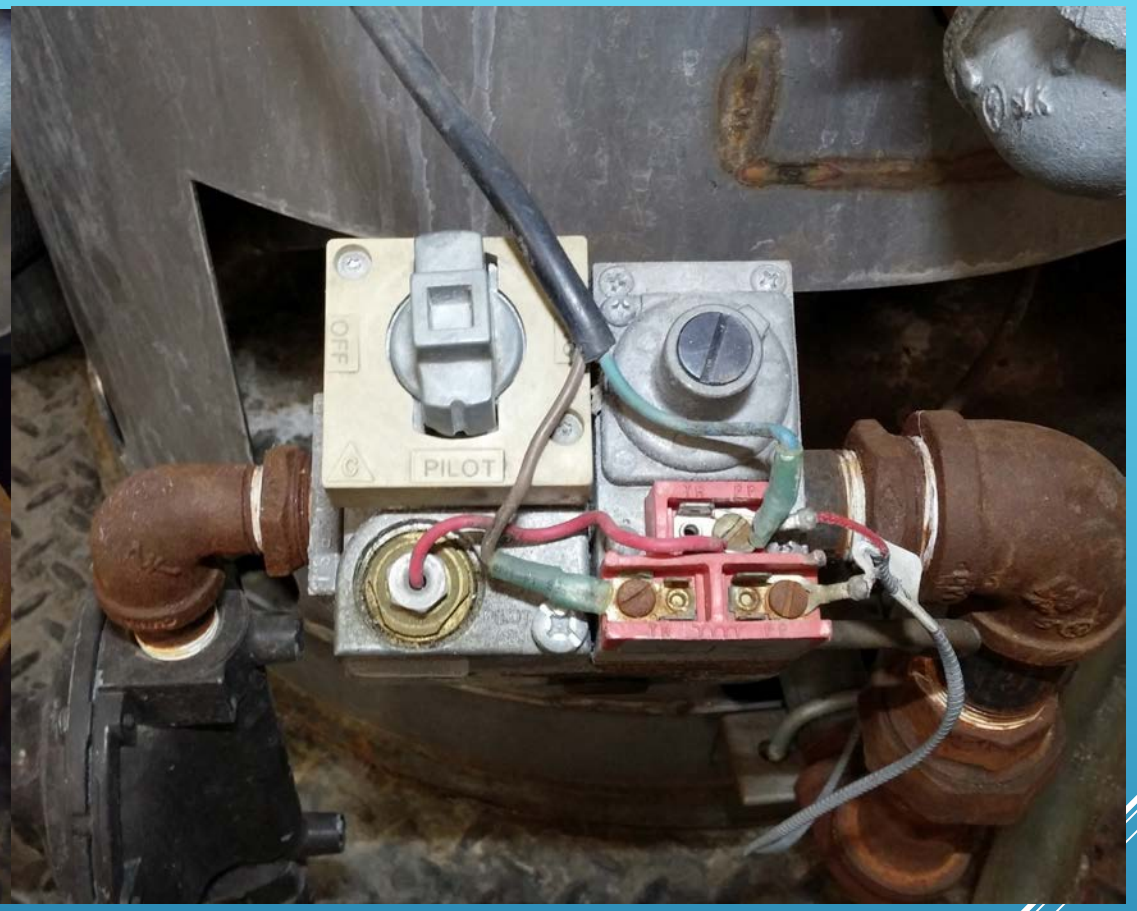
Then the thermal switch closes and sends a signal to the gas valve to open and allow propane into the fire ring.

STEP 5:

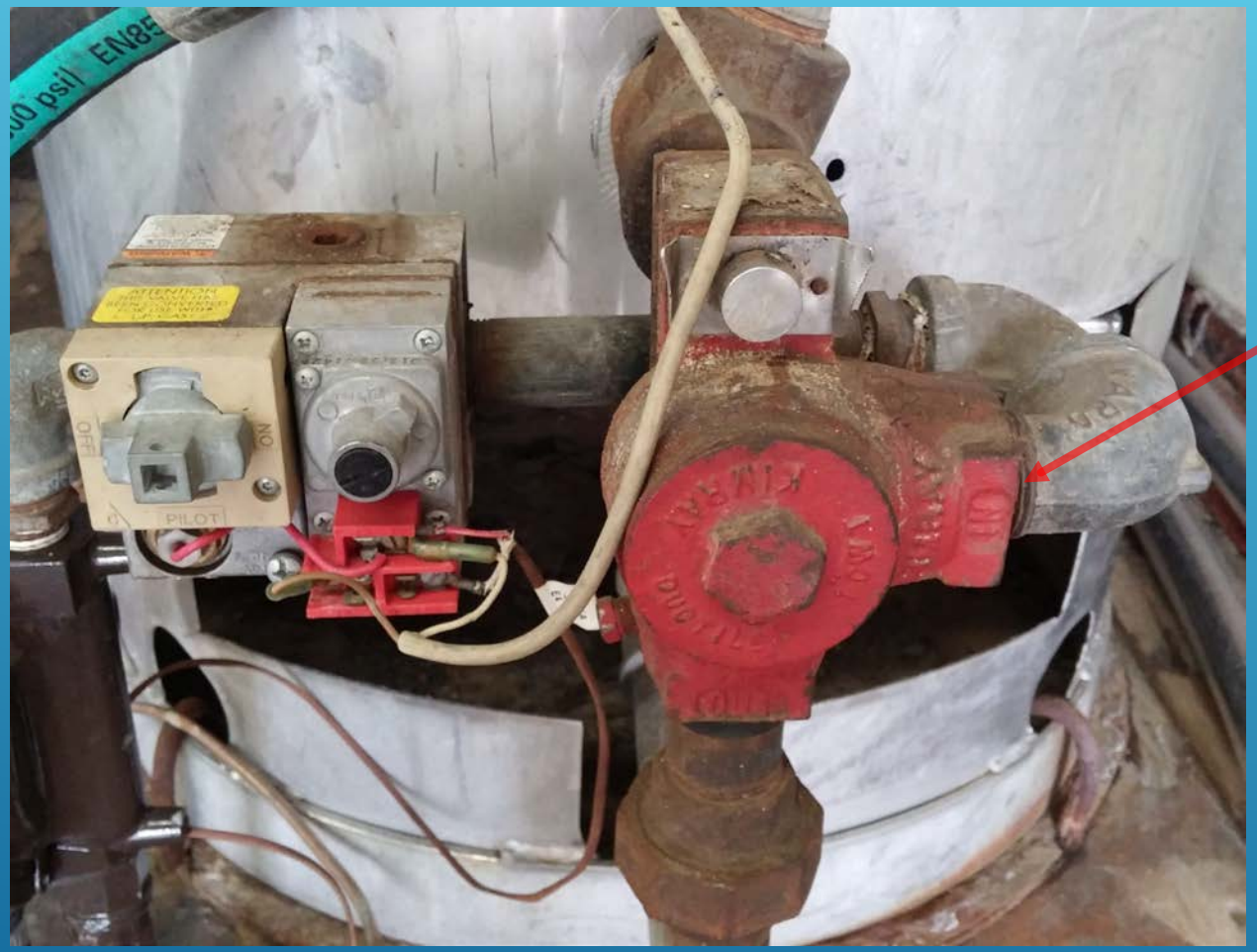
The propane enters into the thermal ring, it ignites from the pilot, and fires up until the thermal probe detects that requested temperature has been reached.

Once met, it sends the signal to the gas valve to close and shut the propane supply off until water temperature drops below requested level and the process starts all over again.



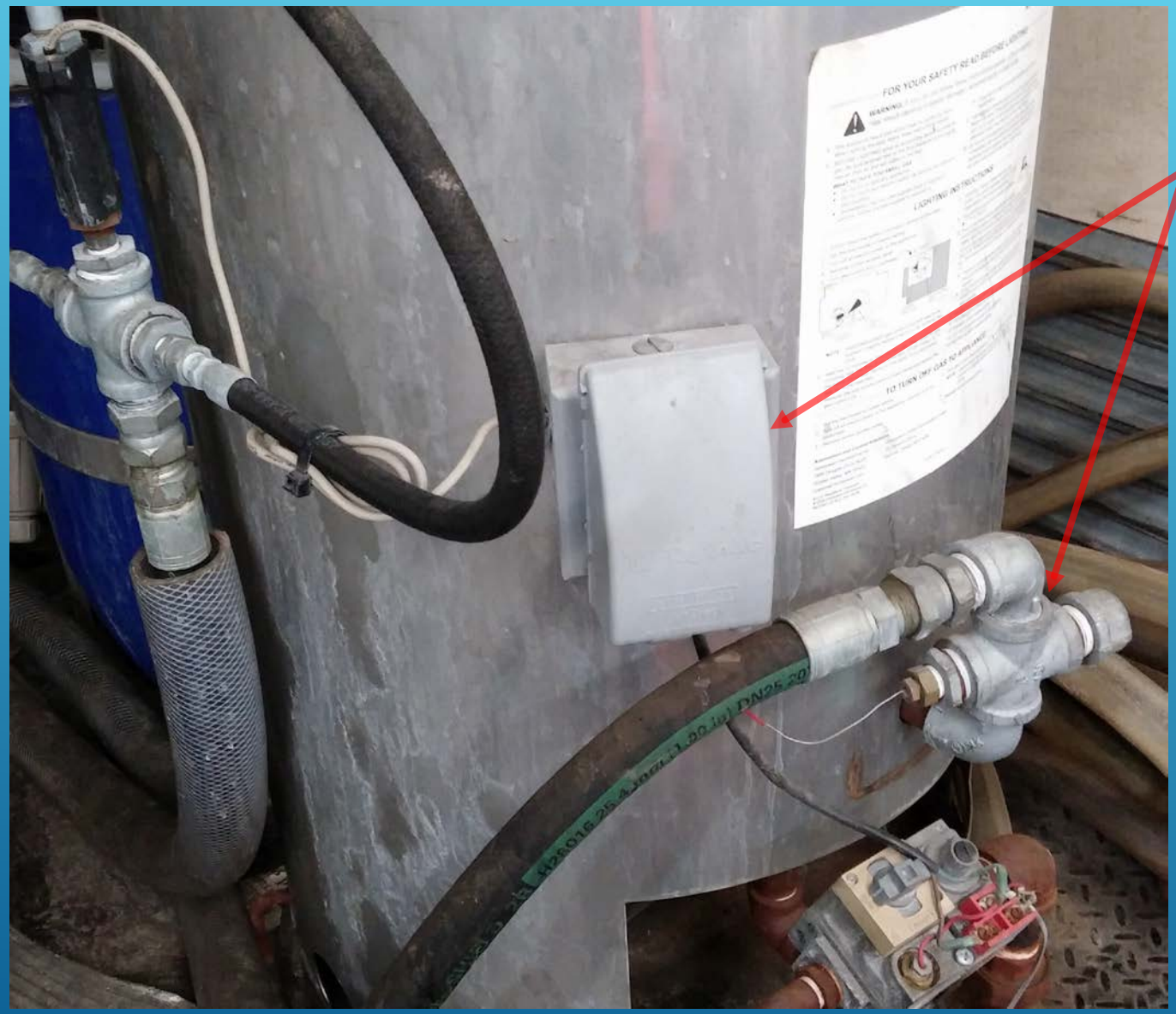


DO NOT LEAVE GAS VALVE IN "ON" POSITION WHILE DRIVING BETWEEN JOBS! THIS COULD RESULT IN POSSIBLE EXPLOSION AND FIRE!



KIMRAY CHANGEOUT

Kimray has ceased making the modulating gas valve that we have used for years.



Bioclean has put together a kit to easily change out the Kimray to a thermal switch assembly. The adjustment lever can be locked so changing settings by someone other than an authorized user can be prevented.

The control box will need to be mounted, the Kimray will need to be removed and the cross and sensor mounted, and the flow switch and gas valve will need to be wired in.

Since the Kimray previously held the fire ring in place and that is now gone, you will need to mount the fire ring to the jacket by using the angle and u-bolt supplied in the kit.