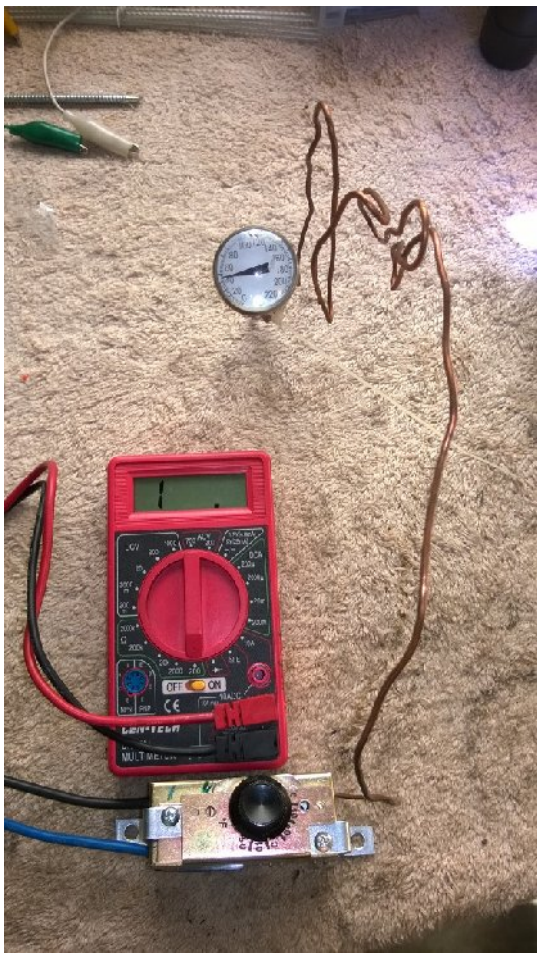
**2010 43QGP Allegro Bus**

**12/25/2015**

**ONE-HUNDRED-EIGHTEENTH -** coach modification – **BASEMENT AQUA-HOT THERMOSTAT RELOCATION.** A recent discussion related to heating the basement for coaches with Aqua-Hot systems lead me to recheck how I thought the basement heating system operated.
Many TRVN members are not sure how to set up their Aqua-Hot to heat the basement. Member questions made me wonder if I really remembered which switches need to be turned ON and which switches did not need to be turned ON to heat the wet bay and basement.
While digesting my turkey and ham this afternoon I performed a few tests on our Aqua-Hot. Three parameters need to be met to begin heating the basement. **ONE**, either the Aqua-Hot's diesel burner needs to be turned ON or the electric element needs to be turned ON. **TWO**, the boiler coolant has to reach the coolant cut off temperature. **THREE**, the basement thermocouple has to close the cozy heat exchanger fans electrical circuit, closing the circuit occurs when the basement thermocouple senses the temperature at or below the thermostats setting. The basement thermostat is adjustable between 0 – 50° (F) most Tiffin coach thermostats are set to turn on at 40° (F).

The thermostat shown to the left has been used by Tiffin for many years it's the only thermostat I've seen used on Tiffin coaches with Aqua-Hot's basement heating system.
During testing I found operation of our thermostat was intermittent. Decided to see if I could locate a thermostat for sell on the Internet, located a White Rodgers 2B61-186 Remote Thermostat 1P Single Throw 48" Capillary 0 – 50 ° (F) on E-bay for $39.95 with free shipping. The seller had make an offer so we went back and forth with counteroffers, while waiting on a second counter response I decided to disassemble the OEM thermostat to see why the switching was intermittent.
In case other members decide to peek inside the thermostat there are several small pieces you do

not want to lose so be careful during disassembly and reassembly. I found the pair of contacts was not properly aligned, after a slight adjustment of the contacts the thermostat was reassembled and tested multiple times checking the operation of the contacts. The E-bay seller got stuck on $ 37.50 and would not lower his price so I decided after tweaking the contacts I would reinstall the OEM thermostat and let someone else purchase the thermostat.




In both above photos a thermometer was tie-wrapped to the thermostats thermocouple bulb. To lower the thermocouple‘s temperature for testing the thermocouple was immersed in a mug of ice and water which lowered the thermocouple’s temperature down to the mid 20° range.
Shown in the above LEFT photo the thermostats circuit is OPEN, resistance across the contacts is infinite or normally termed as an OPEN circuit. The thermometer is displaying a temperature of about 42 ° (F). However the above RIGHT photo is showing a resistance of 1.8 ohms which for the cheap meter I was using is considered a CLOSED circuit the thermometer is displaying a temperature of 38 ° (F), it appears the 40 ° setting on the

thermostat is fairly accurate. If 42° is an OPEN circuit and 38° is a CLOSED circuit the accuracy of the thermostat is pretty good.

Tiffin located our basement thermostat in the passenger side Aqua-Hot compartment with the thermocouple attached to the fresh water tank overflow. Tiffin in recent years has installed the basement thermostat in the driver's side wet bay. While I had the thermostat system disassembled I made the decision to relocate the thermostat to the driver's side wet bay. The thermostat is a low voltage device (12 VDC) so moving the thermostat to a wet environment is not an electrical code problem. Tiffin installed a two wire cable to power the cozy heat exchanger fans, I got lucky as the length of the two wire cable allowed me to re-route the cable from the passenger side Aqua-Hot compartment across the Aqua-Hot to the driver's side Aqua-Hot compartment then five feet toward the rear of the coach across the top of the wet bay where the cable was brought down on the right side wall between the water hose reel and the water hose reel power switch where the thermostat was mounted as seen below.


**Answering the question of what is needed to heat the basement.**
**IF** the Aqua-Hot's diesel burner **OR** the Aqua-Hots electric element is turned ON, **AND** the Aqua-Hot's boiler coolant has reached the cut off temperature, **AND** the basement thermostat's thermocouple has closed the thermostats contacts (basement thermocouple is cold enough to close the contacts) the Aqua-Hot will pump heated coolant thru Zone Three's coolant loop **AND** the basement cozy heat exchanger fans will run blowing heated air into the wet bay and basement.