

Condensing **98 %**
NAVIEN
Navigating Energy and Environment

Navien's Condensing 98%
Tankless Water Heaters

Adjusting the Manifold Pressures

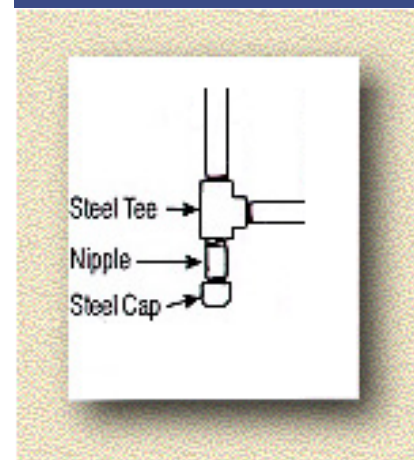
°T-CREATOR
NAVIEN

Adjusting the Manifold Pressure:

Note:

1. Before assuming the manifold pressure has to be adjusted, ensure the DIP switch settings, especially the gas set of 6, is set correctly;
2. Take a reading of the gas line pressure at the dirt pocket to ensure the proper gas line pressures are maintained while the unit is operating at maximum fire (open multiple faucets to start the unit and to ramp it up to maximum fire); to operate at its maximum BTU potential at maximum fire, the unit should have a minimum of 7" WC for Natural Gas and 11" WC for Propane;
3. If the line pressure while the unit is operating at maximum is less than the numbers listed above, you will experience lower hot water volumes and lower hot water temperatures than specified;
4. Adjusting the manifold pressure will not make up for a lack of gas volume coming into the heater.




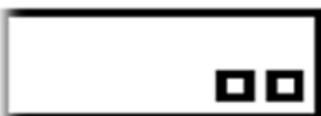

Gas line Dirt Pocket



Adjusting the Manifold Pressure: Set of 6 Dip Switches:

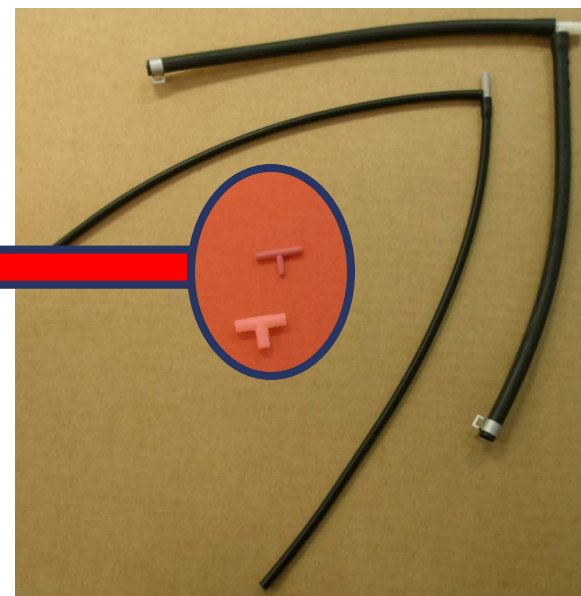
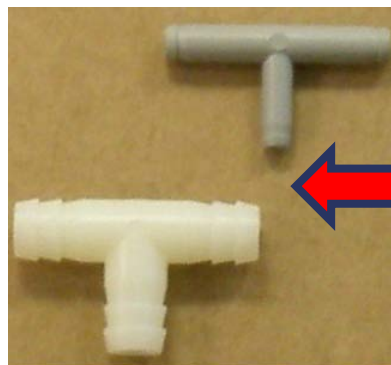
Confirm that you have the proper model selected on the set of 6 DIP switches (#5 & #6):

NR - NP Model / BTU Settings

		NR-240
1 2 3 4 5 6	1 2 3 4 5 6 7 8	NP-240
		NR-210
1 2 3 4 5 6	1 2 3 4 5 6 7 8	NP-210
		NR-180
1 2 3 4 5 6	1 2 3 4 5 6 7 8	NP-180

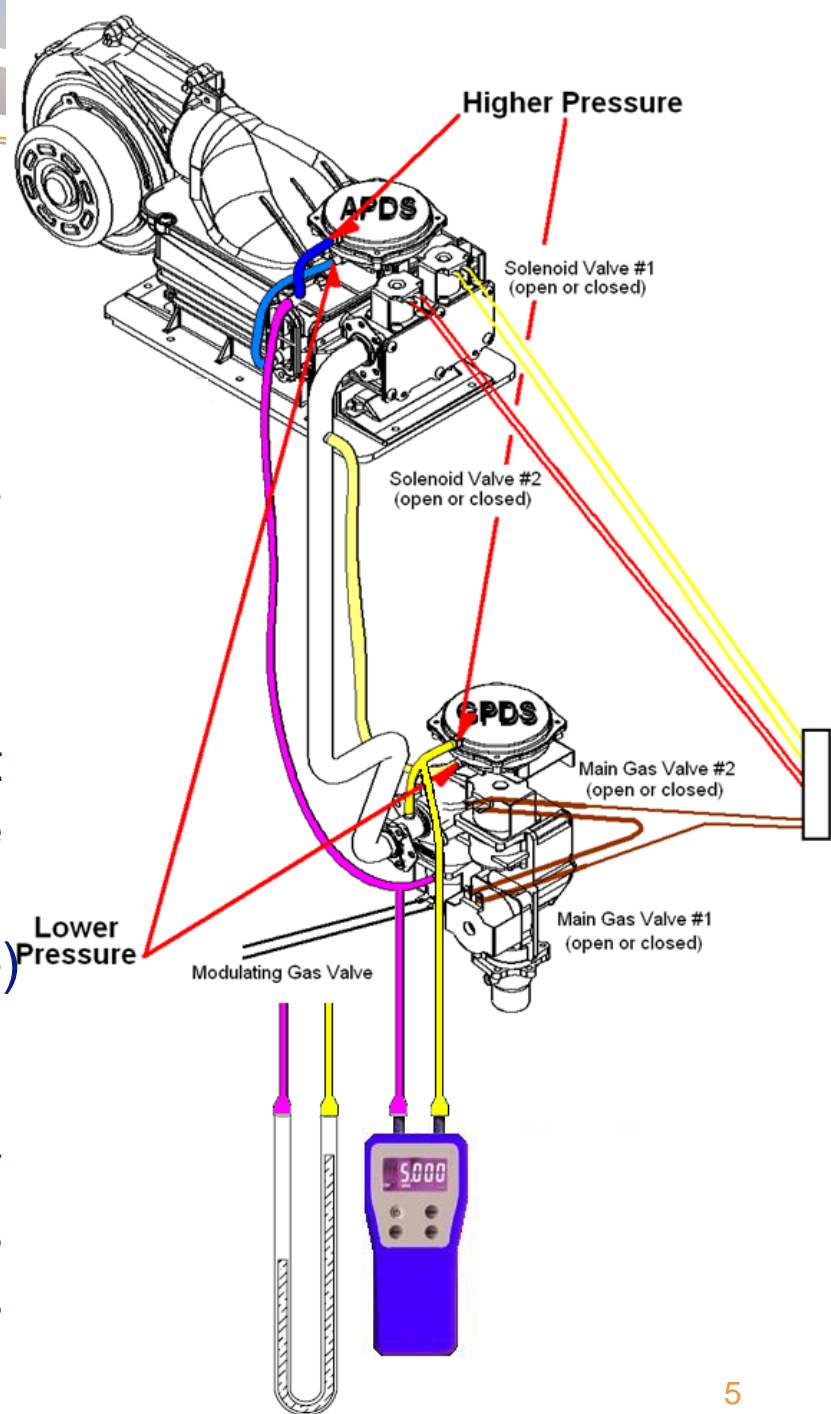
Adjusting the Manifold Pressure:

- To test and adjust the gas manifold pressure, you will require a differential pressure manometer (dual port), a Philips #2 screwdriver, 2 tees (available from Navien) and extra rubber hoses and a small (micro) Philips screwdriver;

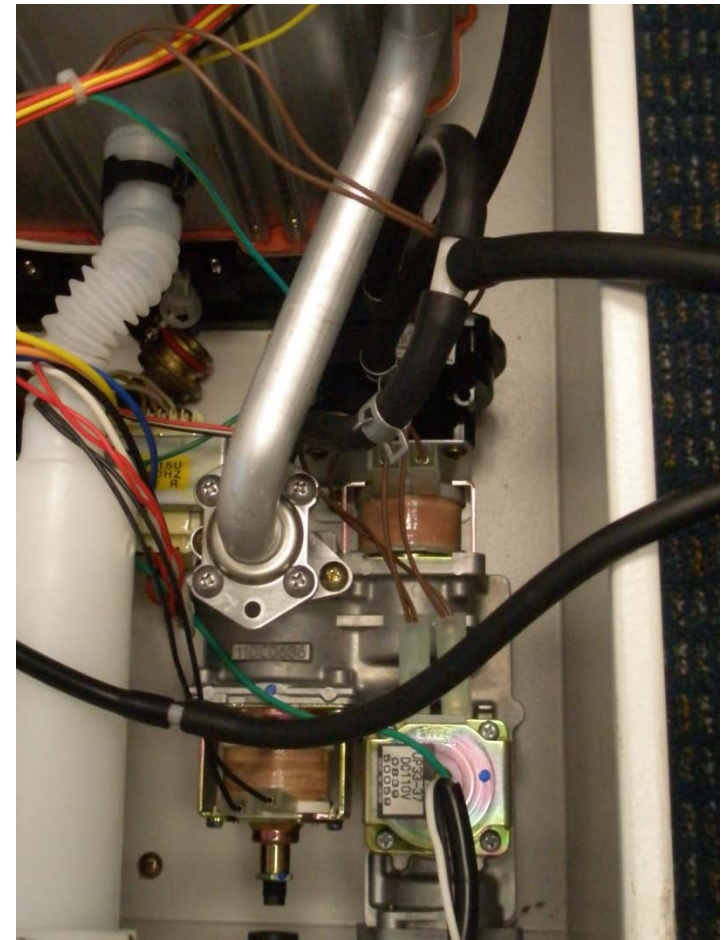
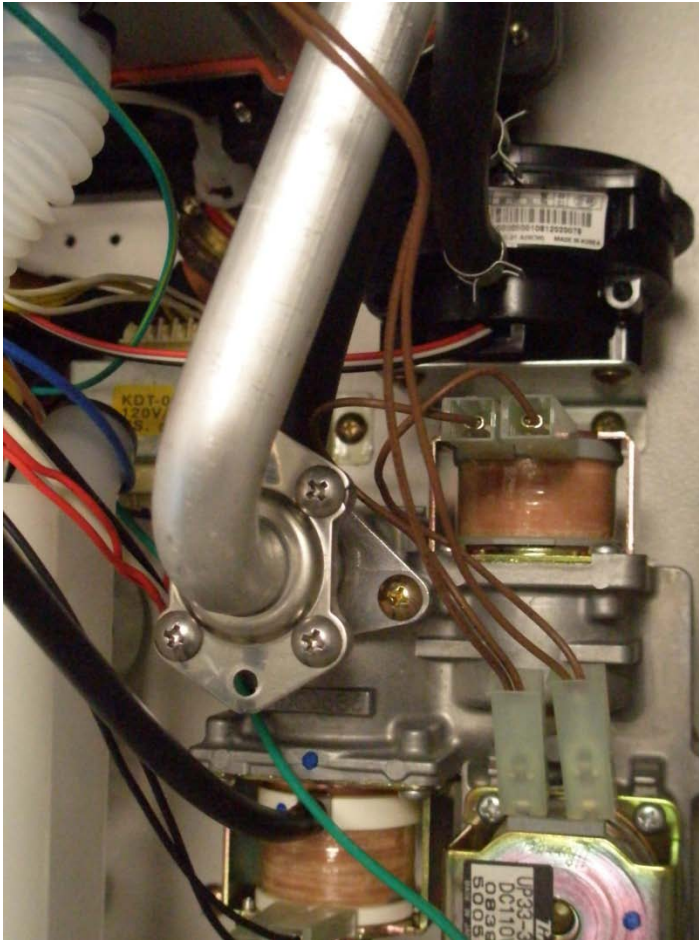


Adjusting the Manifold Pressure:

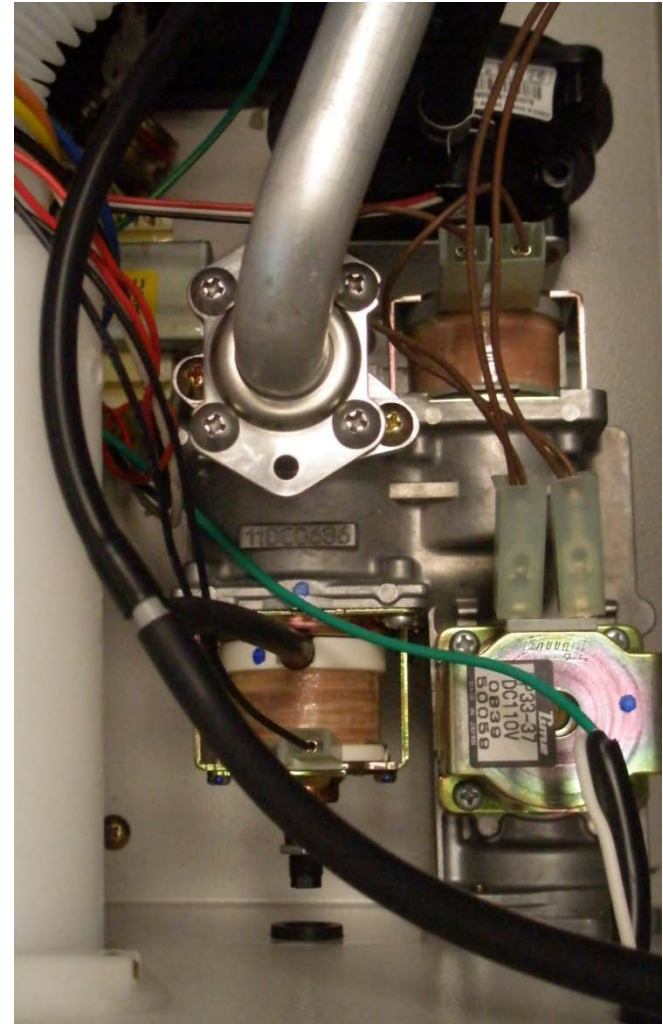
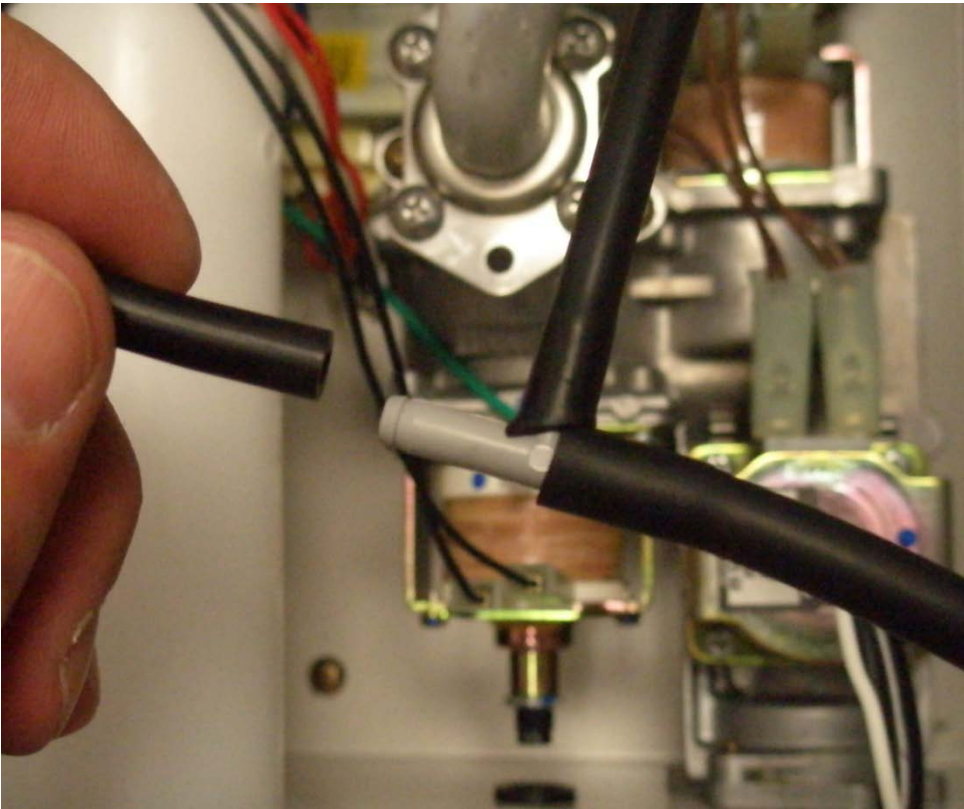
- To measure the manifold pressure, we need to tee into the rubber hoses at 2 points;
- Do not cut the existing hoses as you will need to reattach them once the test is completed; as such, additional hose will be required to complete the test;
- Tee connection #1 (the larger white tee) is inserted between the gas venturi and high pressure port of the GPS;
- Tee connection #2 (the smaller gray tee) is inserted between the air-gas feedback nipple and the modulating gas valve;



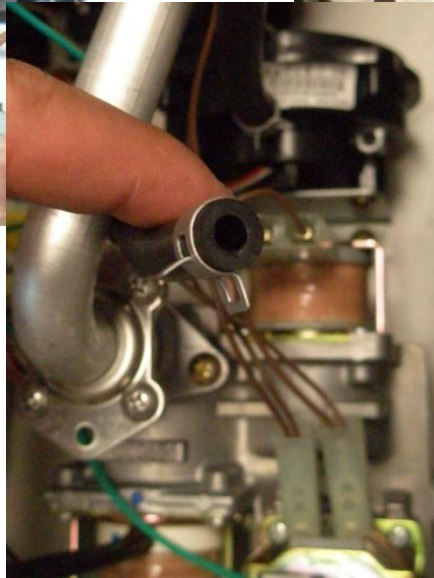
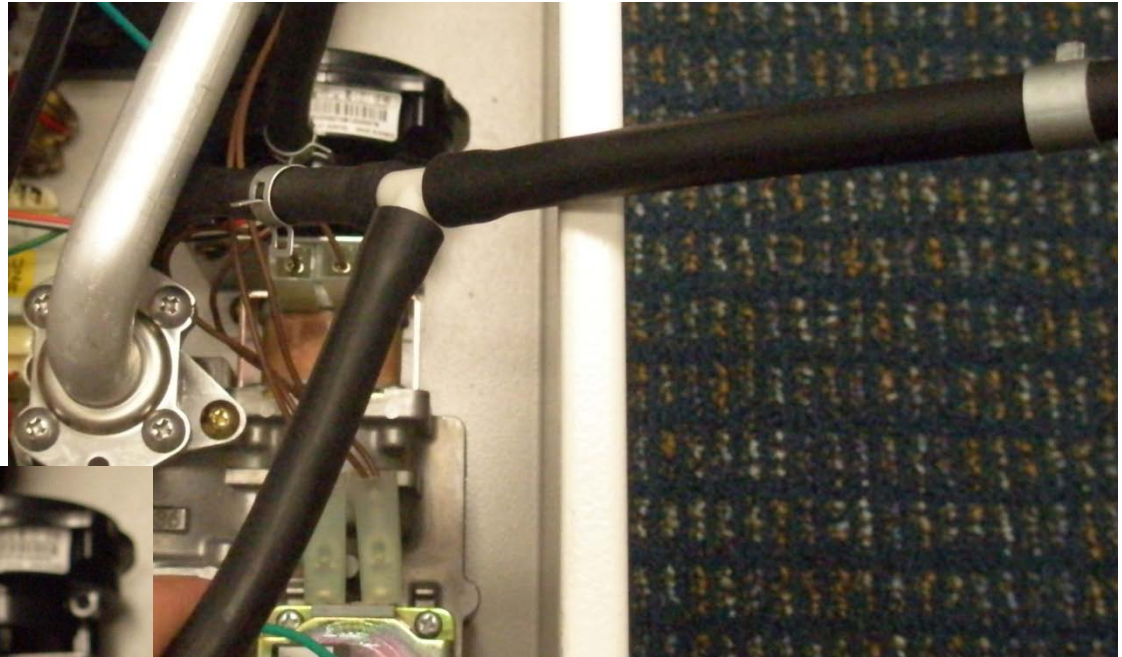
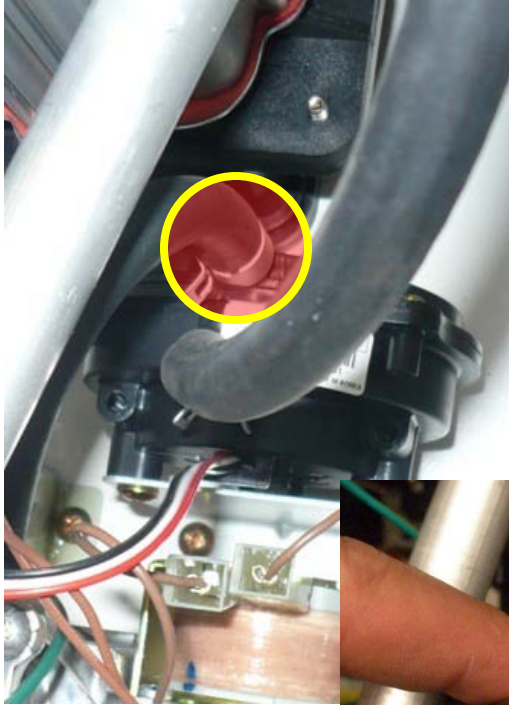
Adjusting the Manifold Pressure:



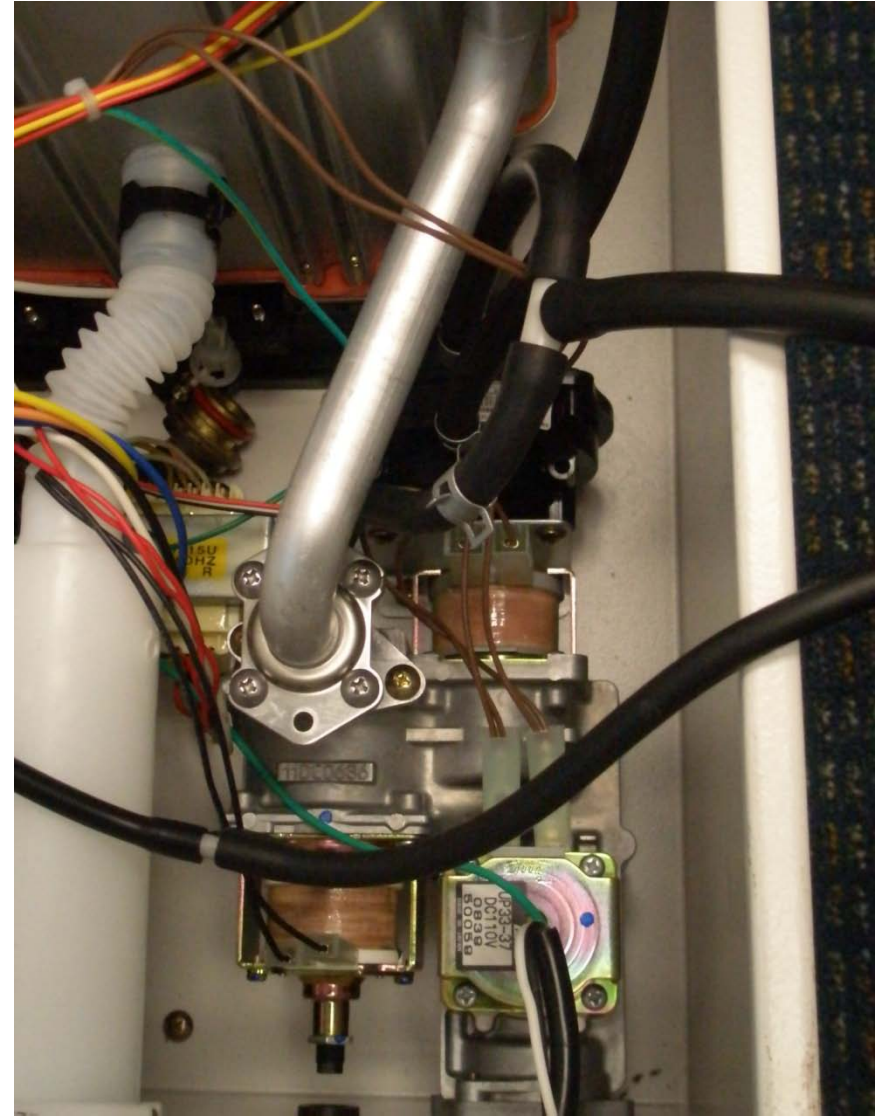
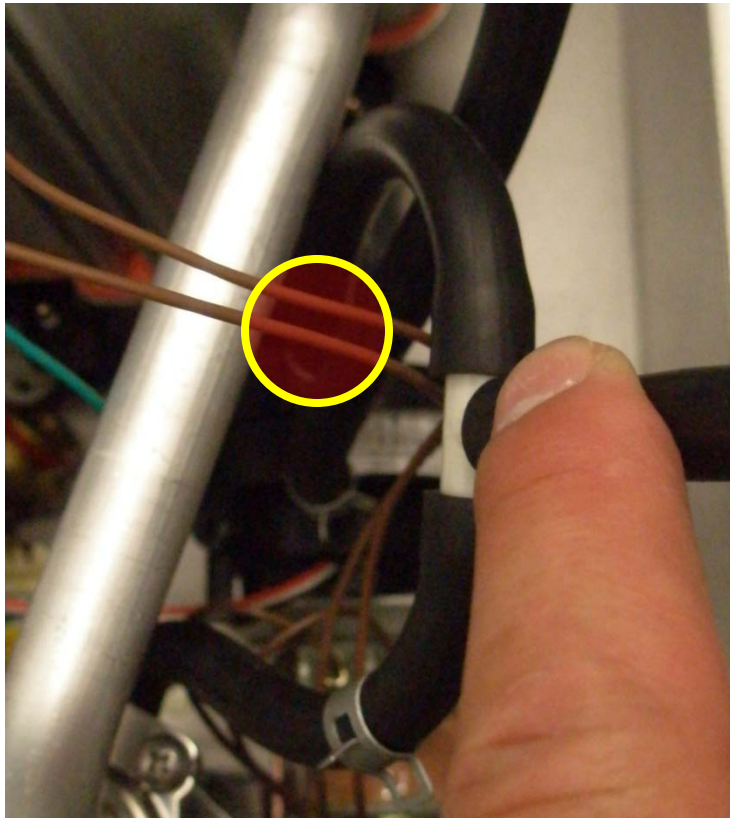
Adjusting the Manifold Pressure:



Adjusting the Manifold Pressure:

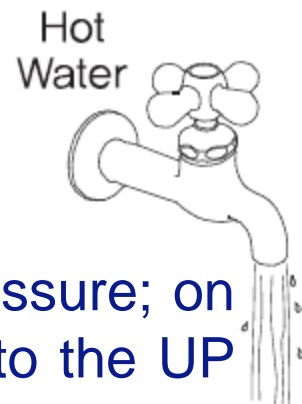


Adjusting the Manifold Pressure:

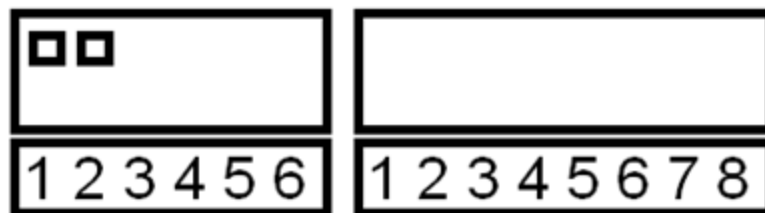


Adjusting the 3-Stage Minimum Manifold Pressure:

- Once the tees are in place and hooked up to the manometer, ensure the water heater is off and then set the manometer to zero;
- Turn on a faucet;
- We will first set the 3-stage minimum manifold pressure; on the set of 6 DIP switches, set switches #1 and #2 to the UP (ON) position;



MINIMUM FIRE
w/ 3-FRAMES OPEN
1 & 2 UP (ON)



- Now we are ready to adjust the minimum manifold pressure:

Adjusting the 3-Stage Minimum Manifold Pressure:

- Note the pressure indicated by the manometer; it should be with the following ranges. Be sure to note the proper model and proper gas type:

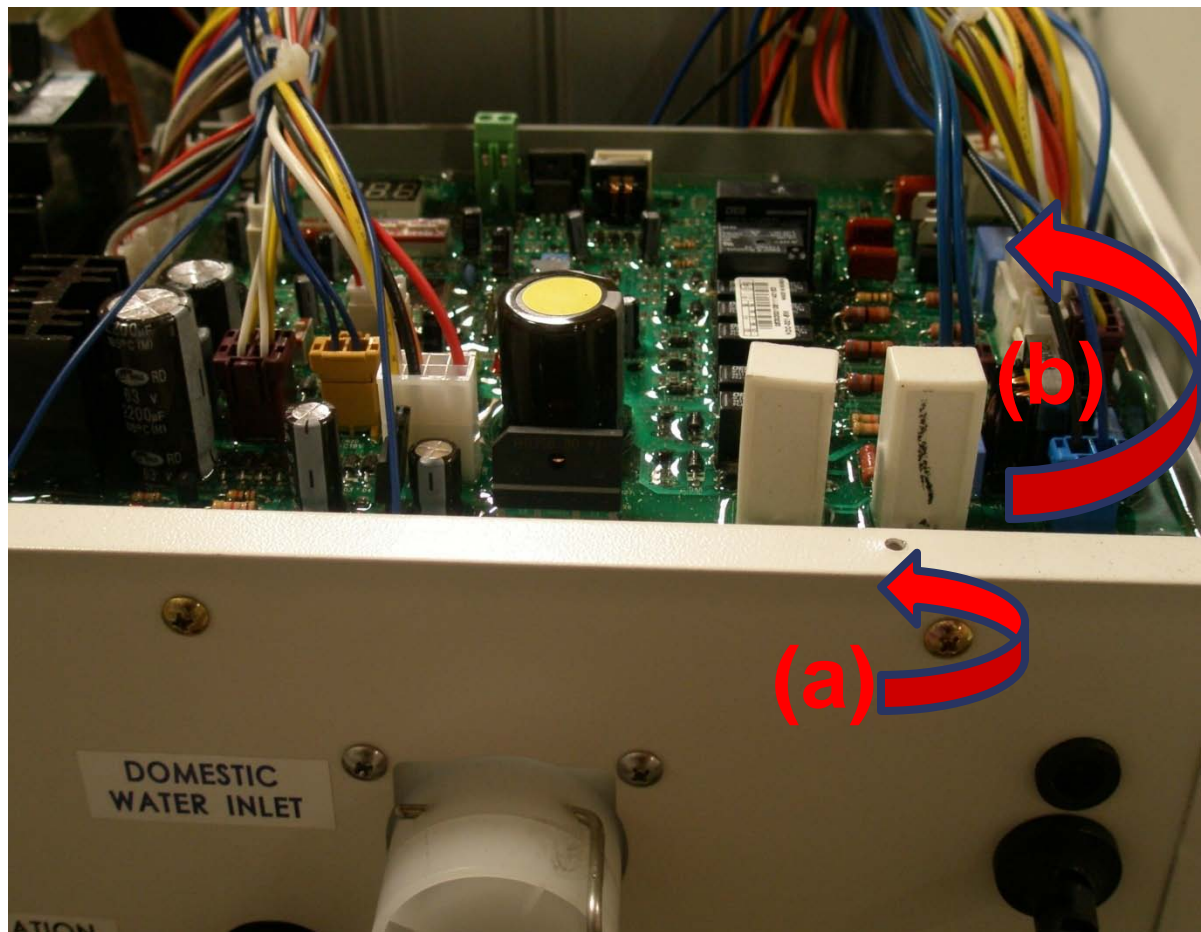
Model	Gas Type	Manifold Gas Pressure Settings	
		3 Stage Minimum Fire	Maximum Fire
NR-180, 180A / NP-180, 180A	NG	0.87 +/- 0.06" WC	2.68 +/- 0.08" WC
NR-210, 210A / NP-210, 210A	NG	0.67 +/- 0.06" WC	1.73 +/- 0.08" WC
NR-240, 240A / NP-240, 240A	NG	0.67 +/- 0.06" WC	2.20 +/- 0.08" WC
NR-180, 180A / NP-180, 180A	LP	1.57 +/- 0.06" WC	4.60 +/- 0.08" WC
NR-210, 210A / NP-210, 210A	LP	1.30 +/- 0.08" WC	3.19 +/- 0.08" WC
NR-240, 240A / NP-240, 240A	LP	1.30 +/- 0.08" WC	3.86 +/- 0.08" WC

- If the pressure is not in the above range, then adjustment will be required.



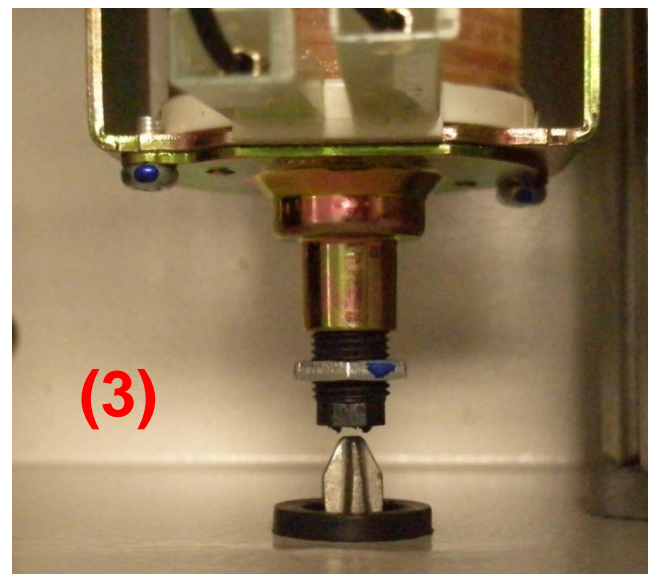
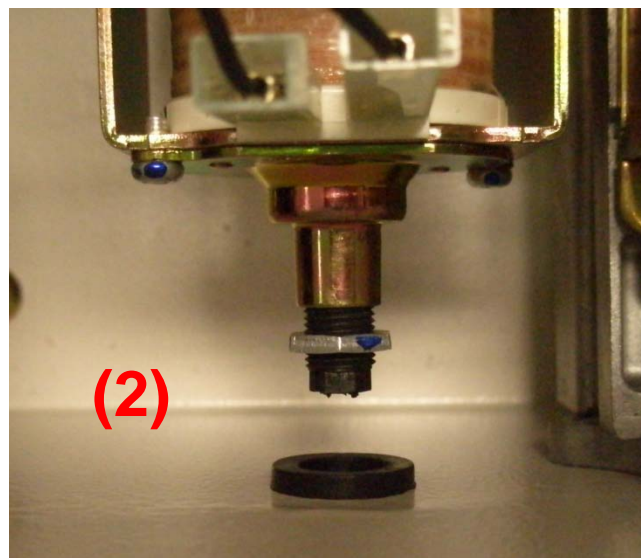
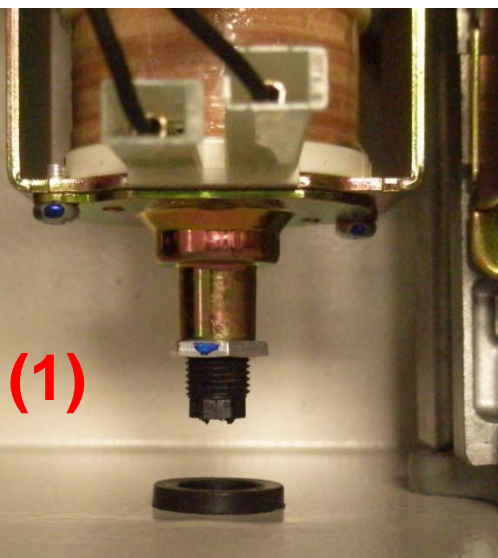
Accessing Behind the Computer Board:

To access behind the board, remove the screw that attaches the right leg of the PCB to the bottom of the case (a). With that screw removed, the PCB will pivot out towards you to the left (b).



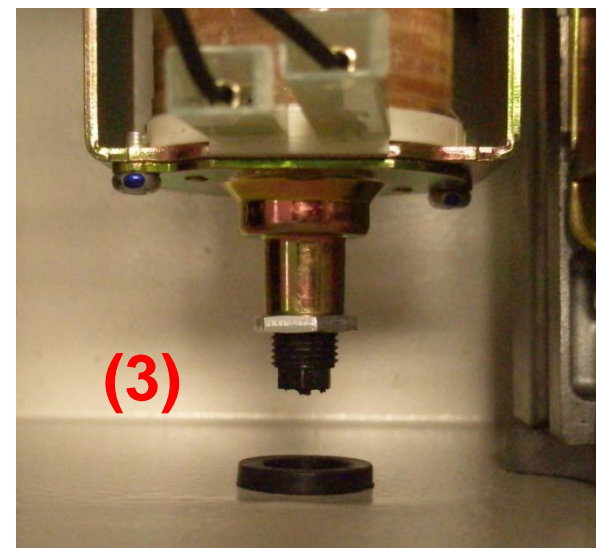
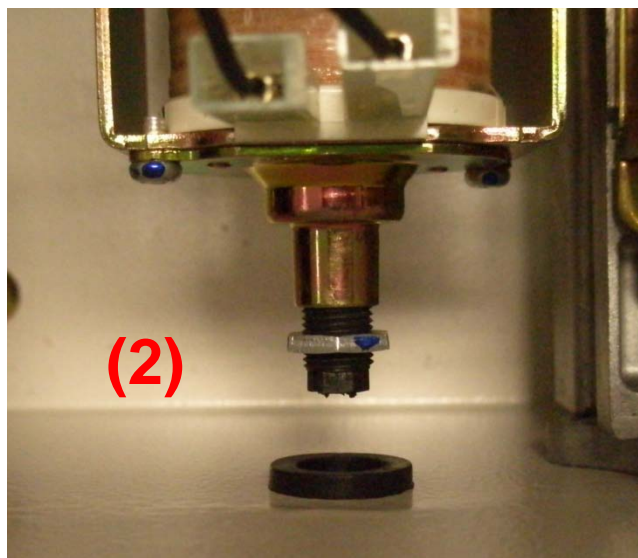
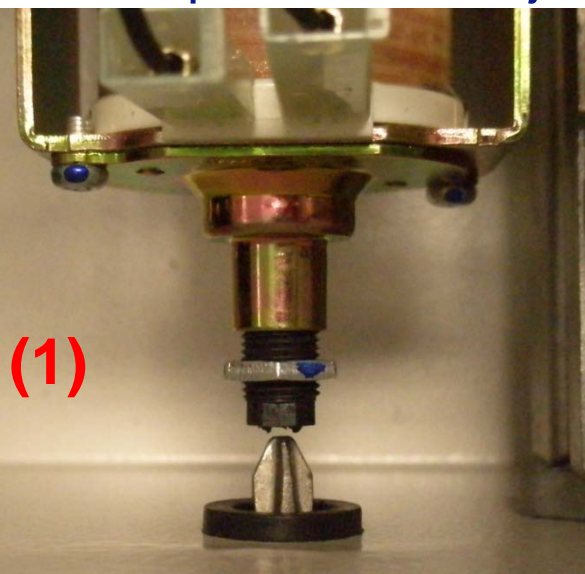
Adjusting the 3-Stage Minimum Manifold Pressure:

- Once the PCB is pivoted to the left, locate the black adjustment screw at the bottom of the modulating gas valve (1). Loosen the set screw by moving it clock wise (CW) (2). Once the set screw is loosened, from the bottom of the heater, insert a #2 Philips screw in into black adjustment screw (3); adjust the screwdriver according to the manometer to bring the value into the specified range:



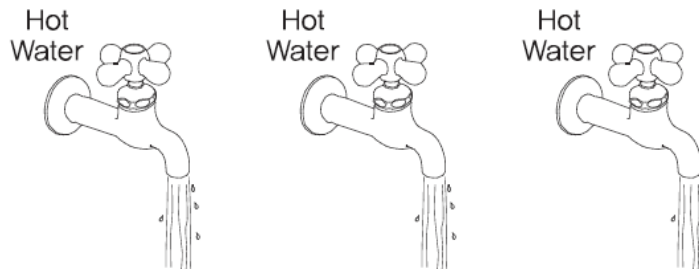
Adjusting the 3-Stage Minimum Manifold Pressure:

- Once the minimum manifold pressure reading on the manometer matches the target pressure outlined in the previous table, the minimum manifold pressure is set properly.
- Tighten the set screw to secure that proper position by moving it counter clockwise (CCW);
- Now proceed to adjusting the maximum manifold pressure;



Adjusting the Maximum Manifold Pressure:

- Turn on multiple faucets;



- to set the maximum manifold pressure, in the set of 6 DIP switches, set switches #1 to the UP (ON) position (#2 is in the DOWN (OFF) position);

**MAXIMUM FIRE:
1 UP & 2 DOWN**



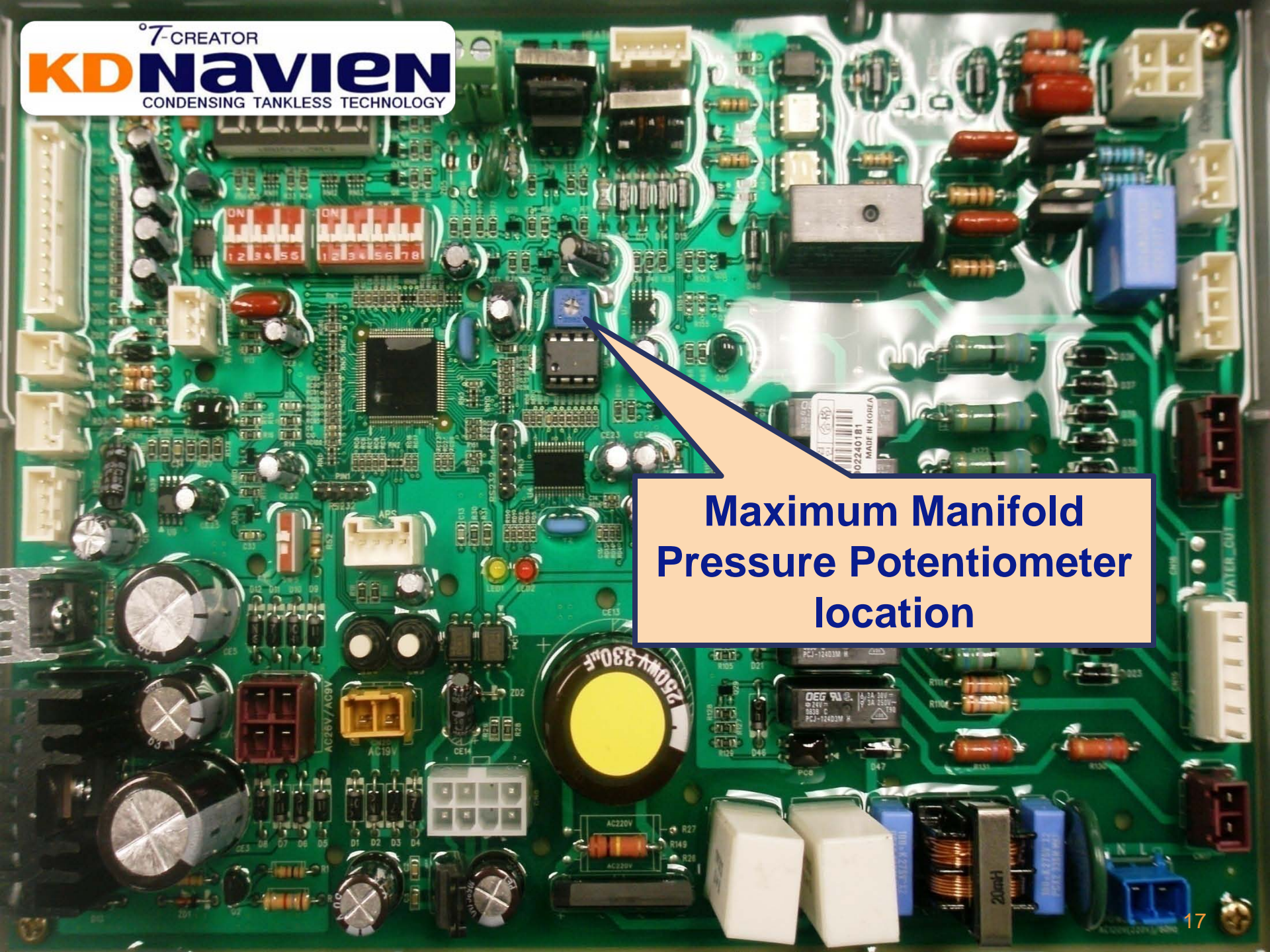
- Now we are ready to adjust the maximum manifold pressure:

Adjusting the Maximum Manifold Pressure:

- Note the pressure indicated by the manometer; it should be with the following ranges. Be sure to note the proper model and proper gas type:

Model	Gas Type	Manifold Gas Pressure Settings	
		3 Stage Minimum Fire	Maximum Fire
NR-180, 180A / NP-180, 180A	NG	0.87 +/- 0.06" WC	2.68 +/- 0.08" WC
NR-210, 210A / NP-210, 210A	NG	0.67 +/- 0.06" WC	1.73 +/- 0.08" WC
NR-240, 240A / NP-240, 240A	NG	0.67 +/- 0.06" WC	2.20 +/- 0.08" WC
NR-180, 180A / NP-180, 180A	LP	1.57 +/- 0.06" WC	4.60 +/- 0.08" WC
NR-210, 210A / NP-210, 210A	LP	1.30 +/- 0.08" WC	3.19 +/- 0.08" WC
NR-240, 240A / NP-240, 240A	LP	1.30 +/- 0.08" WC	3.86 +/- 0.08" WC

- If the pressure is not in the above range, then adjustment will be required.



**Maximum Manifold
Pressure Potentiometer
location**

Potentiometer Settings:

- When burning at maximum fire, if the manifold pressure is not within its standard range, use the variable resistance potentiometer to bring the values into range (you will need a micro precision Philips screwdriver to adjust the potentiometer);
- Range is ¼" turn clockwise to increase and ¼" turn counterclockwise to decrease;

New Type



**To decrease
max. manifold
pressure**



**Factory Default
Position
(about 12:30 on
clock)**



**To increase
max. manifold
pressure**



Potentiometer Settings:

- Over-firing (manifold gas pressure too high) could one possible cause of multiple error codes (001E, 003E, 012E, 016E and 030E);
- Old Potentiometer Type (KDC-320-1M boards):



**To decrease
max. manifold
pressure**

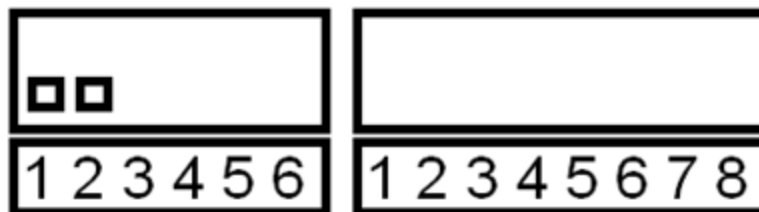
**Factory Default
Position
(about 12:30 on
clock)**

**To increase
max. manifold
pressure**

Adjusting the Maximum Manifold Pressure:

- Once the 3-stage minimum and maximum manifold pressures have been adjusted to their proper targets (as given in the tables), the setting of the manifold pressure is done;
- To complete the process, remove the tees and reattach the air-gas feedback tube (the thin tube running from the upper nipple at the burner plate to modulating gas valve) and the tube supplying the high pressure zone of the GPS;
- Readjust the DIP switch settings to their normal position (switches #1 & #2 in the DOWN (OFF) position):

**NORMAL FIRE:
1 DOWN & 2 DOWN**



- Open multiple faucets to run the water heater at maximum and then gradually reduce to minimum to ensure the proper burner operation. 20