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13-008

09 May, 2013

**BENCH STRIP HEATER REPLACEMENT ON IR (CO, CO2, N2O) ANALYZERS**

**I. PURPOSE:**

To give instructions on how to replace a new strip heater into the Infra-Red (IR) [CO, CO2, and N2O] analyzers

**II. TOOLS:**

Single edge razor blade  
Isopropyl alcohol  
Kim Wipes or Paper towels  
#1 and #2 Phillips screwdrivers

**III. PARTS:**

037250000 ASSY, STRIP HEATER (1.5" x 17.03") for most IR analyzers (with a long bench)  
or  
037250100 ASSY, STRIP HEATER W/TC (1.5" x 12.53") for analyzers with a short bench  
(short bench analyzers are: M300EM / T300M, M360E / T360, M360EM / T360M, M320E / T320, GFC7000 / GFC7002)  
Quantity of 36 inches (36") of HW0000744 FOIL TAPE ALUMINUM, LINED 2 INCH

**IV. PROCEDURE:**

1. Turn the instrument OFF and REMOVE the power cable to the instrument.
2. Remove the top cover of the instrument.
3. Tip the front panel down, loosen the screws on the back panel and tip it down also.
4. Locate the optical sensor bench assembly, see Figure 1.
5. Remove the electrical connectors on the bench.
  - a. 3 connectors from the top for the Synch-Demod / Detector board
  - b. 1 connector from the front of the bench for opto board
  - c. 2 connectors for the thermistors on the left side area of the front
  - d. 1 connector from the right side for the bench and wheel heaters
  - e. 1 connector for the source near the motor
  - f. 1 motor connector

**CAUTION: If the pressure flow board and source are not removed, damage can occur because the weight of the bench will be on the ports and wires. If the Sync –Demod / Detector board cover has been removed – reinstall it to prevent damage**

6. Remove the Pressure / Flow board
  - a. Unplug the electrical connector

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- b. Remove the 1/4" tubing from each barbed brass fitting at the end of the bench coming from the pressure / flow board.
  - c. Remove the 4 mounting screws and remove the board – set aside
7. Remove tubings
- a. 1/8" sample inlet to the bench (black)
  - b. 1/4" fitting on tubing at the pump / orifice
  - c. 1/4" fitting for the sample thermistor (See Figure ).
    - i. Carefully set the thermistor aside out of the way so it doesn't get damaged

**NOTE: The bench is heavy – pre-plan and arrange a large area for the bench to set on a work bench.**

8. Remove the bench mounting screws and shipping screws (if installed).
  - a. 2 are on each side of mounting flange, 4 total
    - i. One of them may have a ground braid ring terminal under the screw head
  - b. Shipping screws from underneath if (if installed) (might have red painted heads), 2 or 4 total
9. Carefully lift the bench out and place on a work bench upside down. See Figure 3
10. Unplug the connector of the strip heater
11. Unplug the connector near the motor for the wheel heater
12. Unscrew the mounting screws from the mounting flange
  - a. One screw may have the ground braid on it – mark or record which screw will need to have it re-installed under. See Figure 4
13. Lift the mounting flange off being careful to not get the connector caught on the flange
14. Pry away the end of the old strip heater and pull up and then pull towards the opposite end of the bench to total remove the heater strip. See Figure 5
15. Use a straight razor blade to scrape away the old adhesive, use alcohol frequently to help soften the old adhesive. The old adhesive will get very sticky and soft, use Kim Wipes to wipe away all residue with liberal amounts of alcohol. All adhesive must be totally gone for the new heater strip to properly adhere to the bottom of the bench. See Figures 6 and 7
16. Trial fit the new strip heater in place, then peel off and cut off about 4" of the backing (clear Mylar) from the wire end of the heater and stick the wire end first – assure proper alignment of the heater before pressing firmly on the surface at the wire end. See Figure 8
17. Peel away the rest of the backing and guide the heater down while pressing along the way until the entire length of the heater is attached.

**NOTE: do not allow bubbles or creases to develop under the heater as this area could overheat if not in firm contact with the metal of the bench.**

18. Use the handle end of a screwdriver or similar object to press down hard onto the heater strip to activate the adhesive. It is very important to press and activate the adhesive so a permanent bond will happen. See Figure 9.
19. Cut and install pieces of the 2" wide aluminum metal tape as depicted in Figure 10 and 11.
  - a. For the 17" long bench heater, the long piece is about 14" long.
  - b. For the 12.5" short bench heater, the long piece is about 9.5" long.
  - c. For both long and short benches, the piece over the wire end is about 1.5" long, and the 2 pieces on each side of the bimetallic thermal interrupter safety switch are .5" x 3".
20. Use the handle end of a screwdriver to press down the tape firmly into place. See Figure 10.
21. Reassemble the bracket and all of the rest of the parts to the bench in reverse order, reinstall the bench into the analyzer, and reattach the electrical and pneumatic connections.
22. Turn on analyzer and observe bench temperature to increase to the correct value, confirm that the value does not go over set temperature and stay up too high indicating an out of control heater.
23. After warming up for a minimum of 1 hour, perform a calibration check to confirm analyzer is in calibration.

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Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6

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Figure 7



Figure 8



Figure 9



Figure 10

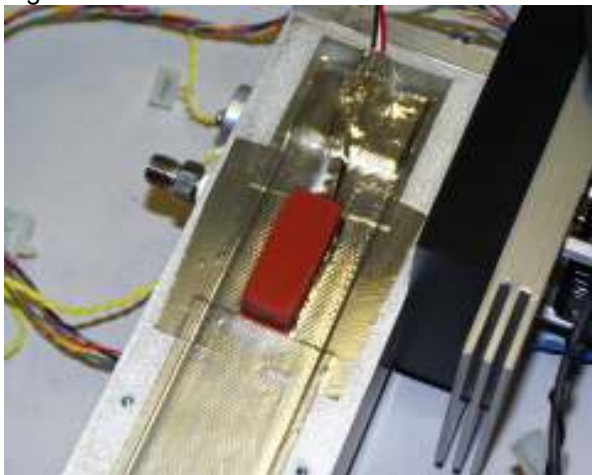


Figure 11

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