



05-016A
5 July, 2005

M450 OPTICAL BENCH CLEANING PROCEDURE

I. PURPOSE:

Occasionally it is necessary to clean out the optical bench in the M450 analyzer, including both windows. This procedure describes how to properly clean the absorption tube and windows.

II. TOOLS:

9/16th inch wrench
Philips head screw driver
Distilled or De-Ionized water
Lint free cloth, (something that won't scratch glass)
Diagonal Cutters
UV-protective eye wear (optional)

III. PARTS:

No parts needed



The electronics used in T-API analyzers are sensitive to Electrostatic Discharge (ESD). When working on any T-API device, please ensure that you are properly grounded prior to handling or touching any electronic circuitry in the analyzers! For more information on how to protect sensitive components from ESD during handling, please contact T-API customer service and ask for the ESD Service note number 03-022A.

IV. PROCEDURE:

- 1.) First power down and unplug the analyzer. Open the analyzer and locate the optical bench on the left hand side (see the attached drawing for a picture of the bench).
- 2.) Loosen the two 1/4" fittings going into and out of the optical bench. Remove all the cables going to the bench. This should include the detector to motherboard cable, the UV lamp

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to UV power supply cable, the pressure sensor to motherboard cable, and the three cables on the top of the bench.

- 3.) After all the fittings and cables have been disconnected, loosen the 4 screws holding the bench into the chassis. For NEMA analyzers make sure to hold the bench as it will fall down if not held in by the screws. You can now remove the entire bench assembly from the chassis of the analyzer. You may have to undo some other cables or cut zip ties to remove the bench.
- 4.) Now that you have the bench out in front of you, remove the 4 Philip head screws on the top of the bench. Locate the thermistor that is heat shrunk to the absorption tube. Being careful, cut the zip ties that hold the thermistor wires to the other wires from the pressure sensor. After this wire is loose, remove the connector from the bracket located on the bench cover that you just removed.
- 5.) Loosen both of the knurled nuts holding the absorption tube onto the manifolds. The tube will NOT come out at this point. Flip the entire bench upside down and remove the two Philips head screws holding the detector manifold in place. At this point you will be able to remove the detector manifold and then the absorption tube.
- 6.) Clean the absorption tube with distilled or de-ionized water. Make sure to dry it well with N2 if you have it. Set the tube somewhere safe and proceed to the next step.
- 7.) Take the two Philip head screws off the detector cover and remove the cover. You should now see a circuit board with the detector in the center. You will want to remove the screws that hold the detector assembly to the manifold. These are the ones located through the holes in the circuit board. The detector assembly will now come off of the detector manifold.
- 8.) You will now see a window and an O-ring that are between the detector manifold and detector assembly. Take out the window, taking special note of how the window and O-ring are orientated (see note below), and clean it with distilled or de-ionized water and a lint free cloth. Make sure it is dry and clean, meaning no streaks, or finger prints, or anything else of that nature. Re-assemble the entire detector assembly/manifold, see the note below.

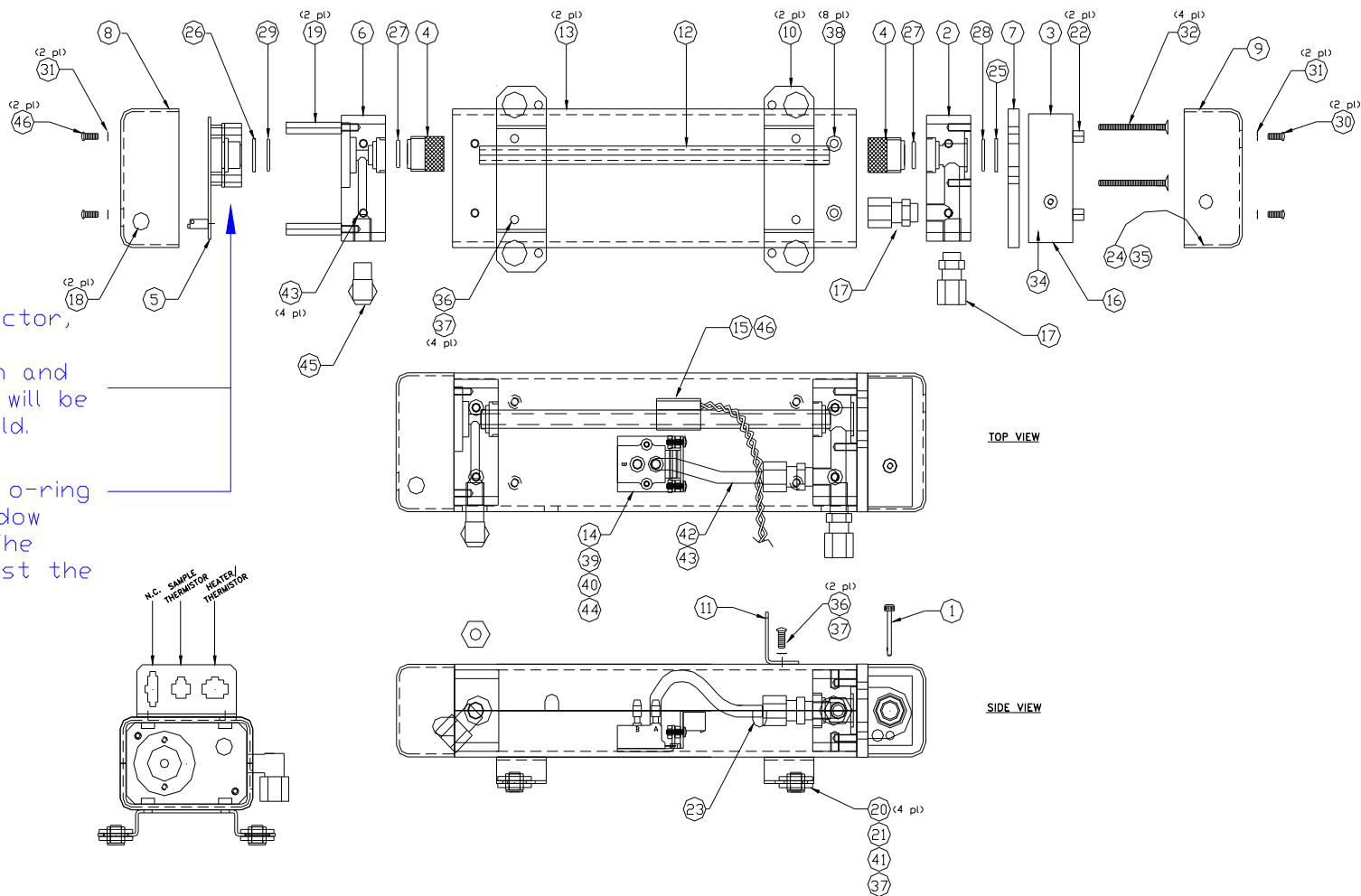
****NOTE**** *there are two different ways the O-ring and window can be assembled.* Look at the detector retaining ring. If there is a notch going around the opening for the detector then you will want to reassemble it with the O-ring around the notch and then the window. If there is not a notch and the retaining ring is flat then you will want to have the window touching the retaining ring and the O-ring between the window and the detector manifold. ***Improper assembly can result in the window breaking.***
- 9.) Go back to the optical bench and remove the two screws holding the lamp manifold to the optical bench and remove the lamp manifold. Remove the lamp from the manifold by loosening the black thumb screw on the top of the manifold and then pull the lamp out. Loosen and remove the tubing going from the pressure sensor to the lamp manifold.
- 10.) Remove the two Philip head screws holding the UV lamp cover on and then pull the cover off. Remove the black foam insulation. You will now see 4 Philip head screws. Remove all 4 of these screws. The lamp block will now come off of the lamp manifold. You will see the O-ring and the window between the two. Remove the window and clean it with distilled or de-ionized water and a lint free cloth. Make sure it is dry and clean, meaning no streaks, or finger prints, or anything else of that nature. Replace the window and reassemble the lamp manifold/block. Re-attach the lamp assembly to the optical bench and hook up the tubing going to the pressure sensor.

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- 11.) Replace the absorption tube and then place the detector assembly back in place ensuring that the absorption tube is seated properly. Screw the detector assembly back into place and then tighten both knurled nuts to hold the absorption tube in place. Put the thermistor connector back into the bracket and run the wires so they will not get pinched from the cover.
- 12.) Replace the cover to the optical bench and reinstall it into the analyzer. Make sure that all the tubing and all wires get reconnected.
- 13.) Power up the analyzer and wait 30 minutes, this will give the UV lamp time to power up and stabilize. On the front panel of the analyzer, press <SETUP><DIAG> Enter 929 when the password pops up. Hit NEXT until you get Signal I/O in the DIAG menu, and press ENTR. Scroll through the values until you get PHOTO_DETECTOR - it will be a mV reading. Locate the UV reference pot located on the detector; you will have to remove a stainless steel cap to access it. Decrease the pot all the way, until the mV reading on the front panel stops decreasing.
- 14) Make sure not to look and the blue light of the UV lamp in this next step as it can be harmful to the eyes, if you have UV protective eyewear put them on now. Adjust the lamp by loosening the thumb screw and rotating the lamp. Make sure not to pull the lamp out, keep it in all the way and just rotate the lamp. Rotate it until you reach the maximum value or 4500mv, which ever comes first, and tighten the thumb screw back down. Again make sure the lamp is pushed all the way in, otherwise the thumb screw could tighten down on the glass part of the lamp and break the glass. If the reading isn't above 4000mv, increase the UV reference pot until it reads 4400 - 4500mv and replace the stainless steel cap.
- 15.) Replace the cover or shut the door on the analyzer and return it to normal operation. If you have any questions during this procedure please contact API at 1-800-324-5190



With notched detector,
 put the o-ring in
 between the notch and
 window. The window will be
 against the manifold.

With non notched
 detector, put the o-ring
 in between the window
 and the manifold. The
 window will be against the
 detector.

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