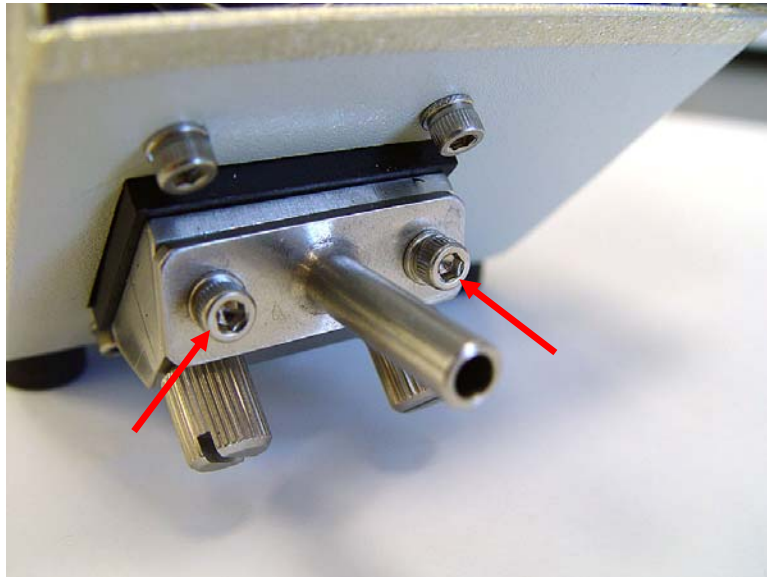


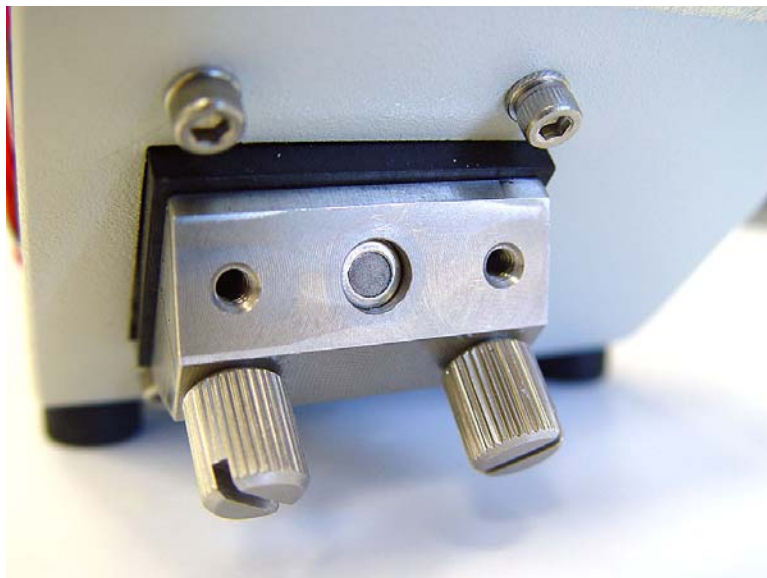
**Description: 3781 Orifice Update Procedure**

**Important: This Instrument Has Static Sensitive Components. Use proper ESD protection during this procedure.**

1. Remove the instrument cover by remove the five Philips button head screws.
2. Using a 7/64" hex driver remove the two SSHC 6-32 X .250 screws holding on the Inlet as shown in Figures #1 & #2.

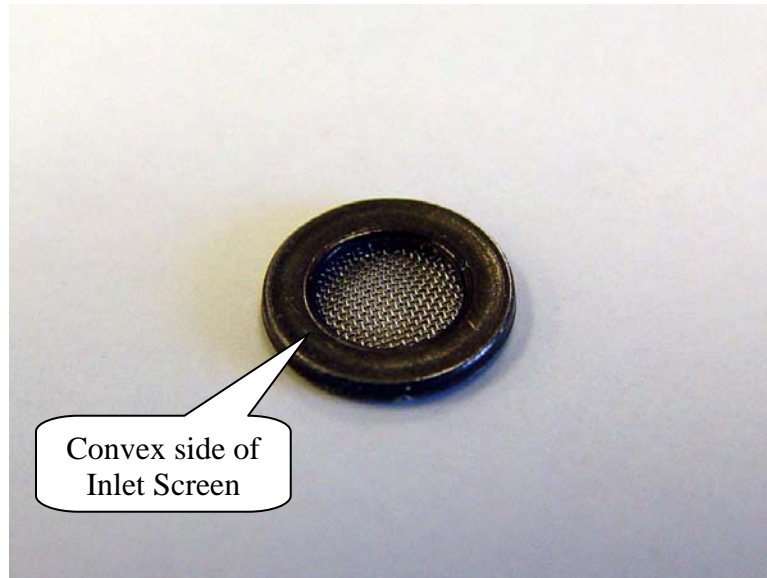


*Figure #1*

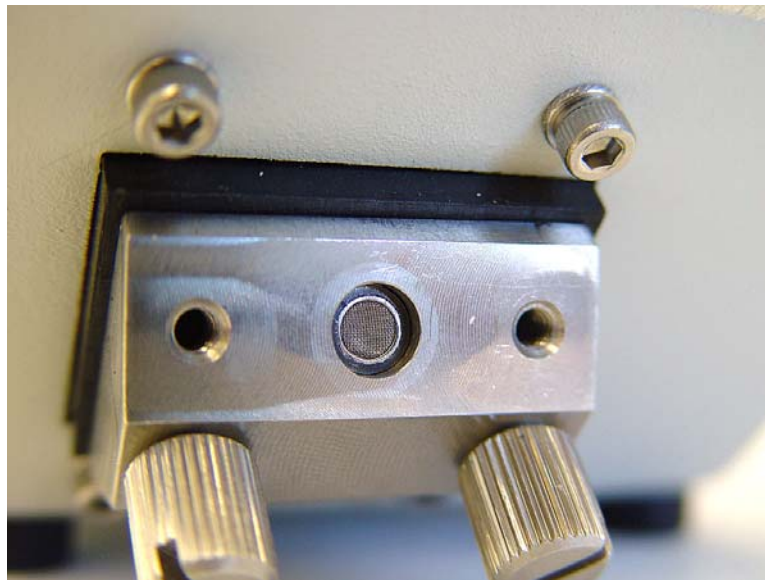


*Figure #2*

3. Identify the convex side of the 1181005 Inlet Screen as shown in Figure #3.

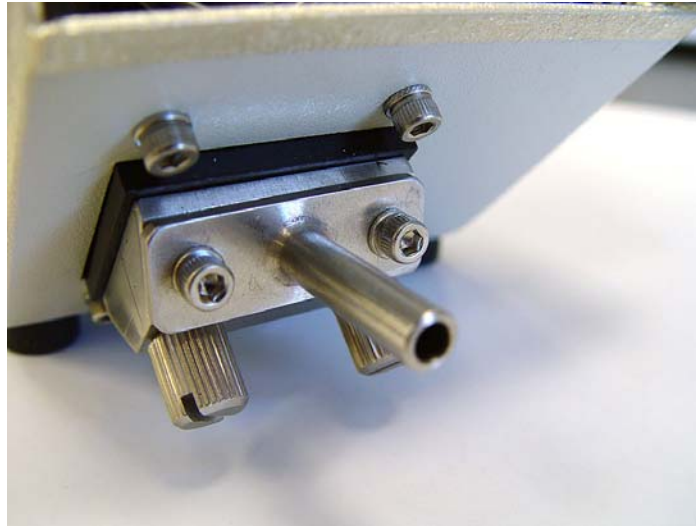


4. Remove the old Inlet Screen and install the new 1181005 Inlet Screen included with the kit convex side in as shown in Figure #3.



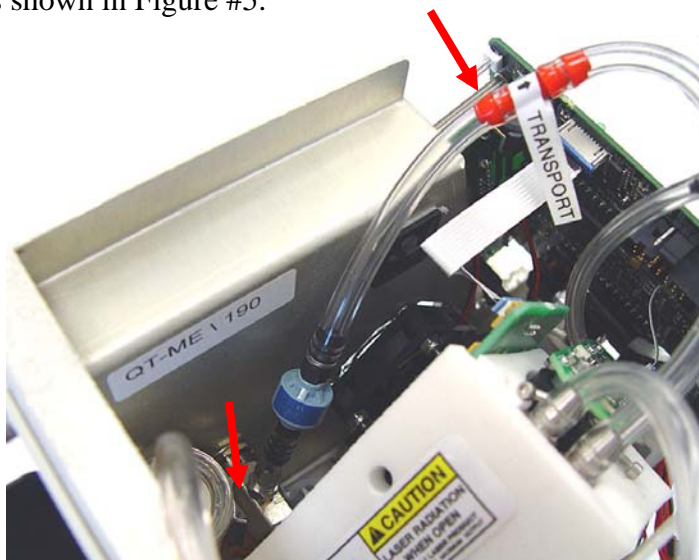
*Figure #3*

5. Fasten the Inlet back onto the Instrument using the two SSHC 6-32 X .250 removed in Step #1. Be careful to ensure the Inlet or the O-Ring on the Inlet does not get misaligned while fastening it back onto the Instrument, refer to Figure #4.



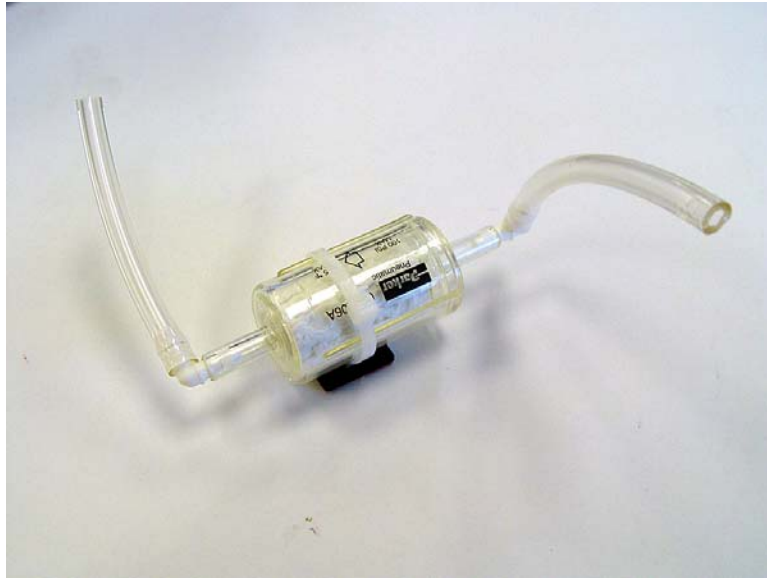
*Figure #4*

6. Cut the tie wrap holding the transport and damper tubing inside the Instrument Cabinet.
7. Disconnect the tubing for the Screen Filter at Bypass Switch and the Transport Orifice as shown in Figure #5.



*Figure #5*

- Included in the kit will be a 1181001 Transport Filter fastened to a tie wrap mount and two pieces of tubing as shown in Figure #6.



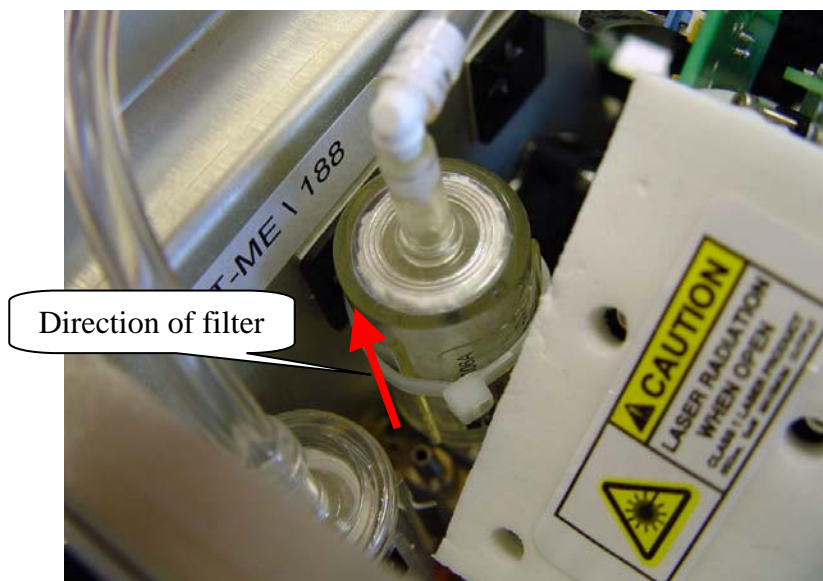
*Figure #6*

9. Creating a small loop as shown connect the tubing from the bottom of the filter to the bypass switch as shown in Figure #8. Use caution to not kink the tubing.



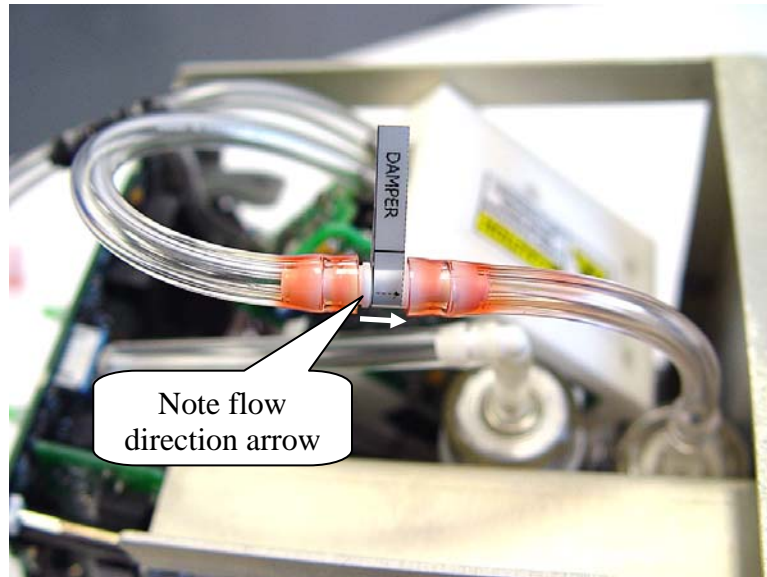
*Figure #8*

10. Remove the backing from the tie wrap mount and adhere to the inside of the Instrument as shown in Figure #7, note the direction of the arrow on the filter.



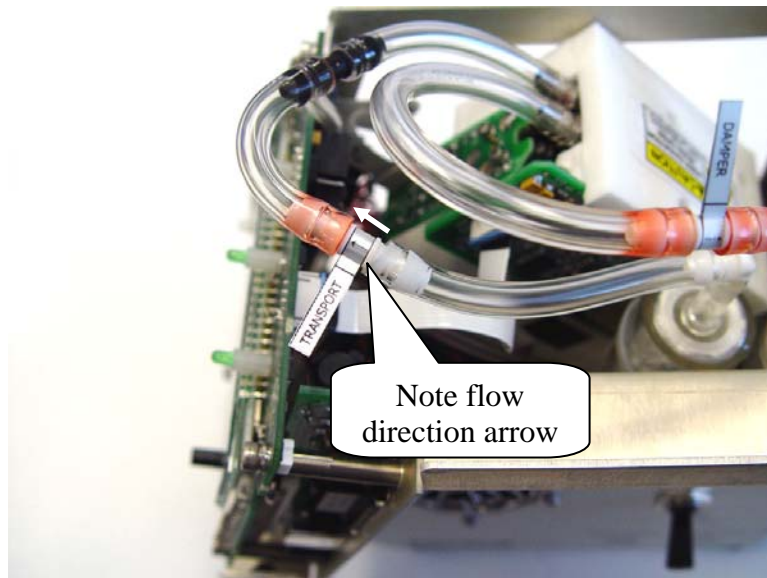
*Figure #7*

11. Remove the old Damper Orifice from the tubing and replace with the new 1181002 Damper Orifice included in the kit as shown in Figure #9.



*Figure #9*

12. Remove the old Transport Orifice from the tubing and replace with the new 1181004 Transport Orifice included with the kit, connect the new transport flow filter as shown in Figure #10.

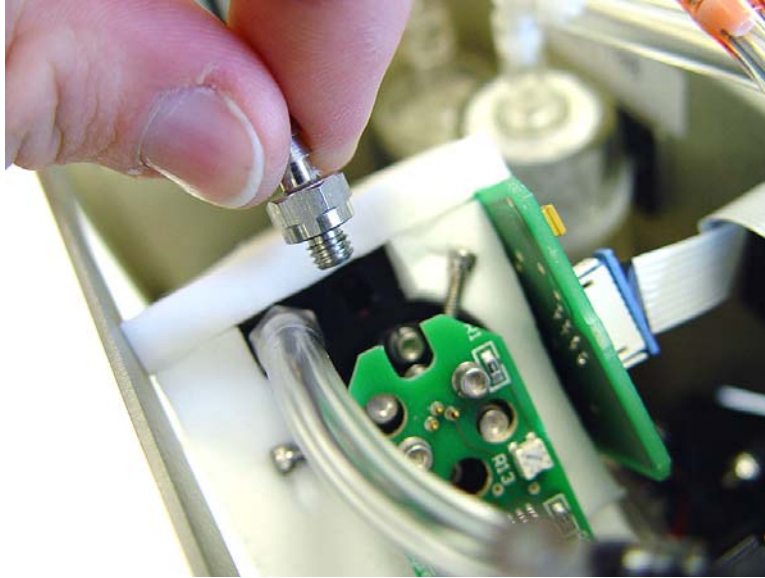


*Figure #10*

13. Note: the following steps describe replacing the flow control orifice.

Replacing the flow control orifice is only required in certain applications. If the user has not experienced trouble with the flow control orifice clogging (sample flow drops) it is recommended to not replace the orifice.

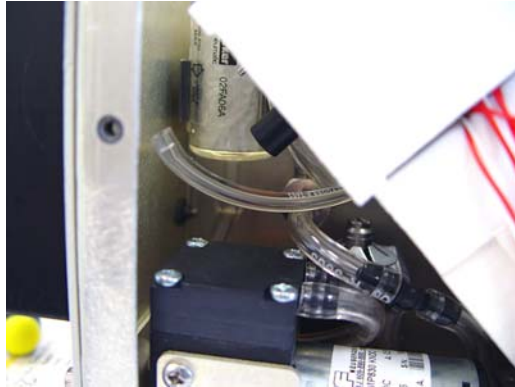
14. Remove the 1/8" barb fitting from the optics block as shown in Figure #11.



*Figure #11*

15. Remove the old Internal Flow Control orifice by using a 2,5 or 3,0mm flat head screwdriver down the threaded hole and line up the head with the slot of the orifice and turn counter clockwise until it is fully removed.

16. Remove the 1/16" tubing from the barb on the backside of the optics block as shown in Figure #12



*Figure #12*

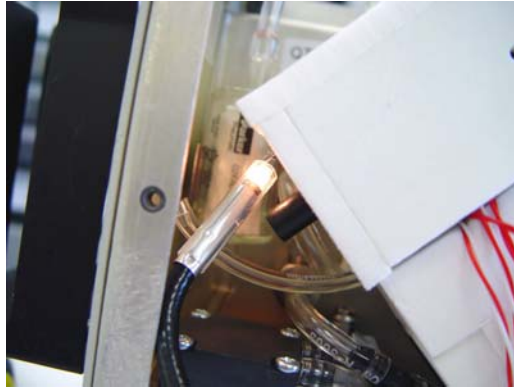
17. Clean threaded hole using a cotton swab and compressed air.
18. Inspect the new 1181003 Flow Control orifice which is included with the kit to make sure the threads have a red thread locker on them as shown in Figure #13.



*Figure #13*

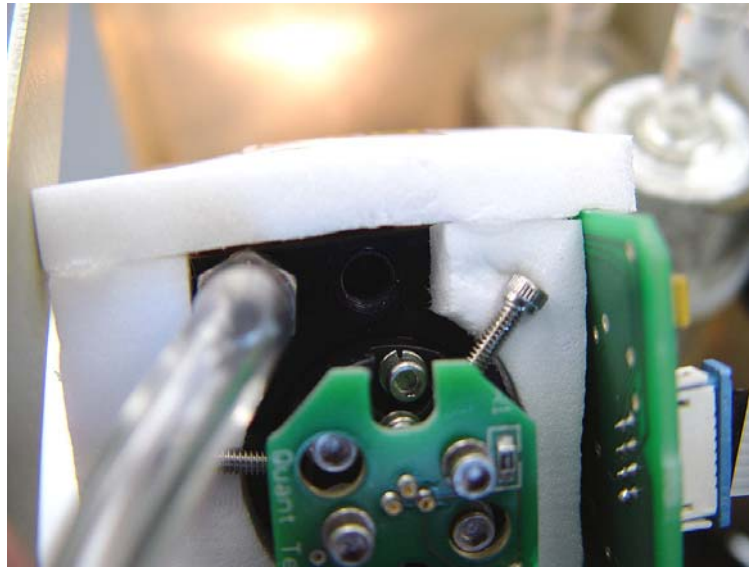
19. Position a light to shine up the fitting as shown in Figure #14.





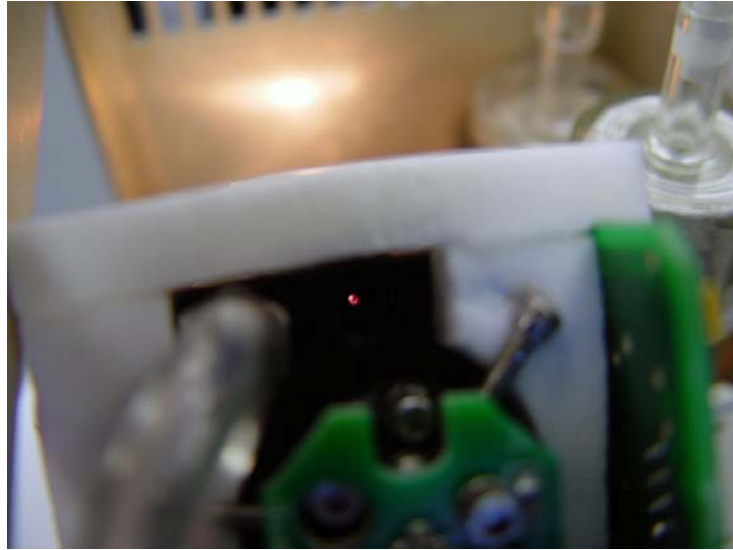
*Figure #14*

20. Fasten the new Flow Control orifice into the threaded hole removing the flat head screwdriver often to check to see if light is still shining through the orifice. Continue fastening until light can no longer be seen through the orifice as shown in Figure #15.



*Figure #15*

21. Once no light can be seen through the orifice turn the orifice 1/4 revolution counter-clockwise and light should be seen through the orifice as shown in Figure #16.



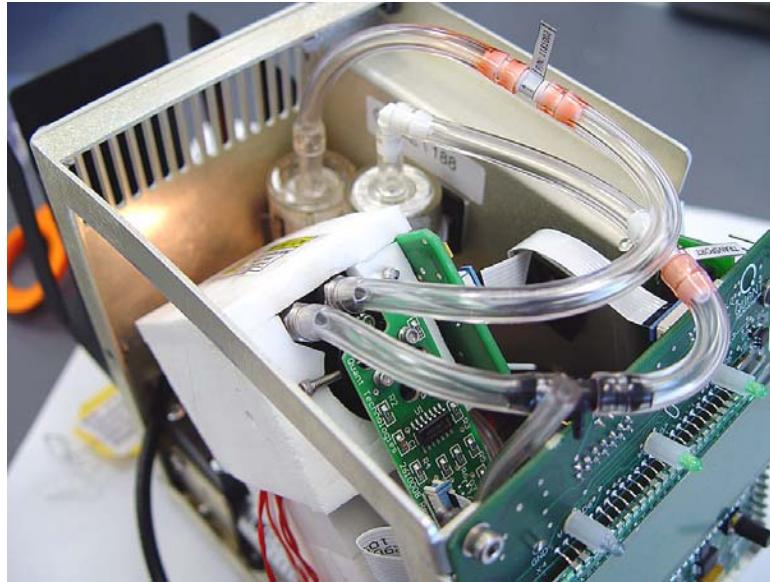
*Figure #16*

22. Inspect the 1/8" barb fitting to make sure that the o-ring has not come off during handling refer to Figure #17.



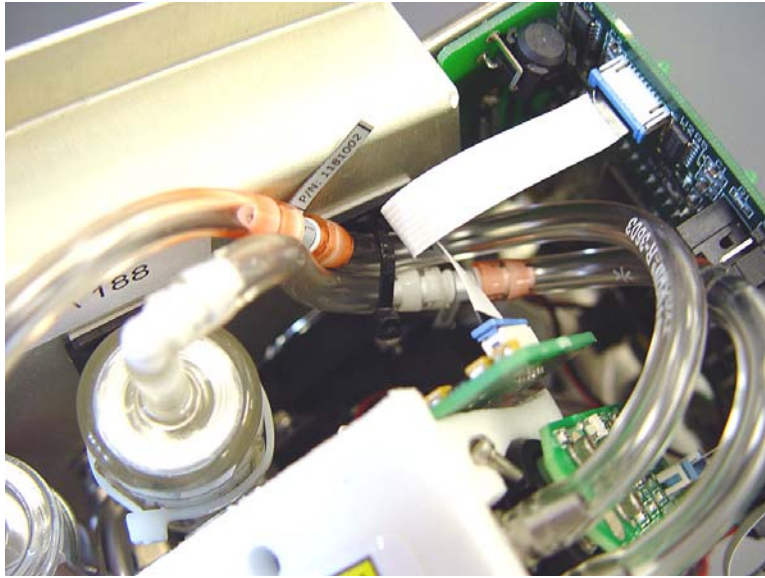
*Figure #17*

23. Fasten the 1/8" barb fitting back into the optics block and place the tubing from the Damper orifice back on the barb as shown in Figure #18.



*Figure #18*

24. Using the included cable tie, fasten the damper & transport orifice tubing back to the tie wrap mount as shown in Figure #19. Check all tubing for kinking.



*Figure #19*

25. Connect the 1/16<sup>th</sup> tubing back to, the barb on the back side of the optics block as shown in Figure #20.



*Figure #20*

26. Power on the instrument and measure the inlet and transport flows. The unit must have water and be otherwise operating normally. Verify the inlet flow is 115-125 cc/min. If the flow is outside that range it is likely that the flow control orifice was not set correctly. Repeat the steps describing setting the orifice.
27. If resetting the flow is required do the following
  - a. Connect the 3781 to a computer running a terminal program. See the user manual for instructions.
  - b. Read the current flow setpoint **SFS** and record the value
  - c. Adjust the flow setpoint (**SFS,####**) to reach 120 cc/min. **####** is the flow setpoint, increase the value if the flow is low, decrease if it is high. If an adjustment greater than +/-100 from the original SFS is required it is possible the orifice was not set correctly.
28. Read the nozzle pressure (**RN**). Verify the value is 100 +/- 10. If the value is high the nozzle requires cleaning. If it is low please contact TSI for service.
29. Carefully aligning the holes of the front cover with the LED's and Button place the front cover back onto the instrument making sure not to pinch any of the tubing. Fasten cover using the five screws which were removed in Step #1, refer to Step #21.



*Figure #21*