

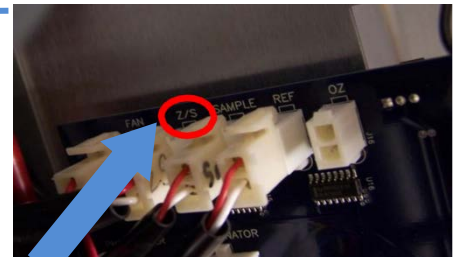
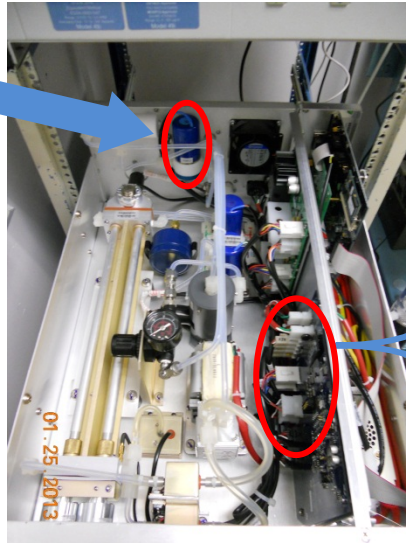
How to Replace the Zero Solenoid in a TEI 49I

Tools needed: Nut driver (5/16 and ¼), Zero solenoid, Solenoid connector crimps and housing, wrenches (5/8 and 9/16), Philips screw driver, camera

*****NOTE: Before touching the instrument, write down ~3minutes worth of ozone values that the instrument is producing prior to replacing anything on the instrument, you will need these values for verification that the replacement of the zero solenoid was a success when you finish the process*****

1. Turn off the instrument by flipping the switch on the front face of the instrument to the “off” position, and unplug the instrument
2. Take off the top of the TEI 49I by un-twisting the four black knobs located on the sides of the instrument
3. Disconnect the zero solenoid connector from the board located at the front of the instrument (*see photo below*), the connector is in the Z/S connector of the board
4. Note that the zero solenoid will be located at the back of the instrument (*see photo below*)

Zero solenoid location



Z/S connector location

5. Take a photo of the current zero solenoid that is in the instrument.
6. Remove the tubing from the zero solenoid by unscrewing the Teflon fittings (there will be 3 fittings that are connected to the solenoid)
7. Remove the solenoid bracket (metal plate that the solenoid is sitting on) by removing the two nuts holding the bracket to the rear panel of the instrument (*see photo below*)

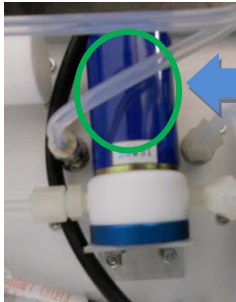


Remove the two screws that connect the bracket to the rear panel of the instrument (tools: Philips screw driver and ¼ nut driver)

8. Remove the solenoid from the metal bracket by removing the two nuts holding the solenoid to the metal bracket (tools: ¼ nut driver)

9. Install the new solenoid by securing the metal bracket to the solenoid (as previously mentioned) and tightly screw on the two nuts to the bottom

*****NOTE: When installing the solenoid to the bracket, make sure that the front of the solenoid (i.e. the part with the sticker) is facing toward the back of the instrument when you re-connect the bracket/solenoid assembly to the rear panel of the instrument*** (see photo below)**



Note that the label sticker (*shown in the photo to the right*) on the solenoid is facing the back of the instrument and that the exposed side of the solenoid with no sticker (*shown in the photo to the left*) is facing toward the inside of the instrument



10. Install the new assembly (bracket with new solenoid connected to it) to the rear panel of the instrument (as previously mentioned) and tightly screw the two nuts to the back
 11. Re-connect the tubing to the solenoid, exactly as it was before you disconnected the original solenoid (tubing to the right of the solenoid should connect to the opening on the solenoid that is on the right, and the tubing to the left of the solenoid should connect to the opening on the solenoid that is on the left, tubing coming in from the back of the instrument is connected to the center opening of the solenoid)
- ***NOTE: Make sure that the front of the solenoid (i.e. the part with the sticker) is facing toward the back of the instrument when you re-connect the tubing to the solenoid*****
12. Connect the new zero solenoid to the front board by connecting the housing to the Z/S connector on the board (located at the front of the instrument)
 13. Take a photo of the new solenoid replacement
 14. Place the cover of the instrument back on and secure the lid with the black knobs located on the sides of the instrument
 15. Plug the instrument back in, and power the instrument back on by flipping the switch on the front face of the instrument to the “on” position
 16. Let the instrument warm up for ~25minutes and make sure that the instrument is collecting reasonable ozone values for that season by checking these values to the ones that you wrote down before you worked on the instrument (i.e. values should be similar to the values the instrument was producing prior to replacing the zero solenoid)

How to extend the length of the solenoid connector wire

(DO ONLY IF: if wire is too short to reach from the back of the instrument, where the solenoid is located, to the front of the instrument, where the board is located)

1. Cut off the connector housing from the end of the solenoid wire (if there is no connector housing at the end of the wire that's fine too)
2. Cut back the black casing that is surrounding the wires using a blade. There should be a red, white, and green wire within the casing; if you don't see a green wire (don't worry) it is probably cut down further within the casing.
 - a. If you do come across the green wire, cut it back so that it will be hidden down within the black casing.
3. Strip the red and white wires so that the wire is exposed (strip the wire so that there is about 1 inch of exposed wire)
4. Tint (apply solder) to the exposed wire (both the red and white strands)
5. To extend the length of the red and white wires, use the old solenoid that you took out of the instrument and cut those wires to a length that you need to extend your new solenoid wire.
 - a. Keep the connector housing that is attached to the end of these wires (old solenoid wires) intact, as you will be using this connector housing instead of having to crimp a new connector housing to the finished wire product.
 - b. Strip the red and white wires so that the wire is exposed (strip the wire so that there is about 1 inch of exposed wire)
 - i. If you do come across the green wire, cut it back so that it will be hidden down within the black casing.
 - c. Tint (apply solder) to the exposed wire (both the red and white strands)
6. Find a red and a white heat shrink wrap (about 2.5 inches) and slide it down over the wires (red shrink wrap with red wire, and white shrink wrap with white wire). You will later pull the shrink wrap over the soldered wire connection, but you must place the shrink wrap on the wires now, so that once the wires are soldered you can slide the heat shrink over the solder connection and create a more sturdy wire connection/splice.
7. Connect the two white wires (white wire from the new solenoid with the white wire from the old solenoid) by applying excess solder to the tip of your soldering tool and, while holding the two wires so that they are touching/overlapping, heat the two wires and add solder until you have a solid connection of the two wires.
8. Repeat step 9 for the red wires
9. Slide the heat shrink wrap over the red wire solder joint and the white solder joint and heat shrink the heat shrink wrap over the solder joints.