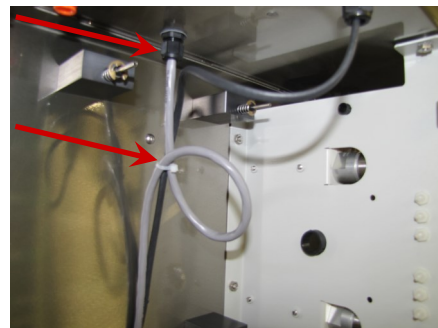
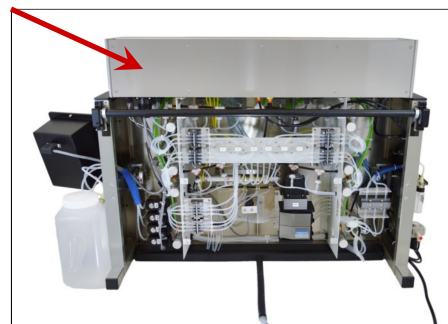


1. Turn power off and unplug the TDF instrument before beginning this procedure.

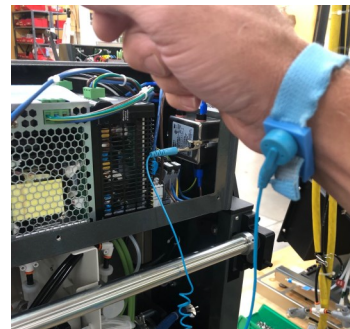
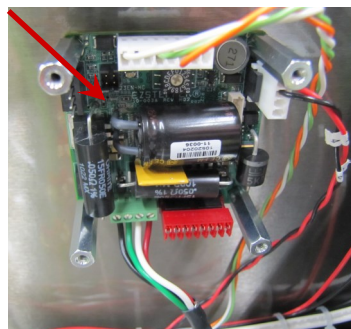
2. Cut the cable tie that holds the in-line heater power cord to the cable from the peristaltic pump motor. Loosen the plastic nut that the grey cable goes through so that there is more slack when working inside the electrical enclosure.



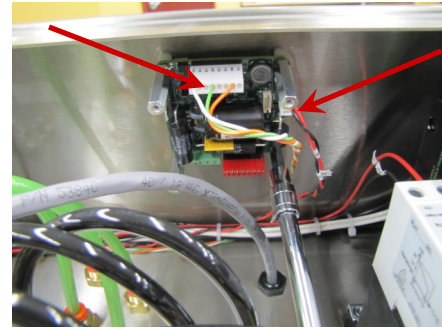
3. Remove top and back panel to the electrical enclosure. A 1/8" Allen wrench driver is needed. One was provided with the instrument on the original purchase.



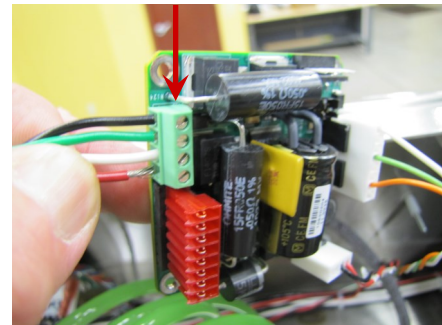
4. Identify the Motor Controller within the electrical enclosure. Use an antistatic wrist strap grounded to one of the studs within the electrical enclosure to eliminate static discharge when working around the circuit boards.



- Remove the two white wire connectors from their positions on the Motor Controller circuit board. These are identified with the red arrows. These simply pull out by grasping the white connectors. Use a ¼" socket to remove the four, ¼" stand-offs holding the Stepper Motor Controller in place. This will facilitate removing the wires from the Pump Motor.



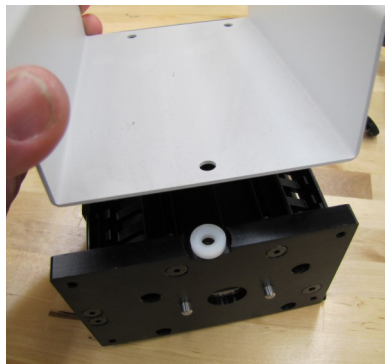
- With the plastic nut having been loosened in step 2, you should be able to pull 6" of slack of the grey motor cable into the electrical enclosure.
- With a very small screwdriver, loosen the four screws that hold the wires that go to the Pump Motor.
- Set aside the old Motor Controller circuit board for return.



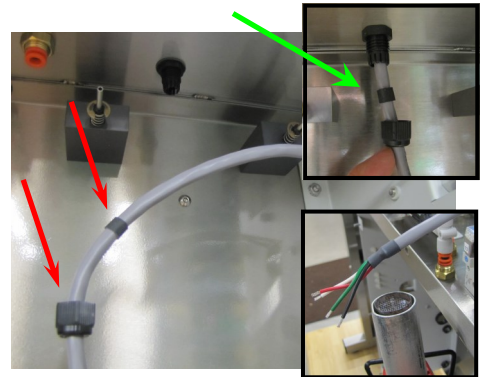
- Remove the old Peristaltic pump and motor assembly. This requires a 3/8" socket or nut-driver.



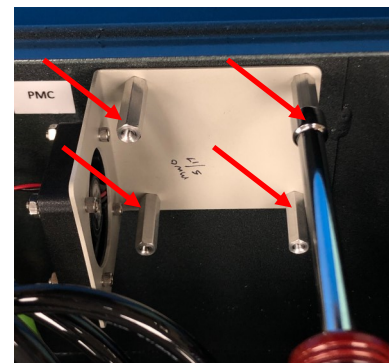
- Install the new High Torque Pump Motor assembly in the same location. Replacement screws, nuts and gaskets are provided in case any have been damaged.



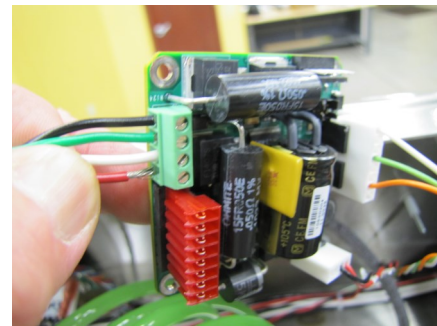
11. Remove the plastic nut and rubber gasket ring from the cable fitting (Green Arrow) for the Pump Assembly cable on the underside of the TDF3 Electrical Enclosure. Slide these over the cable from the Pump Assembly (Red Arrows). Insert the cable through the cable fitting on the underside of the Electrical Enclosure. After feeding the cable through the fitting, heat shrink a 1" length of Z120 Heat Shrink Tubing onto the end of the cable (Inset).



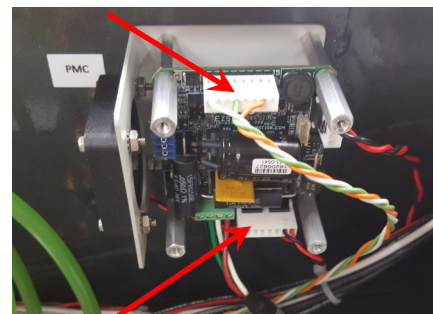
12. Take the new Fan and Bracket assembly and install it as shown using the 1 inch hex stand-offs removed earlier. Tighten these with a 1/4" hex driver. Note that the picture is as viewed from the rear of the instrument.



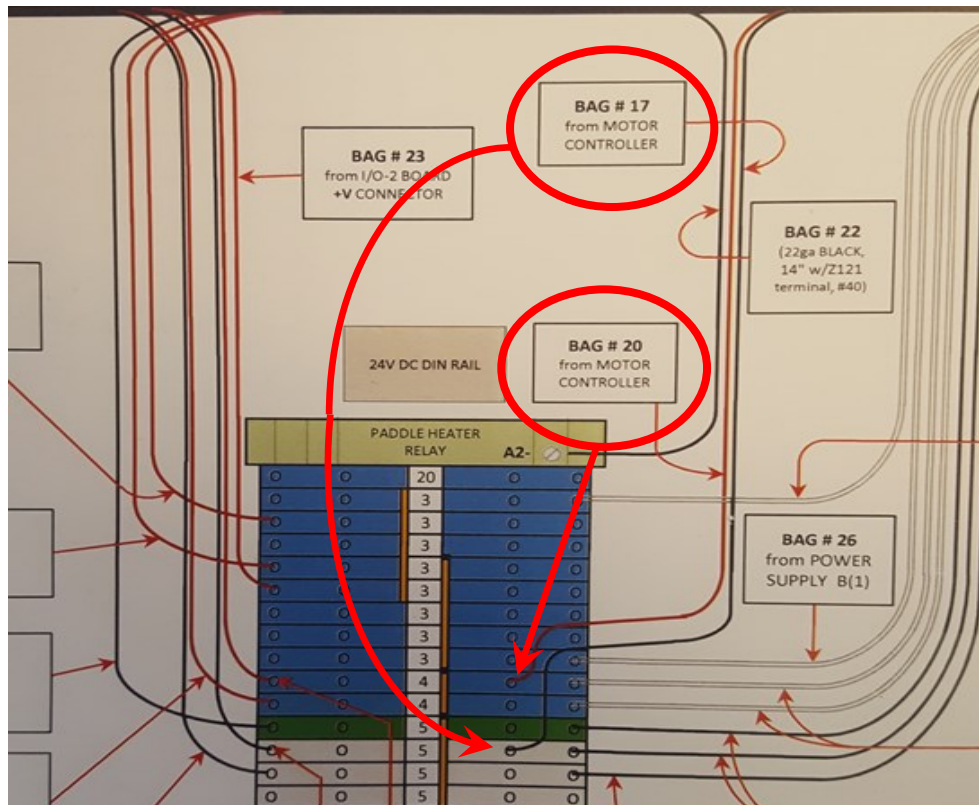
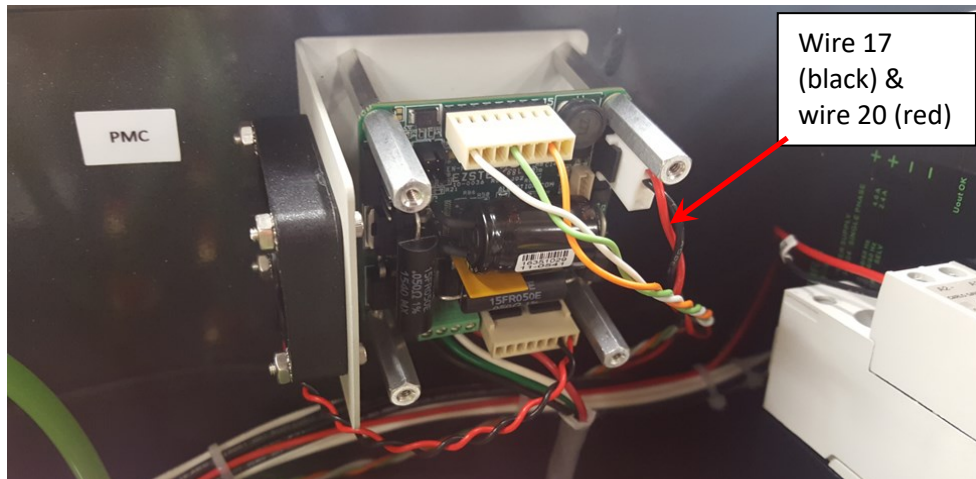
13. If not already done, trim the four wires on the Pump Motor cable back to 3/16" of exposed wire. Connect the four wires to the green wire connector using a small screwdriver. *NOTE: Make sure that there are no exposed wires. If there are, you will need to trim the excess wires.* Connect the wires in the order shown: BLACK, GREEN, WHITE, and RED.



14. Install the new 8301 Stepper Motor Controller on the inside of the Electrical Enclosure. Tighten the four 8035 Male-Female Stand-offs firmly by hand and only an additional 1/4 turn with a 1/4" socket wrench. ***Loosely finger-tighten each one until all four are aligned then snug them lightly once they are in place. Do not over-tighten as the threaded ends can break off.*** Connect the two 8-pin connectors onto the Motor Controller board (see arrows).



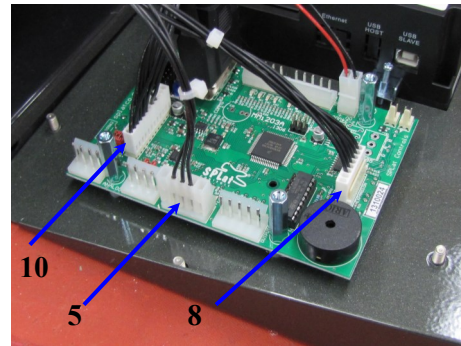
- Replace the #17 and #20 wires. The existing wires are a small gauge and a larger gauge is required for the high-torque pump motor. Trace the 17 and 20 wires back to the DC DIN rail (wire diagram below), carefully cutting cable ties as needed. Reroute the new 20 AWG red and black #17 and #20 wires and connect the 4-pin connector onto the circuit board. You will need a small flat screw driver inserted into the square slot adjacent to the #17 and #20 wire connection to the DIN rail terminal block to free the old wires. Use the same screw driver to hold open the pinch point in the terminal block to insert the new wires. Make sure to twist the wires so that there are no stray wire strands no inserted into the slot. Release the pinch point by removing the screw driver. Gently tug on the wire to make certain it is secure in the DIN rail terminal block.



16. Remove the Control panel from the instrument and unplug the connector from the back. Unscrew the 6 acorn nuts from the back to access the internal components. Use the antistatic wrist strap to mitigate static damage to circuit boards.

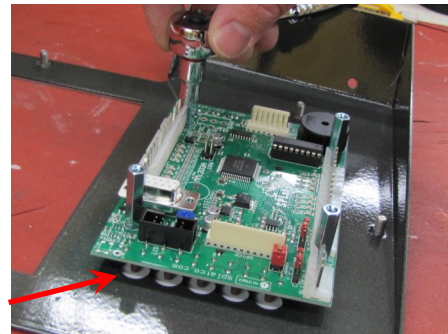


17. Remove the connectors from the SPLat circuit Board. There is a 12-pin, 8-pin, 5-pin and 2-pin connector as well as a serial port connector. Unscrew the four stand-offs and remove the board. Replace with the new SPLat circuit board which contains the latest version of software. Reattach the connectors as they were previously. **Note:** There are several 5-pin rows on the Splat Controller - be sure to use the correct one.

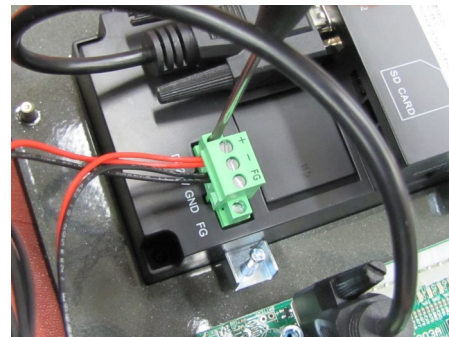


18. Finger-tighten the four standoffs onto the four PEM studs to secure the board. Use a ¼" socket. *As needed, tighten or loosen the two stand-offs near the micro-switches on the circuit board to obtain the appropriate sensitivity of the push-button micro-switch through the front decal.*

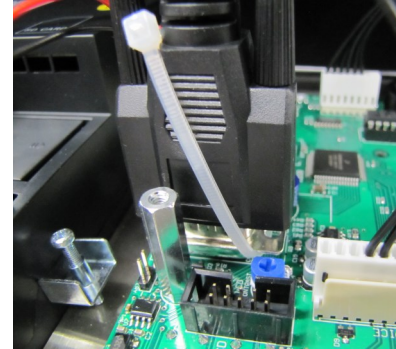
MICRO-SWITCHES



19. Detach the green 3-pin connector from the back of the Touch Screen Display (TSD). Also remove the serial connector. Unscrew the four screws/brackets that hold the old TSD in place. Pop the old TSD out through the front bracket. Install the new one in the same manner. Ease the new TSD into the rectangular hole to avoid bending the bracket.



20. Secure the serial port connector to the Splat circuit board with a cable-tie (provided) as shown in the image.



21. Close the control panel back up and secure with the six acorn nuts removed earlier. Reattach this to the instrument and plug in the connector to the back. Also close up the back of the electrical enclosure removed in step 3.



22. Install the new TDF99 Pump tubes into the peristaltic pump following service Procedure TS028 which accompanies the tube sets. Follow the step in TS028 which describe the break-in process and running of volume calibration. With all this completed, the instrument is ready to be returned to service.