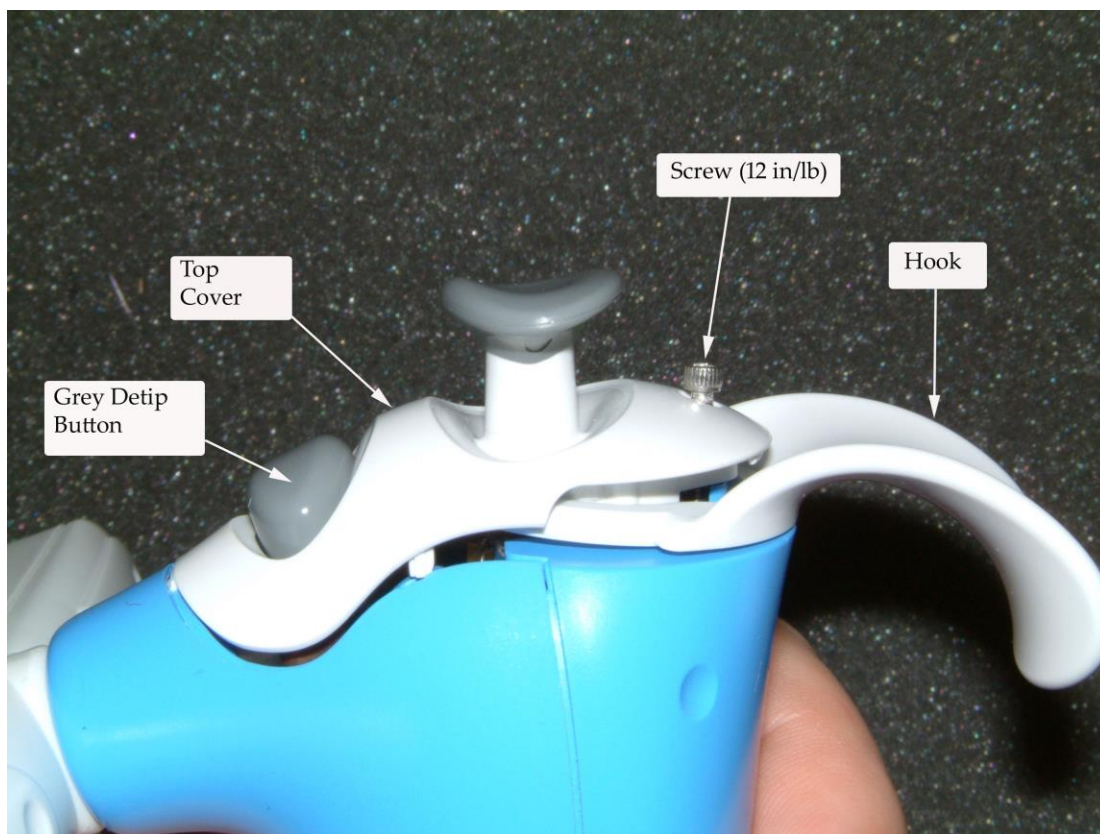


## Multi and Single Channel Air Tube Replacement

**NOTE:** Before replacing any air tubes be **CERTAIN** that the air leak is not caused by something else. Examples include: loose nozzles, leaky seals, and loose connections at the top of the block. See Trouble Shooting Guide.

### ***Disassembly:***

1. Make sure that the Ejector Slide is in the Forward or Ejected position.
2. Remove the screw from the Top Cover and remove the Top Cover and Hook and set parts aside.

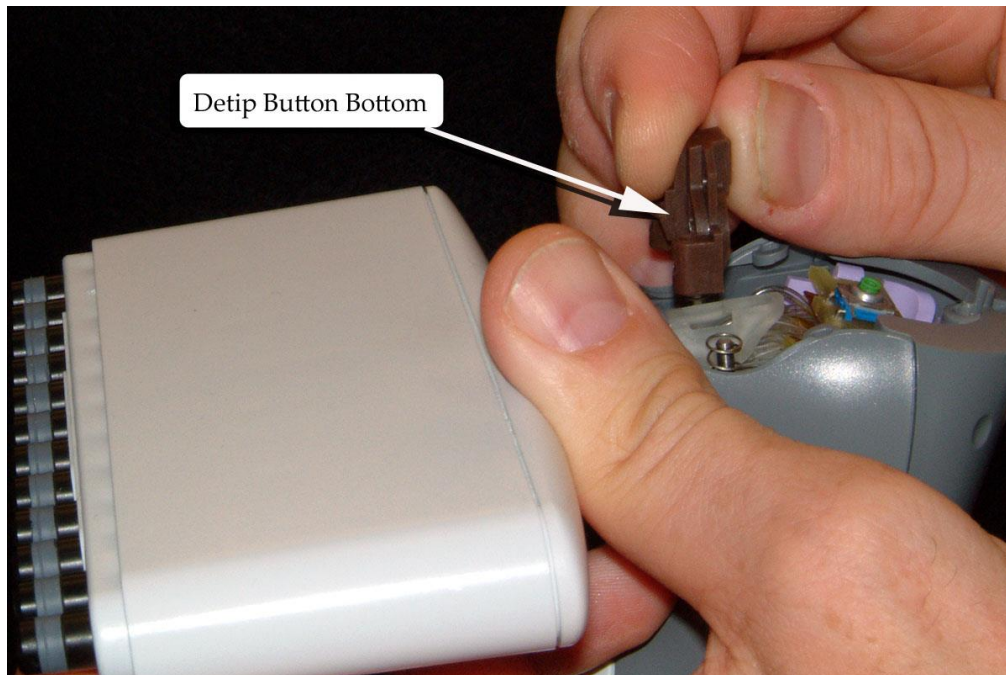


**Figure 1 Top Cover and Hook Removal**

3. Remove the gray Detip Button from the brown Detip Button Bottom and set aside.

4. Hold your finger over the brown Button Bottom while pushing back on the Ejector Slide to release the Button Bottom from the Latch Slide.

**CAUTION: The Button Bottom parts are spring loaded. Handle with care, according to the directions.**



**Figure 2 Detip Button Bottom**

**NOTE:**

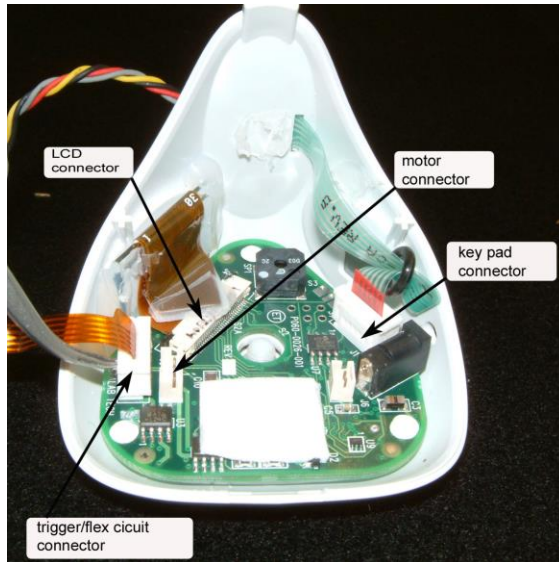
- These instructions refer to the Standard (Right-Hand) Unit. Exceptions for the Left-Hand LCD Location are noted as required. Some photographs may show slightly different parts than those in your unit.

**IMPORTANT:**

- **The PCB is sensitive to static electricity damage. This procedure must be carried out at an Electro Static Discharge (ESD) workstation.**
- **Be careful not to introduce any fibers or particles into the pipette. Any such debris may cause the pipette seals to leak.**
- **Before proceeding, make sure the unit is ready to aspirate as shown by the Up arrow on the display.**

5. Loosen the Captive Screw and carefully remove the bottom from the top of the unit. There are two electrical cables between the parts.
6. Remove the battery.

7. Disconnect the two electrical cables from the PC board:
  - Remove the Trigger/Flex Circuit cable.
  - Pull out the Motor cable.

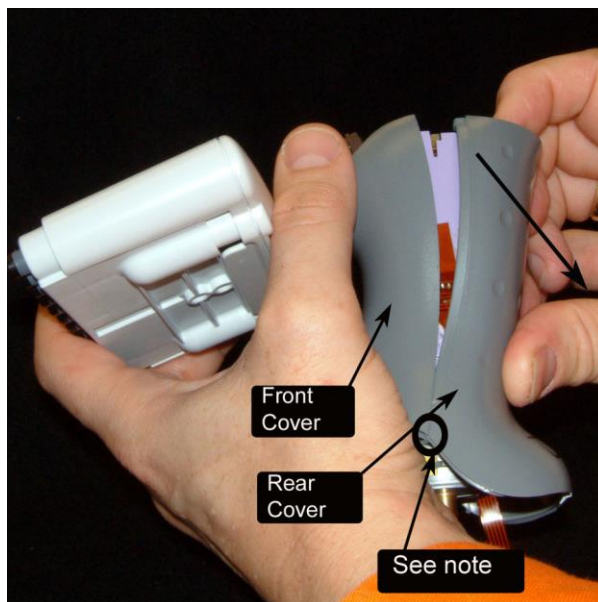


**Figure 3 Flex Cable Connection and Captive Screw**

8. Pull the Rear Cover off, breaking the glue.

**CAUTION: Be careful not to damage the Front or Rear covers.**

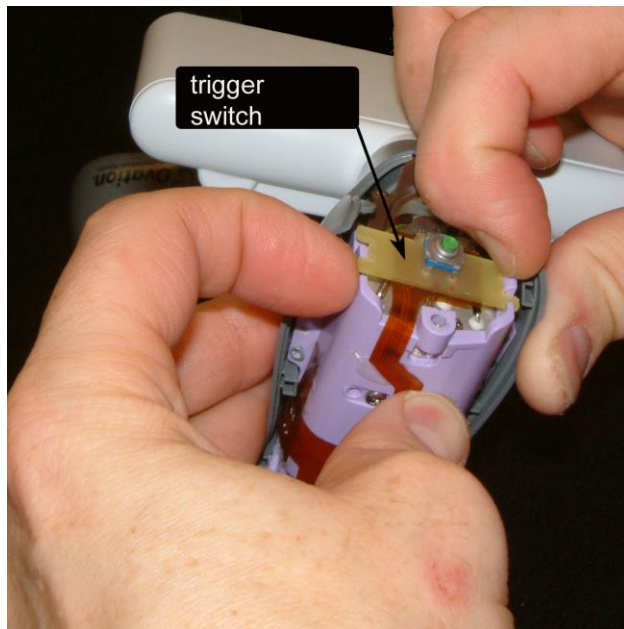
**NOTE: Be careful not to stress the corners on the Front Cover when breaking the glue.**



**Figure 4 Removing Back Cover**



9. Carefully remove the Plunger Trigger Switch from Fingers on the Inner Support.



**Figure 5 Removing Plunger Trigger Switch**

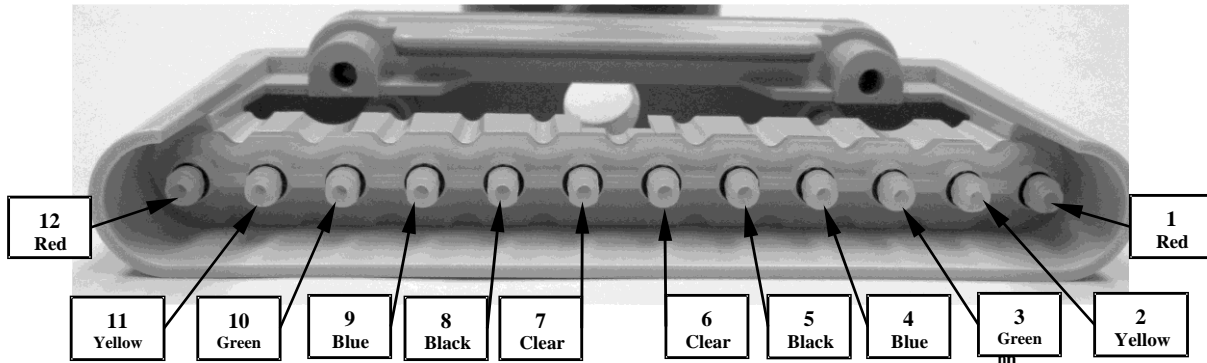
10. Remove the two screws that hold the Ejector Slide onto the pipette.  
**CAUTION: The Ejector Slide is spring loaded.**



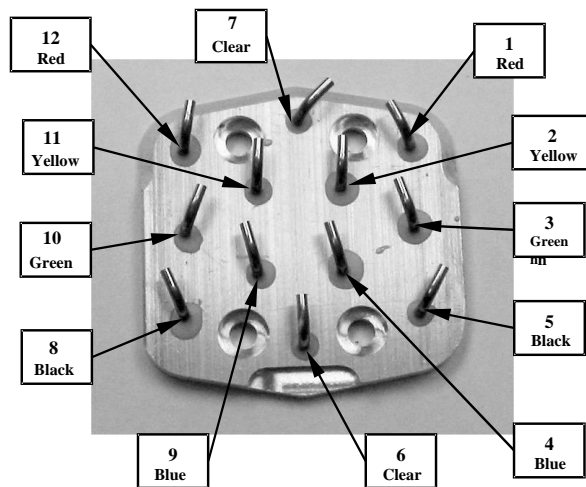
**Figure 6 Removing Ejector Slide**

11. Remove the Ejector Slide and the Ejector Springs and set aside.

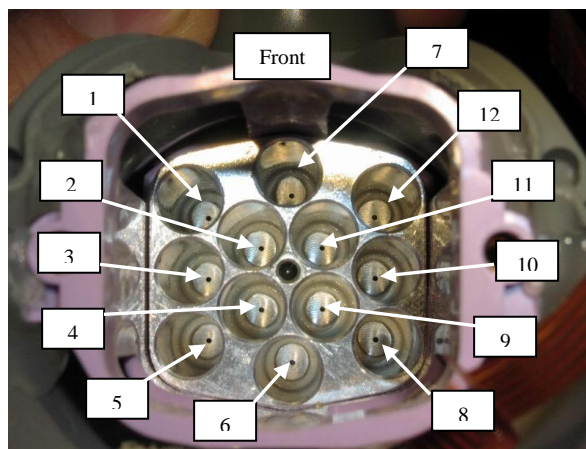
12. Using the charts provided, determine which connection you must remove at the top of the block.



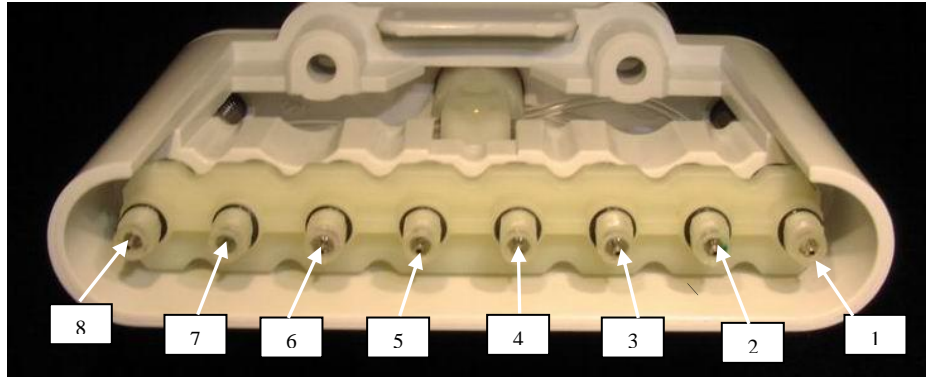
**Figure (7) 12 Channel Numbering at Manifold**



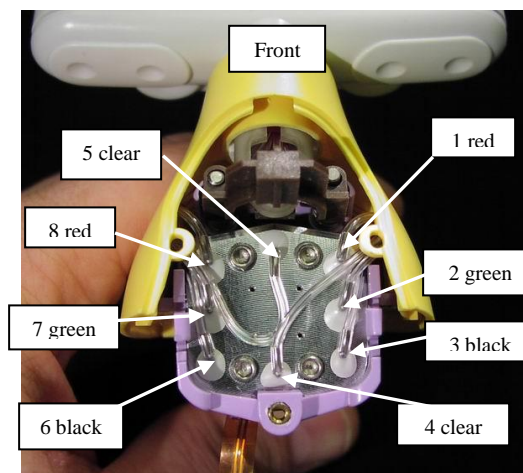
**(Figure 8) 12 Channel numbering at nipples on top of block**



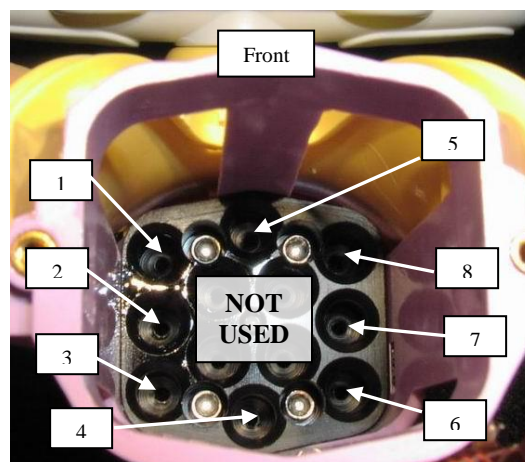
**(Figure 8.1) 12 Channel Numbering from Bores in Bottom of Block**



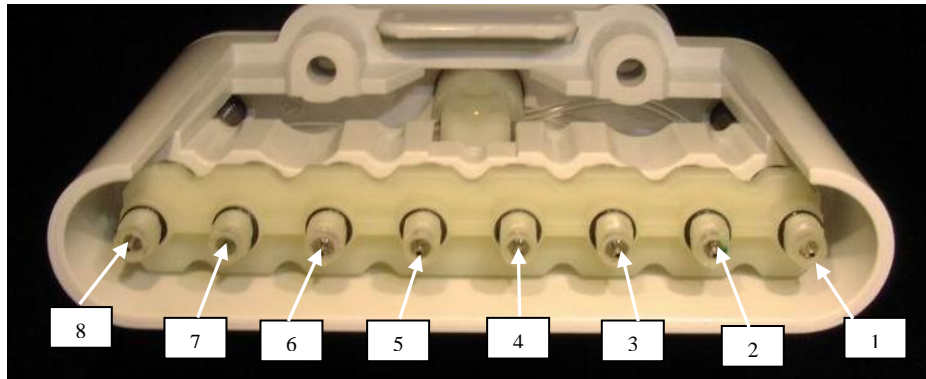
(Figure 8.2) 8 channel numbering at Manifold



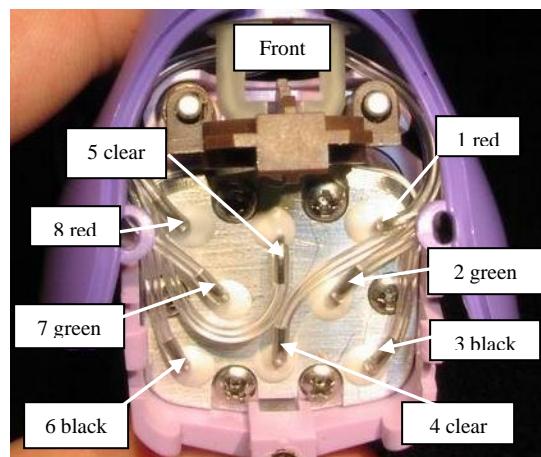
(Figure 8.3) 8 Channel Numbering at Nipples for 20ul, 125ul and 250ul units



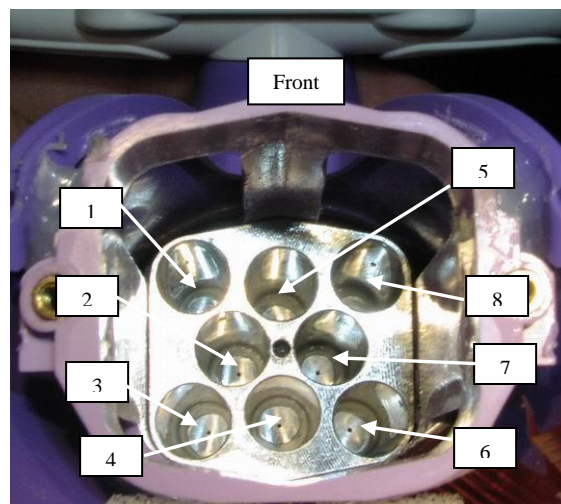
(Figure 8.4) 8 Channel Numbering at Bores for 20ul, 125ul and 250ul units



(Figure 8.2 REPEAT) 8 channel numbering at Manifold



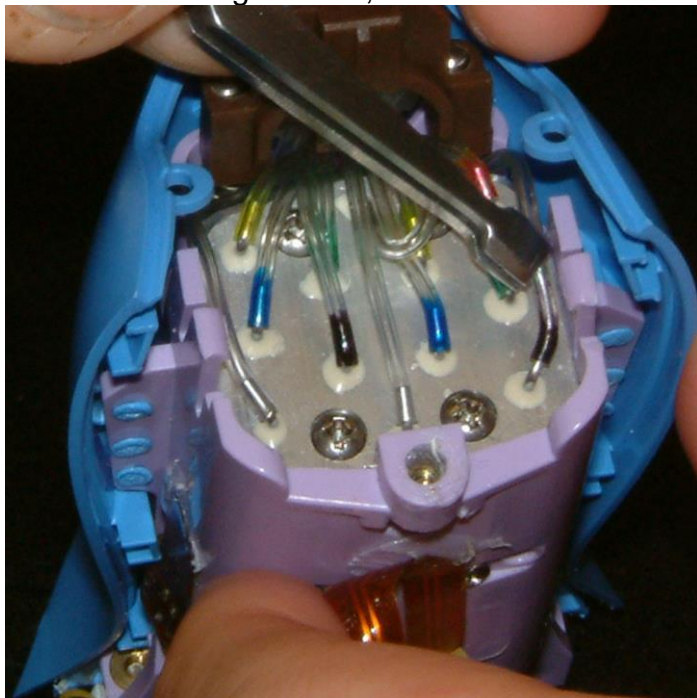
(Figure 8.5) 8 Channel Numbering at Nipples for 850ul units



(Figure 8.6) 8 Channel Numbering at Bores for 850ul units



13. To confirm leaking air tube, first disconnect the suspected air tube.



**Figure 9 Disconnecting old air tube**

14. Remove the tube from the top plate and plug with push pin. Perform leak check to confirm that the leak is in the tube. If there is no leak, re-install the tube as it was found. See the Trouble Shooting Guide.



**Figure 10 Removing tube from top plate and plugging with push pin**



15. Remove the Nozzle from the affected channel.



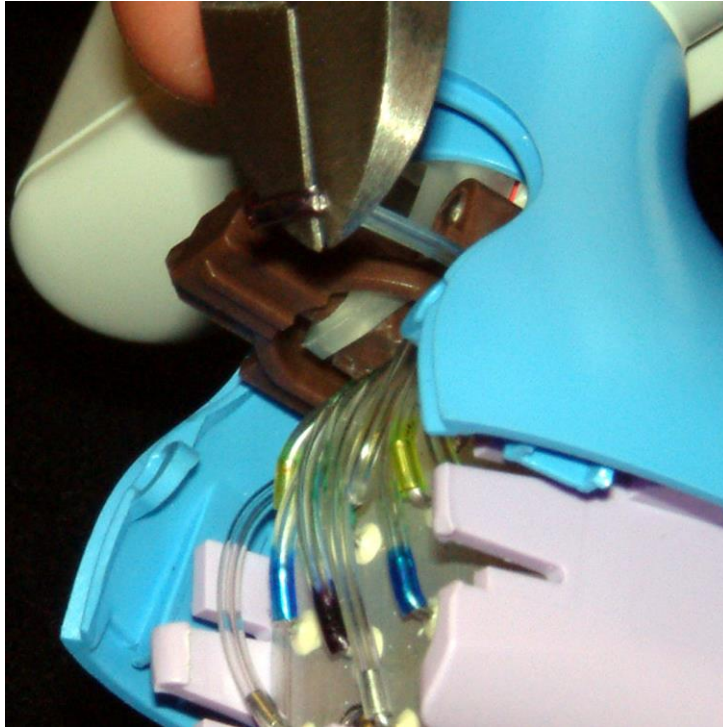
**Figure 11 Removing Nozzle from faulty channel**

16. In this example, we are removing Channel 5.



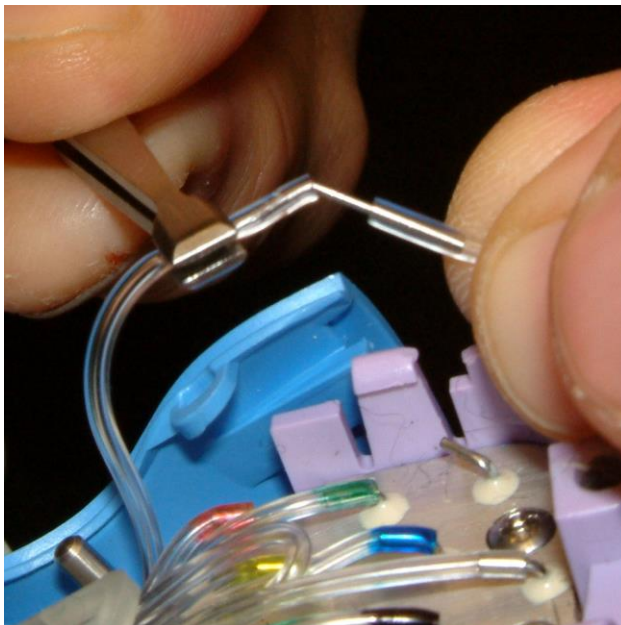
**Figure 12 Channel 5**

17. Cut 5 mm off the end of the old air tube.



**Figure 13 Cutting 5 mm from end of old air tube**

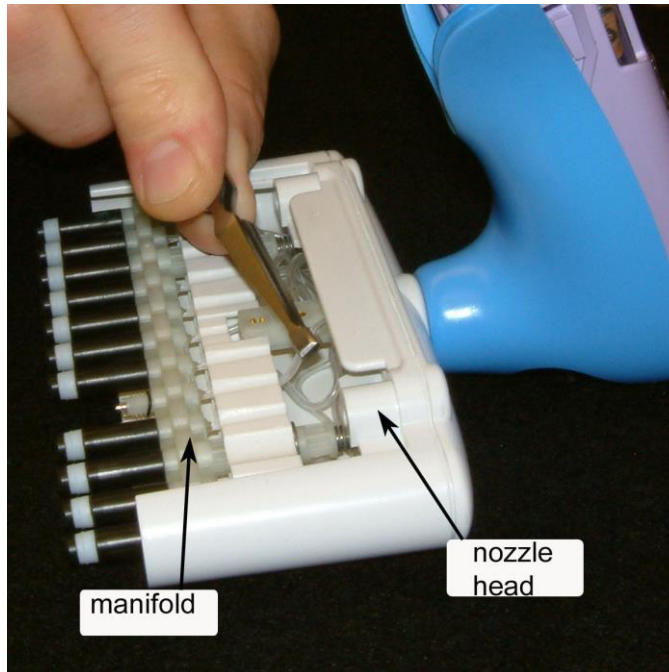
18. Install the Tube Guide Tool onto the Air Tube.



**Figure 14 Installing Tube Guide Tool onto Air Tube**

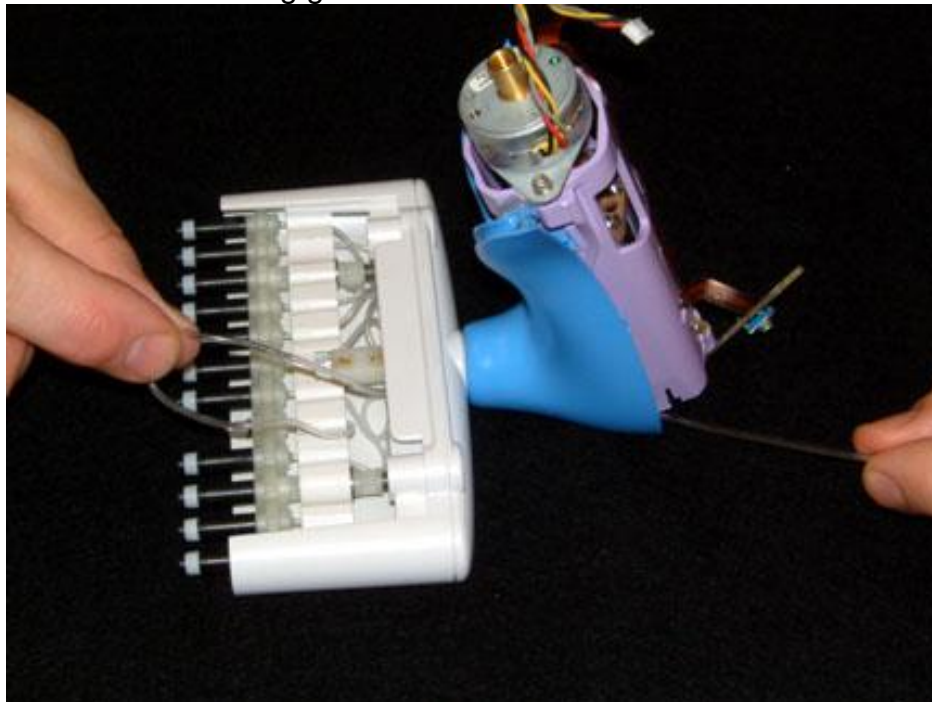
19. Observe routing of old tube.

20. Begin pulling old tube (with Tube Guide Tool attached) through Nozzle Head.



**Figure 15 Pulling old tube through Nozzle Head**

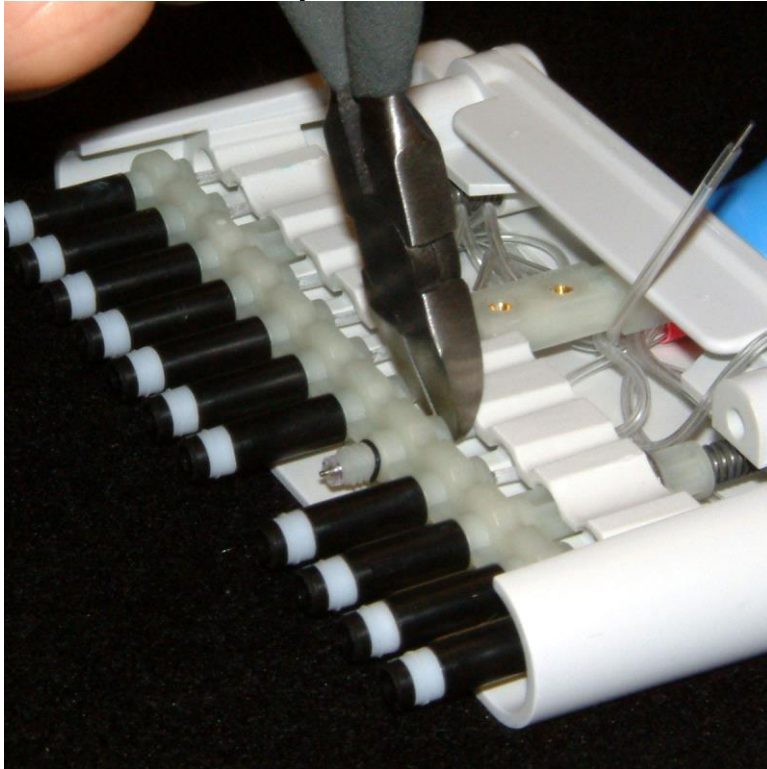
21. Pull the tube guide tool up and out through the system. Stop pulling when the end of the tubing guide tool reaches Nozzle Head as shown.



**Figure 16 Pulling the Tube Guide Tool**



22. Cut the old tube away at the back of the manifold.



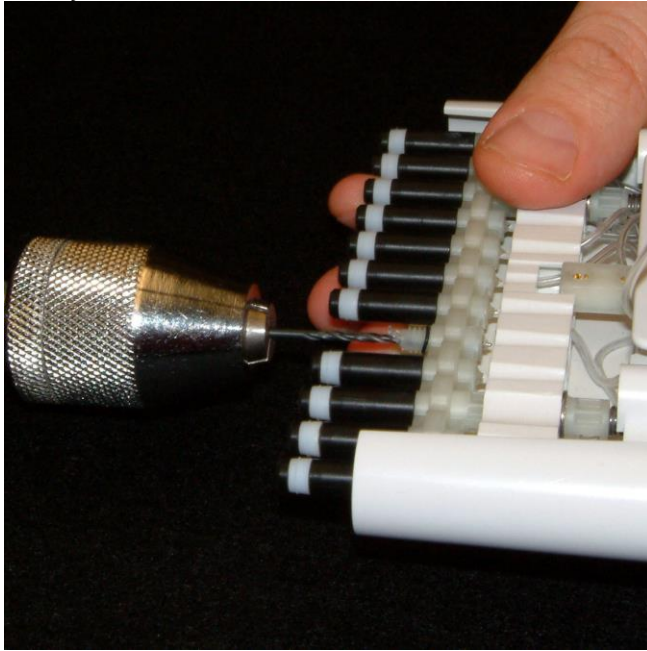
**Figure 17** Cutting old tube away at back of manifold

23. Cut off the flange and pull out the metal tube.



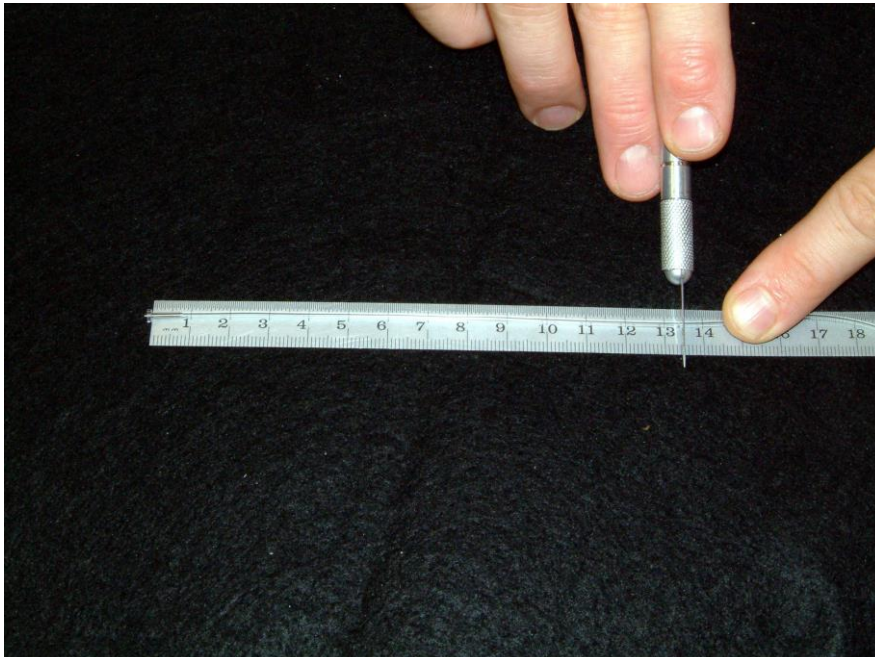
**Figure 18** Pulling out the metal tube

24. Drill the tube out with hand drill with drill bit (.063 inch from tool kit). You should have a clear hole and the drill should go in and out of the hole easily.



**Figure 19 Drilling out the tube**

25. Be sure the new air tube is cut to 13.3 mm.



**Figure 20 Cutting the tube to 13.3 mm**



26. Guide new tube through hole in manifold and attach the tube guide tool.

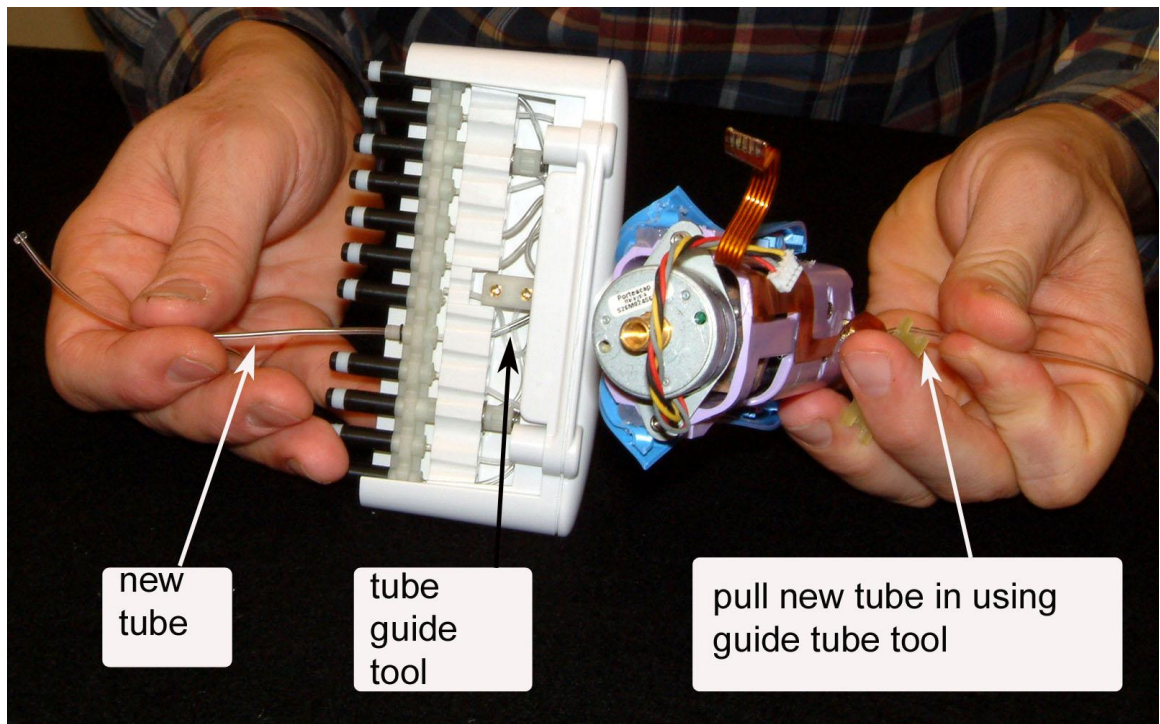


Figure 21 Placing new tube in channel

27. Carefully pull through and reinstall the tube on the same connector at the top of the block.

**IMPORTANT:** Be sure the new tube is routed in the same way as the old tube and that the new tube does not rub against the Button Bottom or latch slide.

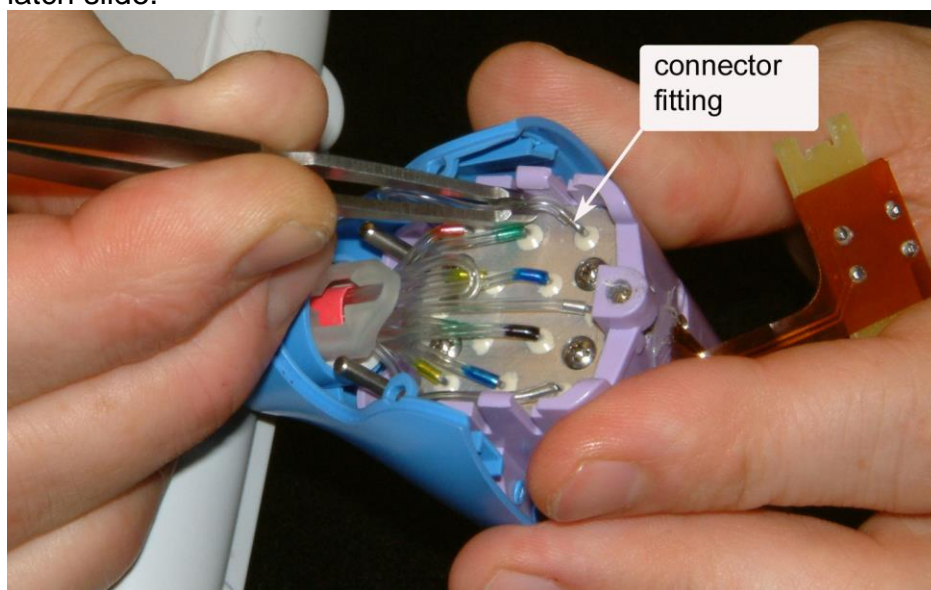
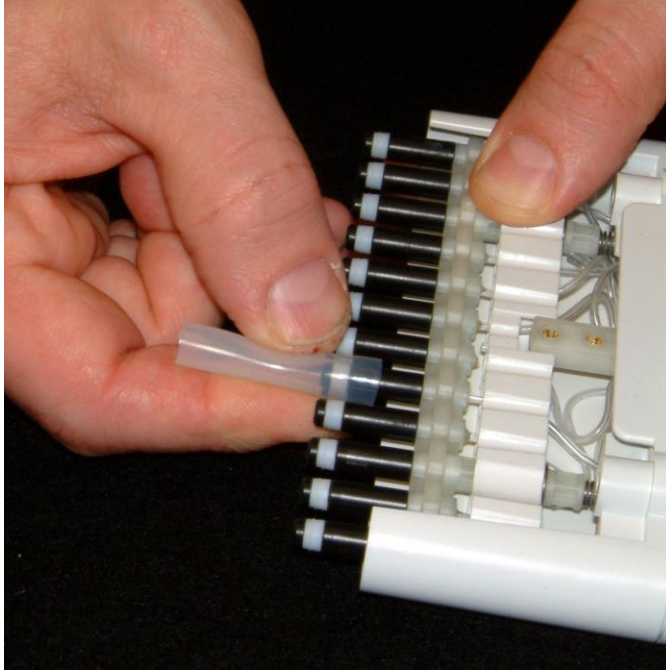


Figure 22 Pulling through and reinstalling the tube

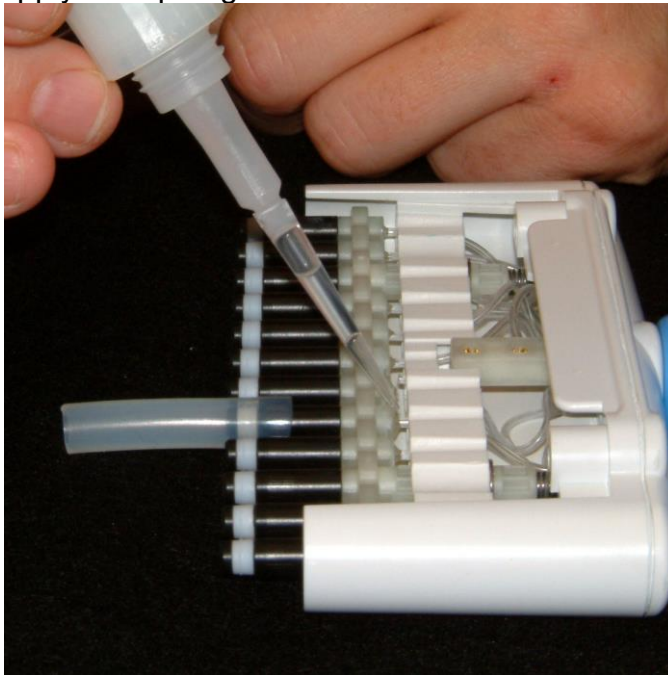


28. Put Nozzle back and install tightly with a piece of silicone tubing included in tool kit.



**Figure 23 Put Nozzle back with silicone tubing**

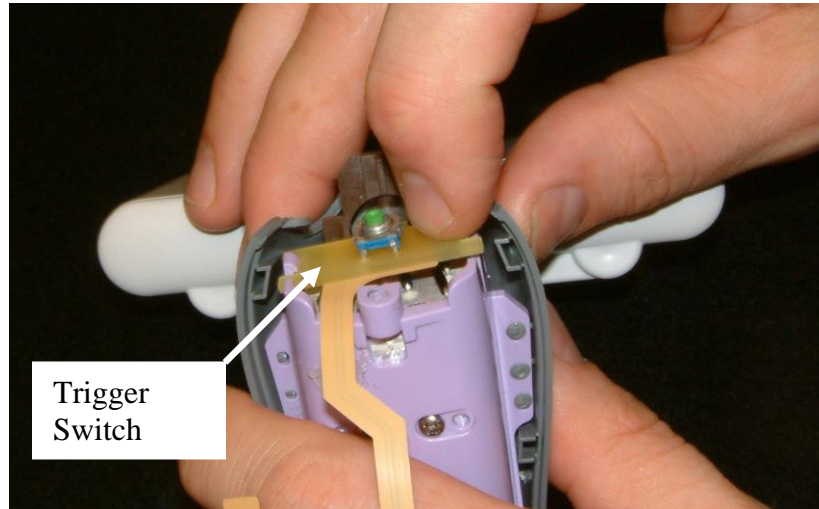
29. Perform static leak check again to be sure the tube doesn't leak.  
30. Apply a drop of glue to the back to retain the air tube.



**Figure 24 Applying a drop of glue to the back**

## Reassembly

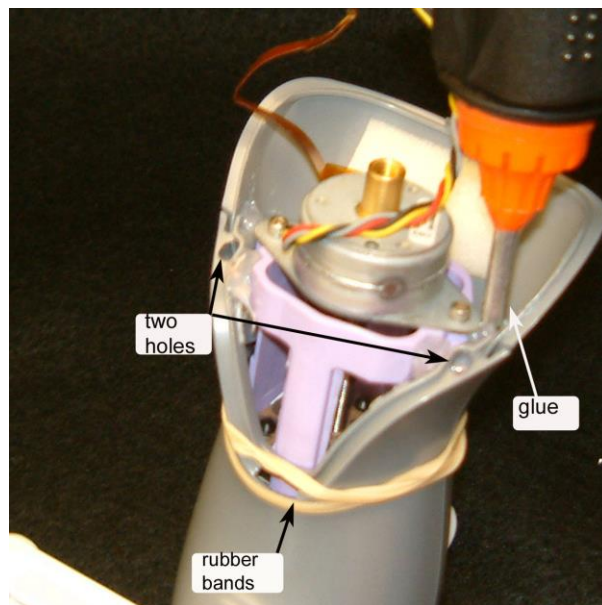
1. Snap the new Trigger Switch into Fingers on the Inner Support as shown.



**Figure 25 Snapping in new Trigger Switch**

2. Temporarily, secure the front and rear covers by using rubber bands, and then apply hot melt glue to the joints as shown.

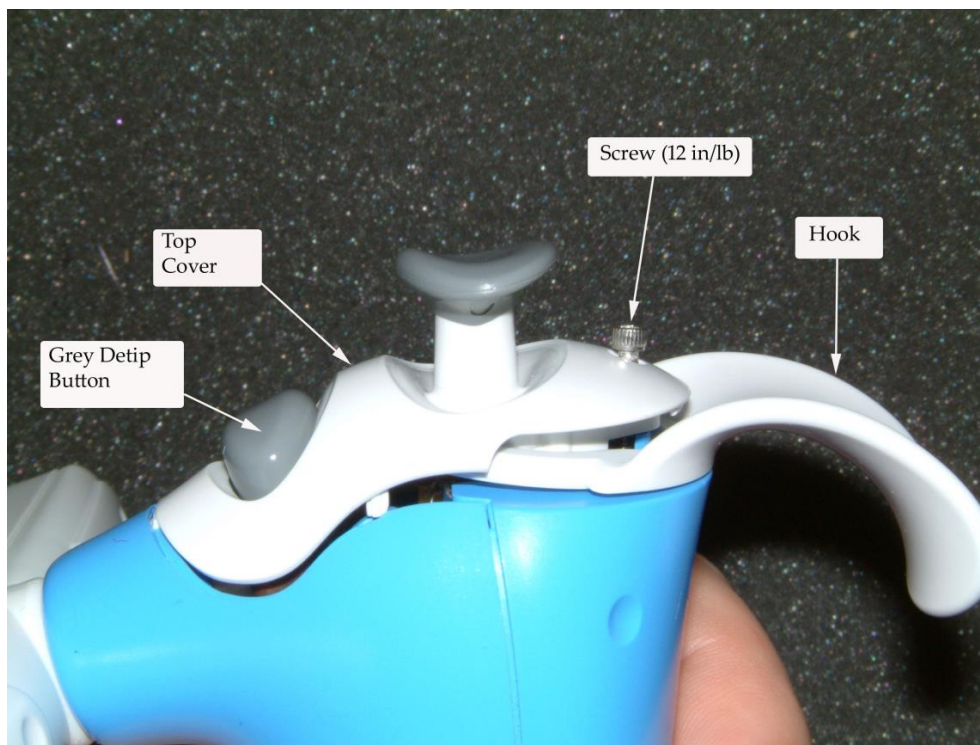
**IMPORTANT: Do not get any glue in the two holes as shown.**



**Figure 26 Securing Front and Rear Covers**

3. After the glue cools, remove the rubber bands.

4. Install the Hook assembly.

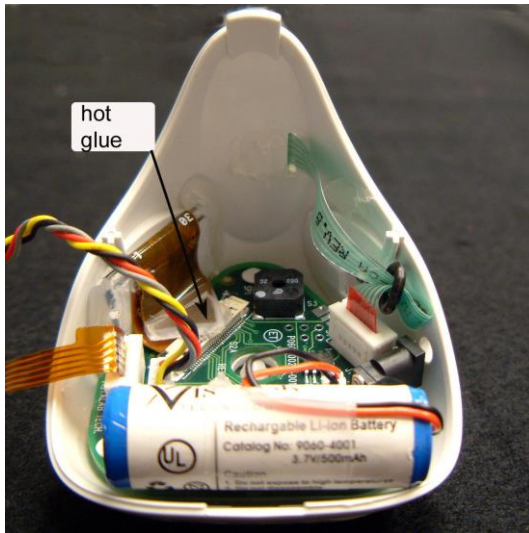


**Figure 27 Top Cover & Hook Installation**

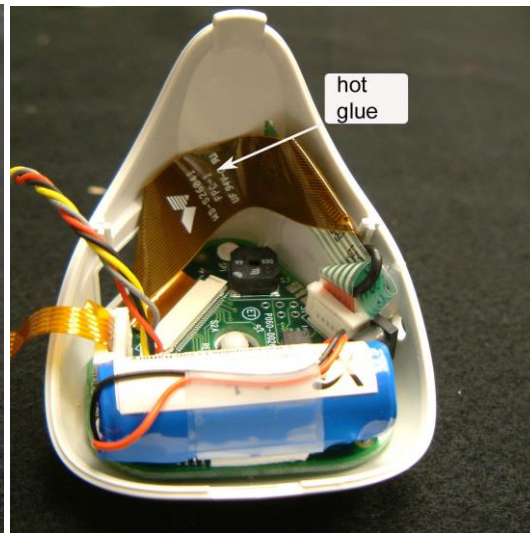
5. Install Top Cover Assembly with one screw and tighten to 12 in/lbs. Make sure that the hook is tight, but still movable.
6. Connect the cables as shown in Figure 28 for a Standard Unit or in Figure 29 for a Left-Hand unit. Seat the connector locks as required. Install the battery and test.
  - Check the three Key Pad buttons and verify that they are responding.
  - If the display does not respond to the keypad, then the Key Pad Flex Cable may be installed backwards.
  - Check the pipetting trigger to verify that the pipette aspirates normally.
  - If the unit does not respond to pressing of the pipetting trigger or displays an error, then check for correct installation of the Trigger Flex Circuit.



The following are Right-Hand and Left-Hand Ovation models.



**Figure 28 Final Wire Routing  
for Standard (Right-Hand) LCD Location**



**Figure 29 Final Wire Routing for Left-Hand  
LCD Location**

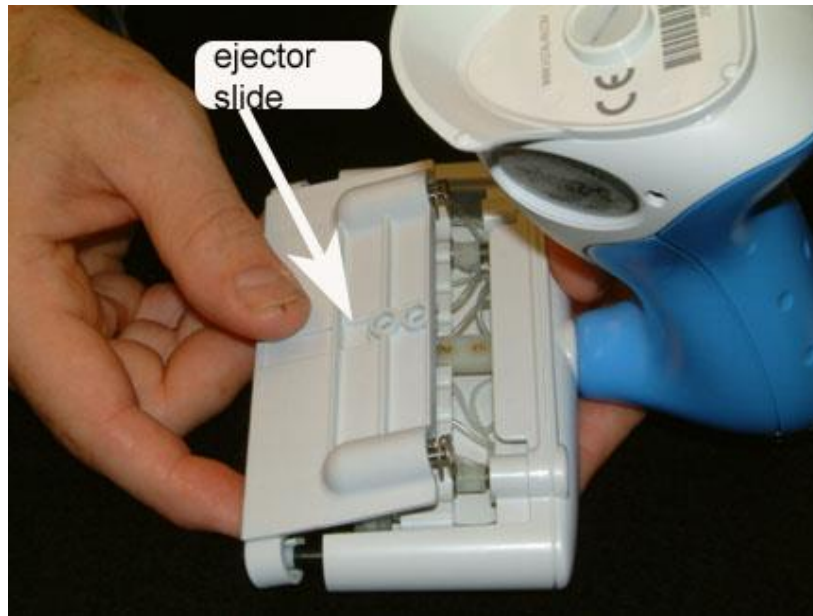
7. Reassemble the Base Assembly to the Upper Body.

**Important: Be sure that the Flex and Motor Cables are routed correctly and are not pinched or protruding.**



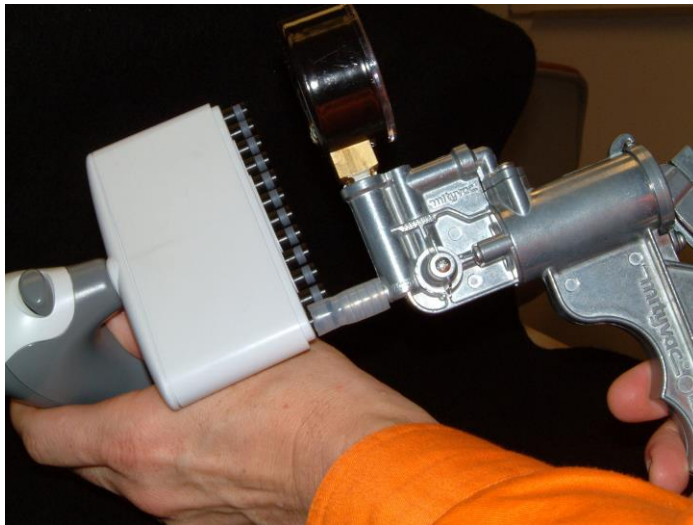
**Figure 30 Reassembling Base to Upper Body**

8. Tighten the Captive Screw with a coin or screwdriver.
9. Reattach Ejector Slide with springs.



**Figure 31 Reattaching Ejector Slide**

10. Install and eject ten sets of tips to ensure that the ejector mechanism works properly.
11. Check for leakage by performing the Pressure Test:
  - Connect each channel to the tubing on the Pressure Test Pump as shown.



**Figure 32 Check for leakage with pressure gauge**

- Pump the pressure to 3 – 5 psi.

**NOTE: Never exceed 5 psi.**



**Figure 33 Pressure Pump at 4 psi**

- Check the pipette through a full aspirate/dispense cycle. The pressure should return to its original reading of 3-5 psi at the end of the cycle and should remain steady for three seconds.
- Check all channels.
- If any channel leaks, remove the Plunger Assembly again. Check for dirt or fibers on the seals and then reseal the plunger seal by pulling the seal retainer down and then releasing it.
- Before reassembling, perform a visual test and be sure that the tips fill properly and at the same time.



- Perform a visual test with liquid to be sure that all tips fill evenly and don't leak.



**Figure 34 Tips filling evenly**

- Reassemble and repeat the leak test until all channels pass.

