

## Piston Seal Replacement (850ul, 1250ul, and 5000ul Units)

### Disassembly:

#### 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 located on your PC Board.

#### 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.**

1. Loosen the Base Screw and carefully remove the bottom of the unit. There are two electrical cables between the parts. **Note: Some Base Screws are captive and some are not.**
2. Disconnect the two electrical cables from the PC board:
  - Lift the Connector Lock and then remove the Trigger/Flex Circuit Connector.
  - Pull out the Motor Connector.

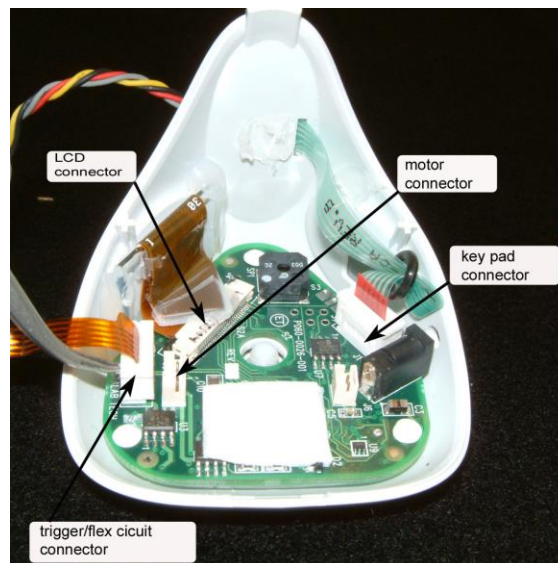
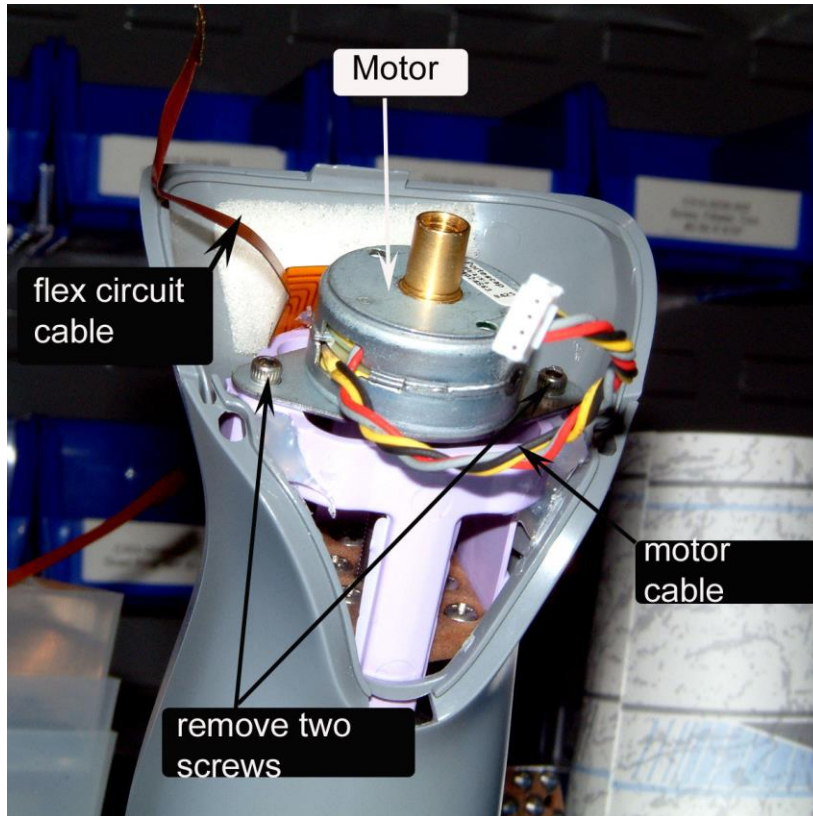


Figure 1 Flex Cable Connection and Captive Screw

3. Unplug the Motor Cable and the Flex Circuit Cable.

4. Use a hex driver to unscrew the two screws on the motor and set aside. Try to keep to keep the unit in the orientation shown in Figure 2 to avoid having the pre-load ball and spring fall out (if present)



**Figure 2 Remove cables and unscrew Motor**

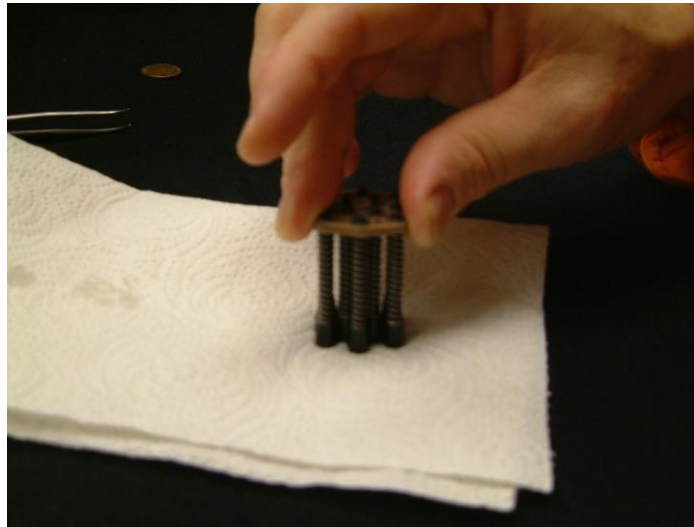
5. Pull out the Piston Assembly.
6. To change the seals, use curved tweezers to remove the O-Ring for each piston.
7. Replace the O-Rings with new parts.

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**Reassembly:**

1. Insert the pistons into 3 mm silicone oil (provided with the kit).
2. Wipe off any excess with a lint-free paper towel.

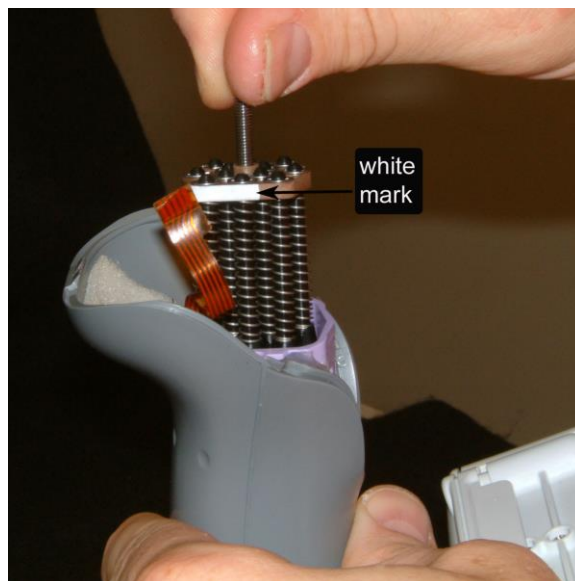
**NOTE: Do not wipe seals directly on cloth or paper.**



**Figure 3 Removing excess oil from Piston Assembly**

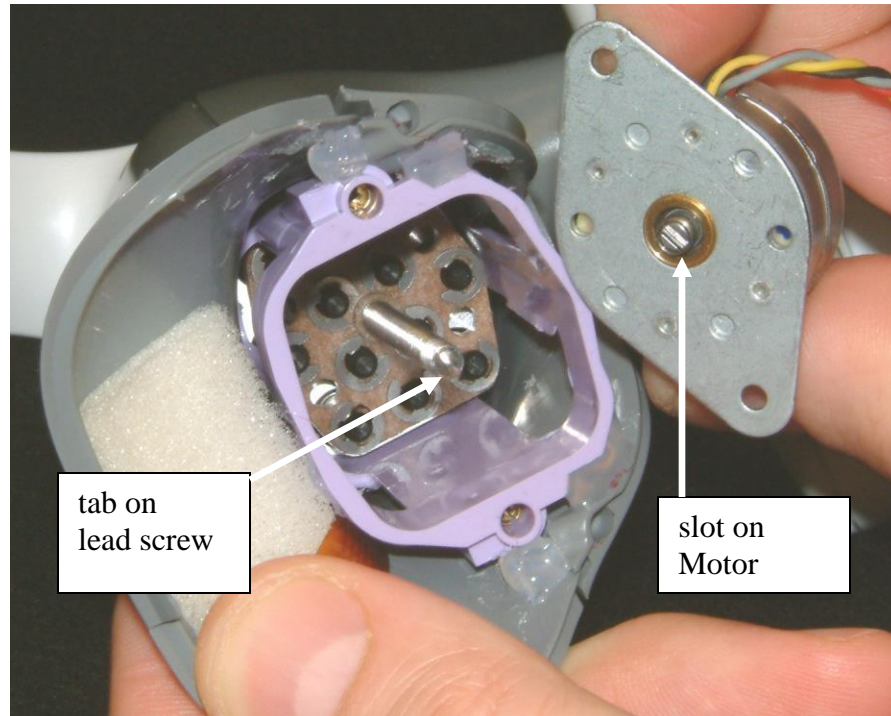
3. Gently insert the Piston Assembly (which holds the pistons) into the Cylinder Block by rocking back and forth to allow the pistons to enter the holes.

**IMPORTANT: Be certain that the white mark is facing the Sensor as shown.**



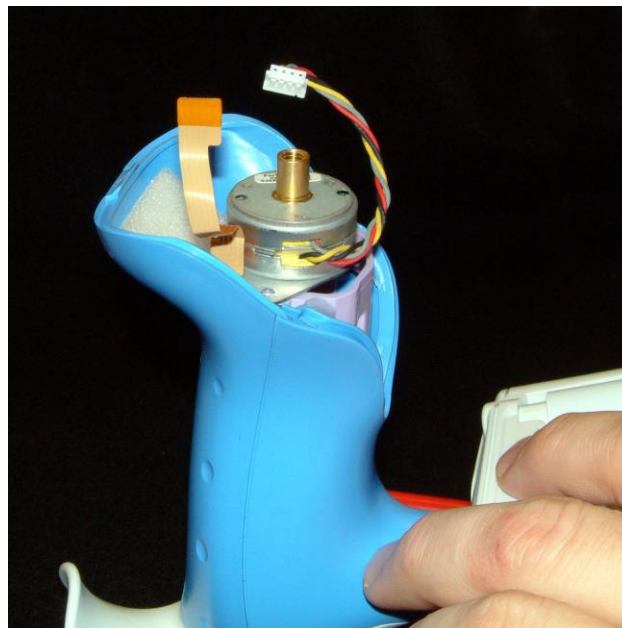
**Figure 4 Inserting Piston Assembly**

4. Align the slot on the Motor coupling with the tab on the lead screw.



**Figure 5** Aligning slot on Motor with tab on lead screw

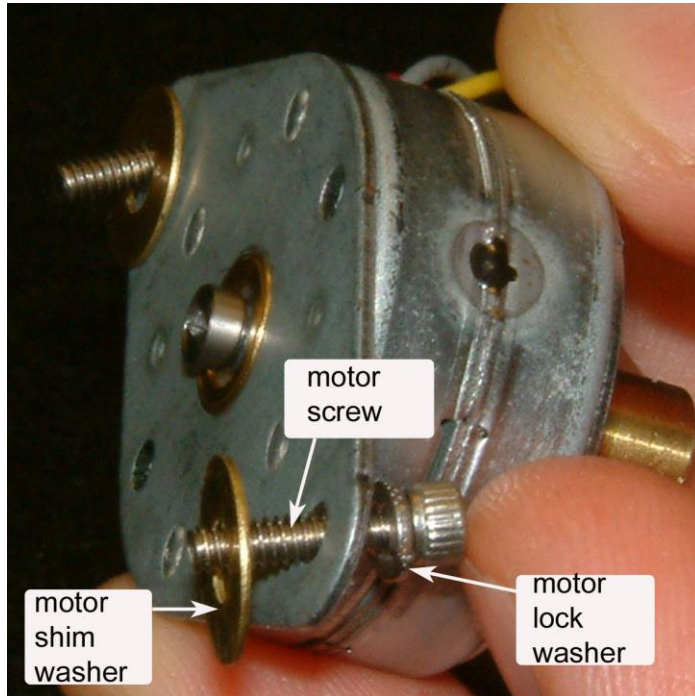
5. Align Motor Cable forward as shown.



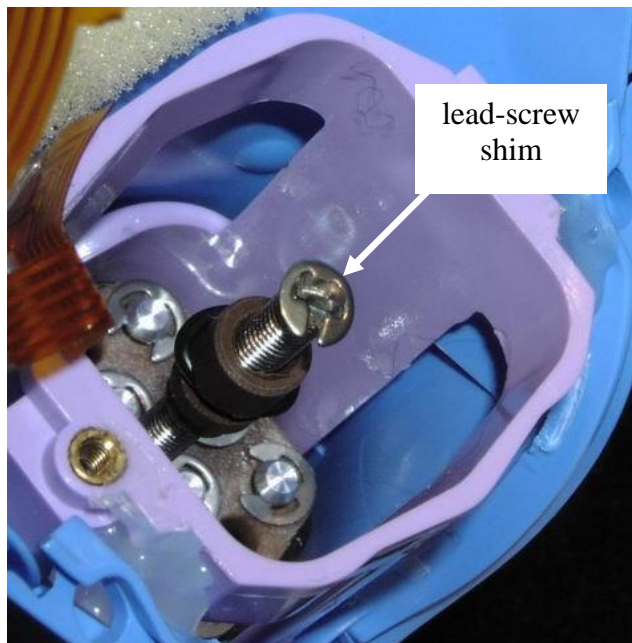
**Figure 6** Motor Cable forward

6. If motor or lead-screw shims are present, replace the shims prior to reattaching the motor.

**Note: Only some units contain shim washers.**

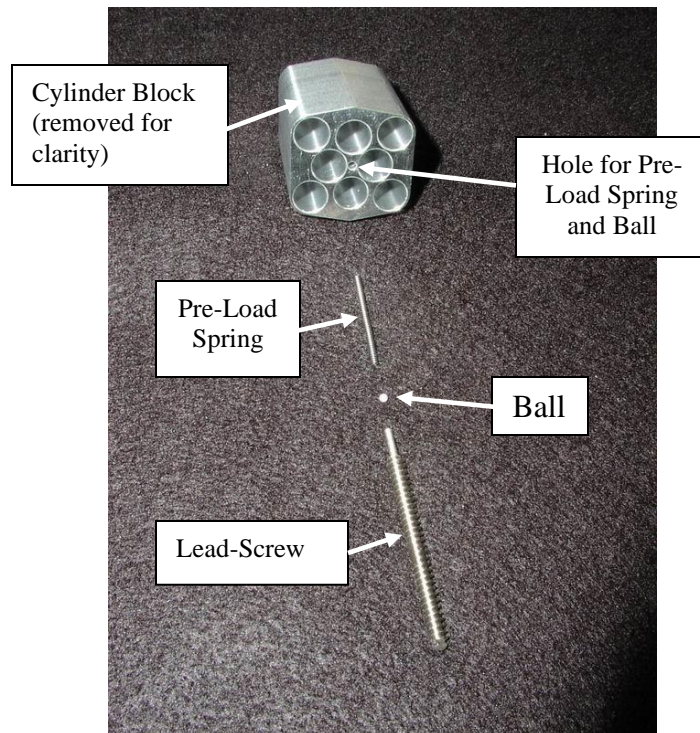


**Figure 7 Reattaching Motor Shim Washers (if present)**



**Figure 10.1 Re-installing lead-screw shim (if present)**

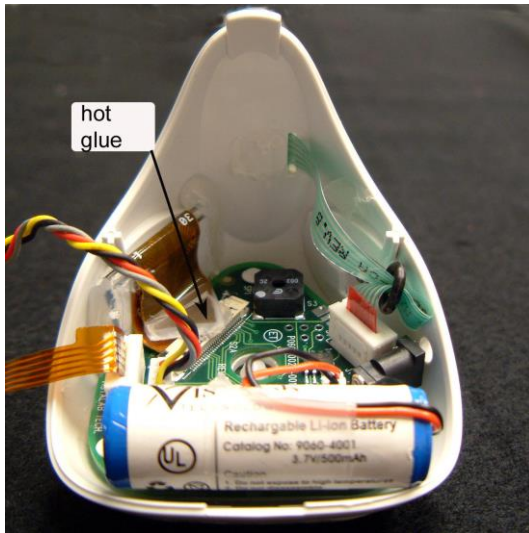
7. If pre-load ball and spring were present, make sure they are still placed in block as shown



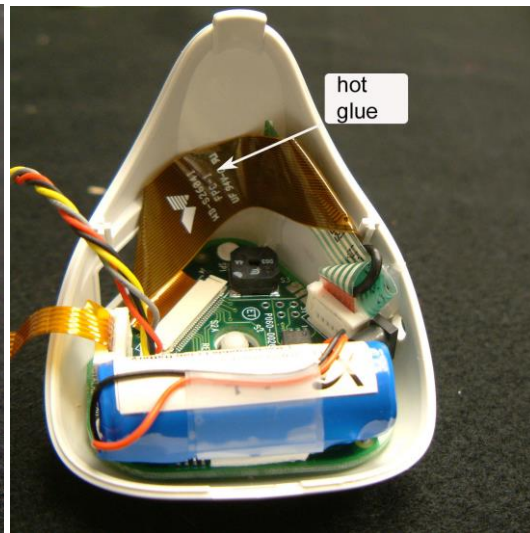
**Figure 10.2 Preload Spring and Ball**

8. Re-attach the motor with two screws.
9. Connect the cables as shown in Figure 8 for a Standard Unit or in Figure 9 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 8 Final Wire Routing for Standard (Right-Hand) LCD Location**



**Figure 9 Final Wire Routing for Left-Hand LCD Location**

9. 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 10 Reassembling Base to Upper Body**

10. Tighten the Captive Screw with a coin or screwdriver.

11. Check for leakage by performing the Pressure Test:
  - Connect each channel to the tubing on the Pressure Test Pump as shown.

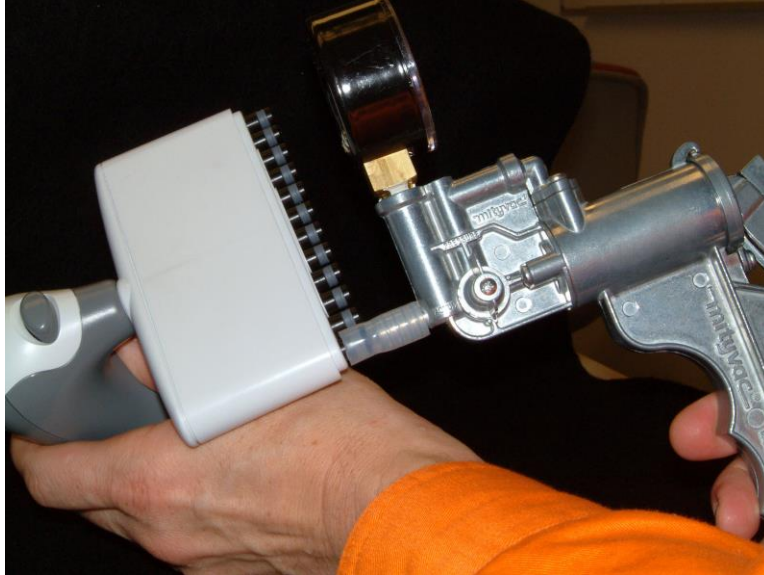


Figure 11 Checking for leakage with Pressure Gauge

- Pump the pressure to 3 – 5 psi.

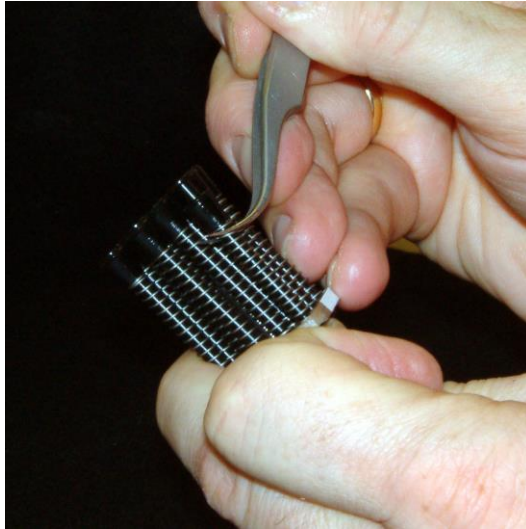
**NOTE: Never exceed 5 psi.**



Figure 12 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 Piston Assembly again. Check for dirt or fibers on the seals and then reseat the piston seals by pulling the seal retainer down and releasing.



**Figure 13 Reseating the Piston**

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

