

TROUBLE SHOOTING THE FM-III (FERROGRAM MAKER)

The FM-III is composed of three separate systems:

1. Pressurizing the Sample Vial.
2. Vacuuming oil and fixer off the glass substrate.
3. Pumping the fixer over the glass substrate.

The only way to check #1 is to put a sample vial of oil and/or fixer in the holder and start the FM-III. If this system is not working, there are a few things to check.

- A. The number one reason the system is not working is the O-ring on the bottom of the sample vial head is cut. This should be replaced with a new o-ring.
- B. Under the thumb screw that the FM-III Sample Tube goes through is another o-ring that can wear out or sometimes move out of place.
- C. Another item to check is that the fitting going into the back of the sample vial head inside the instrument has not come loose.
- D. The last thing to check is the tubing in the peristaltic pump. Over many years, this can wear out and start splitting.

You can tell right away if the vacuum system is not working. Oil will build up at the bottom of the slide and start wicking up underneath it and running down into the well under the magnets. This well should be drained periodically by starting either side of the FM by pressing the top button and pulling the suction head up all the way. This will draw the oil out of the well and into the waste bottle. FM-III's made after serial number 990332 have an automatic drain. There are a few items to check to get the vacuum system operating properly.

- A. Be sure the vacuum head is clear. A paperclip may be used to clean out the hole in the front of the vacuum head.
- B. Check to see if the waste bottles are in their proper position. These have to be sealed on top in order for the vacuum system to work with both brass tubes in the bottle.
- C. The vacuum pumps can be checked in two ways. One is the noise of the pump running when the FM is turned on. The other way is to remove the waste bottle from its nest. You will see two brass tubes coming down out of the waste bottle gasket. The shorter tube goes to the vacuum pump. Start the FM by pressing the top button on the control panel and put your finger over the end of the short brass tube. If the pump is working correctly, you will feel a vacuum on your finger.
- D. If the above three checks are OK and the FM is still not drawing the oil off the slide, the tube from the vacuum head to the waste bottle might be blocked. This can be cleaned out by blowing gently into the LONG brass tube that comes into the waste bottle.

If the fixer doesn't wash down the glass substrate, a few items can be checked.

- A. Press the button on the bottom of the front panel and HOLD IN the button. You should hear the fixer pump clicking. The fixer pump can also be checked by taking off the rear cover of the FM, finding the two fixer pumps in the lower left hand side of the instrument, looking at it from the back. Remove the tube on the "out" side of the pump and press and hold the bottom button on the front control panel. Fixer should come out of the pump.
- B. Just after the "out" side of the fixer pump is a filter on older models of the FM-III that should be changed periodically. Newer FM-III's have a plastic fitting in the tubing that could plug up and has to be cleaned out. FM-III's from serial number FM950931 just have larger diameter tubing and do not need to be cleaned out.
- C. If the fixer is coming out of the delivery head but not dripping correctly on to the glass substrate, the end of the delivery tubing may be pulled out a little and cut on a new angle with a razor blade.