

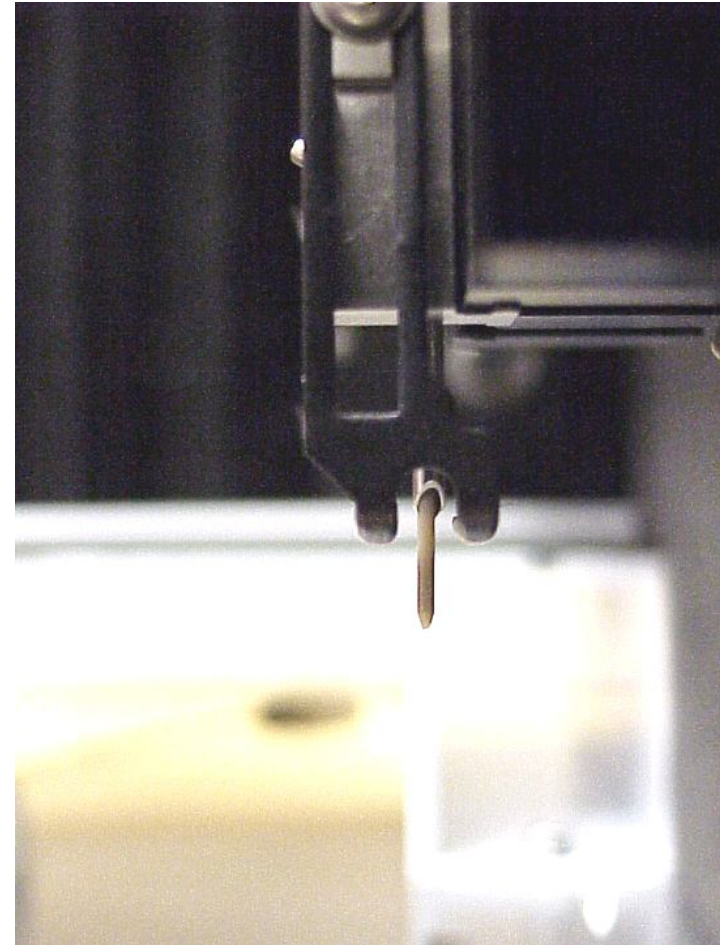
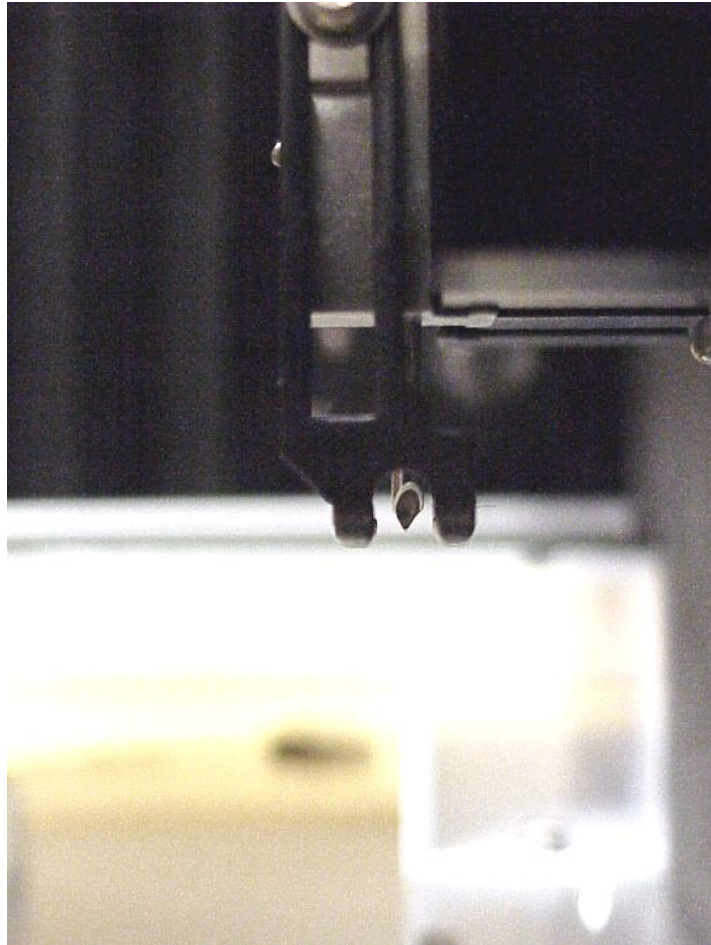
Chapter Five

Removing and Replacing the Needle Assembly

Waters
THE SCIENCE OF WHAT'S POSSIBLE.™

- Removing and Replacing the Needle
- Post Needle Replacement
- Priming the Syringes

Dual Needle Design



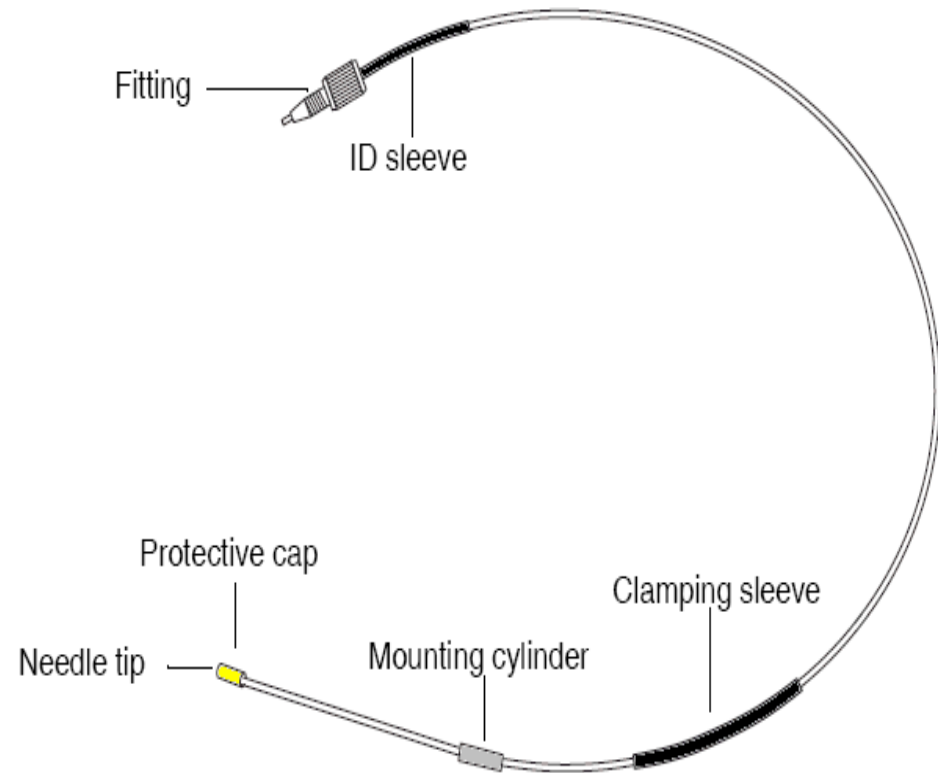
When Should You Replace the Needle?

- Replace the needle assembly:
 - For performance maintenance.
 - If contaminant peaks appear that are not eliminated by changing the needle wash solvent.
 - When the needle becomes bent or the tip gets damaged.
 - If the needle is plugged.

Replacing the Needle

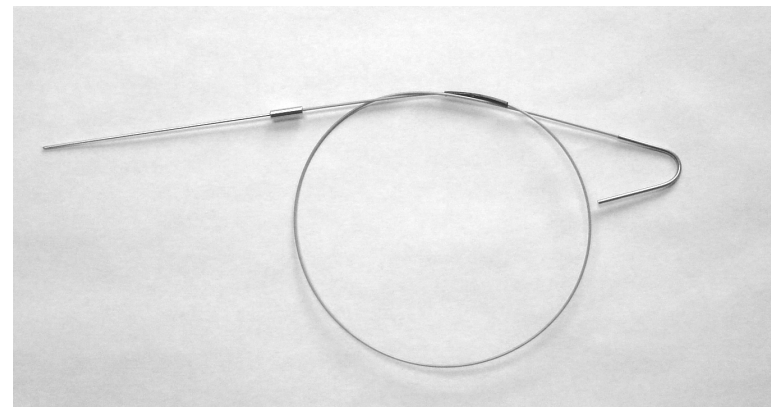
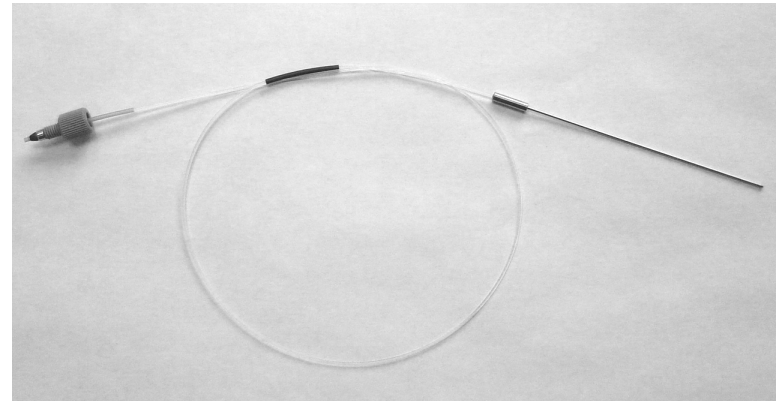
■ Tools and materials required:

- Flat screwdriver
- Needle kit
 - PEEK Needle
 - Compression screw or ferrule
 - 700002644
 - included in Startup kit

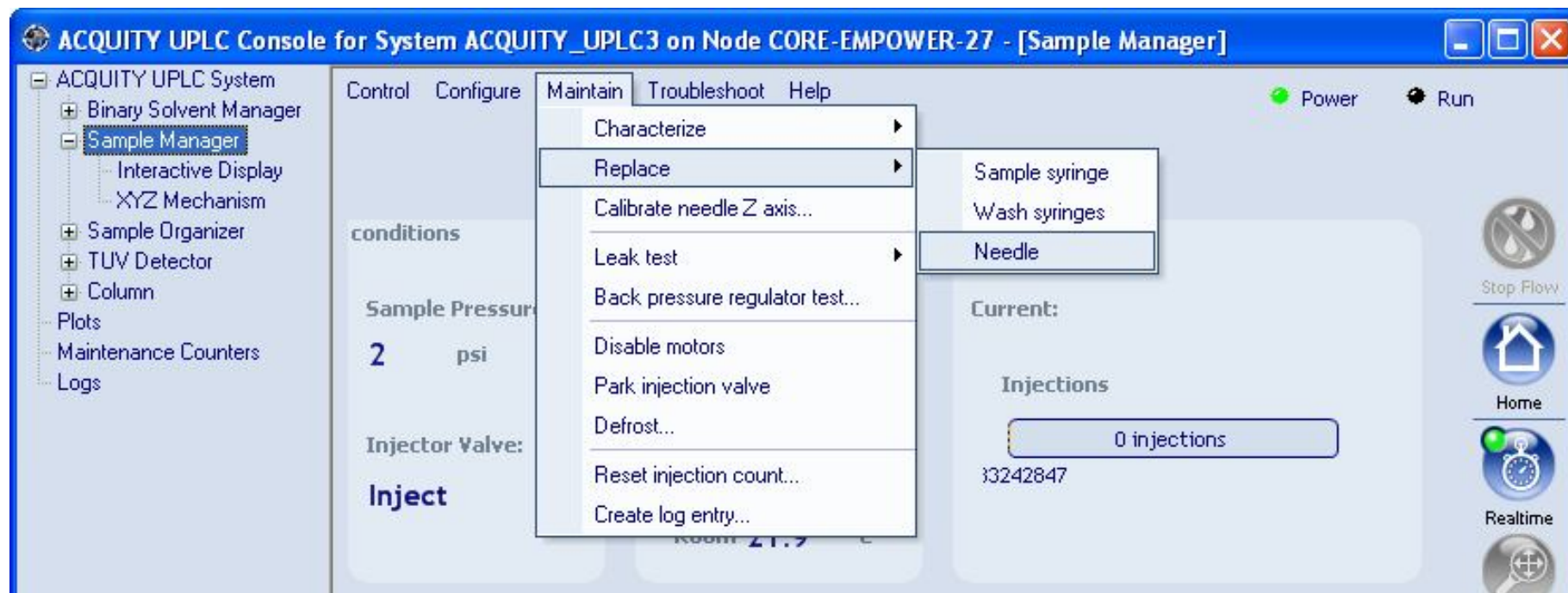


Metal Tip Sample Needles

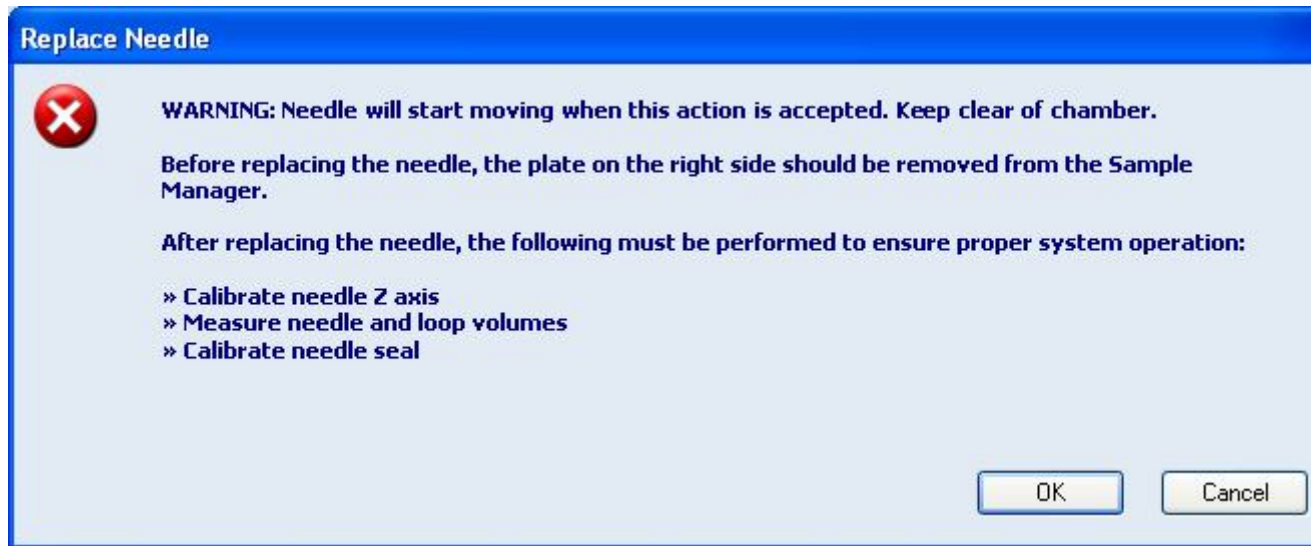
- Metal Tip with PFA tubing
 - Perfluoroalkoxy
 - Compatible with most cap mat covers for microplates
 - Low carryover
 - Available in 30 μ L
- Metal Tip with PEEK
 - Polyetheretherketone
 - 100% metal in fluid path
 - Compatible with most cap mat covers for microplates
 - Available in 30 μ L



Needle Removal



Needle Removal



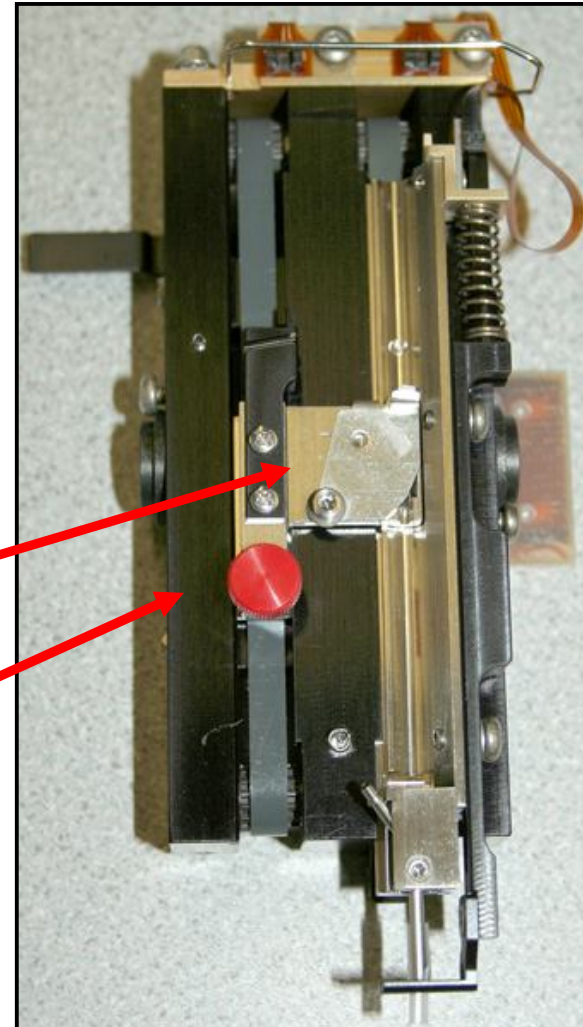
Needle Removal



Needle Removal

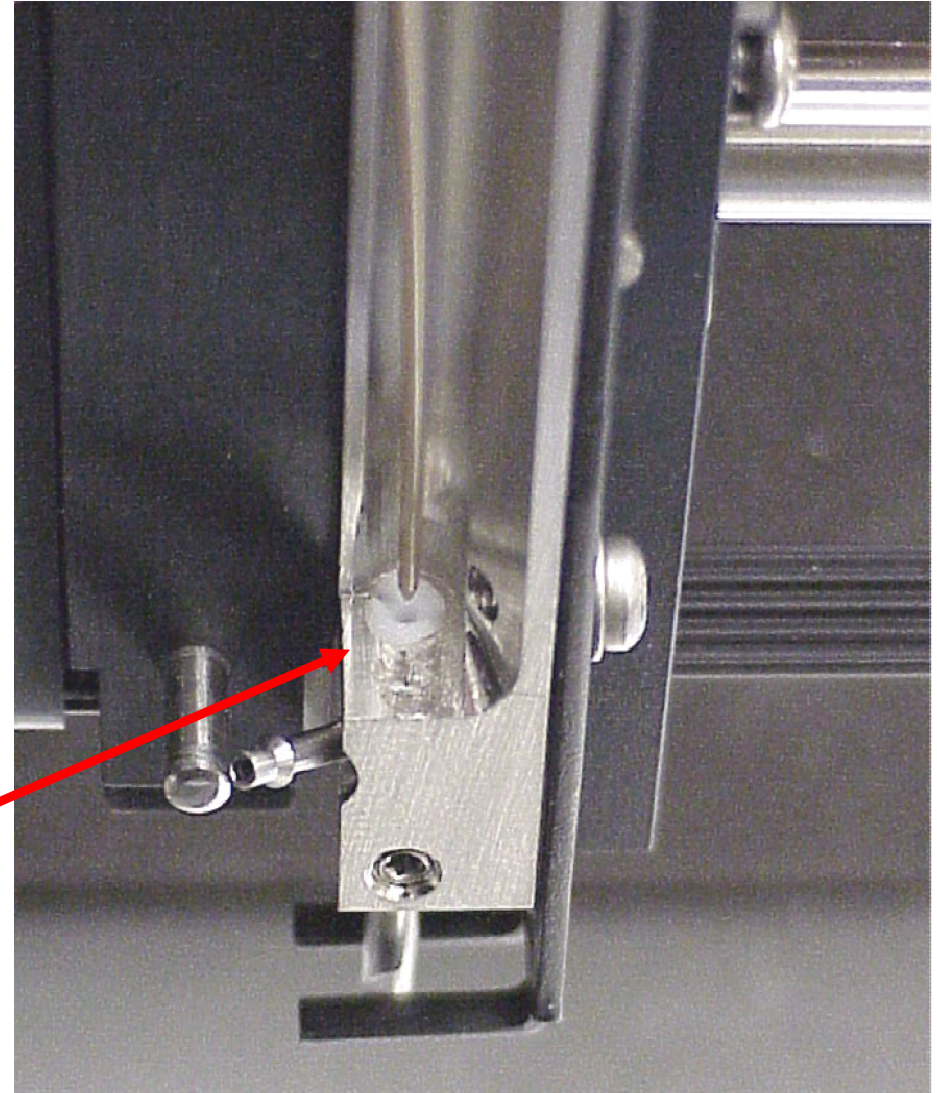
Needle latch

Red thumbscrew



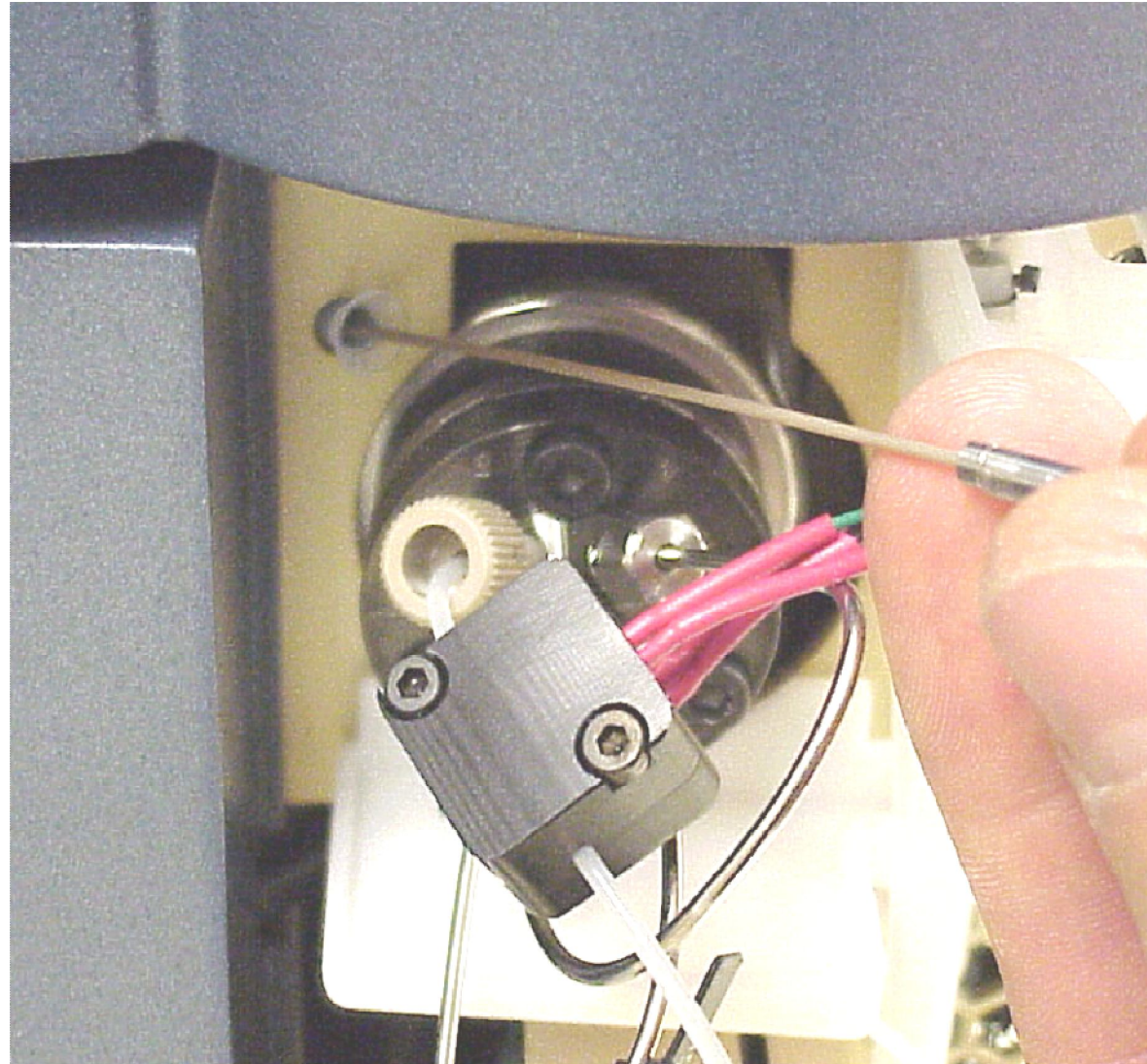
Needle Removal

White plastic needle guide



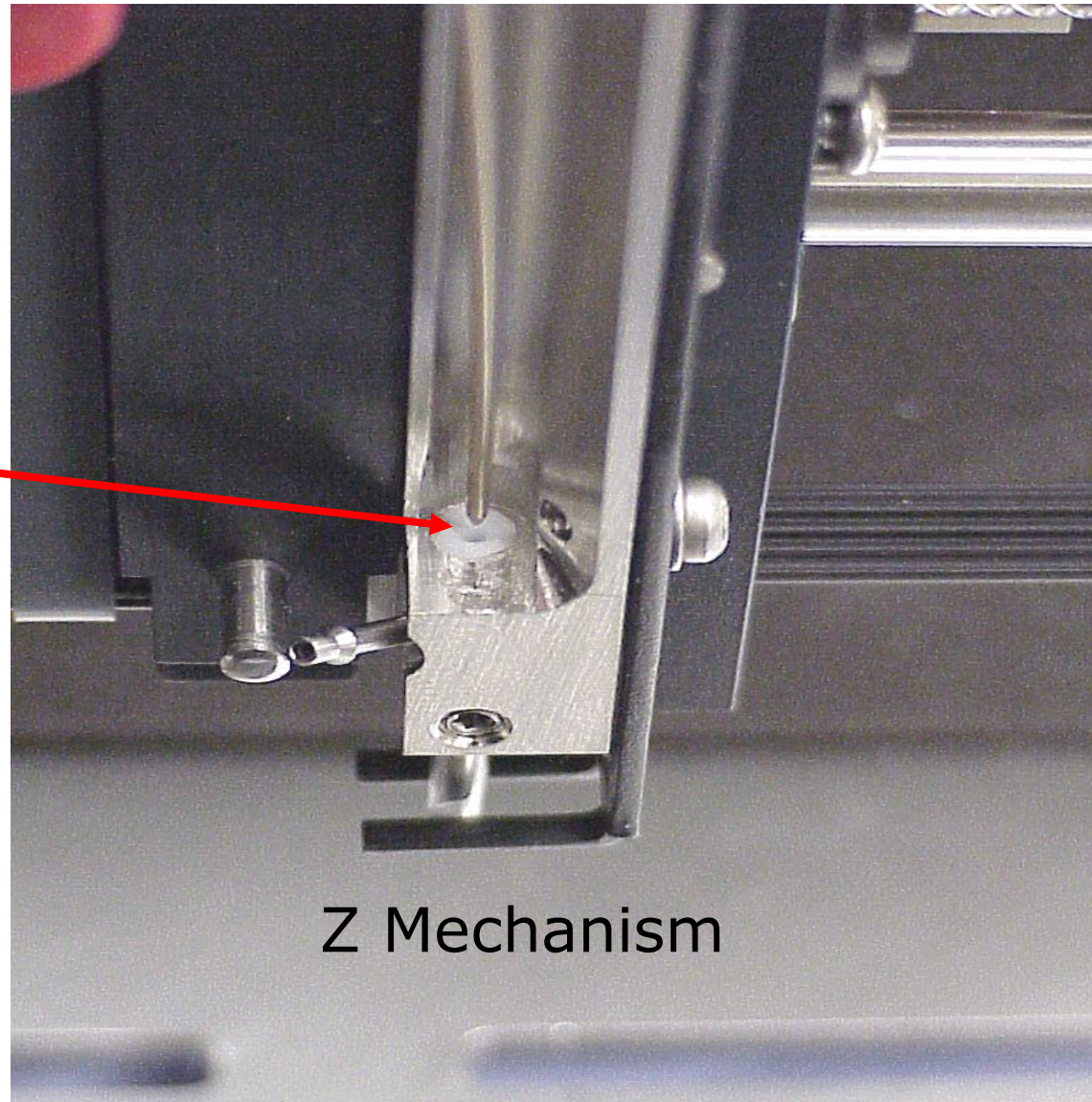
Routing the Needle

Steps 1 – 4



Position Needle into Z Mechanism

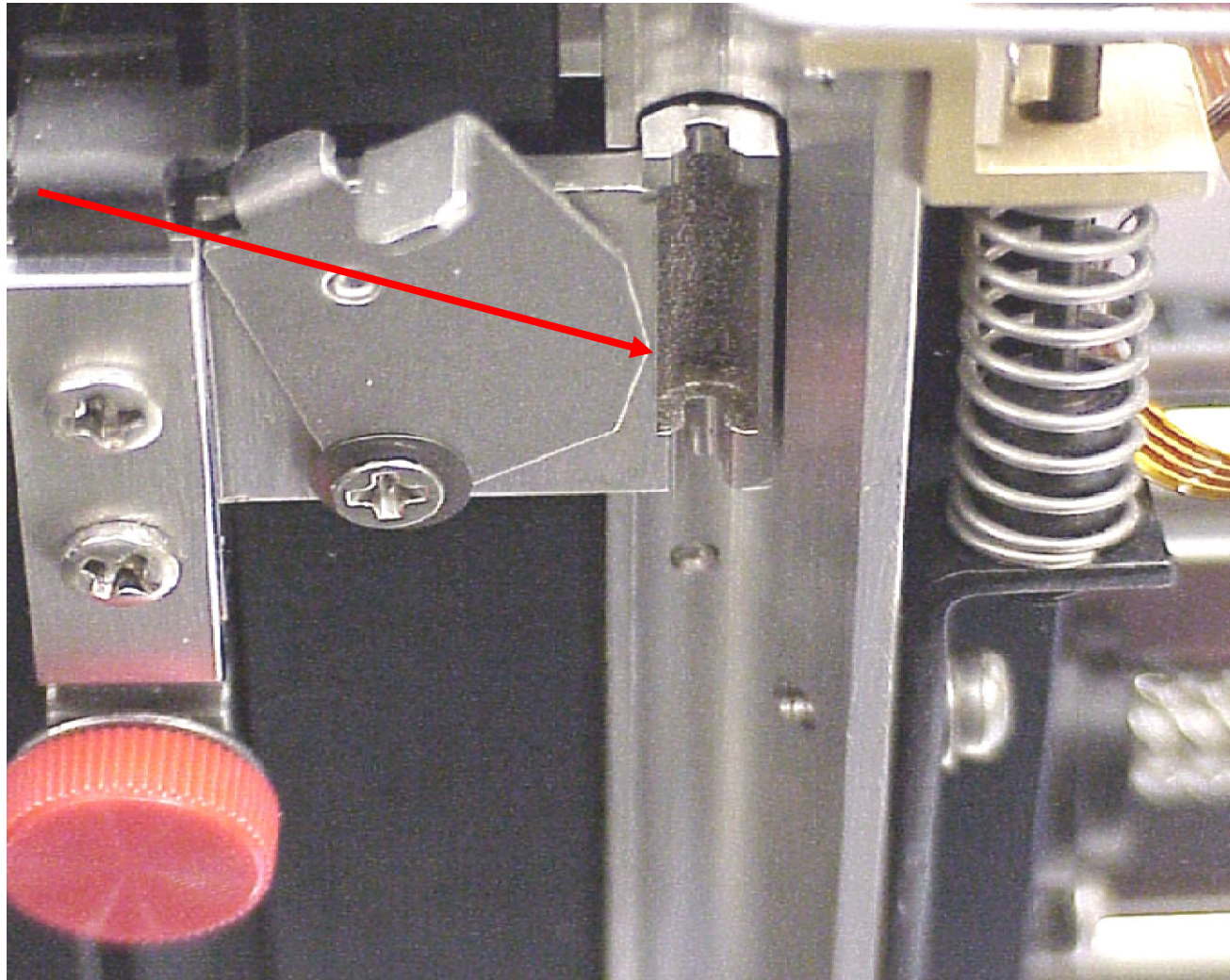
Step 5



Z Mechanism

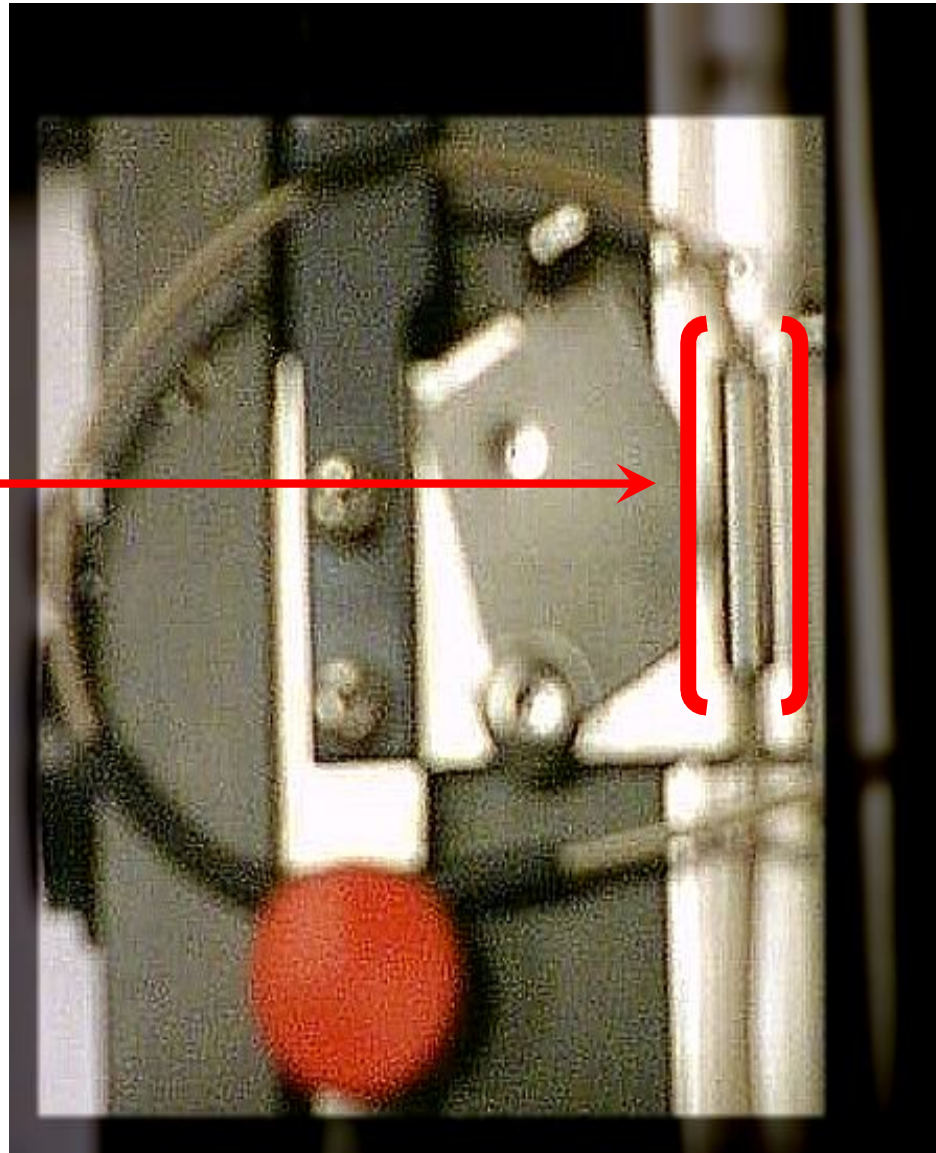
Ferrule Mounting Cavity

Ferrule
mounting
cavity



Inserting Needle into Mounting Ferrule

Step 6



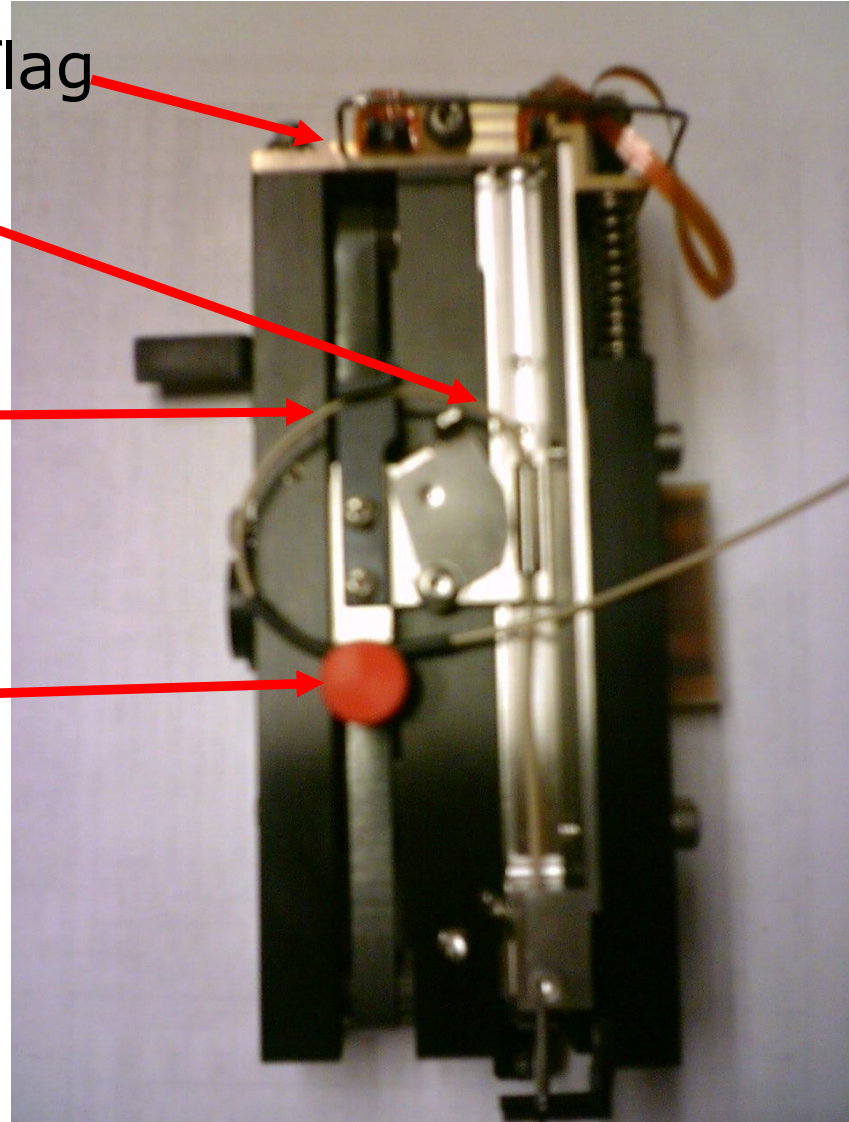
Securing Needle Assembly

Step 7

Z flag

Step 8

Step 9



Attaching Needle to Injector

Step 10

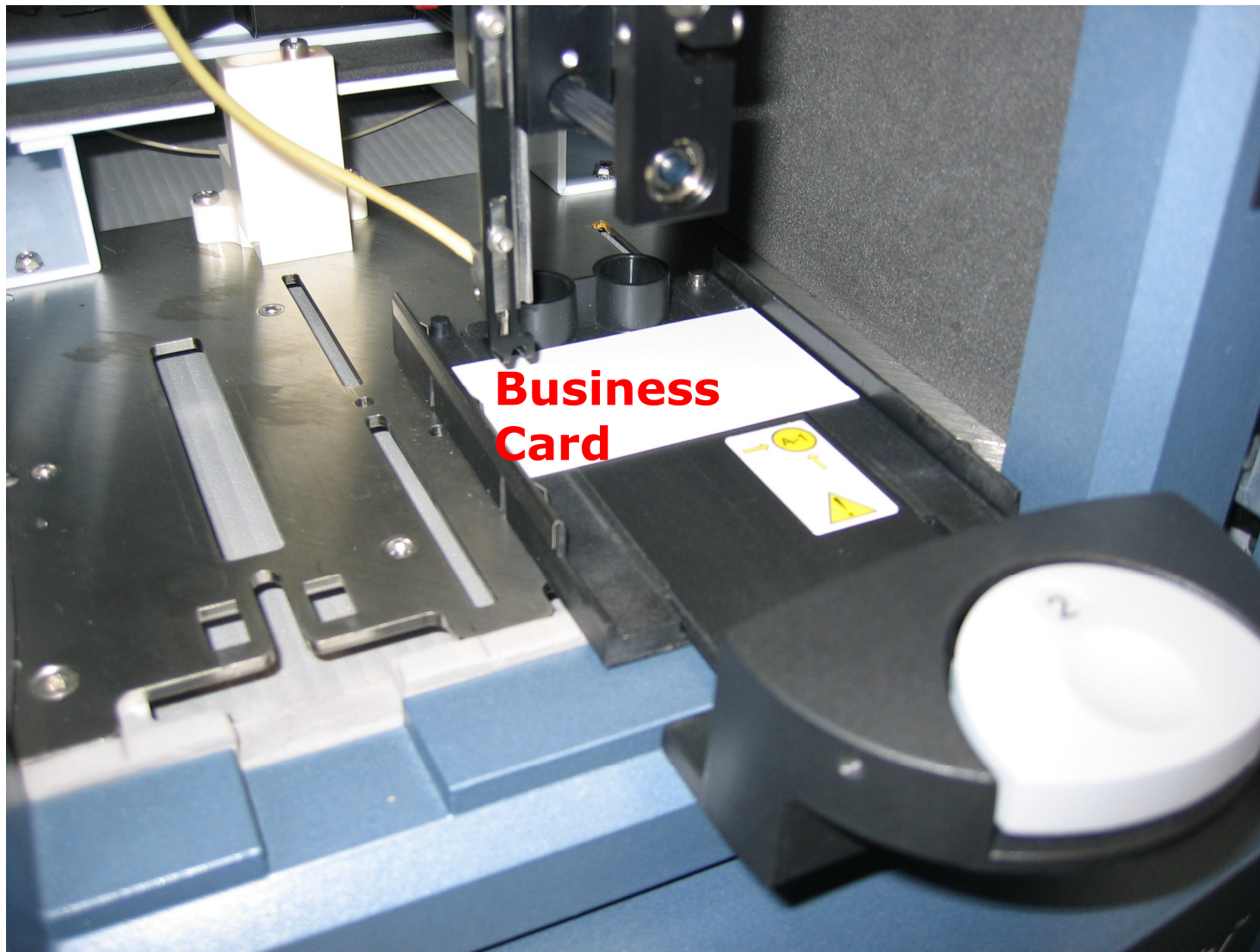


Needle in Port 3 of the Injector

Post Needle Replacement: Tasks

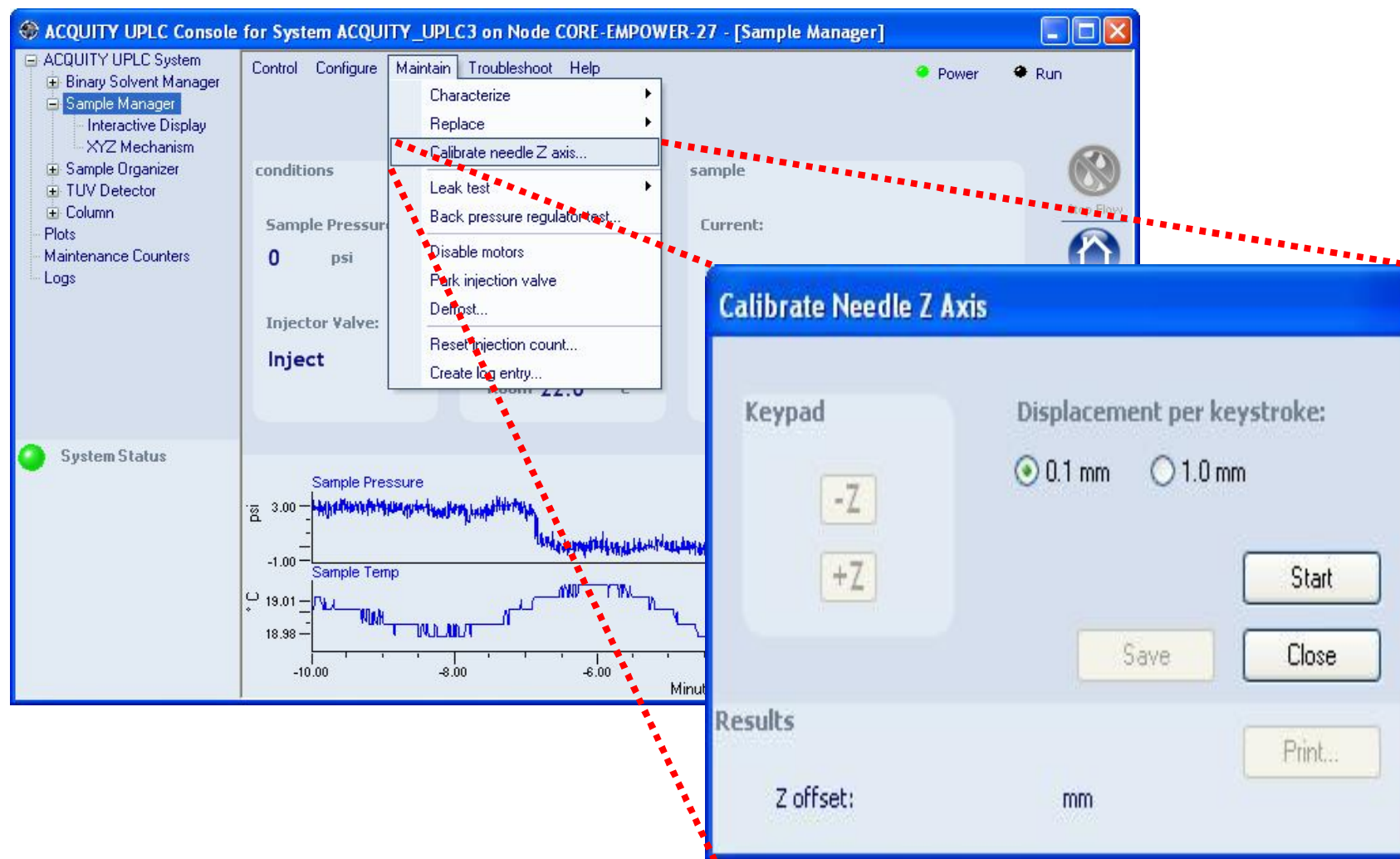
- After replacing the needle, you can perform these tasks:
 1. Calibrate Z axis to coordinate reference.
 2. Calibrate XY and Zp mechanism using teach pin tool to define XY position and enable wash station process.
 3. Prime sample manager.
 4. Calibrate needle seals to set pressure assistance.
 5. Characterize needle and system volume to check position of the sample.

Calibrating Needle Z Axis

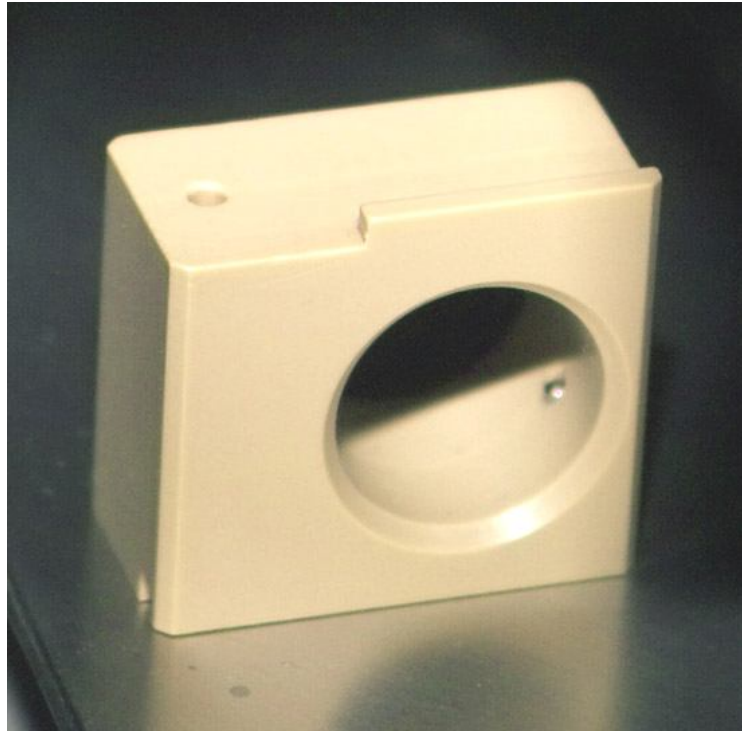


Chassis View

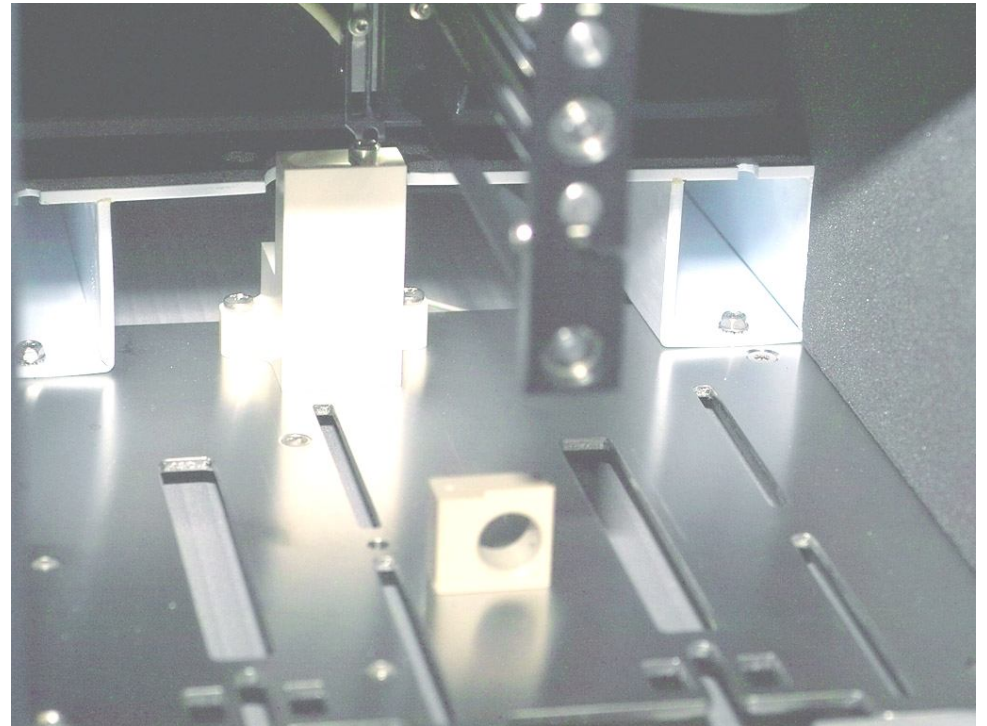
Calibrating Needle Z Axis



Calibrating XY and Zp Mechanism

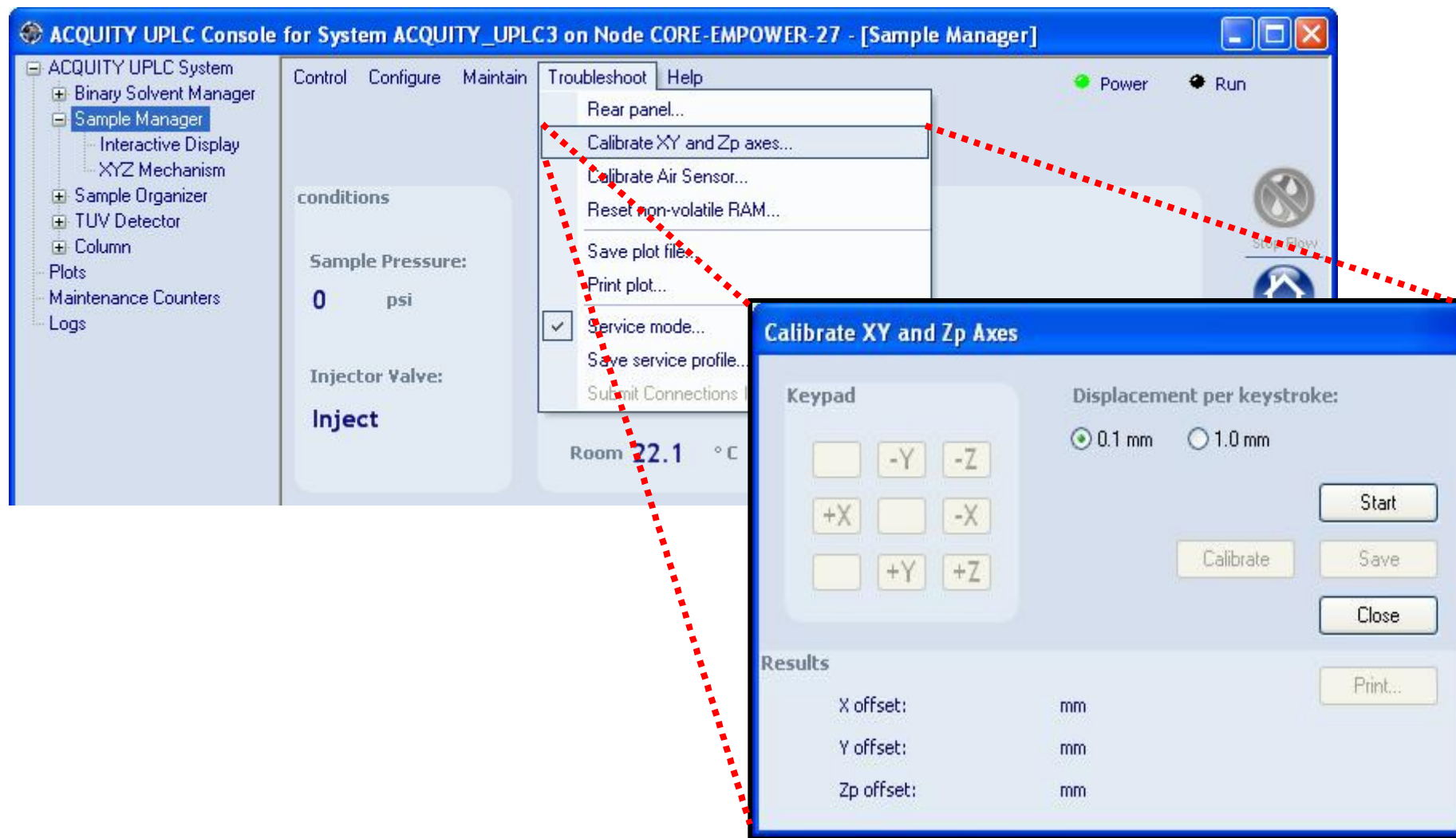


Teach Pin Tool

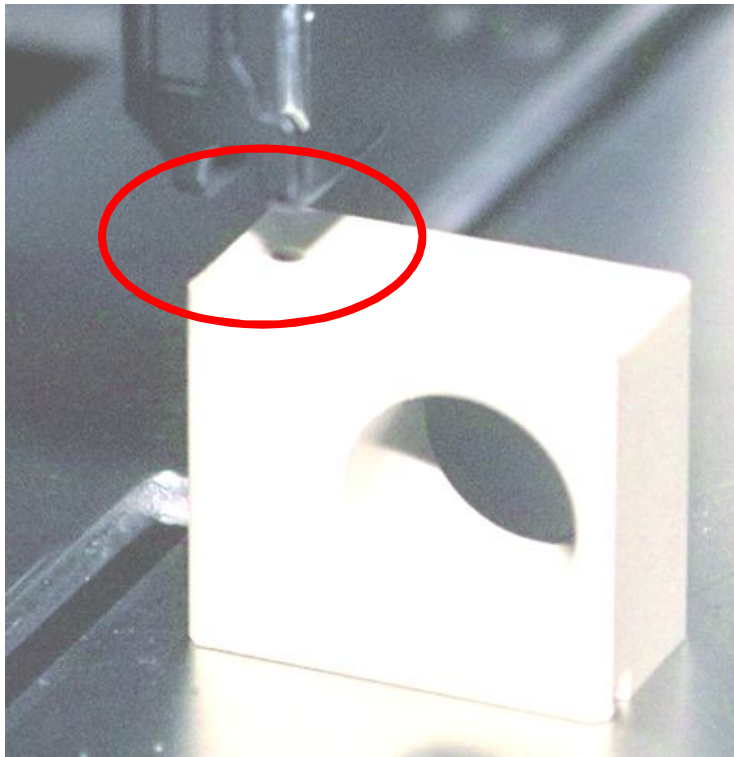


Teach Pin Tool Placement

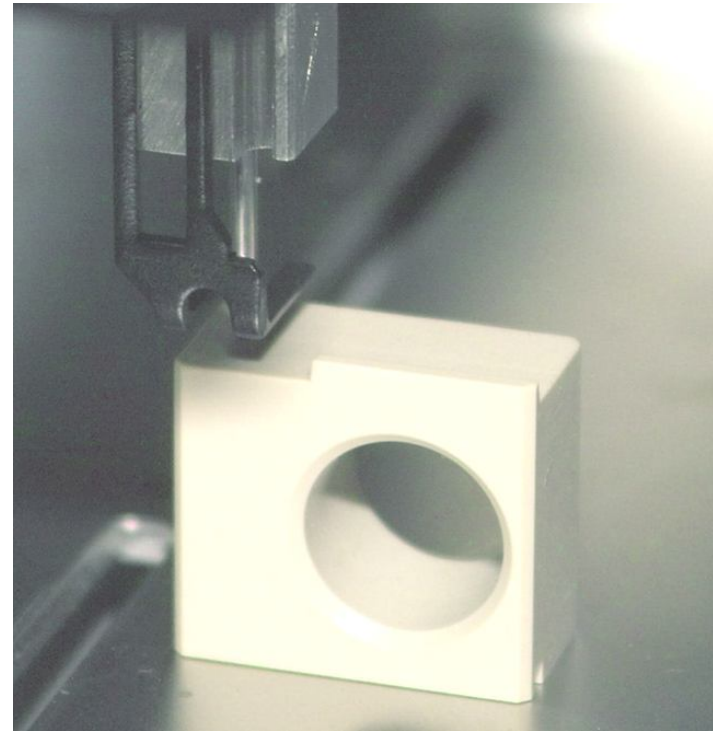
Calibrating XY and Zp Mechanism



Calibrating XY and Zp Mechanism



Teach Pin Tool Hole



Needle Position

Characterize Needle Seals

The screenshot displays the ACQUITY UPLC Console for System ACQUITY_UPLC3 on Node CORE-EMPOWER-27. The 'Sample Manager' tab is active, and the 'Maintain' menu is open, showing the 'Characterize' option. A red dashed line points from the 'Needle seal...' option in the 'Characterize' submenu to the 'Characterize Needle Seal' dialog box.

ACQUITY UPLC Console for System ACQUITY_UPLC3 on Node CORE-EMPOWER-27 - [Sample Manager]

Control Configure Maintain Troubleshoot Help

ACQUITY UPLC System

- Binary Solvent Manager
- Sample Manager
 - Interactive Display
 - XYZ Mechanism
- Sample Organizer
- TUV Detector
- Column
- Plots
- Maintenance Counters
- Logs

conditions

Sample Pressure: 0 psi

Injector Valve: Inject

Power

Characterize

- Needle and loop volumes...
- Needle seal...

Replace

Calibrate needle Z axis...

Leak test

Back pressure regulator test...

Disable motors

Park injection valve

Defrost...

Reset injection count...

Create log entry...

sample

Current:

Characterize Needle Seal

Run time:

0.0 min

0.0

Start

<< Results

Close

Results

Passed:

Pressure: psi

Offset: mm

Print...

Characterize Needle and Loop Volumes

The screenshot displays the ACQUITY UPLC Console for System ACQUITY_UPLC3 on Node CORE-EMPOWER-27. The 'Sample Manager' tab is active, showing a tree view on the left with 'Sample Manager' selected. The main panel shows 'conditions' with 'Sample Pressure' at 0 psi and 'Injector Valve' set to 'Inject'. A 'Maintain' menu is open, showing options like 'Characterize', 'Replace', 'Calibrate needle Z axis...', 'Leak test', 'Back pressure regulator test...', 'Disable motors', 'Park injection valve', 'Defrost...', 'Reset injection count...', and 'Create log entry...'. The 'Characterize' option is highlighted, and a sub-menu is open showing 'Needle and loop volumes...' and 'Needle seal...'. A red dashed line points from the 'Needle and loop volumes...' option to the 'Characterize Needle and Loop Volumes' dialog box.

Characterize Needle and Loop Volumes

Nominal Configuration

Loop volume:	20.0	μL
Needle volume:	26.0	μL

Run time: 0.0 min

Start

<< Results Close

Results

	Measured volume
System volume with loop:	μL
System volume without loop:	μL
Loop:	μL
Needle:	μL

Print...

Summary

- Replace the needle assembly:
 - As part of a performance maintenance
 - If contaminant peaks appear that cannot be eliminated by changing the needle wash solvent
 - When the needle becomes bent or the tip gets damaged
 - If the needle is plugged

- Perform all the necessary tests
 - Calibrate the XYZ
 - Prime the sample manager
 - Calibrate the seals
 - Determine the system volume