

# DADE BEHRING

## **Workarounds**

**Dimension Vista<sup>®</sup> System**

**Rev 1.8**

**Nov 16, 2006**

## Table of Contents

Section 1	Service workarounds .....	3
	Manual alignments .....	3
	Aliquotter .....	3
	Aliquot lane correction manual alignment. ....	7
	Reagent prep .....	8
	Vial Mixer .....	16
	R2 probe.....	21
	Changing a probe.....	22
	Drain ground .....	26
	Cuvette wash clogs and leaks .....	28
	Camera upgrade .....	29
	Changing server 2 and 3 chains.....	32
	Air and Vacuum Checks .....	37
	Adjusting probe mixers .....	39
Section 2	Maintenance Procedures .....	41
	Performance tracking checklist .....	42
	Weekly check for water in filter bowls .....	43
	Checking regulator bowls for condensate.....	43
Section 3	Customer workarounds.....	45
	Sample rack jamming.....	45
	Aliquot plate pusher.....	46

# Section 1 Service workarounds

## Manual alignments

### Aliquotter

NOTES: The Reagent Handling System Auto-Alignment must be performed before the Aliquotter Auto-Alignment sequence (specifically, the Storage Ring must already be aligned).

Sample Racks must be removed from the Sample Rack positioner.

Aliquotter Probe tip must be clean.

After aligning the aliquotter (and cleaning as necessary) follow the steps to offset the alignment manually.

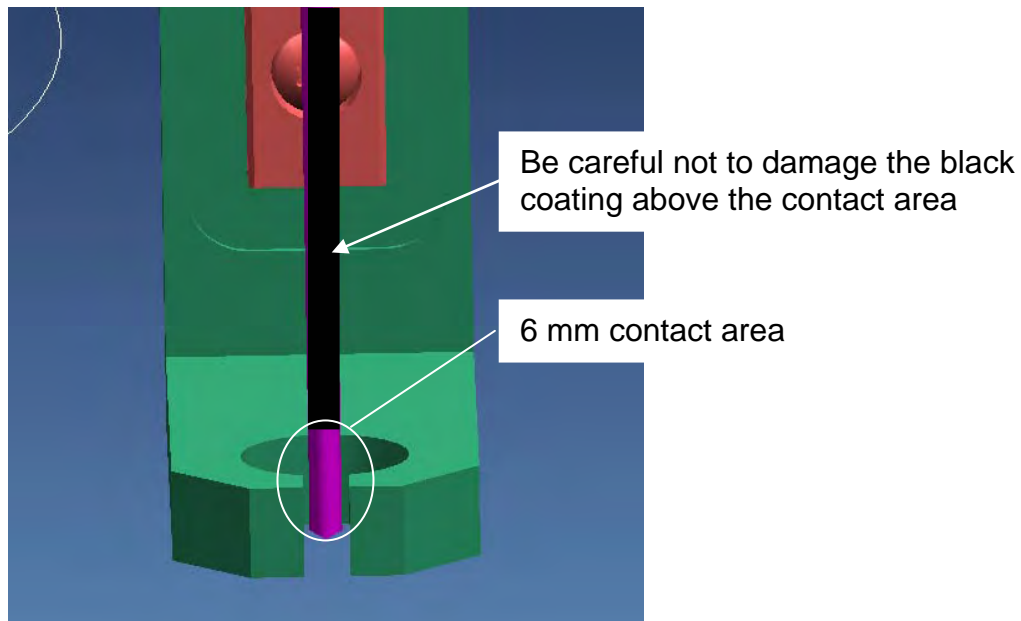
The instrument auto-aligns the aliquotter; however, the process tends to fail easily if any target surface becomes contaminated, which prevents the electrical contact necessary for the instrument to detect the position of the probe.

If auto-alignment fails at a target surface:

1. Inspect the target surface for evidence of contamination, such as discoloration. (The contamination might not be visible, so clean the area where the auto-alignment failed anyway.)
2. Swab that target-touch surface with a 10% bleach solution and/or alcohol wipes. Caution: Avoid touching plastic surfaces with alcohol.
3. Clean off the probe, too.

Following are views of the contact areas:

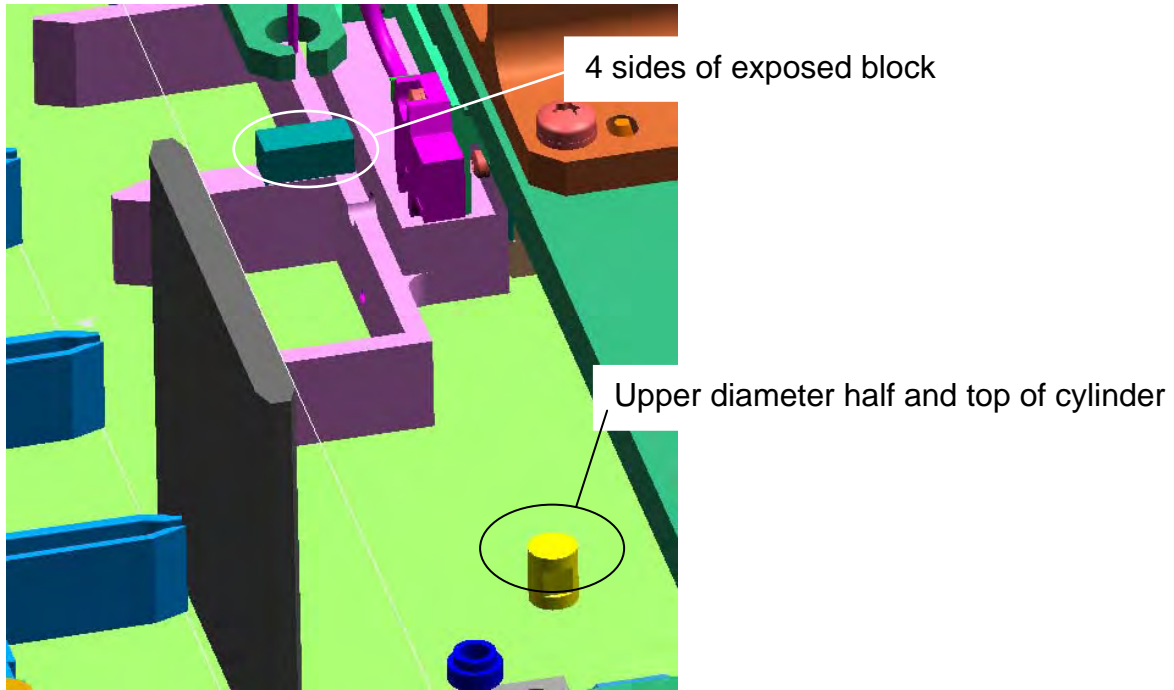
Probe tip contact area



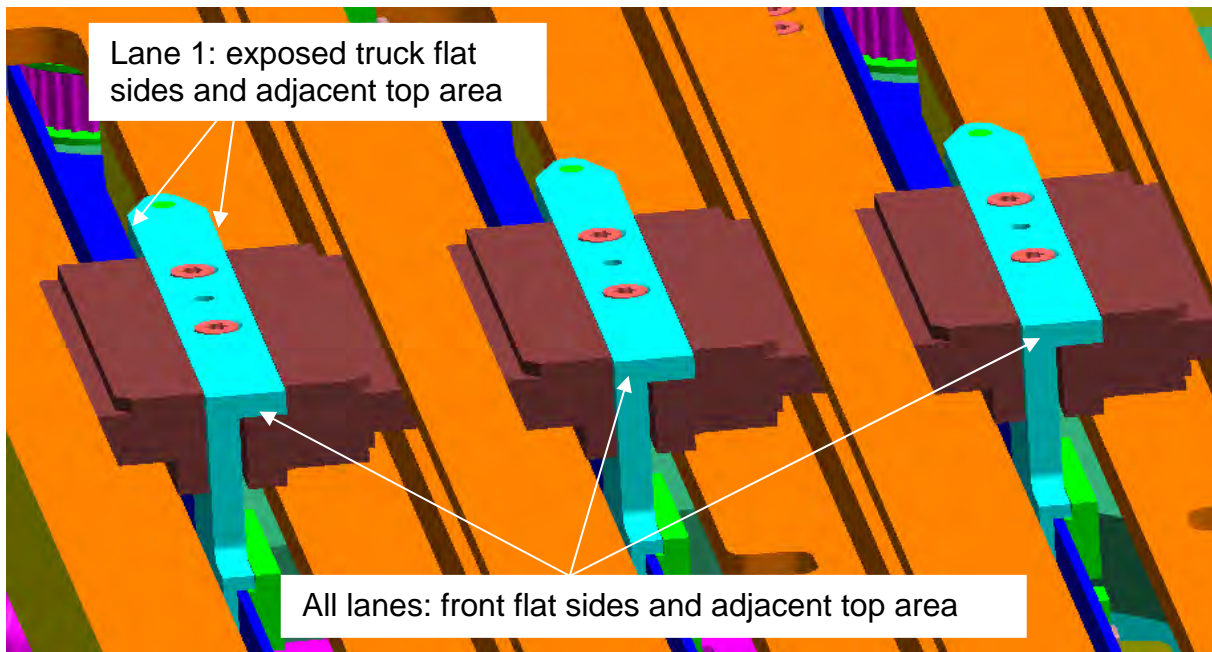
Drain target surfaces



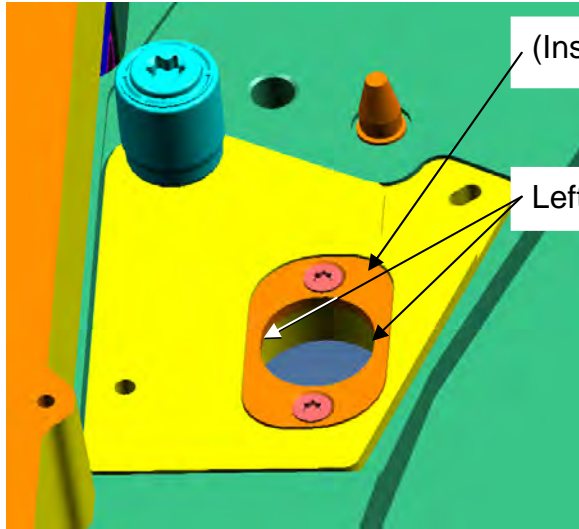
Sample rack target surfaces



Aliquot lane target surfaces



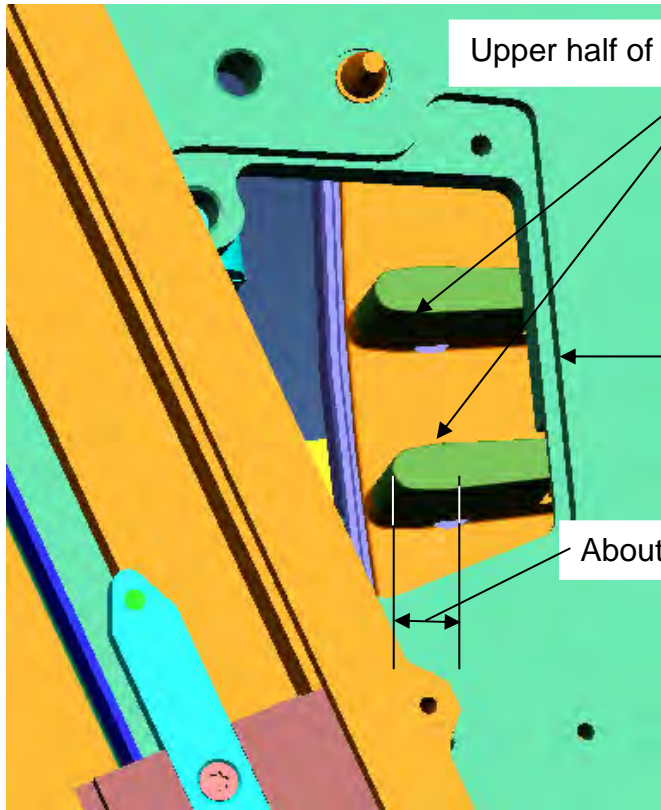
Vial Access target surfaces (future enhancement)



(Insert)

Left and right sides of opening and adjacent top area

Storage ring target surfaces

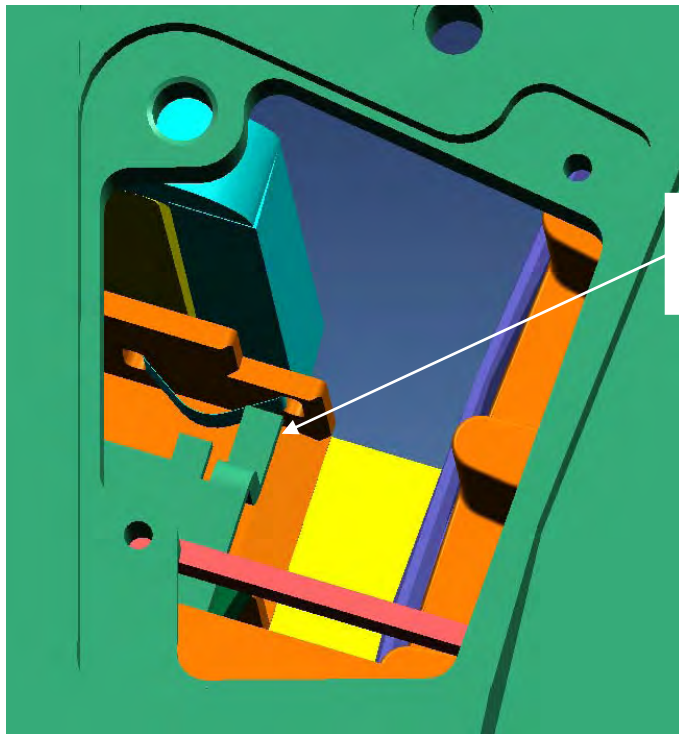


Upper half of opposing fin faces and adjacent top surfaces

(Shown with vial access plate assembly removed)

About 8 mm

## Shuttle 2 target surface



Shuttle 2 pusher lip right face and adjacent top face area

## Aliquot lane correction manual alignment.

Note: The instrument must be in the Instrument Check state.

Aliquotter auto-alignment must be performed before performing this manual alignment

Each step picks up from the previous step, so checking or resetting alignment in the middle of this procedure may require you to look at the previous step(s) to see where the mechanisms are assumed to be positioned

To select a target location without actually moving to the saved target position (offset), press and hold the keyboard 'Ctrl' key and then click the target location. (Used for initial or gross out of alignment, where a collision may occur if a mechanism is moved to a misaligned or unaligned target location)

### Aliquotter Probe Alignment to Aliquot Lane Verification Hole

#### Initial Alignment Verification

1. Go to Instrument Check. Wait for the instrument state to read Alignment Mode.
2. Click Home All Modules.
3. Click the Align tab.
4. Click AliquotLane(n), where (n) = the lane number to verify. In that **conveyer lane** menu click VerificationHoleToAliquotter.

5. Click Aliquotter and in the **horizontal** menu click AliquotLane(n), where (n) = the lane number to verify.
6. While at Aliquotter, in the vertical menu click AlignmentHeight.
7. Verify that the aliquotter probe is off center on the small verification hole in the top of the aliquot truck (probe is forward of the hole approximately 0.75 mm or 1/3 of probe diameter). If correction is necessary, go to Aliquotter Probe Alignment to Aliquot Truck Correction otherwise continue with the next step.
8. While at Aliquotter, click Home Mechanism.
9. Click AliquotLane(n), where (n) is the lane number verified/corrected, and click Home Mechanism.
10. Repeat steps 4 through 9 until all three lanes have been verified.
11. This completes this alignment verification.

#### Aliquotter Probe Alignment to Aliquot Truck Correction

12. While at Aliquotter, in the vertical menu click Move to Home.
13. Click AliquotLane(n), where (n) = the lane number to be corrected. In that conveyer lane menu click nHomeToAliquotterAlignment.
14. While at AliquotLane(n), in that conveyer lane menu enter 4 in the Step Size box and click Step – to adjust the aliquot truck position forward.
15. Click Record new nHomeToAliquotterAlignment to save the new position.
16. While at AliquotLane(n), in that conveyer lane menu click nVerificationHoleToAliquotter.
17. Click Aliquotter and in the Vertical menu click AlignmentHeight.
18. Verify the correction.
19. While at Aliquotter, click Home Mechanism.
20. Click AliquotLane(n), where (n) = the lane number just corrected, and click Home Mechanism.
21. Continue with step 10.

## Reagent prep

### Hardware Required

Flex Alignment Gauge (1000036241) or Flex® Reagent Cartridge



## Alignment Dependencies

All alignments of reagent loader, servers 1-3, storage ring and shuttle 1 **MUST** be done to allow a Flex® Reagent Cartridge (or gauge) to be transferred to the Storage Ring and to shuttle 2 before aligning shuttle 2

NOTE: To select a target location without actually moving to the saved target position (offset), press and hold the keyboard 'Ctrl' key and then click the target location. (This is used for initial or gross out of alignment, where a collision may occur if a mechanism is moved to a misaligned or unaligned target location.)

## To Enter Diagnostics

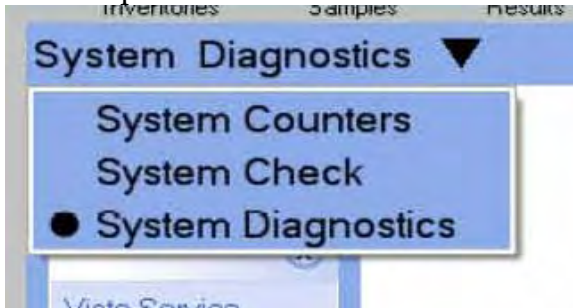
1. Click Advanced



2. Then click Diagnostics



3. Use the pull-down menu to the left to select System Diagnostics



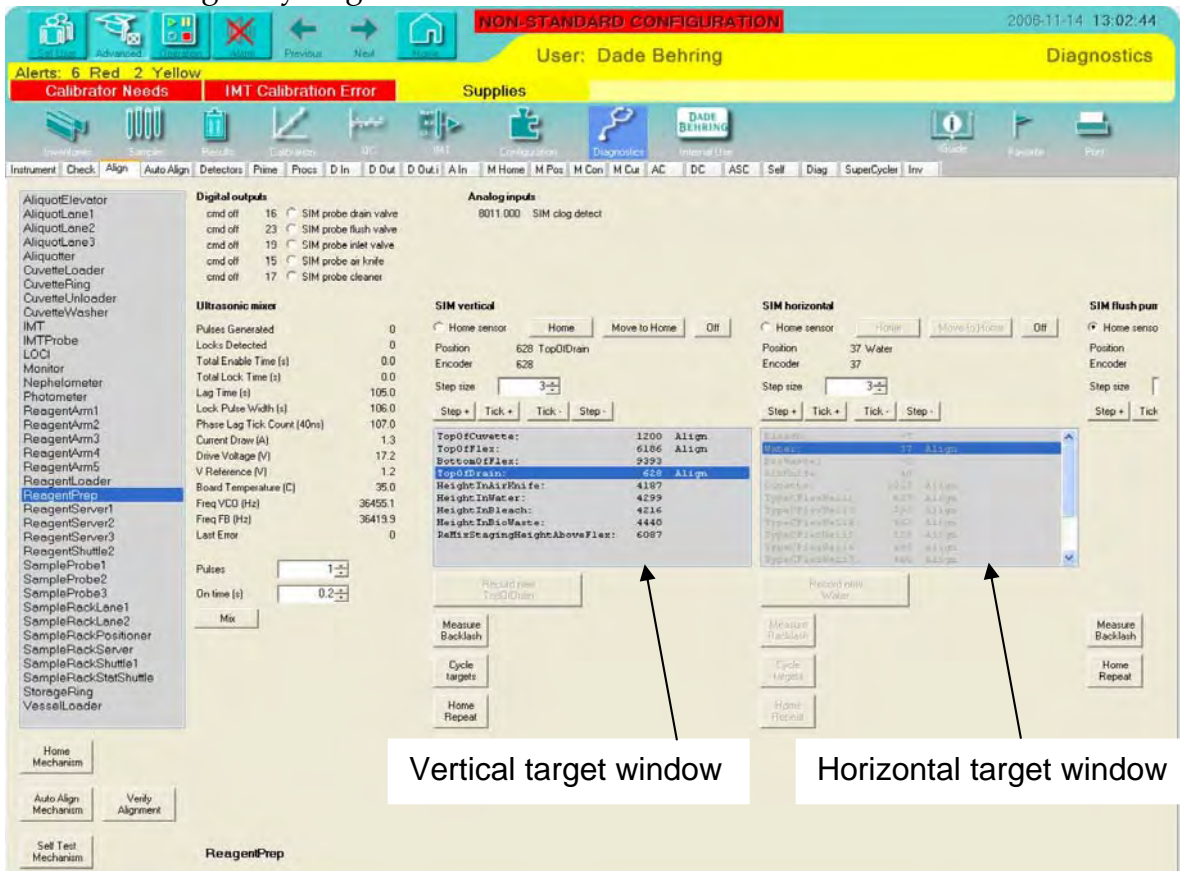
4. Click Vista Diagnostics to enter the Diagnostics menu.



- Click Home All Modules.



- After the modules home, click the Align tab at the top. This displays a menu that has a module listing on the left. The rest of the screen changes to display the appropriate functions for the module selected. In this window you can move a module through any target.



### Aligning the reagent prep probe to the reagent prep probe drain

1. In the module list at left, click ReagentPrep to bring up the reagent prep function menu.

Note the vertical and horizontal target windows. Also note the Step+, Tick+, Tick– and Step– buttons just above the target windows. Click these buttons to move the probe horizontally or vertically. The Step buttons move the probe the number of steps listed in the Step Size window above the buttons. The Tick buttons move the probe one step per click.

2. In the **horizontal** target window, click Water to move the probe to the drain (left port).
3. Next, in the **vertical** target window, click TopOfDrain to move the probe down to the drain well.
4. Use the Step and Tick buttons above the target windows to adjust the probe position until centered on the drain port.

**Notes:** The vertical alignment is done to the top of round drain port within the square well.

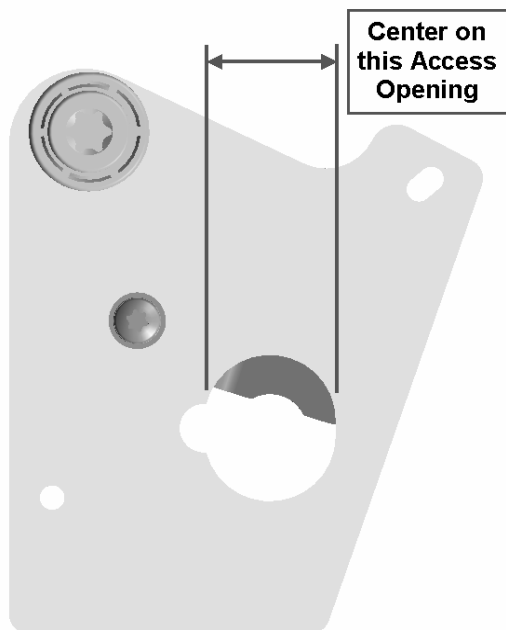
When alignments are moved using the Step/Tick buttons, the button below the target window becomes active, allowing storage of the new alignments.

5. When you are satisfied with the probe placement, click Record new Water to store the new alignment.
6. When you are satisfied with the probe placement, click the Record new TopOfDrain alignment.
7. Click Home Mechanism under the module list to finish the drain alignments.

### Aligning reagent prep probe to Flex prep access

1. Still in ReagentPrep, in the horizontal target window, click ReagentStorage to move the probe over the flex access point.
2. In the vertical target window click ReMixStagingHeightAboveFlex.

3. Verify that the reagent prep probe is centered on the Flex prep access opening.



4. If adjustment is necessary, ensure the probe is high enough to clear, and use the Step/Tick buttons below the horizontal target window to center the probe horizontally. Click Record new ReagentStorage to store the new alignment.
5. Click Home Mechanism beneath the module list again.

### Aligning reagent prep probe to top of Flex

1. Remove the access cover plate over the storage ring at the Flex prep access location.
2. In the module list, click ReagentServer1 and in the left function menu target window click ReagentShuttle1 to bring the transfer slot under shuttle 1.
3. In the module list, click ReagentServer2 and in that function menu target window click ReagentShuttle1 to bring the transfer slot under Shuttle 1.
4. Still in the module list, click ReagentServer3 and in that function menu target window click ReagentShuttle1 to bring the transfer slot under Shuttle 1.
5. Click ReagentShuttle2 and in that function menu target window click AtStorageRing.
6. Enter 82 in the Step size box and click Step – to clear the shuttle 2 pins.
7. In the module list, click StorageRing and in that function menu target window menu click ReagentShuttle1 to bring the transfer slot under Shuttle 1.
8. In the module list, click Reagent Loader and insert a Flex® Reagent Cartridge or alignment gauge into the reagent loader.

9. Click **Load** to load the Flex® Reagent Cartridge into shuttle 1.



10. In the Reagent Shuttle 1 target window, click **AtStorageRing** to move the Flex® Reagent Cartridge into the storage ring.
11. Next above the Reagent Shuttle 1 target window. Enter 82 in the **Step Size** box and click **Step –** to clear the Shuttle 1 pins.
12. In the module list, click **StorageRing**. In that function menu enter 42 in the **Index Pos** box and click **Once** to move the Flex® Reagent Cartridge to shuttle 2.
13. In the module list, click **ReagentShuttle2** and in the reagent shuttle 2 target window click **Well1** to place well 1 for reagent prep probe access.
14. If adjustment is necessary, use the **Step/Tick** function just below the **horizontal** target window to change the reagent prep probe position left or right.
15. Once satisfied with the horizontal position click the **Record new AtReagentStorage** button to store the new alignment.
16. In the module list, click **ReagentPrep** and in the **horizontal** target window click **ReagentStorage** to bring the probe over the Flex® Reagent Cartridge.
17. Also, in the **vertical** target window click **TopOfFlex** to drop the probe to the Flex® Reagent Cartridge.
18. Verify that the reagent prep probe just drags on a piece of paper between the probe and Flex® Reagent Cartridge. If adjustment is necessary, enter 10 in the **Step Size** box just above the **vertical** target window and click **Step +** or **Step –** to adjust the reagent prep probe position down or up, respectively, until the probe just drags on the paper.

**Notes:** If, when you first drop the probe to the Flex® Reagent Cartridge, it hits the Flex® Reagent Cartridge, you may need to raise the probe a few steps, re-home the probe vertically using the home button just above the vertical target window, then reselect the **TopOfFlex** target.

Be aware that you may need to readjust **TopOfFlex** during Re-Mix Access alignments

19. When you are satisfied with probe height, click **Record new TopOfFlex** to store the new position.
20. Click **Home Mechanism** below the module list to home the reagent prep module.
21. In the module list, click **StorageRing** and then click **Home Mechanism**.
22. Replace the storage ring access cover.

**Aligning reagent prep to Flex re-mix access**

1. Remove the access cover plate over server 1 at the reagent prep re-mix access location.



Access cover plate

2. In the module list click **Reagent Prep** to bring up the reagent prep function menu and verify that servers 1, 2, and 3 are all under shuttle 1 before moving the storage ring back under the shuttle.
  - 2.1. In the module list, click **ReagentServer1** and in that function menu target window click **ReagentShuttle1** to bring the transfer slot under Shuttle 1.
  - 2.2. In the module list, click **ReagentServer2** and in that function menu target window click **ReagentShuttle 1** to bring the transfer slot under Shuttle 1.
  - 2.3. In the module list, click **ReagentServer3** and in that function menu target window click **ReagentShuttle 1** to bring the transfer slot under shuttle 1.
3. In the module list, click **ReagentLoader** and in that function menu reagent shuttle one target window, click **AtStorageRing** to bring the shuttle into position.
4. In the module list, click **StorageRing** and in the function menu click **ReagentShuttle1** to move the Flex® Reagent Cartridge under shuttle 1.
5. In the module list, click **ReagentLoader** and in the reagent shuttle 1 target window, click **AtReagentServer1** to move the Flex® Reagent Cartridge into server 1.
6. Still in the **ReagentLoader**, in the **Reagent Shuttle 1** menu enter **52** in the **Step Size** box and click **Step –** to clear the Shuttle 1 pins.
7. In the module list. click **ReagentServer1** and in that target window click **TypeCFlexWell2** to take the server to well 2 access.
8. In the module list, click **ReagentPrep** and in the **horizontal** target window click **TypeCFlexWell2**.
9. Still in **ReagentPrep**, in the **vertical** target window, click **ReMixStagingHeightAboveFlex** to move the probe down near the Flex® Reagent Cartridge.

10. Verify that the reagent prep probe is centered on the well 2 gauge target circle.

**Note:** If the probe is off center toward the gauge ends (left or right), then the reagent prep probe location will likely have to move right or left. If the probe is off center towards the gauge sides (front or rear), then server 1 will likely have to rotate CW or CCW. **Either or both of these adjustments might have to be done.**

11. If left-to-right adjustment is necessary:

11.1. Use Step/Tick + or – above the **horizontal** target window to center the probe.

12. When you are satisfied with left-to-right probe position, click Record new TypeCFlexWell2 below the horizontal target window.

13. If front-to-back adjustment is necessary:

13.1. In the module list, click ReagentServer1,

13.2. Use Step/Tick + or – above the target window to center the probe.

14. When you are satisfied with front-to-back probe position click the Record new TypeCFlexWell2 button below the horizontal target window.

15. In the module list, click Reagent Prep, then click Home Mechanism.

16. In the module list, click ReagentServer1, then click Home Mechanism.

17. Repeat steps 10 through 15 until centered on the well.

18. Repeat steps 7 through 14 for wells 3–11.

**Note:** After ascertaining the probe is over the center of the well, check that TopOfFlex height is a paper thickness above the top of the Flex® Reagent Cartridge. If not, adjust the height to comply. To do so, in the ReagentPrep function menu click Home above the vertical target window to home the probe vertically. Then select the TopOfFlex target in the window. Verify paper height above the Flex® Reagent Cartridge, adjust if necessary.

19. Once you are satisfied with all positions, click Home Mechanism.

20. In the module list, click ReagentServer1 and then click Home Mechanism.

21. While at ReagentServer1, in that target window select Reagent Shuttle 1 to move the Flex® Reagent Cartridge under shuttle 1.

22. In the module list, click ReagentLoader and for reagent shuttle 1 click Home Mechanism to move the Flex® Reagent Cartridge or gauge to the reagent loader.

23. Remove the alignment gauge from the loader.

24. Replace the access cover plate over server 1 at the reagent prep re-mix access location.

## Vial Mixer

Software required: Instrument Check

### Aligning Flex® Reagent Cartridge to shuttle 2 and storage ring.

All alignments of reagent loader, servers 1–3, storage ring and shuttle 1 should be done to allow a Flex® Reagent Cartridge to be transferred to the storage ring and to shuttle 2 before aligning the shuttle 2. The alignment of the aliquot probe and reagent prep probe to the storage ring (the hydration target) **MUST** be done in their respective menus before aligning the storage ring, shuttle 2, and vial mixer. The probe horizontal location is the master location driving the other modules' alignments. Note each step picks up from the previous step, so checking or resetting alignment in the middle of this procedure may require you to look at the previous step to see where the mechanisms are assumed to be positioned.

#### Preparation

1. Remove the cover plate over the storage ring at the hydration target point.
2. Launch the Instrument Check software and wait for the instrument state to read Alignment Mode.
3. Click Home All Modules.
4. Click the AC tab and turn off the vacuum pump by clicking ACPC Vacuum Pump to clear the radio button.
5. Click the Align tab and click Storage Ring.
6. Click At Shuttle 2 to move slot 0 to the shuttle 2 position.
7. In the Reagent Shuttle 2 main menu under the Reagent Shuttle 2 sub-menu click At Storage Ring to move shuttle 2 into the storage ring.
8. Enter 82 into the Step Size box and click Step – to move shuttle 2 to the pick-up position.
9. In the Storage Ring menu click At Shuttle 1 line to bring slot 0 back to shuttle 1.
10. Click the Reagent Loader menu.
11. Click Home in the Flex Loader menu and manually insert a Flex® Reagent Cartridge under shuttle 1.
12. In the Server 2 menu click Reagent Shuttle 1.
13. In the Server 3 menu click Reagent Shuttle 1.
14. In the Reagent Loader-Reagent Shuttle 1 menu, click At Storage Ring.
15. Enter 82 in the Step Size box and click Step – to clear the shuttle 1 pins.



16. In the Storage Ring menu, enter 42 in the Index Pos box and click Once to move the Flex® Reagent Cartridge to shuttle 2.
17. In the Aliquotter-Horizontal menu, click Reagent Storage.

#### Aligning the storage ring to the aliquot probe

1. In the Aliquotter-Vertical menu enter 3000 in the Step Size box and click Step +.
2. In the Storage menu, enter 25 in the Step Size box and click either Step + or Step – as needed to center the Flex® Reagent Cartridge with the probe.
3. If the Reagent Shuttle 2 is highlighted and the Record New Reagent Shuttle 2 box not greyed out then click Record New Reagent Shuttle 2 button to save the new position. Otherwise, hold the Ctrl button on the keyboard down, then click the Reagent Shuttle 2 line and click Record New Reagent Shuttle 2.
4. In the Storage Ring menu, click Home Mechanism, then click Reagent Shuttle 2 line and confirm the Flex® Reagent Cartridge is centered with the probe. If not repeat the above steps.
5. In the Aliquotter menu click Home Mechanism

#### Setting the reagent prep top of Flex position

1. In the Reagent Prep-Vertical menu click Home then the Horizontal menu, click Reagent Storage.
2. In the Vertical menu click Top of Flex.
3. Adjust the height of the probe until it just touches the top of the Flex® Reagent Cartridge by adjusting the Step Size and clicking Step + or Step – to move the probe. When the probe is adjusted to the top of the Flex® Reagent Cartridge hold the Ctrl key on the keyboard down and click the Top of Flex line. If no adjustment is necessary, then Home Mechanism, and go to Aligning the vial mixer to the storage ring.
4. Click the Record New Top of Flex button to save the position.
5. Click Home Mechanism.

#### Aligning the vial mixer to the storage ring

1. In the Reagent Shuttle 2- Reagent Shuttle 2 menu, Enter 20 in the Step Size box and click Step – until the Flex® Reagent Cartridge just starts to enter the vial mixer. At this point enter the Vial Mixer menu click Tick + or Tick – to move the vial mixer so it is aligned with the Flex® Reagent Cartridge.

2. When the Flex® Reagent Cartridge is aligned with the mixer, in the Vial Mixer menu hold the Ctrl key on the keyboard down and click the At Shuttle line, then click Record New at Shuttle to save the vial mixer position.
3. In the Reagent Shuttle 2 menu click Home to move the Shuttle 2 home.
4. Click At Storage Ring and then Home several times to confirm the Flex® Reagent Cartridge moves in and out of the mixer to the storage ring smoothly.

#### Setting the Shuttle 2 Vial Mixer position to equal the Shuttle 2 Home Position

In the Reagent Shuttle 2 menu click Home then hold the Ctrl button down and click At Vial Mixer. This sets the shuttle 2 vial mixer position to the shuttle 2 home position.

#### Setting the Shuttle 2 Drop off Position in the Storage Ring (CAD=3247)

1. In the Reagent Shuttle 2 menu click at Storage Ring and enter 10 in the Step Size box. Reaching in through the hydration hole in the top plate push the Flex® Reagent Cartridge towards the Storage Ring with your hand until it bottoms out. Click STEP PLUS several times then continue to push the Flex® Reagent Cartridge until it bottoms. Click STEP PLUS again until the pushing pin on the Shuttle 2 pusher is just up against the Flex® Reagent Cartridge and no play exists. Do not go so far that an in motion error occurs or the Shuttle 2 will need to be homed and this step repeated. When there is no more play between the Flex® Reagent Cartridge and Shuttle 2 pusher pin, enter 54 in the Step Size box in the Reagent Shuttle 2 menu and click Step –.
2. Hold the Ctrl key on the keyboard down and click At Storage Ring.
3. Click Record New at Storage Ring to save the new position. This number should be approximately 3247.

#### Verifying the drop-off position

1. Click Home Mechanism, then click At Storage Ring.
2. Enter 39 in the Step Size box of the Reagent Shuttle 2 menu the click Step –. This clears the shuttle 2 pins.
3. While observing the Storage ring, go to the Storage Ring menu and click Once to move 1 slot. Observe that the Flex® Reagent Cartridge does not hit the Shuttle 2 pin.
4. Click the down arrow in the Index Pos box until -2 appears then click Once to move the storage ring back 2 slots. Observe the Flex® Reagent Cartridge doesn't hit the shuttle 2 pins. If it does then setting the drop-off point in the storage ring must be re-done to reduce or increase the drop-off point depending on which pin

the Flex® Reagent Cartridge hits. If the Flex® Reagent Cartridge hits the pin closest to the storage ring liner, then the drop-off point needs to be reduced.

5. If no interference occurs then enter 1 in the Index Pos box and click Once to bring the Flex® Reagent Cartridge back under the Shuttle 2.
6. Click Home in the Reagent Shuttle 2 menu.

Setting the Flex to midpoint position.

1. In the Reagent Shuttle 2 menu, click Midpoint.
2. In the Reagent Prep-Horizontal menu click Reagent Storage.
3. In the Vertical menu click Top of Flex.
4. Check to see if the reagent prep probe is between wells 6 and 7. If not, adjust it by doing the following:
  - 4.1. In the Shuttle 2-Reagent Shuttle 2 menu click Step + or Step – to move shuttle 2 as needed to center the probe in between wells 6 and 7. Note: Raise the reagent prep probe up a small amount so it doesn't touch the Flex® Reagent Cartridge during this adjustment.
  - 4.2. In the Reagent Shuttle 2 menu, hold the Ctrl button down and click Midpoint, then click the Record New Midpoint to save the position.
5. In the Reagent Prep menu, click Home Mechanism.
6. In the Shuttle 2 menu, click Storage Ring.

Setting the top of vial and vial A positions.

1. In the Storage Ring menu click At Shuttle 1 to return the Flex® Reagent Cartridge under shuttle 1 which was left over the storage ring.
2. In the Reagent Loader-Reagent Shuttle 1 menu, click Home Mechanism to eject the Flex® Reagent Cartridge. Click Home in the Flex Loader menu.
3. Insert a vial in each end of the vial carrier and insert the carrier under Shuttle 1.
4. In the Reagent Loader Reagent Shuttle 1 menu click At Storage Ring.
5. Enter 82 in the Step Size box in the Reagent Shuttle 1 menu and click Step – to clear the Shuttle 1 pins.
6. In the Reagent Shuttle 2 menu, click Home.
7. In the Storage Ring menu click Reagent Shuttle 2.
8. In the Reagent Shuttle 2-Reagent Shuttle 2 menu click Vial A. Push the vial carrier up against the shuttle 2 home side pin (left side of the instrument as you face the front of the instrument).

9. In the Aliquotter-Horizontal menu, click At Reagent Storage.
10. In the Vertical menu, enter 3200 in the Step Size box in the Vertical menu and click Step +.
11. In the Reagent Shuttle 2-Reagent Shuttle 2 menu adjust the shuttle 2 position by clicking Step + or Step – to center the vial carrier under the aliquot probe. You will need to push the carrier by hand to make sure it is up against the Shuttle 2 home side pin when moving to the left.
12. When the correct Shuttle 2 position is obtained, hold the Ctrl key down on the keyboard and click the Vial A line in the menu.
13. Click the Record New Vial A button to save the setting.
14. In the Aliquotter-Vertical menu click Home.
15. In the Reagent Shuttle 2 menu click Home and then Vial A.
16. In the Aliquotter-Vertical menu click Top of Vial and adjust the vertical setting using the Step + or Step – to adjust the probe to the top of the vial. If an in motion error occurs the vertical must be re-homed and lowered to a starting step count of 3000 then adjusted to the top of vial position.
17. When the top of vial position is determined, hold down the Ctrl key on the keyboard and click the Top of Vial line (if not selected), and click Record New Top of Vial Position to save the setting.

#### Verify the Vial Positions

1. In the Aliquotter-Vertical menu click Home.
2. In the Reagent Shuttle – Reagent Shuttle 2 menu click Home.
3. Right click the Reagent Shuttle 2 title and select Stepper Motor Ramp-Select Different Command. Select Reagent Shuttle 2 Slow Ramp. Click Use Selected Command and Exit.
4. Click Vial A.
5. In the Aliquotter-Vertical menu click Top of Vial.
6. Verify the probe is centered in the vial cap at the top of the cap. Redo the above steps as required to achieve a centered vial position.
7. Click Home in the Vertical Menu.
8. In the Reagent Shuttle 2 menu, click Home.
9. In the Reagent Shuttle-Conveyer Shuttle menu click Vial F.
10. In the Aliquotter-Vertical menu click Top of Vial and check the vial position under the probe. Readjust Vial A position if it is off.

11. Click Home Mechanism in the Aliquotter menu.
12. In the Reagent Shuttle – Reagent Shuttle 2 menu click Home then At Storage Ring.
13. Enter 39 in the Step Size box and click Step – to clear the pins.
14. In the Storage Ring menu click Reagent Shuttle 1 to move the Vial carrier under Shuttle 1.
15. In the Reagent Shuttle 2 – Reagent Shuttle menu click Home Mechanism.
16. In the Reagent Loader-Reagent Shuttle 1 menu click Home Mechanism to eject the carrier.
17. Replace the hydration cover plate.

## R2 probe

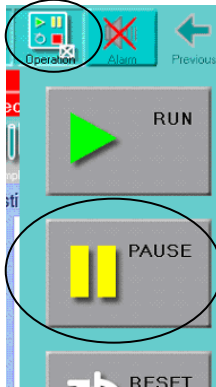
Align the probe horizontally and angularly before aligning it vertically.

1. Make sure the cuvette ring is loaded with cuvettes.
2. Open Instrument Check.
3. Home all modules.
4. Go to the Align tab.
5. Choose the R2 module by selecting it on the screen.
6. Select the horizontal target Cuvette.
7. Select the angular target R2L.
8. Select the vertical target Top of Cuvette.
9. Inspect the horizontal and angular alignment. If necessary, adjust the location of the probe with respect to the cuvette by using the Tick+, Tick-, Step+, or Step- buttons, then save the alignment. (The Tick buttons move the probe one step at a time; the Step buttons move it by the number of steps in the Step Size box.)
10. Select the vertical target Bottom of Cuvette.
11. Inspect the vertical alignment. The probe should be no more than two steps off the bottom of the cuvette. If necessary, use the Tick button to move the cuvette down until the probe is just touching the bottom of the cuvette, then back it off by no more than two steps. Store the new alignment.
12. Do a Home Mechanism for the R2 arm.

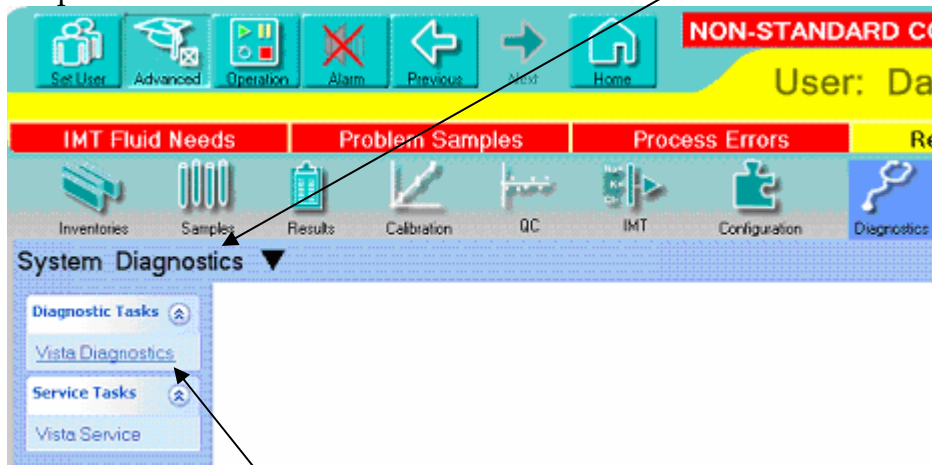
# Changing a probe

Changing a probe is easier if you move the probe carrier to the most convenient location.

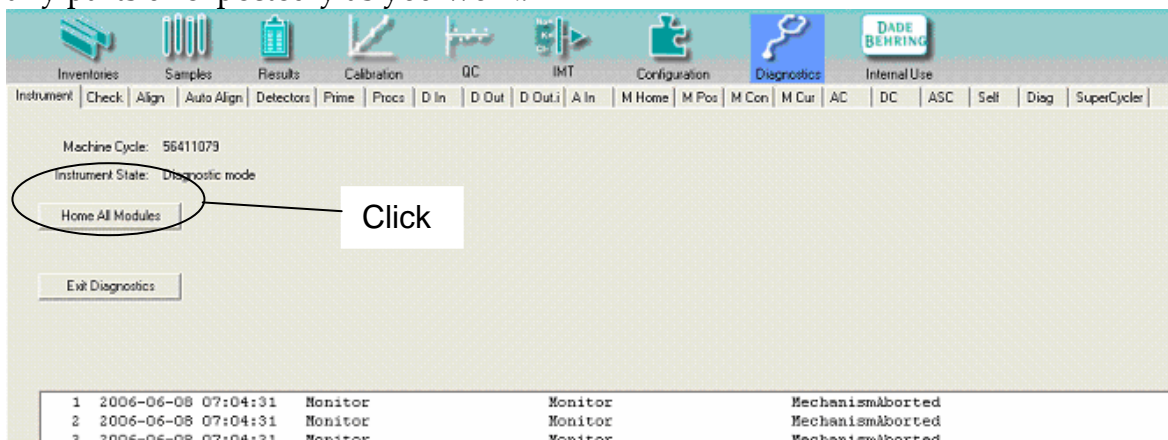
1. Pause the instrument: Click Operation, then PAUSE. Pausing takes several seconds. Wait until Paused appears in the upper right corner of the screen.



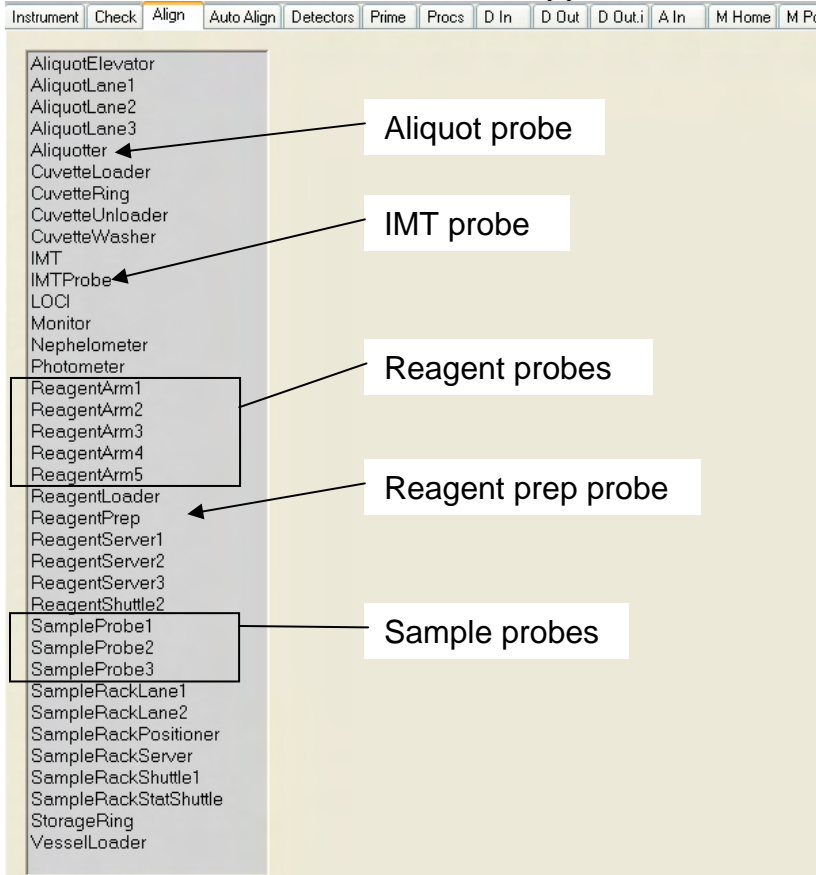
2. Click Advanced, then Diagnostics, then choose System Diagnostics from the blue drop-down menu.



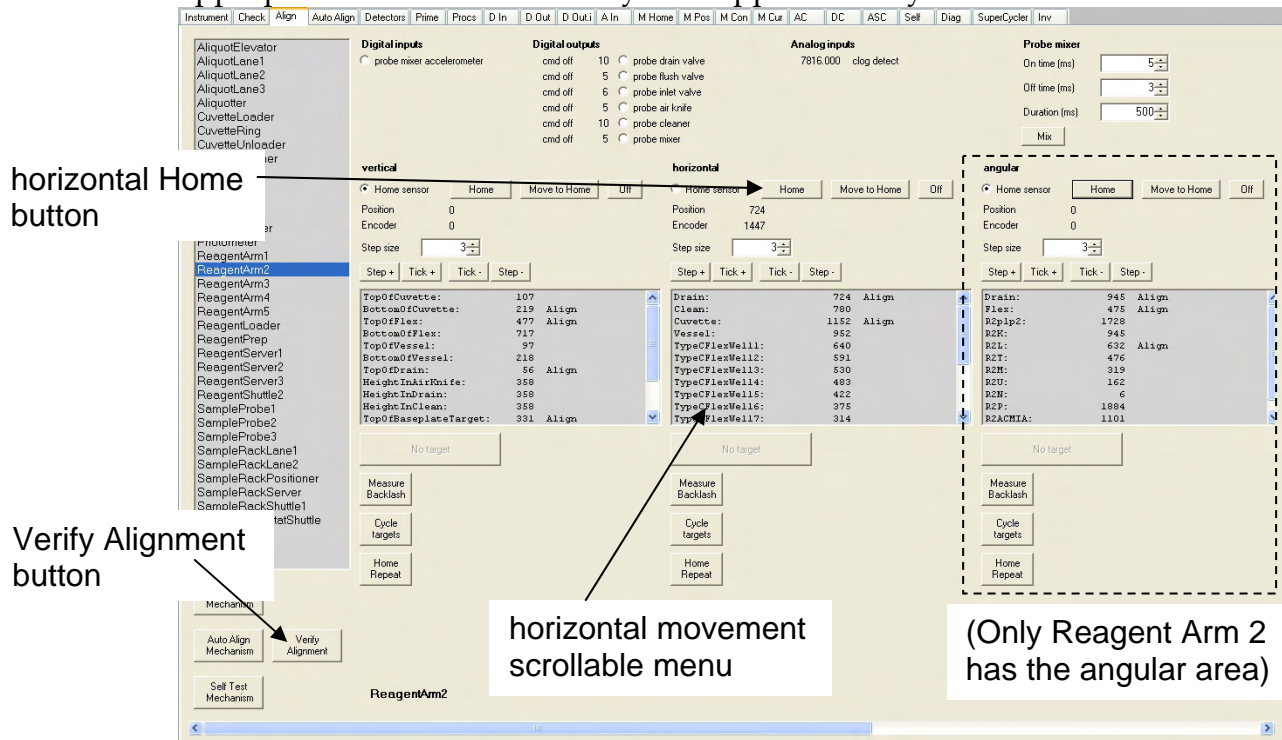
3. Click Vista Diagnostics from the menu on the left. The diagnostics window appears, showing several tabs across the top. Now the instrument will not move any parts unexpectedly as you work.



4. Click Home All Modules. All the probes move to a safe known location; the process takes about a minute.
5. Click the Align tab. A list of modules appears on the left.



- Click the module for the probe you want to install. The screen fills with fields appropriate to the module. They look approximately like this:

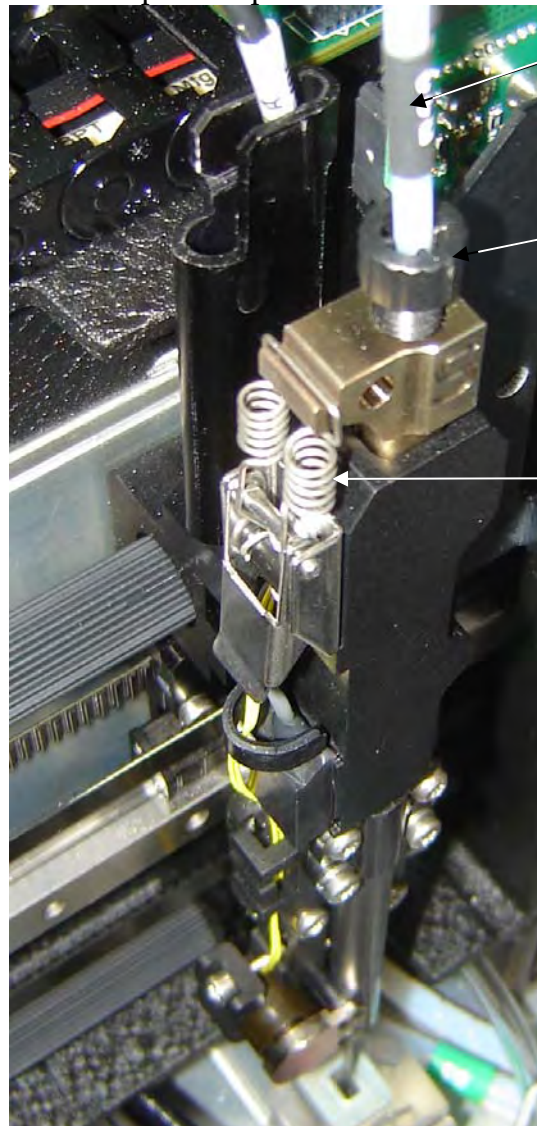


- Follow the table below to move the probe to the best location for removal. Unless told otherwise, chose the appropriate item from the scrollable menu in the horizontal area.

Probe	horizontal menu choice	Other action	Finish
Aliquotter		horizontal Home	Before going to the next probe: 1. Click <b>Home Mechanism</b> 2. Click <b>Verify Alignment</b>
Reagent Prep (aka Ultrasonic)	[No change necessary]	[No change necessary]	
Sample 1	Cuvette		
Sample 2	Cuvette		
Sample 3		Enter <b>350</b> in the horizontal step size field and click <b>+Step</b>	
IMT		Then enter <b>1600</b> in the horizontal step size field and click <b>+Step</b>	
Reagent 1		horizontal Home	
Reagent 2		angular Home	
Reagent 3	Cuvette		
Reagent 4	Cuvette		
Reagent 5	FlexWell 4		



8. Remove the probe.
  - 8.1. Disconnect the tube at the top.
  - 8.2. Release the spring clip.
  - 8.3. Slide the probe up out of the holder.

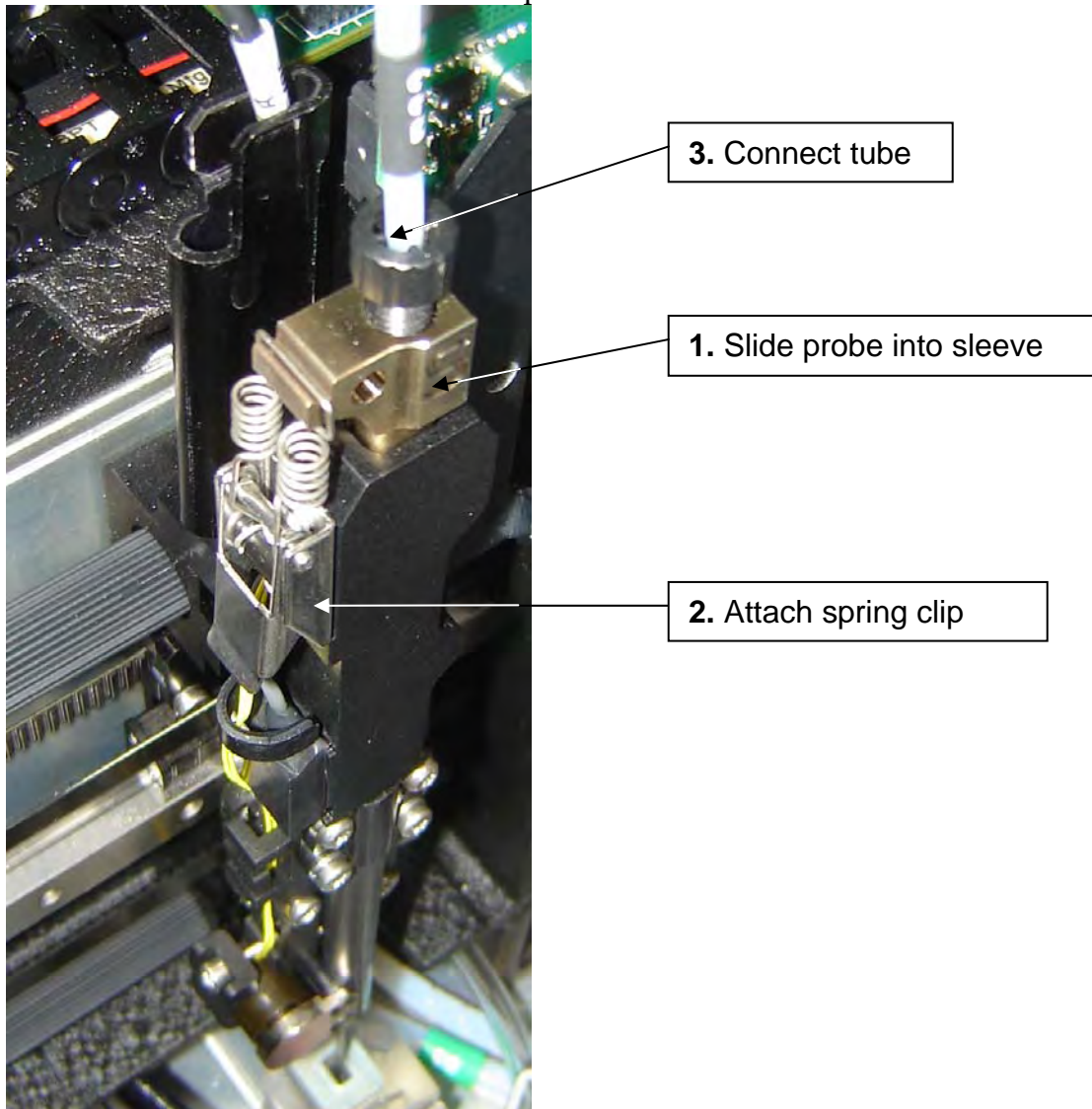


1. Disconnect tube

3. Slide probe out of sleeve

2. Release spring clip

9. Attach the new probe. Each is attached with a spring clip and has a tube to connect. Be sure to attach the correct probe to the correct arm.

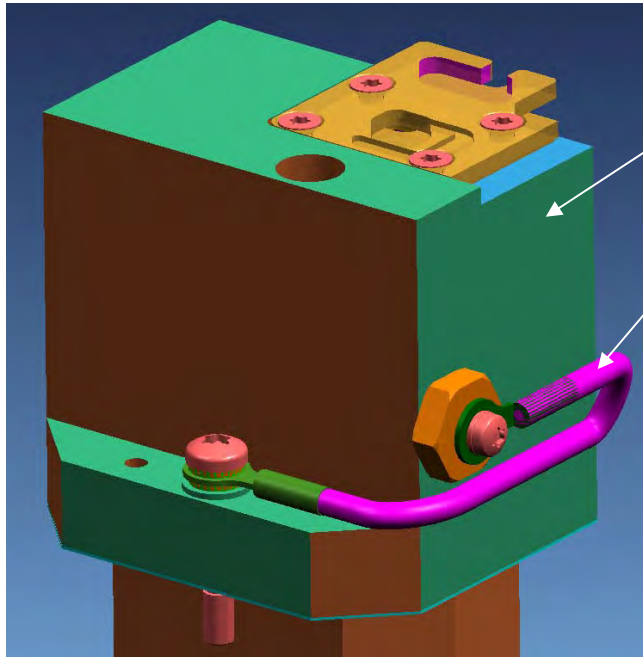


## Drain ground

Aliquotter probe drains marked Rev G already have a grounded aliquot drain; all previous versions need a ground cable on the aliquot drain.

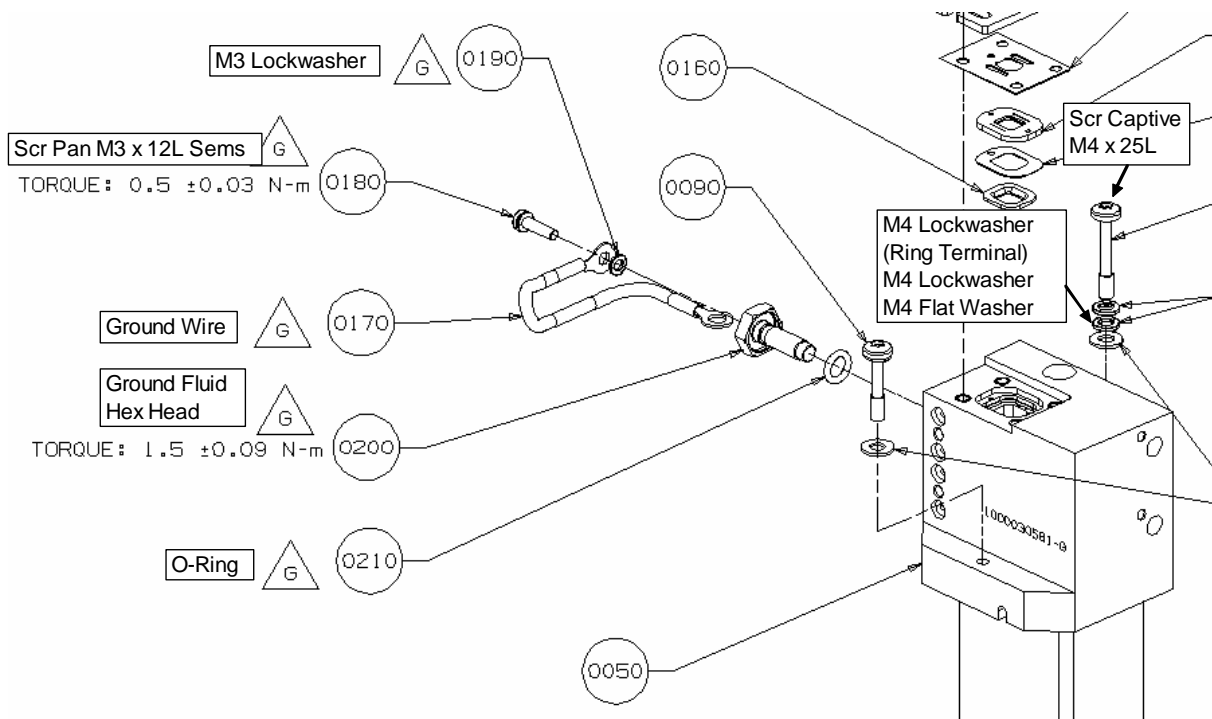
1. Inspect the current drain to verify the ground mod is not already installed. If it is then this mod should be checked off as complete. If not go to step 2.
2. Order the following part: QTY 1 – 1000030581-G Aliquot Probe Assy Drain
3. Make sure the Aliquotter is moved out of the way while working on the drain. Remove the current drain by removing the fluid and vacuum connections, unscrew the two captive mounting screws, and carefully lift the drain out of the instrument.

4. Replace the drain by reversing the steps in number 3 above with the Rev. G drain. You may have to put a little water on the o-ring on the bottom of the drain to help reinstall. Use a swab to apply deionized water to avoid contamination.
5. Perform the Aliquot probe auto alignment.
6. Complete the EPTRACKER procedure STEP 111 – Cycle Testing – “Aliquotter Alignment: Verify drain and probe connections, vacuum and air knife air flow”
7. Sign off mod code MEN on the mod code sticker and notify E. Ivelisse Mora via Lotus Notes email with date of completion, mod code, and serial number.



Rev G drain

Ground wire

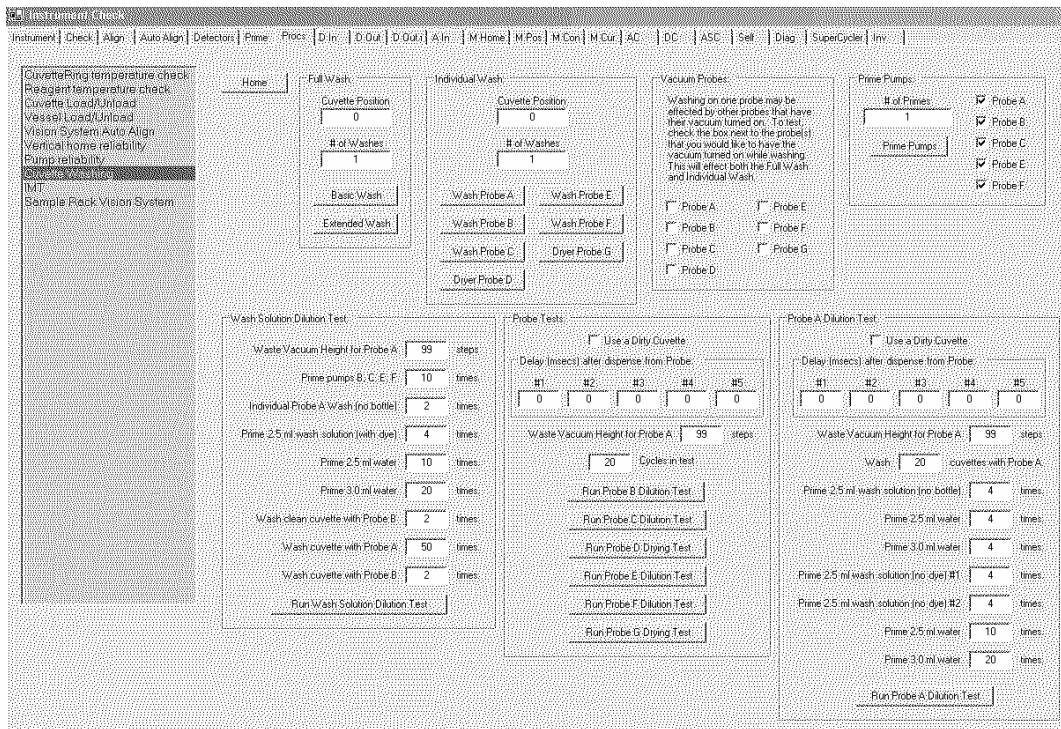


# Cuvette wash clogs and leaks

## Verify functionality

1. Check each wash probe functionality in Instrument Check. Watch for drips on the probes after wash solution delivery. There should be none.
2. Make sure the wash delivery lines do not have air bubbles in the lines.
3. Check the dryer boots and replace if necessary (if damaged).
4. Make sure that there are not any clogs in the manifolds on the vacuum side.
5. Repair any issues if found.

Informational Service Bulletin DV-00001 was issued for some of these checks on an every visit basis.



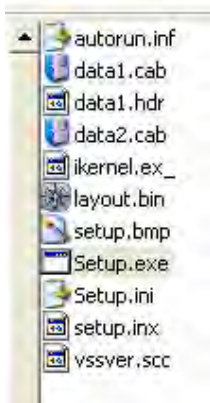
# Camera upgrade

## Tools Needed

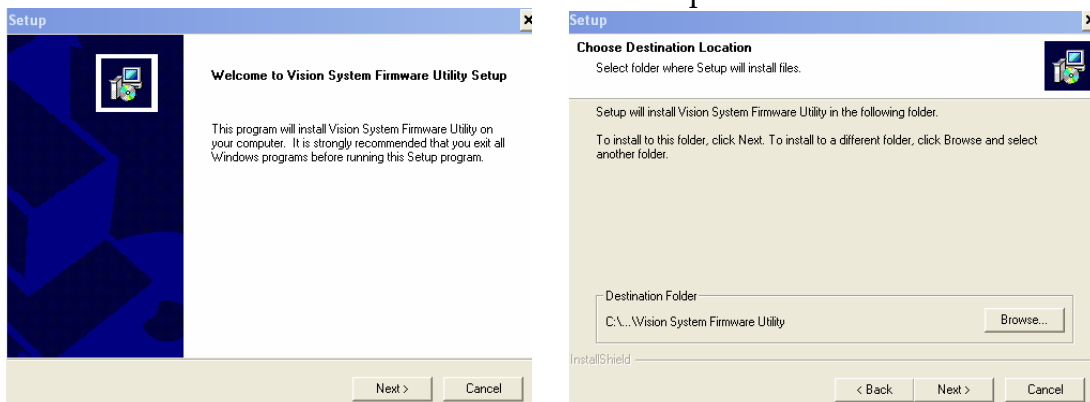
- Firmware Upgrade Kit (cable and software) – P/N 1000036538-a (cable P/N – 1000036407-a and Software CD 1000036537-a)
- Field laptop PC (needs serial port or USB-to-serial converter cable)
- New firmware file for sample rack handling
- New firmware file for reagent loader

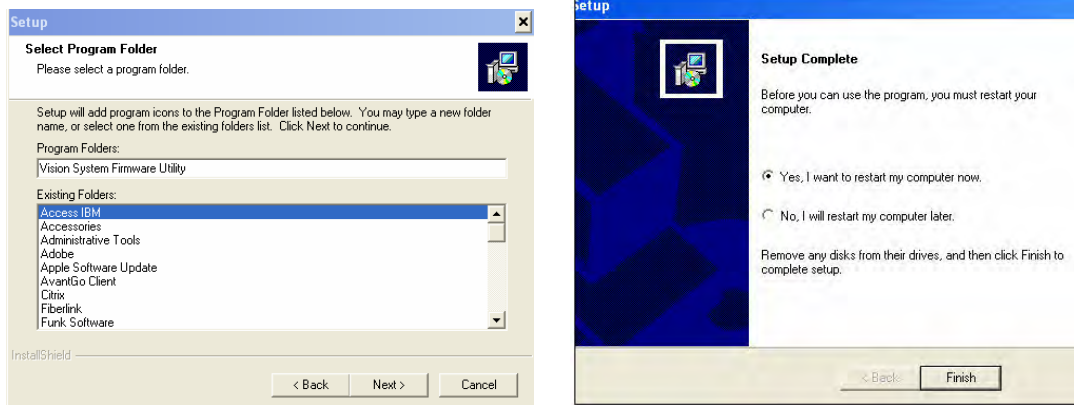
## Directions

1. Install the firmware upgrade utility. Insert CD into cd drive of laptop. If autorun does not work, navigate to the CD using explorer and click the setup.exe program.



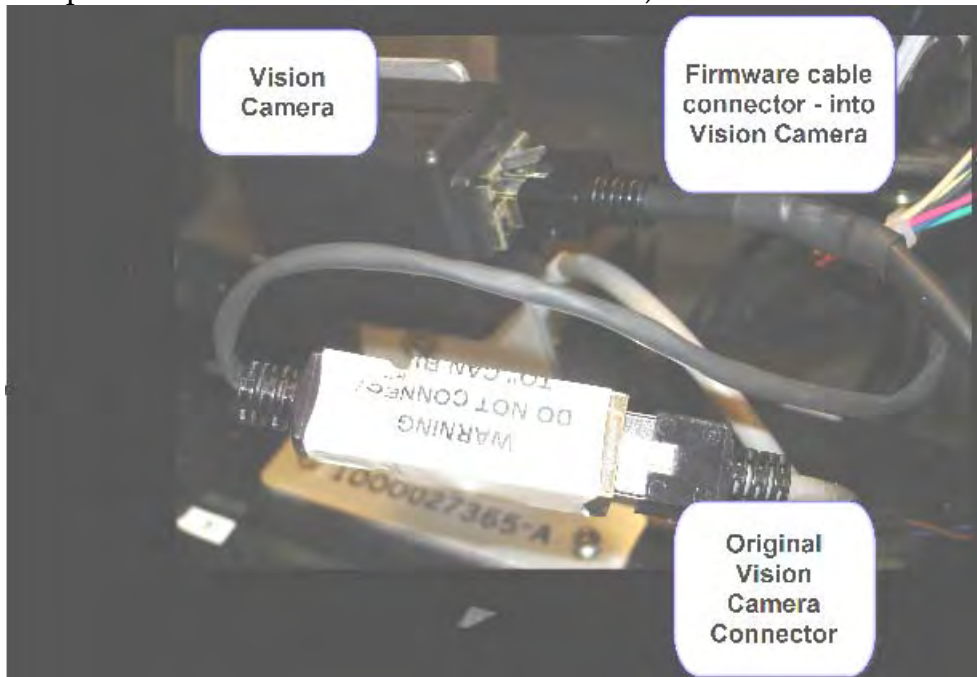
2. Click next 3 times and then click finish. The computer restarts.





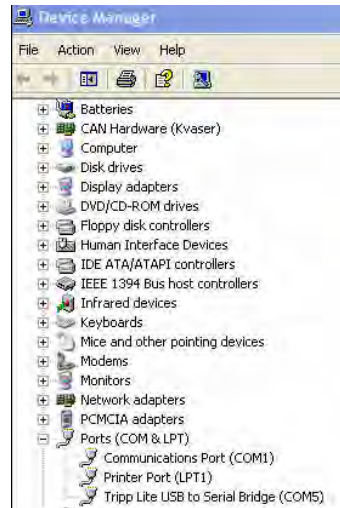
3. Connect the firmware cable to the Vision Camera. Plug the cable that was plugged into the camera into the female rj-45 jack on the firmware upgrade cable. Plug the DB-9 connector into your computer's serial port.

(Note: The instrument needs to have power to the CANs. This procedure can be completed in the Instrument Check software.)



4. Determine the COM port number that you will be connecting the db-9 connector to on your computer. You can use the Device Manager in Windows to let you know.
  - 4.1. Right-click My Computer and click Properties.
  - 4.2. Click the Hardware tab.
  - 4.3. Click Device Manager.

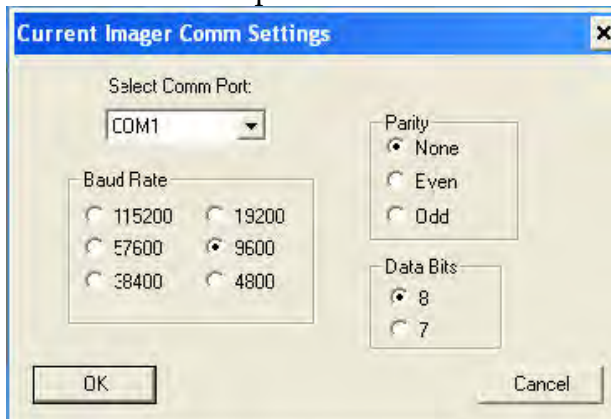
- 4.4. Click the **+** next to **Ports (COM & LPT)**. In this example the USB to Serial Converter is on COM5.



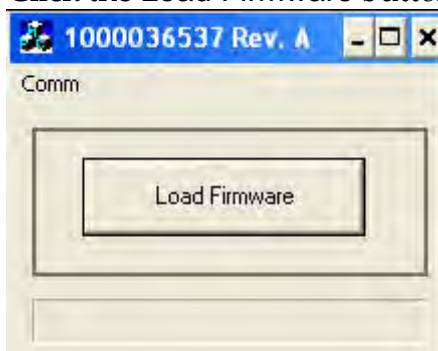
5. Click the application icon.



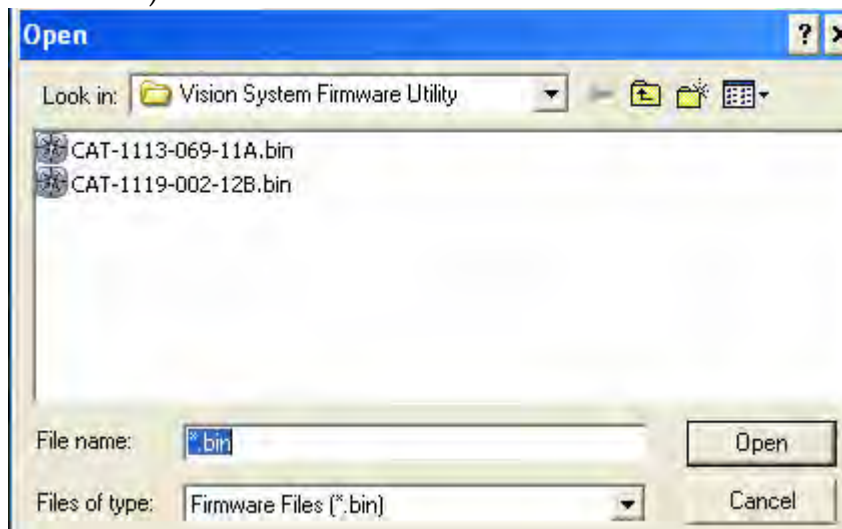
6. Use the **Select Comm Port:** drop down menu to select the proper COM port as determined in step 4.4.



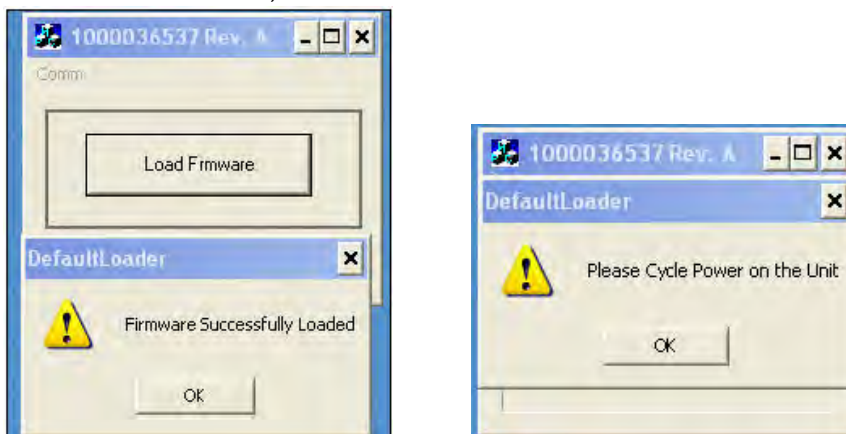
7. Click the **Load Firmware** button



8. Navigate to where your firmware binary files are, select the proper file, and click **Open**. (Note: There are two sample rack handling cameras and one reagent loader camera. The sample rack handling firmware is different from the reagent loader firmware.)



After being selected the firmware is loaded. Do not touch anything until the firmware is successfully loaded. When you see the message reporting that the firmware is loaded, click **OK** twice.



9. Unplug the firmware upgrade cable and plug the original vision camera cable back in. Upgrade all the cameras that need to be upgraded.
10. Auto-align the sample rack handling system or the reagent loader if the firmware was upgraded.
11. Shut down the instrument and restart the Vista software.

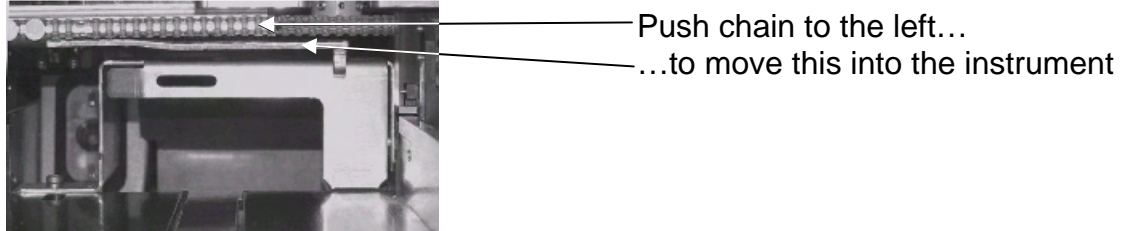
## Changing server 2 and 3 chains

1. Shut down the instrument
2. Remove the right worksurface and bracket.

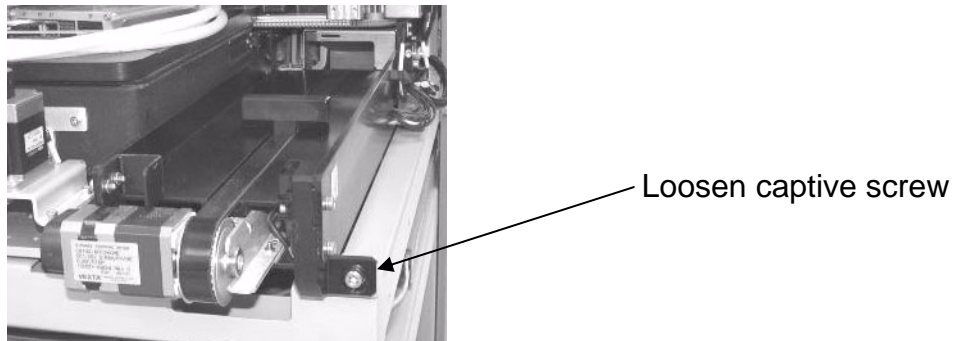


3. Remove the flex loader:

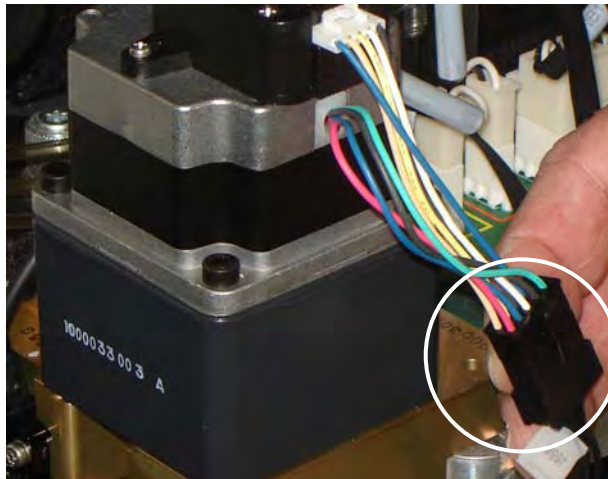
- 3.1. Make sure server 3 is at slot 0 or pushed completely toward the back of the instrument. This prevents moving a Flex and causing an inventory database error.
- 3.2. Push the flex pusher into the instrument so it doesn't catch on the loader when you remove it.



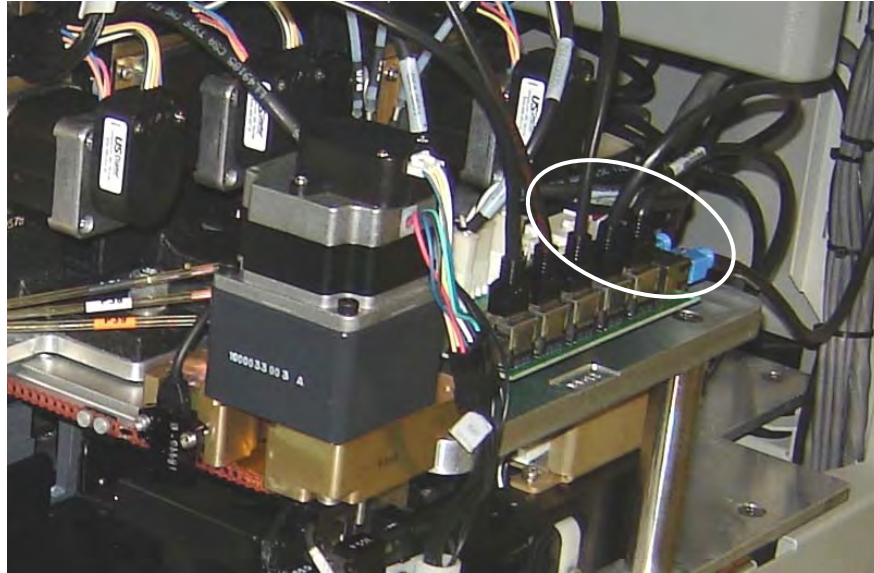
- 3.3. Loosen the T30 screw at front of the bulk loader module.



- 3.4. Disconnect the motor and sensor cable connections.

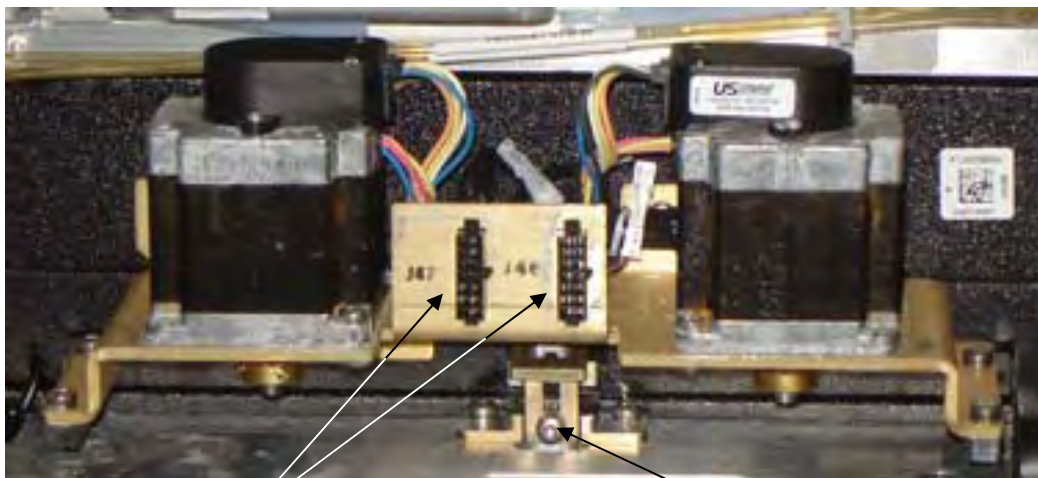


- 3.5. Disconnect the CAN power and data connections at the back. They are the end one in each row.



- 3.6. Pull the module the rest of the way out.

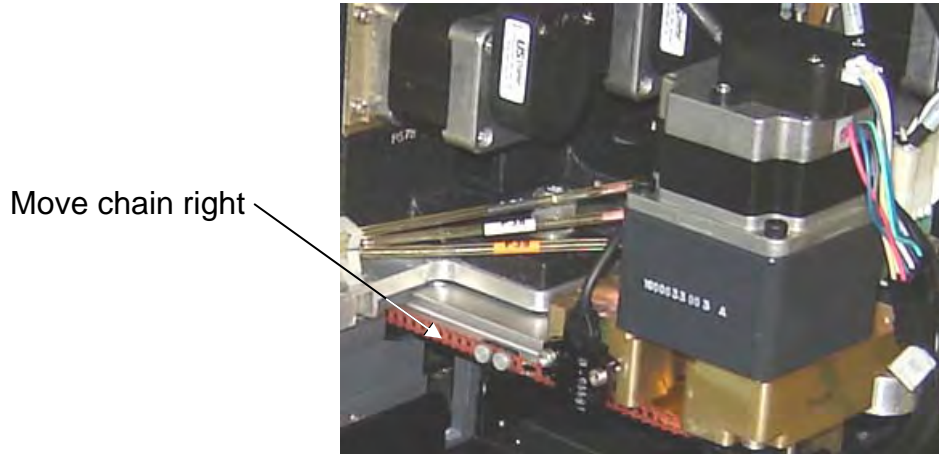
- 4. Disconnect the two motor electrical connections at the front.



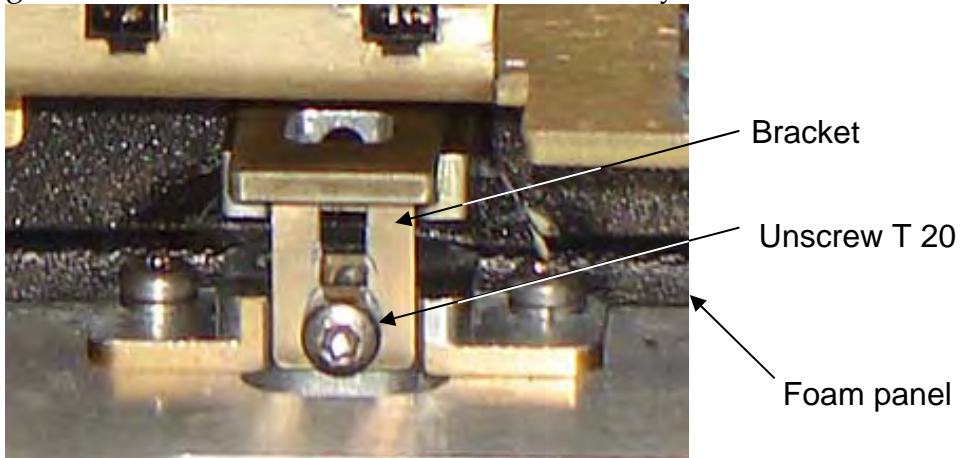
Disconnect

Loosen

5. Pull the chain to move the flex pusher out of the way to the right, next to the shuttle's motor.

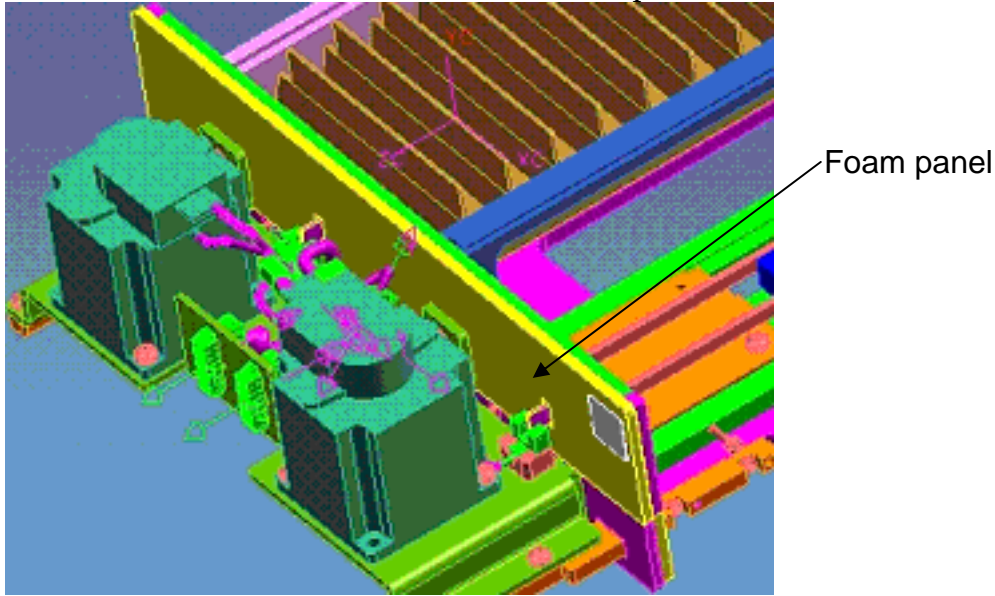


6. Loosen the T 20 screw at the center front between the servers and allow the retaining bracket to drop out of the way. Be sure the bracket drops as far as it will go so it does not catch on the insulation when you remove the servers.

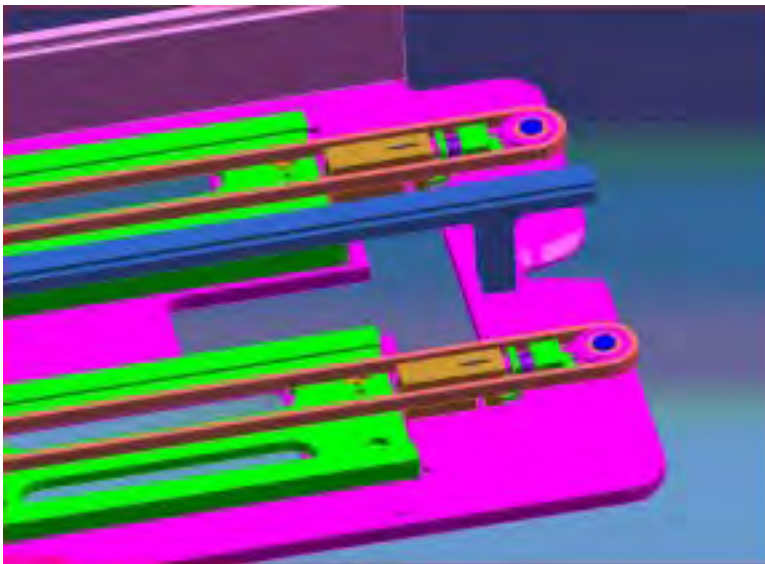


7. Slide the servers out of the instrument. Prevent the cable on the left from catching on the insulation.

- Remove the two screws to remove the foam panel at the front of the servers.



- Turn the servers over to access the chains.



- The chains are held tight by a release tab similar to the tab on a screen door. Push and hold the release tab towards the chain sprocket while pushing the sprocket-shaft assembly toward the motor to relieve the chain tension. Repeat the process to replace the chain. Insure the chain is on the motor sprocket teeth and not the hub and that the release tab is vertical and locked under the black delrin block notch as shown.
- Slip the belt off and replace it.
- Release the tab. The wheel tensions itself automatically.

Replacement is the reverse of removal. Verify the appropriate alignments and run the appropriate service methods to verify operation before returning the instrument to the customer.

# Air and Vacuum Checks

## Air Pressure

1. Adjust the air regulation to the following setting:

Air pressure at gauge supplying aliquot manifold	275 ±7 kPa (40 ±1 psi)
Air pressure at gauge supplying basic and expanded manifolds	138 ±7 kPa (20 ±1 psi)

2. Individually activate the following air knife valves:

- Sample 1      Reagent 1
- Sample 2      Reagent 2
- Sample 3      Reagent 3
- IMT      Reagent 4
- Reagent 5
- Reagent Prep

3. Using hemostats clamp the vacuum tube as each air reading is taken.

4. Take air flow reading at each drain

Wash port air flow	6.0-7.5 Lpm
Gauge required	Flow gauge set for air

5. Deactivate each the above air knives after each reading.
6. Record air flow rate on the attached table.

## Vacuum

7. With the vacuum pump On, verify the vacuum flow level at all sample and reagent drains to the following requirements:

Wash Port Vacuum Flow	13 ±2 Lpm	Plug cleaner port
Cleaner Port Vacuum Flow	3 ±1 Lpm	Plug wash port
Aliquot Wash Port Vacuum Flow	11-15 Lpm	Plug Clean Port
Aliquot Cleaner Port Vacuum Flow	5 ±2 Lpm	Plug Wash Port
Gauge Required	Flow gauge set for vacuum	

S/N			Performed by: _____ Date: _____
Drain	Port	<u>Vacuum Flow</u> Air Off	<u>Air Flow</u> Air On
Aliquot	Port		
	Cleaner		
IMT	Drain		
	Cleaner		
Sample 1	Drain		
	Cleaner		
Sample 2	Drain		
	Cleaner		
Sample 3	Drain		
	Cleaner		
Reagent 1	Drain		
	Cleaner		
Reagent 2	Drain		
	Cleaner		
Reagent 3	Drain		
	Cleaner		
Reagent 4	Drain		
	Cleaner		
Reagent 5	Drain		
	Cleaner		
Reagent Prep	Drain		
	Cleaner		

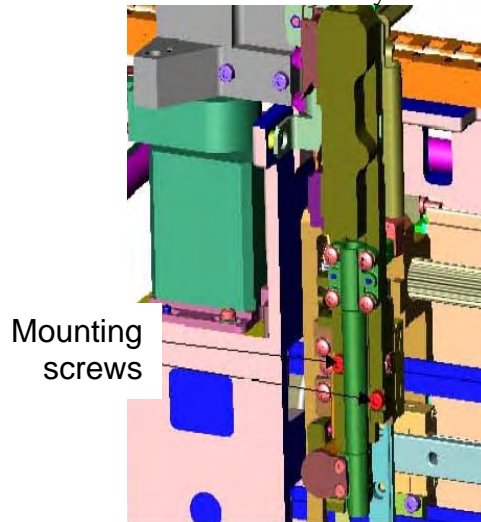
# Adjusting probe mixers

## Tools

- Gauge pin 1.6 mm (for sample and reagent mixers)
- Gauge pin 1.1 mm (for IMT mixer)

## Steps

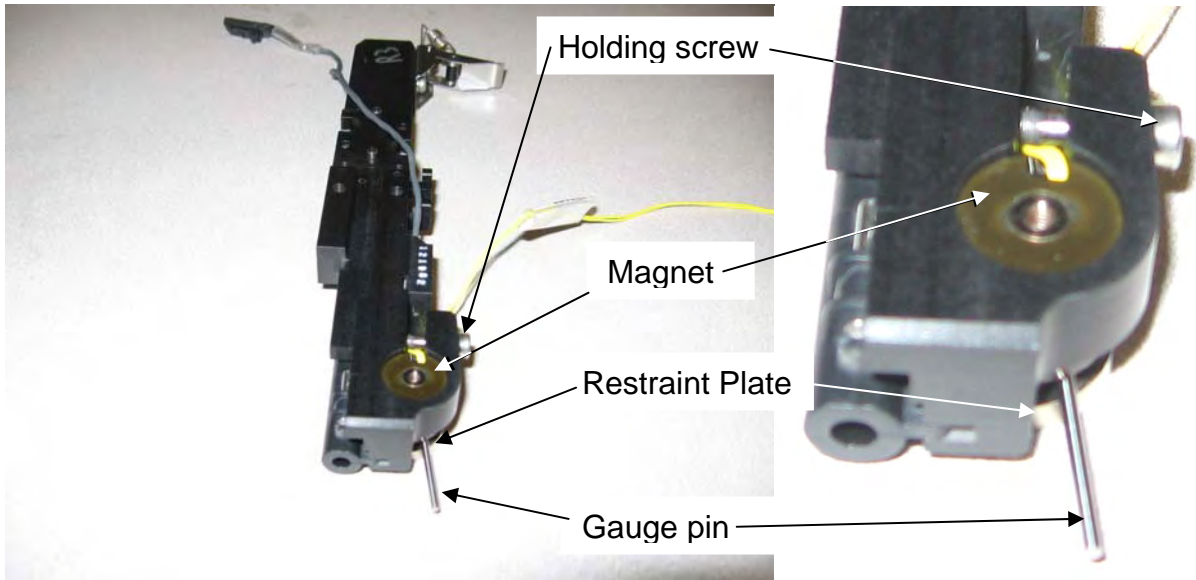
1. Remove mixer from the arm by removing the mounting screws



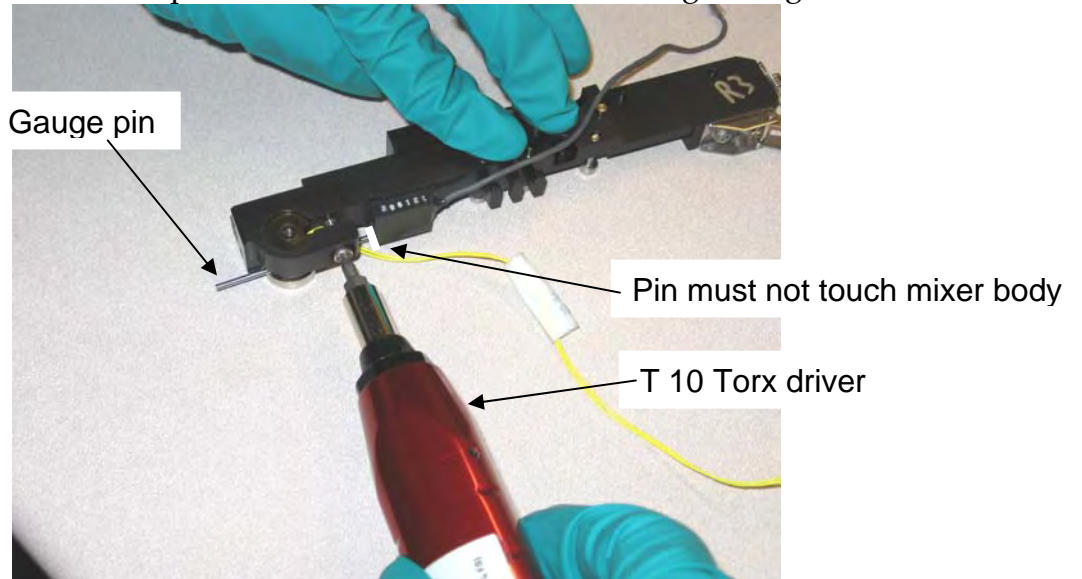
2. Place the mixer base on a flat surface.



3. Place the 1.6 mm gauge pin (or the 1.1 mm pin for an IMT mixer) between the magnet and the mix platen.



4. Ensure the magnet rests freely by gravity on the gauge pin, and does not touch the mixer body, before tightening the screw. While holding the mixer base against the flat surface, use a T 10 driver to tighten the magnet screw snug. Do not overtighten. When the pin is removed, there should be a slight drag.



5. Reinstall the mixer on the arm.



# Section 2 Maintenance Procedures

# Performance tracking checklist

## Dimension Vista Performance Tracking Checklist

Month:					Drain Vacuum Readings					
Weekly	1	2	3	4		Wk 1	Wk 2	Wk 3	Wk 4	
Review error logs. Address issues.						Aliquot				
Inspect drains						Reagent Prep				
Check for bubbles in tubings and manifolds						S1				
Check Millipore screen for maintenance requirements and error codes.						S2				
Check pump area for leaks						S3				
Inspect bulk fluids needles for evidence of corrosion and leaks						IMT				
Check all probes for residue						R1				
Check transfer arm rails for residue						R2				
Check vacuum on all drains and cuvette wash. Record readings						R3				
<b>Monthly</b>				<b>4</b>		R4				
Replace bio-waste pump duckbill valves						R5				
Clean waste chutes						Cuvette Wash				
Remove any cuvette pieces from the cuvette ring.										
Inspect cuvette clips. Replace any broken clips										
Check for water in regulator bowls										
Check Storage ring/Server1 drain line for flow										
Manually verify R2 alignments to cuvette										
Inspect dryer boots on cuvette wash										
Check cabinet air filter										
Check wash probes for functionality in Inst. Check.										
Check wash delivery lines for air bubbles										
Ensure flow on the vacuum side of cuvette wash										

**Note any corrective actions taken:**

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## Weekly check for water in filter bowls

1. Inspect vacuum filter to the left of vacuum pump for excessive water inside its bowl.
2. If bowl contains excessive water the vacuum pump will need to be turned off.
3. Loosen bowl to remove and discard water if needed.



## Checking regulator bowls for condensate

Put the instrument in Diagnostics mode to keep the air compressor from cycling on the instrument while when the bowls are purged of water.

1. Verify that the logon level is at least Administrator. To set Administrator level:
  2. From Vista Home screen.
    - 2.1. Click Set User
    - 2.2. Select Administrator

## 2.3. Enter the PIN 222 and click Enter.



## 3. From Vista Home Screen:

3.1. Select Diagnostics

3.2. Select System Diagnostics

3.3. Select Vista Diagnostics. This ensures that the air compressor does not run while performing this procedure.

4. Remove the two right side bottom panels from the instrument to access the compressor.

5. To purge bowls, loosen the thumbscrews and allow the water to purge off.



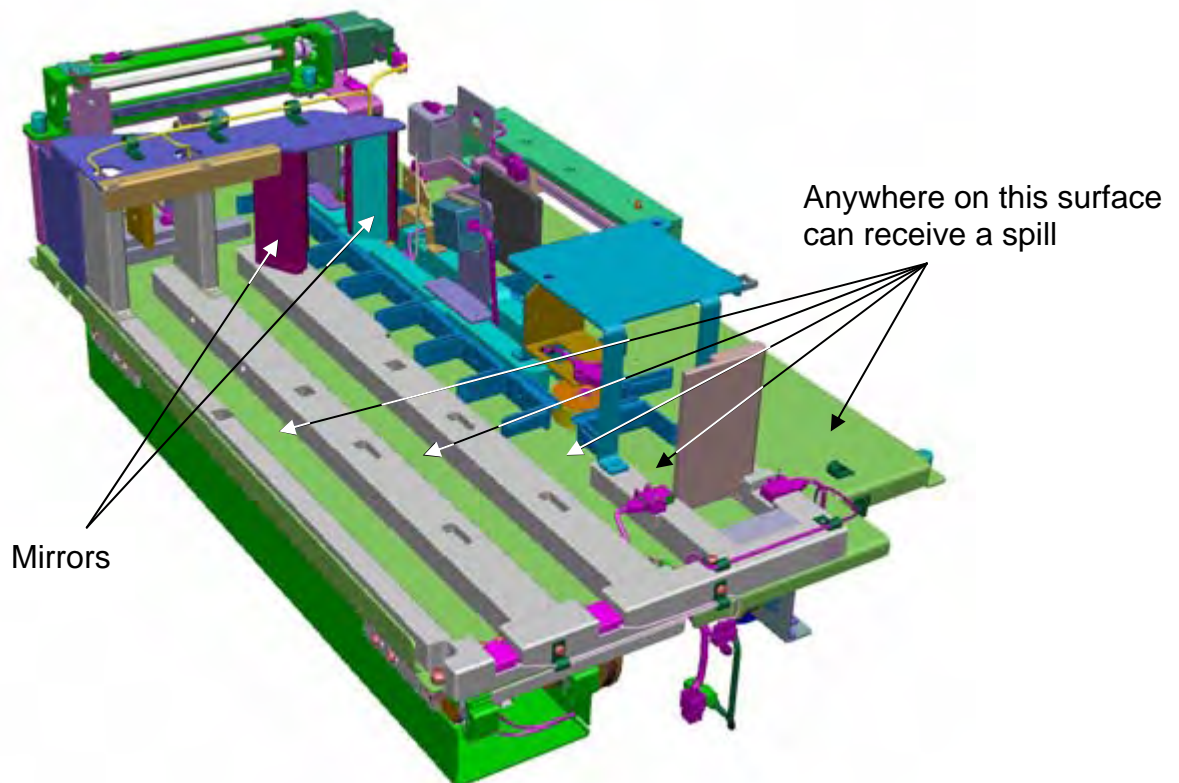
6. Retighten thumbscrews.

## Section 3 Customer workarounds

### Sample rack jamming

If the sample lanes or racks become dirty, they can hinder the racks as they travel, causing them to jam. For detailed instructions, refer to the Operator's Guide Chapter 4: Setup and Supplies, page 4-4, Clean Sample Rack Lane and Inspect Racks; and Chapter 7: Maintenance, page 7-7, Cleaning Procedures.

1. Pause the instrument: When the instrument status is **System Ready**, click **Operation**, then **Pause**.
2. Lift the lid.
3. Locate the spill. It can be at the in and out sample rack lanes, the STAT shuttle area, and near the positioner in the shuttle 2 area. Check for more than one spill.



4. Decontaminate the area with a 10% bleach solution.
5. Dry the area thoroughly with a lint-free cloth.
6. Clean the racks as needed with soapy water, then dry thoroughly.
7. Check for splatter on the two vertical mirrors. Use only water and a very soft cloth to protect the reflective surface from being scratched or corroded.
8. Close the lid.
9. Click Operation, then Reset.

## **Aliquot plate pusher**

Keep at least six aliquot plates in each stack in the loader. This creates enough pressure on the bottom plate so it can drop onto the plate pusher.