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AMS FAQ's and Hardware Tips

Bill Brooks, Ed Fortner, John Jayne

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Questions User's often don't know the answer to...

but should

What are the operating currents for all pumps?

	Gas Load Off (mA)	Gas Load On (mA)	Delta T* (Degrees C) (Closed/Open)
P2	~ 450	~ 850	9/13.3
P3	~ 250	~ 300	9/9.3
P4	~ 200	~ 250	6/5.9
P5	< 200	< 200	6.2/6.5
P6	~ 200	~ 200	9.6/9.6

*Delta T = Pump Temp – Ambient Temp

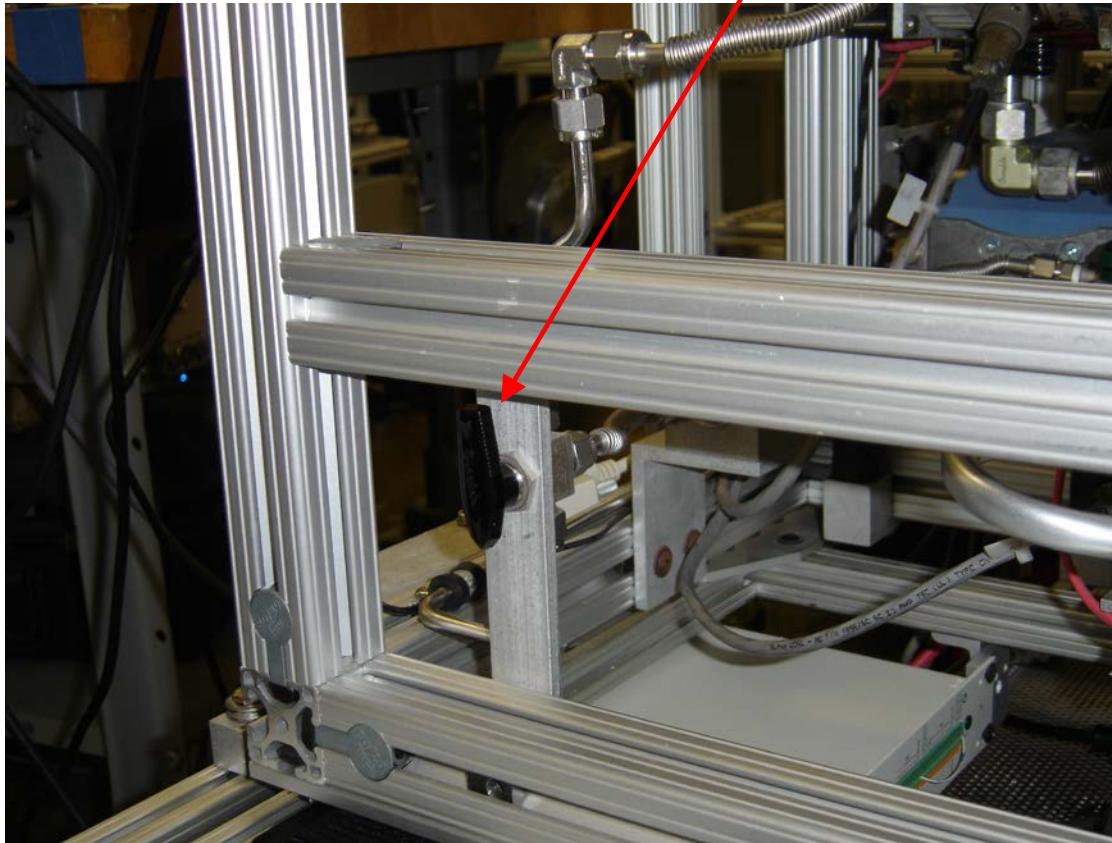


Questions User's often don't know the answer to...

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What is the backing pump pressure?

What is the lens pressure?



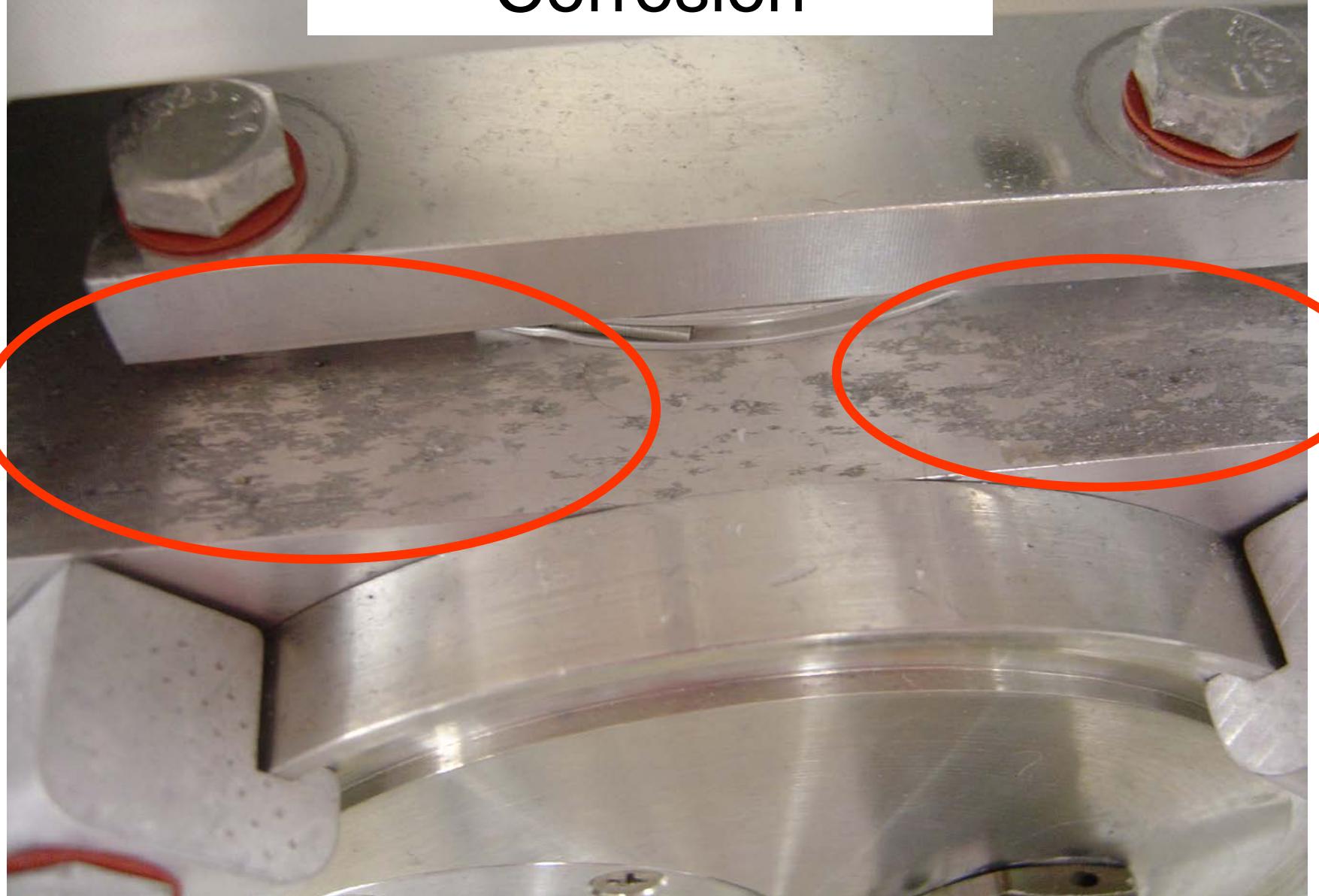


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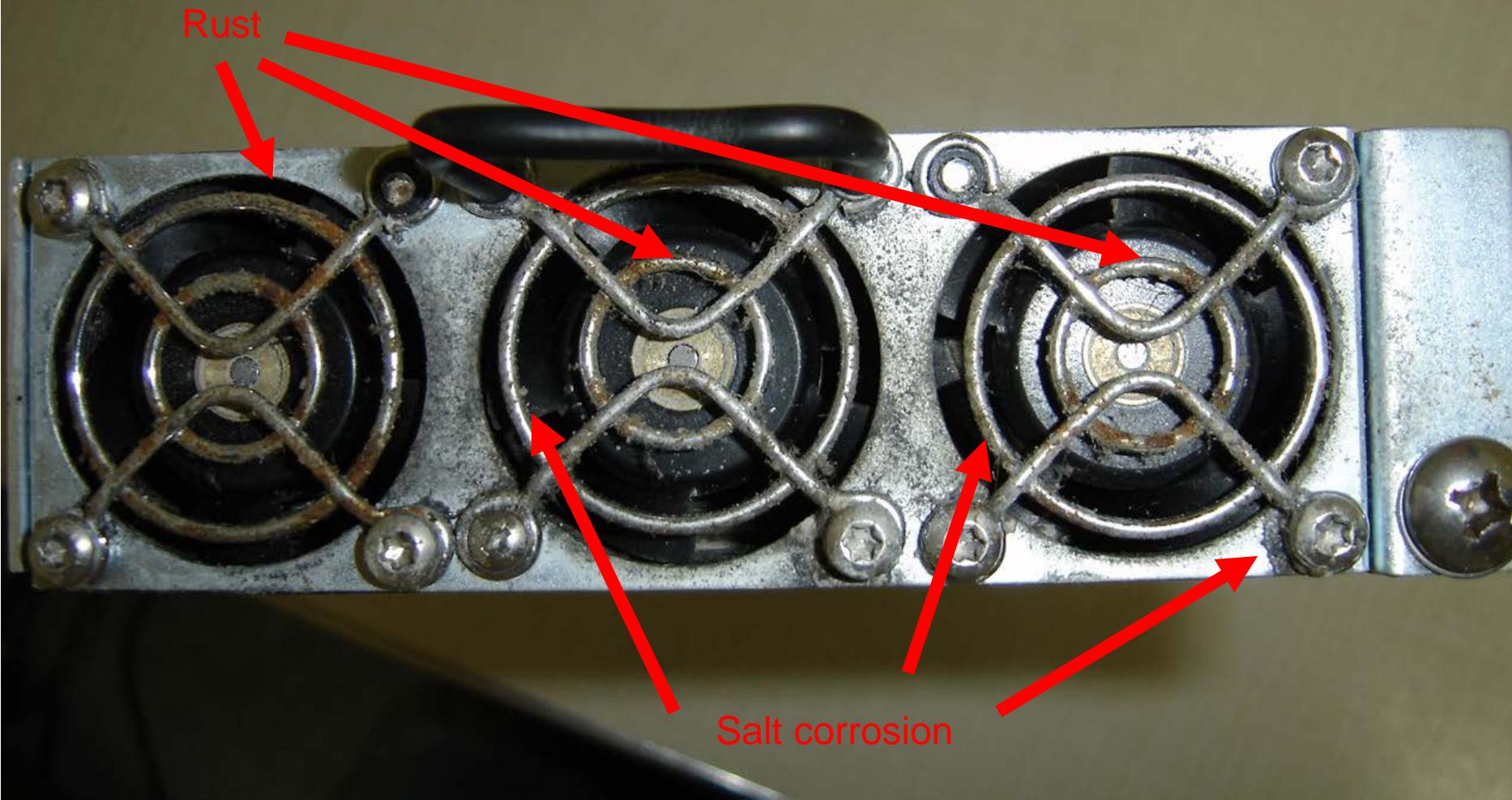
AMS Maintenance

- Clean vacuum chamber surface
- Check for loose/missing connections/fasteners
- Clean cooling fan filters
- Check for stressed cables
- Always monitor pump performance
- Always monitor MD1 pressure (load/no load)
- Dirt inside computer
- “*Dirt*” on computer HD (clean up and defrag)

Corrosion



Corrosion



Inspect Shipping Container

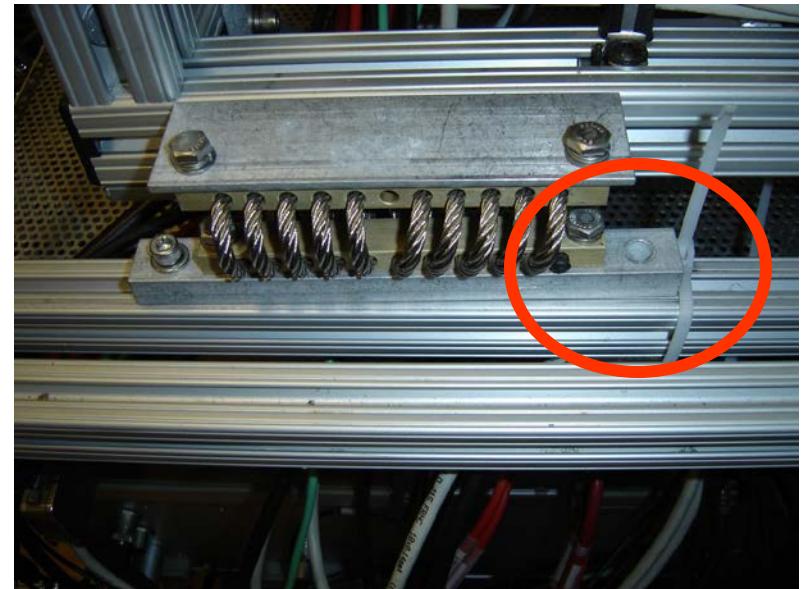
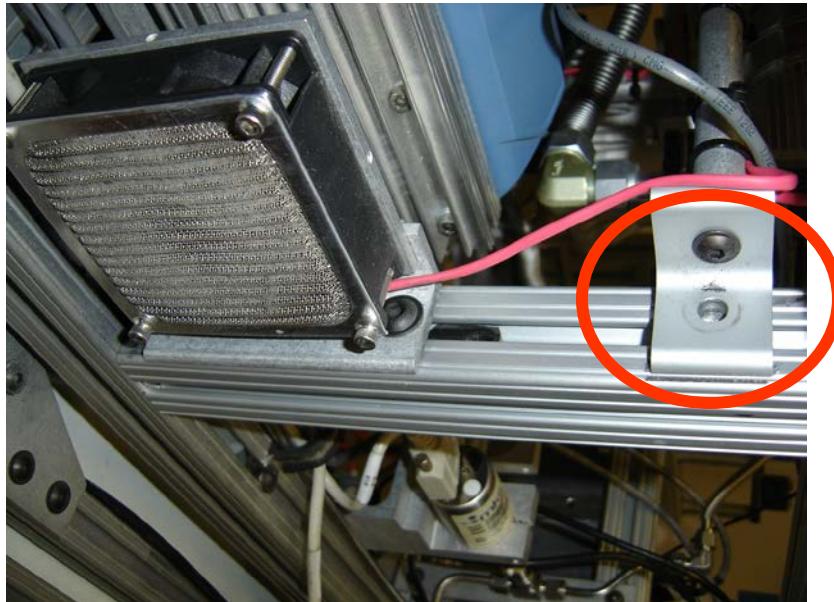


Fork Lift
Damage

Don't leave instrument in the shipping container

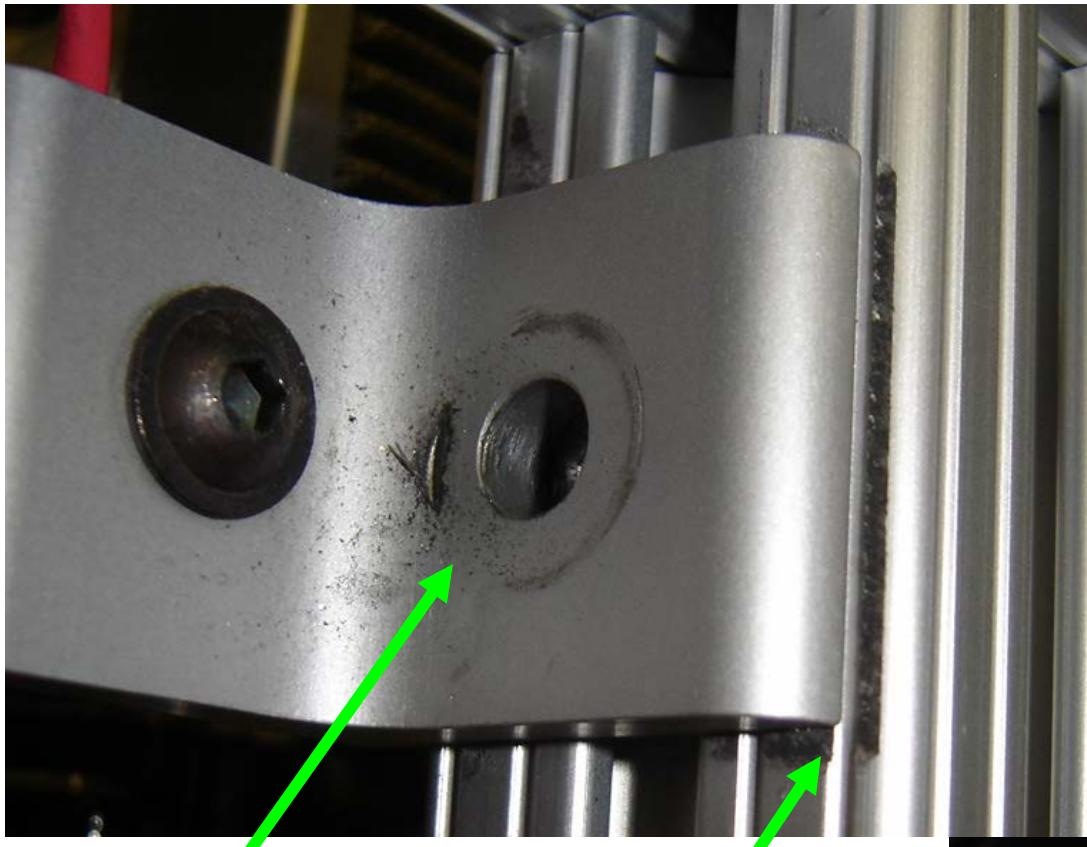
Maintenance Issues, cont'd

Missing fasteners



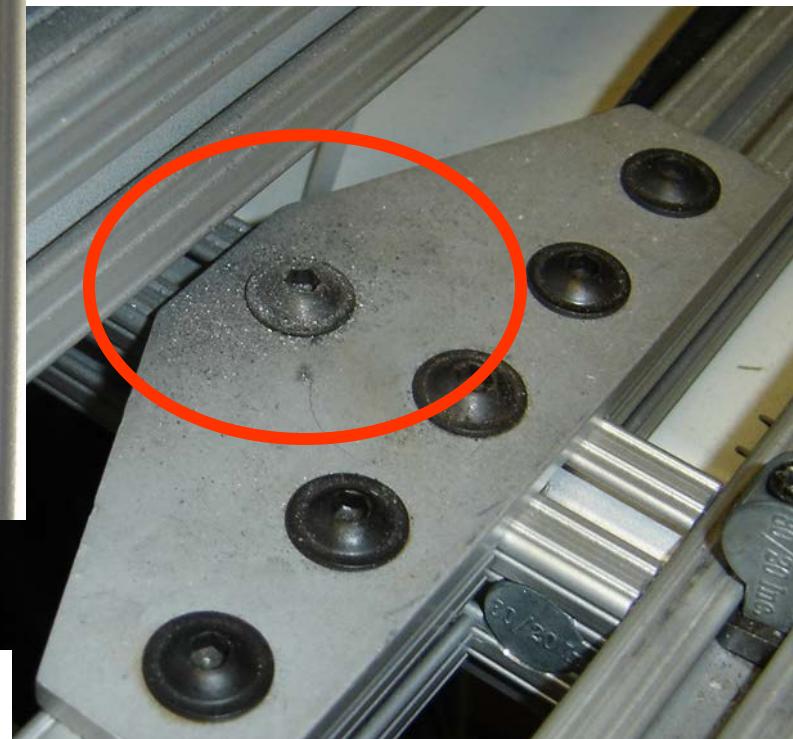
Especially when shipping!

Maintenance Issues, cont'd



Missing fastener, chaffing metal

Aluminum dust





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Q: My AB is low. After checking tuning, should I adjust the particle lens?

A: No. Even if the lens was completely misaligned, that should not affect the magnitude of the AB.



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- Q: The gain has dropped about 20% in a week, and I don't have time to do an IE calibration right now. Should I raise the MCP voltage to compensate?
- A: No. Changes of this size are corrected using the AB. It is best not to increase the MCP until you can do an IE calibration at the same time.



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Q: I did a flow calibration then attached the inlet to the sampling line. Now the lens pressure is reading low. Do I need to calibrate the flow again?

A: No. Lens pressure/flow calibration is a property of the lens.



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Q: Will the vacuum interlock trip if the pump currents get too high?

A: No. Interlock is only triggered by pump rotational speed.



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Q: I just replaced a filament and I can't get the same AB as I had before. What should I do?

A: Try changing filament-ion chamber voltage (maintaining 70V difference). This addresses the fact that some filaments just aren't as good as others.

One should expect to have to retune their AMS after every filament replacement.



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- Q: I replaced a filament. My old filament current was 3.4A, for a emission current of 1.2mA. The new filament needs 3.6A to get the same emission current.
Is there a problem?
- A: Probably not. Different filaments have different resistances. This observation would suggest the new filament has lower resistance than the old one. One should not expect to have the same filament current for different filaments.



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Q: I have had a filament running for about a year. Lately, I've noticed that the emission current is gradually increasing, so I reduce the filament current. Is there a problem?

A: This likely suggests that the filament is burning out and will fail soon. The filament is evaporating, therefore the resistance is increasing. Since the current is held constant, the filament burns hotter giving a higher emission current.



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Q: My P-ToF signal has disappeared, but my MS signal is still working. What should I do?

A: Try restarting the computer. If that does not work, shut the computer down, unplug it, and hold in the power button for 10 seconds.

In older versions of the DAQ, restarting the computer may Cause unwanted Timing Offset change. Check this.

ToF-MS Parameters

Pulser Period (us)	60	16.7 (kHz)
Trigger Delay (ns)	2500	
Nbr of Samples	44896	Max m/z
+ Pulse Width (ns)	2000	
- Pulse Width (ns)	2000	
Timing Offset	<input checked="" type="radio"/> 50	<input type="radio"/> 100 ns



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Q: I had to remove the computer and/or Electronics Box from the rack. After reinstallation, an Analog signal does not work. (i.e. chopper reading, HB, flow, etc.)

A: Comp: Make sure that both of the large, high pin density, NI cables are properly connected. If it looks like they are, unplug them, and check the NI boards for bent pins.

EB: Make sure that all I/O cables are properly connected.



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Q: My chopper speed is fluctuating between about 140Hz and 150Hz, is something wrong?

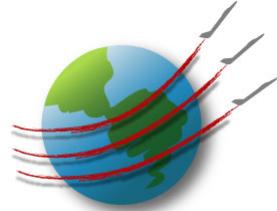
A: The chopper circuitry is temperature dependant, a 10Hz change isn't something to worry about.



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Q: What is the maximum voltage I can set my MCP to?
When is it time to change the MCP?

A: It depends on your specific batch of MCPs, and can range from about 2400V – 2600V. If you are close to 2500V, or you find the gain rapidly decreasing, be prepared to change it soon.



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Q: My Heater Bias won't respond to changes in the software. Do I have a short?

A: Maybe, but before checking for shorts, make sure that the Heater Switch on the EB is in Computer mode, not Manual.



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Lens Alignment Tip

If you determine that you need to do a lens alignment and you have not done one in a very long time with this particular lens there is a precaution you can take before moving the lens.

Turn the TPS off before moving the lens. Ensure you can move the lens both horizontally and vertically. After you have moved in both directions without the system venting then you can turn TPS back on and find the edges of your particle beam.

Leak Checking Tip

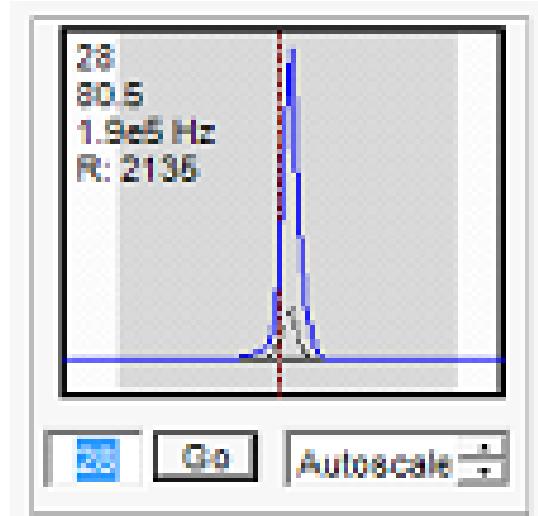




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If the Airbeam (m/z 28,32) has a diff/closed ratio of < 2 you probably have a leak.

You can further get a clue as to where the leak is by looking at your **open** Airbeam. If the leak is in the PToF region the open Airbeam will be attenuated if its in the detection region it wont be.





END



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