Agilent 5977B Series MSD

Laboratory Operator Quick Reference Guide

Ion Source Cleaning

Scheduled Maintenance
Ion Source Cleaning

Clean the parts that contact the sample or ion beam. The other parts normally should not require cleaning.

If the contamination is serious, such as an oil backflow into the analyzer, seriously consider replacing the contaminated parts.

Abrasively clean the surfaces that contact the sample or ion beam.

Use an abrasive slurry of alumina powder and reagent-grade methanol on a cotton swab. Use enough force to remove all discolorations. Polishing the parts is not necessary; small scratches will not harm performance. Also, abrasively clean the discolorations where electrons from the filaments enter the source body.

Rinse away all abrasive residue with reagent-grade methanol.

Take care to avoid recontaminating cleaned and dried parts. Put on new, clean gloves before handling the parts. Do not set the cleaned parts on a dirty surface. Set them only on clean, lint-free cloths.

**NOTE**
The main effect of operating the MSD in CI mode is the need for more frequent ion source cleaning. In CI operation, the ion source chamber is subject to more rapid contamination than in EI operation because of the higher source pressures required for CI.

**CAUTION**
Do not overtighten the repeller nut or the ceramic repeller insulators will break when the source heats up. The nut should only be finger-tight.

**CAUTION**
If insulators are dirty, clean them with a cotton swab dampened with reagent-grade methanol. If that does not clean the insulators, replace them. Do not abrasively or ultrasonically clean the insulators.

**CAUTION**
The filaments, source heater assembly, and insulators cannot be cleaned ultrasonically. Replace these components if major contamination occurs.
EI Ion Source - Stainless or Inert

Clean the parts highlighted in blue.

1. Gold plated set screw
2. Gold plated screw
3. Interface socket
4. Source body
5. Drawout cylinder
6. Drawout plate
7. 4-turn filament
8. Spring washer
9. Lens insulator
10. Entrance lens
11. Ion focus lens
12. Repeller insulator
13. Repeller
14. Flat washer
15. Belleville spring washer
16. Repeller nut
17. Source heater block assembly
18. Repeller block insert

5977B Series MSD Lab Operator Quick Reference Guide
El Ion Source - Extractor

Clean the parts highlighted in blue.

1. Set screws
2. Screws
3. Source body
4. Extractor lens
5. Extractor lens insulator
6. Filaments
7. Spring washer
8. Lens insulator
9. Entrance lens
10. Ion focus lens
11. Repeller insulator
12. Repeller
13. Flat washer
14. Belleville spring washer
15. Repeller nut
16. Source heater block assembly
17. Repeller block insert
Clean the parts highlighted in blue.

1 Source finger grip  
2 Filament block  
3 Extractor lens (5)*  
4 Ceramic insulator for extrctor  
5 Entrance lens (1)*  
6 Ion focus lens (2)*  
7 Lens insulator/holder  
8 M2 × 0.4 screw × 12 mm screw  
9 Source body  
10 Post extractor lens 2 (3)*  
11 Post extractor lens 1 (4)*  
12 M2 × 6 mm screw  
13 Locking ring lens insulator  
14 High efficiency dual filament  
15 Ring heater/sensor assembly  
16 Source mount 1.5 mm  
17 Repeller assembly

* The number in parenthesis is the number engraved on the lens.
Clean the parts highlighted in blue.

1. Set screw
2. Filament screw
3. CI interface tip seal
4. CI repeller insulator
5. CI lens insulator
6. CI drawout cylinder
7. CI drawout plate
8. CI source heater block assembly
9. Entrance lens
10. CI source body
11. CI ion focus lens
12. CI repeller
13. CI filament
14. Dummy filament
## Scheduled maintenance

<table>
<thead>
<tr>
<th>Task</th>
<th>Every week</th>
<th>Every 6 months</th>
<th>Every year</th>
<th>As needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tune the MSD</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Check the foreline pump oil level</td>
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<td></td>
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<tr>
<td>Check the calibration vial(s)</td>
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<td>X</td>
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<tr>
<td>Replace the foreline pump oil*</td>
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<td></td>
<td>X</td>
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<tr>
<td>Replace the diffusion pump fluid</td>
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<td>X</td>
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<tr>
<td>Check the dry foreline pump</td>
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<td>X</td>
</tr>
<tr>
<td>Change the dry foreline pump tip seal</td>
<td></td>
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<tr>
<td>Change the foreline pump oil mist filter</td>
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<td></td>
<td>X</td>
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<tr>
<td>Clean the ion source</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td>Check the carrier gas trap(s) on the GC and MSD</td>
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<tr>
<td>Replace the worn out parts</td>
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<tr>
<td>Lubricate sideplate or vent valve O-rings†</td>
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<tr>
<td>Replace CI Reagent gas supply</td>
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<td></td>
<td>X</td>
</tr>
<tr>
<td>Replace GC gas supplies</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

* Every 3 months for CI MSDs using ammonia reagent gas.

† Vacuum seals other than the side plate O-ring and vent valve O-ring do not need to be lubricated. Lubricating other seals can interfere with their correct function.