Contents

Parts Supplied 3

Separate the MS from the GC 4
  Separate the MS and the 8890 or 7890 GC 4
  Separate the MS and the 9000 GC 5

Remove the MS Covers 7

Attach the Voltage Divider Board 9

Install the Reference Compound Valve 11

Install the MS Wiring Harness 13

Install the MS Covers 16
  Install the Front Cover 16
  Install the MS Top Cover 17

Remove the GC Covers 18
  Remove the 7890/8890 GC Covers 18

Install the 7890/8890 GC Wiring Harness 21

Install the 9000 GC Control Wiring 23
  Remove the 9000 GC cover 23
  Install the GC wiring harness in the 9000 GC 24
  Install the 9000 GC covers 24

Attach the MS and GC 25
  Attach the MS to the 8890 or 7890 GC 25
  Attach the MS and the 9000 GC 26

Edit the GC Method 29
  Configuring the reference valve 29
  Add a Timed Event to the method 30
  Verify the correct column is installed 31

Edit MS method parameters 32
  Add a PFTBA Reference Compound to an MRM method 32
  Add a valve Monitor to the method 33

Maintenance 34
  To Refill the Reference Compound Valve Vial 34

Troubleshooting 35
  Performance 35
  Hardware 36

Warranty 37
The G7050A - Reference Compound Introduction Valve for the Agilent 7010 Triple Quadrupole accessory kit includes the following parts:

Table 1  Parts supplied with the Reference Compound Introduction Valve kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Qty</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MS Wiring Harness</td>
<td>1</td>
<td>G7006-81001</td>
</tr>
<tr>
<td>2</td>
<td>8890/9000 GC Wiring Harness</td>
<td>1</td>
<td>G7006-81002</td>
</tr>
<tr>
<td>3</td>
<td>Reference Compound Valve</td>
<td>1</td>
<td>G7006-60207</td>
</tr>
<tr>
<td>4</td>
<td>Torx-T20 M4 x 0.7 12 MM Lg w/crest washer for mounting PCA voltage divider</td>
<td>2</td>
<td>0515-0382</td>
</tr>
<tr>
<td>5</td>
<td>Aluminum mounting block for PCA voltage divider</td>
<td>1</td>
<td>G7006-00101</td>
</tr>
<tr>
<td>6</td>
<td>PCA Voltage Divider Board</td>
<td>1</td>
<td>G7006-61001</td>
</tr>
<tr>
<td>7</td>
<td>O-ring 6.07 1.75 FKM 75A BRN</td>
<td>3</td>
<td>0905-1014</td>
</tr>
<tr>
<td>8</td>
<td>Dual Adapter Assembly for mounting valves to the Analyzer Manifold</td>
<td>1</td>
<td>G7006-60210</td>
</tr>
<tr>
<td>9</td>
<td>Torx-T20 M 4 x 0.7 45MM Lg w/crest washer for mounting Reference Valve</td>
<td>2</td>
<td>0515-0670</td>
</tr>
<tr>
<td>10</td>
<td>GCMS Tuning Standard - PFTBA 0.5 mL (will be shipped separately from the kit)</td>
<td>1</td>
<td>05971-60571</td>
</tr>
</tbody>
</table>

Figure 1. Parts supplied with the Reference Compound Introduction Valve kit
Separate the MS from the GC

If using an 8890 or 7890 GC see “Separate the MS and the 8890 or 7890 GC” below. If using a 9000 GC see “Separate the MS and the 9000 GC” on page 5.

Separate the MS and the 8890 or 7890 GC

Materials needed
- T-20 Torx drivers
- Ferrule, blank (5181-3308)
- Interface column nut (05988-20066)
- Wrench, open-end, 1/4-inch × 5/16-inch (8710-0510)
- Gloves, clean, lint-free (Large 8650-0030) (Small 8650-0029)

Procedure

**WARNING** Ensure the GC/MS interface and the analyzer zones are cool (below 100 °C) before you vent the MS. A temperature of 100 °C is hot enough to burn skin; always wear cloth gloves when handling analyzer parts.

**WARNING** Ensure the GC/MS interface and GC oven have cooled before you remove the column.

**WARNING** If you are using hydrogen as a carrier gas or for a system with JetClean installed, the carrier gas flow and JetClean hydrogen supply shutoff valves must be closed before turning off the MS power. If the foreline pump is off, hydrogen will accumulate in the MS and an explosion may occur. Before operating the MS with hydrogen carrier gas read the hydrogen safety information. (See Hydrogen Safety on page 16.)

**CAUTION** Ensure the GC oven and the GC/MS interface are cool before turning off carrier gas flow.

1. Vent the MS. Refer to the Agilent 7000/7010 Series TQ GC/MS Operating Manual.
2. Turn off the GC and MS and remove their power cables from the building supply mains. Remove the capillary column from the GC/MS interface.
3. Place a column nut with a blank ferrule on the end of the interface. This will help keep contamination out of the MS. The foreline pump may be located on the floor or on the lab table next to or behind the MS. Move it as needed to provide slack in the tubing and cables.
4. Move the MS away from the GC until you have access to the GC/MS interface cable. See Figure 2 on page 5.
5 Disconnect the GC/MS interface cable. If the MS needs to be moved a significant distance from the GC, also disconnect the APG cable and the LVDS cable if used.

Separate the MS and the 9000 GC

Materials needed

• Screwdriver, T-20 Torx
• Ferrule, blank (5181-3308)
• MS transfer line plug (G4590-60250)
• Gloves, white, nylon, clean, lint-free (Large 8650-0030) (Small 8650-0029)

WARNING Ensure the GC/MS interface and the analyzer zones are cool (below 100 °C) before you vent the MS and remove the 9000 GC/MS Tail. A temperature of 100 °C is hot enough to burn skin; always wear cloth gloves when handling analyzer parts.

WARNING If you are using hydrogen as a carrier gas or for a system with JetClean installed, the carrier gas flow and JetClean hydrogen supply shutoff valves must be closed before turning off the MS power. If the foreline pump is off, hydrogen will accumulate in the MS and an explosion may occur. Before operating the MS with hydrogen carrier gas read the hydrogen safety information.

CAUTION Ensure the GC oven and the GC/MS interface are cool before turning off carrier gas flow.
Procedure

1 Vent the MS. Refer to the Agilent 7000/7010 Series TQ GC/MS Operating Manual.

2 Remove the 9000 GC/MS Tail. Refer to the Agilent 7000/7010 Series TQ GC/MS Operating Manual.

3 Verify that the GC and MS are turned off and that their power cables are unplugged from the building supply mains.

4 Using a T-20 Torx screwdriver, loosen the lock plate by turning the lock plate screw clockwise.

5 The foreline pump may be located on the floor, on the lab bench next to or behind the MS. Move it as needed to provide slack in the tubing and cables.

6 Slide the MS backwards, and then away from the GC until you have access to the GC/MS cables. (See Figure 3 on page 6.)

7 Disconnect the GC/MS interface cables. Disconnecting the cable with the GC on can cause a fault condition. If the MS needs to be moved a significant distance from the GC, also disconnect the APG cable and the LVDS cable if used.

8 Install an MS transfer line plug and blank ferrule on the end of the GC/MS interface. This will help keep contamination out of the MS.

![Figure 3. Separating/connecting the MS and 9000 GC](image-url)
Remove the MS Covers

Materials needed

- Screwdriver, Torx T-20 (8710-1615)

Procedure

For detailed cover removal instructions, refer to the Maintaining the Mainframe section in the Agilent 7000/7010 Series Triple Quadrupole Troubleshooting and Maintenance Manual.

1. Remove the analyzer window cover. See Figure 4 below.

![MS covers diagram]

Figure 4. MS covers
2. Remove the front bottom cover by gasping the cover on both sides and gently pulling the cover forward so you can remove the LED cable.

![Removing the LED cable](image1.png)

Figure 5. Removing the LED cable

3. Use a T-20 screwdriver to remove the seven screws securing the MS top cover.

![Removing MS top cover](image2.png)

Figure 6. Removing MS top cover. Cutout shown is for Instruments with CI or JetClean flow modules
Attach the Voltage Divider Board

Materials needed

- Voltage divider board (Figure 1 item 6)
- Aluminum mounting block for voltage divider board (Figure 1 item 5)
- Two screws (Figure 1 item 4)

Procedure

1. Use a T-20 screwdriver to remove the one or two screws, depending on MS model, attaching the sheet metal baffle to the e-module.

![Remove screws from the metal baffle](image)

Figure 7. Remove screws from the metal baffle

2. If your MS model includes a LED, remove the LED cable from the plastic holder.

![Remove cable from the plastic holder](image)

Figure 8. Remove cable from the plastic holder
3. Use a screwdriver to pry out the top right corner of the sheet metal baffle and remove it from the MS.

![Image of removing the baffle](image1.png)

**Figure 9.** Remove the baffle

4. Align the screw holes in the PCA voltage divider board (Figure 1 item 6) and Aluminum mounting block (Figure 1 item 5), with the tapped screw holes in the front electronics module frame. Use a T20 driver to attach this PCA board and mounting block using two screws (Figure 1 item 4) threaded into the frame (arrows).

![Image of attaching PCA board](image2.png)

**Figure 10.** Attaching the PCA voltage divider board and Aluminum mounting block with two screws
Install the Reference Compound Valve

Materials needed

- Screwdriver, Torx T-20, Flathead
- Reference compound solenoid valve (Figure 1, item 3)
- Two T-20 screws for mounting reference valve (Figure 1, item 9)
- Dual Adapter Assembly (Figure 1, item 8)

Procedure

1. Use a T-20 screwdriver to remove the CAL valve from the analyzer housing. Keep the valve attached to its control wiring.

   ![Figure 11. Remove the CAL valve](image1.png)

2. Fill the reference valve vial with PFTBA (Table 1, item 10). See “Maintenance” on page 34.

3. Replace the valve O-ring in the Analyzer manifold with a new one (Figure 1, item 7).

4. Install two O-rings (Figure 1, item 7) into the Dual Adapter Assembly (Figure 1, item 8).

5. Position the Dual Adapter Assembly as shown, with the through holes positioned over the original CAL valve screw holes on the analyzer.

   ![Figure 12. Position the Dual Adapter Assembly over the original CAL valve screw holes](image2.png)
6 Position the Reference Compound Valve (Figure 1, Item 3) over the rear Dual Adapter Assembly and drop the two long screws (Figure 1, item 9) through the Reference Compound Valve and Dual Adapter Assembly into the threaded holes in the Analyzer manifold.

7 Use a T-20 driver to secure the Dual Adapter Assembly and Reference Compound Valve to the analyzer chamber using the two screws.

8 Use a T-20 screwdriver to attach the original CAL valve to the front inlet position of the Dual Adapter Assembly using the two original screws removed in step 1.

If the CAL valve can’t reach its new mounting location due to the length of its control wire, you must reposition this wiring run so that the CAL valve can be mounted. If equipped, you must remove the CI or JetClean Flow control system cover to access this CAL valve wiring. Use a T-20 driver to remove the screw on the rear of this cover and then lift the cover off.

9 If you removed the Flow control system cover, replace it after rerouting the CAL valve wiring and mounting the CAL valve.

10 Route the Reference Compound Valve wiring through the opening slot shown down to the base of the MS. Route the wiring so that it does not touch the GCMS interface heated zone cover.
Install the MS Wiring Harness

This procedure starts with the MS vented and separated from the GC, the instruments disconnected from the building supply mains, the MS instrument covers removed, the voltage divider board, the reference gas valve, and original calibration valve installed.

Materials needed

- Screwdriver, Torx T-20
- Gloves, clean, lint-free (Large 8650-0030) (Small 8650-0029)
- MS Wiring Harness (Figure 1 item 1)

![MS wiring harness connections](image)

Procedure

1. Plug the wiring harness into the Voltage Divider PCA (Figure 1, Item 6).

![Route wiring to GC and Reference Compound Valve](image)
2. Route the wiring for both the GC and the Reference Compound Valve through the opening shown and drop down both wires to the base of the MS.

3. Route the GC and Reference Compound Valve wiring drops to the base area of the MS.

Figure 17. GC and Reference Compound Valve wiring drops
4. Connect wiring drop from the Reference Compound Valve to the MS wiring harness.

Figure 18. Connecting Reference Compound Valve wiring into the MS Wiring Harness
Install the MS Covers

Install the Front Cover

1. Place the previously removed sheet metal baffle over the e-module.
2. Place the LED cable into the plastic holder if installed.

3. Secure the sheet metal baffle using the one or two previously removed T-20 screws.

4. If your MS model has a LED, plug its cable into the Front Bottom Cover.

Figure 19. Putting the LED cable into the plastic holder

Figure 20. Secure the baffle using the previously removed screws
Install the Front Bottom Cover by holding the cover in place and gently pressing in on it.

Store the Analyzer window cover since it can no longer be used due to interference with the relocated CAL Valve.

Install the MS Top Cover

Position the MS top cover and use a T-20 screwdriver to install the seven screws securing the MS top cover.
Remove the GC Covers

This procedure starts with the MS vented and separated from the GC, both instruments are disconnected from the building supply mains, and the GC heated components cooled to ambient temperature.

If using an 8890 or 7890 GC see “Remove the 7890/8890 GC Covers” below.

If using a 9000 GC see “Install the 9000 GC Control Wiring” on page 23.

Remove the 7890/8890 GC Covers

Materials needed

• Screwdriver, Torx T-20
• GC control wiring harness (Figure 1 item 2)

Procedure

1. Remove the Detector Cover by raising the cover up, then firmly lift up on the right side of the cover to free it from the GC. Set the cover aside.

2. To remove the Pneumatics Cover, first disconnect any vent tubing connected to the split and septum purge vents. Press the buttons located on each side of the Pneumatics Cover and lift up to remove it from the GC. Set the cover aside.

3. Remove the Detector Cover. Set the cover aside.
To remove the Left Side Cover, use a T-20 screwdriver to completely loosen the captive screws, then slide the cover back and remove the Left Side Cover of the GC.

Figure 24. Left side panel cover screw locations
5 Loosen the captive screws on the Right Side Cover, slide the cover back, then remove.

Figure 25. Loosen captive screws located on the GC Right Side Cover
Install the 7890/8890 GC Wiring Harness

1. Route the GC Wiring Harness (Figure 1 item 2) between the split vent filter location and the inlet fan.

Figure 26. GC Wiring Harness passing behind the inlet fan

2. Continue routing the GC Wiring Harness in front of the pneumatic modules and through the opening at the top arrow of the photo going into the GC electronics area.

Figure 27. GC Wiring Harness route across the top of the GC
3. Plug the GC Wiring Harness into the lowest numbered first available socket. In the example below it is plugged into the Valve# 1 socket.

![GC Wiring Harness plug-in location](image)

4. Record the socket Valve# number used to configure this instrument in MassHunter Data Acquisition. See step 3 on page 30.

5. Reinstall the GC Right Side Cover.

6. Route the GC Wiring Harness through the small round opening (arrow below) in the GC Left Side Cover.

![GC control wiring harness plug-in location](image)

7. Plug the GC Wiring Harness into the MS Wiring Harness. See Figure 18 on page 15.

8. Reinstall the GC Left Side Cover.

9. Reinstall the GC Pneumatics Cover and Detector Cover.
Install the 9000 GC Control Wiring

Remove the 9000 GC cover

Materials needed

- Screwdriver, Torx T-20
- GC Wiring Harness (Figure 1 item 2)

Procedure

1. Completely loosen the two captive screws securing the GC Left Side Cover to the GC.

2. Slide the GC Left Side Cover back, tilt the top away from the GC, and remove the cover.
Install the GC wiring harness in the 9000 GC

Materials needed

- Screwdriver, Torx T-20
- GC Wiring Harness (Figure 1 item 2)

Procedure

1. Route the GC Wiring Harness through the round opening on the back of the 9000 GC just above the right end of the handle on the back of the GC.
2. Plug the male end of the GC Wiring Harness into the ALS connector PCA.
3. Plug the GC Wiring Harness into the MS wiring harness. See Figure 18 on page 15.

Install the 9000 GC covers

1. Position the GC Left Side Cover on the GC and secure using two captive screws. See Figure 30.
Attach the MS and GC

If using an 8890 or 7890 GC see “Attach the MS to the 8890 or 7890 GC”.
If using a 9000 GC see “Attach the MS and the 9000 GC” on page 26.

Attach the MS to the 8890 or 7890 GC

This procedure starts with both instruments shut down and at room temperature

1 Position the MS so the end of the GC/MS interface is near the GC.
2 Reconnect the GC/MS interface cable and, if present the LVDS and the APG cable.
3 Slide the MS to its regular position next to the GC.
   Be careful not to damage the GC/MS interface as it passes into the GC. Ensure the end of
   the GC/MS interface extends into the GC oven.
4 The foreline pump may be located on the floor or on the lab bench next to or behind the
   MS.
5 Install the capillary column. Refer to the Agilent 7000/7010 Series TQ GC/MS Operating
   Manual.
6 Pump down the MS.
   Ensure your MS meets all the conditions listed in the Pump Down section of the Agilent
   7000/7010 Triple Quad GC/MS Operating Manual before starting up and pumping down
   the MS. Failure to do so can result in personal injury.

WARNING
Do not turn on any GC heated zones until carrier gas flow is on. Heating a column with no
carrier gas flow will damage the column.

CAUTION
During pumpdown, do not push on the filament board safety cover. Pressing there may
damage the enclosed electronics.

7 Turn on the GC. Enter appropriate temperature setpoints for the GC/MS interface and GC
   oven.
Attach the MS and the 9000 GC

This procedure starts with both instruments shut down and at room temperature

1. Position the MS so the end of the GC/MS interface is near the GC. (See Figure 3 on page 6.)

2. Tighten the thumb screw at the top of the interface heater clamp. If the thumb screw is loose when reconnecting the GC/MS, it will be difficult to tighten when installing the 9000 GC/MSD Tall.

3. Open the GC front door.

4. Connect the GC/MS interface cables and, if used, the APG cable.

5. Slide the MS against the GC with the GC/MS interface entering the GC side opening (see Figure 8 on page 9), and the metal brackets entering their slots in the base of the GC. Be careful not to damage the GC/MS interface as it passes into the GC.

6. Slide the MS forward until the GC/MS interface lightly contacts the bus.
7 Using a T-20 Torx screwdriver, tighten the lock plate by turning the lock plate screw counterclockwise.

8 Install the 9000 GC/MS Tail. Pump down the MS. Refer to the Agilent 7000/7010 Series TQ GC/MS Operating Manual.

**WARNING** Ensure your MS meets all the conditions listed in the Pump Down section of the Agilent 7000/7010 Triple Quad GC/MS Operating Manual before starting up and pumping down the MS. Failure to do so can result in personal injury.

**CAUTION** Do not turn on any GC heated zones until carrier gas flow is on. Heating a column with no carrier gas flow will damage the column.

**CAUTION** During pumpdown, do not push on the filament board safety cover. Pressing there may damage the enclosed electronics.

9 Turn on the GC. Enter appropriate temperature setpoints for the GC/MS interface and GC oven.
Figure 34. A view of the completed MS installation
Edit the GC Method

When configured with a 7890 or 8890 GC, this procedure requires the GC valve ID number where the cable harness connects. This section assumes working with Agilent MassHunter GCMS Acquisition 10.1 and above.

Refer to SGS AXYS Method 16130 and the Agilent application note DE44221.5046296296 "An Alternate Testing Protocol for EPA 1613B using Agilent Triple Quadrupole GC/MS“ for injection type, oven program, etc.

1. Load a similar analytical method to use as a starting point.

   When you load a method, the software compares the actual source/quad temperatures to the setpoints stored in the tune file that is part of that method. If they are not within a 3 °C tolerance, you are asked if you want to download the new setpoints.

2. Save the method with a new name.

Configuring the reference valve

1. Click on the GC parameters icon or select Instrument > GC parameters.

2. Select Configuration > Miscellaneous.

Figure 35. GC parameters icon

Figure 36. Selecting Configuration > Miscellaneous
3. In the Valve Configuration table, select Switching Valve as the Valve Type for the item number used.

When configured with a 7890 or 8890 GC, the Valve# number was recorded in step 4 on page 22. Select this number as the item Number in the Valve Configuration table. For a 9000 GC, use item 1 currently named Valve# 1. Enter a name for this valve in the Name field, for example Reference Compound Valve in item 1.

![Valve Configuration example](image1)

4. Click Apply and then select Valves to display the Valves table.

![Valves table displaying newly installed Reference Compound Valve](image2)

5. To test that the valve is operating correctly, select On, click Apply, and listen for a click at the valve's location. De-select On to close the valve. If you did not hear a click, please go to the troubleshooting section of this manual.

6. Click OK to close the GC Edit Parameters window.

Add a Timed Event to the method

Using the example parameters will result in the valve opening at time 0.1 min (six seconds) after injection has taken place and will close at time 50.5 minutes.
1 Click on the GC parameters icon or select Instrument > GC parameters.

2 Select Events to display the Runtime Events table. Enter the Time when the reference valve opens, select Valve for the Event Type, See Figure 39 on page 31.

3 Select the Valve number assigned to the reference valve for the Position, and select On for the Setpoint.

4 Enter the Time when the reference valve closes, select Valve for the Event Type, select the valve number assigned to the reference valve for the Position, and select Off for the Setpoint.

5 Click OK to close the GC Edit Parameters window and add this timed event to the method.

Verify the correct column is installed

1 In the MassHunter GC parameters window select Configuration > Columns

2 Verify that the following column is installed and selected for this method. If this column is not installed you must install it first and return here to verify and save the method.

   For 8890/7890 Agilent DB-5, 60 m x 0.25 mm, 0.1 um (p/n 122-5061)

   For 9000 GC use the equivalent Agilent DB-5, 60 m x 0.25 mm, 0.1 um column

3 Save the method.
Edit MS method parameters

Refer to SGS AXYS Method 16130 and the Agilent application note DE4422.5046296296 "An Alternate Testing Protocol for EPA 1613B using Agilent Triple Quadrupole GC/MS".

Add a PFTBA Reference Compound to an MRM method

1. Click on the MS parameters icon or select Instrument > MS parameters.

2. In the Time Segment table, select a time segment where the reference compound MRM Transition data is required.

3. In the MRM Transition table, click the Add a row at the end of the table icon.

4. Enter the reference compound MRM transition data for that time segment.

PFTBA reference signal: MRM 414->264 (Wide:Unit) at 35V CE, 15 ms dwell time

5. Repeat the above steps for the remaining Time Segments where the reference compound might be found.
6 Click OK to save these MRM transitions and close the Triple Quad MS Method Editor window.

7 Save the method.

**Add a valve Monitor to the method**

1 Select Instrument > Edit Monitors to open the Select Monitors dialog.

2 Select the valve number from the Available Monitors column, click Add, and click OK.

3 MassHunter prompts you to arrange monitors. If needed, drag the new valve monitor to a preferred location.

4 This monitor displays 1.0 when the valve is open and 0.0 when the valve is closed.

5 Double Click on the Monitor to open the settings for it. Change the Monitor Label from Valve 1 to Reference Compound and click OK.

6 Save the method.
Maintenance

To Refill the Reference Compound Valve Vial

This procedure requires that the “Configuring the reference valve” on page 29 was completed.

Materials needed

- PFTBA calibrant (05971-60571)
- Syringe

Procedure

1. If equipped with a gas flow controller, set the gas flow to Gas Off.
2. Vent the MS.
3. Loosen the collar holding the Compound Reference Vial in place. Do not remove the collar.
4. Remove the vial from the collar.

**CAUTION** Do not rinse the vial with any solvents. Never expose the inside of the vial to chlorinated solvents or isopropyl alcohol or water.

5. Fill the vial no higher than the bottom of the internal tube with fresh PFTBA calibrant (05971-60571).
6. Replace the vial and tighten the collar finger-tight.
7. Pump down the MS. Do not allow the filament to energize.

**CAUTION** After loosening the collar sealing the vial, you must always purge the reference valve. Failure to do so will result in severe contamination of the ion source contamination and could damage the filament and electron multiplier (EM).

8. In the Instrument Control panel, select the GC Parameters icon to display the GC Edit Parameters window.
9. Select Valves to display the Valves table.

11. De-select On to close the Reference Compound Valve after 30 seconds.
12. Click OK to close the GC Edit Parameters window.
**Troubleshooting**

This section assumes working with Agilent MassHunter GCMS Acquisition 10.1 and above.

**Performance**

The method states “The response of the MRM product ion shall not vary by more than ±20% throughout the run.”

Upper limit = average of all PFTBA signal data points within method specified time range multiplied by 1.2

Lower limit = average of all PFTBA signal data points within method specified time range multiplied by 0.8

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause</th>
<th>Possible solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference compound response not stable</td>
<td>Interference from matrix</td>
<td>Perform further sample cleanup</td>
</tr>
<tr>
<td></td>
<td>Column bleed interference</td>
<td>Use column, Agilent DB-5, 60 m × 0.25 mm, 0.1 um (p/n 122-5061), described in SGS AXYS Method 16130 and Agilent application notes, Column film thickness can affect the amount of bleed which intern effects the stability of the reference mass response.</td>
</tr>
<tr>
<td></td>
<td>Valve needs purging</td>
<td>Purge valve before running</td>
</tr>
<tr>
<td></td>
<td>Flow rate changing during run</td>
<td>Use constant flow. Ensure column is configured correctly</td>
</tr>
<tr>
<td></td>
<td>Ambient temperature changes at the vial can effect evaporation of PFTBA.</td>
<td>Maintain stable temperature at reference valve vial location.</td>
</tr>
<tr>
<td>Reference compound signal trending down during run</td>
<td>Column bleed interference</td>
<td>Use column described in SGS AXYS Method 16130 and Agilent application notes, Column film thickness can affect the amount of bleed which intern effects the stability of the reference mass response.</td>
</tr>
<tr>
<td></td>
<td>Ambient temperature changes at the vial can effect evaporation of PFTBA.</td>
<td>Maintain stable temperature at reference valve vial location.</td>
</tr>
<tr>
<td>No reference compound signal but other compounds present</td>
<td>Reference mass compound vial needs refilling</td>
<td>Refer to maintenance section of this manual</td>
</tr>
<tr>
<td></td>
<td>Valve not opening</td>
<td>Manually open/close valve in the GC method editor screen and listen for click of valve opening</td>
</tr>
<tr>
<td></td>
<td>Cables are unplugged</td>
<td>If GC was moved away from the MS the valve cable may have been unplugged. Check connection.</td>
</tr>
<tr>
<td></td>
<td>Valve is leaking</td>
<td>To troubleshoot used manual tune to review PFTBA in MS1 scan mode or find air duster/similar masses. The valve can be opened and closed via the GC front panel while in Manual tune screen</td>
</tr>
</tbody>
</table>
### Hardware

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference mass signal too low</td>
<td>Collision energy not set correctly</td>
<td>Adjust collision energy as per SGS AXYS Method 16130 and Agilent application notes. Agilent recommends 414.0-&gt;264.0 at CE=35V.</td>
</tr>
<tr>
<td></td>
<td>Ion source requires cleaning</td>
<td>Clean ion source</td>
</tr>
<tr>
<td></td>
<td>Electron multiplier needs replacing</td>
<td>If EMV is &gt;2200V on tune report, consider replacing EM</td>
</tr>
<tr>
<td>Reference mass signal too abundant</td>
<td>Collision energy not set correctly</td>
<td>Adjust collision energy as per SGS AXYS Method 16130 and Agilent application notes. Agilent recommends 414.0-&gt;264.0 at CE=35V.</td>
</tr>
<tr>
<td></td>
<td>Gain factor set too high</td>
<td>Use lower gain factor setting in the method as per A Quick-Start Guide to Optimizing Detector Gain for GC/MS Agilent application note 5991-2105EN.</td>
</tr>
</tbody>
</table>

#### Reference Compound Valve does not "click"

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method keeps the Reference Compound valve open</td>
<td>Refer to section &quot;Configuring the reference valve&quot; on page 29.</td>
</tr>
<tr>
<td>Reference Compound Valve is faulty</td>
<td>Call Agilent assist</td>
</tr>
<tr>
<td>The voltage divider PCA electronic board has failed</td>
<td>Call Agilent assist, voltage divider PCA has an LED that turns on when valve is open. Check LED status.</td>
</tr>
<tr>
<td>A cable is disconnected</td>
<td>Inspect the connections between the GC and MS wiring harnesses, the MS PCB, the GC 9000 PCB or the 8890/7890 valve connectors, and the PFTBA solenoid valves.</td>
</tr>
</tbody>
</table>

#### Leaks

<table>
<thead>
<tr>
<th>O-ring seal broken</th>
<th>If a leak is found to be at the Reference Compound Valve by spraying air duster around the valve, vent MS and in spec/clean O-rings. Including the O-ring around the vial.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To troubleshoot used manual tune to review PFTBA in MS1 scan mode or find air duster/similar masses. The valve can be opened and closed via the GC front panel while in Manual tune screen.</td>
</tr>
</tbody>
</table>
Warranty

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