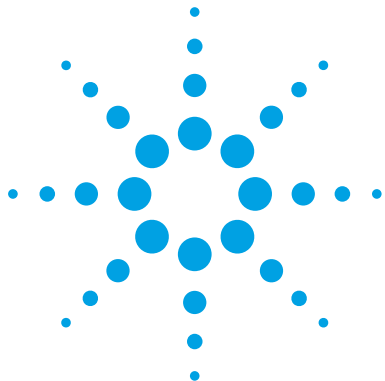




Nebulizer Adjustment Fixture

User Guide

- Before you begin 2
- To inspect the nebulizer 3
- To adjust or replace the nebulizer needle 6
- Troubleshooting 12

This guide applies to the Nebulizer Adjustment Fixture Kit (p/n G1960-67470).
Use this kit to adjust these nebulizers:



Microflow Nebulizer Assembly (G1946-67260)



ES Tested Nebulizer (G1958-67098)



Tested ESI Nebulizer Assembly (G1946-67098)



Tested APCI Nebulizer Assembly (G1946-67037)

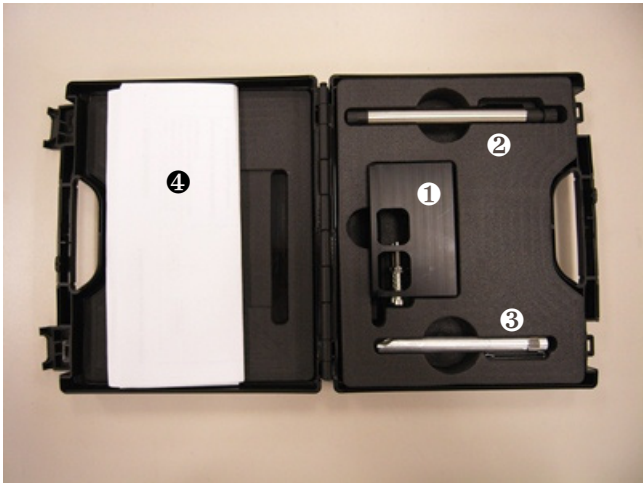


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Before you begin

Make sure that your kit includes these parts:

Callout Number	Description	Part Number
1	Nebulizer Adjustment Fixture	GT430-20470
2	LED Flashlight	2140-0826
3	40× Magnifier	1000-1541
4	User Guide	G1960-90470



To inspect the nebulizer

- 1 Insert the nebulizer into the [Nebulizer Adjustment Fixture](#):
 - a Carefully insert the tip of the nebulizer into the end of the [Nebulizer Adjustment Fixture](#).
 - b Slide the heads of the two spring loaded socket head cap screws through the mounting holes on the body of the nebulizer.
 - c Turn the nebulizer body 1/8 turn counter-clockwise.

If the nebulizer is too tight or too loose, loosen or tighten the nut on the captured screws to adjust the tension on the spring.
- 2 To inspect the *end* of the nebulizer for poor needle centering, plugged needles, or nozzle damage ([Figure 1](#)):
 - a Gently push the [40× Magnifier](#) into the end horizontal position of the [Nebulizer Adjustment Fixture](#). The focal length approximately corresponds to the end of the magnifier.
 - b Push the [LED Flashlight](#) into the [Nebulizer Adjustment Fixture](#). No tool is needed.

For ES or ESI nebulizers, use Vertical #2 Position.

For APCI nebulizers, use Vertical #1 Position.

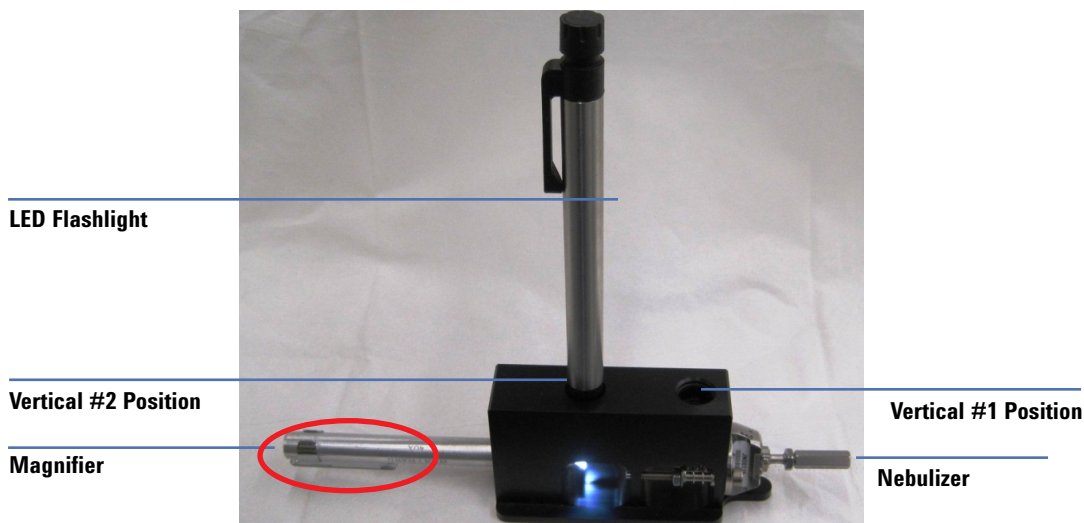


Figure 1 Setup to inspect the end of the nebulizer. Pocket clip of the [40× Magnifier](#) is circled.

To inspect the nebulizer

- 3 To inspect the *side* of the nebulizer for the correct needle adjustment length, damaged needle, or corroded nozzle (Figure 2):
 - a Gently push the **LED Flashlight** into the end horizontal position of the **Nebulizer Adjustment Fixture**.
 - b Push the **40× Magnifier** into the **Nebulizer Adjustment Fixture**. No tool is needed. The focal length approximately corresponds to the end of the magnifier.

For ES or ESI nebulizers, use Vertical #2 Position.

For APCI nebulizers, use Vertical #1 Position.

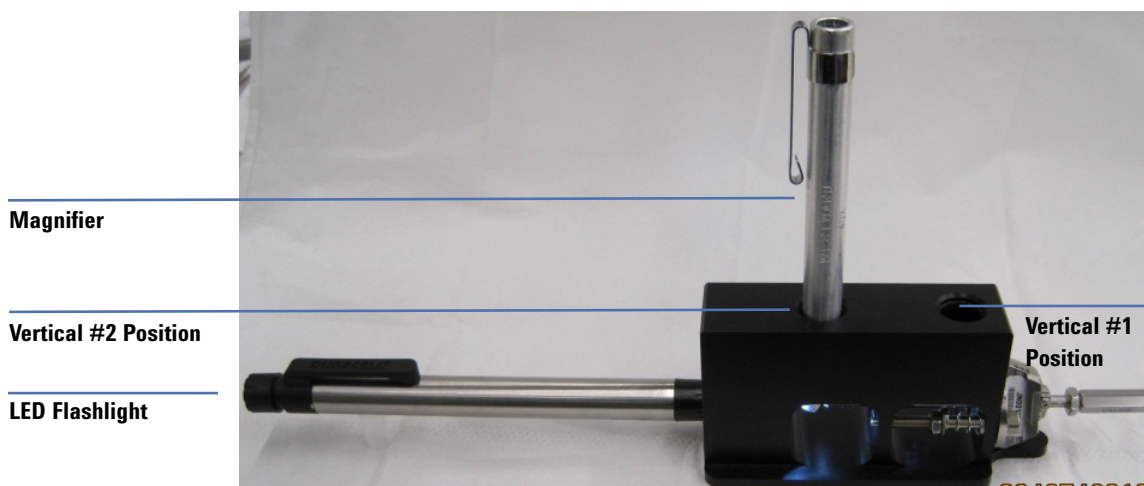


Figure 2 Setup to inspect the side of the nebulizer

- 4 Turn on the **LED Flashlight**. The on/off switch is at the end of the flashlight.

CAUTION

Do not hit or touch the end of the nebulizer or you can damage the needle.

- 5 Gently slide and rotate the 40× Magnifier into or out of the Nebulizer Adjustment Fixture to focus the magnifier on the end of the nebulizer nozzle and needle. For the APCI nebulizer, if needed, remove the pocket clip to focus properly. See Table 2 for correct needle position.

If the needle is not in the correct position or shows signs of wear or damage, continue to “To adjust or replace the nebulizer needle” on page 6.

To adjust or replace the nebulizer needle

- When needed**
- When the needle is plugged. Common symptoms of a plugged needle are:
 - increased LC back pressure
 - off-axis spraying
 - dripping from the nebulizer
 - reference nebulizer needle is not spraying.
 - When the needle appears to be corroded or damaged. See [Figure 3](#).

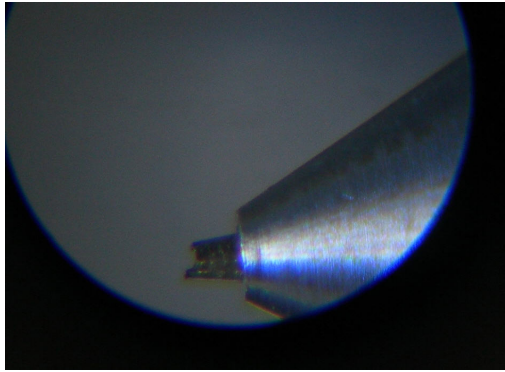


Figure 3 Corroded needle in nebulizer

- Tools needed**
- Nebulizer Adjustment Fixture
 - clean gloves
 - pliers or wrench, depending on nebulizer holder
 - long-nose pliers (p/n 7810-0004)
 - 3-mm open-end wrench (p/n 8710-2699)
 - wrench or driver, depending on nebulizer style:
 - ¼-inch x 5/16-inch open-end wrench (p/n 8710-0510)
 - T6 Torx driver (p/n 8710-2548)
 - 1.5-mm ball driver (p/n 8710-1570)

Parts needed nebulizer needle kit. See [Table 1](#). Each kit contains:

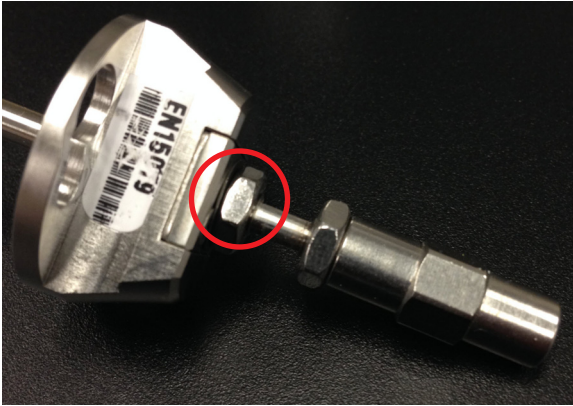
- needle
- ferrule
- needle holder

Table 1 Needle replacement kits

Nebulizer	Part Number
ESI Nebulizer Replacement Kit used with ES Nebulizer	G1958-60137
ESI Nebulizer Accessory Ship Kit used with ESI Nebulizer	G1946-68703
APCI Nebulizer Accessory Ship Kit used with Tested APCI Nebulizer Assembly	G1946-68704

- 1 Put on [clean gloves](#).
- 2 Determine the nebulizer holder type from [Figure 4](#).

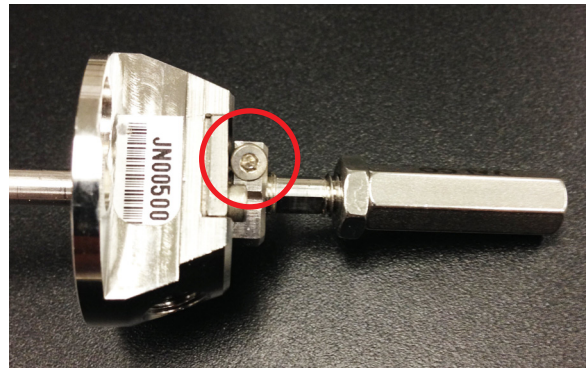
To adjust or replace the nebulizer needle



Nebulizer with locknut (original needle holder).



Nebulizer with T6 Torx screw (screw p/n 0515-0677)



Nebulizer with 1.5-mm hex screw.

Figure 4 Nebulizer needle holders

- 3 Install the nebulizer in the [Nebulizer Adjustment Fixture](#).
- 4 Loosen the locknut next to the zero-dead-volume (ZDV) union.
- 5 Remove the union from the nebulizer [needle holder](#).
- 6 Loosen the fastener (locknut, 1.5-mm hex screw, or T6 Torx screw) that secures the [needle holder](#) in place.

- 7 If you need to replace the needle:
- a Loosen the **needle holder** and pull it out of the nebulizer body. Dispose of the used needle properly.
 - b Rinse the inside of the nebulizer body with water and an organic solvent (methanol is preferred) to remove any contamination inside the nebulizer body.
 - c Thread the new **needle holder** into the nebulizer body.
 - d While holding the adjustment fixture in a vertical position, install the new **ferrule** in the needle holder. The wider end goes into the **needle holder**.
 - e Carefully remove the new **needle** from the shipping tube and adhesive strip. Identify the sharp end of the needle.



Figure 5 Blunt end of nebulizer needle



Figure 6 Sharp end of nebulizer needle (zoomed)

CAUTION

Do not bend the needle as you slide it into the ferrule. The needle is fragile. A bent needle results in poor alignment with the nebulizer body.

- f Carefully slide the sharp end of the **needle** through the **ferrule** until 1 cm of the **needle** remains at the ferrule.
- g Push the **needle** into the **ferrule** until the needle is slightly visible flush with the ferrule.

To adjust or replace the nebulizer needle

If the **needle** is pushed in too far, when the union is installed and the **ferrule** is compressed, the HPLC flow is restricted or blocked, which results in poor or no spray from the nebulizer.

- h** Reinstall the locknut and the union. Hand-tighten the union.
- i** Hold the **needle holder** steady with a **3-mm open-end wrench** or **¼-inch x 5/16-inch open-end wrench**, depending on your nebulizer holder style.
- j** Tighten the union one-half to three quarters of a turn, or until an audible squeak is heard.

The ferrule is now compressed.

- 8** Use a **¼-inch x 5/16-inch open-end wrench** to adjust the top of the **needle** to the proper distance from the end of the nozzle. See **Table 2**.
- 9** Tighten the lock nut and verify adjustment while you view the nebulizer tip through the magnifier.

See **Figure 7** and **Figure 8** for images of correctly adjusted nebulizer needles.

Table 2 Recommended Needle adjustment Distance

Nebulizer	Distance
Microflow Nebulizer Assembly	0.003 inch
ES Tested Nebulizer	0.000 (flush)
Tested ESI Nebulizer Assembly	0.003 inch
Tested APCI Nebulizer Assembly	0.000 (flush)

To adjust or replace the nebulizer needle

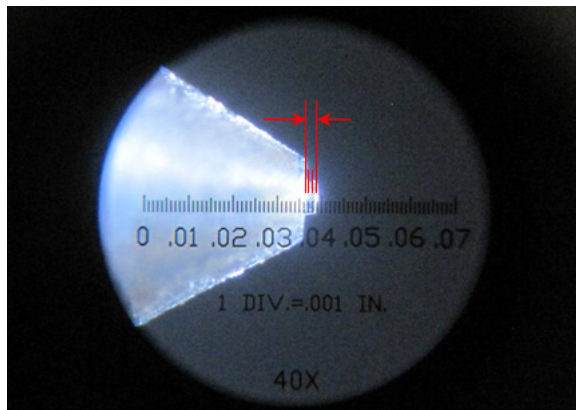


Figure 7 Side view of a correctly adjusted Tested ESI Nebulizer, with 0.003-inch distance marked.

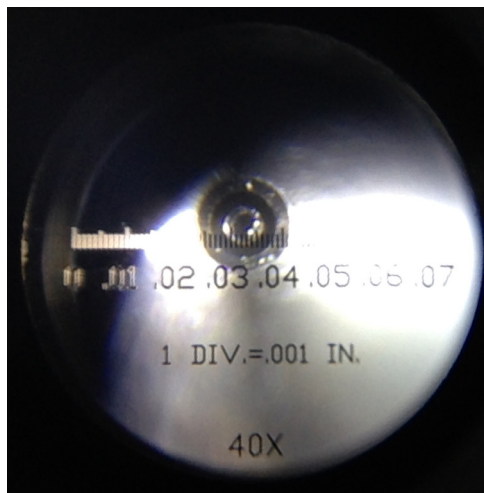
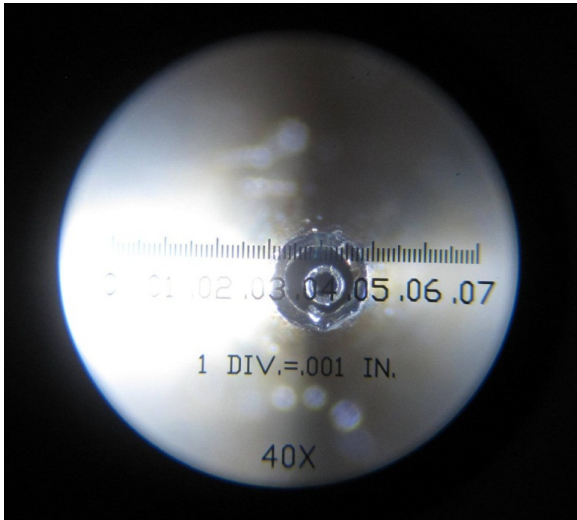
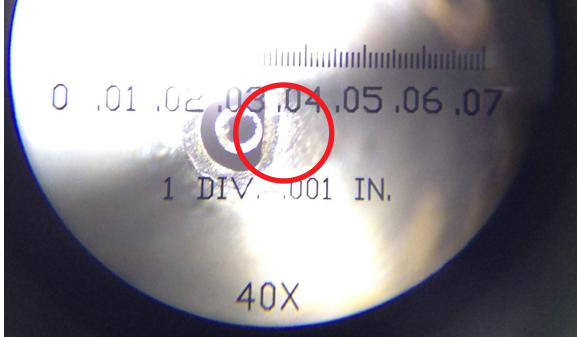
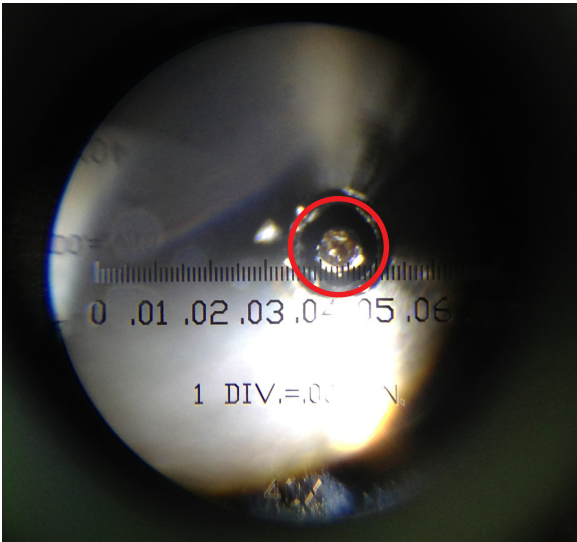


Figure 8 Example of a centered needle.

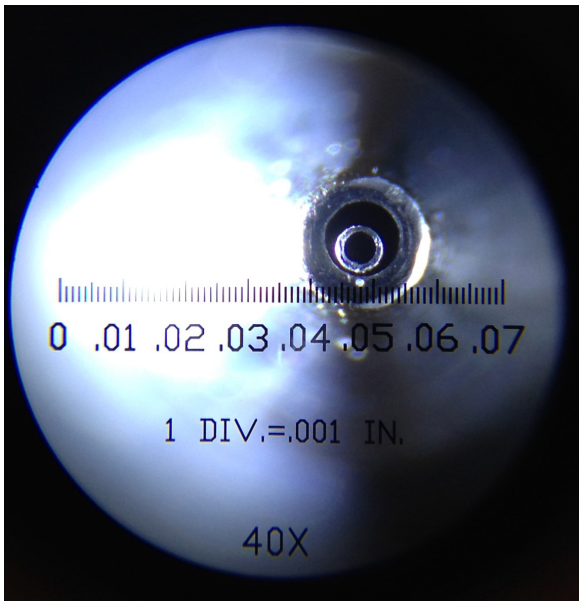
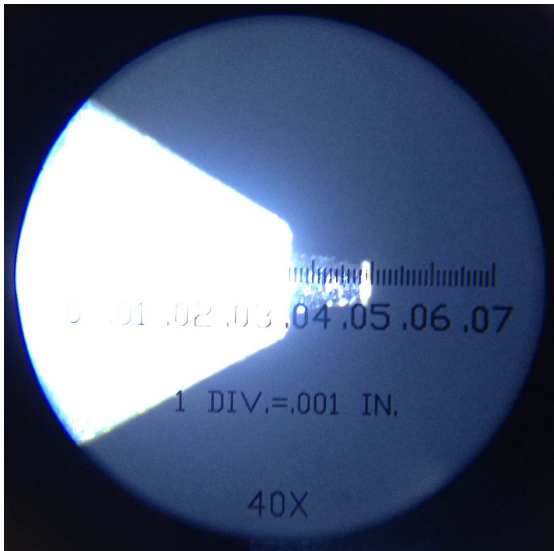
Troubleshooting

The figures below show badly adjusted or damaged nebulizers.

	Problem	Solution
	Concentricity of needle is poor	Replace the needle. If the replacement needle is still out of concentricity, the nebulizer body or the needle holder is damaged or bent. Replace the complete assembly.
	Nozzle body is damaged	Replace the entire nebulizer assembly.

	Problem	Solution
	Needle is clogged with salt.	Sonicate the nebulizer assembly in water and methanol. When sonicating, do not allow the tip of the nozzle to touch the beaker or flask. After sonication, if the needle is still clogged, replace the needle.

Troubleshooting

	Problem	Solution
	Needle is touching the nozzle	Replace the needle. If the replacement needle is still out of concentricity, the nebulizer body is bent. Replace the nebulizer.
	Needle is too far out of the nozzle.	Adjust the needle to the appropriate distance. See Table 2 .

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In This Book

This book contains instructions to inspect and adjust your nebulizer using the Nebulizer Adjustment Fixture.

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