INSTRUMENTS

Digester Gas Monitor

Maintenance Manual

Part Number: 71-0427

Revision: D

Released: 7/5/23

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Table of Contents

Introduction

This manual provides instructions for replacing parts of the Digester Gas Monitor that don't require replacement as part of normal periodic maintenance or are that unlikely to need replacement. See the Digester Gas Monitor Operator's Manual for replacement instructions for:

- sensors
- particle filter
- hydrophobic filter
- oil mist filter
- internal water trap
- external water trap
- water traps' filter element

Replacing the Dryer

Replace the dryer if the inner tube appears severely discolored or if the inner tube or area around the inner tube becomes clogged or contaminated with excessive amounts of particulates.

1. Turn off or unplug all incoming power to the Digester Gas Monitor.
2. Open the Digester Gas Monitor housing door, then place the power switch in the OFF position.

3. Turn the flow regulator knob all the way counterclockwise to close the flow regulator's output.

4. Locate the dryer in the center of the Digester Gas Monitor.

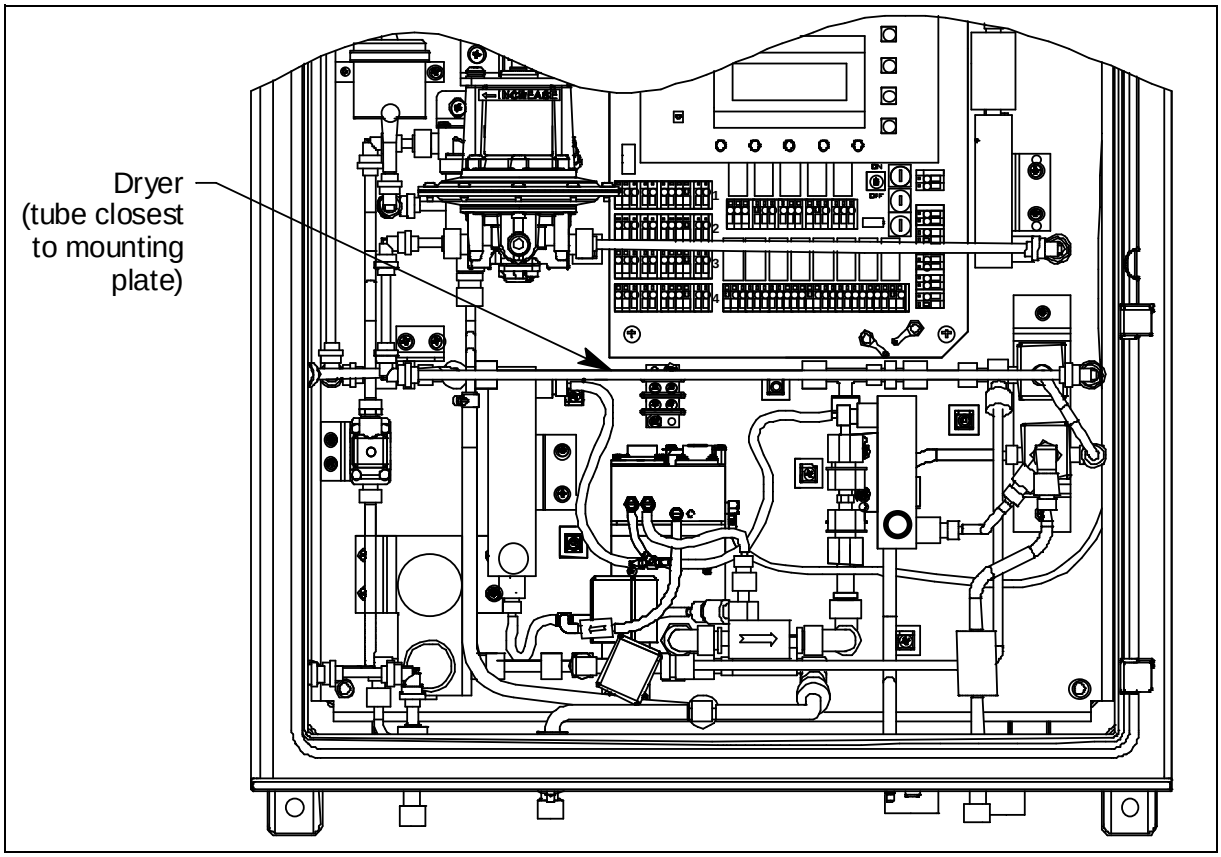


Figure 1: Dryer Location

5. There is a zip tie connecting the dryer to the bracket shown in the figure below. Cut the zip tie and remove it from the dryer and bracket.

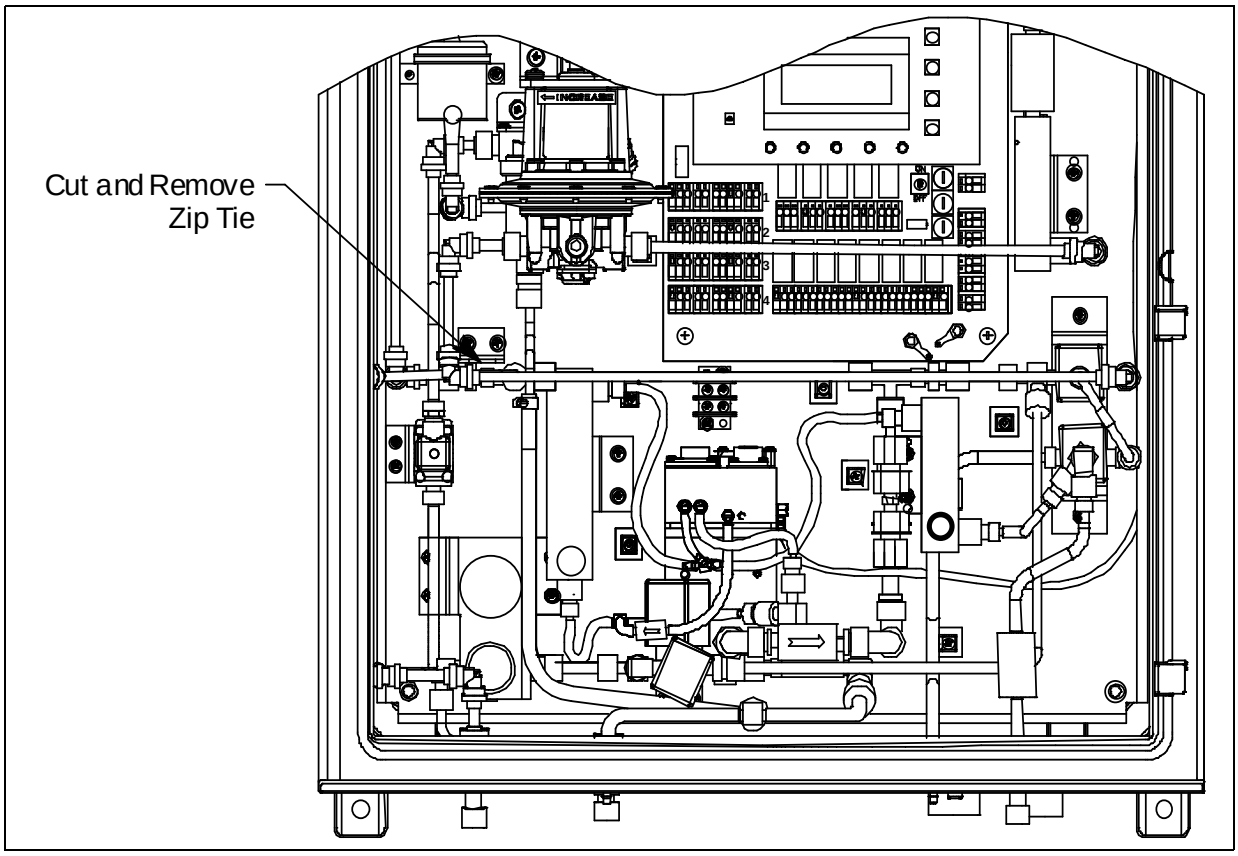


Figure 2: Dryer Zip Tie Removal

6. Unscrew the 4 connections shown in the figure below using a 5/8 inch wrench. Do not rotate the 2 fittings shown in the figure below.

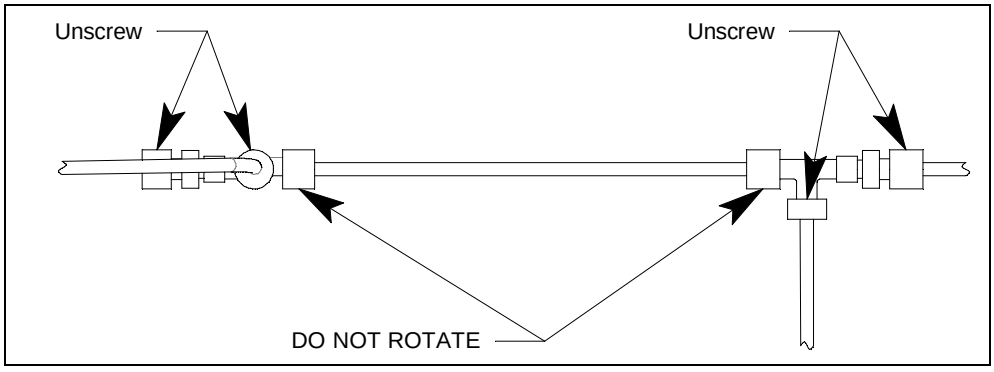


Figure 3: Dryer Removal

7. Remove the old dryer.
8. Install the new dryer in the same orientation as the old dryer.
9. Reconnect the 4 connections.

10. Install a new zip tie by guiding it around the dryer and through the 2 holes in the bracket as shown below.

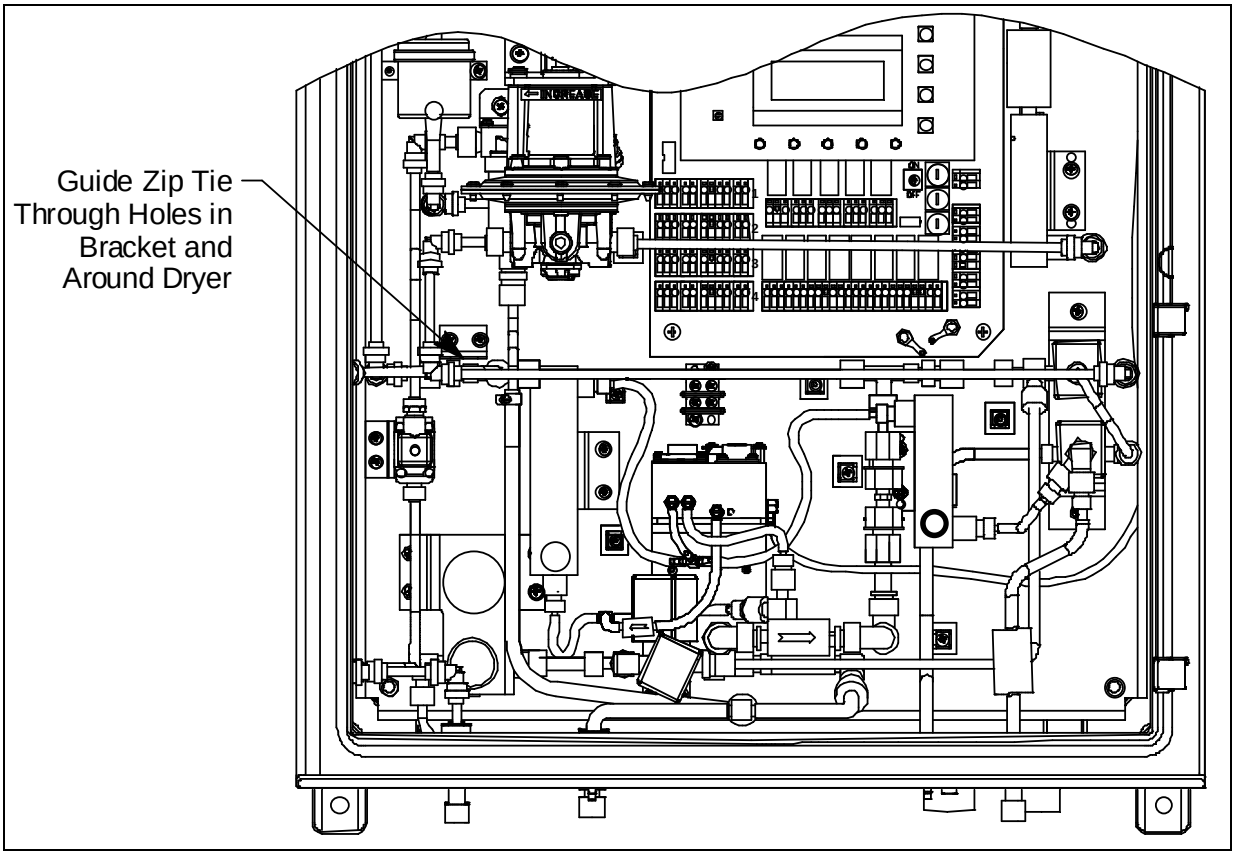


Figure 4: Installing a New Zip Tie

11. Plug in or turn on all incoming power to the Digester Gas Monitor.

12. Place the Digester Gas Monitor's power switch in the ON position, then verify that the PILOT light is on.

13. Turn the flow regulator knob clockwise to set the sensor flow to 3 SCFH once the system has started up.

14. Close and secure the housing door.

Replacing the H_2S Dilution Sample Flowmeter

Replace the H_2S Dilution Sample Flowmeter if it becomes dirty or wet and cannot be properly flushed out or cleaned or if the flowmeter ball sticks so that it is difficult to accurately determine the flowrate.

1. Turn off or unplug all incoming power to the Digester Gas Monitor.
2. Open the Digester Gas Monitor housing door, then place the power switch in the OFF position.
3. Turn the flow regulator knob all the way counterclockwise to close the flow regulator's output.
4. Locate the H_2S Dilution Sample Flowmeter in the center of the Digester Gas Monitor.

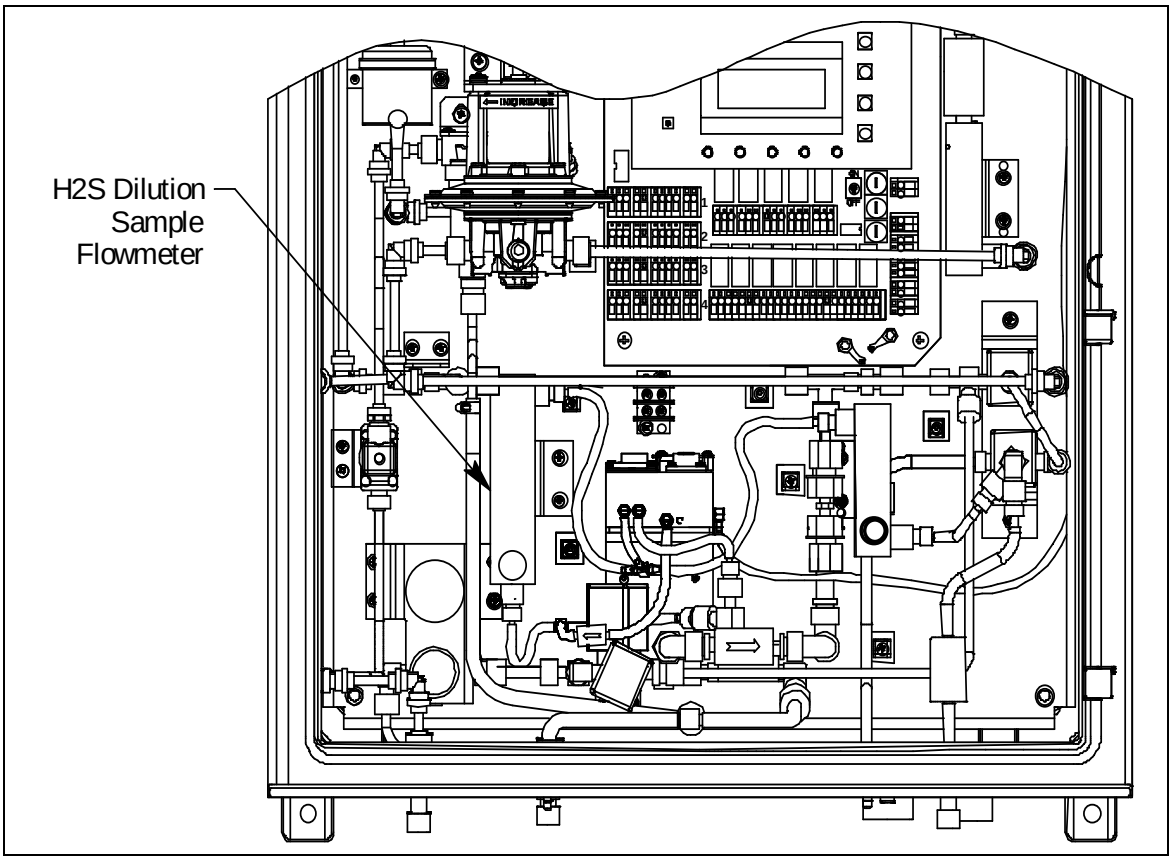


Figure 5: H_2S Dilution Sample Flowmeter Location

5. Use pliers to remove the clamps from the tubing connections at the top and bottom of the flowmeter (shown below). Then remove the tubing from the hose barb fittings. If the tubing gets damaged, replace it with 1/8 inch ID x 1/4 inch OD tubing.

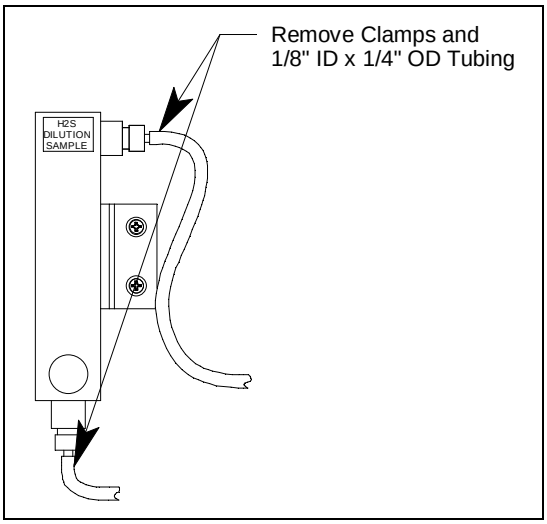


Figure 6: H_2S Dilution Sample Flowmeter Clamp and Tubing Removal

6. Unscrew the 2 screws holding the bracket to the plate. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot while replacing the flowmeter.

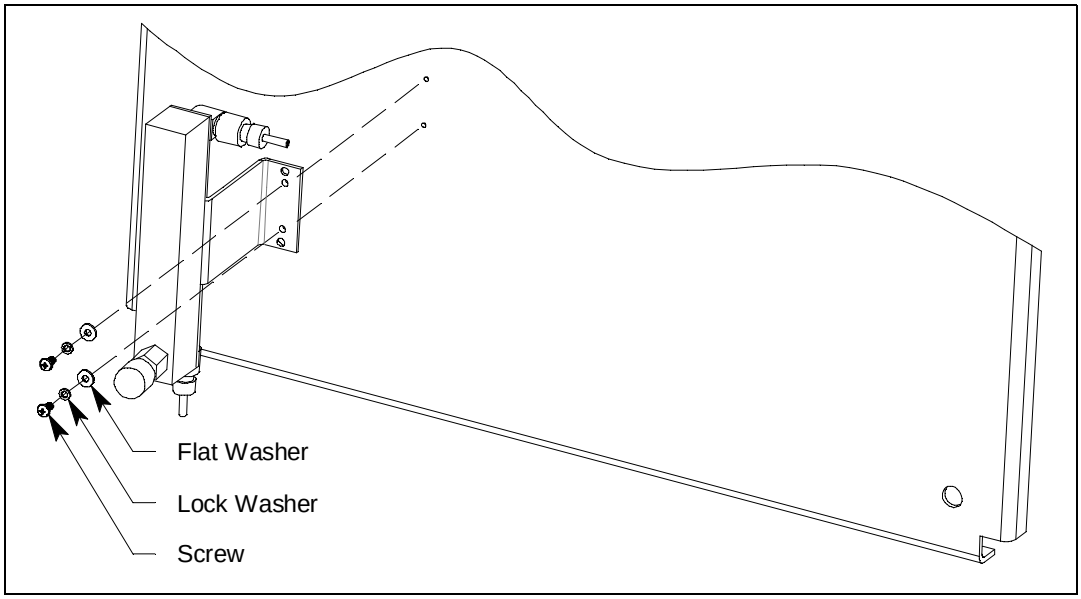


Figure 7: Removing H_2S Dilution Sample Flowmeter Bracket from Plate

7. Remove the flowmeter and bracket assembly from the plate.

8. There are 2 fittings connected together on each end of the flowmeter. For each end, unscrew the outermost fittings from the fittings connected to the flowmeter.

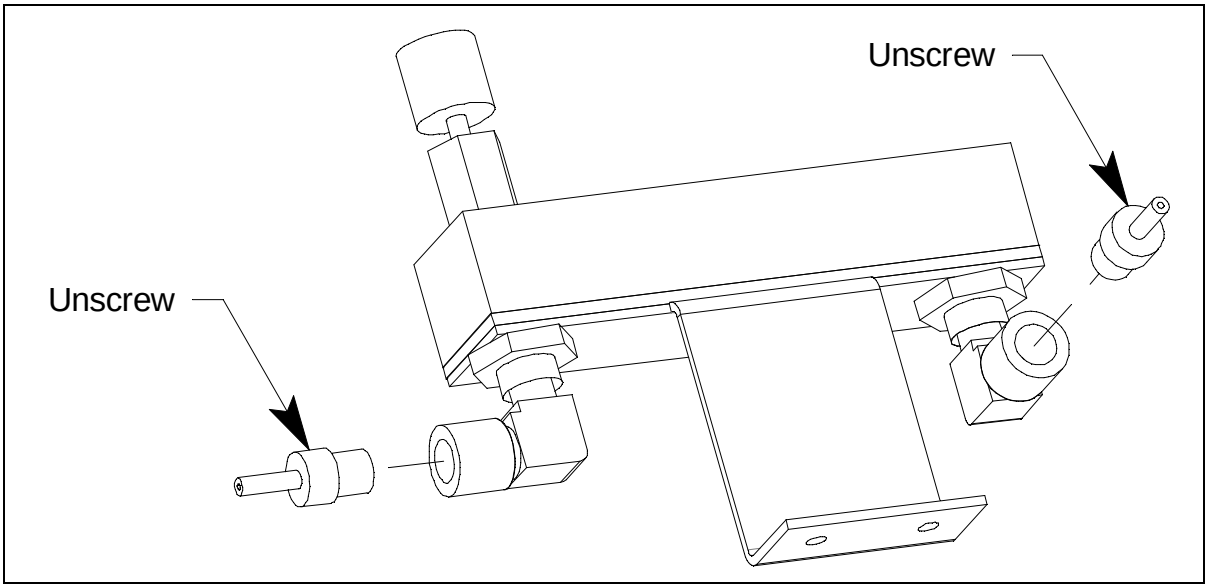


Figure 8: H_2S Dilution Sample Outermost Fitting Removal

9. Unscrew the 2 fittings from the top and bottom of the flowmeter.

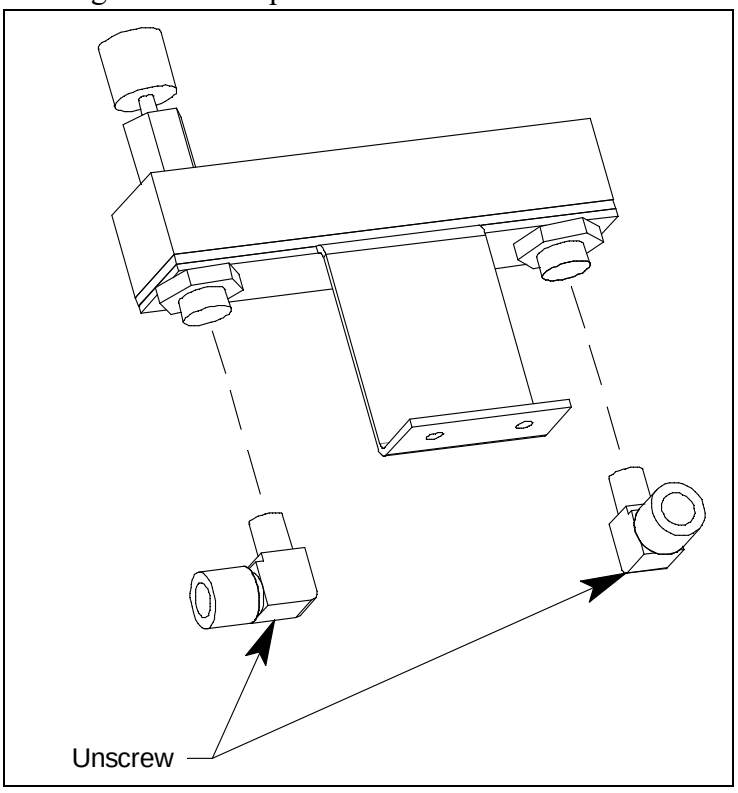


Figure 9: H_2S Dilution Sample Flowmeter Fitting Removal

10. Unscrew the hex nuts. New hex nuts come with the replacement flowmeter.

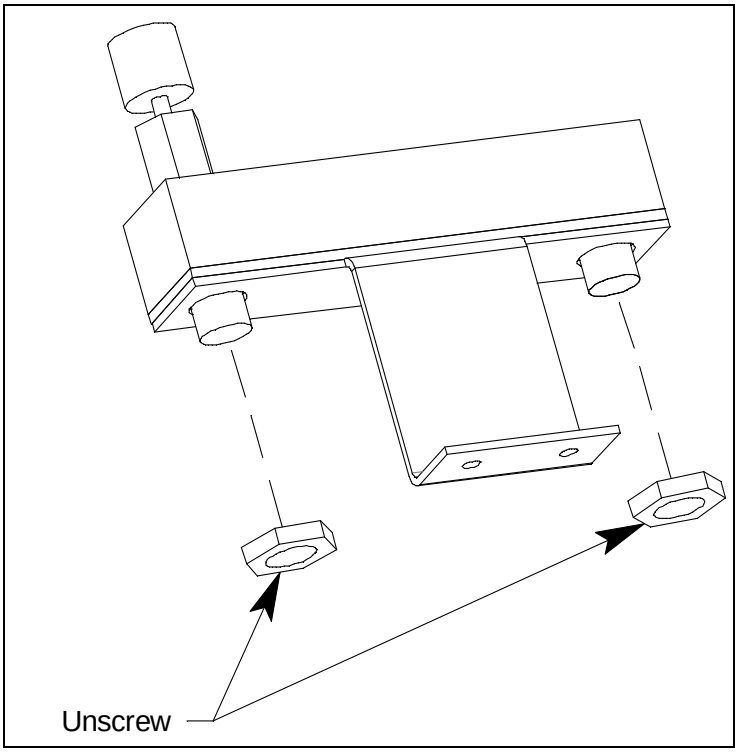


Figure 10: H_2S Dilution Sample Hex Nut Removal

11. Remove the old flowmeter from the bracket.

12. Install the new flowmeter onto the bracket using the hex nuts that came with the new flowmeter. Be sure the bracket and the flowmeter are in the correct orientation relative to each other.

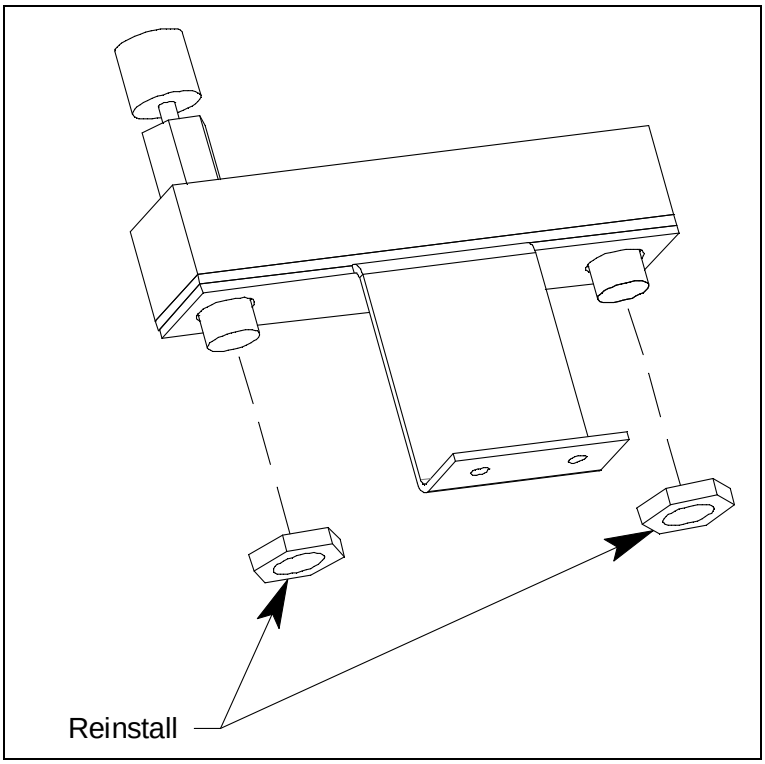


Figure 11: H_2S Dilution Sample Hex Nut Install

13. Put new Teflon tape on the L-shaped fittings and screw them into the new flowmeter. Be sure the fittings end up in the orientation shown in Figure 13 below.

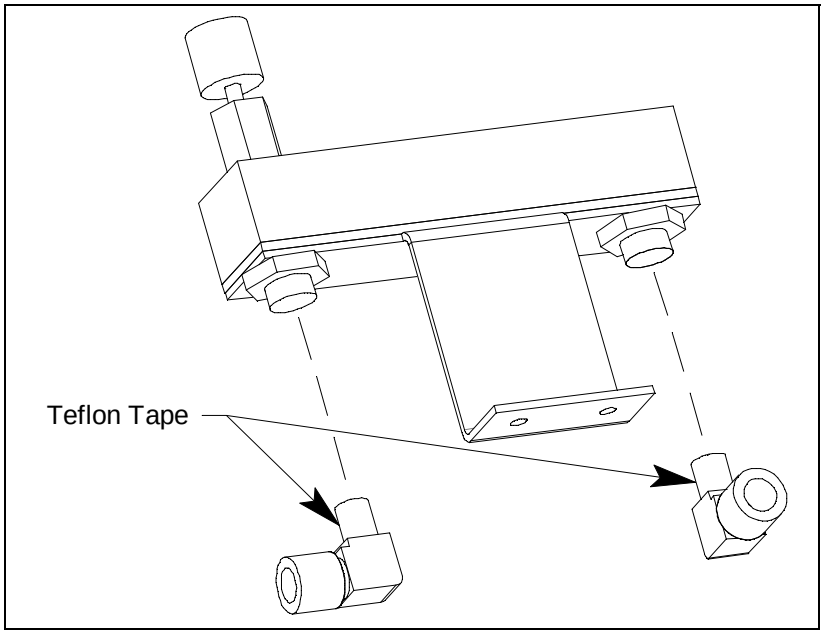


Figure 12: Installing Fittings on New H_2S Dilution Sample Flowmeter

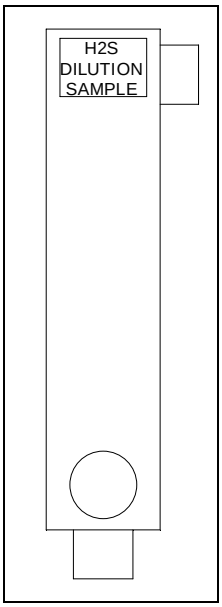


Figure 13: Correct H_2S Dilution Sample Flowmeter Fitting Orientation

14. Put new Teflon tape on the outermost fittings and screw them into the fittings connected directly to the flowmeter.

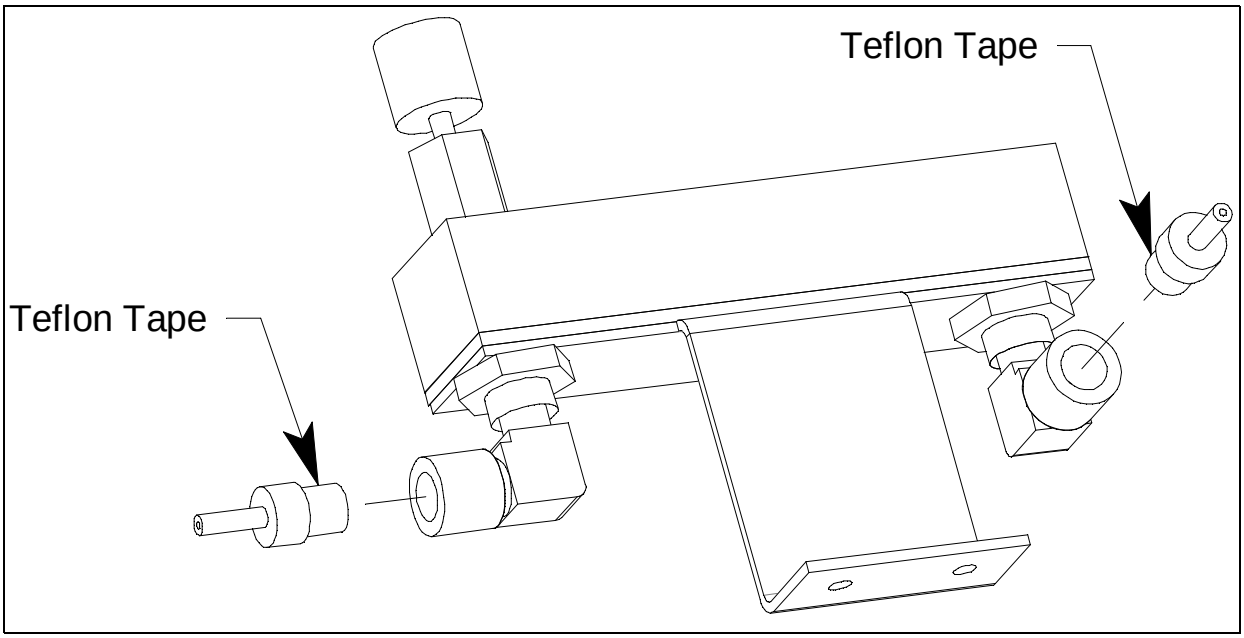


Figure 14: Reinstalling the Outermost Fittings

15. Reinstall the flowmeter/bracket assembly by using the screws, lock washers, and flat washers removed in Step 6 to attach the bracket to the plate.

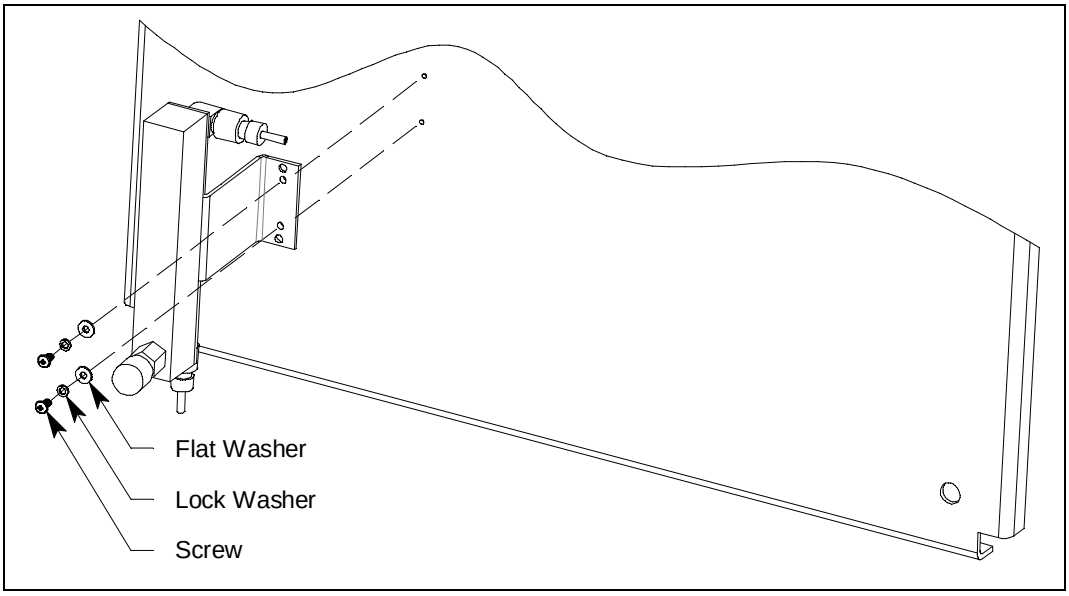


Figure 15: Attaching the H_2S Dilution Sample Flowmeter Bracket to Plate

16. Reconnect the tubing to the fittings.
17. Use pliers to reinstall the clamps over the tubing fitting connections.
18. Plug in or turn on all incoming power to the Digester Gas Monitor.
19. Place the Digester Gas Monitor's power switch in the ON position, then verify that the PILOT light is on.
20. Turn the flow regulator knob clockwise to set the sensor flow to 3 SCFH once the system has started up.
21. Close and secure the housing door.

Replacing the H_2S Dilution Air Flowmeter

Replace the H_2S Dilution Air Flowmeter if it becomes dirty or wet and cannot be properly flushed out or cleaned or if the flowmeter ball sticks so that it is difficult to accurately determine the flowrate.

1. Turn off or unplug all incoming power to the Digester Gas Monitor.
2. Open the Digester Gas Monitor housing door, then place the power switch in the OFF position.
3. Turn the flow regulator knob all the way counterclockwise to close the flow regulator's output.

4. Locate the H_2S Dilution Air Flowmeter in the center of the Digester Gas Monitor.

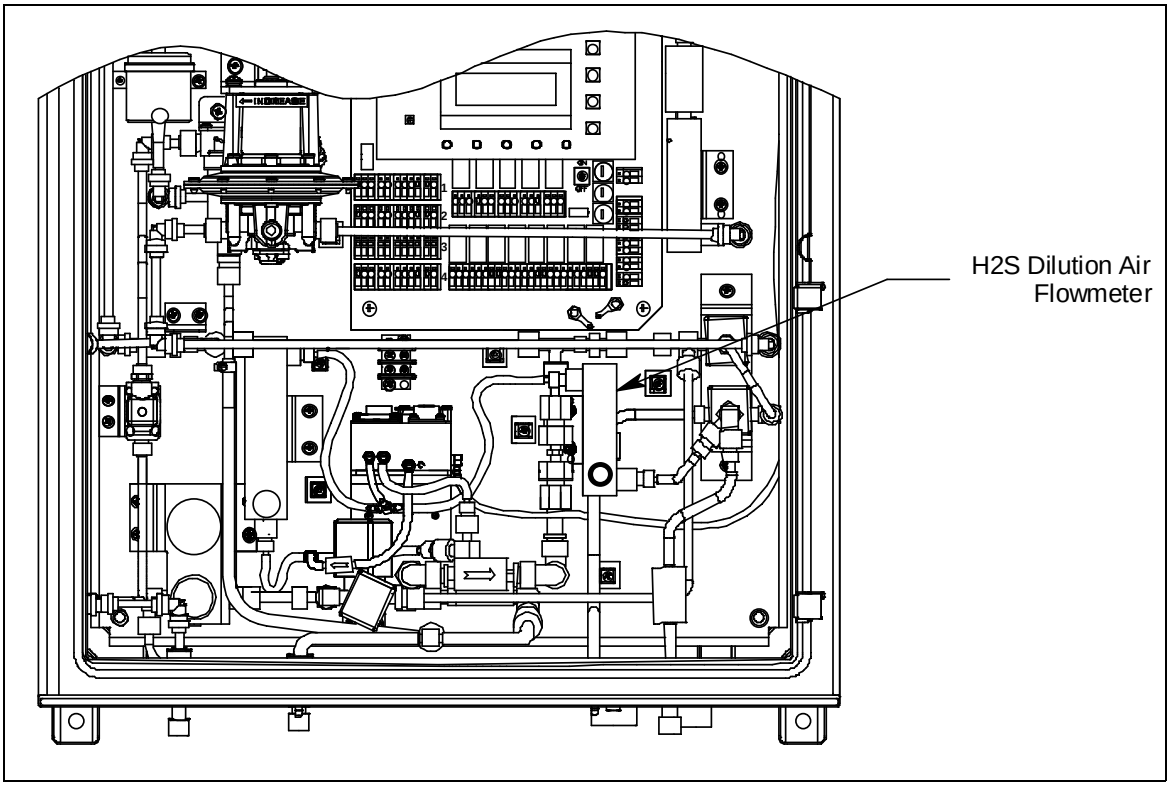


Figure 16: H_2S Dilution Air Flowmeter Location

5. Use pliers to remove the clamps from the tubing connections at the top and bottom of the flowmeter (shown below). Then remove the tubing from the hose barb fittings. If the tubing gets damaged, replace it with 1/8 inch ID x 1/4 inch OD tubing.

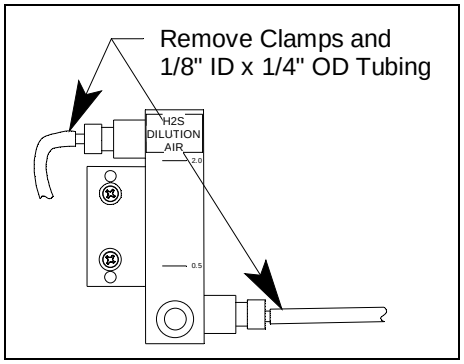


Figure 17: H_2S Dilution Air Flowmeter Clamp and Tubing Removal

6. Unscrew the 2 screws holding the bracket to the plate. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot while replacing the flowmeter.

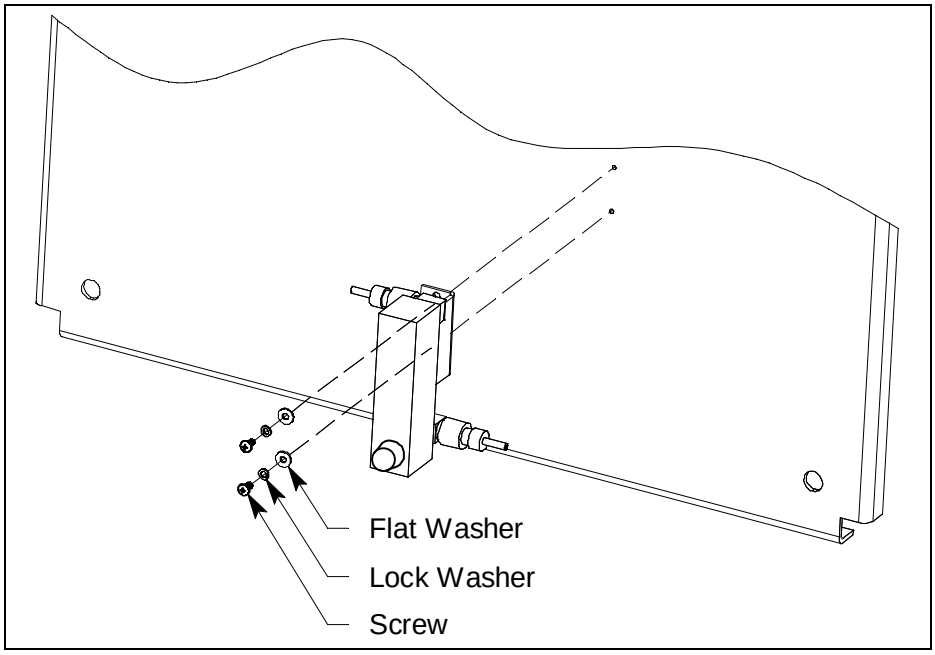


Figure 18: Removing the H_2S Dilution Air Flowmeter Bracket from the Plate

7. Remove the flowmeter and bracket assembly from the plate.

8. Unscrew the 2 screws holding the bracket to the old flowmeter. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot while replacing the flowmeter. ***These screws, flat washers, and lock washers are different than the screws, flat washer, and lock washers used to connect the bracket to the plate. Do not mix these parts up.***

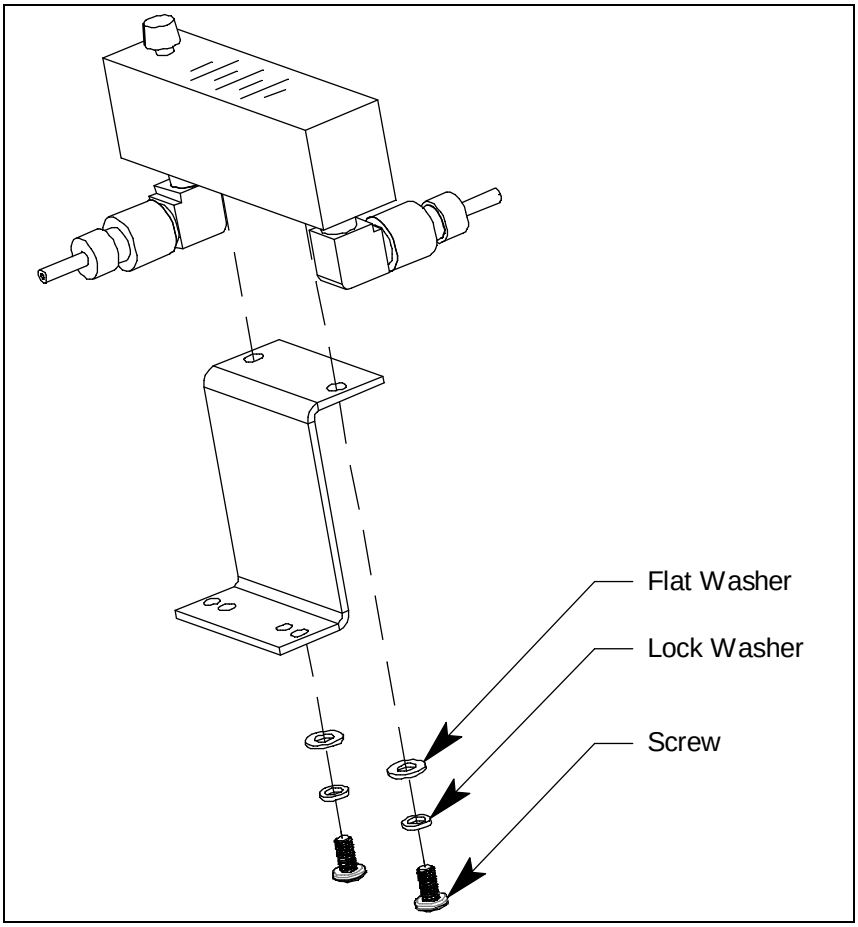


Figure 19: Removing the Bracket from the H_2S Dilution Air Flowmeter

9. Unscrew the 2 fittings from the top and bottom of the flowmeter.

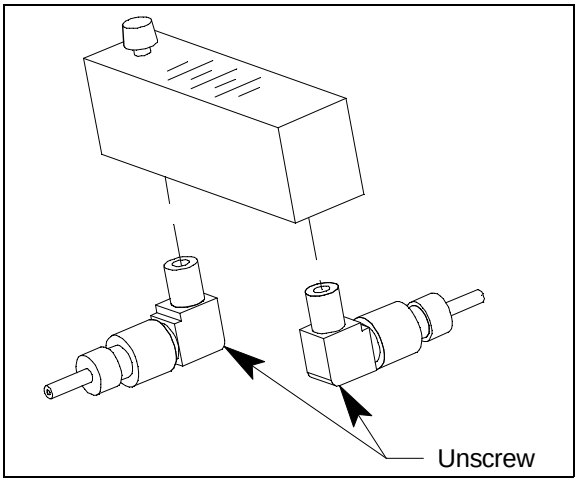


Figure 20: H_2S Dilution Air Flowmeter Fitting Removal

10. Put new Teflon tape on the fittings and screw them onto the new flowmeter. Be sure the fittings end up in the orientation shown in Figure 22 below.

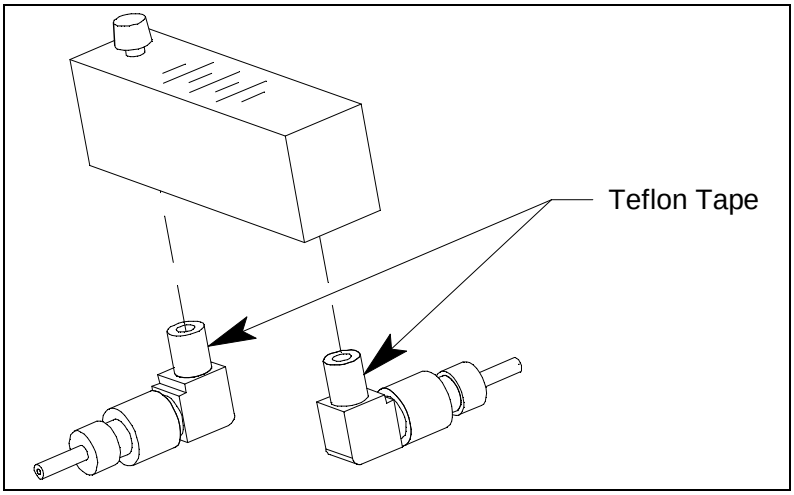


Figure 21: Installing Fittings On New H_2S Dilution Air Flowmeter

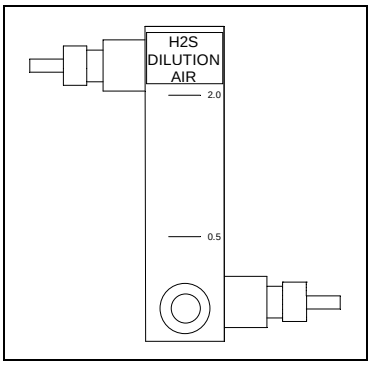


Figure 22: Correct H_2S Dilution Air Flowmeter Fitting Orientation

11. Install the bracket onto the new flowmeter using the screws, lock washers, and flat washers removed in Step 8. Be sure the flowmeter and the bracket are in the correct orientation relative to each other.

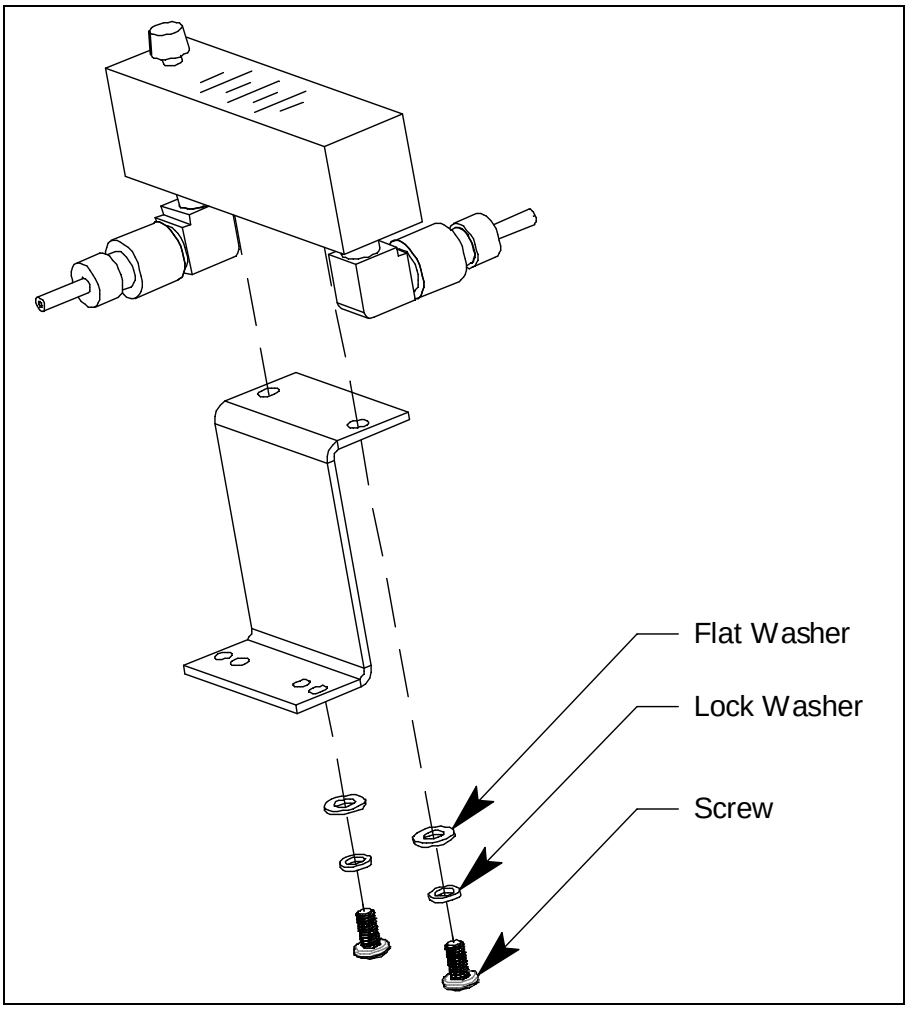


Figure 23: Attaching Bracket to New H_2S Dilution Air Flowmeter

12. Reinstall the flowmeter/bracket assembly by using the screws, lock washers, and flat washers removed in Step 6 to attach the bracket to the plate.

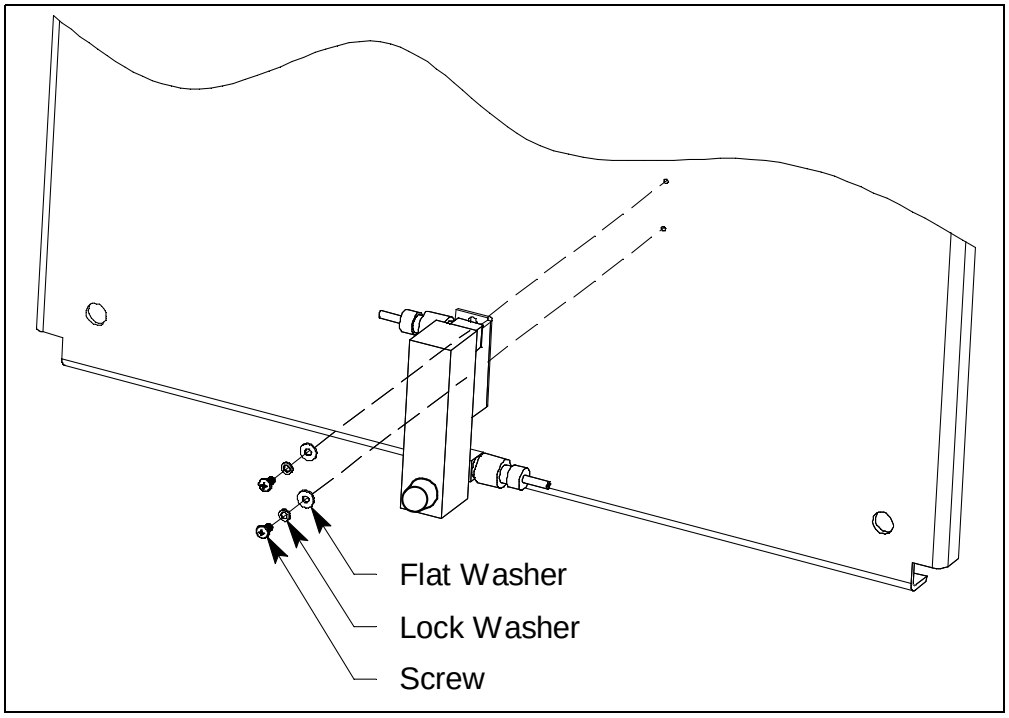


Figure 24: Attaching H_2S Dilution Air Flowmeter Bracket to Plate

13. Reconnect the tubing to the fittings.
14. Use pliers to reinstall the clamps over the tubing fitting connections.
15. Plug in or turn on all incoming power to the Digester Gas Monitor.
16. Place the Digester Gas Monitor's power switch in the ON position, then verify that the PILOT light is on.
17. Turn the flow regulator knob clockwise to set the sensor flow to 3 SCFH once the system has started up.
18. Close and secure the housing door.

Replacing the Sensors Flow Flowmeter

Replace the Sensors Flow Flowmeter if it becomes dirty or wet and cannot be properly flushed out or cleaned or if the flowmeter ball sticks so that it is difficult to accurately determine the flowrate.

1. Turn off or unplug all incoming power to the Digester Gas Monitor.
2. Open the Digester Gas Monitor housing door, then place the power switch in the OFF position.

3. Turn the flow regulator knob all the way counterclockwise to close the flow regulator's output.

4. Locate the Sensors Flow Flowmeter on the right side of the Digester Gas Monitor.

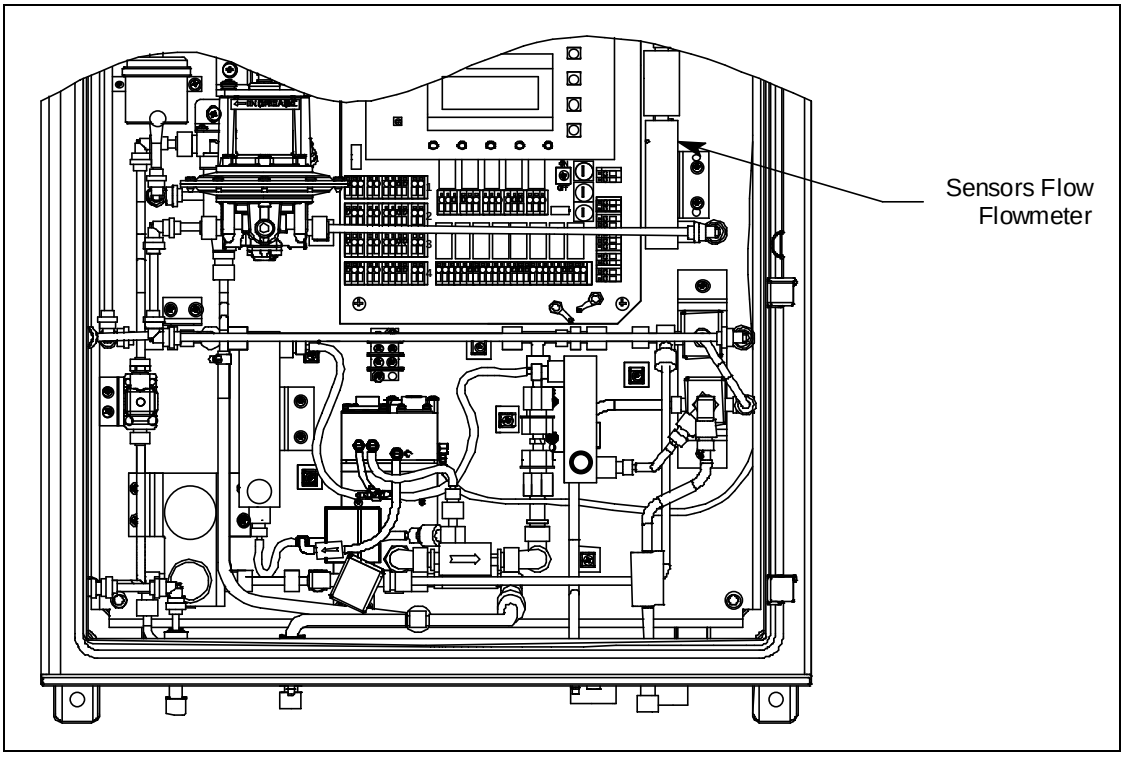


Figure 25: Sensors Flow Flowmeter Location

5. Use pliers to remove the clamp from the tubing connection at the top of the flow switch. Then remove the tubing from the hose barb fitting. If tubing gets damaged, replace it with 1/8 inch ID x 1/4 inch OD tubing.

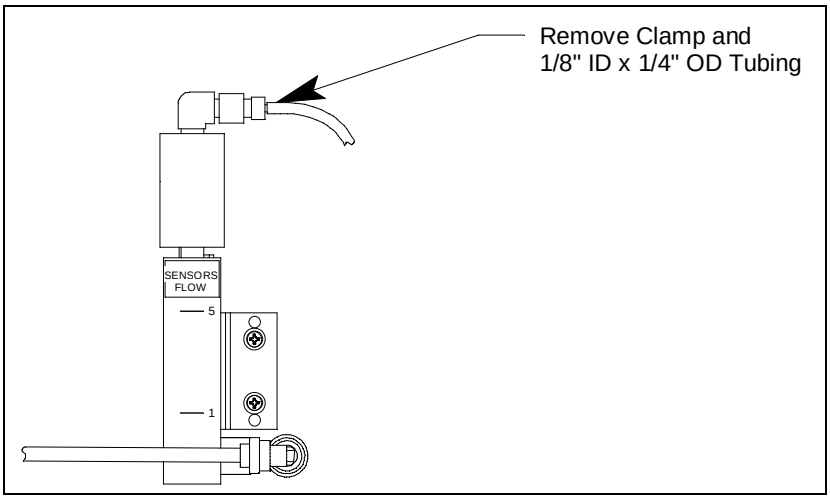


Figure 26: Sensors Flow Flowmeter Clamp and Tubing Removal

6. Grasp the push fitting at the bottom of the flowmeter and push the collet toward the mounting plate and pull the rigid tubing out of the fitting.

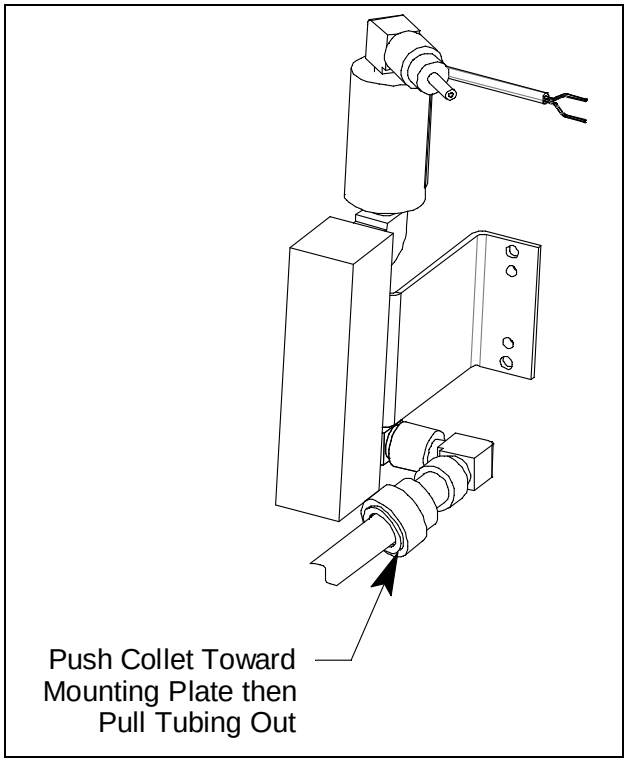


Figure 27: Rigid Tubing Removal

7. Unscrew the 2 screws holding the bracket to the plate. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot while replacing the flowmeter.

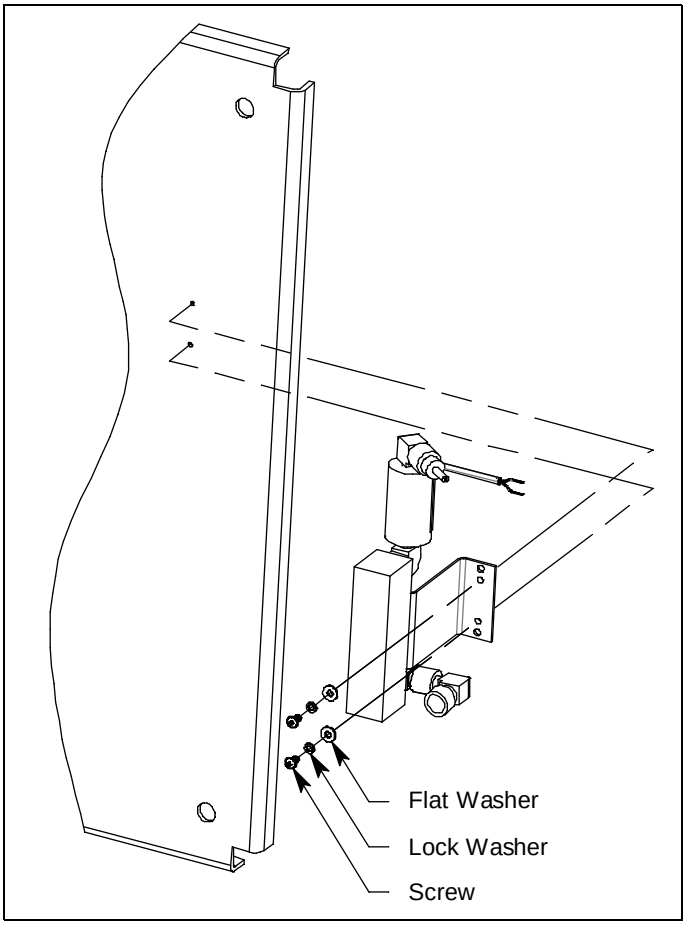


Figure 28: Removing the Sensors Flow Flowmeter Bracket from the Plate

8. Remove the flowmeter/flow switch/bracket assembly from the plate.

9. Unscrew the 2 screws holding the bracket to the old flowmeter. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot while replacing the flowmeter. ***These screws, flat washers, and lock washers are different than the screws, flat washer, and lock washers used to connect the bracket to the plate. Do not mix these parts up.***

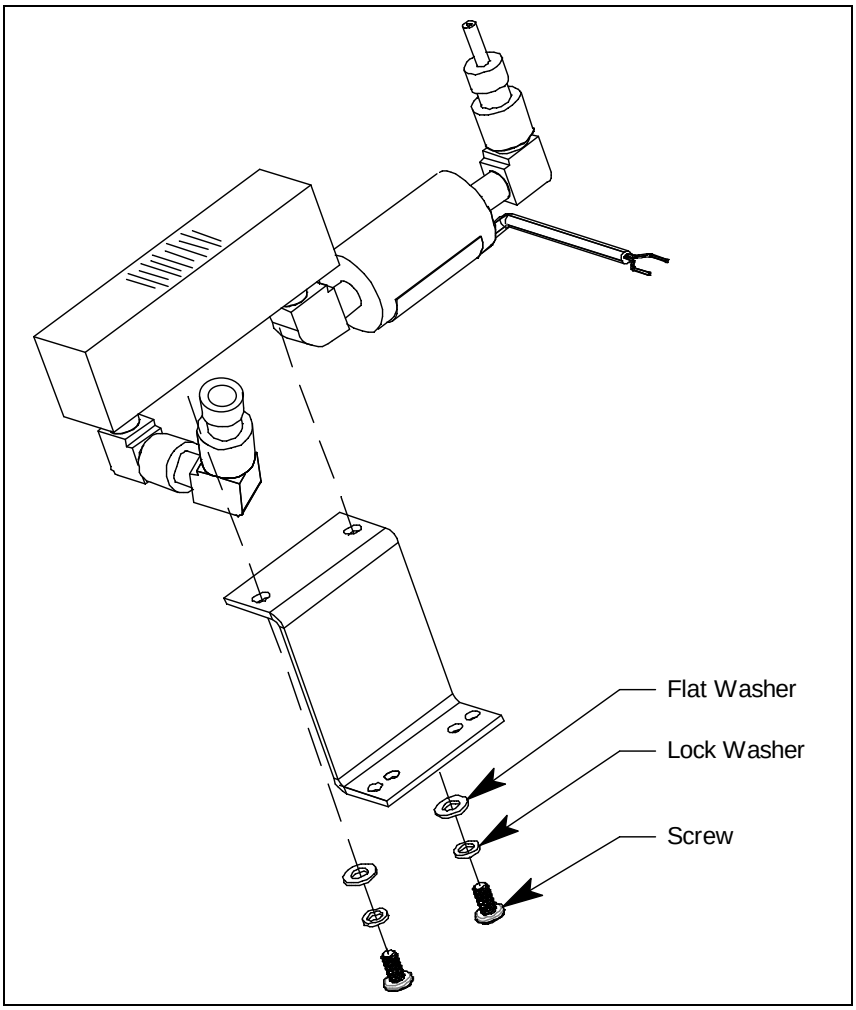


Figure 29: Removing the Bracket from the Sensors Flow Flowmeter

10. There are 2 fittings connected together on the bottom of the flowmeter. Unscrew the outermost fitting from the fitting connected to the flowmeter.

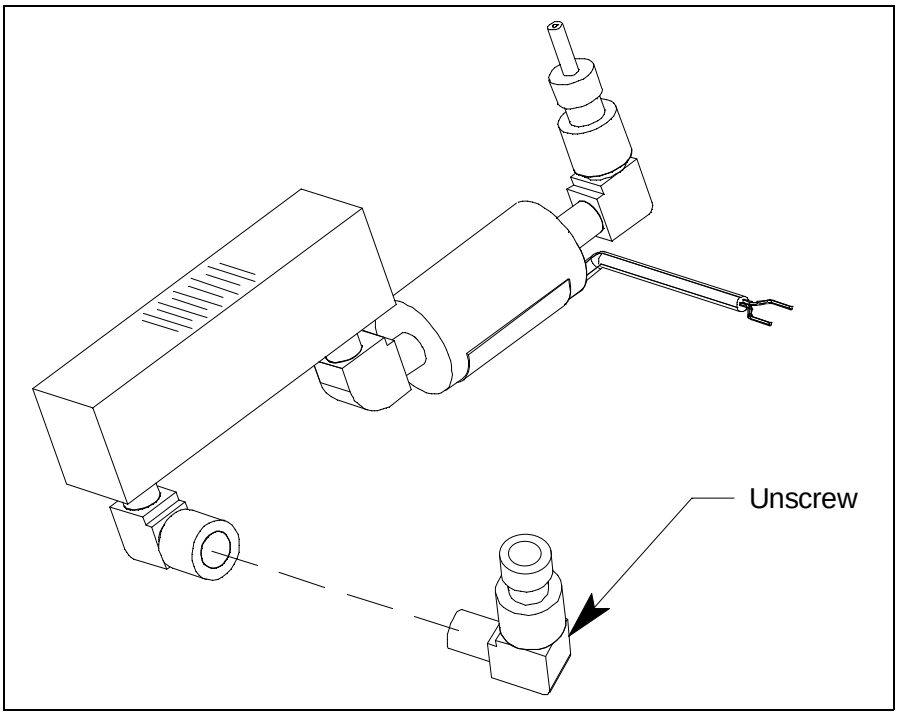


Figure 30: Disassembling the Bottom Fitting

11. Unscrew the fitting from the bottom of the flowmeter.

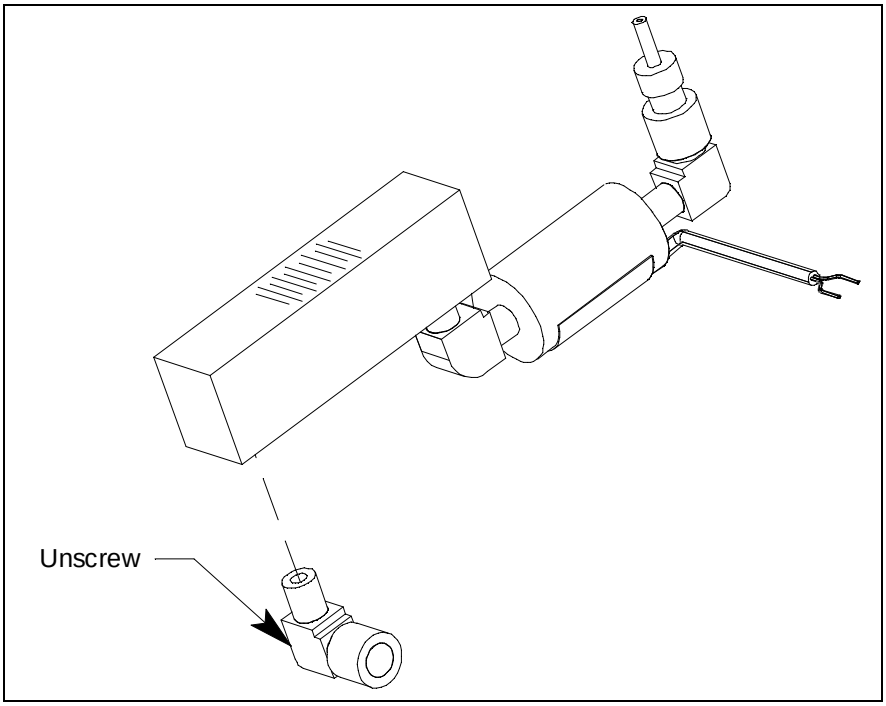


Figure 31: Removing the Bottom Fitting

12. Unscrew the fitting from the top of the flowmeter. The top fitting has the flow switch connected to the other end. Be sure to not unscrew the flow switch from the fitting.

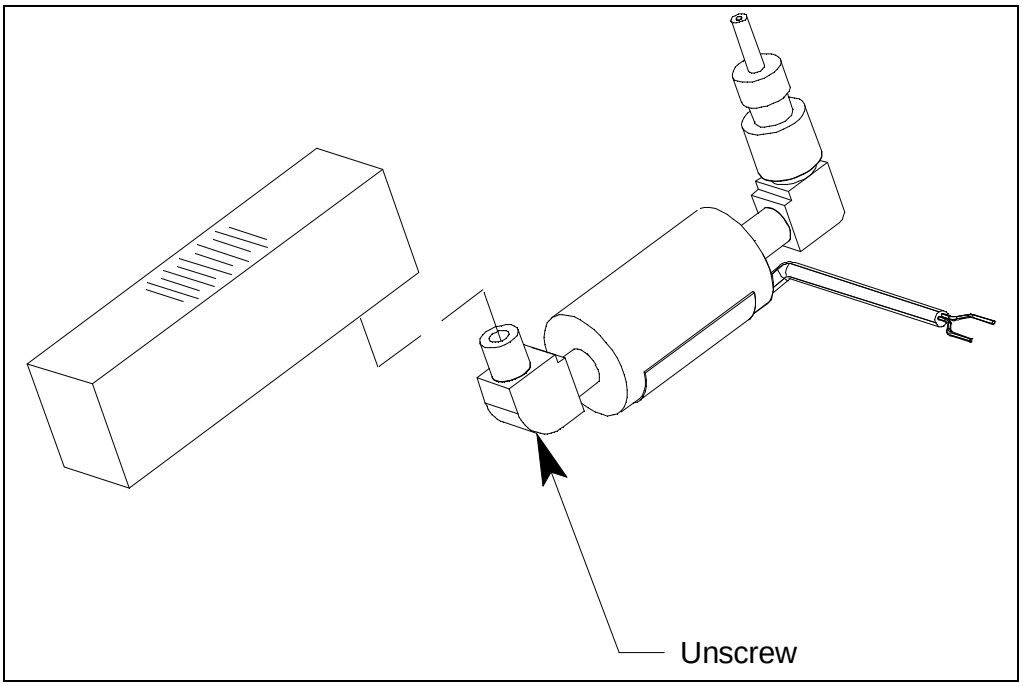


Figure 32: Sensors Flow Flowmeter Fitting Removal

13. Put new Teflon tape on the flow switch fitting and screw it into the top of the new flowmeter. Be sure the flow switch ends up in the orientation shown in Figure 35 below.

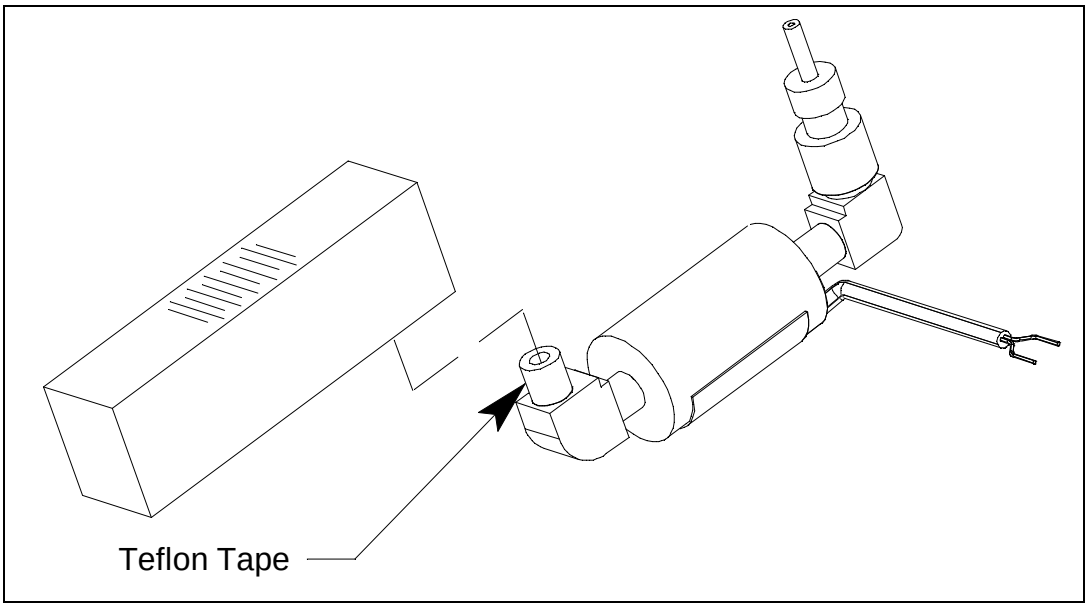


Figure 33: Installing Fittings On New Sensors Flow Flowmeter

14. Put new Teflon tape on the L-shaped bottom fitting and screw it into the bottom of the new flowmeter. Be sure the fitting ends up in the orientation shown in Figure 35 below.

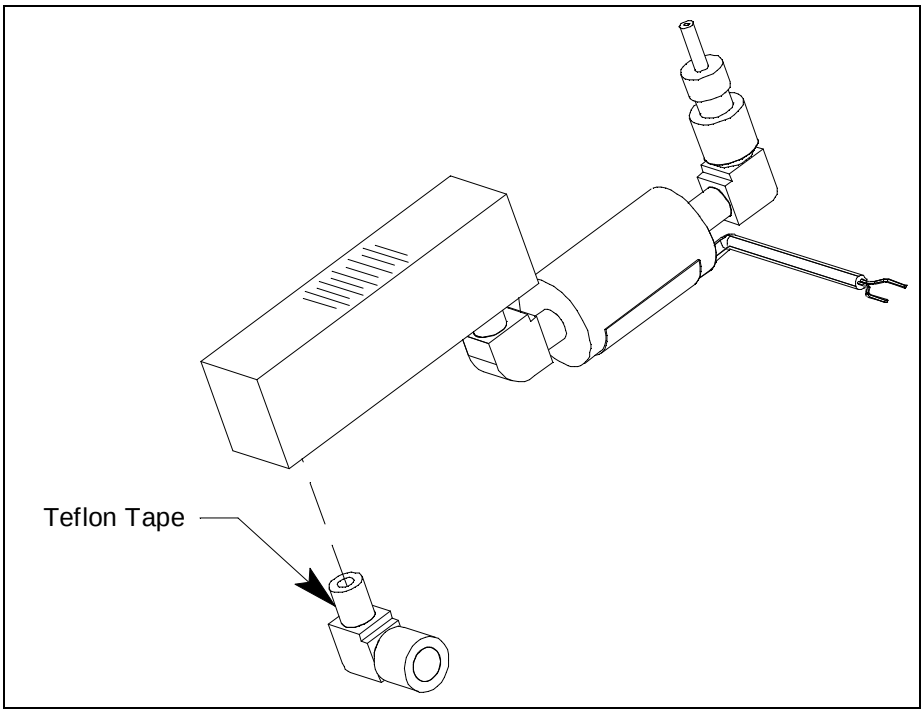


Figure 34: Reinstalling the Bottom Fitting

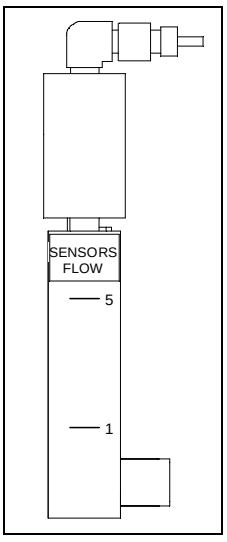


Figure 35: Correct Sensors Flow Flowmeter Fitting Orientation

15. Put new Teflon tape on the outermost fitting and screw it into the fitting connected directly to the bottom of the flowmeter. Be sure the fitting ends up in the orientation shown in Figure 37 below.

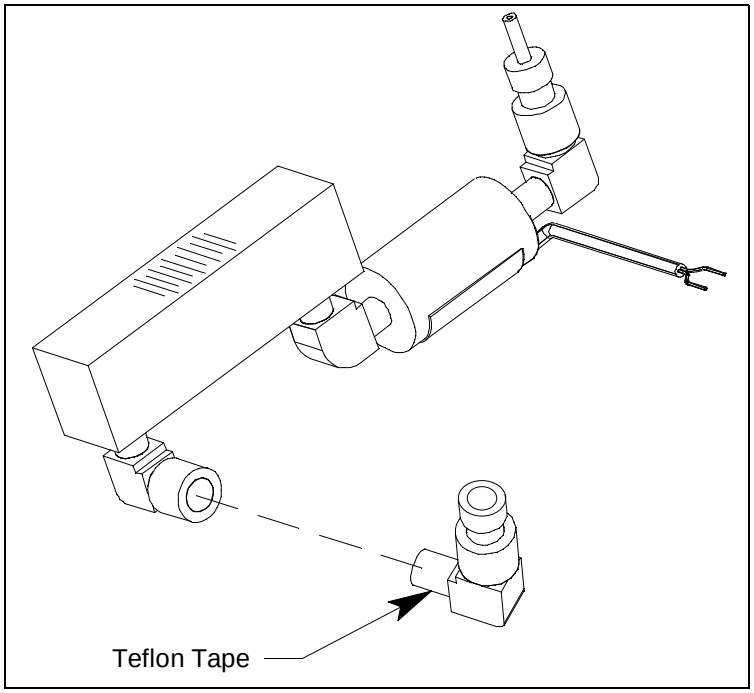


Figure 36: Reassembling the Bottom Fitting

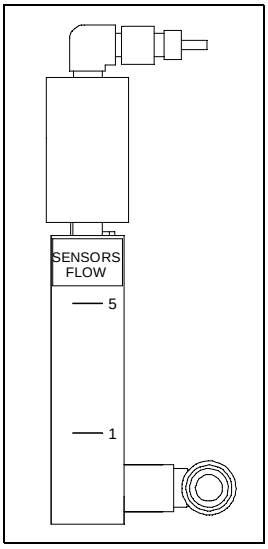


Figure 37: Correct Fitting Orientation

16. Install the bracket onto the new flowmeter using the screws, lock washers, and flat washers removed in Step 9. Be sure the flowmeter and bracket are in the correct orientation relative to each other.

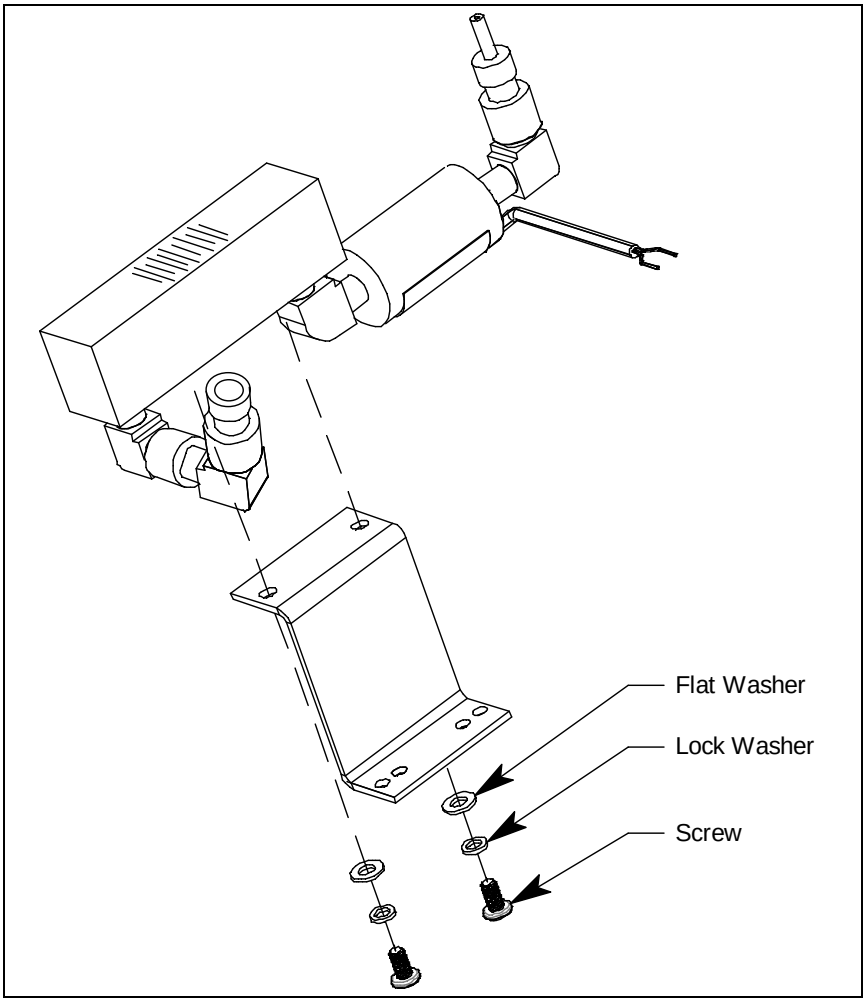


Figure 38: Attaching Bracket to New Sensors Flow Flowmeter

17. Reinstall the flowmeter/flow switch/bracket assembly by using the screws, lock washers, and flat washers removed in Step 7 to attach the bracket to the plate.

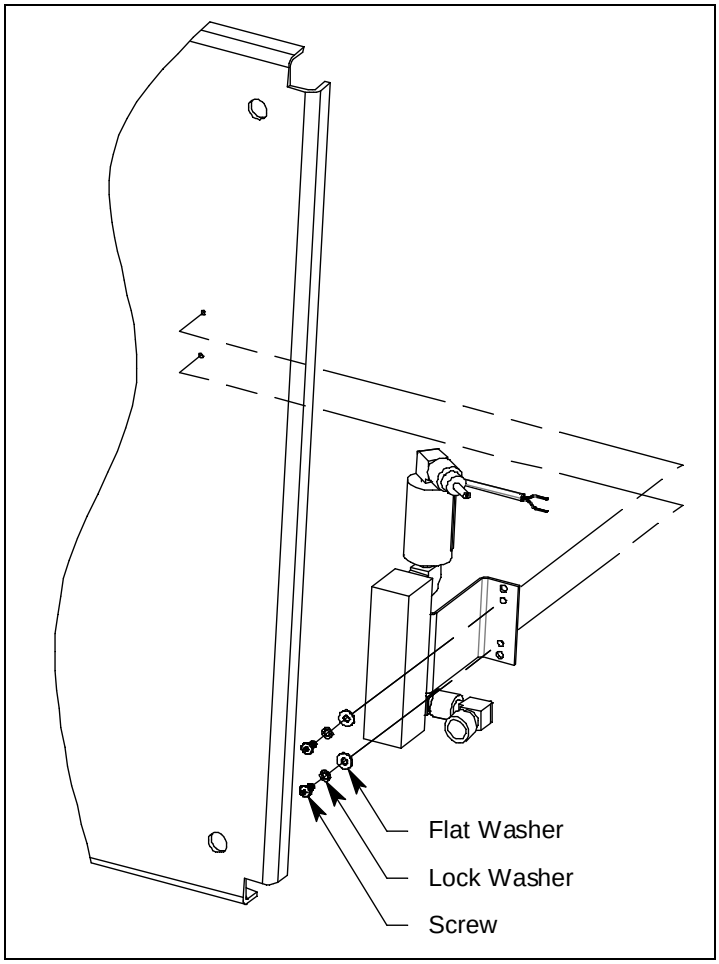


Figure 39: Attaching the Sensors Flow Flowmeter Bracket to Plate

18. Reconnect the rigid tubing to the fitting on the bottom of the flowmeter.

19. Reconnect the flexible tubing to the fitting on the flow switch.

20. Use pliers to reinstall the clamp over the flexible tubing fitting connection.

21. Plug in or turn on all incoming power to the Digester Gas Monitor.

22. Place the Digester Gas Monitor's power switch in the ON position, then verify that the PILOT light is on.

23. Turn the flow regulator knob clockwise to set the sensor flow to 3 SCFH once the system has started up.

24. Close and secure the housing door.

Replacing the Sample Regulator

Replace the sample regulator if the Flow to Sensors flowmeter cannot be set low enough.

1. Turn off or unplug all incoming power to the Digester Gas Monitor.
2. Open the Digester Gas Monitor housing door, then place the power switch in the OFF position.
3. Turn the flow regulator knob all the way counterclockwise to close the flow regulator's output.
4. Each side of the sample regulator has a push fitting. Press the collet of one of the push fittings toward the sample regulator and gently pull out the installed tubing. Do the same thing with the other push fitting.

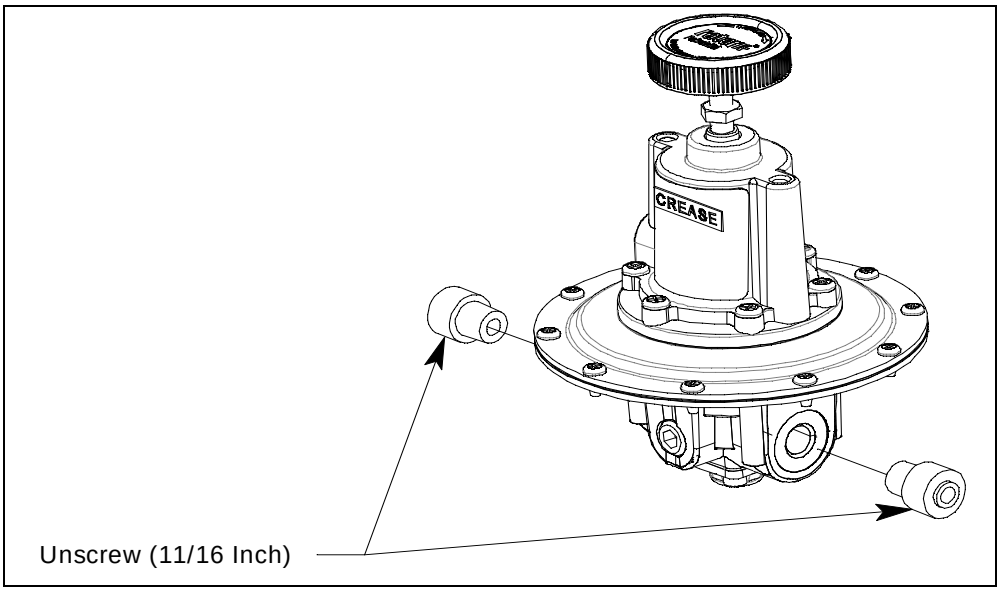


Figure 40: Sample Regulator Push Fitting Removal

5. Unscrew the 4 screws that retain the installation bracket to the mounting plate. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot.

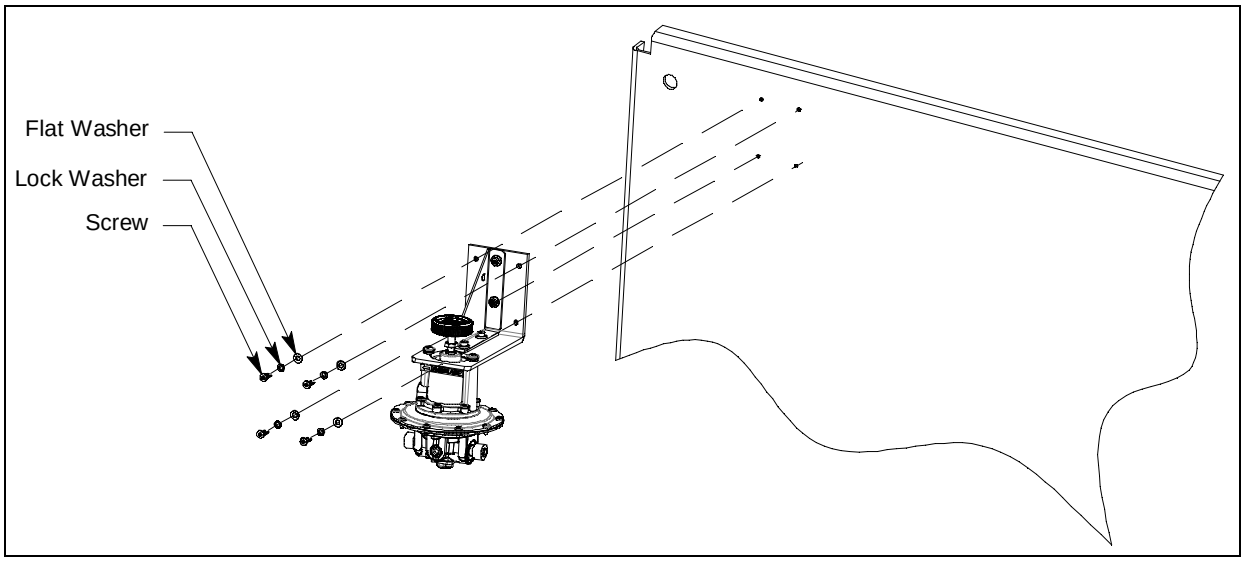


Figure 41: Removing Sample Regulator Bracket from Plate

6. Unscrew the 2 screws holding the bracket to the old sample regulator. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot while replacing the sample regulator. ***These screws, flat washers, and lock washers are different than the screws, flat washer, and lock washers used to connect the bracket to the plate. Do not mix these parts up.***

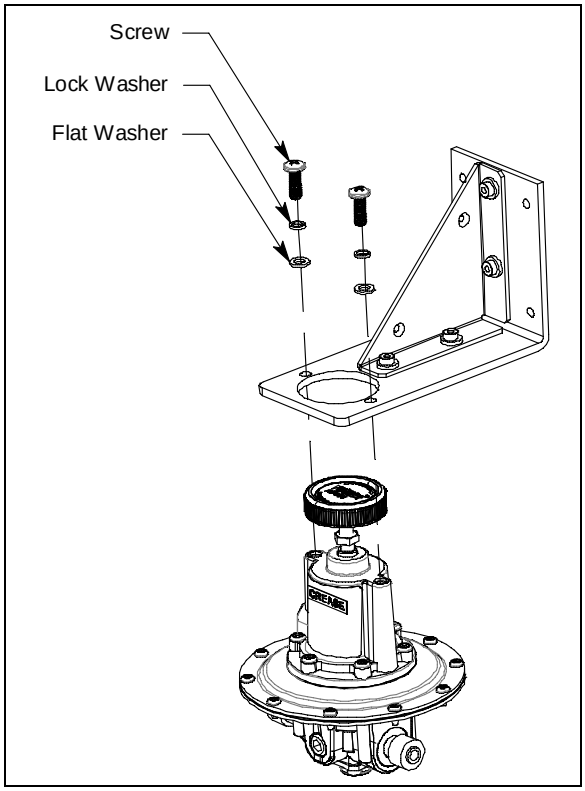


Figure 42: Removing the Sample Regulator from the Bracket

7. Use a 11/16 inch wrench to unscrew the push fittings from the old sample regulator.

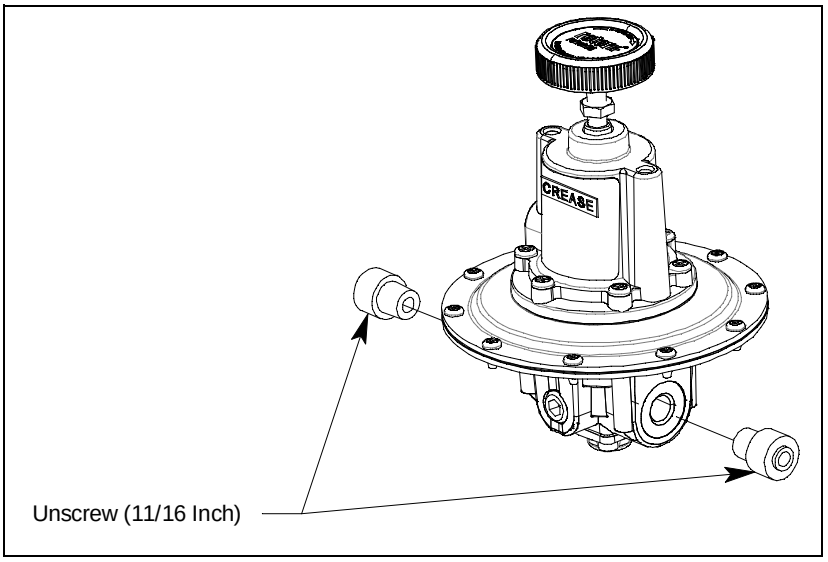


Figure 43: Removing Push Fittings from the Sample Regulator

8. Screw the push fittings back into each side of the new sample regulator using a 11/16 inch wrench being careful not to over-tighten the fittings. Use Teflon tape to seal the threads.

9. Screw sample regulator back onto the installation bracket using the screws, lock washers, and flat washers removed in Step 6. Be sure the "INCREASE" label is facing front.

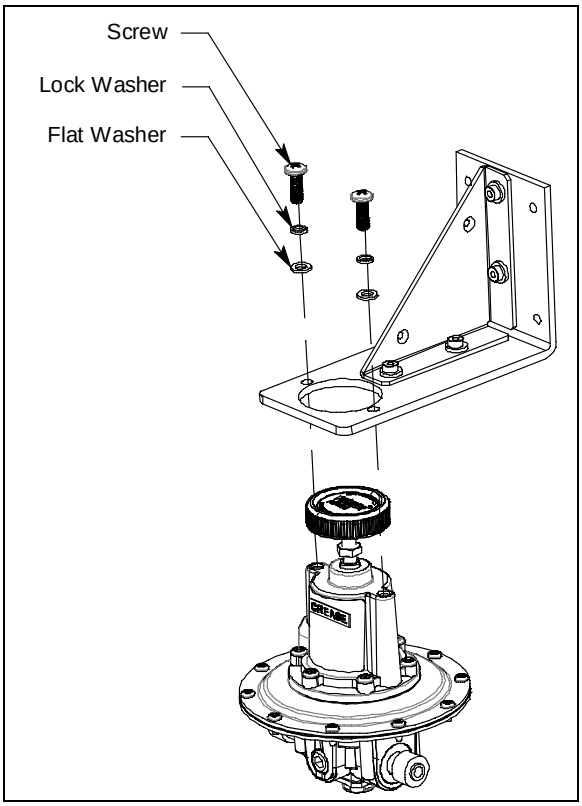


Figure 44: Installing Sample Regulator to Bracket

10. Reinstall the sample regulator/bracket assembly to the mounting plate using the screws, lock washers, and flat washers removed in Step 5.

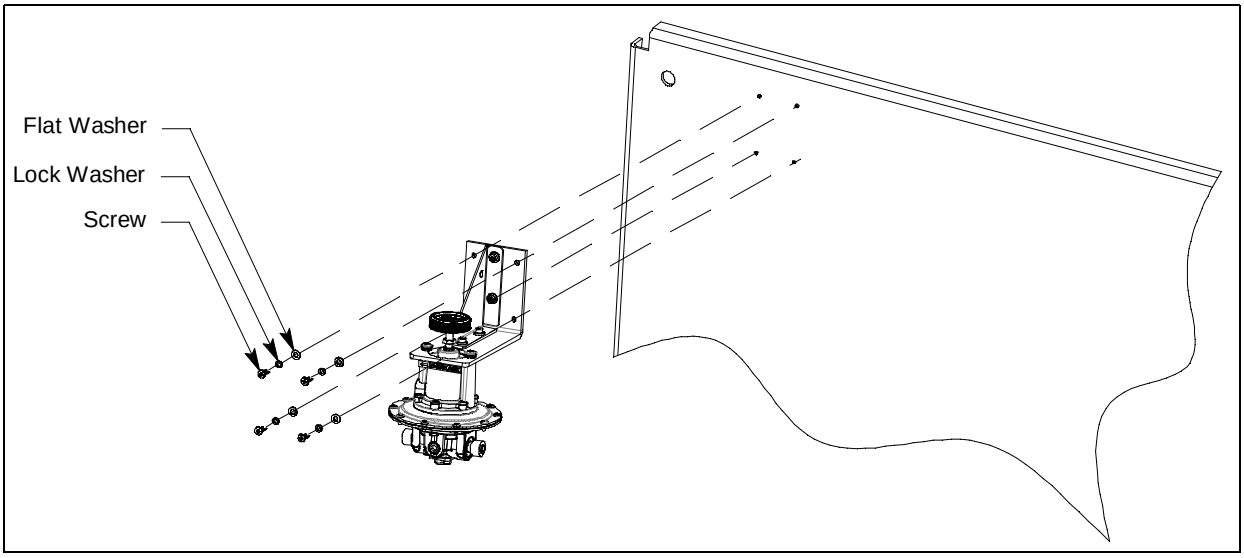


Figure 45: Reinstalling Sample Regulator/Bracket Assembly to Mounting Plate

11. Reconnect the tubing on either side of the sample regulator by pushing the tubing into the push fitting until you feel it lock into place.

12. Plug in or turn on all incoming power to the Digester Gas Monitor.

13. Place the Digester Gas Monitor's power switch in the ON position, then verify that the PILOT light is on.

14. Loosen the nut below the sample regulator's adjustment knob. Turn the sample regulator knob all the way clockwise. Tighten the nut below the knob.

15. Turn the flow regulator knob clockwise to set the sensor flow to 3 SCFH once the system has started up.

16. Close and secure the housing door.

Replacing the Aspirator

Replace the aspirator if it becomes clogged and cannot be cleaned.

1. Turn off or unplug all incoming power to the Digester Gas Monitor.
2. Open the Digester Gas Monitor housing door, then place the power switch in the OFF position.
3. Turn the flow regulator knob all the way counterclockwise to close the flow regulator's output.
4. Locate the aspirator along the bottom of the Digester Gas Monitor.

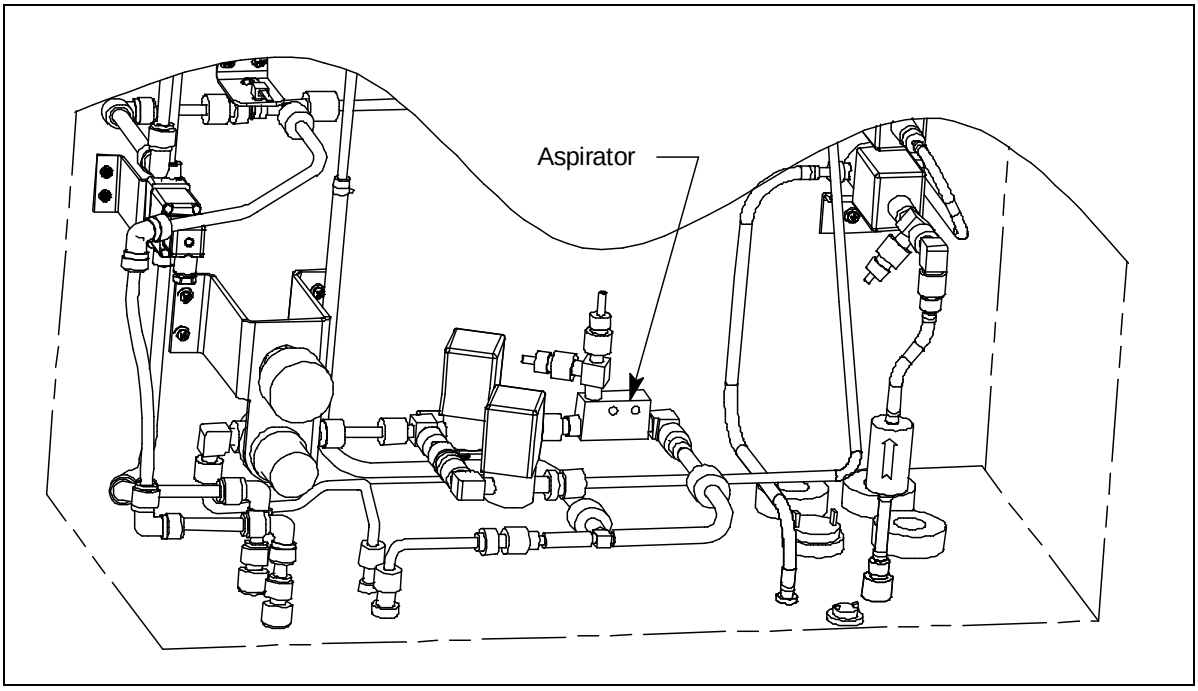


Figure 46: Aspirator Location

5. Disconnect the solenoid valve wiring from the solenoid wiring terminal strips for Solenoid Valves C and D using a small flat blade screwdriver to unscrew the terminals. There are 2 wires per solenoid valve. It does not matter which of the wires is connected to a particular terminal on the appropriate terminal strip so it is not necessary to pay attention to the wires' terminal position when disconnecting them from the terminal strip.

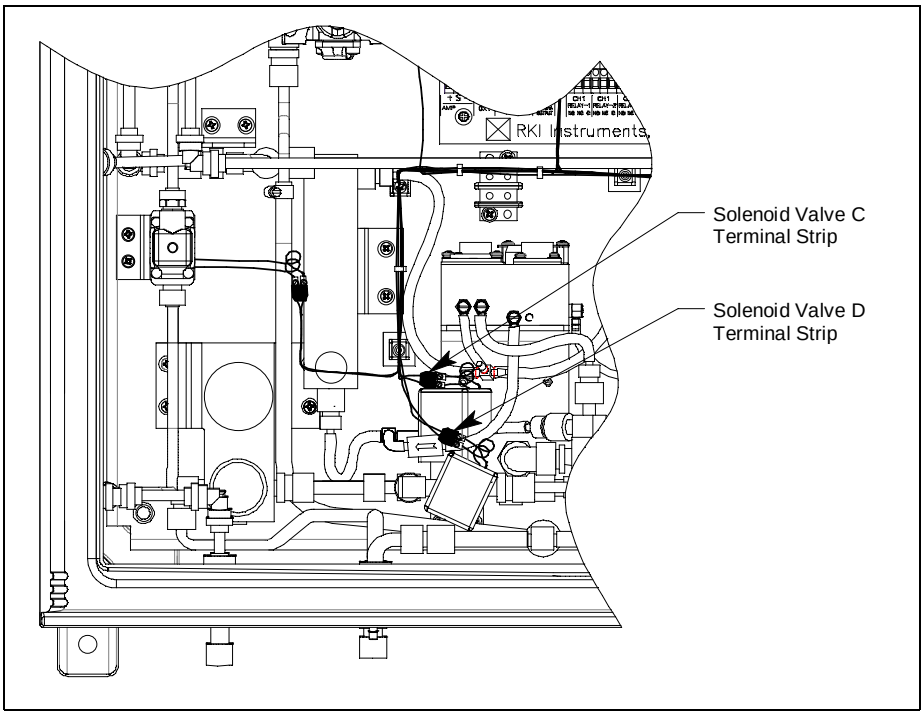


Figure 47: Disconnecting the Solenoid Valve Wiring for Aspirator Replacement

6. Locate the oil mist filter.

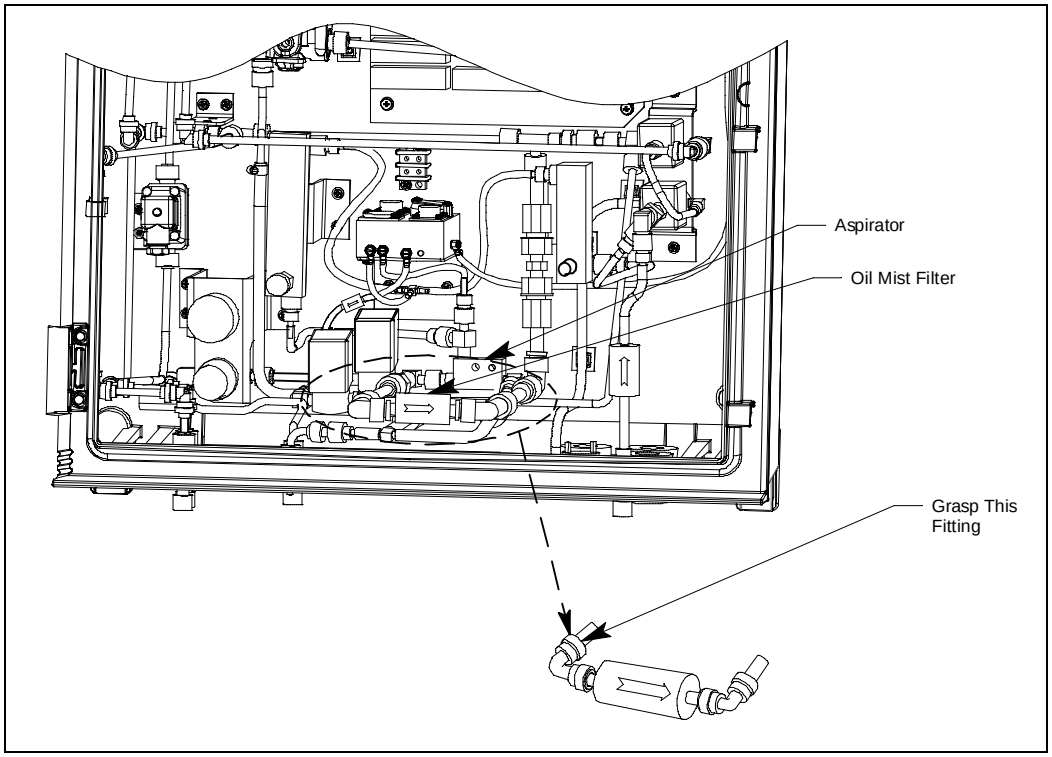


Figure 48: Oil Mist Filter Removal for Aspirator Replacement

7. Locate the white, right angle push fitting on the left side of the oil mist filter. One collet faces the oil mist filter and one faces the back, toward the mounting plate. Press the rear-facing collet toward the fitting and pull the fitting away toward you.

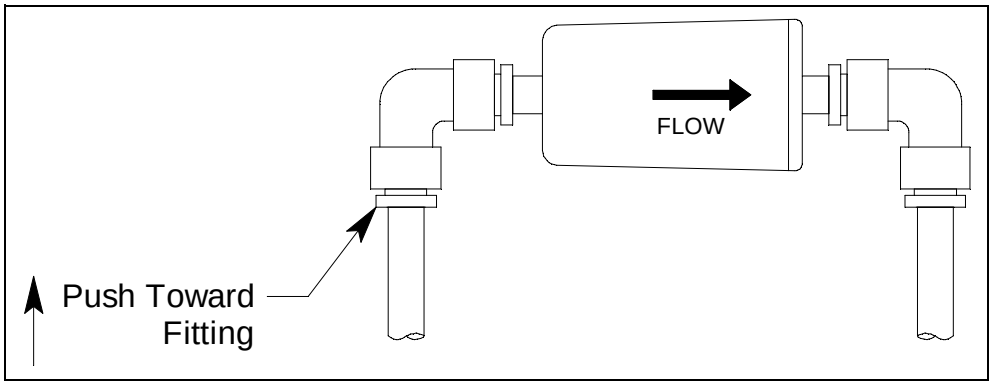


Figure 49: Removing the Oil Mist Filter from the Flow System

8. Rotate the oil mist filter clockwise to get it out of the way.

9. Remove the clamps and flexible tubing in the 2 locations shown below. If tubing gets damaged, replace it with 1/8 inch ID x 1/4 inch OD tubing.

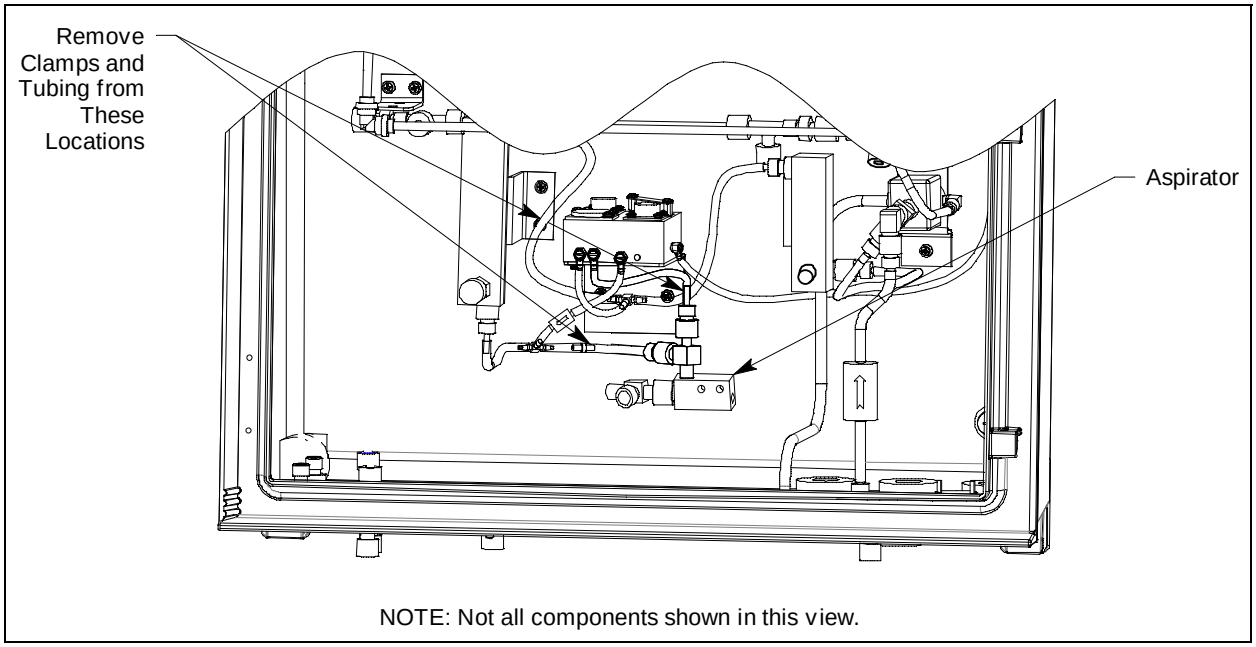


Figure 50: Clamp and Tubing Removal for Aspirator Replacement

10. Use a 9/16 inch open-end wrench or adjustable wrench to unscrew the nut shown below. Once the nut is loose, slide the nut down the tubing leaving the ferrules at the end of the tubing exposed. The ferrules should not come off.

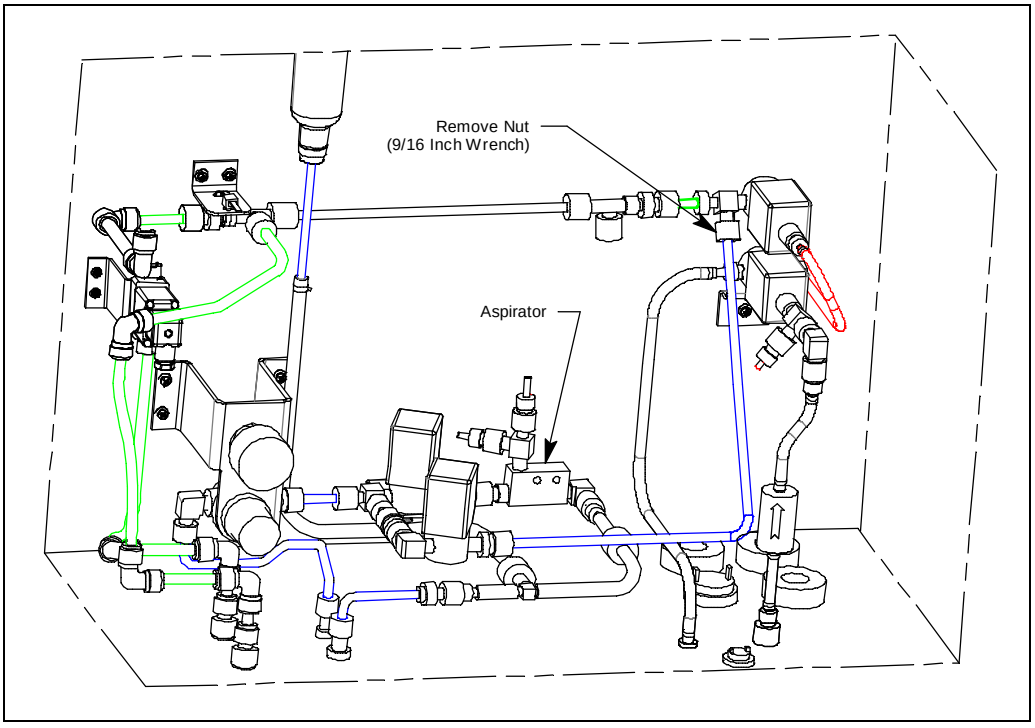


Figure 51: Nut Removal

11. Unscrew the nut shown below. The fitting has a nut and a hex. The hex is positioned in front of the nut. Use a 1/2 inch open-end wrench or an adjustable wrench to hold the hex in place. Use a 9/16 inch open-end wrench or adjustable wrench to unscrew the nut. Once the nut is loose, slide the nut down the tubing leaving the ferrules at the end of the tubing exposed. The ferrules should not come off.

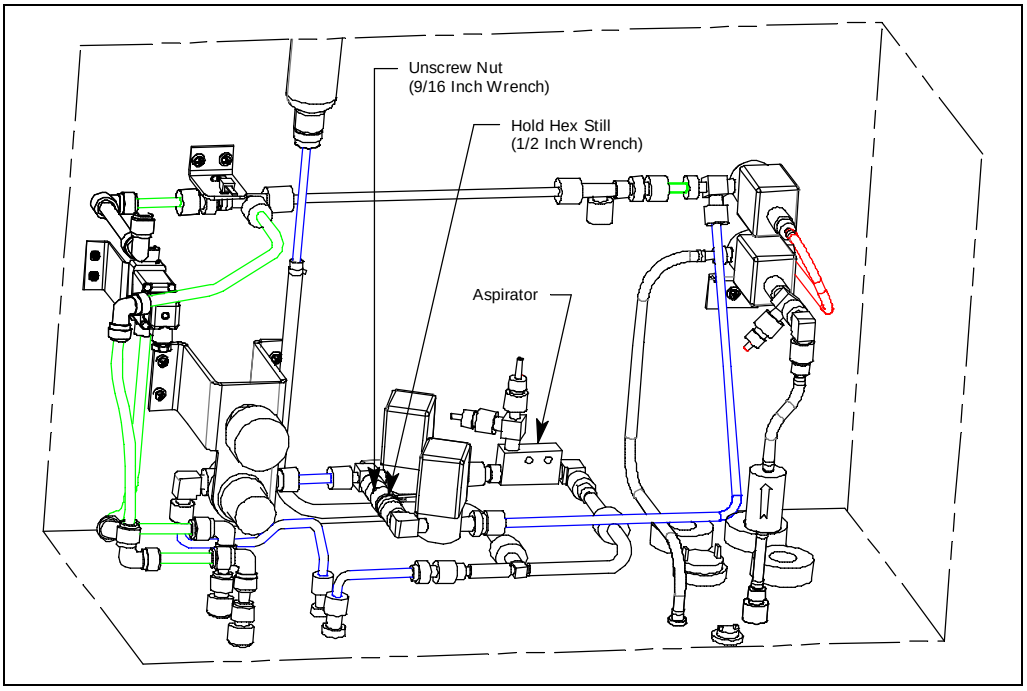


Figure 52: Nut Removal

12. Remove the disconnected assembly from the Digester Gas Monitor.

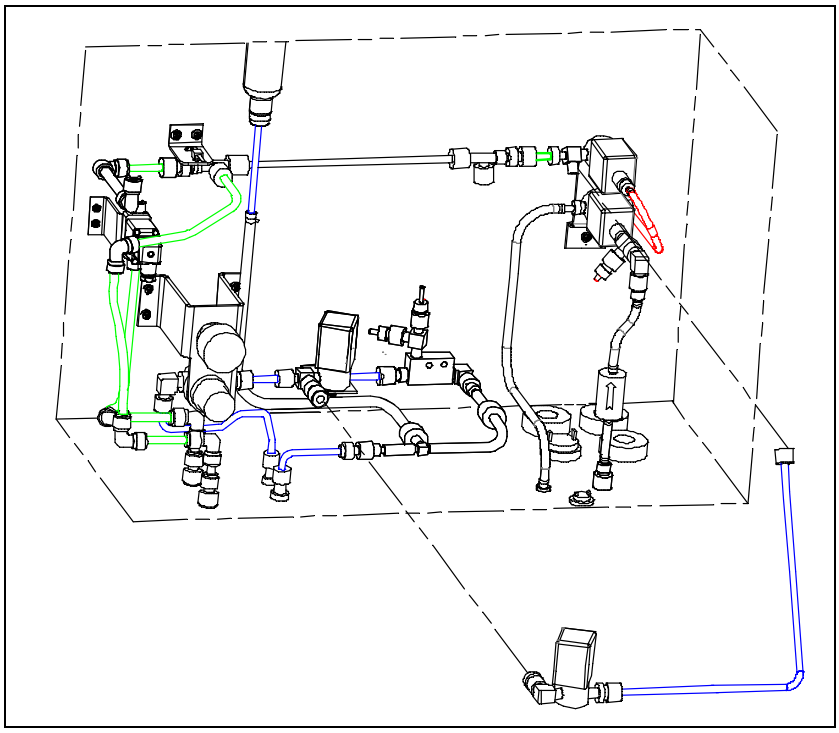


Figure 53: Solenoid Valve D/Tubing Assembly Removal for Aspirator Replacement

13. Use a 9/16 inch open-end wrench or adjustable wrench to unscrew the nuts shown below. Once each nut is loose, slide the nut down the tubing leaving the ferrules at the end of the tubing exposed. The ferrules should not come off.

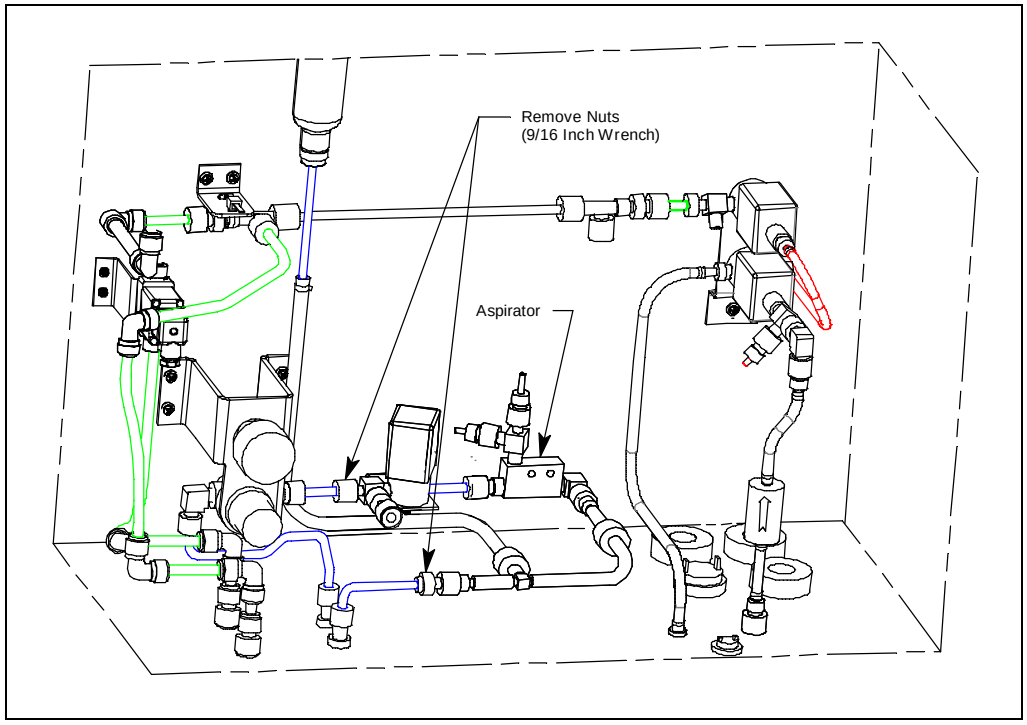


Figure 54: Nut Removal for Aspirator Replacement

14. Unscrew the nut from the bottom of the water trap. The fitting has a nut and a hex. The hex is positioned above the nut. Use a 9/16 inch open-end wrench or an adjustable wrench to hold the hex in place. Use a second 9/16 inch open-end wrench or adjustable wrench to unscrew the nut.

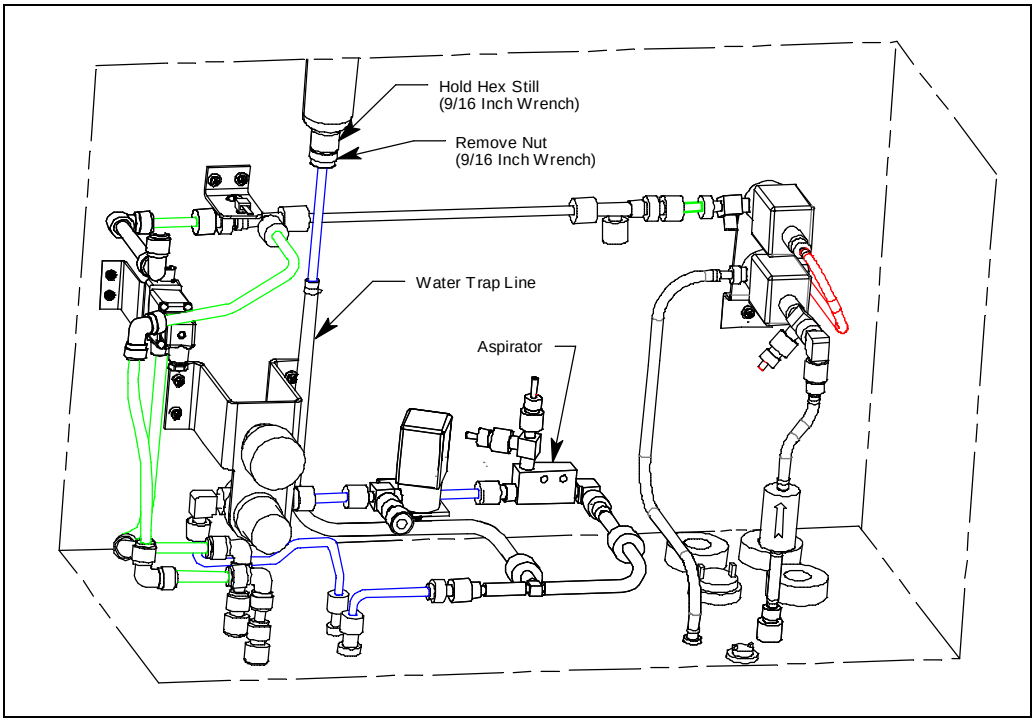


Figure 55: Water Trap Line Removal for Aspirator Replacement

15. Once the nut is loose, slide the nut down the tubing leaving the ferrules at the end of the tubing exposed. The ferrules should not come off.

16. Unscrew the 2 screws holding the Solenoid Valve C bracket to the plate. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot while replacing the aspirator.

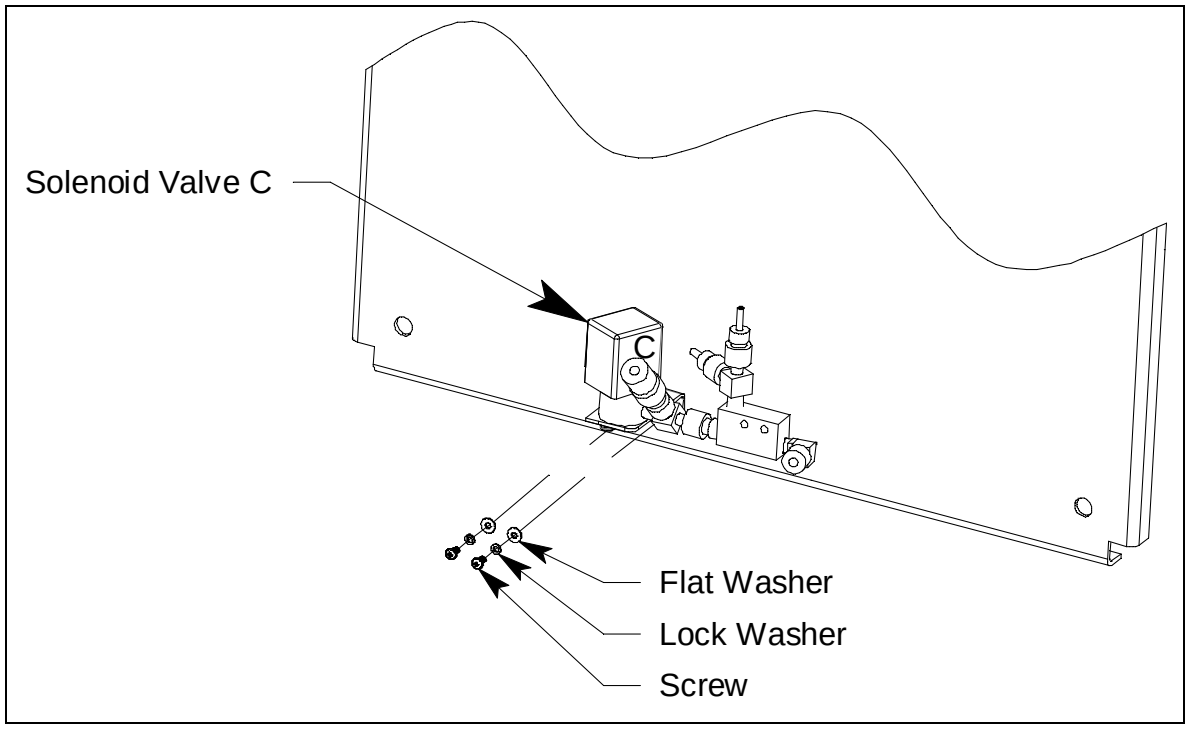


Figure 56: Solenoid Valve C Bracket Removal for Aspirator Replacement

17. Remove the disconnected assembly from the Digester Gas Monitor.

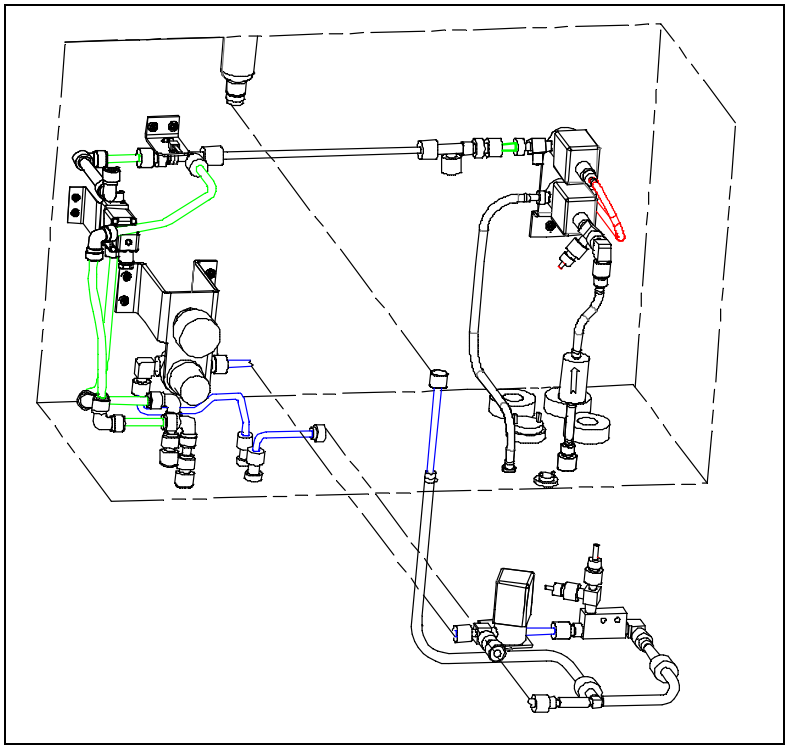


Figure 57: Aspirator Assembly Removal

18. Unscrew the 2 fittings shown below from the old aspirator.

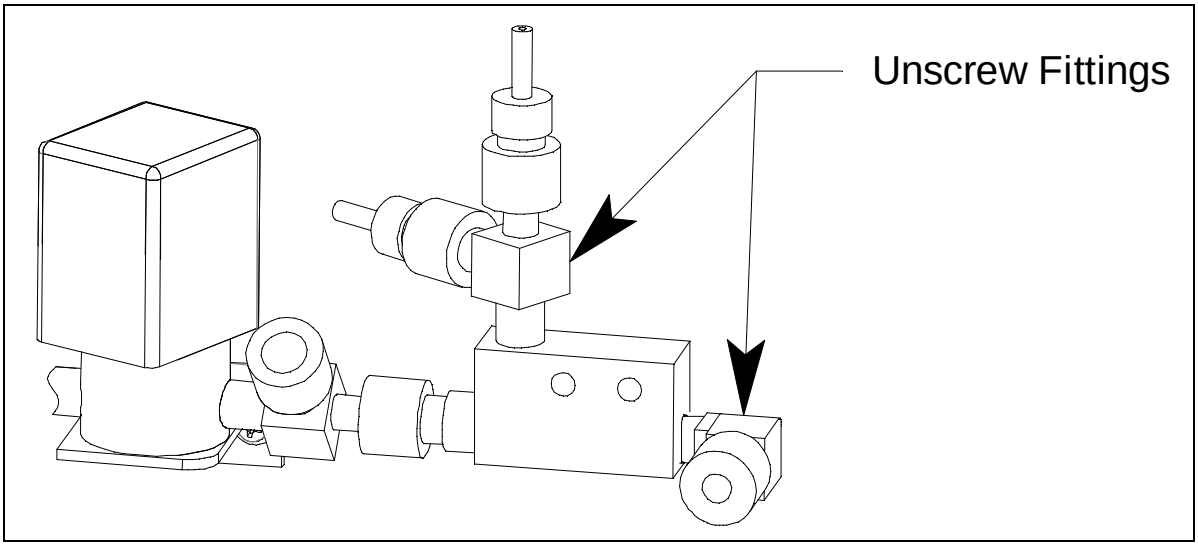


Figure 58: Aspirator Fitting Removal

19. Unscrew the old aspirator from the third fitting.

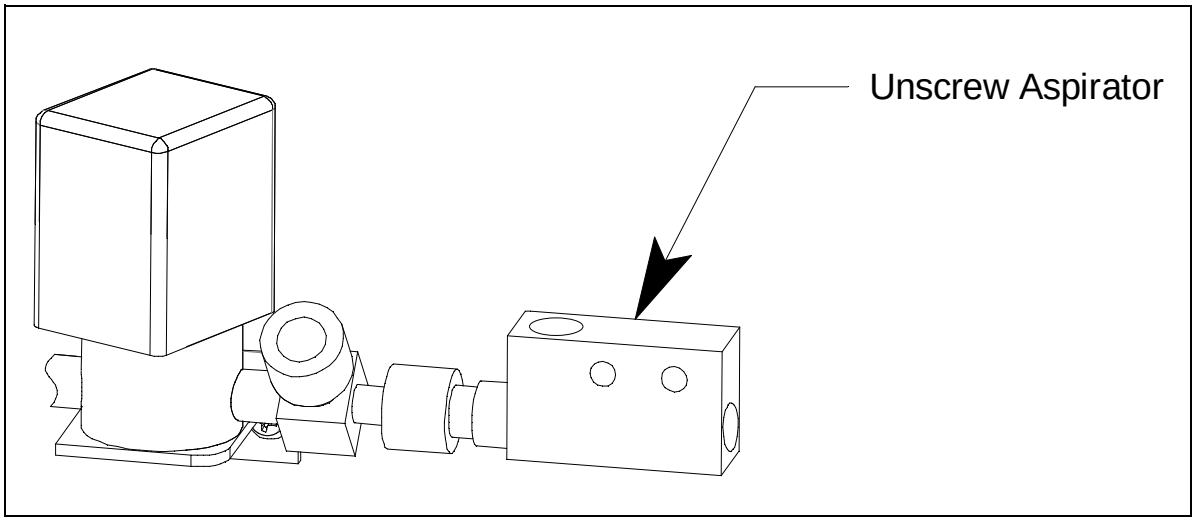


Figure 59: Aspirator Removal

20. The new aspirator has a threaded fitting coming off of its left side. Wrap that thread in Teflon tape and then screw it into the fitting coming from the solenoid valve, as shown below. Be sure the aspirator is in the correct orientation once it's fully tightened. The text on the aspirator should be facing forward in a readable orientation.

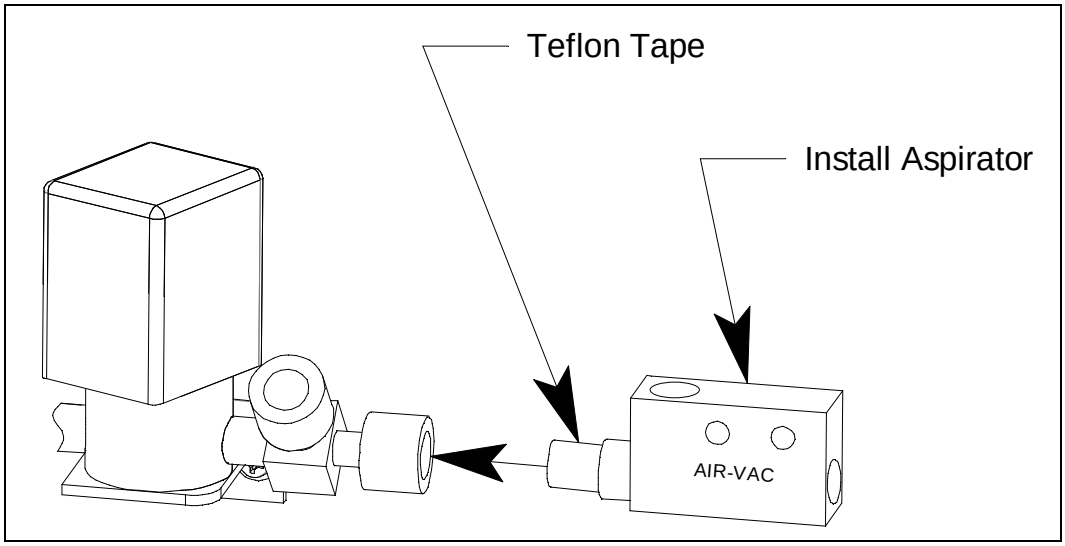


Figure 60: Installing the New Aspirator

21. Wrap Teflon tape around the threads on the 2 fittings that were removed from the old aspirator and screw those fittings into the appropriate place on the new aspirator. Be sure the fittings are in the correct orientation once they're tightened.

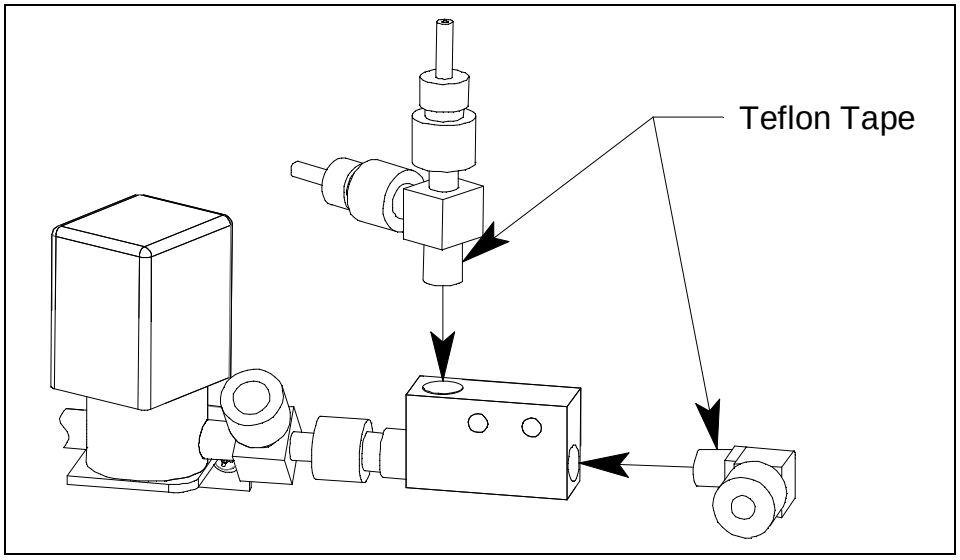


Figure 61: Installing the Fittings on the New Aspirator

22. Guide the assembly containing the aspirator back into the Digester Gas Monitor's housing. Finger-tighten the indicated nuts to hold the assembly in place.

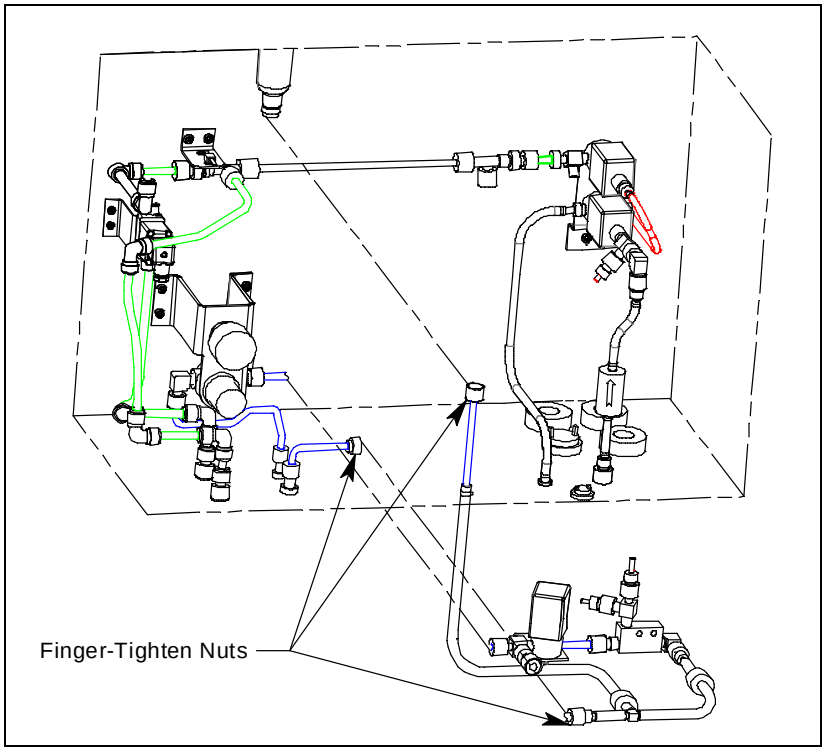


Figure 62: Aspirator Assembly Installation

23. Reinstall the Solenoid Valve C bracket by using the screws, lock washers, and flat washers removed in Step 16 to attach the bracket to the plate.

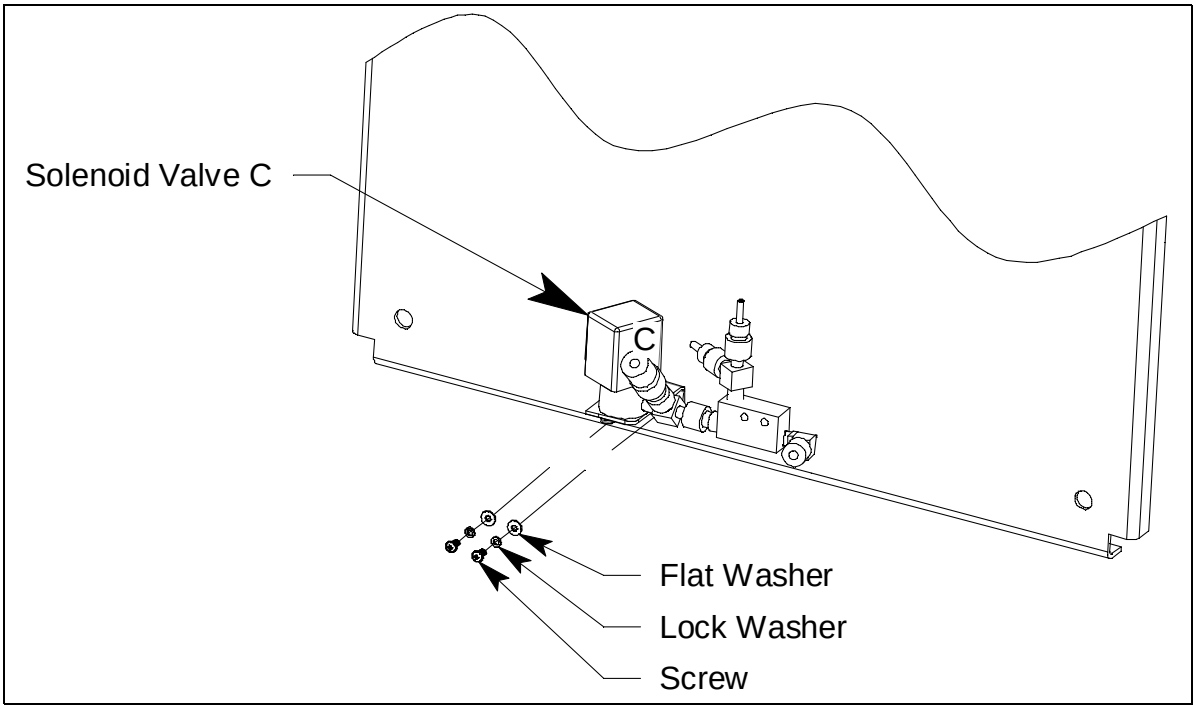


Figure 63: Reinstalling the Solenoid Valve Bracket

24. Tighten the nut on the bottom of the water trap. Use a 9/16 inch open-end wrench or an adjustable wrench to hold the fitting's hex in place. Use a second 9/16 inch open-end wrench or adjustable wrench to tighten the nut.

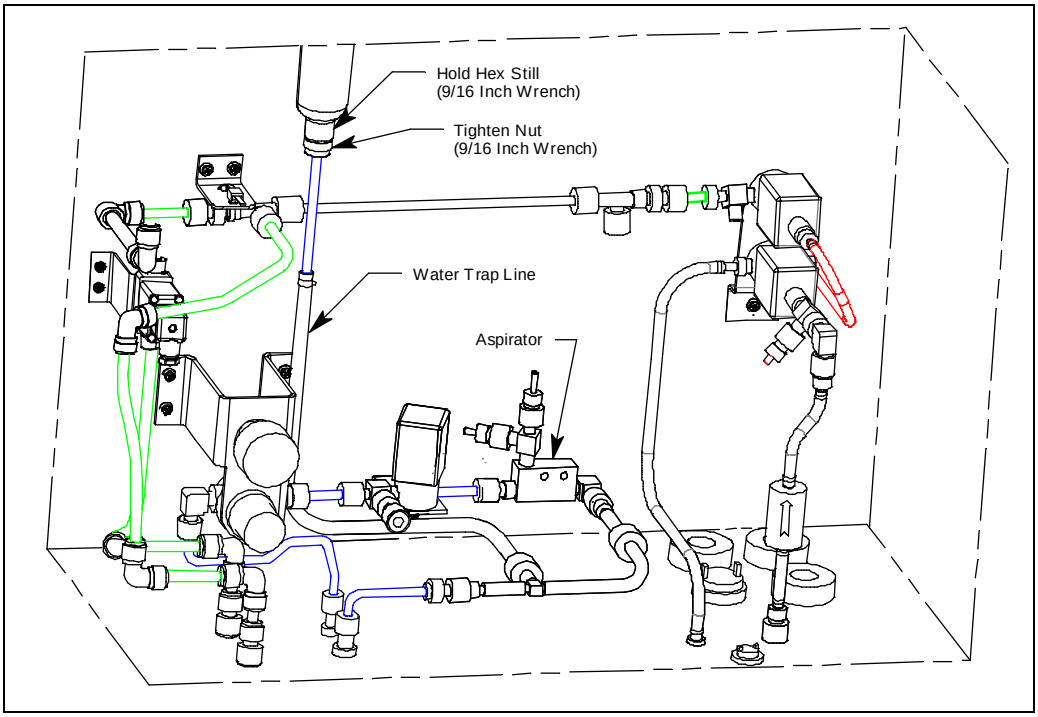


Figure 64: Water Trap Line Install for Aspirator Replacement

25. Use a 9/16 inch open-end wrench or adjustable wrench to tighten the nuts shown below.

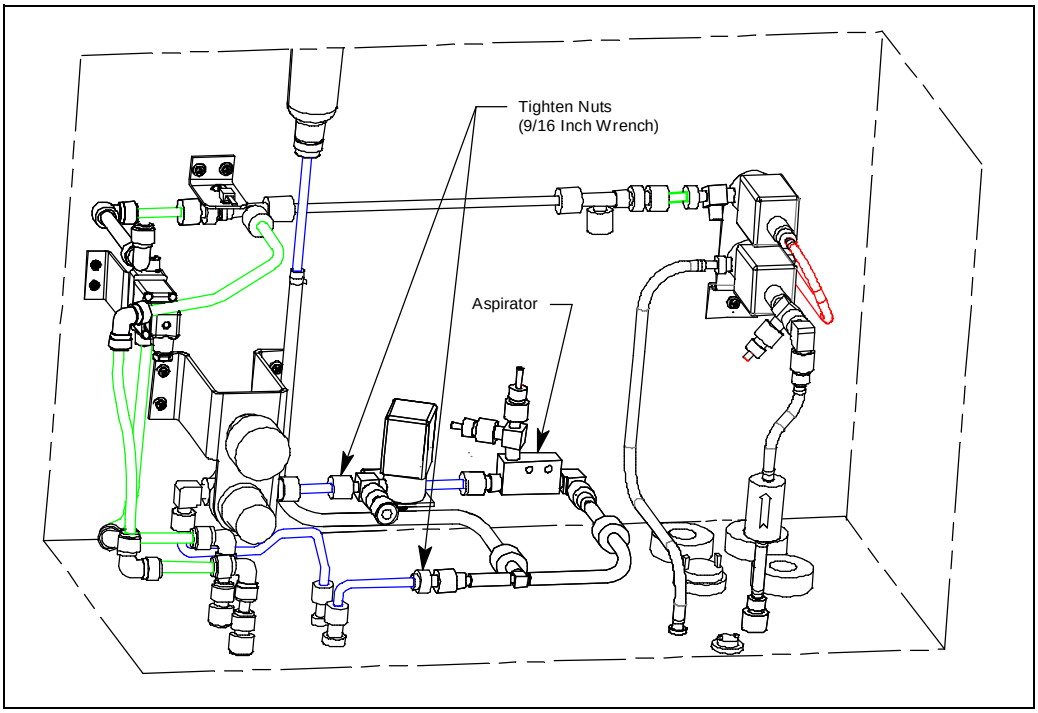


Figure 65: Nut Installation for Aspirator Replacement

26. Guide the assembly containing Solenoid Valve D back into the Digester Gas Monitor's housing.

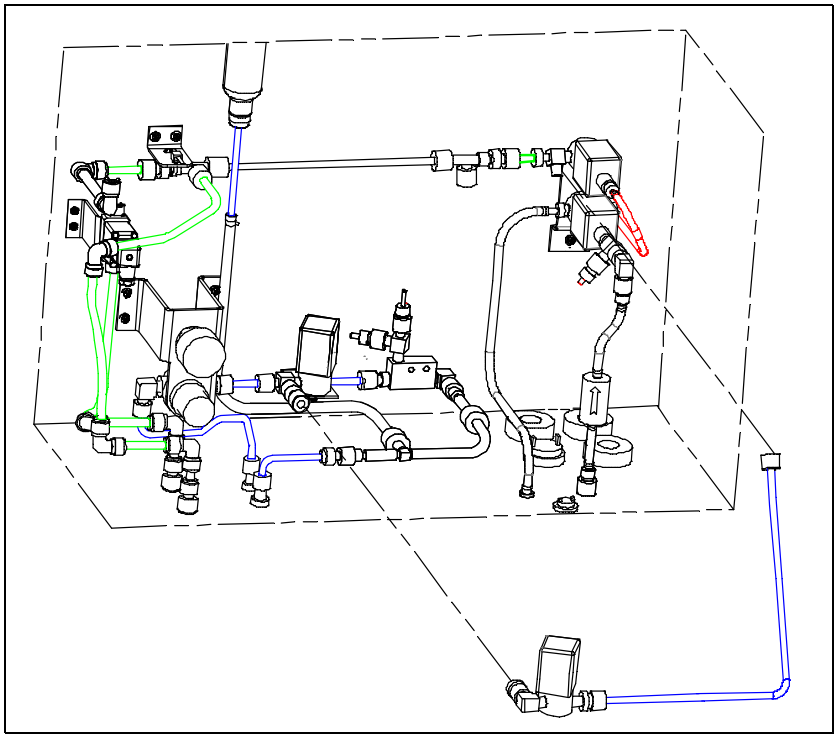


Figure 66: Solenoid Valve D/Tubing Assembly Installation

27. Tighten the nut shown below. The fitting has a nut and a hex. The hex is positioned in front of the nut. Use a 1/2 inch open-end wrench or an adjustable wrench to hold the hex in place. Use a 9/16 inch open-end wrench or adjustable wrench to tighten the nut.

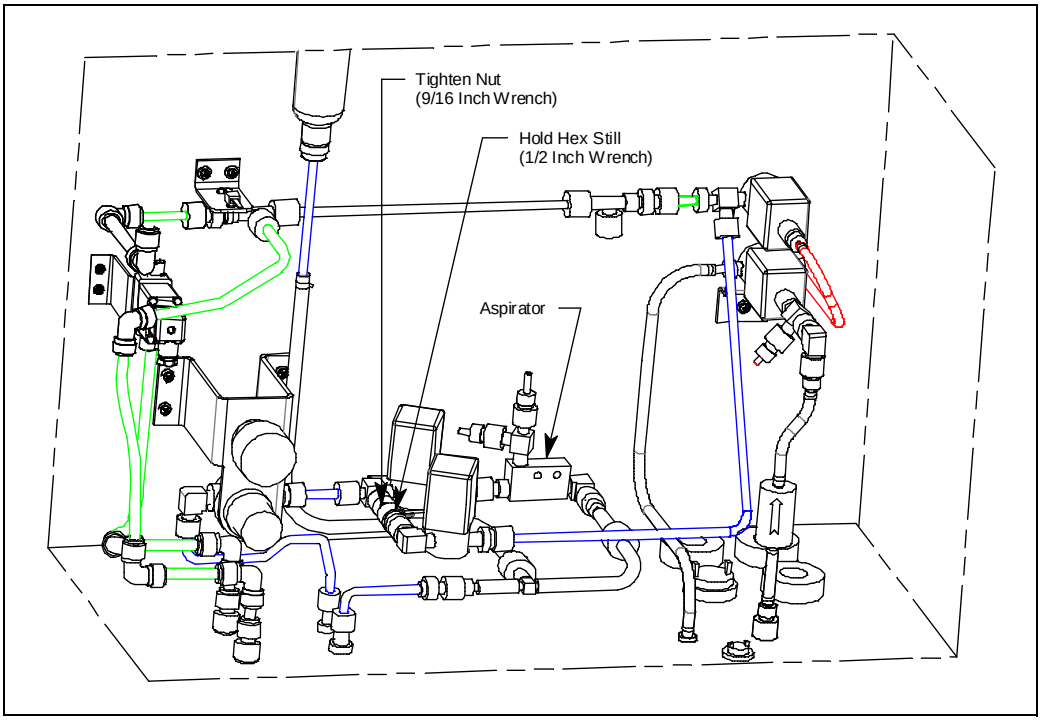


Figure 67: Nut Installation

28. Use a 9/16 inch open-end wrench or adjustable wrench to tighten the nut shown below.

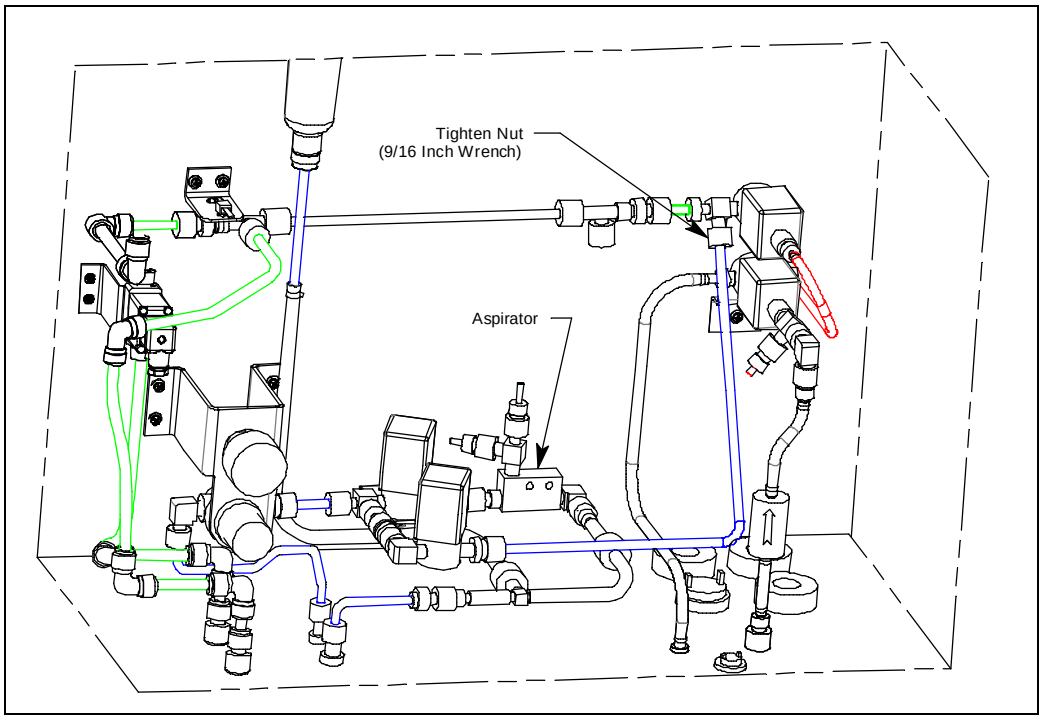


Figure 68: Nut Removal

29. Reconnect the flexible tubing to the appropriate fittings as shown below.

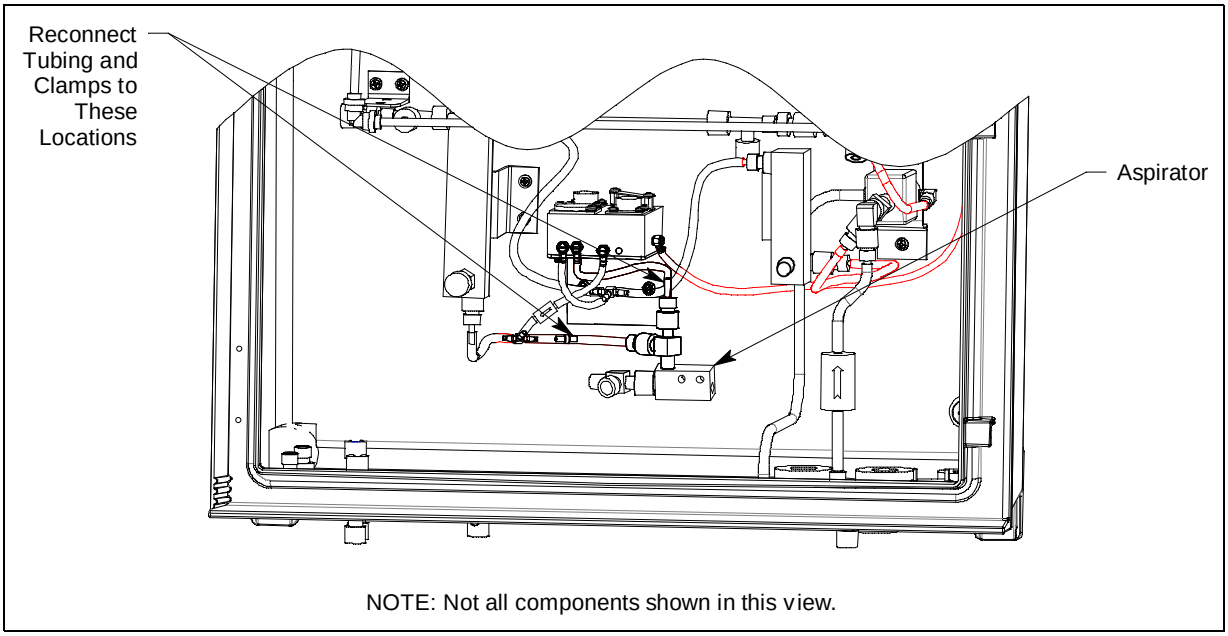


Figure 69: Reconnecting the Flexible Tubing

30. Use pliers to reinstall the clamps over the tubing fitting connections.

31. Rotate the oil mist filter back into position and reconnect it to the flow system by pushing the push fitting onto the open rigid tubing until it bottoms out. The arrow on the filter should be pointing to the right.

32. Reconnect the solenoid wiring.
    a. Insert the wires into the appropriate solenoid terminal strip. Each solenoid terminal strip is labeled with a letter that correspond to the letter label on the solenoid valve. For example, the wires coming from the solenoid valve labeled “C” should be wired to the terminal strip labeled “C”.
    b. Use a small flat blade screwdriver to tighten the terminals.
33. Plug in or turn on all incoming power to the Digester Gas Monitor.
34. Place the Digester Gas Monitor’s power switch in the ON position, then verify that the PILOT light is on.
35. Turn the flow regulator knob clockwise to set the sensor flow to 3 SCFH once the system has started up.
36. Close and secure the housing door.

Replacing Solenoid Valve B

Replace Solenoid Valve B if it does not switch ports reliably or if it gets stuck.

1. Turn off or unplug all incoming power to the Digester Gas Monitor.
2. Open the Digester Gas Monitor housing door, then place the power switch in the OFF position.
3. Turn the flow regulator knob all the way counterclockwise to close the flow regulator’s output.
4. Locate Solenoid Valve B on the right side of the Digester Gas Monitor. It has a “B” label on it.

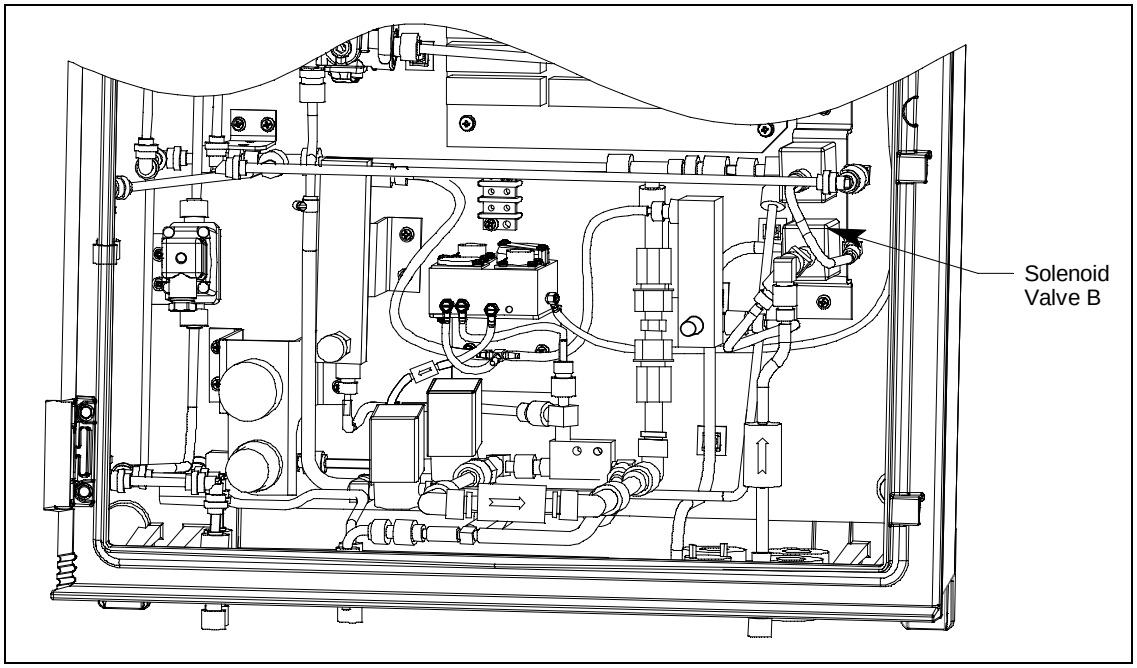


Figure 70: Solenoid Valve B Location

5. Use pliers to remove the clamps from the 4 tubing connections shown in the figure below. Then remove the tubing from the hose barb fittings. If tubing gets damaged, replace it with appropriate tubing. See Figure 72 for tubing sizes.

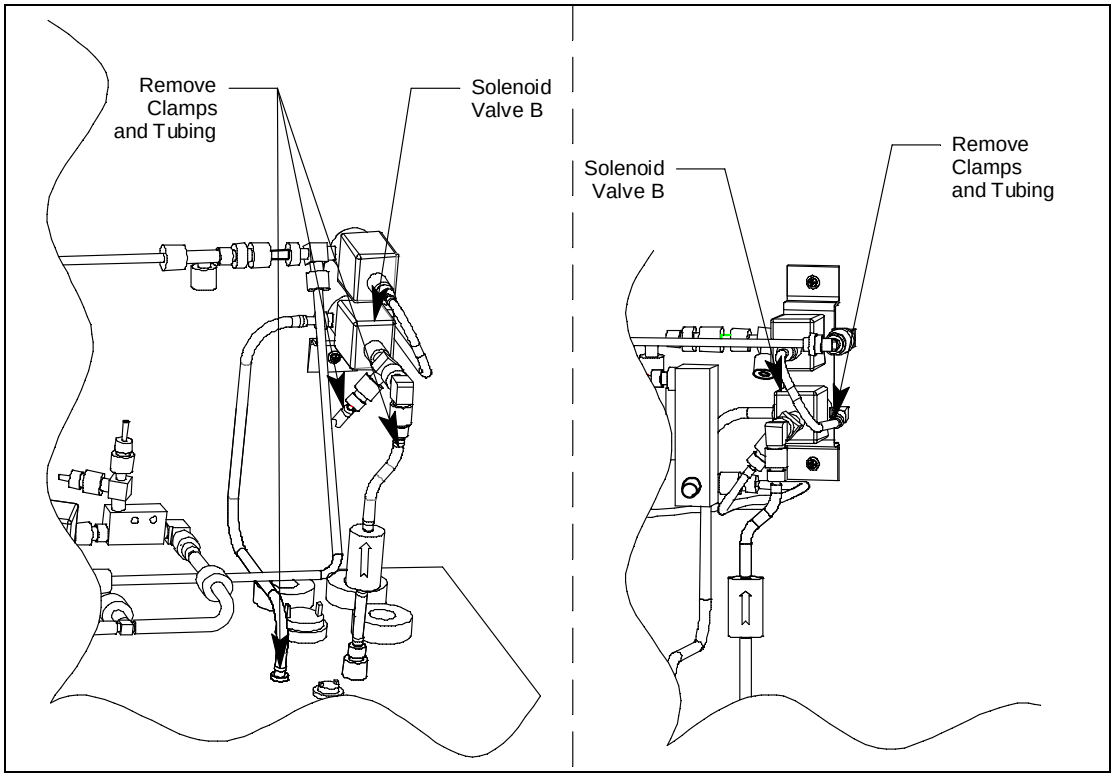


Figure 71: Clamp and Flexible Tubing Removal

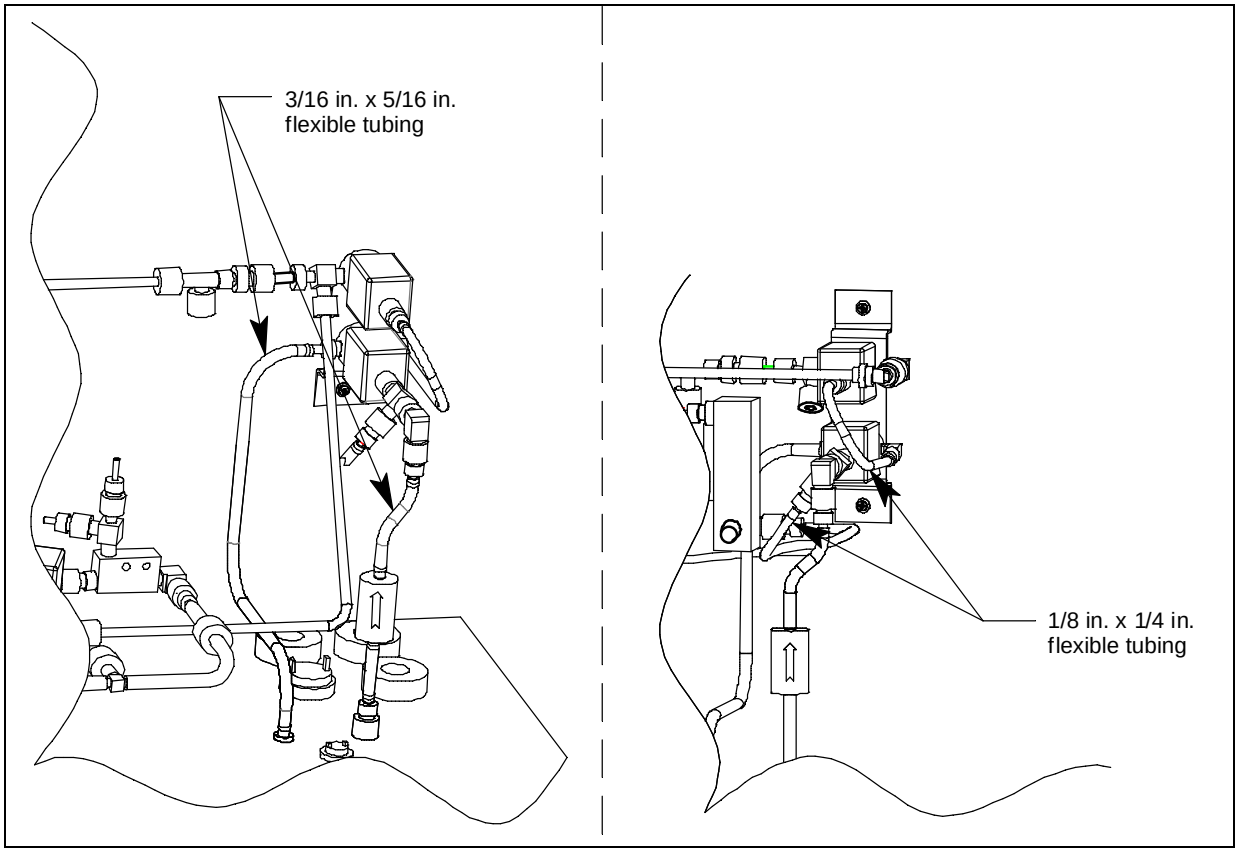


Figure 72: Flexible Tubing Sizes

6. Unscrew the 2 nuts shown below using a 9/16 inch wrench. Once each nut is loose, slide the nut down the tubing leaving the ferrules at the end of the tubing exposed. The ferrules should not come off.

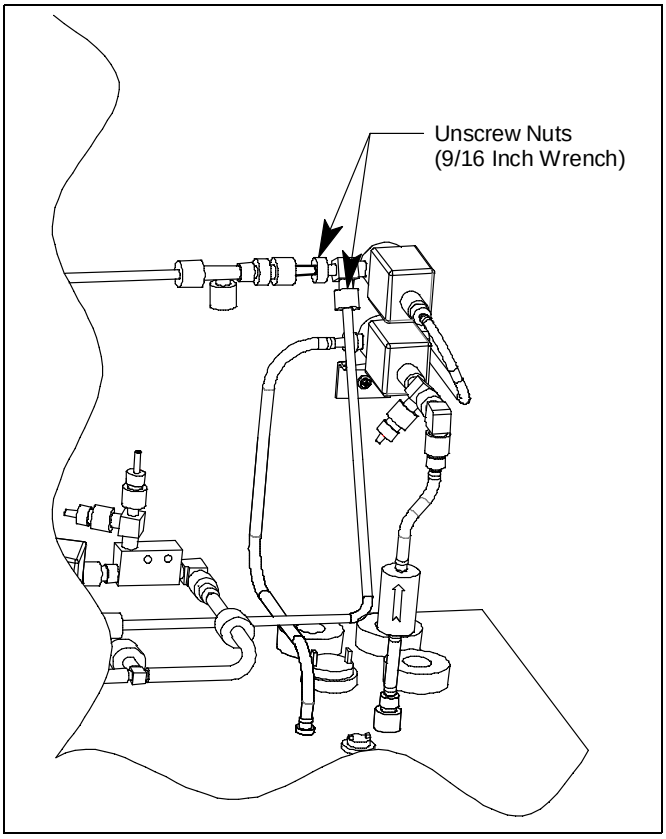


Figure 73: Removing the Nuts

7. There is a push fitting on the right side of Solenoid A. Press the collet of that push fitting toward the back of the Digester Gas Monitor and pull the tubing assembly away from it.

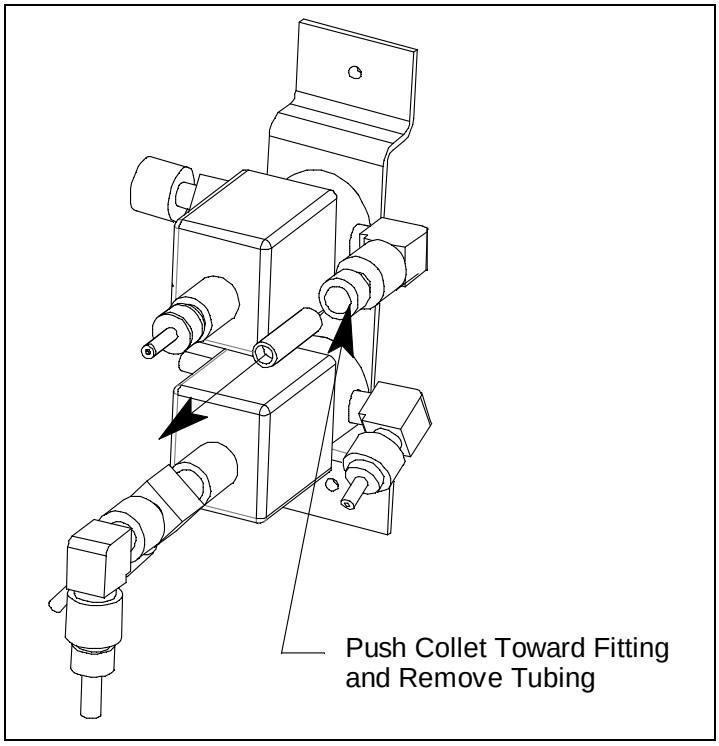


Figure 74: Removing the Push Fitting Connection

8. Disconnect the solenoid valve wiring from the solenoid wiring terminal strips for Solenoids A and B using a small flat blade screwdriver to unscrew the terminals. There are 2 terminals per solenoid valve. It does not matter which of the wires is connected to a particular terminal on the appropriate terminal strip so it is not necessary to pay attention to the wires' terminal position when disconnecting them from the terminal strip.

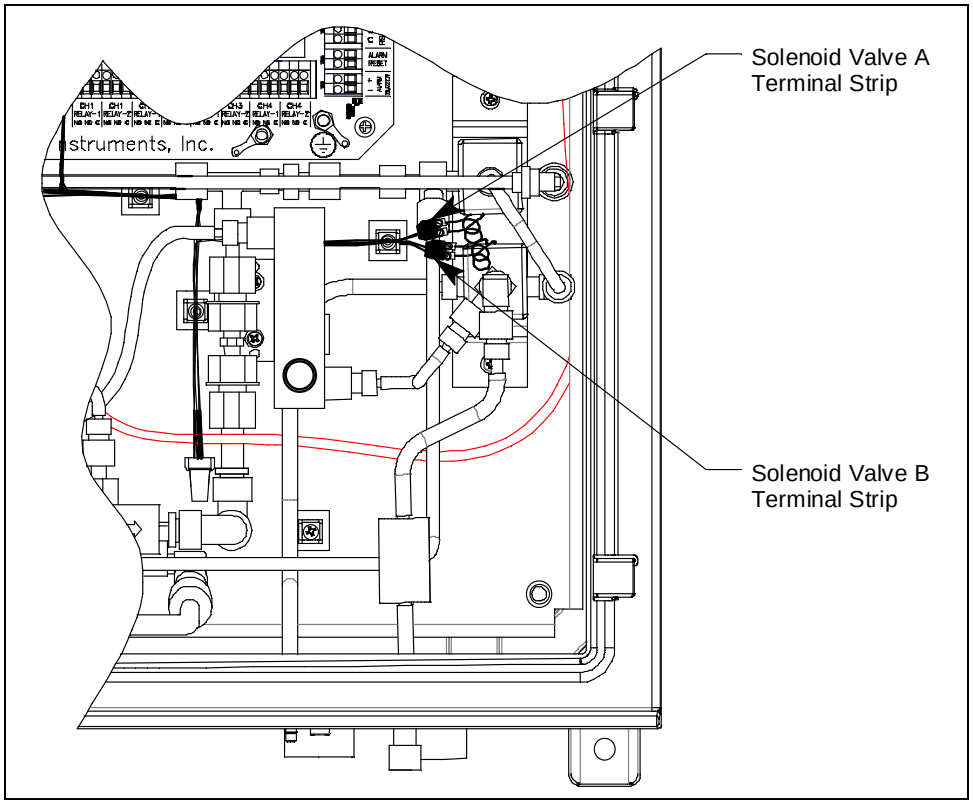


Figure 75: Solenoid Valve Wire Removal

9. Unscrew the 2 screws holding the bracket to the plate. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot while replacing the solenoid valve. Pull the solenoid valve/bracket assembly away from the mounting plate.

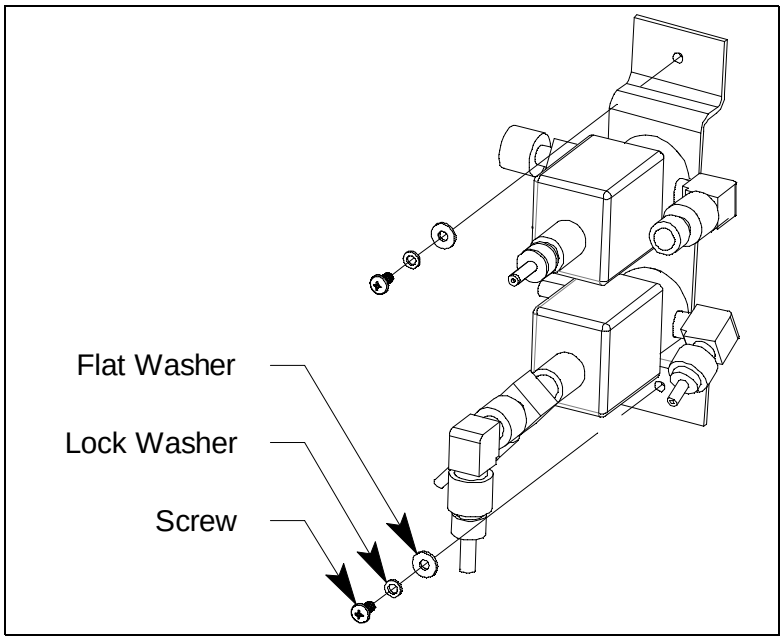


Figure 76: Removing the Bracket from the Plate

10. Unscrew the 2 screws holding Solenoid Valve B to the bracket. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot while replacing the solenoid valve. ***These screws, flat washers, and lock washers are different than the screws, flat washer, and lock washers used to connect the bracket to the plate. Do not mix these parts up.***

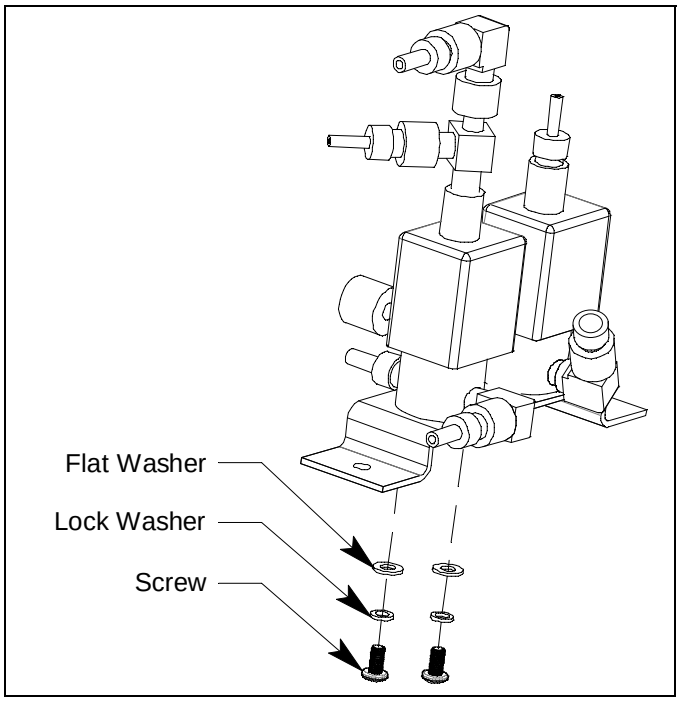


Figure 77: Removing Solenoid Valve B from the Bracket

11. Remove the three fittings from Solenoid Valve B. Be sure to grasp each fitting in the location shown below.

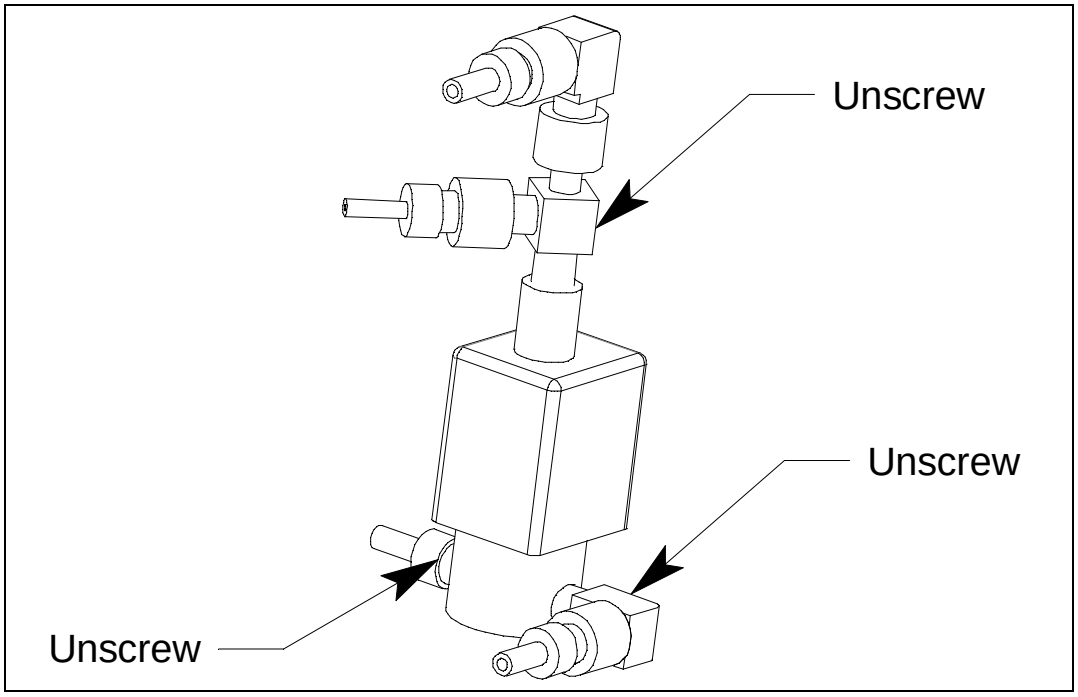


Figure 78: Removing the Fittings

12. Install new Teflon tape on each fitting's thread and screw the fittings into the new Solenoid Valve B. The solenoid valve has 2 labeled ports: Port A and Port B. Be sure that the correct fitting gets attached to the correct port on the solenoid valve and that the fittings end up in the orientation shown below.

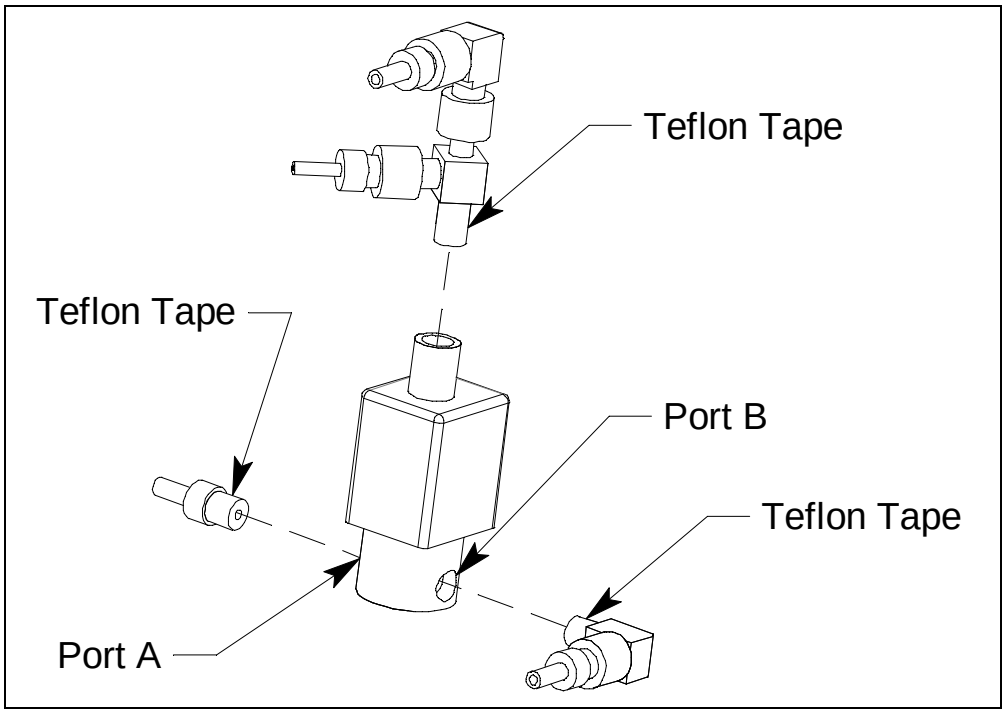


Figure 79: Attaching Fittings to New Valve

13. Install the new Solenoid Valve B onto the bracket using the screws, lock washers, and flat washers that were removed in Step 10. Be sure that the orientation of the solenoid valve is correct.

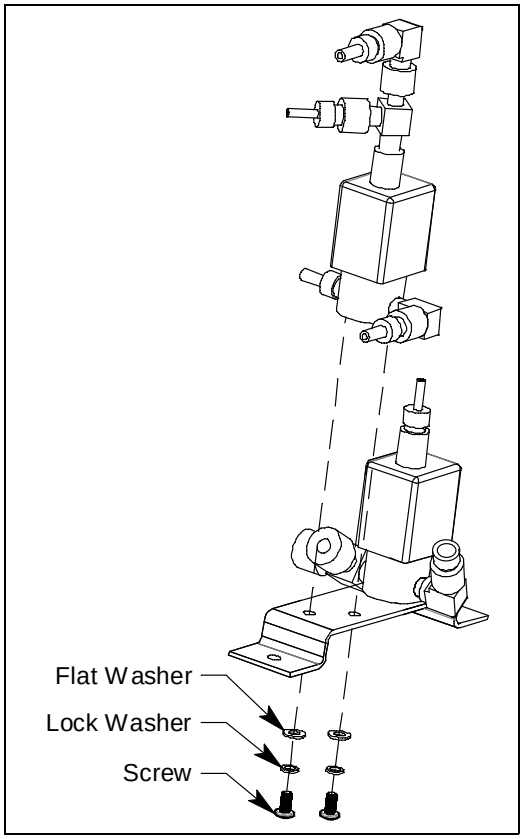


Figure 80: Connecting New Solenoid Valve B to Bracket

14. Install the bracket onto the plate using the screws, lock washers, and flat washers that were removed in Step 9.

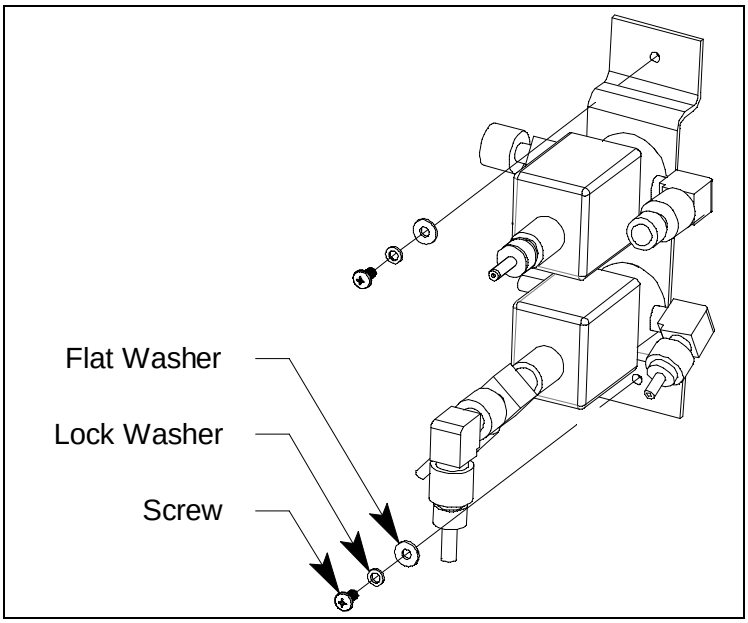


Figure 81: Attaching Bracket to Plate

15. Reconnect the rigid tubing assembly to the right side of Solenoid A.

16. Reconnect the rigid tubing connections shown below by inserting the tubing with ferrules into the appropriate fitting and using a 9/16 inch open-end wrench or adjustable wrench to tighten each nut.

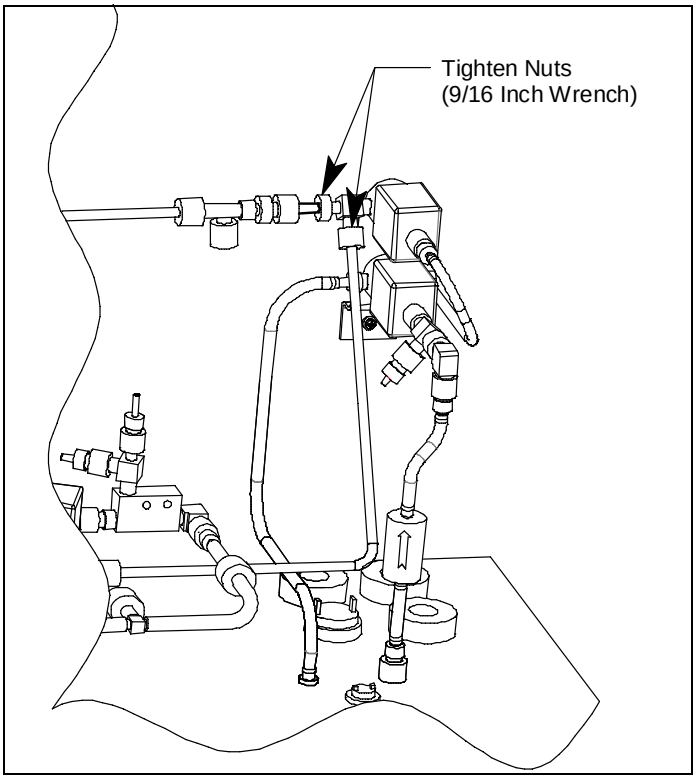


Figure 82: Reinstalling Rigid Tubing

17. Reconnect the flexible tubing connections.

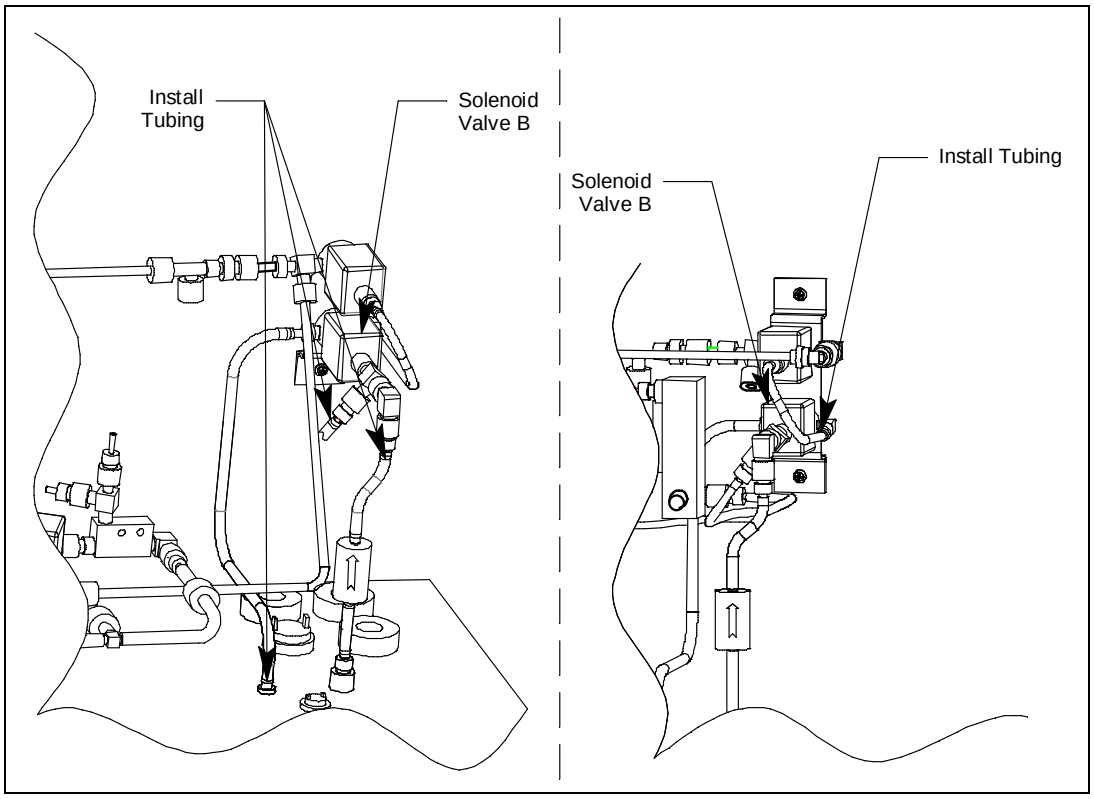


Figure 83: Flexible Tubing Installation

18. Use pliers to reinstall the clamps over the tubing fitting connections.

19. Reconnect the solenoid wiring.
    a. Insert the wires into the appropriate solenoid terminal strip. Each solenoid terminal strip is labeled with a letter that correspond to the letter label on the solenoid valve. For example, the wires coming from the solenoid valve labeled “A” should be wired to the terminal strip labeled “A”. It does not matter which wire goes to which terminal. It only matters that the 2 wires coming from 1 solenoid valve go to the correct 2-point terminal strip.
    b. Use a small flat blade screwdriver to tighten the terminals.

20. Plug in or turn on all incoming power to the Digester Gas Monitor.

21. Place the Digester Gas Monitor’s power switch in the ON position, then verify that the PILOT light is on.

22. Turn the flow regulator knob clockwise to set the sensor flow to 3 SCFH once the system has started up.

23. Close and secure the housing door.

Replacing Solenoid Valve C2

Replace Solenoid Valve C2 if it does not switch ports reliably or if it gets stuck.

1. Turn off or unplug all incoming power to the Digester Gas Monitor.
2. Open the Digester Gas Monitor housing door, then place the power switch in the OFF position.
3. Turn the flow regulator knob all the way counterclockwise to close the flow regulator's output.
4. Locate Solenoid Valve C2 on the left side of the Digester Gas Monitor. It has a "C2" label on it.

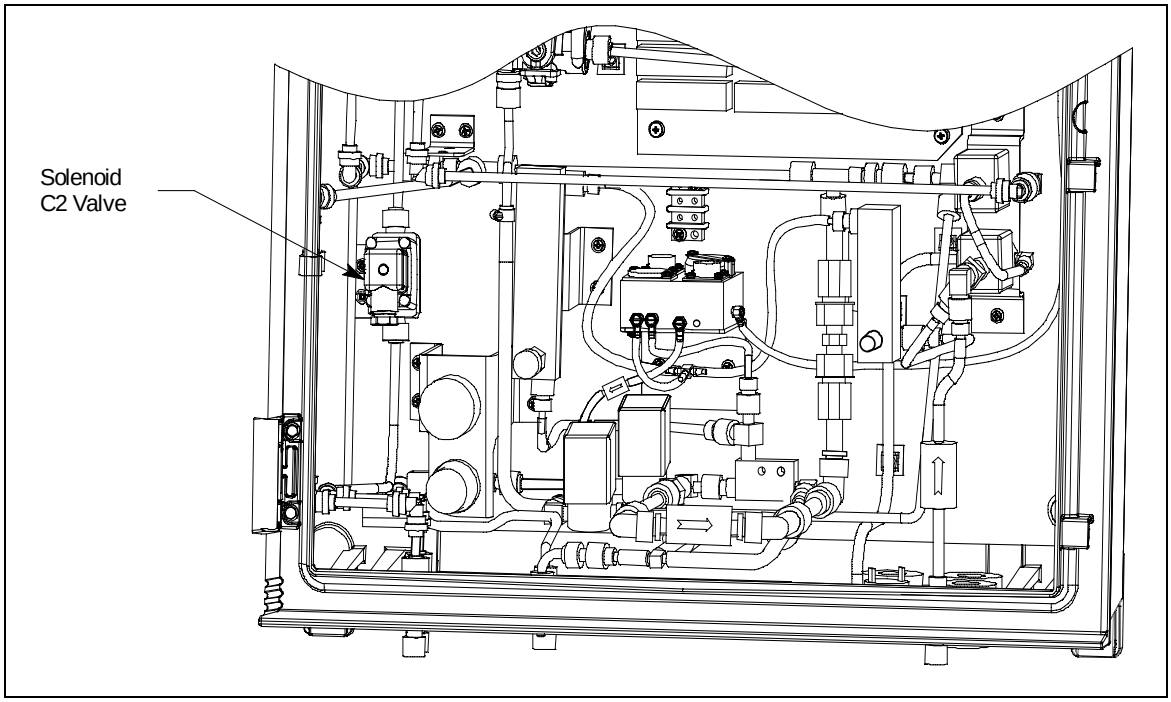


Figure 84: Solenoid Valve C2 Location

5. There are two push fittings on the top and bottom of Solenoid Valve C2. Press the collet of each fitting towards the valve and pull the tubing assembly away from the valve.

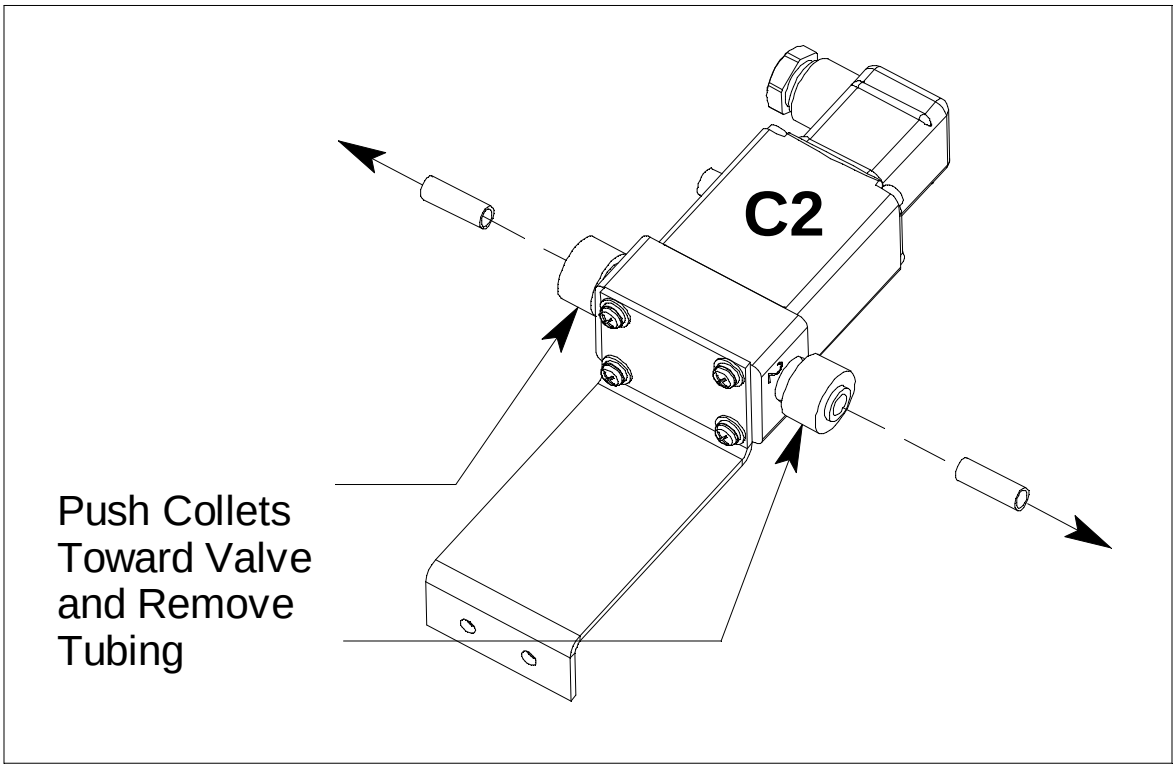


Figure 85: Removing the Push Fitting Connection

6. Disconnect the solenoid valve wiring from the solenoid wiring terminal strip for Solenoid C2 using a small flat blade screwdriver to unscrew the two terminals.

   Note which wire is connected to which terminal when disconnecting them from the terminal strip.

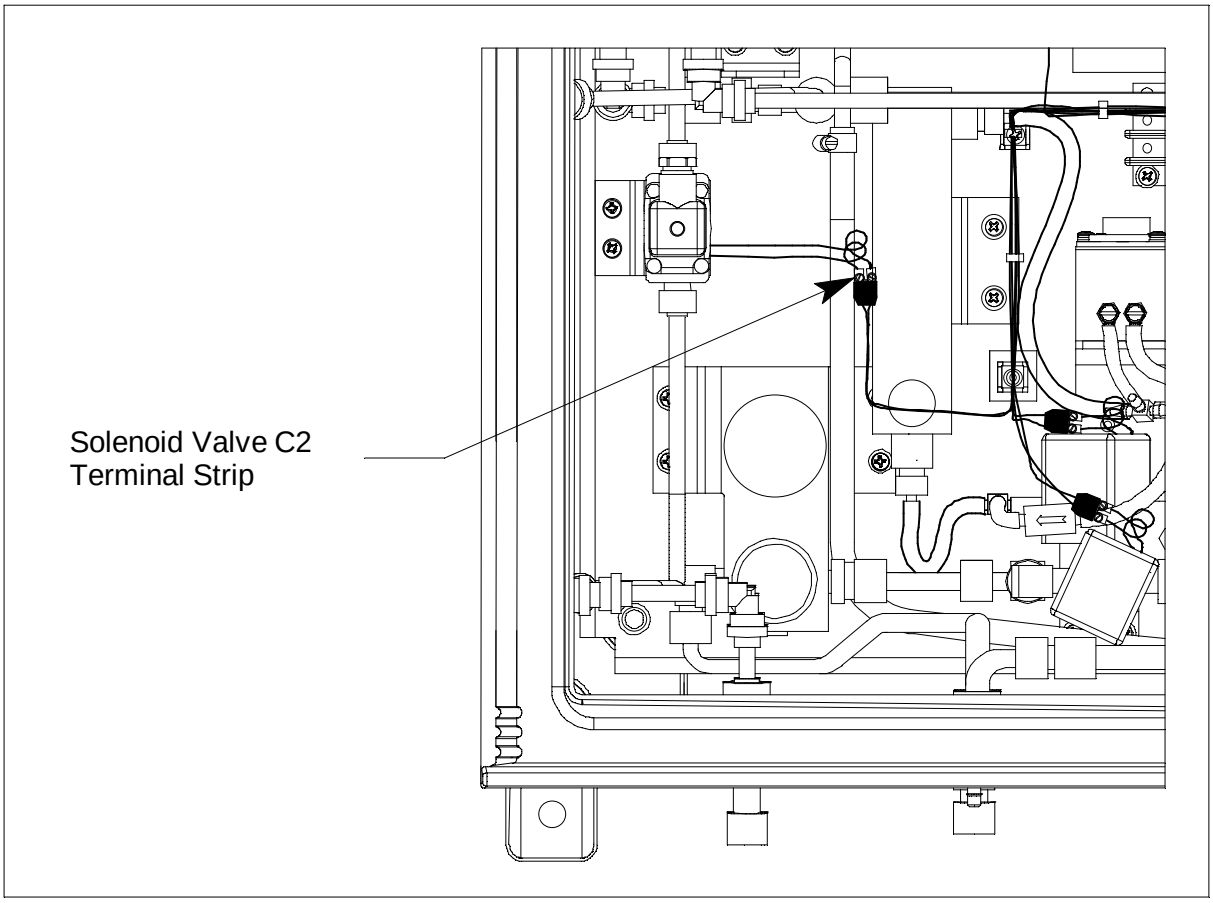


Figure 86: Solenoid Valve Wire Removal

7. Disconnect the green ground wire from the ground stud in the lower right corner of the main PCB.

8. Unscrew the 2 screws holding the bracket to the plate. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot while replacing the solenoid valve. Pull the solenoid valve/bracket assembly away from the mounting plate.

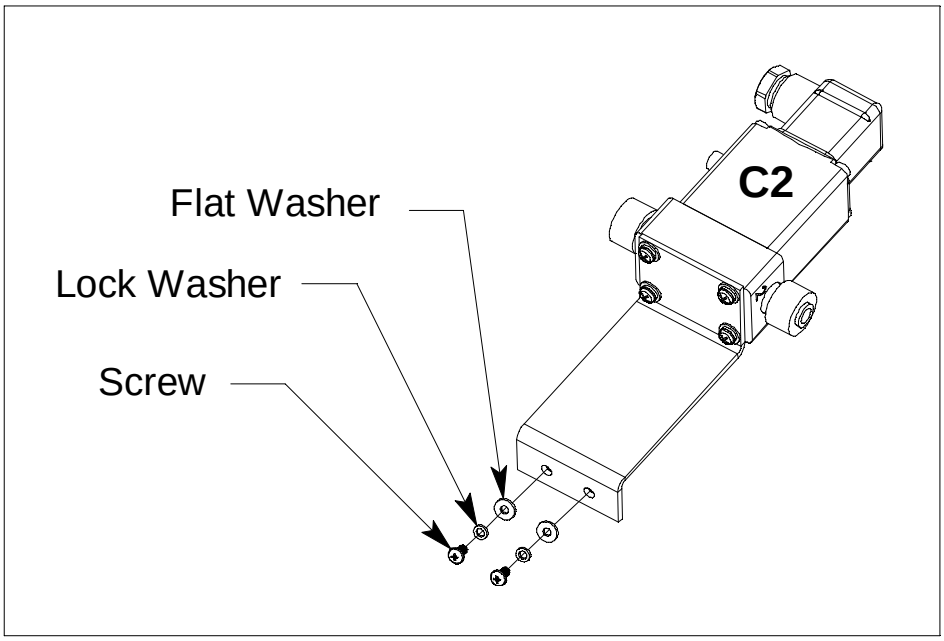


Figure 87: Removing the Bracket from the Plate

9. Unscrew the 4 screws holding Solenoid Valve C2 to the bracket. There is a flat washer and a lock washer beneath each screw. Keep the screws, flat washers, and lock washers in a safe spot while replacing the solenoid valve. ***These screws, flat washers, and lock washers are different than the screws, flat washer, and lock washers used to connect the bracket to the plate. Do not mix these parts up.***

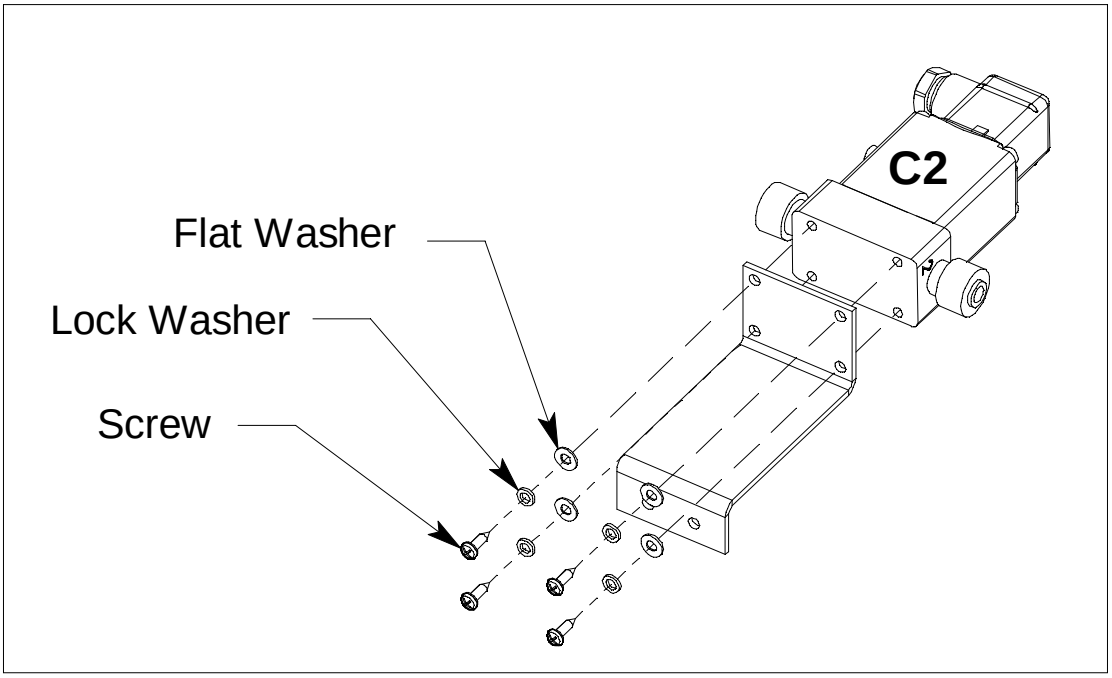


Figure 88: Removing Solenoid Valve C2 from the Bracket

10. Unscrew the two fittings from Solenoid Valve C2. Be sure to grasp each fitting in the location shown below.

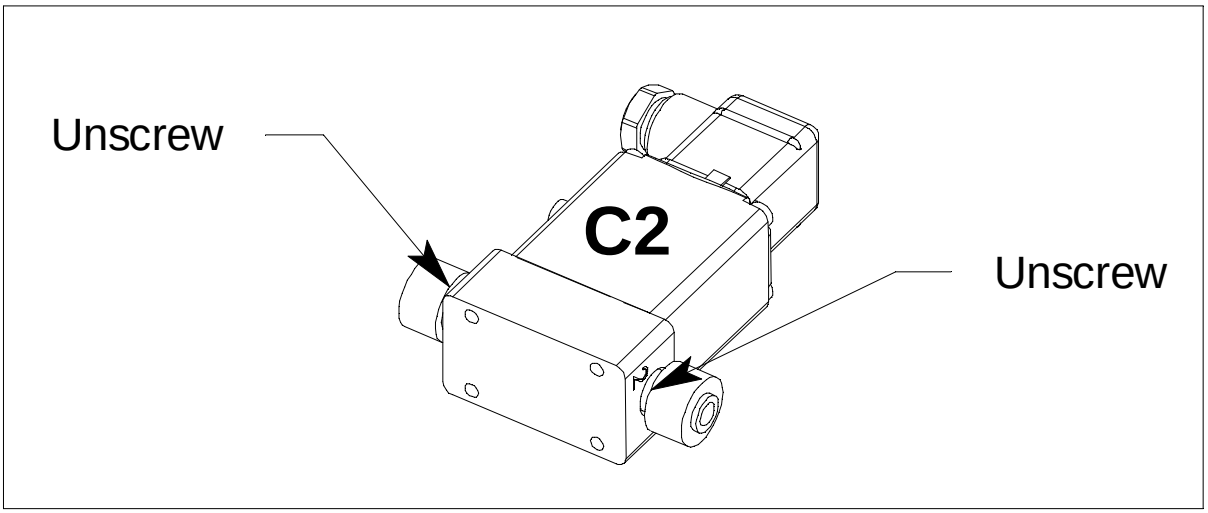


Figure 89: Removing the Fittings

11. Install new Teflon tape on each fitting's thread and screw the fittings into the new Solenoid Valve C2.

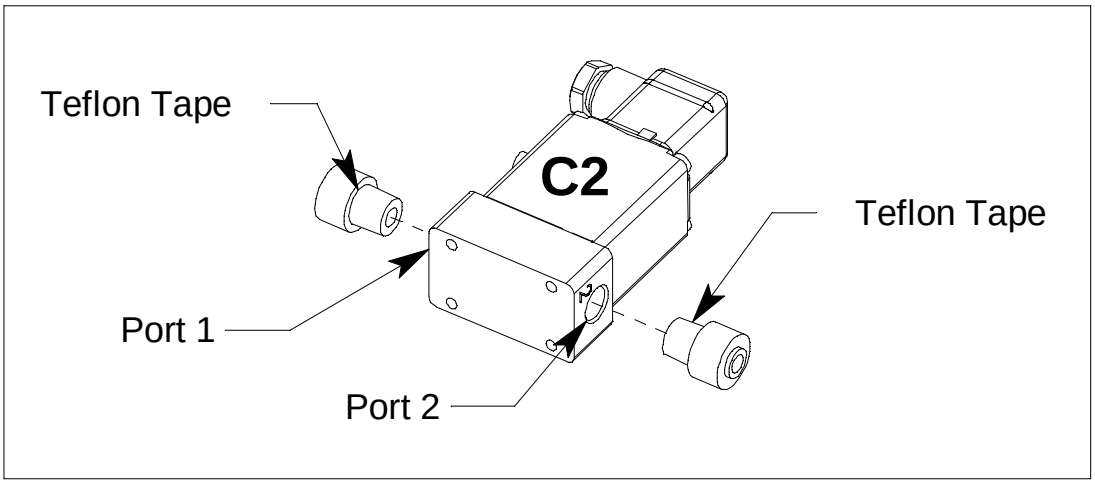


Figure 90: Attaching Fittings to New Valve

12. Install the new Solenoid Valve C2 onto the bracket using the screws, lock washers, and flat washers that were removed in Step 9. Be sure that the orientation of the solenoid valve is correct.

13. Install the bracket onto the plate using the screws, lock washers, and flat washers that were removed in Step 8.

14. Reconnect the rigid tubing assembly to the top and bottom sides of Solenoid C2 by inserting the tubing with ferrules into the appropriate fitting.

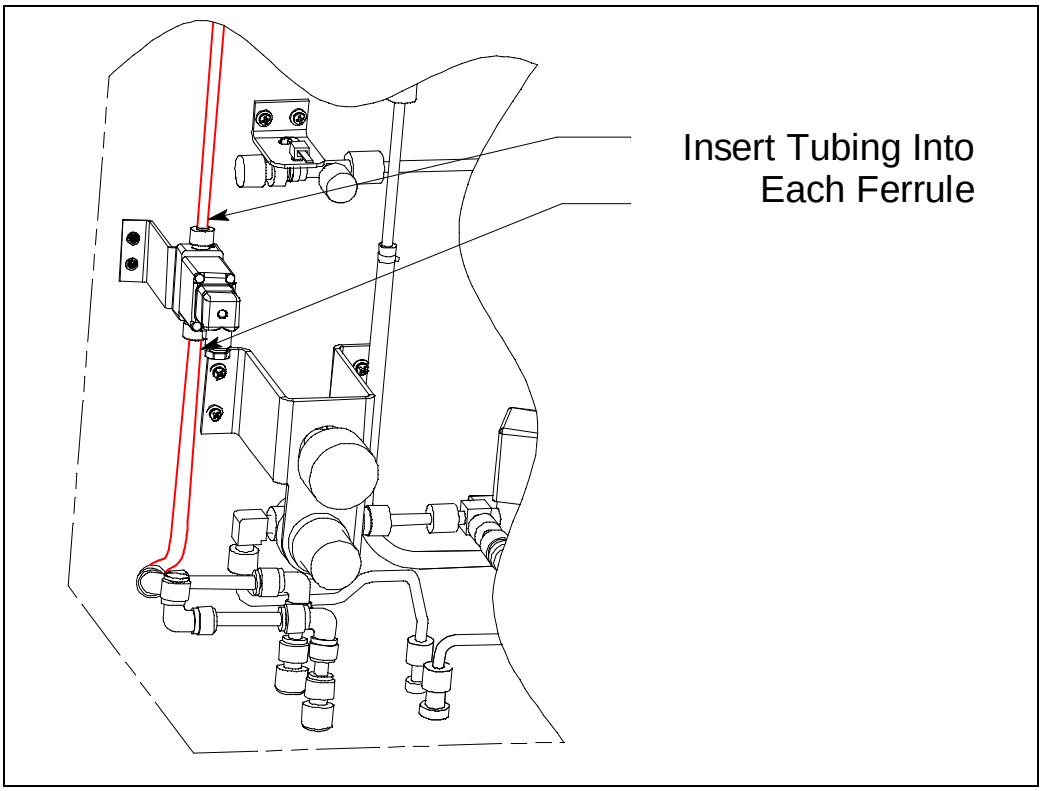
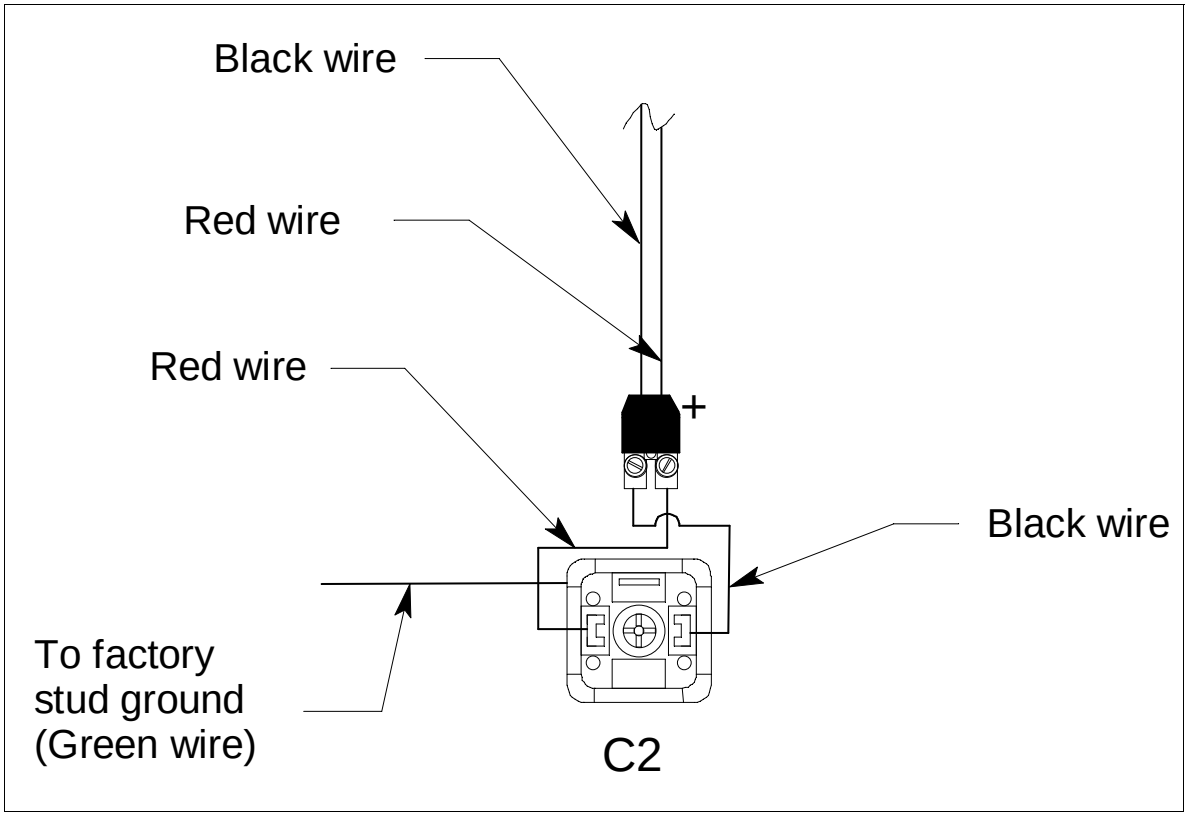


Figure 91: Reinstalling Rigid Tubing

15. Reconnect the solenoid wiring:
    a. Insert the wires from the solenoid valve to the terminal strip labeled C2. Connect the solenoid valve's red wire in line with the red wire coming out of the 2 point terminal strip. Connect the solenoid valve's black wire in line with the black wire coming out of the 2 point terminal strip. Refer to the following figure.



    b. Use a small flat blade screwdriver to tighten the terminals.
    c. Connect the ground wire from the solenoid valve to the ground stud in the lower right corner of the main board.

16. Plug in or turn on all incoming power to the Digester Gas Monitor.

17. Place the Digester Gas Monitor’s power switch in the ON position, then verify that the PILOT light is on.

18. Turn the flow regulator knob clockwise to set the sensor flow to 3 SCFH once the system has started up.

19. Close and secure the housing door.

Replacing the IR CH_4 and IR CO_2 Sensor Preamps

1. Turn off the Digester Gas Monitor
2. Turn off incoming power to the Digester Gas Monitor.
3. Open the housing door of the Digester Gas Monitor.
4. Turn the flow regulator knob all the way counterclockwise to close the flow regulator's output.
5. The sensor wiring is routed to the main circuit board using zip ties. Cut these zip ties.
6. Unscrew the appropriate sensor's wiring from the detector/transmitter terminal strip on the main board. The methane sensor is connected to Channel 1 and the CO_2 sensor is connected to Channel 2.

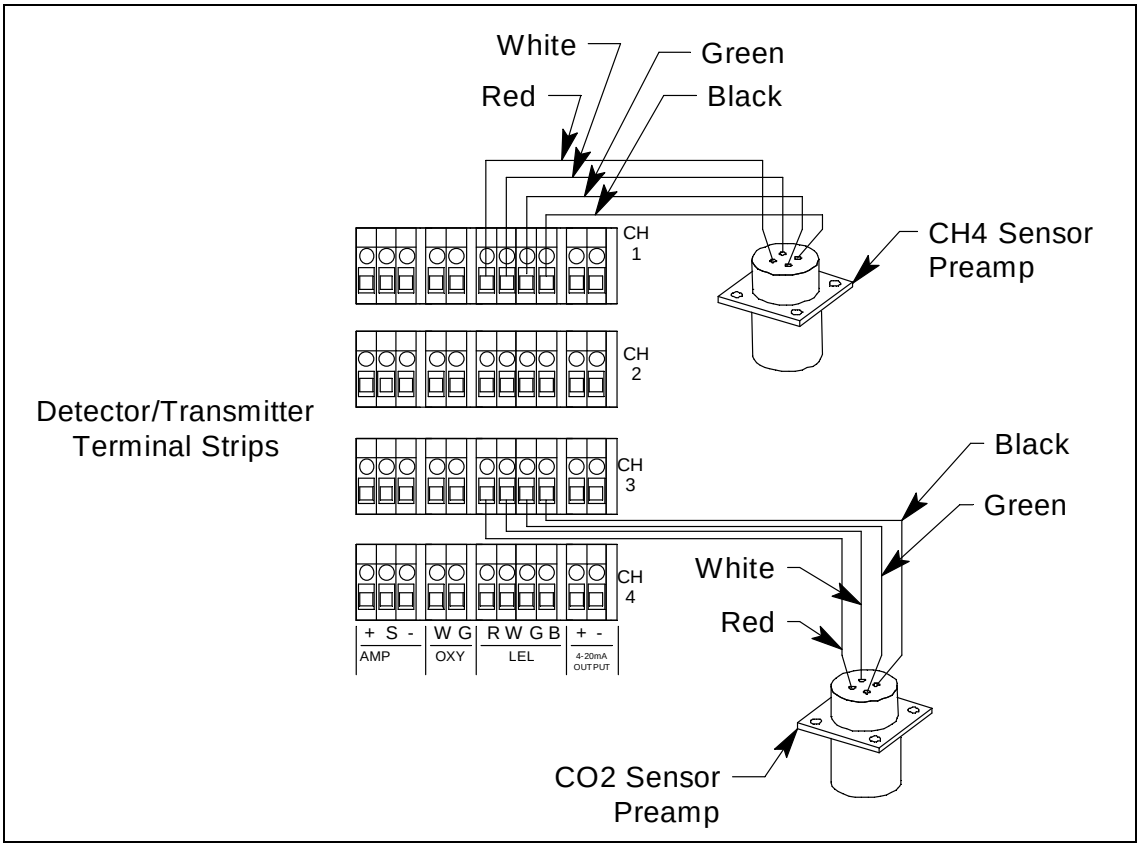


Figure 92: Methane and CO_2 Sensor Connections to Main Board

7. Locate the sensor preamp you intend to replace. The methane preamp is located in the lower right corner of the flow block when viewed from the top. The CO_2 preamp is located in the upper left corner of the flow block when viewed from the top.

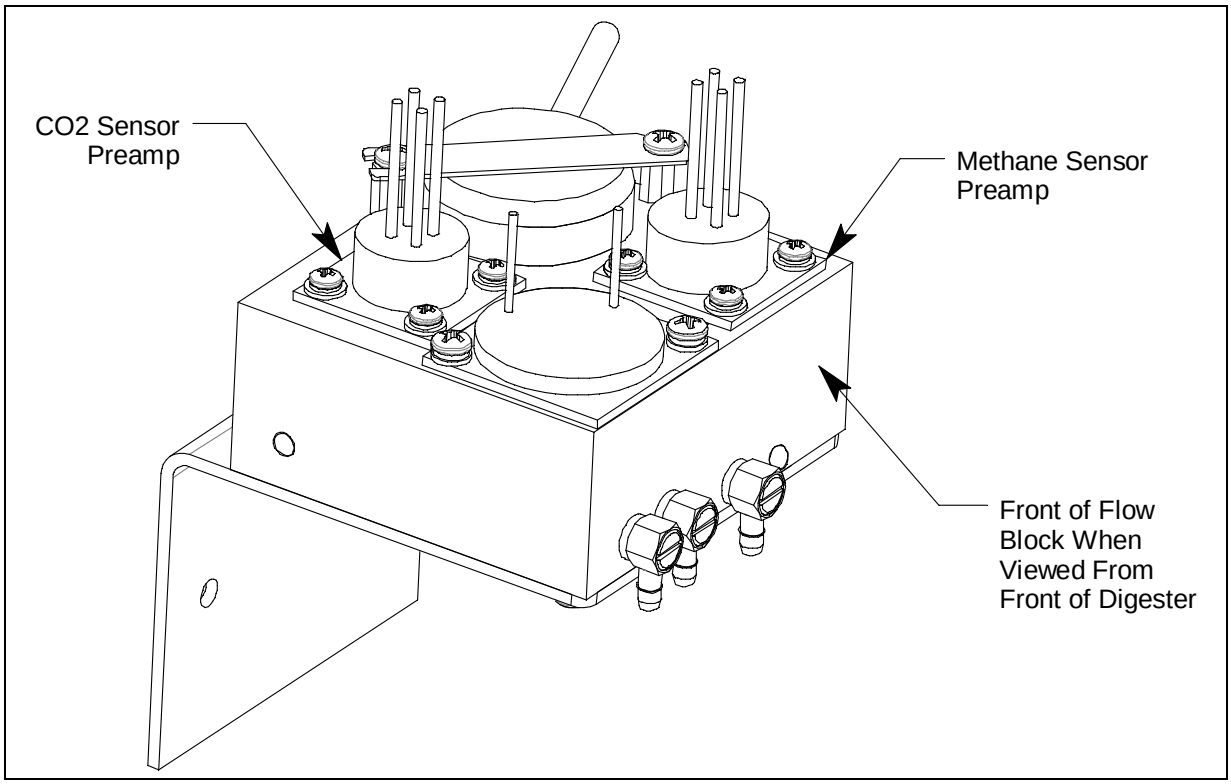


Figure 93: Methane and CO_2 Preamp Location

8. Unscrew the 4 screws that retain the preamp circuit board. Take care not to lose the flat washer and lock washer under each screw head.
9. Lift the preamp circuit board and sensor away from the flow block.

   There is a gasket in the bottom of the sensor cavity. Make sure the gasket stays in place.
10. Pull the sensor off the preamp circuit board. Discard the old preamp.
11. Plug the sensor into the new preamp circuit board.

12. Reinstall the preamp circuit board with the sensor onto the flow block using the screws, lock washers, and flat washers removed in Step 8. Be sure to tighten the screws firmly and evenly.

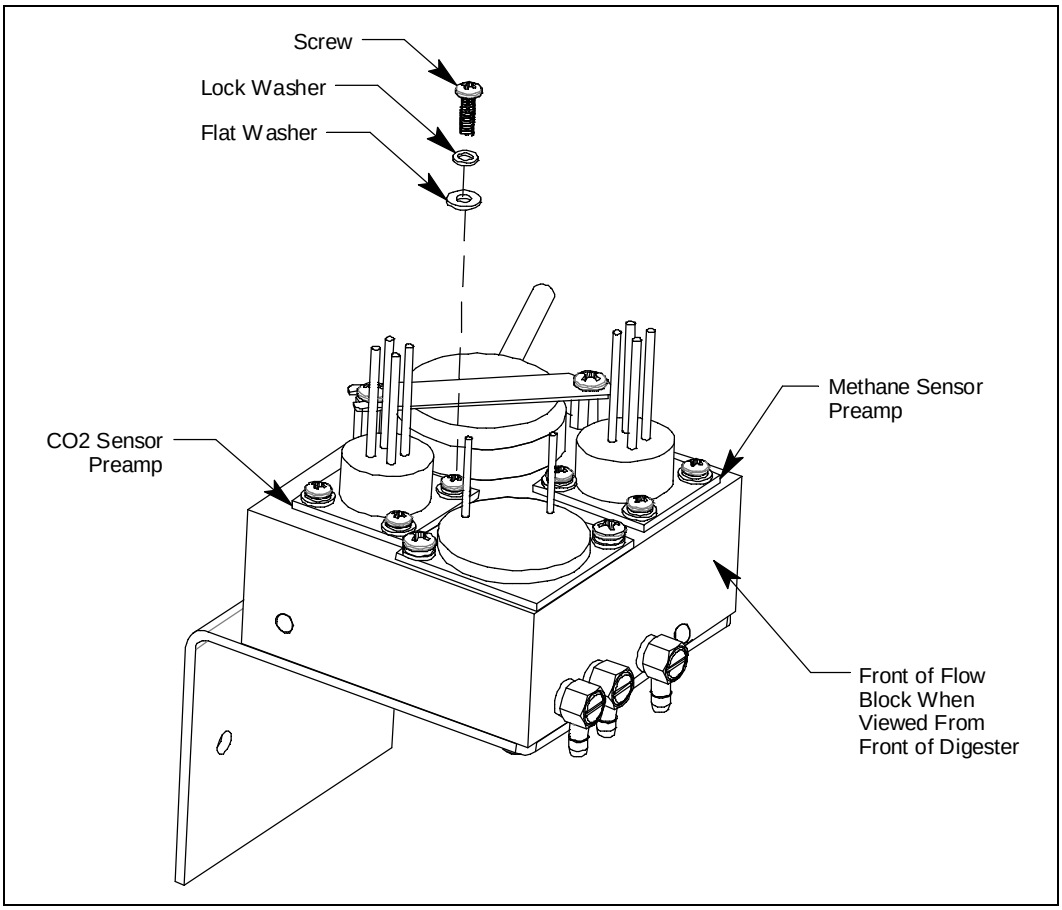


Figure 94: Methane and CO_2 Preamp Installation

13. Route the wires from the preamp circuit board to the appropriate detector/transmitter terminal strip on the main board and connect them as shown below.

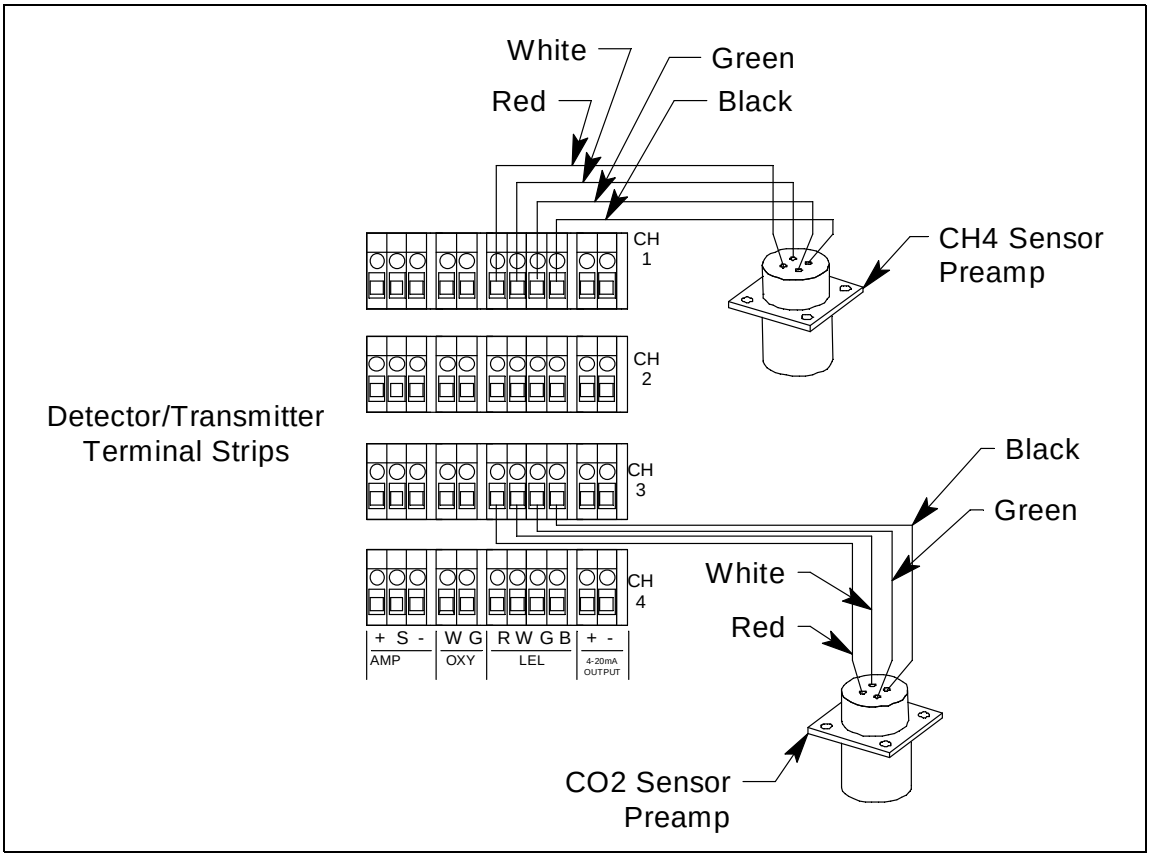


Figure 95: Methane and CO_2 Sensor Connections to Main Board

14. Hold all of the sensor wires together and re-zip tie them to the anchors on the main circuit board.

15. Turn the flow regulator knob clockwise to set the sensor flow to 3 SCFH when you restart the system.

16. Turn on incoming power.

17. Calibrate the sensor as described in the Calibration section of the Digester Manual.

Replacing the H_2S Sensor Preamp

1. Turn off the Digester Gas Monitor

2. Turn off incoming power to the Digester Gas Monitor.

3. Open the housing door of the Digester Gas Monitor.

4. Turn the flow regulator knob all the way counterclockwise to close the flow regulator's output.

5. The sensor wiring is routed to the main circuit board using zip ties. Cut these zip ties.

6. Unscrew the H_2S wiring from the Channel 4 detector/transmitter terminal strip on the main board.

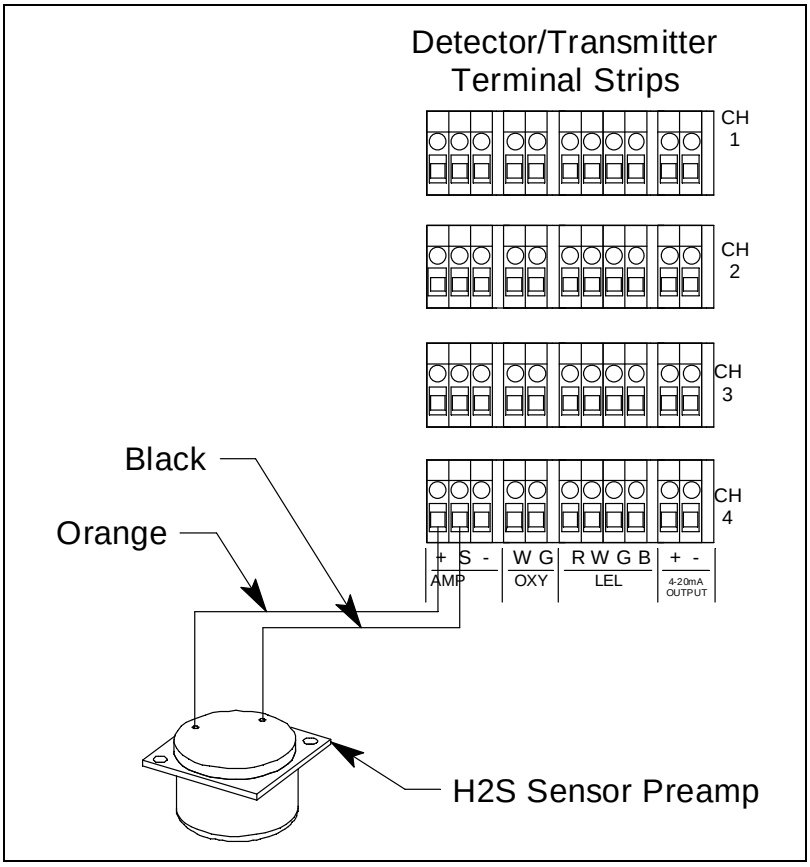


Figure 96: H_2S Sensor Connection to Main Board

7. The H_2S sensor preamp is located in the bottom left corner of the flow block when viewed from the top.

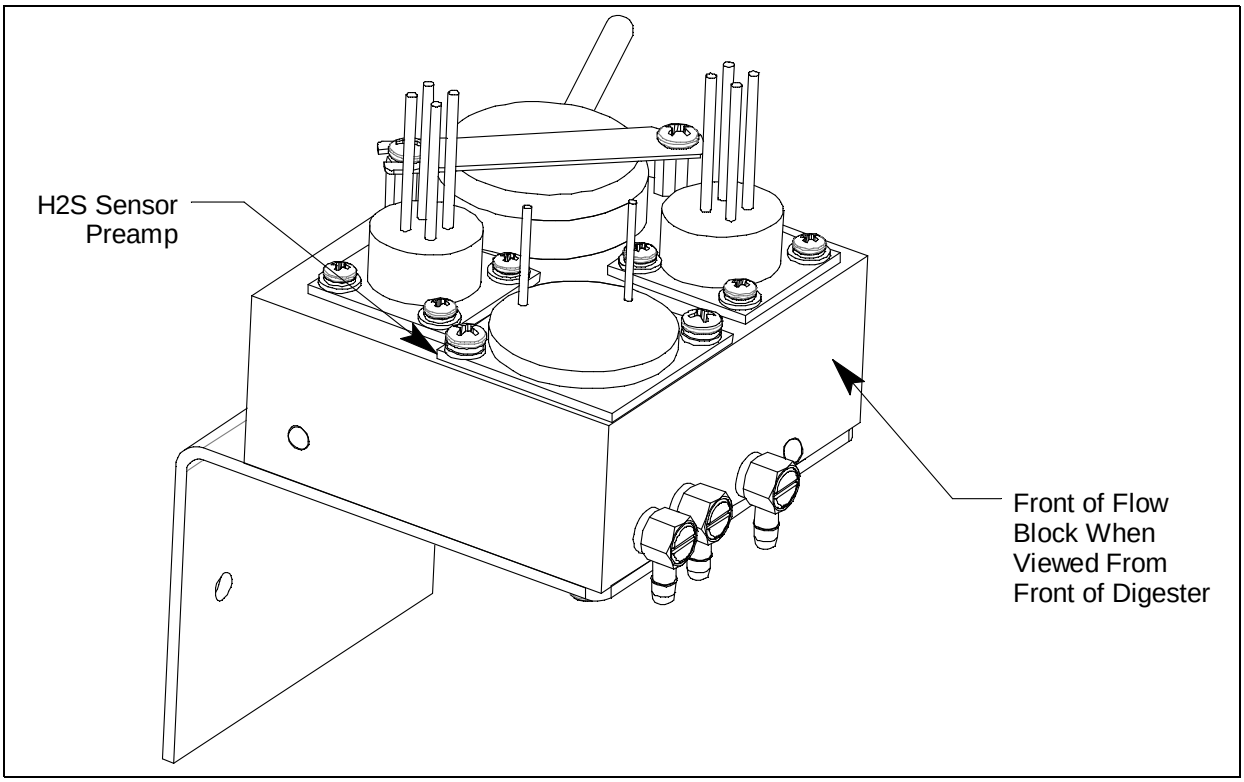


Figure 97: H_2S Preamp Location

8. Unscrew the 2 screws that retain the preamp circuit board. Take care not to lose the flat washer and lock washer under each screw head.
9. Lift the preamp circuit board and sensor away from the flow block.

   Be careful not to pull on the cable that connects the preamp circuit to the main circuit board.

   There is a gasket in the bottom of the sensor cavity. Make sure the gasket stays in place.
10. Pull the sensor off the preamp circuit board. Discard the old preamp.
11. Plug the sensor into the new preamp circuit board.

12. Reinstall the preamp circuit board with the sensor onto the flow block using the screws, lock washers, and flat washers removed in Step 8. Be sure to tighten the screws firmly and evenly.

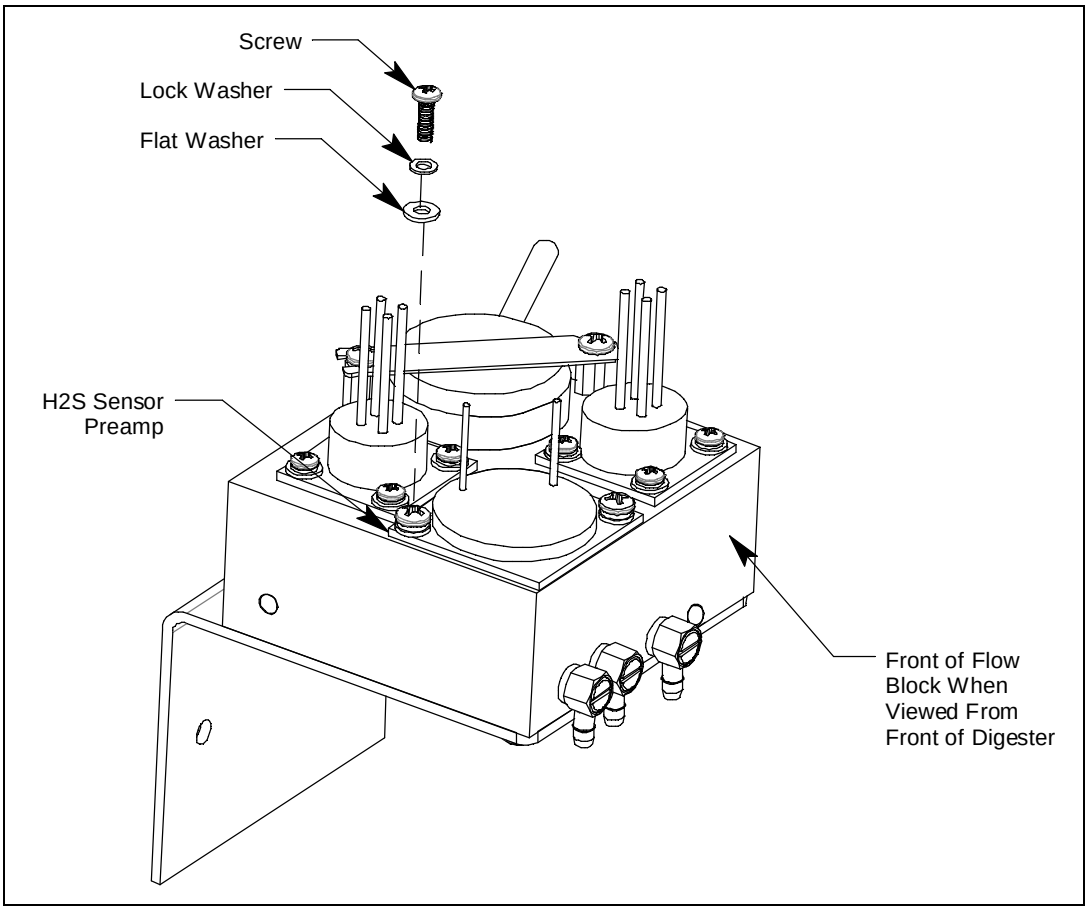


Figure 98: H_2S Preamp Installation

13. Route the wires from the preamp circuit board to the Channel 4 detector/transmitter terminal strip on the main board and connect them as shown below.

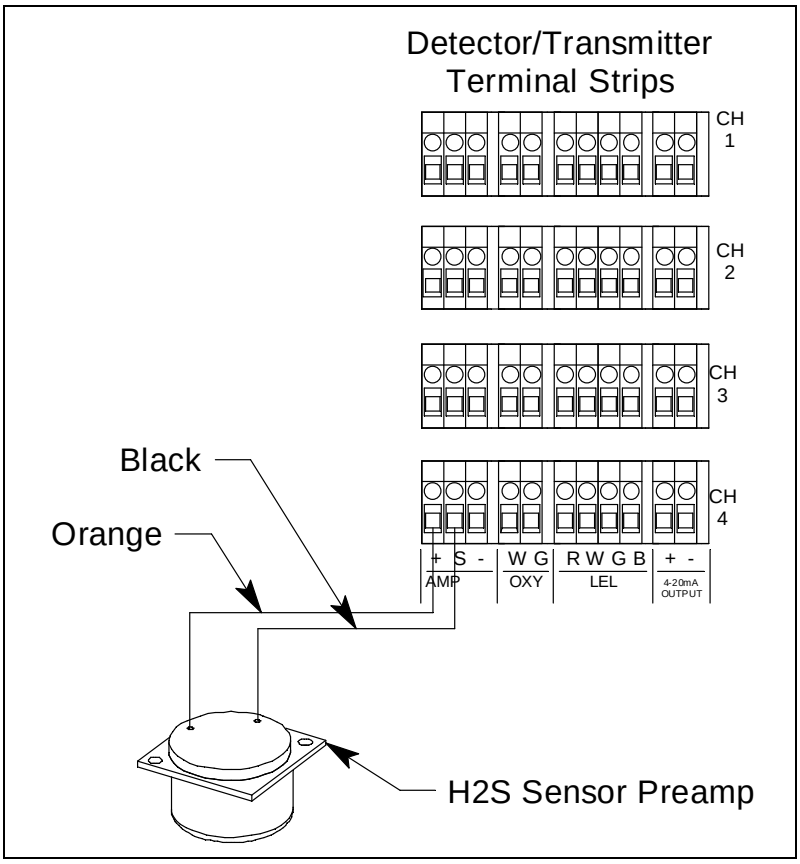


Figure 99: H_2S Sensor Connection to Main Board

14. Hold all of the sensor wires together and re-zip tie them to the anchors on the main circuit board.

15. Turn the flow regulator knob clockwise to set the sensor flow to 3 SCFH when you restart the system.

16. Turn on incoming power.

17. Calibrate the sensor as described in the Calibration section of the Digester Manual.

Parts List

Table 1 lists the part numbers and descriptions for replacement parts and accessories that may be needed when performing maintenance on the Digester Gas Monitor. These part numbers are not included in the Digester Gas Monitor Operator's Manual and only apply to the replacement procedures described in this Maintenance Manual.

Table 1: Parts List, Digester Gas Monitor Maintenance

Part No.	Description
06-1248RK	Sample tubing (3/16 in. x 5/16 in.; specify length when ordering)
06-1252RK	Sample tubing (1/8 in. x 1/4 in.; specify length when ordering)
10-0120RK	Screw, 4-40 x 3/8 Phillips SS (for connecting IR preamp to flow block)
10-0170	Screw, 6-18 x 1/2 pan head, sheet metal (for connecting Solenoid Valve C2 to bracket)
10-0200RK	Screw, 6-32 x 5/16 Phillips SS (for connecting H_2S preamp to flow block)
10-0209RK	Screw, 6/32 x 3/8 Phillips SS (for connecting flowmeter/solenoid valve brackets to mounting plate)
10-0450RK	Screw, 10/32 x 3/8 Phillips SS (for connecting flowmeter or Solenoid Valve B to bracket)
10-0454RK	Screw, 10/32 x 5/8 Phillips SS (for connecting sample regulator bracket to mounting plate)
10-0528RK	Screw, 1/4-20 x .75 Phillips SS (for connecting sample regulator to bracket)
11-0221RK	Washer, split lock, #4 (for connecting IR preamp to flow block)
11-0222RK	Washer, flat, #4 (for connecting IR preamp to flow block)
11-0231RK	Washer, split lock, #6 (for connecting flowmeter/solenoid valve brackets to mounting plate and for connecting H_2S preamp to flow block)
11-0232RK	Washer, flat, #6 x .375 OD (for connecting flowmeter/solenoid valve brackets to mounting plate)
11-0233RK	Washer, flat, #6 x .267 OD (for connecting H_2S preamp to flow block)
11-240RK	Washer, flat, #8 x .375 OD (for connecting Solenoid Valve C2 to bracket)
11-241RK	Washer, split lock, #8 (for connecting Solenoid Valve C2 to bracket)
11-0251RK	Washer, split lock, #10 (for connecting flowmeter, Solenoid Valve B, or sample regulator to bracket)
11-0253RK	Washer, flat, #10 x .435 (for connecting flowmeter, Solenoid Valve B, or sample regulator to bracket)
11-0260RK	Washer, flat, 1/4 x .465 (for connecting sample regulator to bracket)
11-0261RK	Washer, split lock, 1/4 (for connecting sample regulator to bracket)
15-0701	Tubing clamp, for 1/8" ID x 1/4" OD tubing
15-0702	Tubing clamp, for 3/16" ID x 5/16" OD tubing

Table 1: Parts List, Digester Gas Monitor Maintenance

Part No.	Description
16-0131RK	Fitting for H_2S Dilution Air Flowmeter, H_2S Dilution Sample Flowmeter, bottom of Sensors Flow Flowmeter, right side of aspirator, and Port B of Solenoid Valve B*
16-0175RK	Fitting for top and left of aspirator and top of Solenoid Valve B*
17-0645RK	Fitting for Port A of Solenoid Valve B*
17-2556RK	Elbow push fitting, for oil mist filter, internal water trap, and hydrophobic filter*
17-3507RK	Fitting for bottom of internal water trap*
17-3511RK	Fitting for top of Sensors Flow Flowmeter*
17-3520RK	Fitting for left and right side of external water trap*
17-4815RK	Fitting for left and right side of internal water trap*
30-0901RK	Aspirator
31-0023RK-03	H_2S Dilution Air flowmeter replacement, with label
31-0030RK-01	Sensors Flow flowmeter replacement, with label
31-0032-01	H_2S Dilution Sample flowmeter replacement, with label
31-3002-01	Sample regulator replacement, with label
32-0221-02	Solenoid Valve C2 replacement, with label
32-0222-01	Solenoid Valve B replacement, with label
33-2100RK	Dryer
57-0094RK-02	Infrared preamp circuit board (for CH_4 and CO_2 sensors)
57-0149RK-02	H_2S sensor preamp circuit board
71-0266RK	*Digester Gas Monitor Operator's Manual*
71-0427	*Digester Gas Monitor Maintenance Manual* (this document)
* *Fitting is only the fitting directly connected to items listed. Any fittings that may be connected to the listed fitting are not included.*	