Varian Pump Seal Wash Kit Installation Instructions

Introduction

The pump seal wash kit for the 920-LC pump washes the pump seals of the dual piston pump to remove any potential build-up of contaminants such as buffer residues, which can cause unnecessary wear and tear on pump seals resulting in leaks and down time.

The pump seal wash kit is an easy to fit and use washing mechanism that can be set up as either an automated process or run manually.

The following steps are required to install the Varian Pump Seal Wash Kit:

- Removing the pump heads
- Removing the pump seals
- Attaching the washing mechanism and pump seal
- Configuring manual washing
- Configuring automated washing

These installation instructions also include information on using the pump seal wash from the Galaxie™ software and suggested maintenance procedures. Additional information can be found in the Varian 900-LC Series Help, which can be accessed by pressing F1 on your keyboard when the Galaxie software is open.

Parts List

Number of Parts	Description of Part
1	Washing Mechanism
1	Tube
2	Washing Seal
2	Pump Seal
1	Nipple (M-I)
1	Syringe (5 mL)
1	Screw Driver (L=100 mm)
1	Wrench 17
1	Stopper
1	Clamp DKN-5
3	Pushing Screw
3	Ferrule
5	Cable ties - Tie cable Panduit PLT1-1M-M

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Removing the Pump Heads and Pump Seals

Warning – Chemical Hazard
Contact with chemicals can burn or cause other harm to you. Wear safety glasses, laboratory coat, and gloves. Observe standard laboratory safety precautions when using solvents or strong acids.

Remove the pump heads and seals using the following procedure:

1. Ensure the flow is stopped and the drain valve is open.
2. Disconnect the inlet tubing 4-way joint screw. See Figure 1.
3. Disconnect the outlet tubing from the pump heads.

Note The isocratic pumping system will not have the 4-way inlet joint shown in Figure 1.

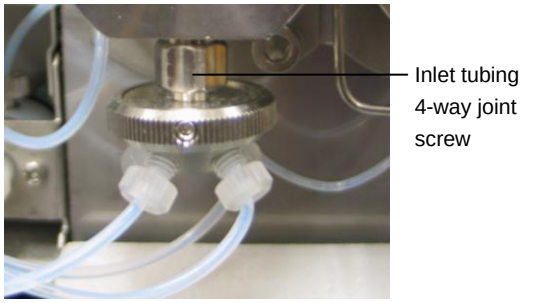

Figure 1. Four-way joint

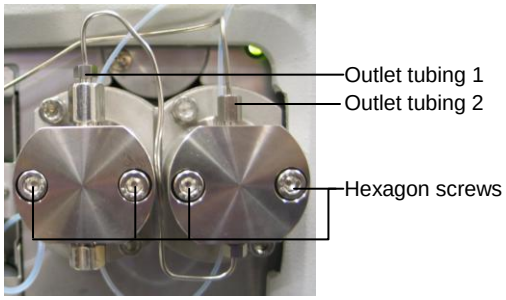

Figure 2. Outlet tubing

4. Gradually and alternately loosen the four hexagon screws that hold the pump heads with a 4 mm Allen key (hex wrench). See Figure 2.
5. Carefully pull out each pump head toward you with both hands. Note where the seal is located. The seal may either remain in the pump head or on the piston. See Figure 3 and Figure 4. If the seal has remained on the piston you can gently pull the piston guide toward you, which will loosen the pump seal. See Figure 5 and Figure 6.

Note Take care not to damage the piston.

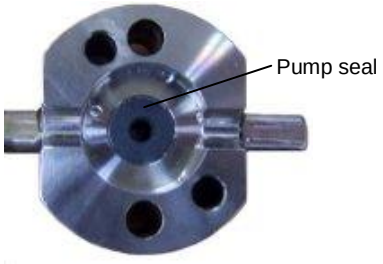

Figure 3. Top down view of pump head with seal.

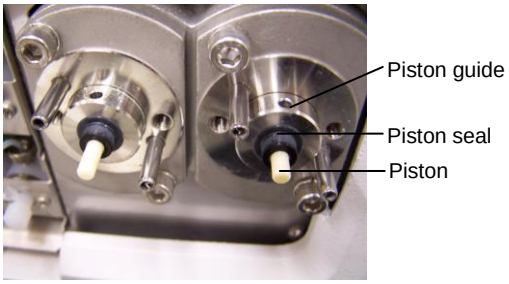

Figure 4. Pump heads removed with pump seals remaining on the piston.

Note Take care not to damage the piston.

Figure 5. Pulling the piston guide to remove the seal.

Figure 6. Pump seal after being pushed by the piston guide.

6. Gently remove the piston guide, pulling the pump seal off the piston. Do not discard the piston guide.

Figure 7. Piston guide and pump seal.

Note If your pump seal has remained on the pump head, and not on the piston as shown in Figure 3, continue to Step 7. If your pump seal was removed in Step 6, as shown in Figures 5-7 above, skip to Step 8.

7. If the pump seal remains in the pump head, pull out the pump seal by screwing the Varian seal remover tool (part number 7211149500) into it. Pull the seal remover tool out carefully to remove the seal. Do not reuse this seal.

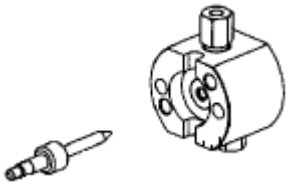

Figure 8. Varian pump seal remover tool and pump head diagram

8. Wipe the surface of the piston with gauze or any other soft cloth.
9. Wash the pump head thoroughly with distilled water or organic solvent. Depending on the circumstances, use a neutral detergent and/or an ultrasonic cleaner.
10. Lubricate the new seals with distilled water or an organic solvent depending on your system requirements.

Attaching the Washing Mechanism and Pump Seal

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To attach the washing mechanism:

1. Fit the piston bearings of the washing mechanism onto the pistons. When facing the pump heads, the washing mechanism should be fitted as shown with the piston bearing with tubing union on the left pump head.

Figure 9. Union and fitting

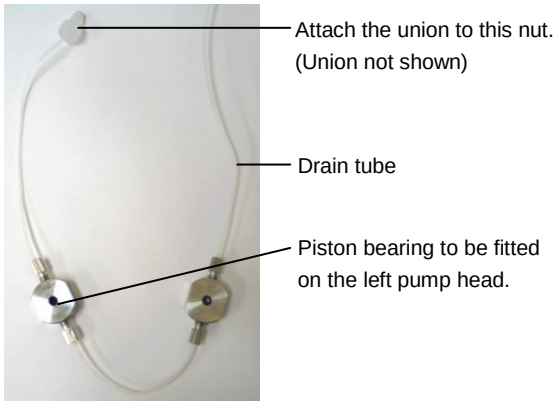

Figure 10. Washing mechanism

2. Once fitted, the washing mechanism should have both piston bearings fitted onto the pistons.

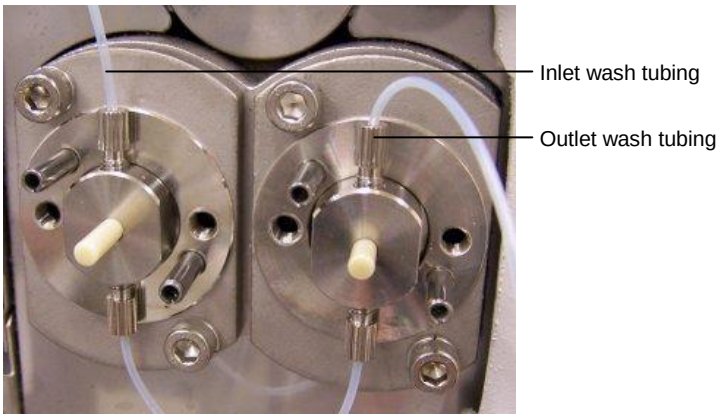

Figure 11. Washing mechanism installed on the pistons.

3. Lubricate the seals with distilled water or an organic solvent depending on your system requirements.
4. Carefully slide the pump seals along the piston pushing the wider side of the seal towards the piston bearing. See Figure 12.
5. Fit each of the pump heads carefully along the piston. Avoid damaging the pistons.

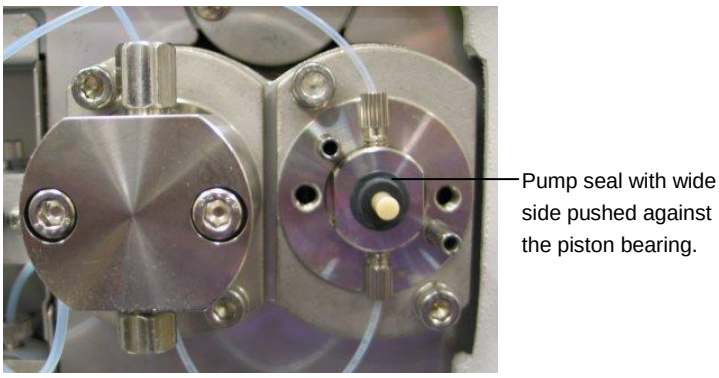

Figure 12. Left pump head re-attached to the pump body

6. Use a hex wrench to tighten the hexagon screws lightly.
7. Retighten them by alternating between each hexagon screw and tightening each one approximately 30º. Repeat 4 to 5 times.

Caution Uneven tightening may damage the pump head.

Note A new pump seal may gradually loosen as it is used, causing leaks. If necessary, retighten the pump head hexagon screws with the hex wrench as described in Step 6.

8. Attach the bottom section of the outlet tubing 1 first to make it easier to attach the top section. See Figure 13.
9. Attach the top of outlet tubing 1.
10. Attach the top of outlet tubing 2.
11. Attach the 4-way joint screw. See Figure 14.
12. Turn on the pump and with the drain valve open, flow mobile phase through the pump head to fill it and purge air bubbles. Check for leaks and tighten the relevant component.

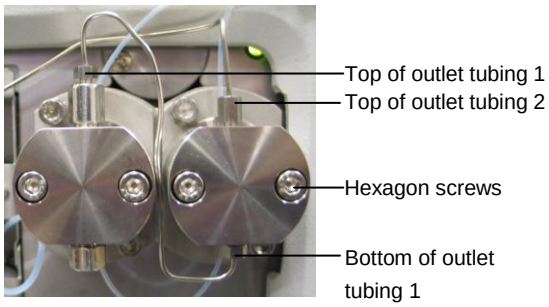

Figure 13. Outlet tubing.

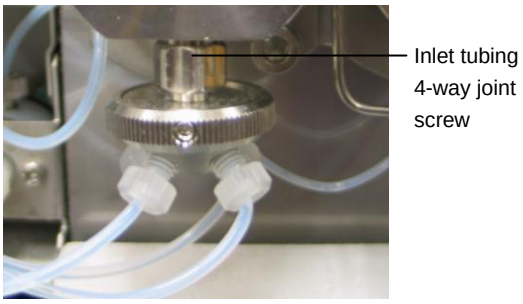

Figure 14. Four-way joint.

Configuring Manual Washing

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In manual washing mode, the washing loop is filled with washing solution that is injected with the supplied syringe.

To configure manual washing:

1. Starting at the outlet port on the pump head washing mechanism, measure a 440 mm length of the outlet wash tubing (the longer piece of tubing on the washing mechanism). Cut off the remaining tubing.
2. Thread the outlet wash tubing into the large waste tubing. See Figure 17 for details.
3. Fasten the outlet wash tubing to the side of the pump with a cable tie so that the end is steady. See Figure 17 for details.

Note If the tube end is in contact with the surface of the liquid, it is not possible to check for leaks.

4. Fill the syringe with washing solution.
5. Connect the syringe to the syringe union on the inlet tube and inject the washing solution until the flow path of the washing mechanism is filled or until the air bubbles are purged.
6. Remove the syringe and quickly fit the stopper.

Configuring Automatic Washing

Warning – Chemical Hazard
Contact with chemicals can burn or cause other harm to you. Wear safety glasses, laboratory coat, and gloves. Observe standard laboratory safety precautions when using solvents or strong acids.

For use with the autosampler only.

To configure automatic washing:

1. Remove the syringe union on the inlet pump wash tubing and replace it with the dual threaded union.
2. At port 5 on the syringe valve, slowly pull the tubing out of the large wash tube. See Figure 17.
3. Attach a nut and ferrule (supplied in the kit) to the end of the tubing and then screw the nut and ferrule into the free side of the dual threaded union.

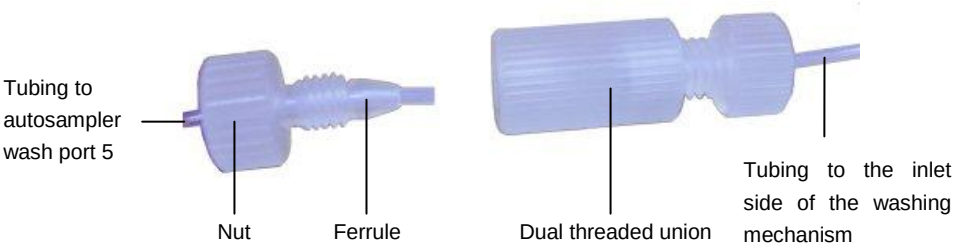

Figure 15. Nut and ferrule on tubing and dual threaded union.

4. Run the tubing from port 5 on the autosampler syringe valve over the syringe valve and down the right side of the autosampler.

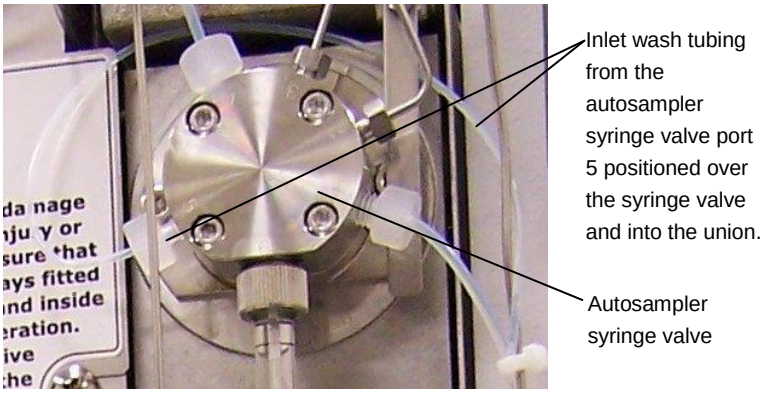

Figure 16. Tubing layout with syringe valve.

5. Starting at the outlet port on the pump head washing mechanism, measure a 440 mm length of the outlet wash tubing (the longer piece of tubing on the washing mechanism). Cut off the remaining tubing.
6. Thread the outlet wash tubing into the large waste tubing.
7. Fasten the outlet wash tubing to the side of the pump with a cable tie so that the end is steady. See Figure 17 for details.

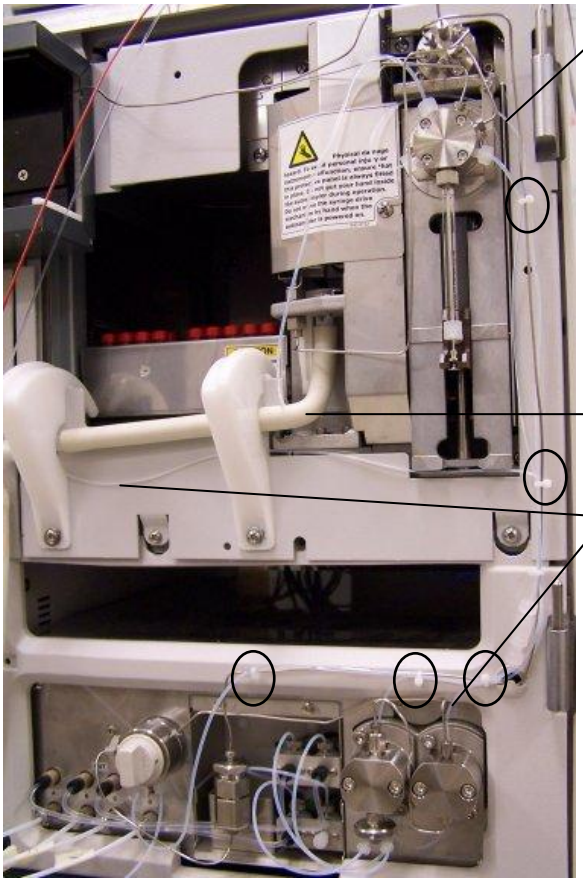

Figure 17. Tubing layout for both the inlet and outlet wash tubing.

Using the Pump Seal Wash in Galaxie™

After configuring the hardware for automatic washing use the software to run mobile phase through the pump heads.

To run mobile phase through the pump heads:

1. Click **Start > Programs > Galaxie > Galaxie**.
2. Choose the HPLC system that the pump wash seal kit was installed on.
3. Double-click the white area in the autosampler tile in the Overview Status page in the software to open the Device Settings page.

Autosampler tile on the Status Overview page in the Galaxie software.

Figure 18. Status Overview page in the Galaxie software.

4. Click **Flush Syringe Barrel** to start the washing process.

Note You will need to repeat Step 4 approximately 12 times to fill the pump seal wash kit and tubing from the autosampler syringe.

Follow Steps 1-4 in this procedure to wash your pump heads when necessary.

Maintenance and Inspection

Maintenance

While the pump seal washing mechanism is meant for long term use, it is necessary to replace parts over time.

Follow the directions above to replace a pump seal, tubing that has become blocked, or fittings or ferrules that have become worn with use.

For additional maintenance procedures for your Varian 900-LC Series HPLC, please see the Help. To access it, click **Start > Programs > Galaxie > Help > Varian 900-LC Series HPLC Help > Maintenance**.

Periodic Inspection

Use the following table for maintenance times and procedures.

No.	Check item	Frequency	Procedure
1	Leakage of pump washing solution	Daily	• Check if the washing mechanism is filled with washing solution. • Check for air bubbles in washing solution. • If washing solution overflows the washing mechanism, replace the pump seal.
2	Leakage from flow path	Daily	• Visually check the tubing and connections. • Retighten the nut or ferrule at the leak point or replace the seal. • If the check valve leaks retighten it.
3	Pressure level and variations in analysis	Weekly	Check if the baseline drifts. If so, check the flow path, column, etc.
4	Washing of flow path	When contaminated	If contaminated, wash from the inlet tube to the sample injector with water or isopropanol for about 30 minutes.
5	Replacement of pump seal	Every 4 months	Refer to replacing pump seals.

For further information about Varian and our products please contact your local Varian representative or e-mail:

customercare@varianinc.com

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