

Agilent 1290 Infinity Pump Head Maintenance

Technical Note

Notices

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Introduction

This technical note describes the maintenance of 1290 Infinity Binary Pump G4220A/B heads and 1290 Infinity Quaternary Pump G4204A heads. Agilent recommends using refurbished pump heads for maintenance and repair instead of disassembling pump heads. Such pump heads are available through Agilent service.

Please carefully follow all instructions step by step and use recommended tools like the pump head alignment tool and a torque wrench. Any deviation from these procedures may damage pump heads or may significantly reduce the life time of the pump heads.

The 1290 Infinity pump service kit (5067-4699) includes all tools required for the procedures described in the technical note.

Overview of Maintenance Parts

General

1290 Infinity Pump Heads exist in several variants:

- Binary pump head A
- Binary pump head B
- Quaternary pump head

All pump heads exist in two variants: with and without seal wash option.

1 Introduction
Overview of Maintenance Parts

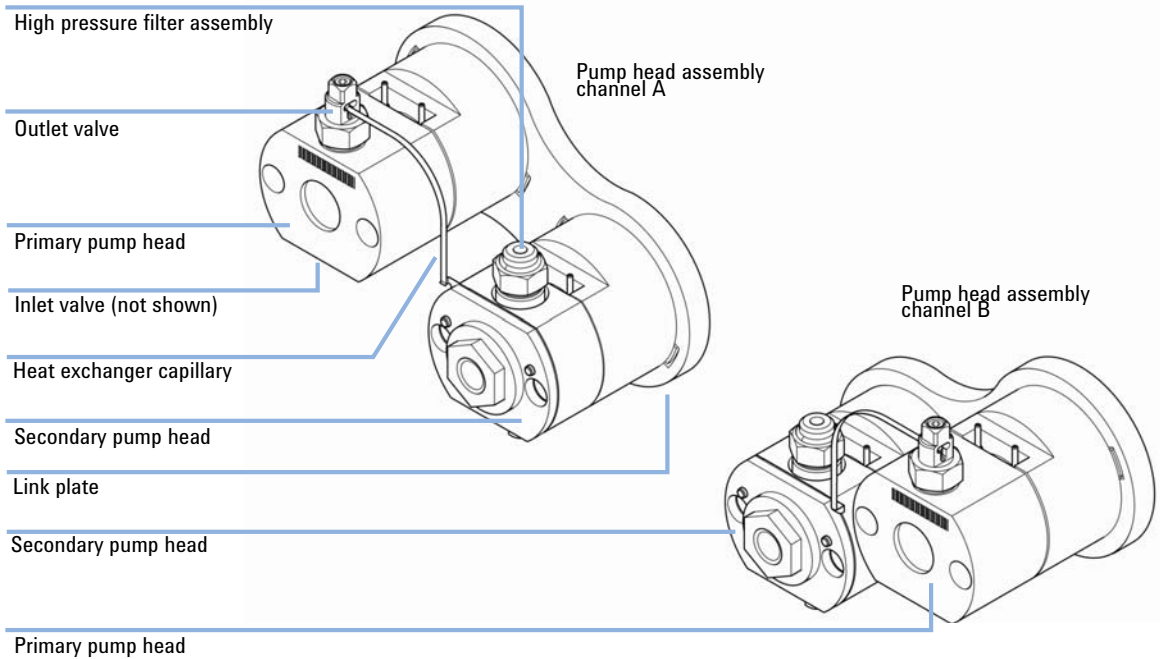


Figure 1 Pump heads channel A and B (Binary Pump)

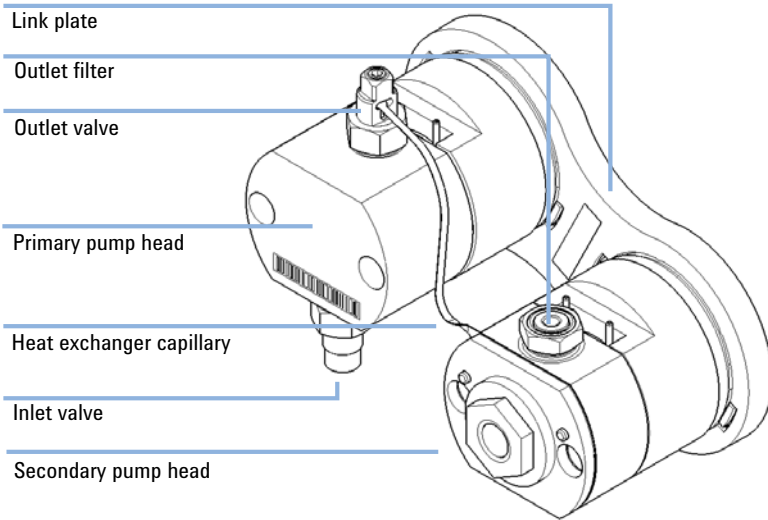


Figure 2 Pump head (Quaternary Pump)

Maintenance Parts of the Binary Pump

p/n	Description
0905-1420	PE seals (pack of 2)
5067-5678	Piston 1290 Infinity Pumps, ceramic The piston must only be replaced if it is damaged.
5062-2484	Gasket, seal wash (pack of 6) only if seal wash option is installed
0905-1718	Wash Seal PE only if seal wash option is installed
01018-22707	PTFE frits (pack of 5)
5067-4728	Seal cap

Maintenance Parts of the Quaternary Pump

p/n	Description
0905-1420	PE seals (pack of 2)
5067-5678	Piston 1290 Infinity Pumps, ceramic The piston must only be replaced if it is damaged.
5062-2484	Gasket, seal wash (pack of 6) only if seal wash option is installed
0905-1718	Wash Seal PE only if seal wash option is installed
G4204-60004	Outlet filter 1290 Infinity Quaternary Pump



2

Pump Head Maintenance (Binary Pump)

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2 Pump Head Maintenance (Binary Pump)

Disassembling the Pump Head of the Binary Pump

Disassembling the Pump Head of the Binary Pump

When If parts inside the pump head need to be replaced

Tools required	p/n	Description
	G4220-20012	Torque wrench 2 – 25 Nm
	G4220-20013	4 mm hex bit
	G4220-20014	2.5 mm Hex Bit
	G4220-20015	Adapter ¼ in square to hex
	8710-0510	Wrench open 1/4 — 5/16 inch

Parts required	p/n	Description
	0905-1718	Wash Seal PE

See “[Maintenance Parts of the Binary Pump](#)” on page 10 for further parts.

CAUTION

Damage of the pump piston

Removing pump heads in a position other than the maintenance position can damage the pump piston.

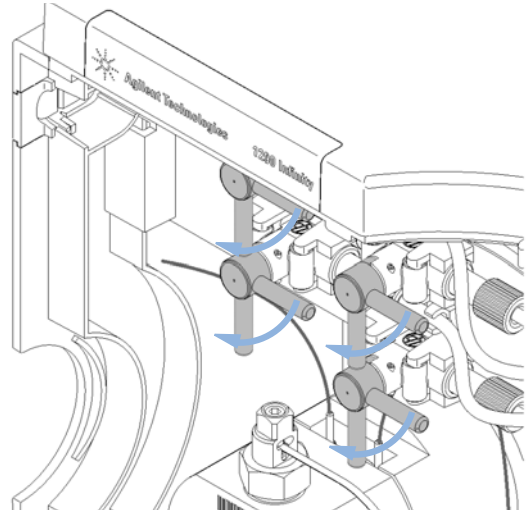
→ Before switching off the pump, bring it to the maintenance position.

NOTE

This procedure describes replacements for the pump heads of channel A. Replacement for channel B can be done accordingly. The primary pump head does not have a heat exchanger. Seal wash parts are optional for both pump heads.

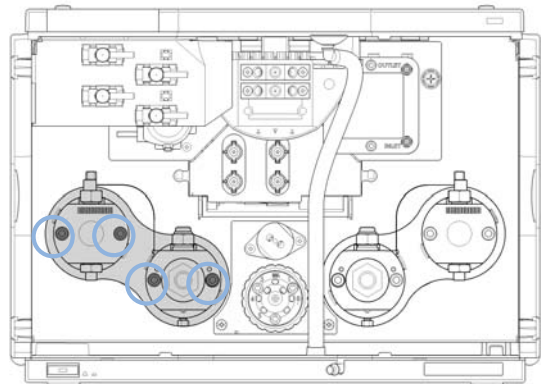
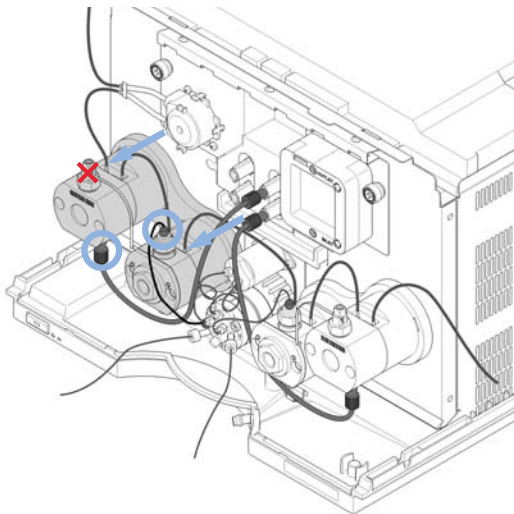
1 In Lab Advisor go to **Tools > Remove/Install Pump Head** and follow instructions given on the screen.

2 Close the shut-off valve of the respective pump channel.



3 Remove the flow connection between the degassing unit and the primary pump head inlet. Remove the capillary connection at the top of the secondary pump head to the pump valve. If installed, remove the tubings of the seal wash option.

4 Open the 4 screws holding the pump heads.



NOTE

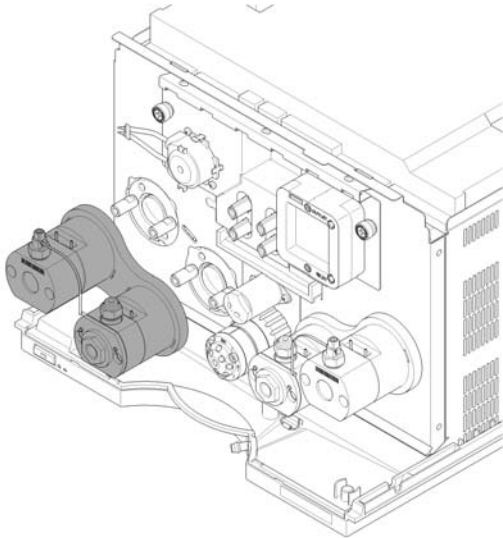
Open all screws step by step, not screw by screw.

DO NOT REMOVE the capillary connection between the pump heads marked by the red X.

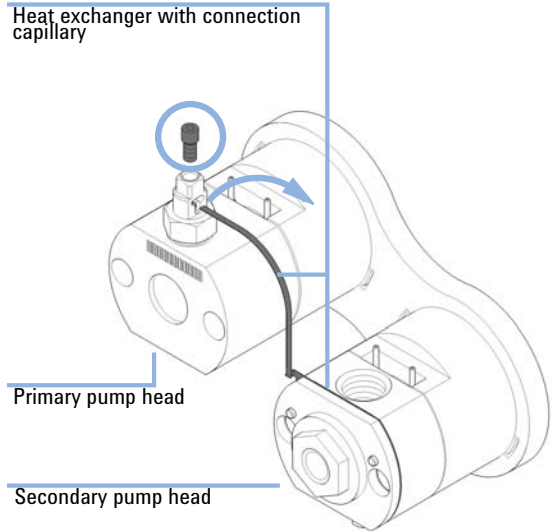
2 Pump Head Maintenance (Binary Pump)

Disassembling the Pump Head of the Binary Pump

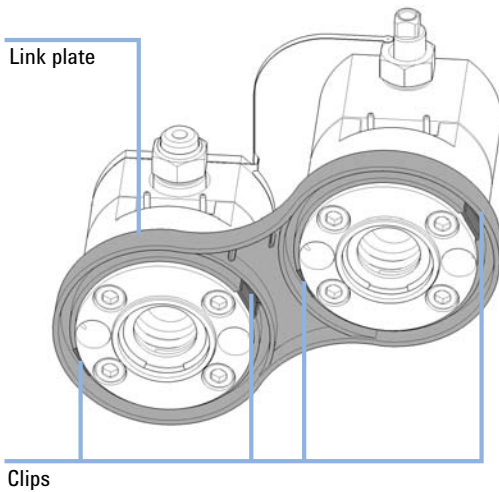
- 5** Remove the complete pump head assembly by holding it with both hands and pulling it to the front.



- 6** Open the 2.5 mm hex screw at the top of the primary pump head, which fixes the connection capillary of the heat exchanger. Then lift up the capillary and remove it from the primary pump head.



- 7** Remove both pump heads from the link plate by pushing the clips at the rear of the plate.



Pump Head Maintenance (Binary Pump) 2
Disassembling the Pump Head of the Binary Pump

Primary Pump Head of the Binary Pump

Primary Pump Head with Seal Wash (Binary Pump)

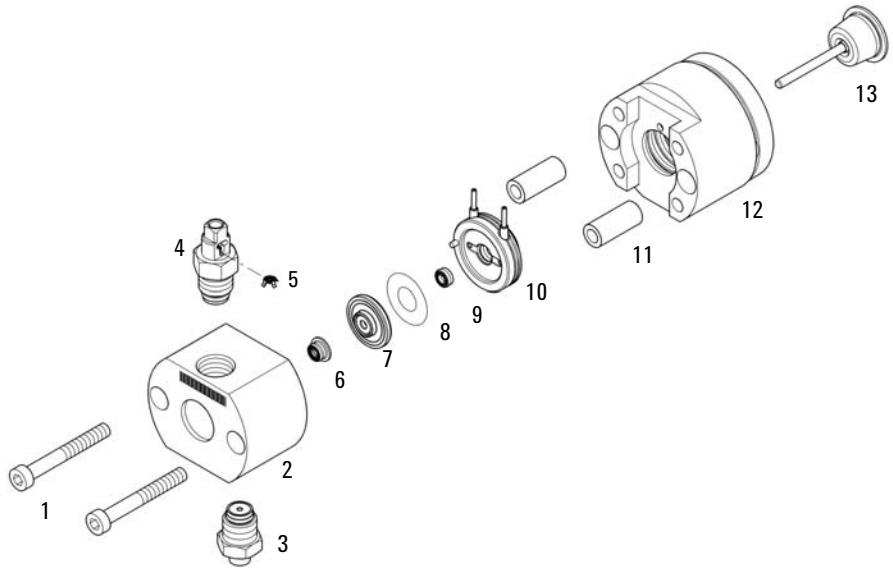


Figure 3 Primary pump head (Binary Pump) with seal wash

Item	p/n	Description
1	0515-1218	Screw M5, 40 mm long
2		Pump Chamber Housing (order pump head)
3	G4220-60022	Inlet valve (primary pump head)
4	G4220-60028	Outlet valve 1290 Infinity Pump (primary pump head)
5	G4220-20020	Internal gold seal for 1290 Infinity outlet valve
6	0905-1420	PE seals (pack of 2)
7	G4220-60016	Seal holder including backup ring
8	5062-2484	Gasket, seal wash (pack of 6)
9	0905-1718	Wash Seal PE
10	G4220-63010	Support Ring (Seal Wash)
11		Pump Head Ferrules (order pump head)
12		Piston Housing (order pump head)
13	5067-5678	Piston 1290 Infinity Pumps, ceramic

2 Pump Head Maintenance (Binary Pump)
Primary Pump Head of the Binary Pump

Primary Pump Head Without Seal Wash (Binary Pump)

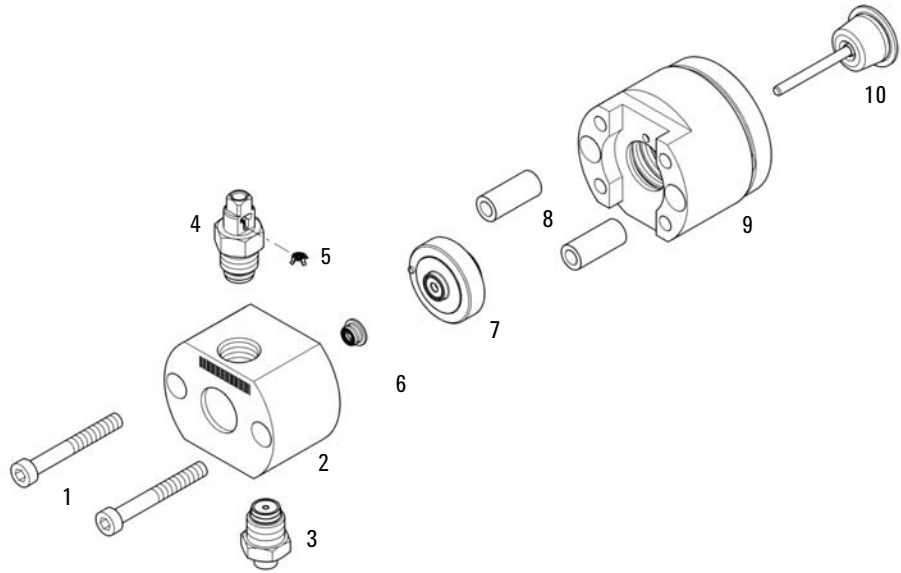


Figure 4 Primary pump head (Binary Pump) without seal wash

Item	p/n	Description
1	0515-1218	Screw M5, 40 mm long
2		Pump Chamber Housing (order pump head)
3	G4220-60022	Inlet valve (primary pump head)
4	G4220-60028	Outlet valve 1290 Infinity Pump (primary pump head)
5	G4220-20020	Internal gold seal for 1290 Infinity outlet valve
6	0905-1420	PE seals (pack of 2)
7	G4220-60015	Support ring including backup ring
8		Pump Head Ferrules (order pump head)
9		Piston Housing (order pump head)
10	5067-5678	Piston 1290 Infinity Pumps, ceramic

2 Pump Head Maintenance (Binary Pump)

Primary Pump Head of the Binary Pump

Disassembling the Primary Pump Head of the Binary Pump

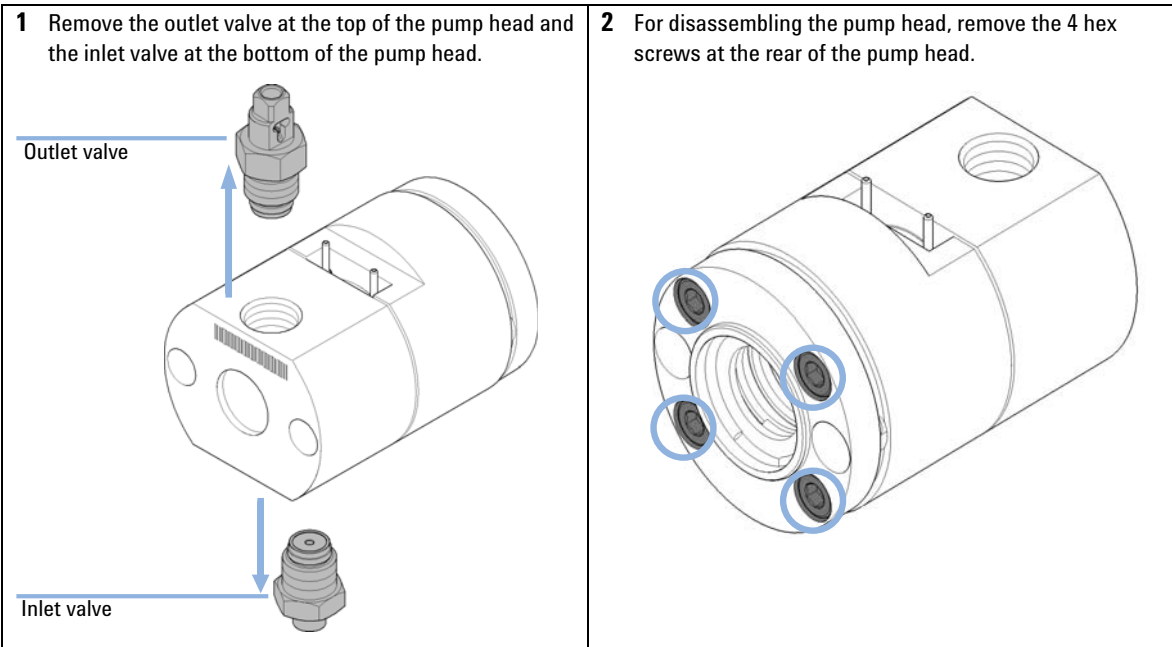
Tools required	p/n	Description
	8710-0510	Wrench open 1/4 — 5/16 inch
	G4220-20012	Torque wrench 2 – 25 Nm
	G4220-20013	4 mm hex bit
	01018-23702	Insert tool

CAUTION

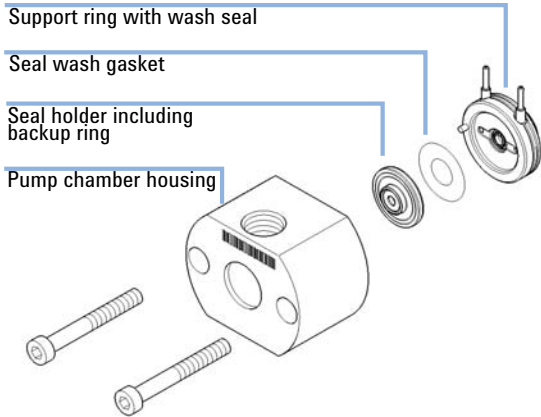
Damage of pump piston

The pump piston is made of ZrO₂-based ceramic, which is a very hard and resistant material, but it is sensitive to shearing forces from the side.

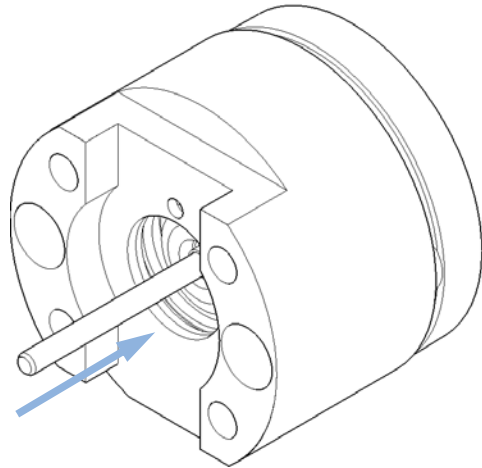
- Do not try to remove the pump piston from the rear.
- Do not use the piston for removing pump seals.



3 Remove the front part of the pump head including pump chamber housing with pump seal and seal holder. If the seal wash option is installed, also remove the support ring with wash seal and gasket.



4 Remove the piston from the piston housing by pushing it to the rear, then pull it out from the rear.

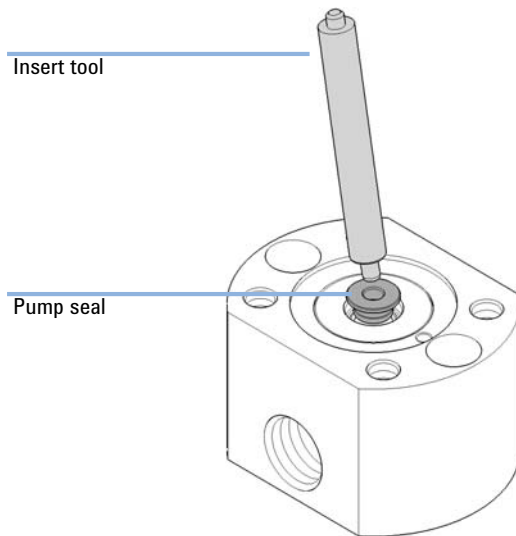


5 Check the pump pistons for scratches, grooves and dents when changing the piston seals.

NOTE

Damaged pistons cause micro leaks and will decrease the lifetime of the seals.

6 Use the soft plastic side of the insert tool for removing the pump seal from the pump chamber housing.



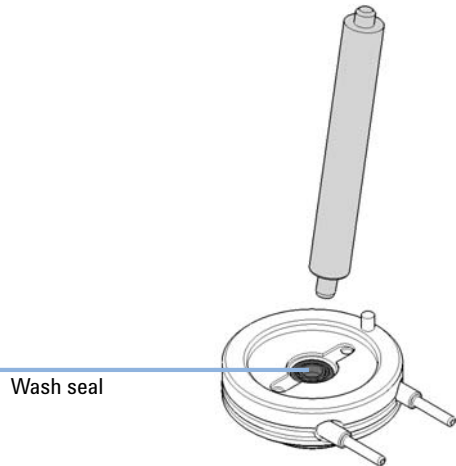
NOTE

Do not use the pump piston for that purpose!

2 Pump Head Maintenance (Binary Pump)

Primary Pump Head of the Binary Pump

- 7 If the wash seal shall be replaced by a new one, use the steel side of the insert tool for removing it.



Secondary Pump Head of the Binary Pump

Secondary Pump Head With Seal Wash (Binary Pump)

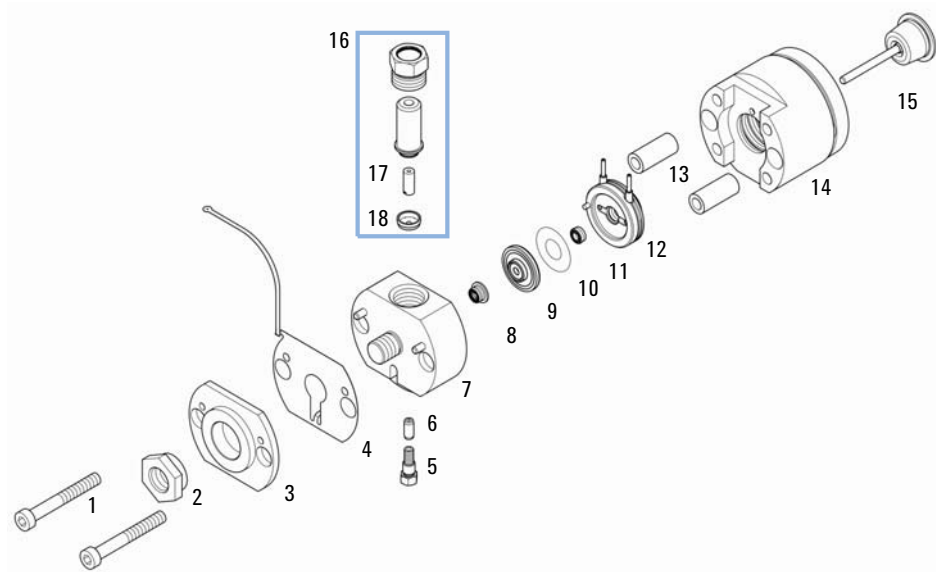


Figure 5 Secondary pump head (Binary Pump) with seal wash

Item	p/n	Description
1	0515-1218	Screw M5, 40 mm long
2	G4220-20003	Pump Head Screw
3		Pump Head Front Plate (order pump head)
4	G4220-81013	Heat Exchanger (secondary pump head only)
5	0515-5237	Heat Exchanger Screw
6	G4220-20001	Spacer Fitting
7		Pump Chamber Housing (order pump head)
8	0905-1420	PE seals (pack of 2)
9	G4220-60016	Seal holder including backup ring
10	5062-2484	Gasket, seal wash (pack of 6)
11	0905-1718	Wash Seal PE
12	G4220-63010	Support Ring (Seal Wash)
13	(2x)	Pump Head Ferrules (order pump head)
14		Piston Housing (order pump head)
15	5067-5678	Piston 1290 Infinity Pumps, ceramic
16	G4280-60026	High Pressure Filter Assembly (secondary pump head)
17	01018-22707	PTFE frits (pack of 5)
18	5067-4728	Seal cap

2 Pump Head Maintenance (Binary Pump)
Secondary Pump Head of the Binary Pump

Secondary Pump Head Without Seal Wash (Binary Pump)

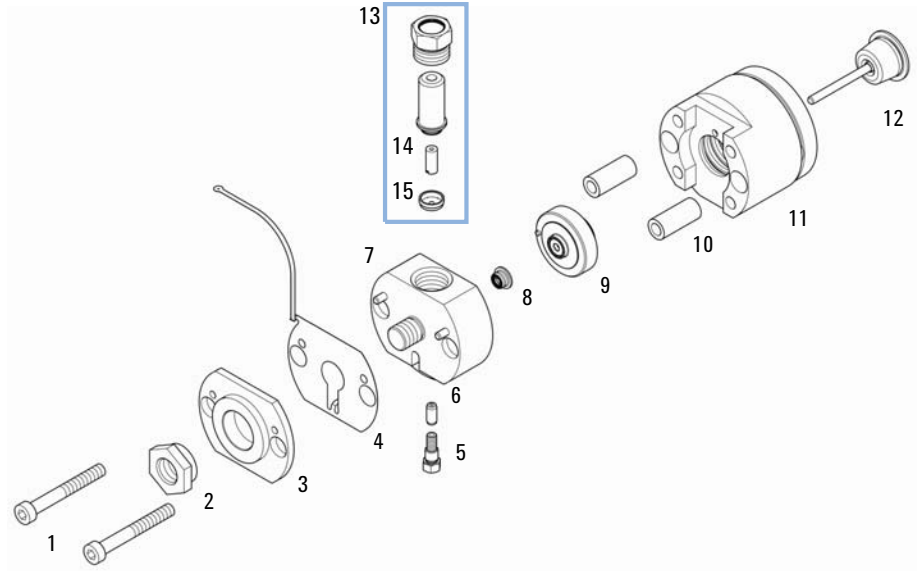


Figure 6 Secondary pump head (Binary Pump) without seal wash

Pump Head Maintenance (Binary Pump) 2
Secondary Pump Head of the Binary Pump

Item	p/n	Description
1	0515-1218	Screw M5, 40 mm long
2	G4220-20003	Pump Head Screw
3		Pump Head Front Plate (order pump head)
4	G4220-81013	Heat Exchanger (secondary pump head only)
5	0515-5237	Heat Exchanger Screw
6	G4220-20001	Spacer Fitting
7		Pump Chamber Housing (order pump head)
8	0905-1420	PE seals (pack of 2)
9	G4220-60015	Support ring including backup ring
10	(2x)	Pump Head Ferrules (order pump head)
11		Piston Housing (order pump head)
12	5067-5678	Piston 1290 Infinity Pumps, ceramic
13	G4280-60026	High Pressure Filter Assembly (secondary pump head)
14	01018-22707	PTFE frits (pack of 5)
15	5067-4728	Seal cap

2 Pump Head Maintenance (Binary Pump)

Secondary Pump Head of the Binary Pump

Disassembling the Secondary Pump Head of the Binary Pump

Tools required	p/n	Description
	8710-0510	Wrench open 1/4 — 5/16 inch
	G4220-20012	Torque wrench 2 – 25 Nm
	G4220-20013	4 mm hex bit
	01018-23702	Insert tool

Parts required	p/n	Description
	01018-22707	PTFE frits (pack of 5)
	5067-4728	Seal cap

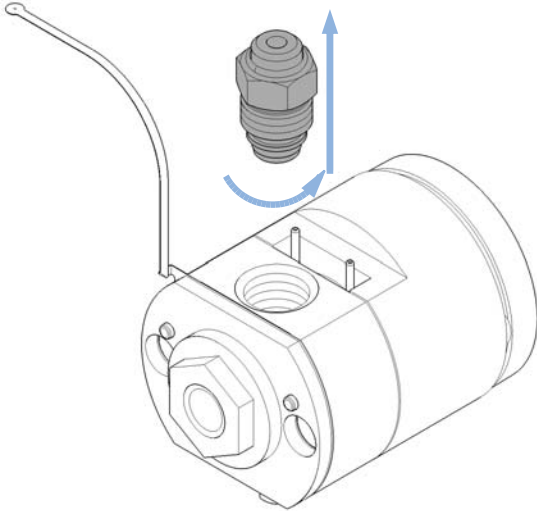
CAUTION

Damage of pump piston

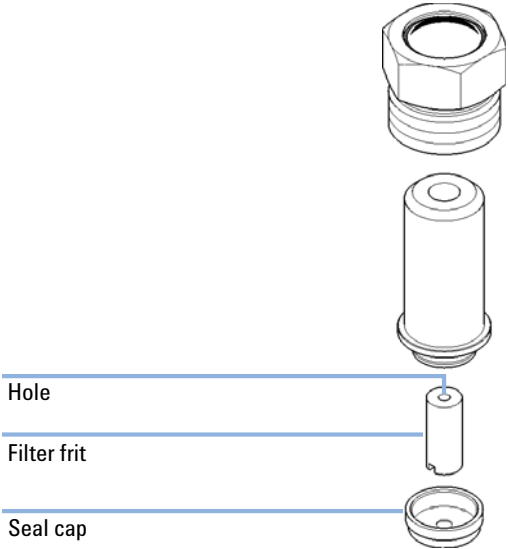
The pump piston is made of ZrO₂-based ceramic, which is a very hard and resistant material, but it is sensitive to shearing forces from the side.

- Do not try to remove the pump piston from the rear.
 - Do not use the piston for removing pump seals.
-

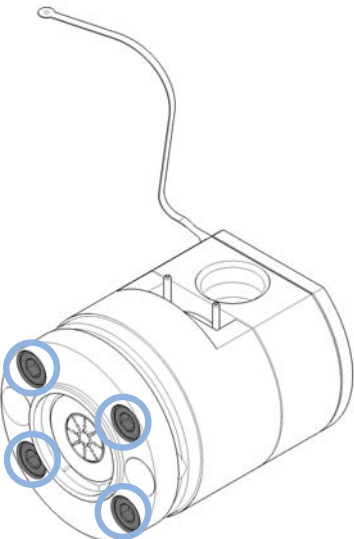
1 Remove the filter assembly at the top of the pump head.



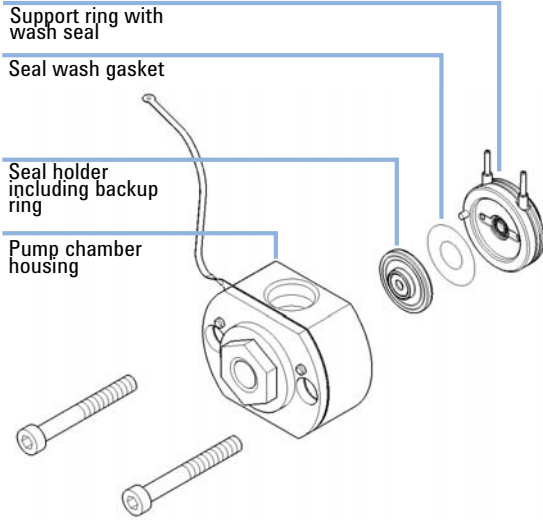
2 Replace the filter frit and seal cap as desired. Please note the correct orientation of the filter frit.



3 For disassembling the pump head, remove the 4 hex screws at the rear of the pump head.



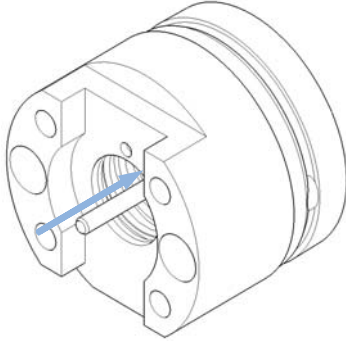
4 Remove the front part of the pump head including pump chamber housing with pump seal and seal holder. If the seal wash option is installed, also remove the support ring with wash seal and gasket.



2 Pump Head Maintenance (Binary Pump)

Secondary Pump Head of the Binary Pump

- 5 Remove the piston from the piston housing by pushing it to the rear, then pull it out from the rear.



- 6 Check the pump pistons for scratches, grooves and dents when changing the piston seals.

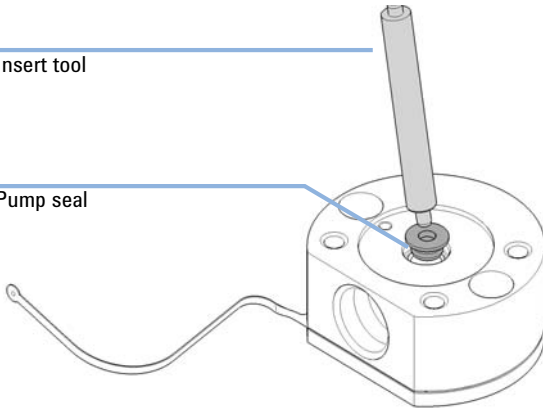
NOTE

Damaged pistons cause micro leaks and will decrease the lifetime of the seals.

- 7 Use the soft plastic side of the insert tool for removing the pump seal from the pump chamber housing.

Insert tool

Pump seal

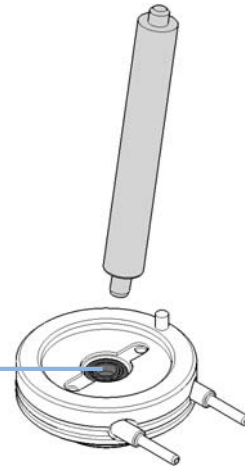


NOTE

Do not use the pump piston for that purpose!

- 8 If the wash seal shall be replaced by a new one, use the steel side of the insert tool for removing it.

Wash seal



Replacing the Heat Exchanger

Tools required **Description**
Wrench, 19 mm

Parts required

p/n	Description
G4220-81013	Heat Exchanger (secondary pump head only)
0515-5237	Heat Exchanger Screw
G4220-20001	Spacer Fitting

Preparations

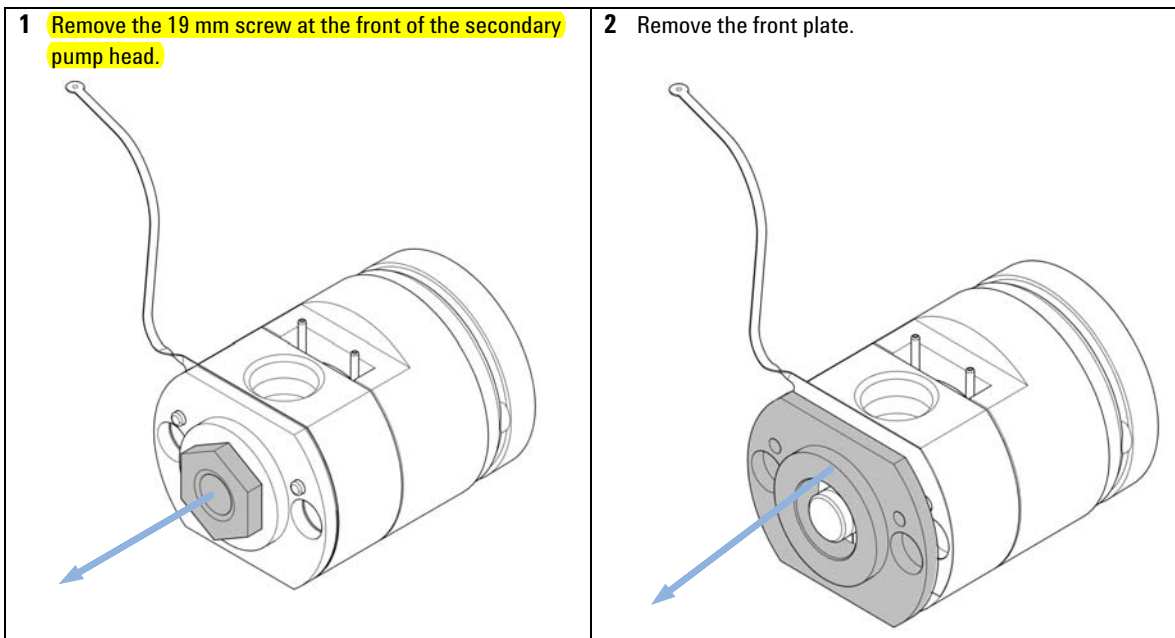
- Remove the pump head assembly from the pump
- Remove the secondary pump head from the link plate

CAUTION

Loss of small spacer fitting

Inside the secondary pump head is a small spacer fitting, which can be dropped easily when removing the heat exchanger.

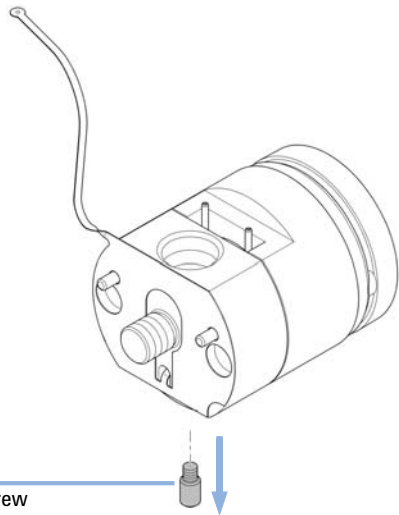
→ The heat exchanger does not need to be removed for pump head maintenance.



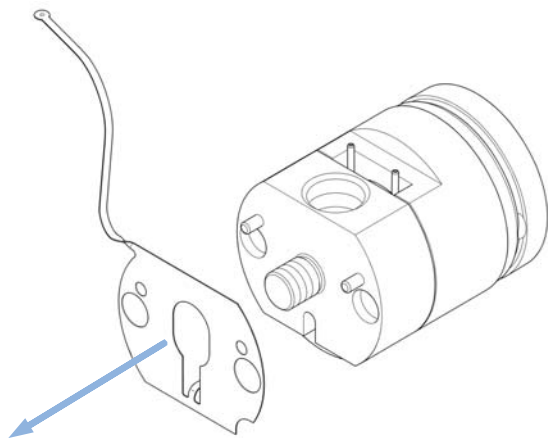
2 Pump Head Maintenance (Binary Pump)

Secondary Pump Head of the Binary Pump

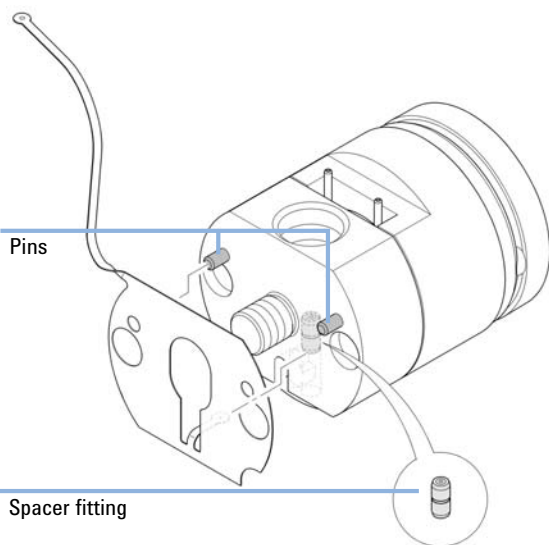
- 3** Remove the 2.5 mm hex screw at the bottom of the pump head. Do not drop the golden spacer fitting.



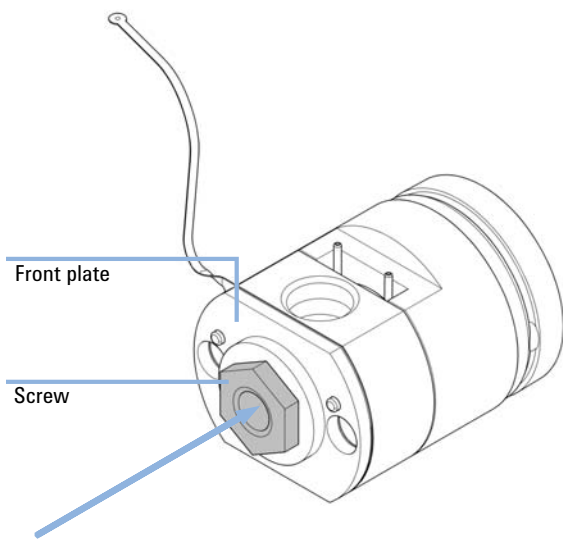
- 4** Lift out the heat exchanger.



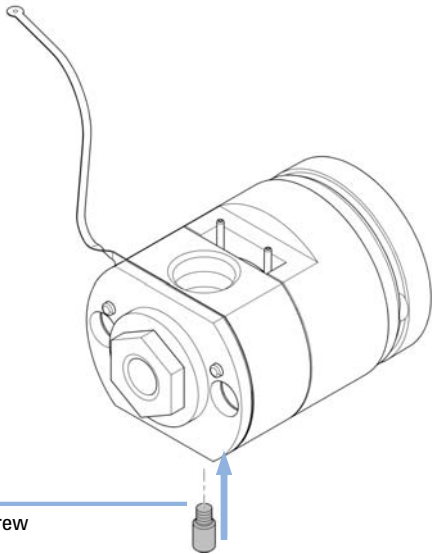
- 5** If removed, first insert the spacer fitting. Then insert the new heat exchanger to the opening in the pump head and lift it over the pins.



- 6** Use the 19 mm screw for fixing the front plate.



7 Insert and fix the 2.5 mm hex screw.



Hex screw

2 Pump Head Maintenance (Binary Pump)

Assembling the Pump Head of the Binary Pump

Assembling the Pump Head of the Binary Pump

When Before installing the pump head.

Tools required	p/n	Description
		Pump head alignment tool
	G4220-20012	Torque wrench 2 – 25 Nm
	G4220-20013	4 mm hex bit
	G4220-20014	2.5 mm Hex Bit
	G4220-20015	Adapter ¼ in square to hex
	01018-23702	Insert tool

Parts required **Description**
Maintenance parts
See “[Maintenance Parts of the Binary Pump](#)” on page 10 for details.

CAUTION

Limited life time of the pump head
Inserting the backup seal wrongly may limit the life time of the pump head.
→ Please note the correct orientation of the backup seal.

CAUTION

Damage of the pump piston
The pump piston is very sensitive to shearing forces from the side.
→ Use the alignment piston of the pump head alignment tool for the alignment procedure described below.

CAUTION

Wrong orientation of pins on support ring
Assembling the pump head without paying attention to the correct orientation of the pins on the support ring can lead to leaks or damage of the piston and pump head.
→ Observe pins on the support ring, which help assembling the parts of the pump head in the correct orientation.

CAUTION

Damage of the pump head assembly

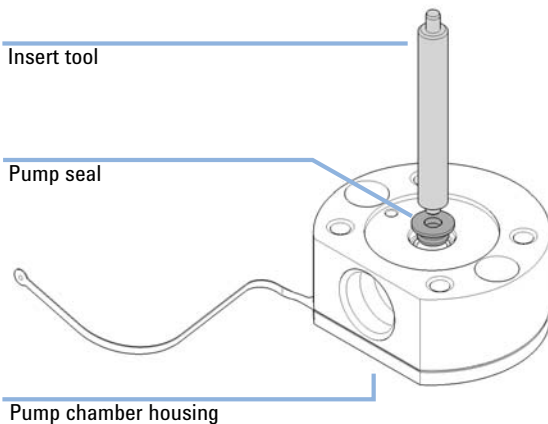
When installing the pump head assembly, the pump drives need to be in maintenance position, where they are retracted. Using the pump drive in default position will damage the pump head assembly.

→ Bring the pump drive to the maintenance position.

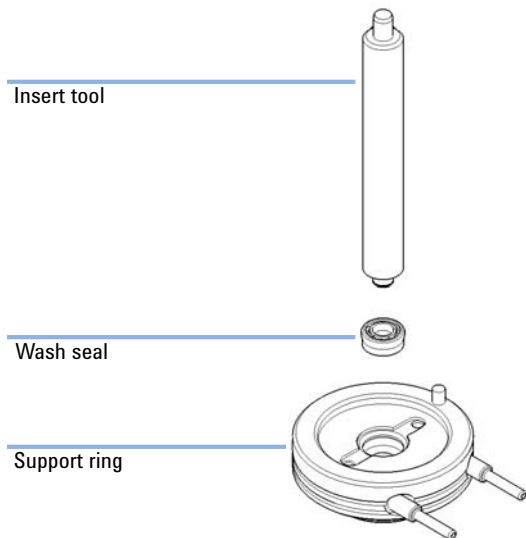
NOTE

This procedure describes how to assemble the secondary pump head using the pump head alignment tool. Assembling the primary pump head can be done accordingly. The secondary pump head has the heat exchanger capillary, which must fit into the openings of the alignment tool, whereas the primary pump head does not have a heat exchanger. See [Figure 1](#) on page 8.

1 Use the soft plastic side of the insert tool for inserting the piston seal to the pump chamber housing.



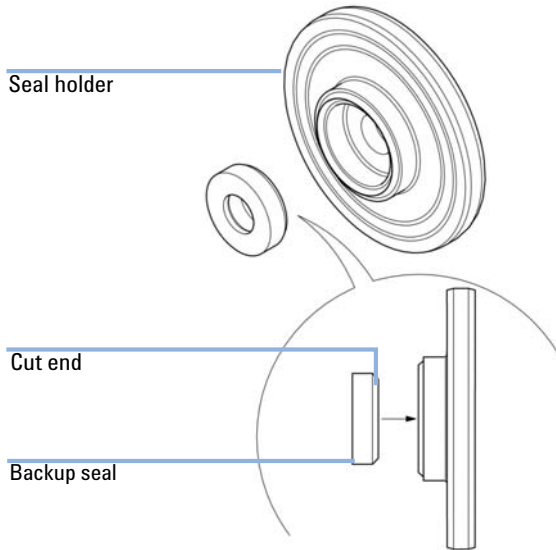
2 If the seal wash option is installed, use the soft plastic side of the insert tool for inserting the wash seal into the support ring.



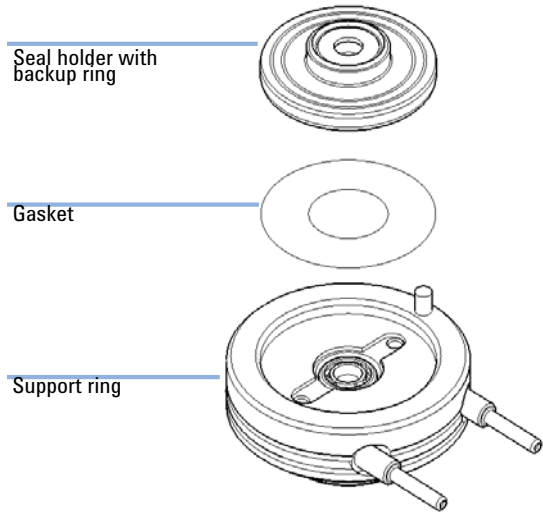
2 Pump Head Maintenance (Binary Pump)

Assembling the Pump Head of the Binary Pump

- 3** Initial versions of the seal holder and support ring allowed removing the backup ring. In any case, avoid doing so. If the backup seal by accident has been removed from the seal holder, insert it in the correct orientation as shown below. Please ensure that the cut end faces the seal holder.



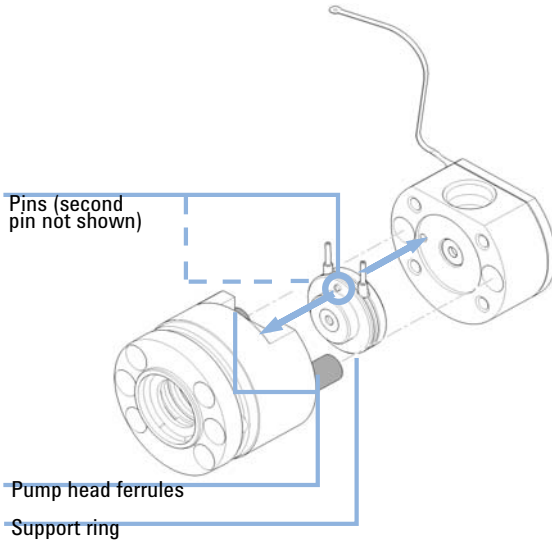
- 4** If the seal wash option is installed, put the gasket into the support ring and insert the seal holder.



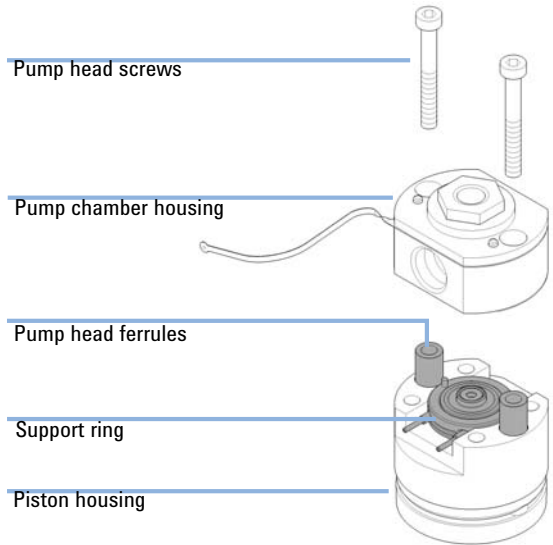
Pump Head Maintenance (Binary Pump) 2

Assembling the Pump Head of the Binary Pump

- 5** Insert the support ring and pump head ferrules into the piston housing. Observe the pins on the support ring, which help you assembling the pump head correctly.



- 6** Assemble the pump head by putting the pump chamber housing on top of the support ring. Insert and tighten the two pump head screws.



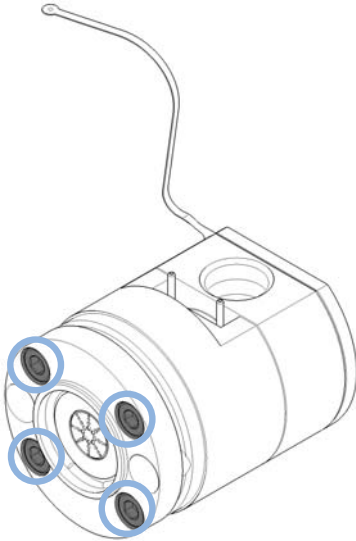
NOTE

Do NOT install the inlet and outlet valves (primary pump head) and the high-pressure filter (secondary pump head) at this stage.

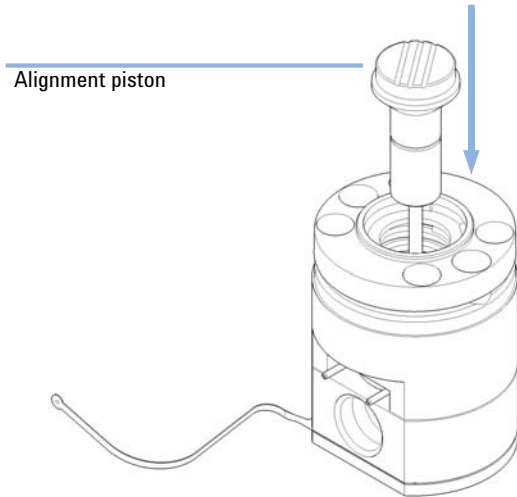
2 Pump Head Maintenance (Binary Pump)

Assembling the Pump Head of the Binary Pump

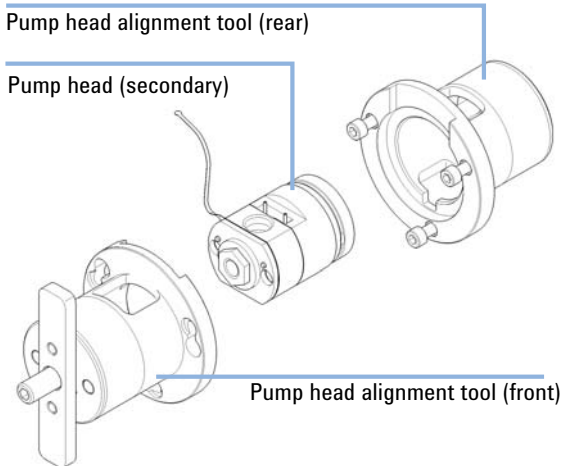
- 7** Loosely close the 4 screws at the rear of the pump head. The screws will be fixed tightly later.



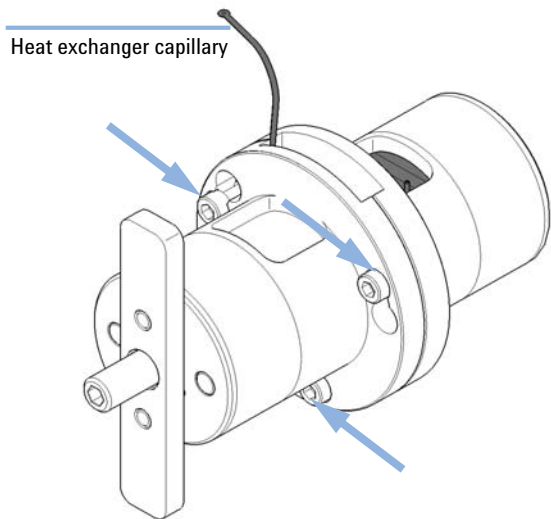
- 8** Insert the alignment piston of the pump head alignment tool.



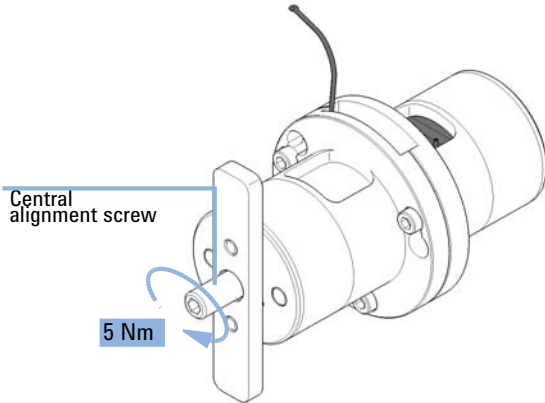
- 9** Insert the pump head to the pump head alignment tool. There are openings for the seal wash support ring and heat exchanger of the secondary pump head.



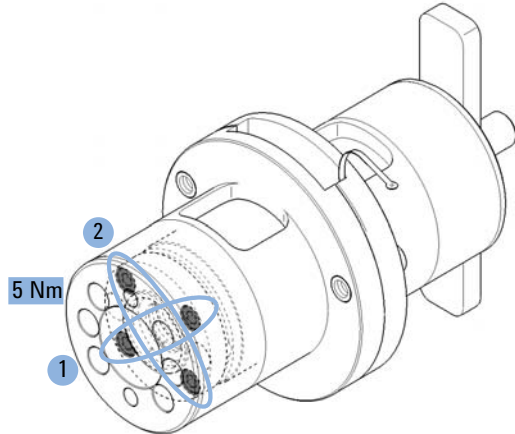
- 10** Close the tool by closing the 3 screws at the connection ring.



11 Using a torque key, set 5 Nm and fix the central alignment screw.



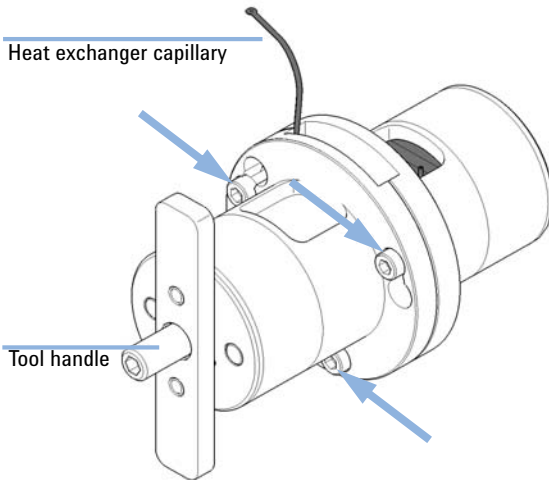
12 Using a torque key, set 5 Nm and fix the 4 screws at the rear of the alignment tool. Tighten screws crosswise.



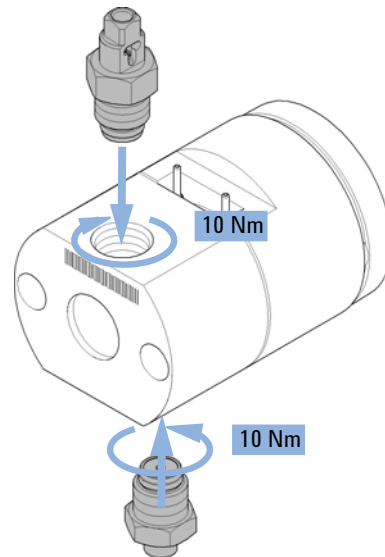
NOTE

This procedure will align pump head parts to their correct positions and close the pump head tightly.

13 Open the 3 screws which have closed the pump head alignment tool and take out the aligned pump head. In case the pump head sticks inside the alignment tool, you can use the handle and insert it to the rear of the tool for pushing out the pump head.



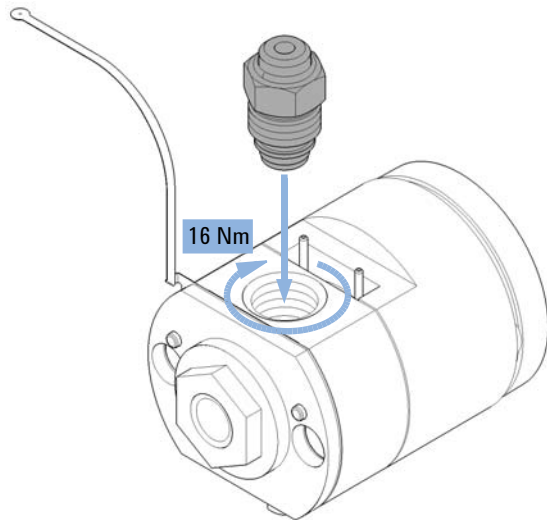
14 For the primary pump head, install the inlet valve and outlet valve using the torque wrench. Set 10 Nm for the inlet valve and 10 Nm for the outlet valve.



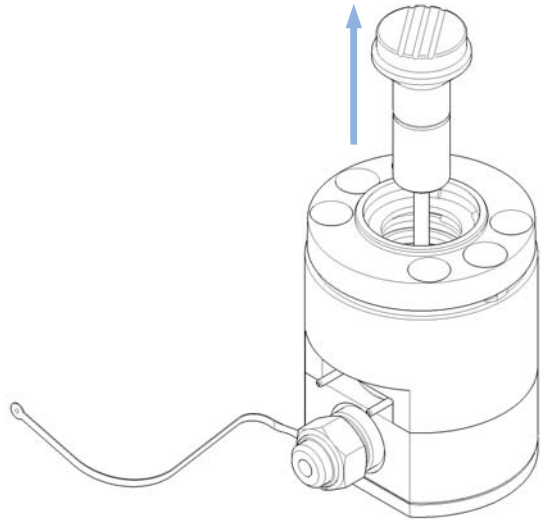
2 Pump Head Maintenance (Binary Pump)

Assembling the Pump Head of the Binary Pump

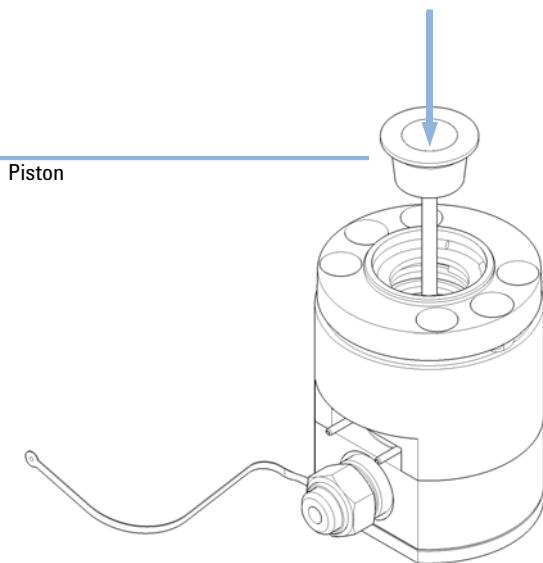
15 For the secondary pump head, assemble and install the high pressure filter assembly using the torque wrench (14 mm hex wrench) set to 16 Nm.



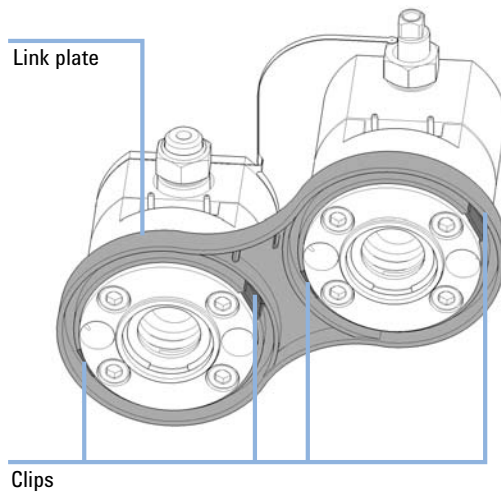
16 Remove the alignment piston.



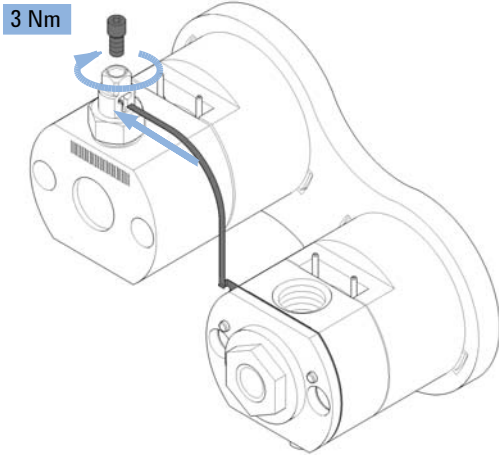
17 Insert the pump piston.



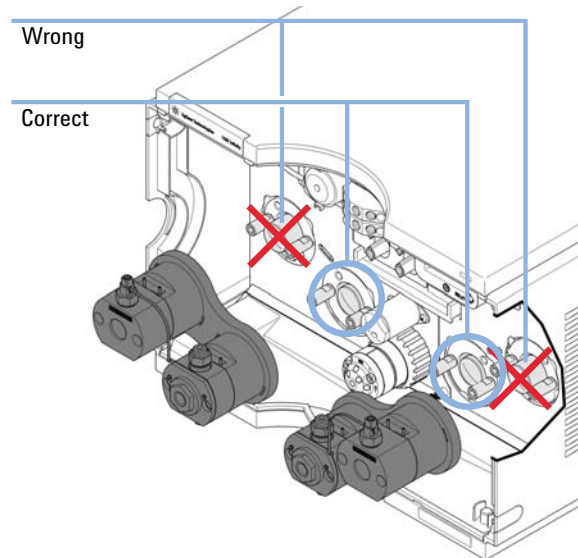
18 Insert both pump heads to the link plate and make sure that the clips snap in that fix the pump heads.



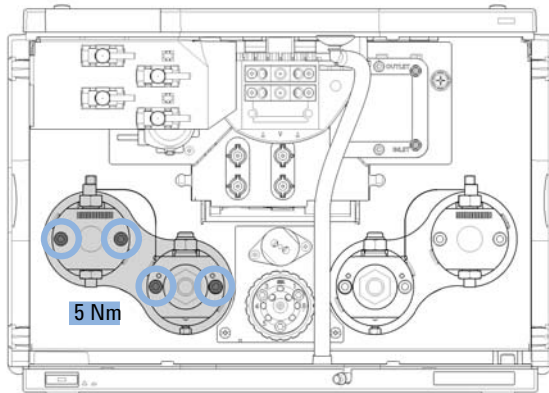
19 Insert the heat exchanger capillary into the outlet of the primary pump head. Using a torque key, set 3 Nm and close the hex screw at the top of the outlet.



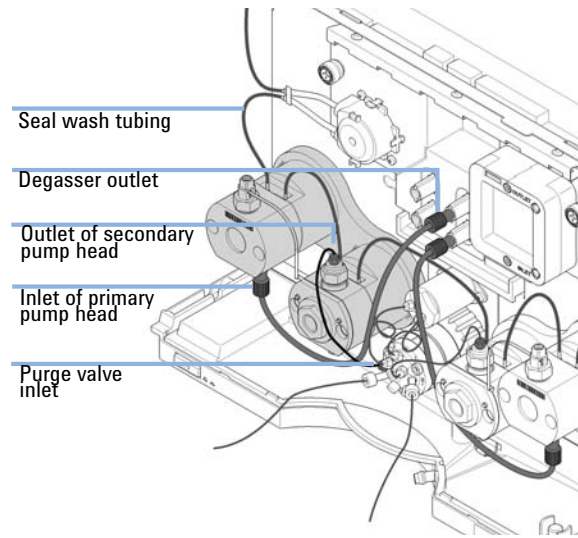
20 Bring the pump drive to the maintenance position using the Lab Advisor user interface, see “Disassembling the Pump Head of the Binary Pump” on page 12. Both pump drives must be retracted.



21 Install the pump head assembly by fixing the 4 screws using a 4 mm hex key and a torque wrench set to 5 Nm. Install screws step by step, not screw by screw.



22 Install flow connections as described in *Replacing the Pump Heads* in the user manual.



2 Pump Head Maintenance (Binary Pump)

Assembling the Pump Head of the Binary Pump



3 Pump Head Maintenance (Quaternary Pump)

Disassembling the Pump Head of the Quaternary Pump	44
Primary Pump Head of the Quaternary Pump	48
Primary Pump Head with Seal Wash (Quaternary Pump)	48
Primary Pump Head Without Seal Wash (Quaternary Pump)	50
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Disassembling the Secondary Pump Head of the Quaternary Pump	60
Replacing the Heat Exchanger	63
Assembling the Pump Head of the Quaternary Pump	66



3 Pump Head Maintenance (Quaternary Pump)

Disassembling the Pump Head of the Quaternary Pump

Disassembling the Pump Head of the Quaternary Pump

When If parts inside the pump head need to be replaced

Tools required	p/n	Description
	G4220-20012	Torque wrench 2 – 25 Nm
	G4220-20013	4 mm hex bit
	G4220-20014	2.5 mm Hex Bit
	G4220-20015	Adapter ¼ in square to hex
	8710-0510	Wrench open 1/4 — 5/16 inch

Preparations Remove tubing connections to the MCGV.

CAUTION

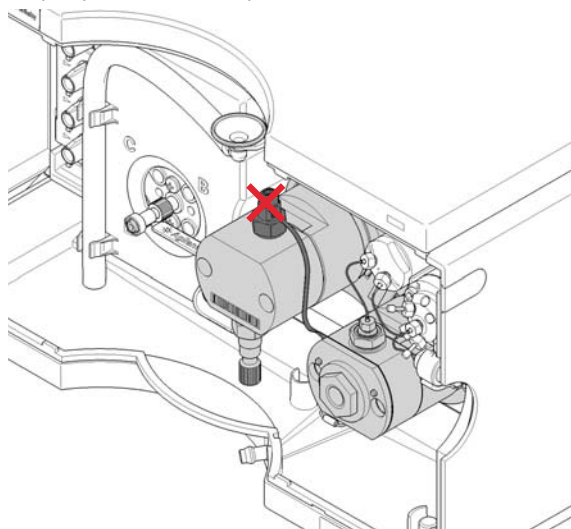
Damage of the pump piston

Removing pump heads in a position other than the maintenance position can damage the pump piston.

→ Before switching off the pump, bring it to the maintenance position.

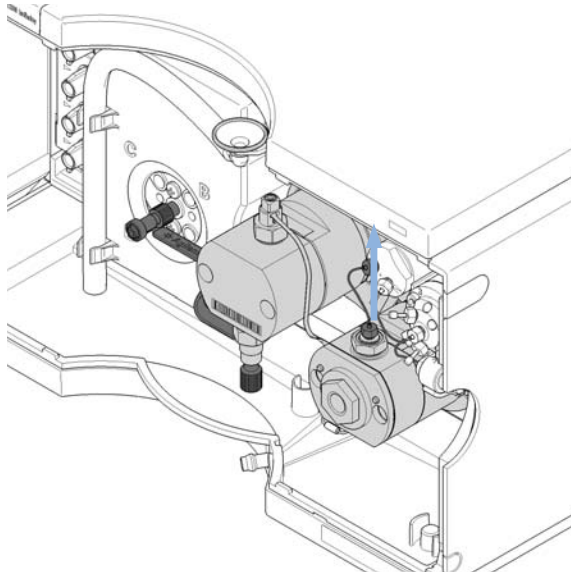
- 1 In Lab Advisor go to **Tools > Remove/Install Pump Head** and follow instructions given on the screen.
- 2 If applicable, remove flow connections of the seal wash option.

- 3 DO NOT REMOVE the capillary connection between the pump heads marked by the red X.

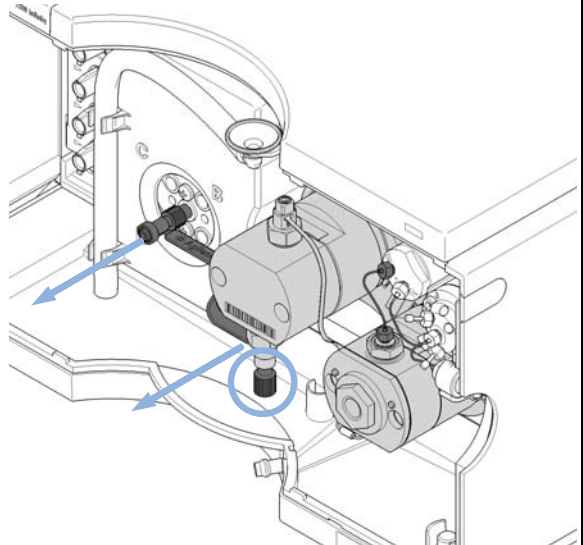


Disassembling the Pump Head of the Quaternary Pump

- 4 Remove the capillary connection from the outlet filter on the secondary pump head to the pressure sensor.



- 5 Open the screw at the bottom of the primary pump head and remove the inlet weaver. Refer to the *Service Manual* for instructions on how to replace the inlet weaver.



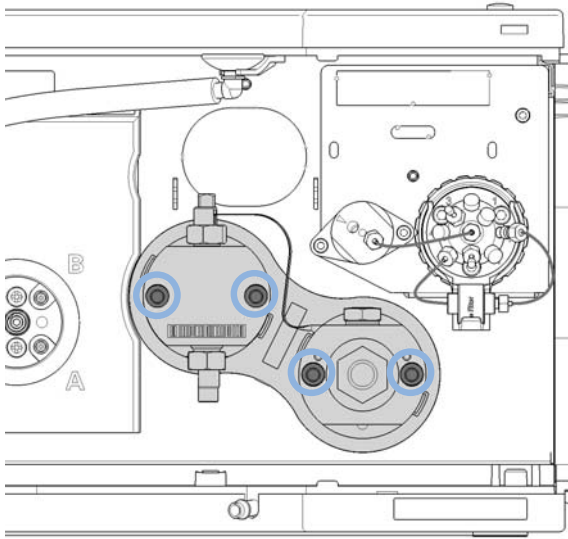
NOTE

Do not drop the PEEK adapter at the end of the Inlet Weaver inserted to the inlet valve.

3 Pump Head Maintenance (Quaternary Pump)

Disassembling the Pump Head of the Quaternary Pump

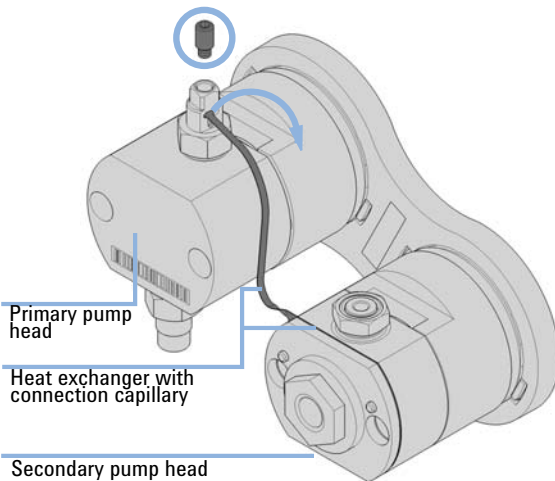
6 Open the four screws holding the pump heads.



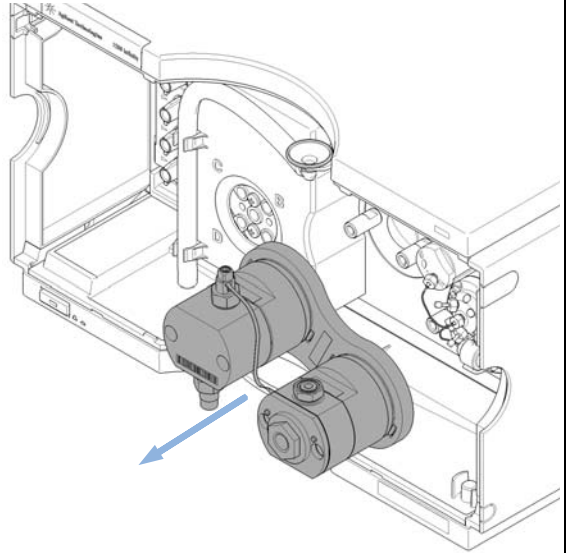
NOTE

Open all screws step by step, not screw by screw.

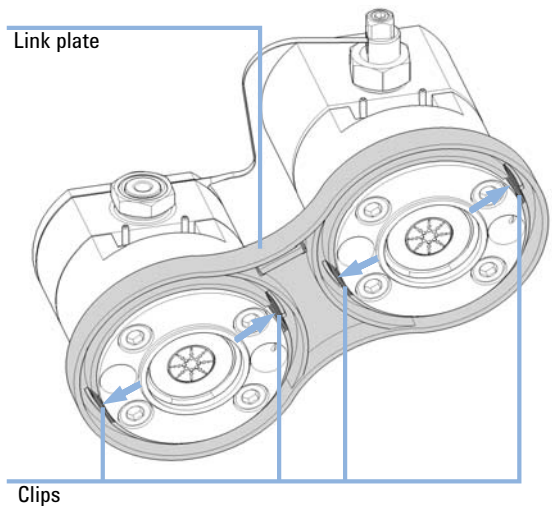
8 Open the 2.5 mm hex screw at the top of the primary pump head, which fixes the connection capillary of the heat exchanger. Then lift up the capillary and remove it from the primary pump head.



7 Remove the complete pump head assembly by holding both heads and pulling it to the front.



9 Remove both pump heads from the link plate by pushing the clips at the rear of the plate.



Pump Head Maintenance (Quaternary Pump) 3
Disassembling the Pump Head of the Quaternary Pump

3 Pump Head Maintenance (Quaternary Pump)
Primary Pump Head of the Quaternary Pump

Primary Pump Head of the Quaternary Pump

Primary Pump Head with Seal Wash (Quaternary Pump)

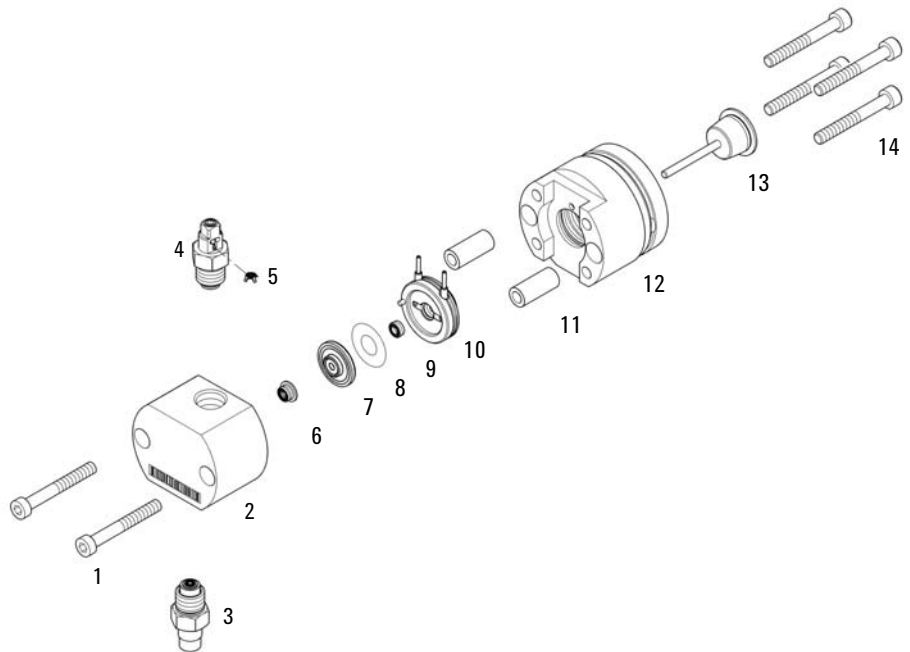


Figure 7 Primary pump head (Quaternary Pump) with seal wash

Item	p/n	Description
1, 14	0515-1218 (6x)	Screw M5, 40 mm long
2		Pump Chamber Housing (order pump head)
3	G4204-60022	Inlet Valve 1290 Infinity Quaternary Pump
4	G4220-60028	Outlet valve 1290 Infinity Pump (primary pump head)
5	G4220-20020	Internal gold seal for 1290 Infinity outlet valve
6	0905-1420	PE seals (pack of 2)
7	G4220-60016	Seal holder including backup ring
8	5062-2484	Gasket, seal wash (pack of 6)
9	0905-1718	Wash Seal PE
10	G4220-63010	Support Ring (Seal Wash)
11	(2x)	Pump Head Ferrules (order pump head)
12		Piston Housing (order pump head)
13	5067-5678	Piston 1290 Infinity Pumps, ceramic

3 Pump Head Maintenance (Quaternary Pump)
Primary Pump Head of the Quaternary Pump

Primary Pump Head Without Seal Wash (Quaternary Pump)

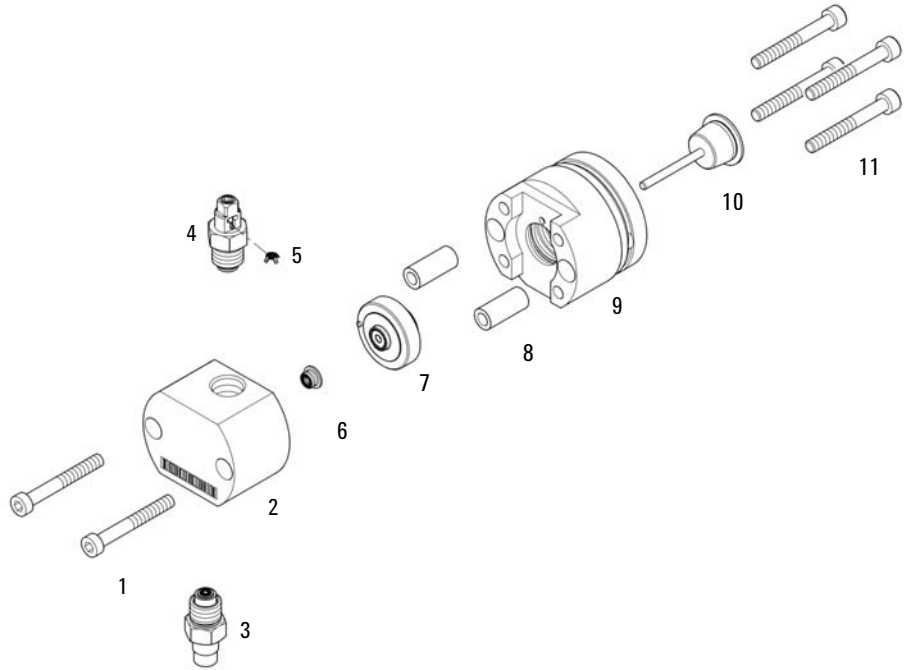


Figure 8 Primary pump head (Quaternary Pump) without seal wash

Item	p/n	Description
1, 11	0515-1218 (6x)	Screw M5, 40 mm long
2		Pump Chamber Housing (order pump head)
3	G4204-60022	Inlet Valve 1290 Infinity Quaternary Pump
4	G4220-60028	Outlet valve 1290 Infinity Pump (primary pump head)
5	G4220-20020	Internal gold seal for 1290 Infinity outlet valve
6	0905-1420	PE seals (pack of 2)
7	G4220-60015	Support ring including backup ring
8	(2x)	Pump Head Ferrules (order pump head)
9		Piston Housing (order pump head)
10	5067-5678	Piston 1290 Infinity Pumps, ceramic

3 Pump Head Maintenance (Quaternary Pump)

Primary Pump Head of the Quaternary Pump

Disassembling the Primary Pump Head of the Quaternary Pump

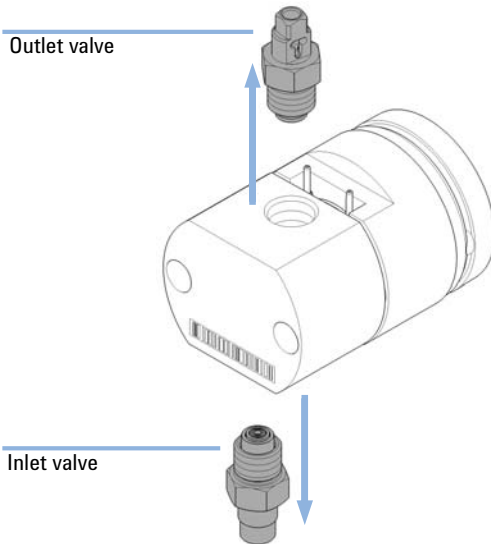
CAUTION

Damage of pump piston

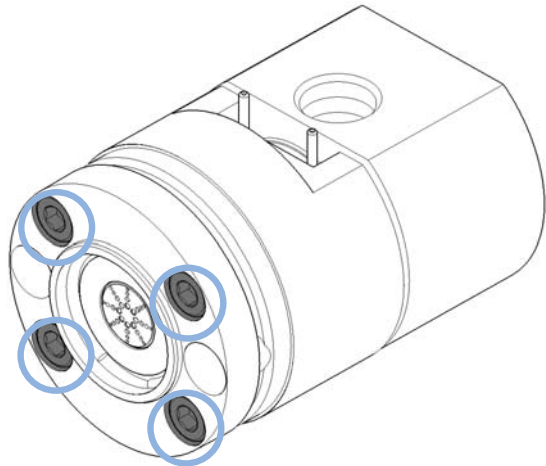
The pump piston is made of ZrO_2 -based ceramic, which is a very hard and resistant material, but it is sensitive to shearing forces from the side.

- Do not try to remove the pump piston from the rear.
- Do not use the piston for removing pump seals.

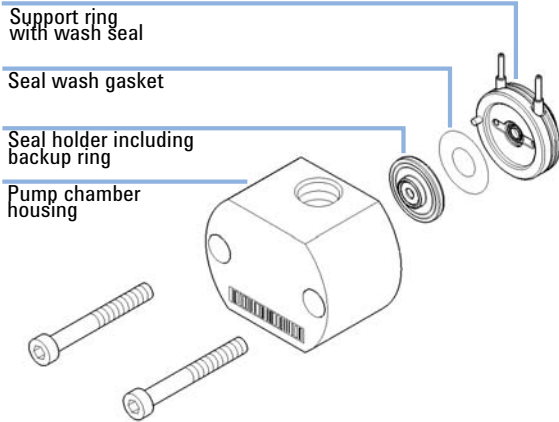
1 Remove the outlet valve at the top of the pump head and the inlet valve at the bottom of the pump head.



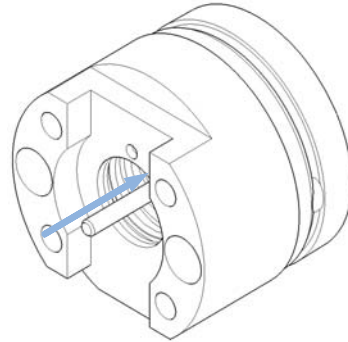
2 For disassembling the pump head, remove the 4 hex screws at the rear of the pump head.



- 3** Remove the front part of the pump head including pump chamber housing with pump seal and support ring. If the seal wash option is installed, also remove the seal holder including backup ring, and the gasket.



- 4** Remove the piston from the piston housing by pushing it to the rear, then pull it out from the rear.

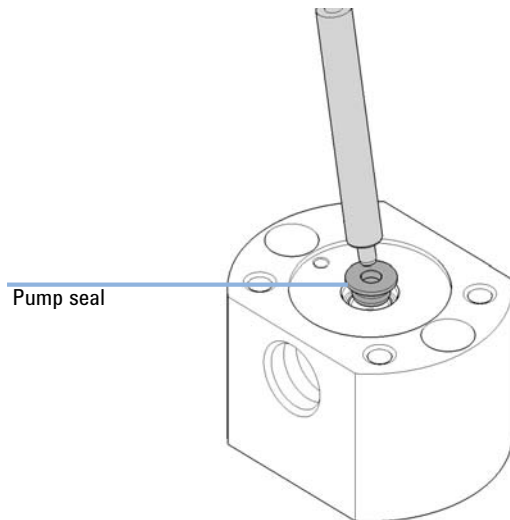


- 5** Check the pump pistons for scratches, grooves and dents when changing the piston seals.

NOTE

Damaged pistons cause micro leaks and will decrease the lifetime of the seals.

- 6** Use the soft plastic side of the insert tool for removing the pump seal from the pump chamber housing.



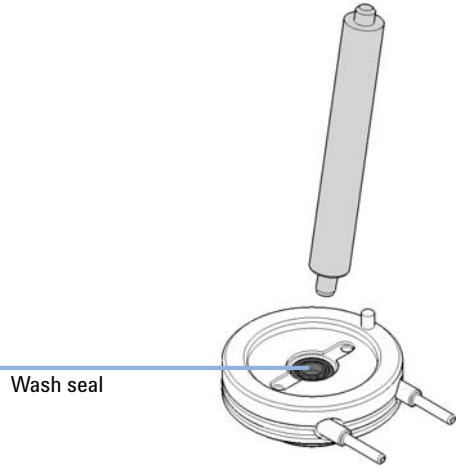
NOTE

Do not use the pump piston for that purpose!

3 Pump Head Maintenance (Quaternary Pump)

Primary Pump Head of the Quaternary Pump

- 7 If the wash seal shall be replaced by a new one, use the steel side of the insert tool for removing it.



3 Pump Head Maintenance (Quaternary Pump)
Secondary Pump Head of the Quaternary Pump

Secondary Pump Head of the Quaternary Pump

Secondary Pump Head With Seal Wash (Quaternary Pump)

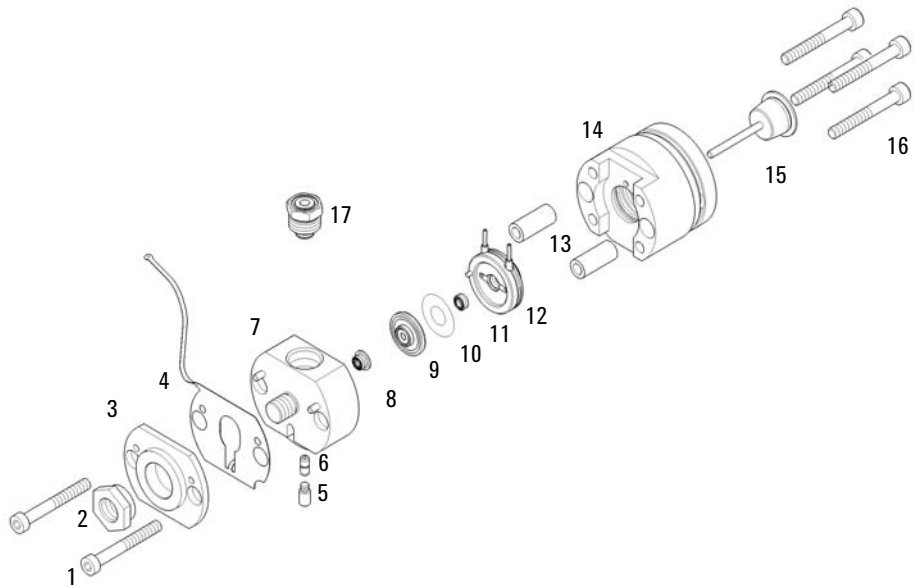


Figure 9 Secondary pump head (Quaternary Pump) with seal wash

Pump Head Maintenance (Quaternary Pump) 3

Secondary Pump Head of the Quaternary Pump

Item	p/n	Description
1, 16	0515-1218 (6x)	Screw M5, 40 mm long
2	G4220-20003	Pump Head Screw
3		Pump Head Front Plate (order pump head)
4	G4220-81013	Heat Exchanger (secondary pump head only)
5	G4220-20028	Screw for Microfluidic Metal Structures
6	G4220-20001	Spacer Fitting
7		Pump Chamber Housing (order pump head)
8	0905-1420	PE seals (pack of 2)
9	G4220-60016	Seal holder including backup ring
10	5062-2484	Gasket, seal wash (pack of 6)
11	0905-1718	Wash Seal PE
12	G4220-63010	Support Ring (Seal Wash)
13	(2x)	Pump Head Ferrules (order pump head)
14		Piston Housing (order pump head)
15	5067-5678	Piston 1290 Infinity Pumps, ceramic
17	G4204-60004	Outlet filter 1290 Infinity Quaternary Pump

3 Pump Head Maintenance (Quaternary Pump)
Secondary Pump Head of the Quaternary Pump

Secondary Pump Head Without Seal Wash (Quaternary Pump)

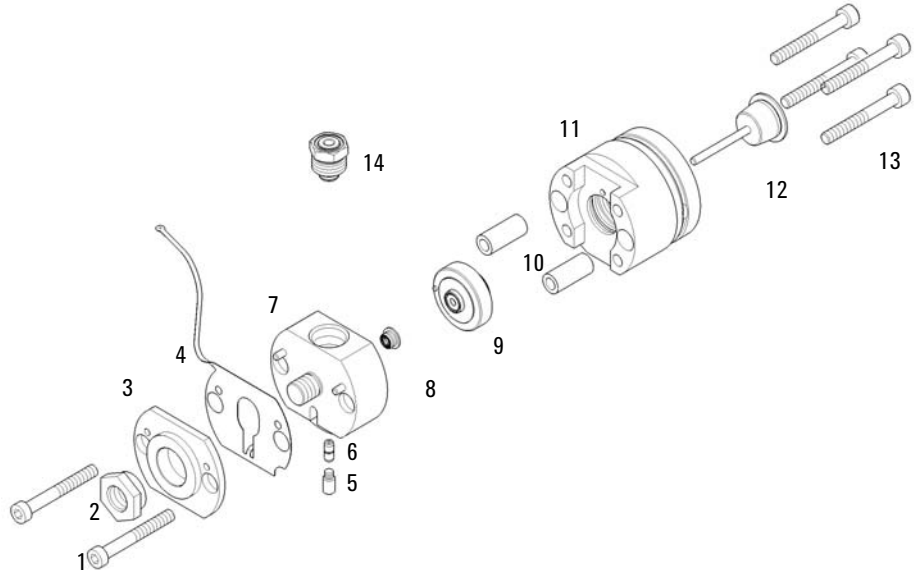


Figure 10 Secondary pump head (Quaternary Pump) without seal wash

Pump Head Maintenance (Quaternary Pump) 3
Secondary Pump Head of the Quaternary Pump

Item	p/n	Description
1, 13	0515-1218 (6x)	Screw M5, 40 mm long
2	G4220-20003	Pump Head Screw
3		Pump Head Front Plate (order pump head)
4	G4220-81013	Heat Exchanger (secondary pump head only)
5	G4220-20028	Screw for Microfluidic Metal Structures
6	G4220-20001	Spacer Fitting
7		Pump Chamber Housing (order pump head)
8	0905-1420	PE seals (pack of 2)
9	G4220-60015	Support ring including backup ring
10	(2x)	Pump Head Ferrules (order pump head)
11		Piston Housing (order pump head)
12	5067-5678	Piston 1290 Infinity Pumps, ceramic
14	G4204-60004	Outlet filter 1290 Infinity Quaternary Pump

3 Pump Head Maintenance (Quaternary Pump) Secondary Pump Head of the Quaternary Pump

Disassembling the Secondary Pump Head of the Quaternary Pump

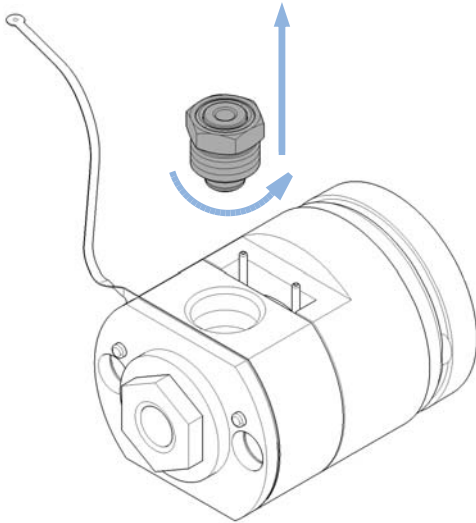
CAUTION

Damage of pump piston

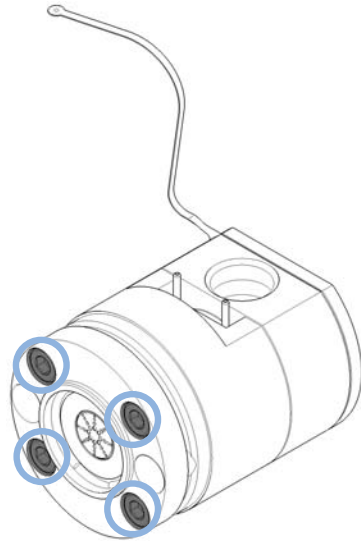
The pump piston is made of ZrO₂-based ceramic, which is a very hard and resistant material, but it is sensitive to shearing forces from the side.

- Do not try to remove the pump piston from the rear.
- Do not use the piston for removing pump seals.

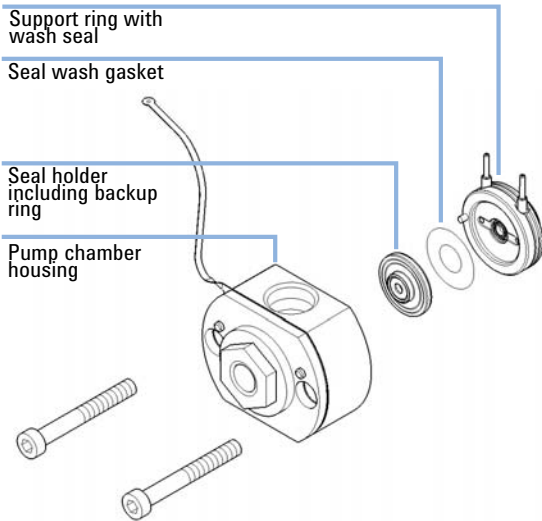
1 Remove the outlet filter at the top of the pump head.



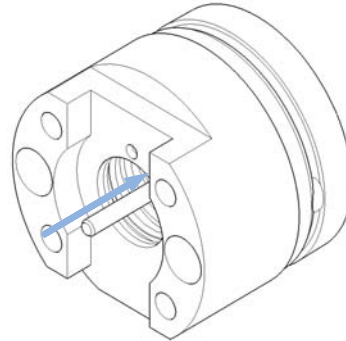
2 For disassembling the pump head, remove the 4 hex screws at the rear of the pump head.



3 Remove the front part of the pump head including pump chamber housing with pump seal and seal holder. If the seal wash option is installed, also remove the support ring with wash seal and gasket.



4 Remove the piston from the piston housing by pushing it to the rear, then pull it out from the rear.

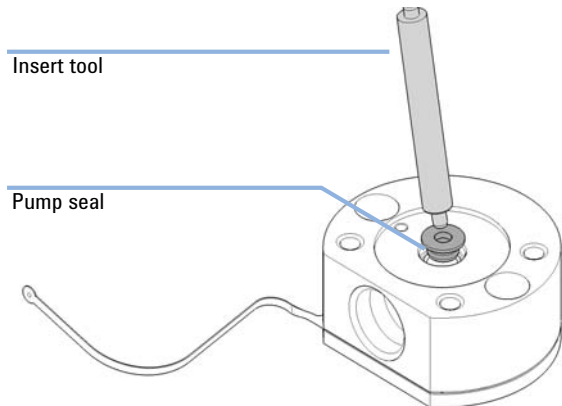


5 Check the pump pistons for scratches, grooves and dents when changing the piston seals.

NOTE

Damaged pistons cause micro leaks and will decrease the lifetime of the seals.

6 Use the soft plastic side of the insert tool for removing the pump seal from the pump chamber housing.



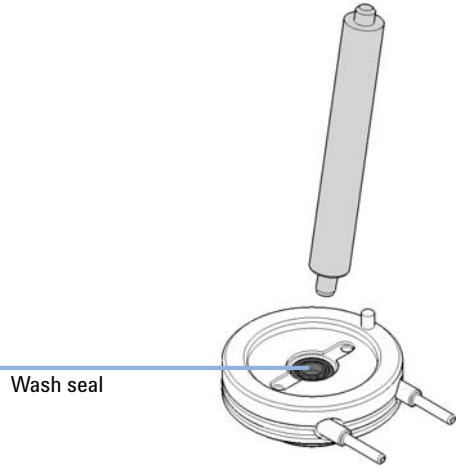
NOTE

Do not use the pump piston for that purpose!

3 Pump Head Maintenance (Quaternary Pump)

Secondary Pump Head of the Quaternary Pump

- 7 If the wash seal shall be replaced by a new one, use the steel side of the insert tool for removing it.



Replacing the Heat Exchanger

Tools required	Description	
	Wrench, 19 mm	
Parts required	p/n	Description
	G4220-81013	Heat Exchanger (secondary pump head only)
	0515-5237	Heat Exchanger Screw
	G4220-20001	Spacer Fitting

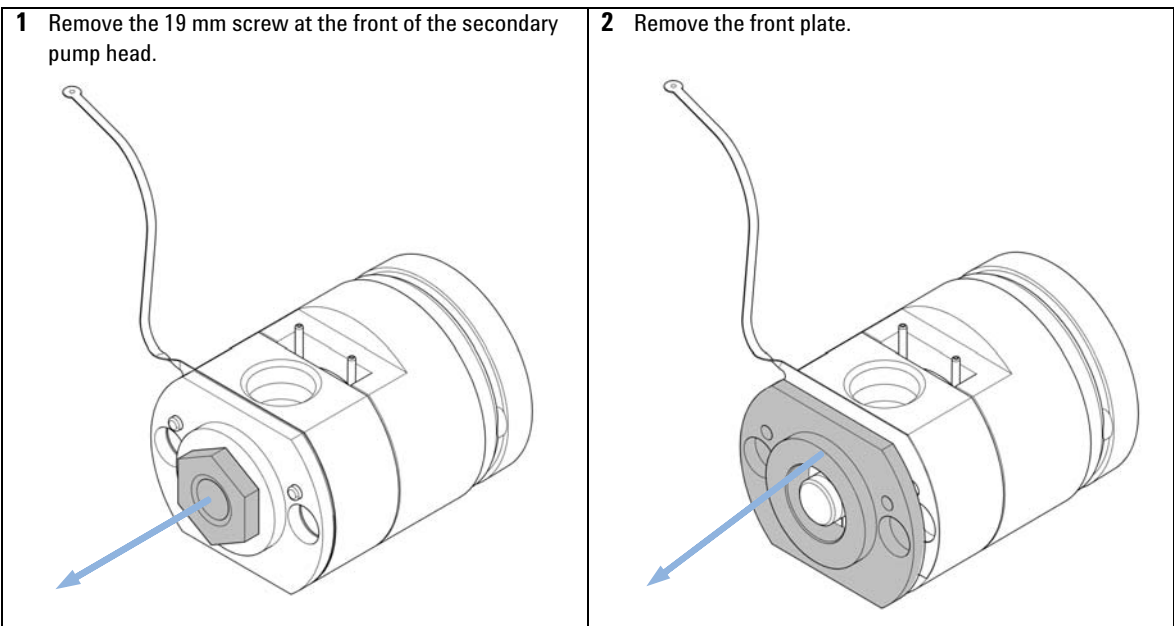
- Preparations**
- Remove the pump head assembly from the pump
 - Remove the secondary pump head from the link plate

CAUTION

Loss of small spacer fitting

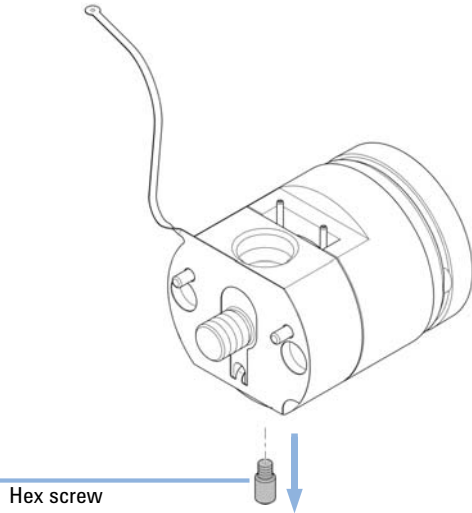
Inside the secondary pump head is a small spacer fitting, which can be dropped easily when removing the heat exchanger.

→ The heat exchanger does not need to be removed for pump head maintenance.

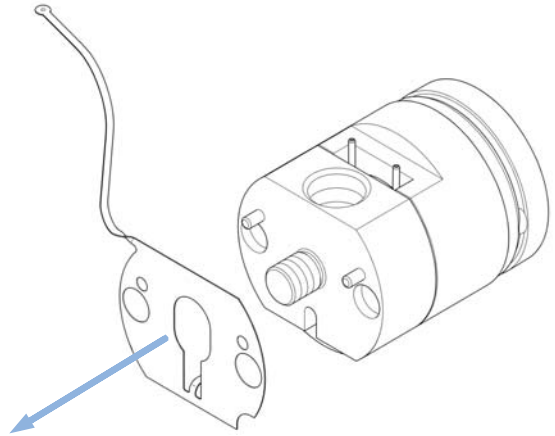


3 Pump Head Maintenance (Quaternary Pump) Secondary Pump Head of the Quaternary Pump

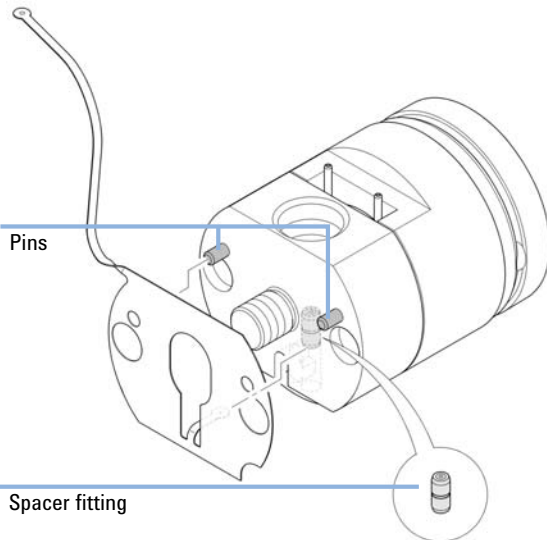
- 3** Remove the 2.5 mm hex screw at the bottom of the pump head. Do not drop the golden spacer fitting.



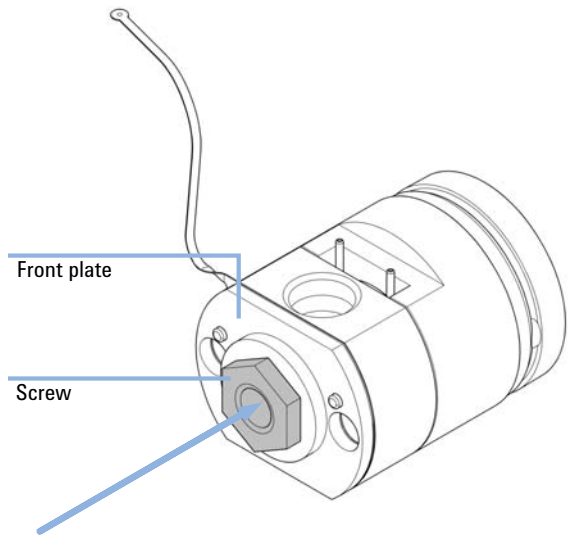
- 4** Lift out the heat exchanger.



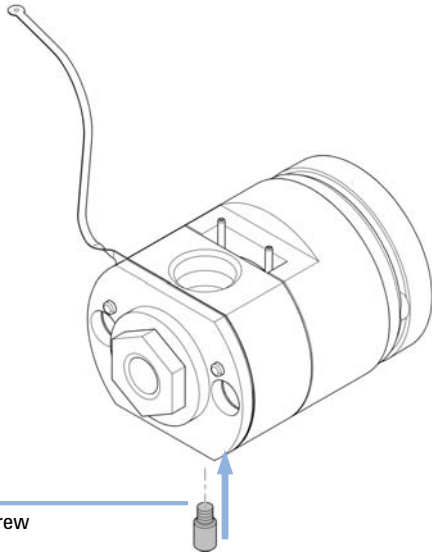
- 5** If removed, first insert the spacer fitting. Then insert the new heat exchanger to the opening in the pump head and lift it over the pins.



- 6** Use the 19 mm screw for fixing the front plate.



7 Insert and fix the 2.5 mm hex screw.



Hex screw

3 Pump Head Maintenance (Quaternary Pump)

Assembling the Pump Head of the Quaternary Pump

Assembling the Pump Head of the Quaternary Pump

When Before installing the pump head.

Tools required	p/n	Description
		Pump head alignment tool
	G4220-20012	Torque wrench 2 – 25 Nm
	G4220-20013	4 mm hex bit
	G4220-20014	2.5 mm Hex Bit
	G4220-20015	Adapter ¼ in square to hex
	01018-23702	Insert tool

Parts required **Description**
Maintenance parts

See “[Maintenance Parts of the Quaternary Pump](#)” on page 10 for details.

CAUTION

Limited life time of the pump head

Inserting the backup seal wrongly may limit the life time of the pump head.

→ Please note the correct orientation of the backup seal.

CAUTION

Damage of the pump piston

The pump piston is very sensitive to shearing forces from the side.

→ Use the alignment piston of the pump head alignment tool for the alignment procedure described below.

CAUTION

Wrong orientation of pins on support ring

Assembling the pump head without paying attention to the correct orientation of the pins on the support ring can lead to leaks or damage of the piston and pump head.

→ Observe pins on the support ring, which help assembling the parts of the pump head in the correct orientation.

CAUTION

Damage of the pump head assembly

When installing the pump head assembly, the pump drives need to be in maintenance position, where they are retracted. Using the pump drive in default position will damage the pump head assembly.

→ Bring the pump drive to the maintenance position.

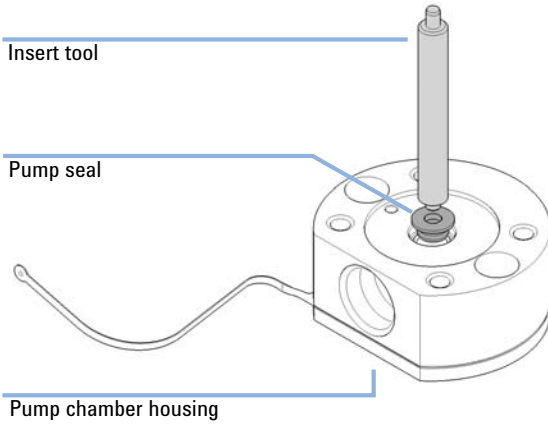
NOTE

This procedure describes how to assemble the secondary pump head using the pump head alignment tool. Assembling the primary pump head can be done accordingly. The secondary pump head has the heat exchanger capillary, which must fit into the openings of the alignment tool, whereas the primary pump head does not have a heat exchanger. See [Figure 2](#) on page 9.

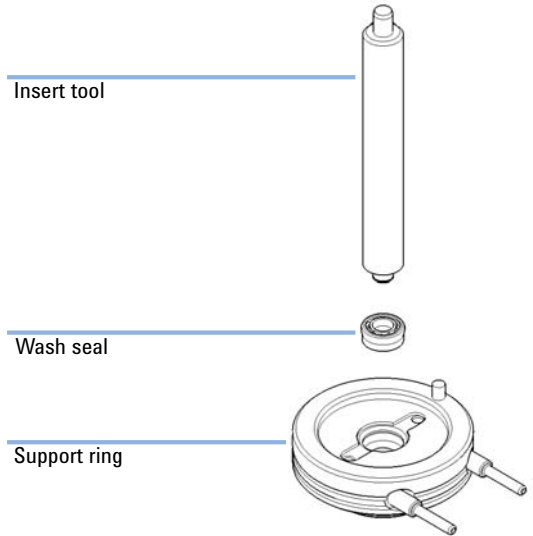
3 Pump Head Maintenance (Quaternary Pump)

Assembling the Pump Head of the Quaternary Pump

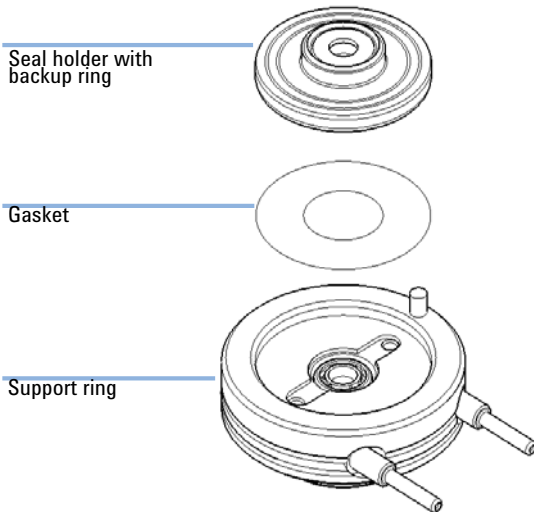
1 Use the soft plastic side of the insert tool for inserting the piston seal to the pump chamber housing.



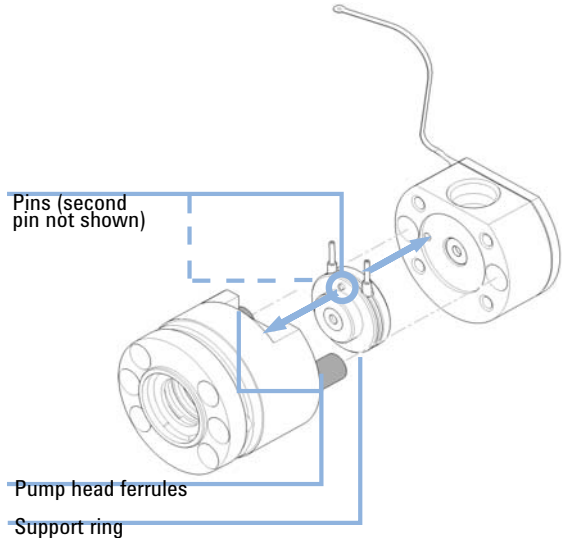
2 If the seal wash option is installed, use the soft plastic side of the insert tool for inserting the wash seal into the support ring.



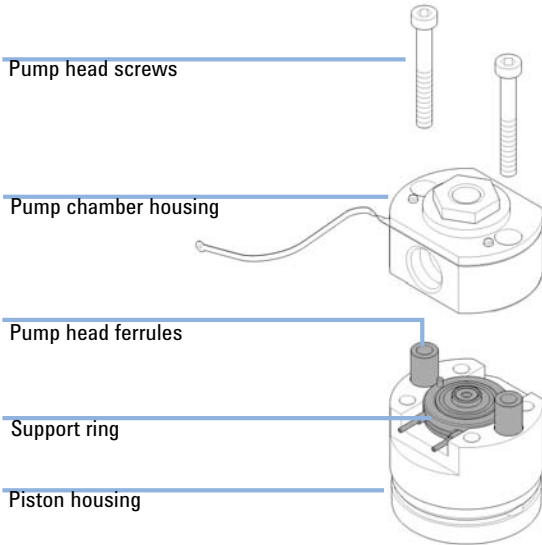
3 If the seal wash option is installed, put the gasket into the support ring and insert the seal holder.



4 Insert the support ring and pump head ferrules into the piston housing. Observe the pins on the support ring, which help you assembling the pump head correctly.



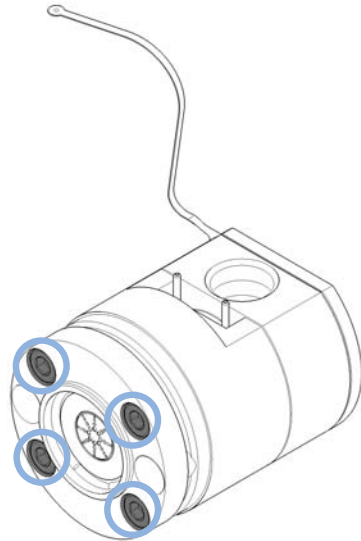
5 Assemble the pump head by putting the pump chamber housing on top of the support ring. Insert and tighten the two pump head screws.



NOTE

Do NOT install the inlet and outlet valves and the outlet filter at this stage.

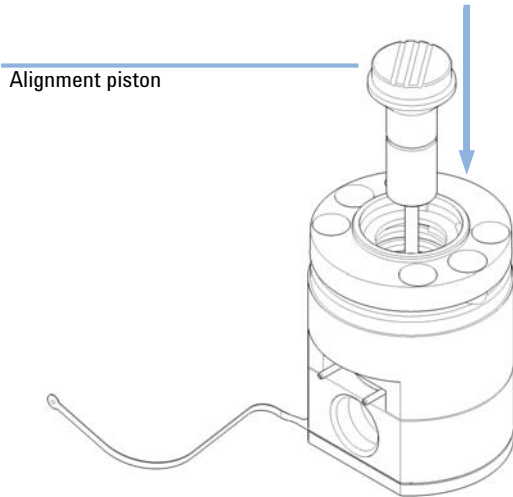
6 Loosely close the 4 screws at the rear of the pump head. The screws will be fixed tightly later.



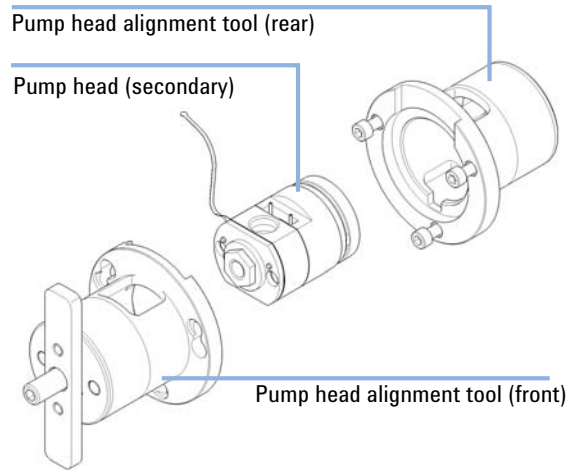
3 Pump Head Maintenance (Quaternary Pump)

Assembling the Pump Head of the Quaternary Pump

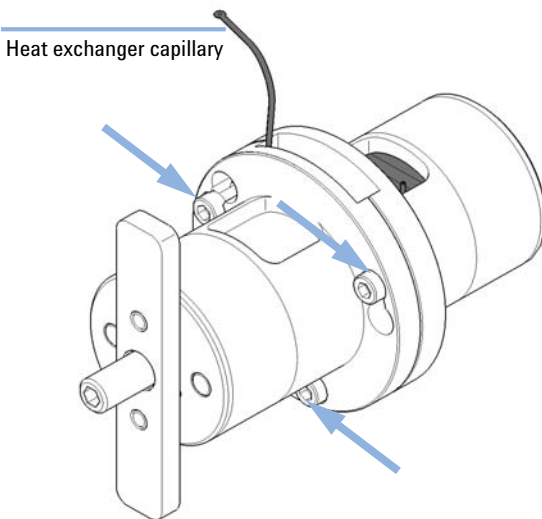
7 Insert the alignment piston of the pump head alignment tool.



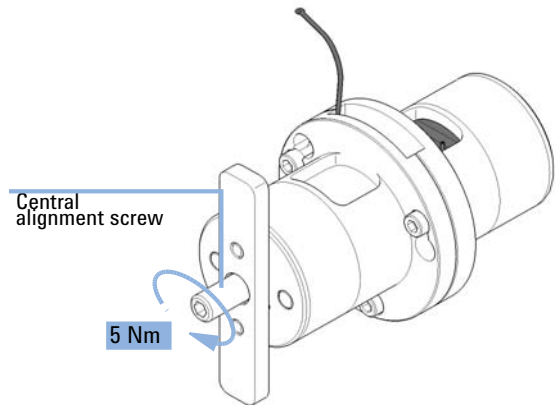
8 Insert the pump head to the pump head alignment tool. There are openings for the seal wash support ring and heat exchanger of the secondary pump head.



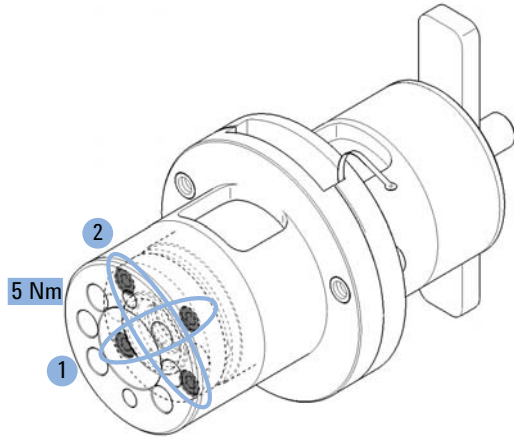
9 Close the tool by closing the 3 screws at the connection ring.



10 Using a torque key, set 5 Nm and fix the central alignment screw.



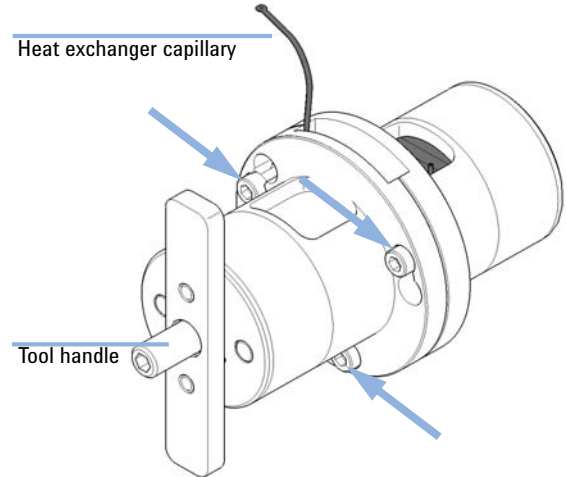
11 Using a torque key, set 5 Nm and fix the 4 screws at the rear of the alignment tool. Tighten screws crosswise.



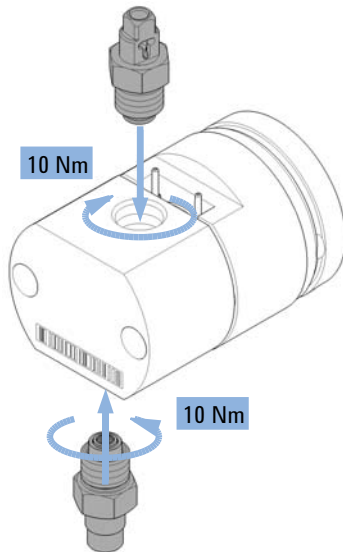
NOTE

This procedure will align pump head parts to their correct positions and close the pump head tightly.

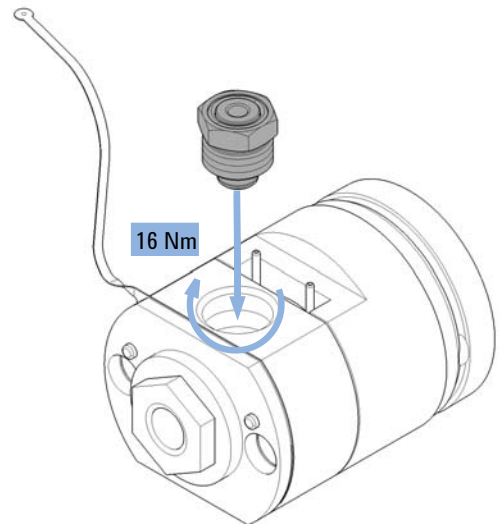
12 Open the 3 screws which have closed the pump head alignment tool and take out the aligned pump head. In case the pump head sticks inside the alignment tool, you can use the handle and insert it to the rear of the tool for pushing out the pump head.



13 For the primary pump head, install the inlet valve and outlet valve using the torque wrench. Set 10 Nm for the inlet valve and 10 Nm for the outlet valve.



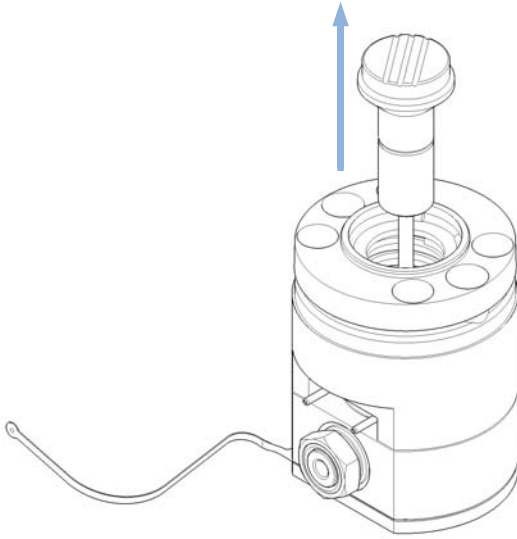
14 For the secondary pump head, install the outlet filter using the torque wrench (14 mm hex bit) set to 16 Nm.



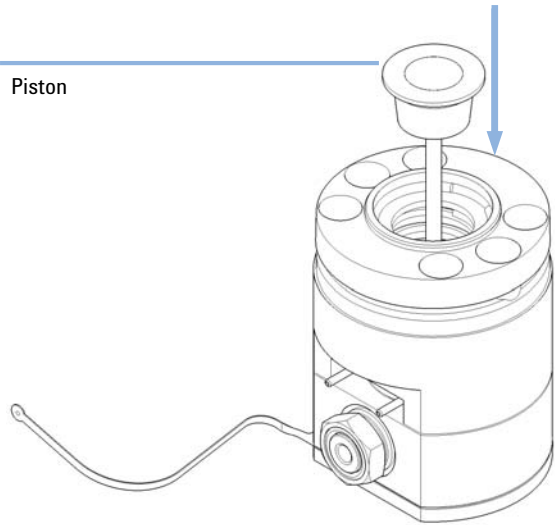
3 Pump Head Maintenance (Quaternary Pump)

Assembling the Pump Head of the Quaternary Pump

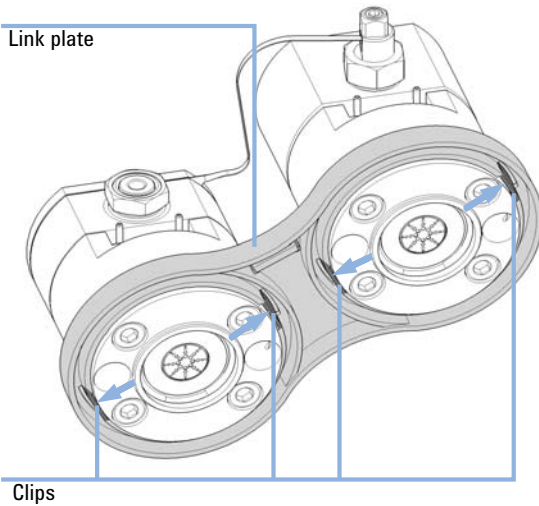
15 Remove the alignment piston.



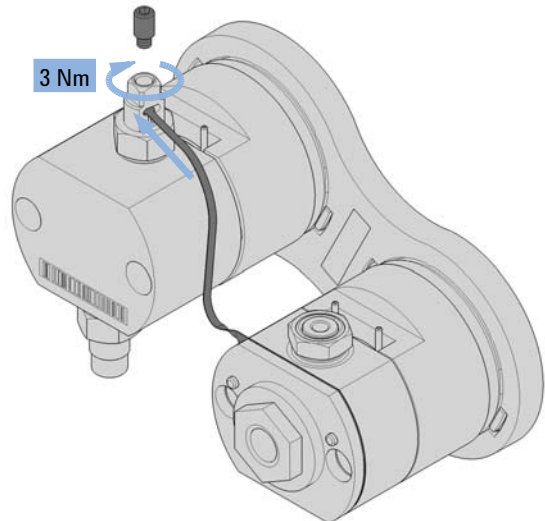
16 Insert the pump piston.



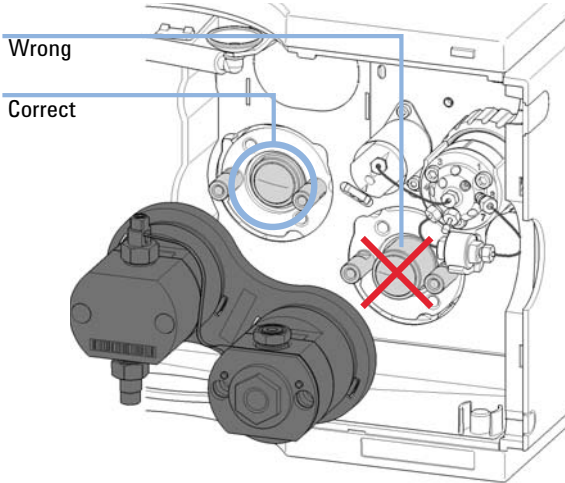
17 Insert both pump heads to the link plate and make sure that the clips snap in that fix the pump heads.



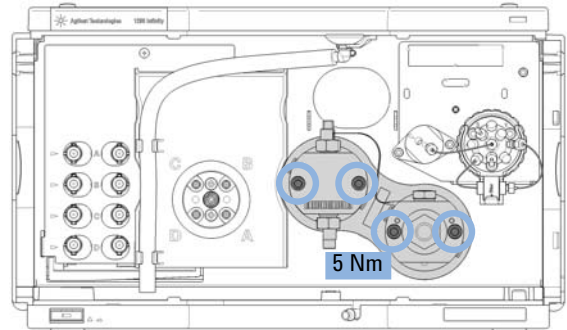
18 Insert the heat exchanger capillary into the outlet of the primary pump head. Using a torque key, set 3 Nm and close the hex screw at the top of the outlet.



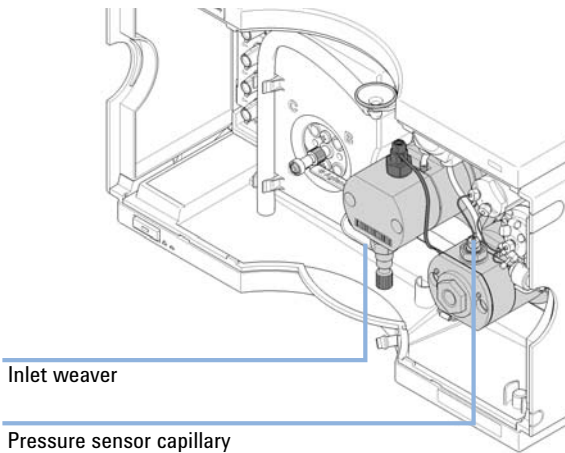
19 Bring the pump drive to the maintenance position using the Lab Advisor user interface, see [“Disassembling the Pump Head of the Quaternary Pump”](#) on page 44. Both pump drives must be retracted.



20 Install the pump head assembly by fixing the 4 screws using a 4 mm hex key and a torque wrench set to 5 Nm. Install screws step by step, not screw by screw.



21 Install flow connections as described in *Replacing the Pump Heads* in the user manual.



3 Pump Head Maintenance (Quaternary Pump)

Assembling the Pump Head of the Quaternary Pump



4 Overview of 1290 Infinity Pump Service Kit

Overview of 1290 Infinity Pump Service Kit 76



4 Overview of 1290 Infinity Pump Service Kit

Overview of 1290 Infinity Pump Service Kit

Overview of 1290 Infinity Pump Service Kit

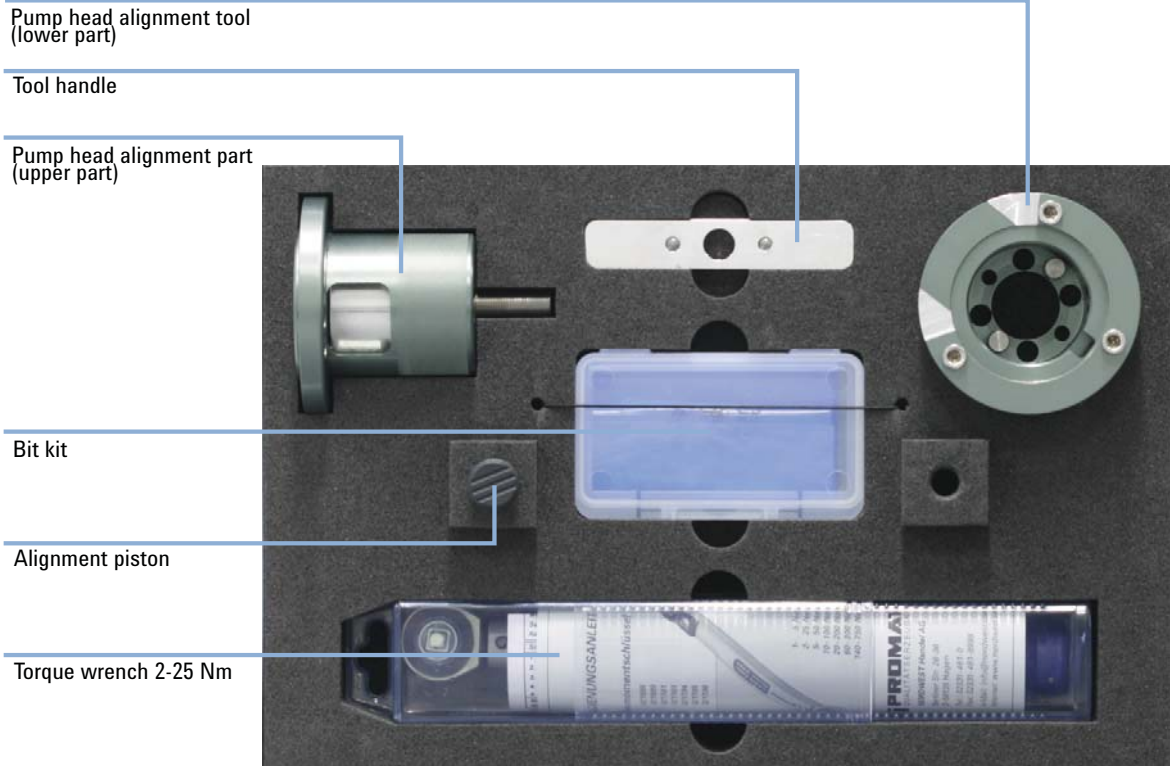


Figure 11 Overview of the 1290 Infinity pump service kit

1290 Infinity Pump Service Kit

p/n	Description
5067-4699	1290 Infinity pump service kit Pump head alignment tool
G4220-20012	Torque wrench 2 – 25 Nm
5023-0282	Bit kit contains the following three items:
G4220-20013	4 mm hex bit
G4220-20014	2.5 mm Hex Bit
G4220-20015	Adapter ¼ in square to hex

NOTE

Reprints of this technical note are not orderable.

An electronic version of this note can be downloaded from
<http://www.chem.agilent.com/en-US/Search/Library/Pages/LibrarySearch.aspx>.

Replacement Kit

p/n	Description
5023-0285	Replacement kit for 1290 Infinity pump head alignment tool (piston/handle)

NOTE

The replacement kit is not part of the pump service kit, but can be ordered under the given number.

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