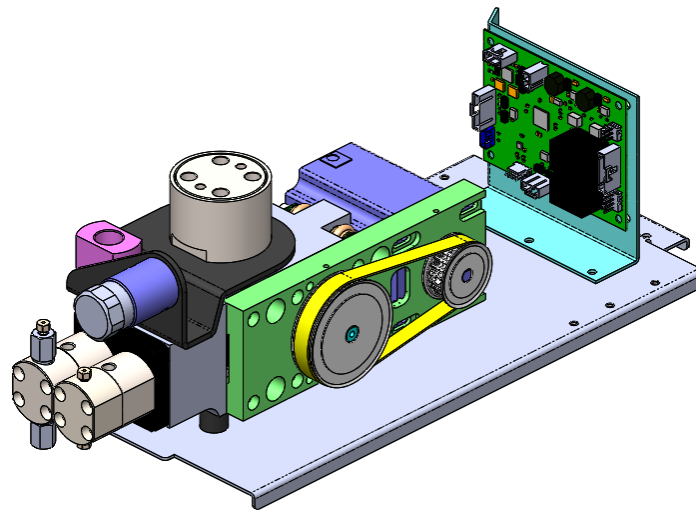
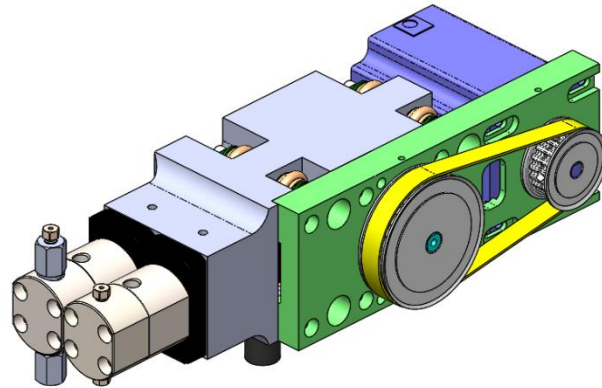


Model 540 Pump Service Guide



About this Guide

This Guide is intended for service technicians who are responsible for maintenance of the ASI 540 pump mechanical assembly. It is assumed that the user of this guide is familiar with standard laboratory terminology.

WARNING ! Read the safety instructions and the rest of this guide before using the ASI 540 Series Model

Safety Instructions: The following safety instructions apply to the ASI 540 Series Model:



WARNING! Personal injury Hazard: Use of this pump in a manner not approved by the manufacturer may inhibit its safety protection.

Caution: Changes or modifications to this unit not expressly approved by the manufacturer could void the instrument warranty and render the system inoperable.



WARNING! Electrical Shock Hazard: The supplied power cord must be used with a power outlet containing a protective ground contact.



WARNING! Electrical Shock Hazard: Disconnect power cords from the power supply before attempting any type of maintenance.



WARNING! Electrical Shock Hazard: Do not change the external or internal grounding connections. Tampering with or disabling these connections could create a safety hazard and /or damage the system. The pump, as shipped is properly grounded in accordance with normal safety regulations.



Do not dispose of equipment as unsorted municipal waste. Follow local municipal waste ordinances for proper disposal.

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Model 540 Pump Mechanical Assembly

Description and Specifications

The Model 540 series pump features standard flow ranges: Micro, Analytical, Semi-prep, or Prep flash chrom. All ASI pump types feature a self-priming pump head; a patented floating pump seal design for extended seal wear; and an integral prime/purge assembly for changing solvent quickly.

Pump Description	Flow Range (mL/min)	Max Pressure (psi)
Micro (SST & Titanium)	0.0005 - 4.000	7000
Micro (Biocompatible PEEK)	0.0005 - 4.000	4000
Micro UPLC (SST)	0.0005 - 0.250 0.0005 - 4.000	15000 7000
Analytical (SST & Titanium)	0.001 - 10.000	7000
Analytical (Biocompatible PEEK)	0.001- 10.000	4000
Analytical UPLC (SST)	0.001 - 1.000 1.000 - 10.000	15000 7000
Semi-Prep (SST & Titanium)	0.010 - 40.000	3500
Semi-Prep (Biocompatible PEEK)	0.010 - 40.000	3500
Prep (SST & Titanium)	0.010 - 125.00	1500
Prep (Biocompatible PEEK)	0.010 - 125.00	1500
Flash Chrom	0.010-125.00	750

- Micro accuracy: $\pm 1\%$ or $\pm 1 \mu\text{L}/\text{min.}$, whichever is greater
- Micro precision: .25% from 0.10 mL/min. to 4 mL/min. at 20 ° C.
- Other Accuracy: $\pm 1\%$ or $\pm 2 \mu\text{L}/\text{min.}$, whichever is greater, 0.001-10mL/min. @500psi
- Other Precision: .25% from 0.1 mL/min. to 10 mL/min. at 20 ° C.
- Pulsation: 1% Δ P/P @1,500 psi pressure

Performance specifications determined with degassed solvents & ASI parts/accessories.

Pump features common to all pumps

- Operating Temperature: 10 – 40°C. $\leq 80\%$ RH non-condensing
- Operating Altitude: 2000m maximum
- CAT II: Device
- Dimensions approximate: 6.75" W x 15.6" D x 6.75" H
- Weight: 16 lbs.
- Power Input: AC 85 - 264V, 50/60Hz
- Method programming via USB-serial computer connection and Modbus protocol. (Up to 1000 Method- Steps)
- Serial - USB 2.0 with Modbus RTU

Intended use of ASI 540 series pump

ASI 540 series pumps are intended for use as pumps for science & engineering applications requiring high pressure metering or accurate fluid flows. Common applications include analytical & process chemistry instrumentation. ASI pumps must be used in laboratory or process locations under ambient conditions--including 10-40°Celsius; <80% Relative Humidity (non-condensing); and ≤ 2000m altitude.

- ASI pumps must not be used for medical; or clinical diagnostic purposes without additional customer-validation to ensure compliance with applicable laws and regulations.
- ASI pumps must never be operated in the presence of explosive fumes or dust.
- Fluid-flow refers to degassed mobile-phases comprised of various combinations of buffers or reagents dissolved in solvents. Refer to solvent-list for applicable solvents.
- All mobile phases shall be rendered particle-free by means of filtration to ≤ 10 µm.
- Chemicals with ignition points ≤150° Celsius shall never be used-by or stored-near ASI pumps.
- Contact ASI prior to use of ASI pump with concentrated acids, bases, halide salts & high viscosities.

⚠ Failure to observe these requirements may result in property-damage; personal-injury; or death.

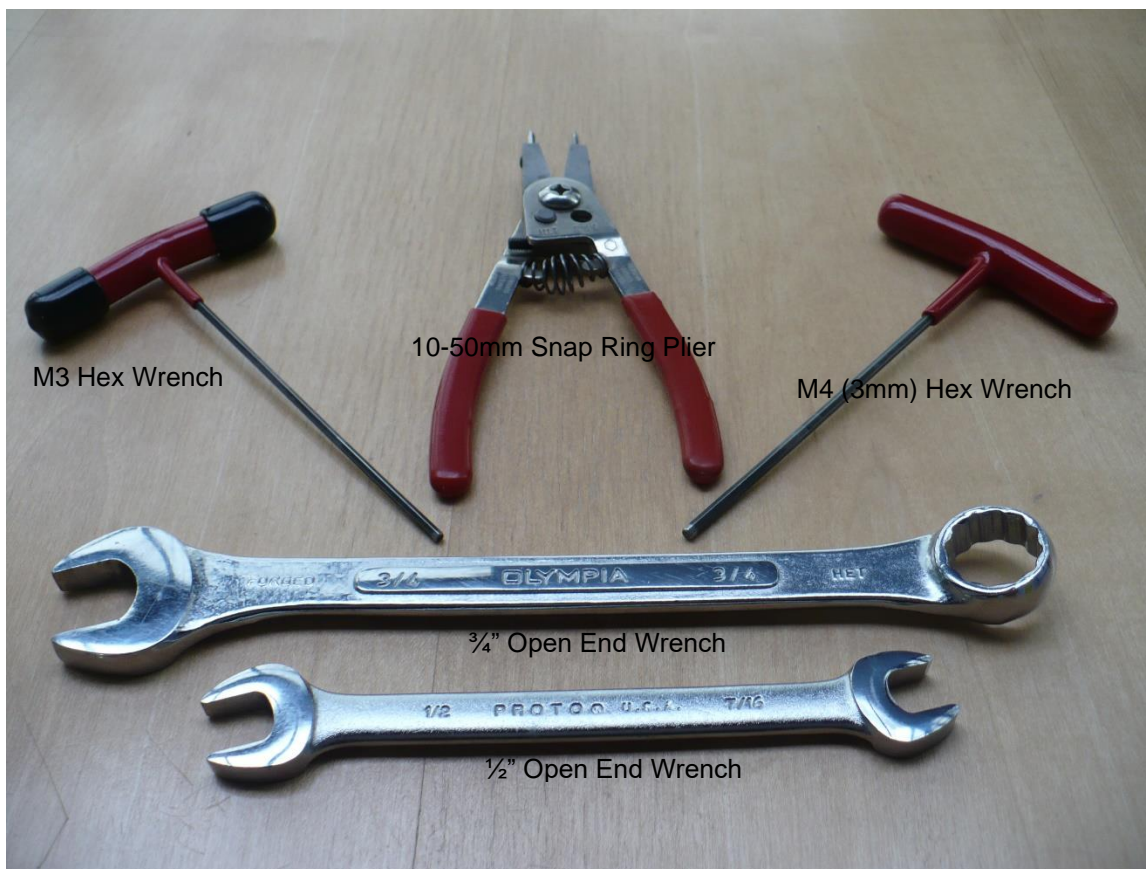
Operator/service certification

ASI pumps must be operated and serviced by appropriately trained and certified chemical technicians or process technicians.

- Operators and service technicians must read, understand and implement safety procedures and required periodic maintenance.
- All operator-serviceable items are accessible from the pump exterior. Operators must never open sheet-metal enclosure.
- All pump service tasks that are not explicitly listed as operator-serviceable must be performed by certified service technicians or ASI.
- All pump calibration shall be performed by properly trained and certified service technicians. Pump configuration or firmware alterations shall not be performed without specific prior approval of ASI.

⚠ Failure to observe these requirements may result in property-damage or personal-injury.

Required tools for routine service & maintenance



Routine Service & Maintenance

General service information

There are number of repairs and some replacement of parts that can be performed by the trained service rep or user. These are typical of many pumps used in Liquid Chromatography and are described in detail in this section. The repairs that may be addressed are associated with the pump mechanism itself and the hydraulics module. Electronics or pump drive repairs require factory service. However, service personnel may replace pump controllers, pressure transducer and spring housing.



WARNING

HAZARDOUS VOLTAGES ARE EXPOSED!

*All work that would require removal of the cover **MUST** be performed with the power cable unplugged from the instrument. Pump damage, personal injury may occur.*

Pump Head Repairs

1. Replacing the Wash Seals (ASI P/N: 540-1127)

- 1) Remove the 1/8" tube that connects the pump head to the purge valve housing.
- 2) Use M4 (3mm) hex wrench to remove the head and manifold from the piston assembly by unscrewing the four M4 x 50 screws that hold the head, manifold, and spring housing together (see figures 1-3).



Figure 1



Figure 2

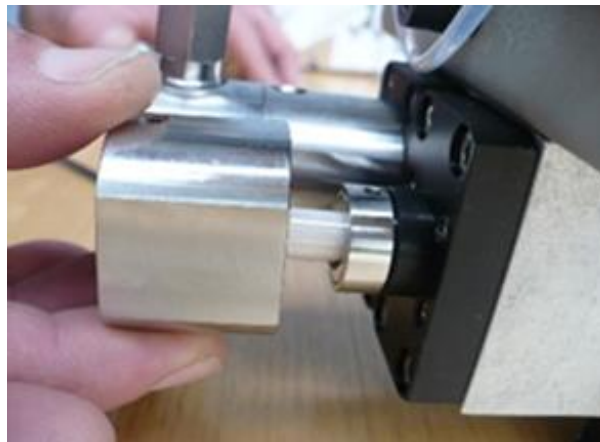


Figure 3

- 3) Remove the old wash seal from the manifold (this can be done with an old prep piston rod by inserting piston into the seal and tilting it (see figure 4).



Figure 4

- 4) Carefully press the new wash seal into the manifold with a suitable pressing device, preferably made of PEEK material (see figure 5). Note that the metal spring inside the seal should face outwards, towards to the front of the pump (see figure 6).



Figure 5



Figure 6

- 5) Reassemble manifold and pump head over the piston and replace and tighten the four M4 X 50 screws with their respective M4 split lock washer (see figures 2,3 and 7).



Figure 7

2. Replacing the Main Seals (ASI P/N: 540-1131)

- 1) Remove the 1/8" tube that connects the pump head to the purge valve housing.
- 2) Remove the head from the piston assembly by unscrewing the four M4 x 50 screws.
- 3) Remove the old main seal from the head (this can be done with an old prep piston rod by inserting piston into the seal and tilting it (figure 4).
- 4) Carefully press the new main seal into the pump head with a suitable pressing device, preferably made of PEEK material. Note that the metal spring inside the seal should face outwards, towards the front of the pump (see figure 6).
- 5) Reassemble the manifold and head over the piston and replace and tighten the four M4 x 50 socket cap screws with their respective M4 split lock washer (see figures 2,3, and 7).

Note: *If the seals are worn, then it is almost certain that the pistons will need to be replaced (especially if buffers are being used.) If the seal is badly worn, then the pump head will be contaminated with seal wear material. Remove the check valves from pump head and sonicate the head in a light soap solution for 30 minutes. Rinse thoroughly, then sonicate for 10 minutes in deionized water. Wet seal and pump head with IPA prior to reassembly. The inlet valve should be flushed with 50 mL of HPLC grade IPA or Water and inspected. When running buffers, it is essential to use the wash seal option.*

⚠ Caution: *Failure to periodically replace seals will result in leaks and inaccurate flow. Property damage and personal injury due to leak may result.*

3. Replacing Spring Housing Assembly (ASI P/N: 522-0010-05)

- 1) Remove old spring housing assembly, by unscrewing four M4 x 10 screws that hold it in place (see figure 8).
- 2) Reverse step #1 with new spring housing assembly.



Figure 8

4. Replacing the Pistons (ASI P/N: 522-1036)

- 1) Remove the head & manifold as described in the section above and remove the wash seal retainer. The face of the manifold is now exposed, along with the pistons

Note: As an alternative to removing the head and manifold, the piston can be replaced by just removing the snap-ring, pulling out the piston, and inserting a new one.

- 2) Using M4 (3mm) hex wrench, carefully unscrew the four M4 x 10 socket head cap screws that hold each spring housing assembly to the face of the pump. Since the two piston springs are in compression, within this assembly, it is best to back the screws out about one turn at a time, alternating from the left side to the right side and back again to the left side. When these screws are removed, the spring housing assembly is free to remove (see figure 9).

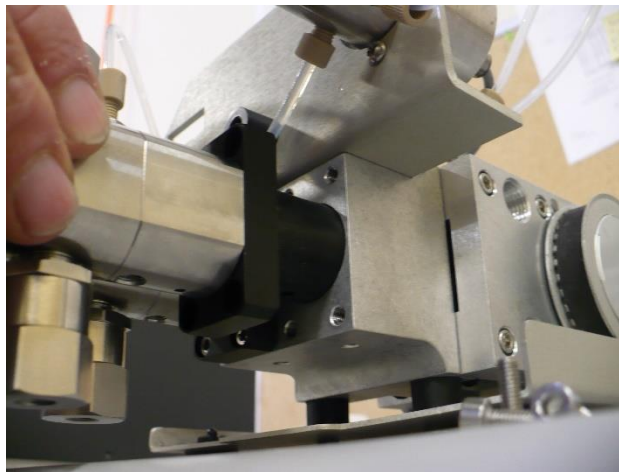


Figure 9

- 3) From the rear of the spring housings, remove the retaining ring with a snap ring plier. The pistons can now be removed (see figures 10 and 11).



Figure 10



Figure 11

- 4) Replace the pistons with new pistons by pressing piston down against spring, then replacing the retaining ring with the snap ring tool (see figures 12, 13 and 14).



Figure 12



Figure 13



Figure 14

- 5) Re-insert the spring housing using the (8) M4 x 10 socket head cap screws and retighten, by first tightening the left hand screws about one turn and then tightening the right hand screws about the same amount. During this operation, the face of the spring housing should be kept parallel to the face of the casting and the front panel of the pump. Continue tightening these screws as described until the spring housing is seated firmly against the machined face of the casting and the screws are fully tightened.
- 6) Replace the wash seal retainer over the piston (see figure 15).

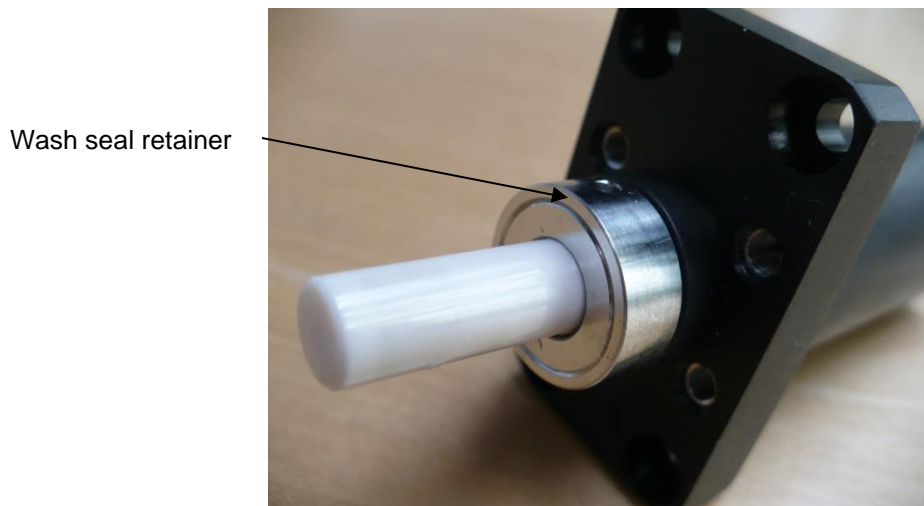


Figure 15

- 7) Replace the manifold and the head
- 8) Fully tighten the four M4x50 screws (with their respective split-lock washers) for each spring housing assembly.
- 9) Replace the tubing between the heads and purge valve assembly.

Note: It is not always obvious by visual inspection if a piston is worn or scratched. Use $\geq 10x$ magnification to look for a glazed appearance, or axial grooves and scratches. The piston is worn if any of these conditions are visible. If pistons are worn, then inspect piston seals. When running buffers, it is essential to use the wash seal option.



Warning

Failure to periodically inspect and replace pistons may result in inaccurate flows, erratic pressure, leaks, and premature failure of seals and check valves. Property damage may occur.

5. Replacing Outlet Check Valve Cartridge (ASI P/N: A500-1060)

- 1) Remove tubing from outlet housing
- 2) Use ½" open end wrench to unscrew the outlet housing
- 3) Remove the cartridge from the housing and replace with the new cartridge. Arrow on the cartridge corresponding to the direction of flow (see figure 16)



Figure 16

6. Replacing Inlet Check Valve Assembly (ASI P/N: 540-1069)

- 1) Unscrew the old check valve assembly with a ¾" wrench (figure 17).
- 2) Screw in the new inlet assembly, applying enough torque to fully tighten.

Note: For removal, use wrench on the upper part of the check valve assembly. On insertion use wrench on lower part of the check valve assembly. This will ensure that the two halves of the assembly are not unscrewed from each other.



Figure 17

Hydraulic Module Repairs

Replacing the Purge Valve Stem Assembly (500-3010)

Replacement of the purge valve assembly may become necessary if a leak develops. Remove the knob on the front of the purge valve/pulse damper assembly by loosening the set screw positioning the knob on the stem of the purge valve with 5/64" hex wrench (See figure 10). Removing the knob will expose the 1/2" nut on the front of the purge valve cartridge. Loosen the nut with a 1/2" open end wrench and remove the cartridge from the purge valve damper.

This purge valve cartridge assembly may be obtained from the factory. Consult with your sales representative.

- 1) First remove the knob on the purge valve by releasing the set screw with a 5/64 hex wrench (see figures 18 and 19).

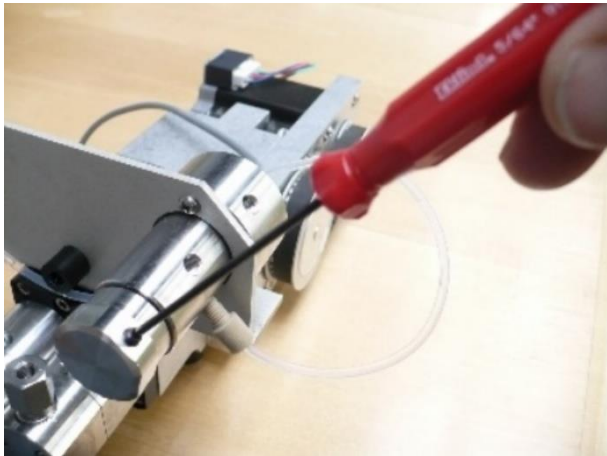


Figure 18



Figure 19

- 2) Remove the purge valve with a 1/2" open end wrench (see figure 20 and 21).



Figure 20



Figure 21

- 3) Check that neither the original gasket nor purge valve seat remain in the purge valve housing (see figure 22 and 23).



Figure 22



Figure 23

- 4) Screw in and tighten the replacement purge valve assembly with a 1/2" wrench.
- 5) Replace the knob, making sure that the hex set screw is positioned over the flat on the valve stem, and tighten (see figure 24).

Note: Ensure that a slight gap remains between the knob and purge valve housing. This ensures that the knob will be able to close the purge valve without "bottoming out" when turned fully clockwise.



Figure 24

Appendix

Trouble Shooting Remedy Table

Problem	Cause	Remedy
Inaccurate flow rate (Check pump hydraulics)	Air in head (note 1)	Run propanol for 45 minutes at 1000 psi or more to eliminate air from the head. Then switch to the desired mobile phase.
	Clogged inlet filter	Check that the solvent bottle filters are not clogged. When the pump is running against a load, note the pressure. Remove the solvent bottle filter from the end of the line. If the pressure increases, then it is likely that the filter is clogged. Replace with a new filter.
	Faulty check valve Worn seals (note 2)	Lift solvent filter from solvent, allow an air bubble to enter the intake line while the pump is running. Monitor the air bubble and check that it is proceeding upwards toward the pump head, in sync with the pump stroke. If the air bubble reciprocates (up and down) then the intake valve is faulty and needs to be replaced. If the bubble proceeds towards head without “slipping” back toward solvent bottle, then both inlet and outlet valves are functioning correctly. If the bubble does not move at all, then either the outlet valve is faulty or the main piston seals are faulty and should be replaced. Note this test is best performed while purging with No pressure against pump & with purge valve closed.
	Worn seals (note 2)	Check for leaks behind the main piston seals by inspecting the ¼ - 28 port at the bottom of the manifold. If Wash solvent has been used, then dry the area behind the seals with compressed air. A slight amount of solvent leakage is normal for serviceable seals, but if solvent is leaking enough to visibly drip, and then the seals should be replaced
	Worn pistons (note 4)	If the seals need to be replaced, then most likely the pistons are also worn. Unfortunately worn pistons are extremely difficult to check visually. If buffers are being used and the seals are worn, then it is almost certain that the pistons will need to be replaced. When running buffers, it is essential to use the wash option.

Trouble Shooting Remedy Table (continued)

Problem	Cause	Remedy
Erratic pressure	Dirty inlet valve	Remove inlet valve and flush with 50mL of clean HPLC grade solvent.
	Dirty outlet valve	Replace with new valve.
	Clogged solvent filter	Replace with new filter.
	Leak at solvent inlet line (note 3)	Tighten fitting or replace.
	Worn pump seal or piston	Replace seal. Inspect piston and replace if worn.
	Air in pump head (note 1)	Run propanol for 45 minutes at 1000 psi or more to eliminate air from the head. Then switch to the desired mobile phase.
	Not using degassed solvents	Degas, preferably using vacuum and sonication.
	Bubbles in inlet line	Degas solvent. Replace solvent inlet filter. Make sure solvent bottle still has solvent.
Pressure display remains at Zero when system is pressurizing	Pressure transducer cable connector fault	Contact ASI tech support or your distributor
Pressure display increases to some pressure, and drops to zero even though system is still pressurized	Incorrect pressure transducer zero offset	Contact ASI tech support or your distributor
Operating pressure is lower than normal	Worn seal (note 2) or piston (note 3)	Replace seal. Inspect piston and replace if worn.
	Air in pump head or intake line	Run propanol for 45 minutes at 1000 psi or more to eliminate air from the head. Then switch to the desired mobile phase.
	Clogged solvent inlet filter	Clean or replace with new filter
	Dirty inlet valve / outlet valve	Remove check valve and flush with 50 mL of clean HPLC grade solvent. Replace with new check valve, if needed.
	Leaky fitting	Tighten or replace fitting (note 5)

Trouble Shooting Remedy Table (continued)

Problem	Cause	Remedy
Seal life unusually short	Scratched piston (note 3)	Replace with new piston.
	Build-up of salts on piston	Always run DI water through the pump before shutting down for the day when running buffers. Install and use wash seal option.
	Mobile phase incompatible with seal material	Use a Teflon seal.
Frequent check valve failure	Contaminated solvent	Use clean HPLC grade solvent.
	No solvent filter	Always use 10 µm or finer solvent filter for Micro & Analytical pumps. Use 20 µm solvent filter for Semi-Prep & Prep pumps.
	Worn pump seal (note 2)	Replace seal. Inspect piston and replace if worn.
	Service life of check valves has been exceeded	Install new check valves.
Failure to prime	Excess back pressure in the pump head	Open purge valve, or open pump head fittings at outlet check valve.
	Check valve installed upside down	Verify that arrow on check valve body is aligned with the flow for both inlet and outlet check valves.
	Clogged solvent inlet filter	Clean or replace with new filter.

Note 1: This symptom is normal after replacing a pump seal or piston. Wet the seal and inside of the pump head with IPA to reduce the amount of time it takes to eliminate air from the head. When starting the pump after replacing the seals or pistons, it is advisable to run propanol for 30 minutes at a pressure between 500 and 3000 psi.

Note 2: If the seals are worn, then it is almost certain that the pistons will need to be replaced (especially if buffers are being used.) If the seal is badly worn, then the pump head will be contaminated with seal wear material. Remove the check valves from pump head and sonicate the head in a light soap solution for 30 minutes. Rinse thoroughly, then sonicate for 10 minutes in deionized water. Wet seal and pump head with IPA prior to reassembly. The inlet valve should be flushed with 50 mL of HPLC grade IPA or Water and inspected. **When running buffers, it is essential to use the wash seal option.**

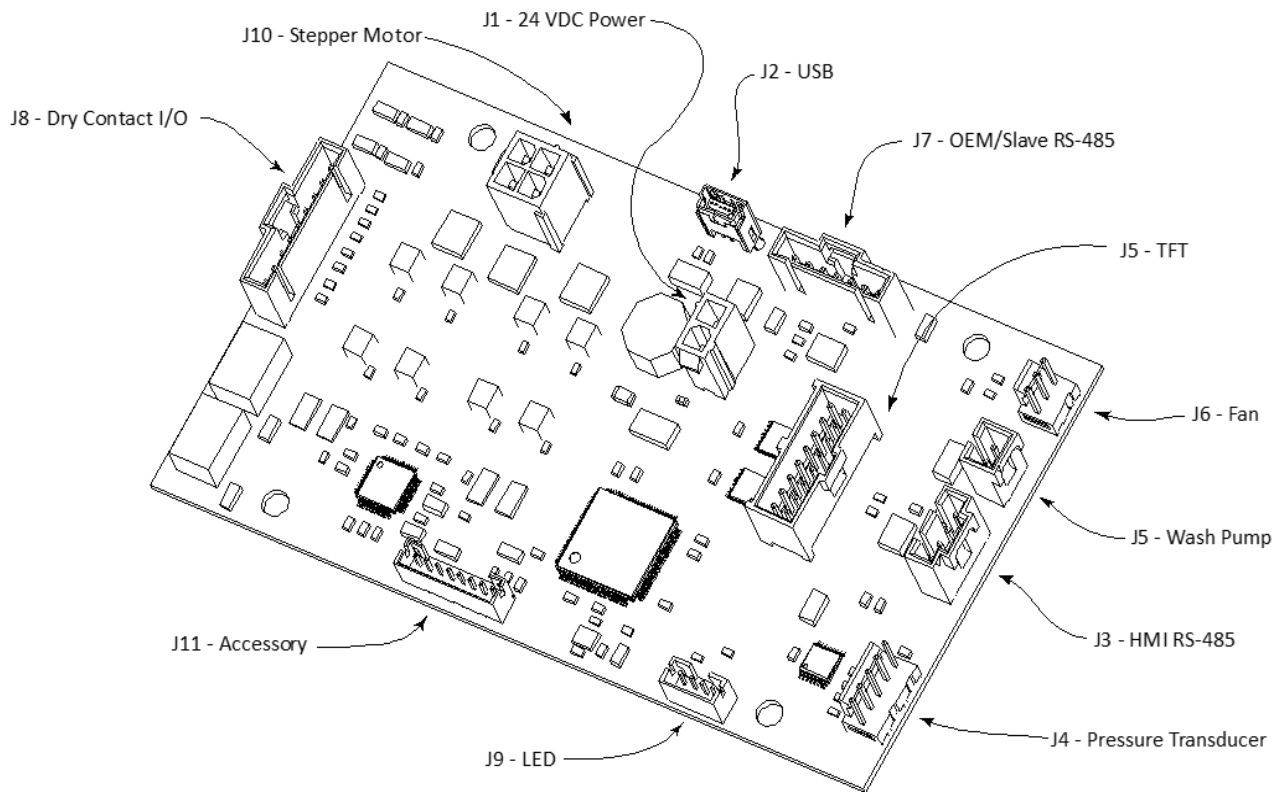
Note 3: It is not always obvious by visual inspection if a piston is worn or scratched. Use $\geq 10\times$ magnification to look for a glazed appearance, or axial grooves and scratches. The piston is worn if any of these conditions are visible. If pistons are worn, then inspect piston seals. When running buffers, it is essential to use the wash seal option.

Note 4: This problem may not be easy to detect. On the intake side of the pump there is a slight vacuum, so air will leak into the pump rather than solvent leaking out. There will be no visible sign of

a leak. To detect this problem, make sure that there is no air in the intake lines, then open the outlet fitting and watch for air bubbles coming out (place a drop of solvent at the outlet fitting to observe air bubbles). If you continue to observe air bubbles after 60 seconds, then air is probably entering the head from the inlet fitting, a leaky pump seal, or insufficiently tightened inlet housing.

Note 5: If a slight amount of additional tightening does not slow stop the leak, replace the fitting. Over-tightening the fitting can damage the seat, strip the threads, or worse, cause the nut to shear off. Never exceed 15 in-lbs. of torque.

Electronics, connector pins & relay contacts



Reference table below. Connector & pin labels are silkscreened on PCBA

Pump Controller PCBA Connectors & Pins

Figure ID Number	Pin Number	Function	Description & Connector Part Number
J1 24 VDC Power	1	+24 Volt power	Housing Molex # 0039012020
	2	0V power supply return	Terminal Molex # 0039000184
J2 USB	1	V Bus	Connector – any USB-compliant Mini-B Plug
	2	D-	
	3	D+	
	4	ID	
	5	GND	
J3 HMI	1	+ 5V	Housing Molex #0050579404 Terminal Molex #16020082
	2	RS-485 A+	
	3	RS-485 B-	
	4	GND	
J4 Pressure Transducer	1	Excitation + (5 VDC)	Housing Molex #0022013057 Terminal Molex #0008550130
	2	Excitation -	
	3	Signal -	
	4	Signal +	
	5	GND (for DJ transducers)	
J5 Wash Pump	1	Pump +	Housing Molex #0050579402 Terminal Molex #16020082
	2	Pump – DO NOT CONNECT TO POWER SUPPLY NEGATIVE	
J6 Fan	1	GND, Fan negative, Black	Housing Molex #0022012037 Terminal Molex #0008550130
	2	+24V Fan positive, Red	
	3	Tachometer, Yellow	
J7 OEM RS-485	1	+ 5V	Housing Molex #0050579407 Terminal Molex #16020082
	2	RS-485 A+	
	3	Tie to pin 4 to enable terminator	
	4	RS-485 B-	
	5	GND (Signal reference)	
	6	GND (Power supply return)	
	7	+ 24 VDC	
J8 Dry Contact Inputs and Outputs	1	+5 VDC to energize dry-contacts or negative terminal of external input supply.	Housing Molex #50579409 Terminal for AWG 22-24 Molex #0016020087 Terminal for AWG 24-30 Molex #0016020082
	2	Input 1 +	
	3	Input 2 +	
	4	Input 3 +	
	5	Input 4 +	
	6	Output 1 +	
	7	Output 1 -	
	8	Output 2 +	
9	Output 2 -		

Figure ID Number	Pin Number	Function	Description & Connector Part Number
J9 LEDs	1	Red Anode / Green Cathode	Housing JST PN PHR-4 Terminal JST PN SPH-002GW-P0.5L
	2	Red Cathode / Green Anode	
	3	Blue Anode / Yellow Cathode	
	4	Blue Cathode / Yellow Anode	
J10 Motor	1	Phase A + Stepper Motor Pin 6, wire Green	Housing Molex # 0039012040 Terminal Molex #0039000075 Molex Drawing SD-5557-003
	2	Phase A – Stepper Motor Pin 4, wire Black	
	3	Phase B + Stepper Motor Pin 1, wire Blue	
	4	Phase B – Stepper Motor Pin 2, wire Red	

Replacement Parts List

ASI Part No.	Replacement parts for ASI Pump 540 series
500-1196	Outlet Housing, ASI Model 500 Analytical, Semi-prep and Prep Head, ASI Model 520 & 540 Semi-prep Head
500-1196P	Outlet Housing, ASI Model 520, 540 Semi-prep PEEK Head
500-1196-2	Outlet Housing, ASI Model 520 & 540 Prep Head
500-1910P	Inlet Housing for ASI Model 520 and 540, Semi-prep PEEK Head and Outlet Housing for ASI Model 520 and 540, Prep PEEK Head
500-1910-1	ASI 520 & 540 Series Semi-Prep Pump Head, Inlet Housing
500-1911P	Inlet Housing for ASI Model 520 and 540, Prep PEEK Head
500-1911-1	ASI 520 & 540 Series Prep Pump Head, Inlet Housing
500-2135-01	ASI 500, 520 & 540 Series, Solvent Inlet Line Assembly for Analytical and Micro Pumps
500-2135-02	ASI 500, 520 & 540 Series, Solvent Inlet Line Assembly for Semi-Prep Pumps
500-2135-03	ASI 500, 520 & 540 Series, Solvent Inlet Line Assembly for Prep Pumps
500-3010	Purge Valve Assembly
A500-1009-U-2	Piston Seal Assembly, UHMW-PE, Varian 212 LC, ASI Model 500, 520 & 540 Micro Head /pkg 2
A500-1009-U-10	Piston Seal Assembly, UHMW-PE, Varian 212 LC, ASI Model 500, 520 & 540 Micro Head /pkg 10
A500-1023-02	Wash Seal Assembly, UHMW-PE, Varian 212 LC, ASI Model 500, 520 & 540 Micro Head /pkg 2
A500-1023-10	Wash Seal Assembly, UHMW-PE, Varian 212 LC, ASI Model 500, 520 & 540 Micro Head /pkg 10
A500-1050	Inlet/Outlet Cartridge for ASI Model 500 Analytical Head Outlet Cartridge for ASI Model 520 & 540 Semi-prep Head
A500-1050ACN	Inlet/Outlet Cartridge for ASI Model 500 Analytical Head Outlet Cartridge for ASI Model 520 & 540 Semi-prep Head
A500-1054	Outlet Check Valve Assembly, ASI Model 500 Analytical Head and ASI Model 520 & 540 Semi-prep Head
A500-1054ACN	Outlet Check Valve Assembly, ASI Model 500 Analytical Head and ASI Model 520 & 540 Semi-prep Head
A500-1060	Inlet Cartridge for ASI Model 500, 520 & 540 Semi-prep Head and ASI Model 500 Prep Head, Inlet/Outlet Cartridge for Model 520 & 540 Prep Head
A500-1060ACN	Inlet Cartridge for ASI Model 500, 520 & 540 Semi-prep Head and ASI Model 500 Prep Head, Inlet/Outlet Cartridge for Model 520 & 540 Prep Head
A002-2013	Pump Controller Board
522-0002	ASI 520 & 540 Series Frame Drive Assembly with Motor, for Micro and Analytical Pump
522-0002-02	ASI 520 & 540 Series Frame Drive Assembly with Motor, for Semi-Prep and Prep Pump
522-0010-01	ASI 520 & 540 Series Spring Housing Assemblies with Analytical Pump Head, Primary, SST
522-0010B-01	ASI 520 & 540 Series Spring Housing Assemblies with Analytical Pump Head, Primary, PEEK
522-0010T-01	ASI 520 & 540 Series Spring Housing Assemblies with Analytical Pump Head, Primary, Titanium

522-0010-03	ASI 520 & 540 Series Spring Housing Assemblies with Semi-Prep Pump Head, Primary, SST
522-0010B-03	ASI 520 & 540 Series Spring Housing Assemblies with Semi-Prep Pump Head, Primary, PEEK
522-0010T-03	ASI 520 & 540 Series Spring Housing Assemblies with Semi-Prep Pump Head, Primary, Titanium
522-0010-05	ASI 520 & 540 Series Spring Housing Assemblies with Prep Pump Head, Primary, SST
522-0010B-05	ASI 520 & 540 Series Spring Housing Assemblies with Prep Pump Heads, Primary, PEEK
522-0010T-05	ASI 520 & 540 Series Spring Housing Assemblies with Prep Pump Head, Primary, Titanium
522-0010-07	ASI 520 & 540 Series Spring Housing Assemblies with Micro Pump Head, Primary, SST
522-0010B-07	ASI 520 & 540 Series Spring Housing Assemblies with Micro Pump Head, Primary, PEEK
522-0010T-07	ASI 520 & 540 Series Spring Housing Assemblies with Micro Pump Head, Primary, Titanium
522-0011-02	ASI 520 & 540 Series Spring Housing Assemblies with Analytical Pump Head, Damping, SST
522-0011T-02	ASI 520 & 540 Series Spring Housing Assemblies with Analytical Pump Head, Damping, Titanium
522-0011-08	ASI 520 & 540 Series Spring Housing Assemblies with Micro Pump Head, Damping, SST
522-0011T-08	ASI 520 & 540 Series Spring Housing Assemblies with Micro Pump Head, Damping, Titanium
522-1005K	ASI 520 & 540 Series Wash Kit for Analytical Pump Head, Isocratic
522-1015K	ASI 520 & 540 Series Wash Kit for Analytical Pump Head, Gradient
522-1015-02-10	Retainer, Wash Seal, PK/10
522-1021-10	Retaining, Spring, PK/10
522-1023K	ASI 520 & 540 Series Wash Kit for Micro Pump Head, Isocratic
522-1033	Piston Ceramic, ASI Model 520 & 540 Micro Head
522-1033K	ASI 520 & 540 Series Wash Kit for Micro Pump Head, Gradient
522-1034	Piston Sapphire, ASI Model 520 & 540 Analytical Head
522-1035	Piston Sapphire, ASI Model 520 & 540 Semi-prep Head
522-1036	Piston Ceramic, ASI Model 520 & 540 Prep Head
522-1039-10	Spring, PK/10
522-1051	Inlet Housing, ASI Model 520 & 540 Micro and Analytical Head
522-1051P	Inlet/Outlet Housing, ASI Model 520 and 540 for Micro and Analytical PEEK Head
522-1052	Outlet Housing, ASI Model 520 & 540 Micro and Analytical Head
522-1054P	Outlet Check Valve Assembly, ASI Model 520 and 540 Semi-prep PEEK Head
522-1057	ASI 520 & 540 Series, Intake Tube & Fittings for Micro & Analytical Pump
522-1059	ASI 520 & 540 Series Outlet Tube & Fittings for Micro, Analytical & Semi-Prep Pump
522-1060	ASI 520 & 540 Series Outlet Tube & Fittings for Prep Pump
522-1062	Inlet Check Valve Assembly, ASI Model 520 & 540 Semi-Prep Head
522-1062ACN	Inlet Check Valve Assembly, ASI Model 520 & 540 Semi-Prep Head
522-1062P	Inlet Check Valve Assembly for ASI Model 520 and 540 Semi-prep PEEK Head
522-1064	Inlet Check Valve Assembly, ASI Model 520 & 540 Micro and Analytical Head

522-1064ACN	Inlet Check Valve Assembly, ASI Model 520 & 540 Micro and Analytical Head
522-1064P	Inlet Check Valve Assembly, ASI Model 520 and 540 for Micro and Analytical PEEK Head
522-1065	Outlet Check Valve Assembly, ASI Model 520 & 540 Micro and Analytical Head
522-1065ACN	Outlet Check Valve Assembly, ASI Model 520 & 540 Micro and Analytical Head
522-1065P	Outlet Check Valve Assembly, ASI Model 520 and 540 for Micro and Analytical PEEK Head
522-1066	Outlet Check Valve Assembly, ASI Model 520 & 540 Prep Head
522-1066ACN	Outlet Check Valve Assembly, ASI Model 520 & 540 Prep Head
522-1066P	Outlet Check Valve Assembly for ASI Model 520 and 540, Prep PEEK Head
522-1067	Inlet Check Valve Assembly, ASI Model 520 & 540 Prep Head
522-1067ACN	Inlet Check Valve Assembly, ASI Model 520 & 540 Prep Head
522-1067P	Inlet Check Valve Assembly for ASI Model 520 and 540, Prep PEEK Head
522-1072	Small Pulley
522-1073	Large Pulley
522-1075	Drive Belt
522-1090	ASI 520 & 540 Series Transfer Tube with fittings for Micro Pump
522-1091	ASI 520 & 540 Series Transfer Tube with fittings for Analytical Pump
522-1092	ASI 520 & 540 Series Transfer Tube with fittings for Semi-Prep Pump
522-1093	ASI 520 & 540 Series Transfer Tube with fittings for Prep Pump
522-1094	ASI 520 & 540 Series Crossover Tube with fittings for Micro Pump
522-1095	ASI 520 & 540 Series Crossover Tube with fittings for Analytical Pump
522-1096	ASI 520 & 540 Series Crossover Tube with fittings for Semi-Prep Pump
522-1097	ASI 520 & 540 Series Crossover Tube with fittings for Prep Pump
522-1129-2	Piston Seal, Wash Seal Assembly, UHMW-PE, ASI Model 520 & 540 Analytical Head /pkg 2
522-1129-10	Piston Seal, Wash Seal Assembly, UHMW-PE, ASI Model 520 & 540 Analytical Head /pkg 10
522-1130-2	Piston Seal, Wash Seal, UHMW-PE, ASI Model 520 & 540 Semi-prep Head /pkg 2
522-1130-10	Piston Seal, Wash Seal, UHMW-PE, ASI Model 520 & 540 Semi-prep Head /pkg 10
522-1240	Inlet Cartridge for ASI Model 520, 540 Semi-prep PEEK Head and Inlet/Outlet Cartridge for Model 520, 540 Prep PEEK Head
522-1752	Inlet/Outlet Cartridge for ASI Model 520 and 540 for Micro and Analytical PEEK Head
522-1752NS	Outlet Cartridge for ASI Model 520 and 540 Semi-prep PEEK Head
522-1975	Inlet/Outlet Cartridge for ASI Model 520 & 540 Micro and Analytical Head
522-1975ACN	Inlet/Outlet Cartridge for ASI Model 520 & 540 Micro and Analytical Head
522-2128	Piston Seal, Wash Seal with Hastelloy spring, UHMW-PE, ASI Model 520 & 540 Semi-prep Head /each
522-4012	Pressure Transducer Assembly
522-HO75SS-10	Retaining Ring, PK/10
540-1127-2	Piston Wash Seal, UHMW, ASI Model 540, Prep Head /pkg 2
540-1127-10	Piston Wash Seal, UHMW, ASI Model 540, Prep Head /pkg 10
540-1131-2	Piston Main Seal, ASI Model 540, Prep Head, Teflon / pkg 2
540-1131-10	Piston Main Seal, ASI Model 540, Prep Head, Teflon / pkg 10

