

Print Head Recovery Quick Guide with Print Head Doctor 4

WARNING: Print heads can be damaged by excessive use of ultrasound, pressure, temperature and aggressive chemicals. It is always a good idea to minimize the risk of a print head damage by using no ultrasound, low pressures, low temperatures and using less aggressive recovery fluids (1X, 1UV, 1DX, 1W). If no progress can be made this way, you can start introducing short periods of ultrasound, warming up the fluids, and using more aggressive chemicals.

Print Head Sensitivity

Here is the list of print heads sorted by sensitivity in an ascending order. Less sensitive print heads can handle more pressure, temperature, ultrasound and chemistry. Less sensitive heads can be cleaned starting with Step 3 below. Others should go through steps 1 and 2. If you are working with Epson heads, please read the Quick Guide for Epson head recovery with PHD4, as these heads are way too sensitive and require extra care.

Spectra S-class (SL128, SM128, SE128)	Very low sensitivity.	Spectra Q-Class	Medium to high sensitivity.
Spectra Nova and Galaxy	Low sensitivity.	Ricoh Gen4	Medium to high sensitivity.
Konica-Minolta KM512	Medium sensitivity.	Xaar 500	Medium to high sensitivity.
Konica-Minolta KM256	Medium sensitivity.	Xaar 1001	Medium to high sensitivity.
Konica-Minolta KM1024	Medium sensitivity.	Kyocera KJ	High sensitivity.
Xaar 128	Medium sensitivity.	HP Aprion	High sensitivity.
Seiko SPT510 and SPT508	Medium sensitivity.	Epson DX4	Very high sensitivity.
HP X2	Medium sensitivity.	Epson DX5	Very high sensitivity.
Hitachi (Ricoh) Gen3	Medium sensitivity.	Epson - all other models	Very high sensitivity.
		Canon PF-03	Very high sensitivity.

Explanation of the Recovery Cycles

Dr - Drain Cycle - is used to empty the tank, or when you need to pump fluids in a forward direction for a short time.

Ar - Air Cycle - is used to purge the fluid out of the internal filter and tubing. Do not start Air cycle when a print head is connected, as it will over-pressurize it.

C1 - Combined Normal Cycle - will do a Thru-head flushing*, then Reverse flushing with a suction** method, then forward flushing. It uses ultrasound 30% of the time.

F1 - Forward Normal Cycle - will pump the fluid in a forward direction (i.e. forward flush) with 30% of ultrasonic time.

R1 - Reverse Normal Cycle - will reverse flush the print head using suction, with 30% of ultrasound.

C2 - Combined Normal 2 Cycle - will reverse flush and then forward flush the print head. 30% of ultrasound.

F2 - Forward Easy Cycle - forward flushes your print head without using any ultrasound.

R2 - Reverse Easy Cycle - reverse flushes your print head with a suction method without any ultrasound.

C3 - Combined Easy Cycle - same as Combined Normal but without any ultrasound.

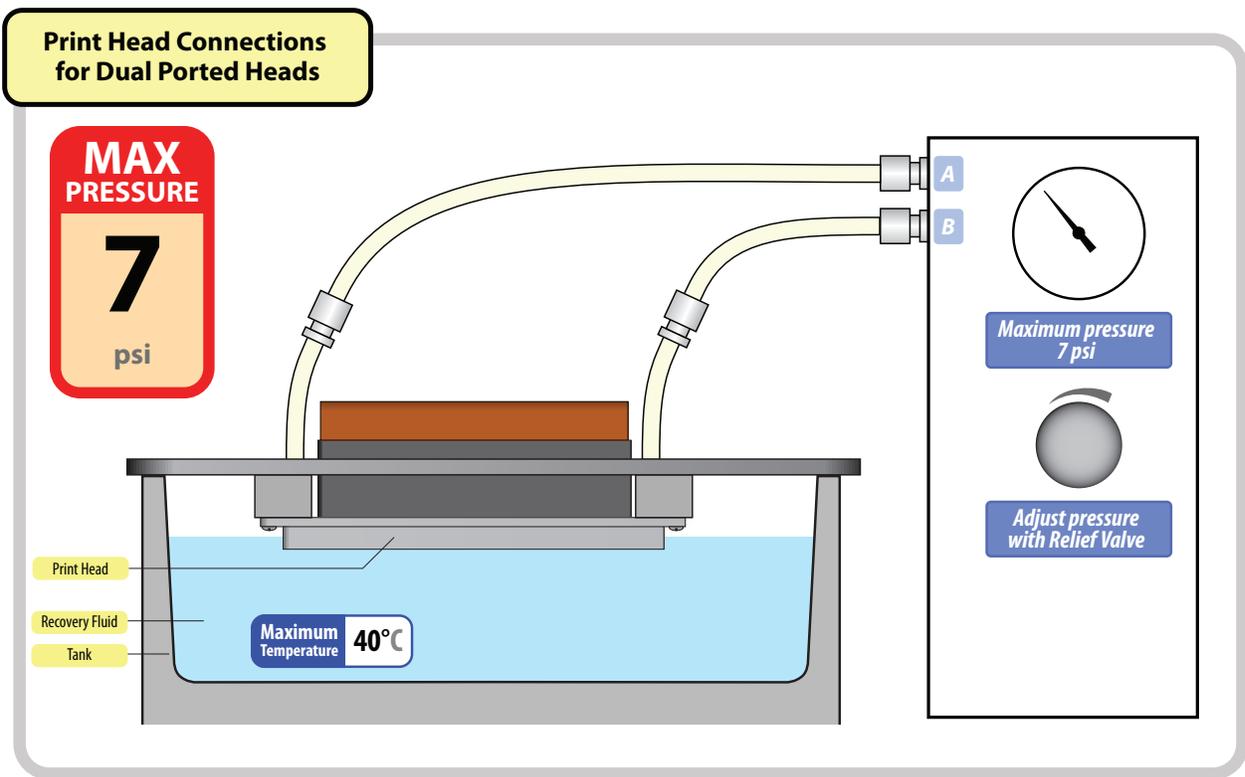
Notes: * Thru-head flushing will run the fluid through the print head by pumping it into one port, and letting it drain from the other port with no resistance. This way we get to flush the insides of a print head without pressurizing the nozzles. ** Suction method of reverse flushing will apply vacuum to print head ports and will suck the fluid out. The fluid will enter the print head from the nozzles and will run upwards, flushing it out. Please note that this method will partially block the nozzles because the impurities in the solution will be sucked in the nozzles, but this is a very light blockage that can be recovered by a short forward flushing cycle.

Useful Tips

Protect your print head's electronics from the fluids. Wrap the areas where fluids may get on the electronics with tape. Make sure that the print head is submerged into the fluid by only 3mm (1/8") and not deeper.

Do not clean your print head for too long. One hour a day will be enough. Purge the print head with a weak flush and then with air, and let it sit for a day without any fluids inside. Before installing the print head on your printer, test the nozzles by pushing the flushing solution that came with your ink through the print head using a syringe. Do not apply too much pressure. Once you see the nozzles are in a good condition, put the head on the printer. Otherwise you'll need to re-flush it.

Do not use alcohol to clean the electronics of a print head. If you want to remove moisture from the electronic parts, use the spray-on Contact Cleaner that can be found in automotive parts stores.



Print Head Recovery Steps for Dual Ported Print Heads

Step 1. Light Flushing of Sensitive Print Heads

We will attempt to unclog your print head the safest way possible. Use fluid # 1X for solvent print heads, or 1UV for UV curable, or 1W for water-based ones. Do not set the temperature, but watch it not to exceed 30°C. Set up your print head as shown on the picture. Open the relief valve. Start Drain cycle and watch the Print Head Pressure. Using the Relief Valve, adjust the pressure to be around 6 psi. Lift the print head for a moment to see the condition of the nozzles. Stop the cycle. Now start the C3 (Combined Easy) cycle and stop it after 2...3 minutes. Start the F2 (Forward Easy) cycle and let it run for 15 minutes. Watch the pressure: it should never exceed 7 psi. Adjust it when necessary. Check the nozzles. If you see an obvious progress, continue with the forward flushing for another full F2 cycle. If no progress has been observed, move on to Step 2.

Step 2. Medium Strength Flushing of Sensitive Print Heads

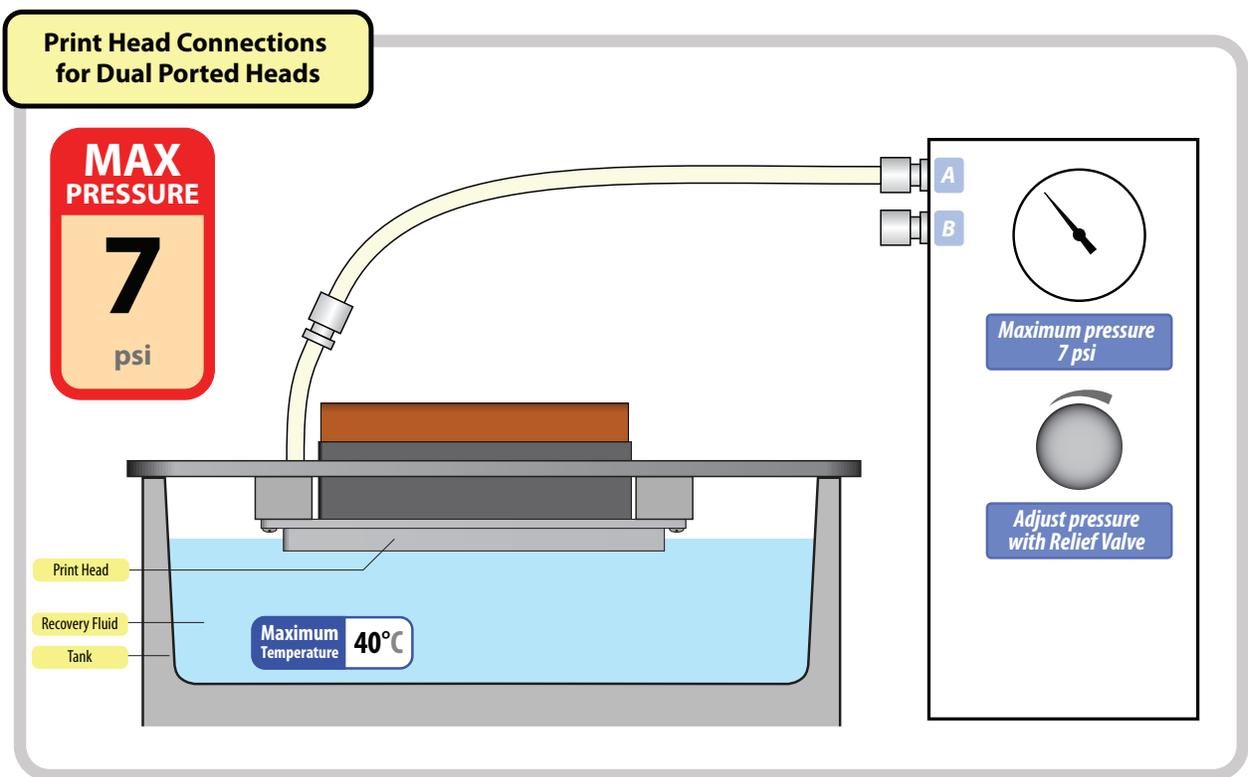
Continue with the less aggressive recovery fluid (#1). Start C3 (Combined Easy) cycle and while it's running, turn on the ultrasound for 30 seconds. Stop the cycle after 2 minutes. Start F2 (Forward Easy) cycle and turn on the ultrasound for 30 seconds while it's running. Stop the cycle after 10 minutes. Always keep an eye on the forward pressure (7 psi max). Re-check the nozzles and if there was no progress, move on to Step 3.

Step 3. Powerful Flushing of Robust Print Heads

Please note that this process poses a higher risk for sensitive print heads.

Run C1 (Combined Normal) cycle for a full length of it. Re-check the nozzles. If you see a great deal of improvement, run the full F1 (Forward Normal) Cycle. If no further progress is observed, change the recovery fluid to the next one, following the Fluid Changeover Instructions contained in a separate document. Repeat the F1 cycle with the new fluid. Robust print heads can handle as much as 4 hours of continuous flushing, while other heads should be flushed for no longer than 1...2 hours per day. If no improvement is taking place after each cycle, it means that the recovery fluid should be changed to another one.

When you're done cleaning a print head, flush it out with fluid 1X (or a distilled water for water-based heads), and fill it with the flushing solution that comes with your ink.



Print Head Recovery Steps for Single Ported Print Heads

Step 1. Light Flushing of Sensitive Print Heads

We will attempt to unclog your print head the safest way possible. Use fluid # 1X for solvent print heads, or 1UV for UV curable, or 1W for water-based ones. Do not set the temperature, but watch it not to exceed 30°C. Set up your print head as shown on the picture above. Open the relief valve. Start Drain cycle and watch the Print Head Pressure. Using the Relief Valve, adjust the pressure to be around 6 psi. Lift the print head for a moment to see the condition of the nozzles. Stop the cycle. Now start the R2 (Reverse Easy) cycle and stop it after 2...3 minutes. Start the F2 (Forward Easy) cycle and let it run for 15 minutes. Watch the pressure: it should never exceed 7 psi. Adjust it when necessary. Check the nozzles. If you see an obvious progress, continue with the forward flushing for another full F2 cycle. If no progress has been observed, move on to Step 2.

Step 2. Medium Strength Flushing of Sensitive Print Heads

Continue with the less aggressive recovery fluid (#1). Start R2 (Reverse Easy) cycle and while it's running, turn on the ultrasound for 30 seconds. Stop the cycle after 2 minutes. Start F2 (Forward Easy) cycle and turn on the ultrasound for 30 seconds while it's running. Stop the cycle after 10 minutes. Always keep an eye on the forward pressure (7 psi max). Re-check the nozzles and if there was no progress, move on to Step 3.

Step 3. Powerful Flushing of Less Sensitive Print Heads

Please note that this process poses a higher risk for sensitive print heads.

Run C2 (Combined Normal 2) cycle for a full length of it. Re-check the nozzles. If you see a great deal of improvement, run the full F1 (Forward Normal) Cycle. If no further progress is observed, change the recovery fluid to the next one, following the Fluid Changeover Instructions contained in a separate document. Repeat the F1 cycle with the new fluid. Robust print heads can handle as much as 4 hours of continuous flushing, while other heads should be flushed for no longer than 1...2 hours per day. If no improvement is taking place after each cycle, it means that the recovery fluid should be changed to another one.

When you're done cleaning a print head, flush it out with fluid 1X (or a distilled water for water-based heads), and fill it with the flushing solution that comes with your ink.

