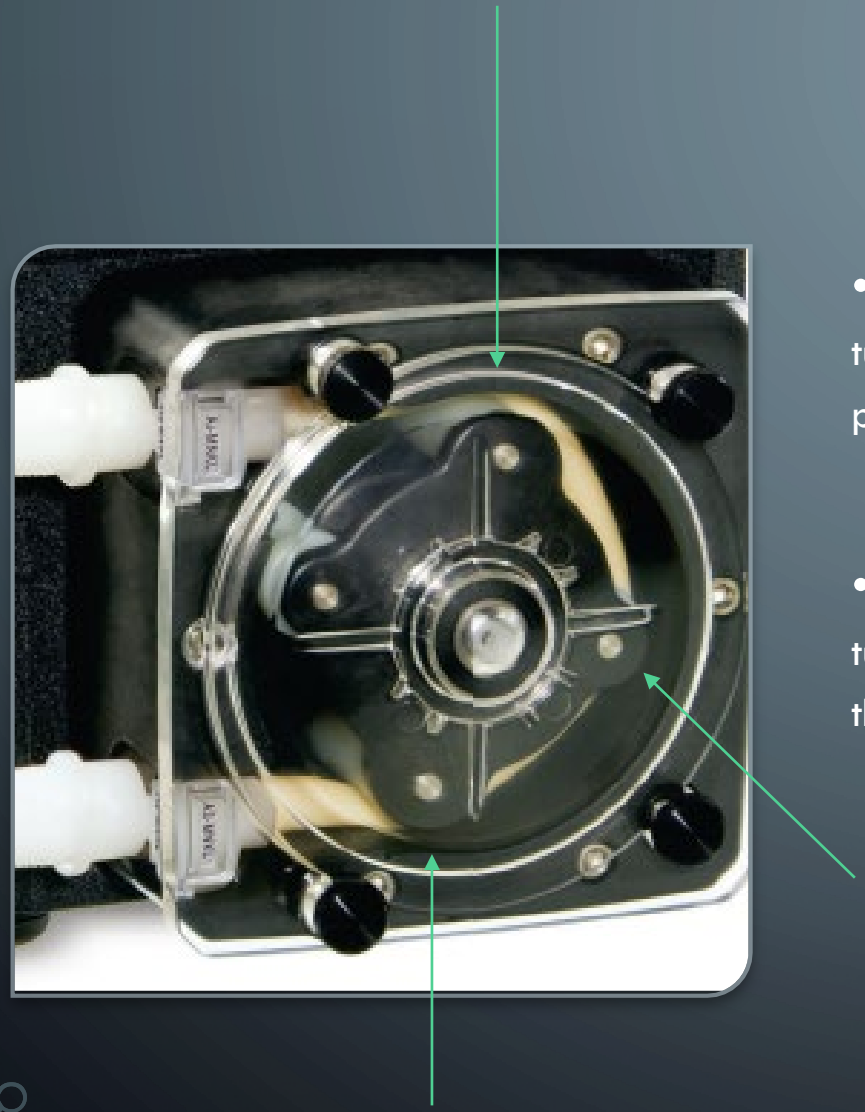
CHEMICAL METERING PUMP MAINTENANCE

BY MARK WOLF

PERISTALTIC PUMPS

- There are many different brands of peristaltic metering pumps, but all operate in much the same way, and as such have common maintenance points and issues.



- The most common and frequent routine maintenance point is the pump tube itself. This is the point of contact which propels the chemical being pumped to its injection point.

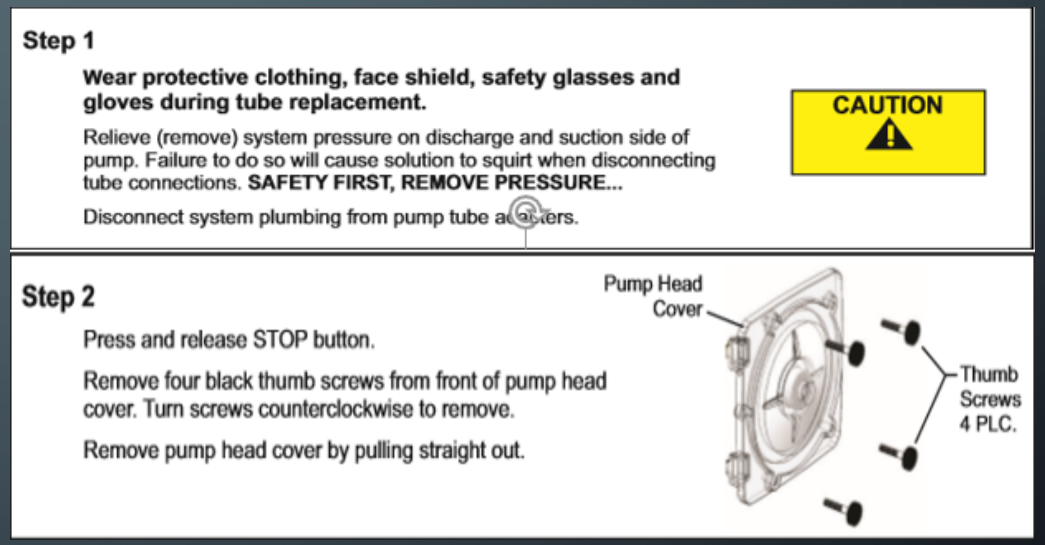
- The frequent cycling of the roller assembly eventually wears out the tube. If it is not preemptively replaced a chemical leak will occur inside the pump housing.

TUBE LIFE TIMER

- Most peristaltic pumps as a result, come equipped with a tube life timer.
- The manufacturer provides an estimated tube life based on material of the tube and chemical being pumped, but the most effective way to prevent leaks is to monitor your specific system and figure out where the typical failure point is. Once this is known you can monitor the tube life timer and replace the tube before it breaks.

REPLACEMENT OF PUMP TUBES

- Replacing a pump tube from one peristaltic brand to another is very similar.
- The following is an example of tube replacement on an M2 metering pump.



Step 1

Wear protective clothing, face shield, safety glasses and gloves during tube replacement.

Relieve (remove) system pressure on discharge and suction side of pump. Failure to do so will cause solution to squirt when disconnecting tube connections. **SAFETY FIRST, REMOVE PRESSURE...**

Disconnect system plumbing from pump tube adapters.

CAUTION

Step 2

Press and release STOP button.

Remove four black thumb screws from front of pump head cover. Turn screws counterclockwise to remove.

Remove pump head cover by pulling straight out.

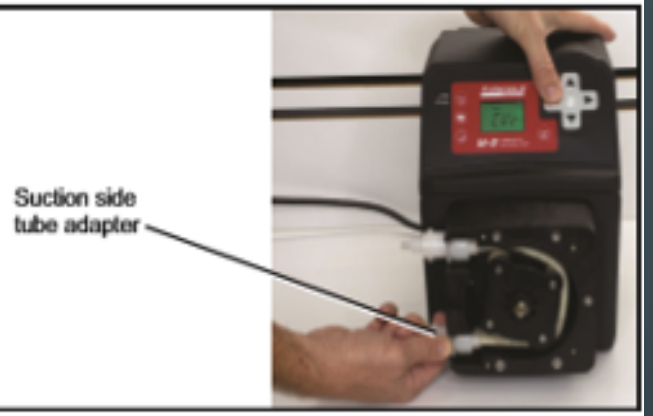
Step 3

With pump stopped, securely grab hold of suction side of tube adapter.

CAUTION! Keep fingers away from rollers and rotor.

Press and release START button to allow rotation of rotor.

Gently pull suction side tube adapter out, away from pump.



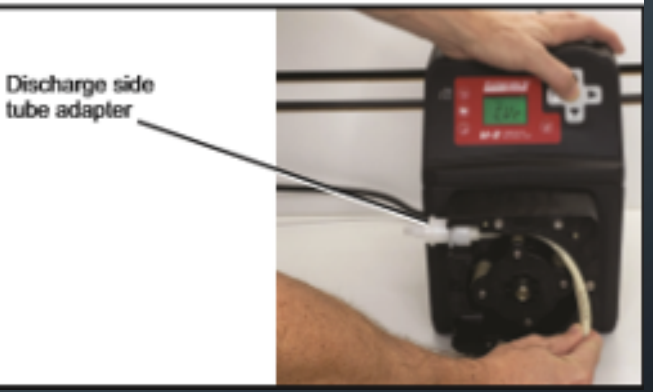
Step 4

Continue to pull suction side adapter out of pump head while rotor is in rotation.

Press and release STOP button.

Carefully pull discharge side of tube adapter out of pump head.

Dispose of used tubing properly.



INSTALLATION OF NEW TUBE ASSEMBLY

Step 1

Press and release stop button to ensure pump is stopped.

With pump stopped, press suction side of tube adapter securely into pump head.

Clip Tube Installation Tool to discharge side of tube adapter.

Always keep fingers away from rollers and rotor.

Step 2

Your hand should only come in contact with installation tool.

Press and release START button.

Use installation tool to leverage tubing into pump head while rotor is rotating.

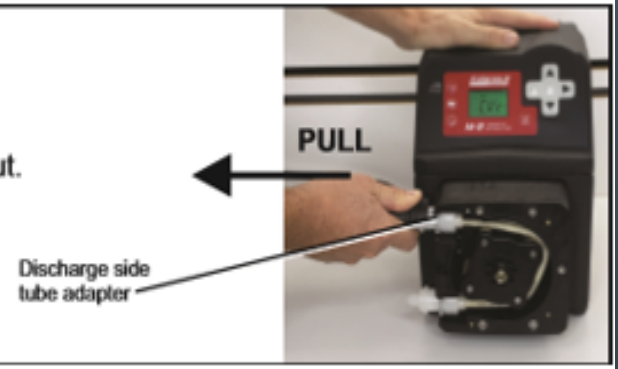
Step 3

Continue to hold onto installation tool.

Allow rotor to rotate a few times, this will stretch tubing out.

After a few rotations, pull installation tool and tubing in direction of rotation.

Press discharge side of tube adapter securely into pump head.

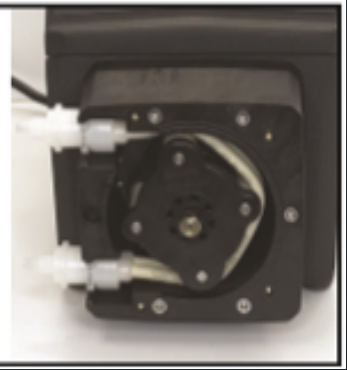


Step 4

Press and release STOP button on pump.

Suction and discharge tube adapter ends should be securely held in place on pump head as illustrated in photo.

Secure pump head cover to pump head using four black thumb screws.



ROUTINE MAINTENANCE AND INSPECTION

Pump requires very little maintenance. However, pump and all accessories should be checked weekly. This is especially important when pumping chemicals. Inspect all components for signs of leaking, swelling, cracking, discoloration or corrosion. Replace worn or damaged components immediately.

Cracking, crazing, discoloration during first week of operation are signs of severe chemical attack. If this occurs, immediately remove chemical from pump. Determine which parts are being attacked and replace them with parts that have been manufactured using more suitable materials. Manufacturer does not assume responsibility for damage to pump that has been caused by chemical attack.

- When changing pump tube assembly, pump head chamber, roller assembly and pump head cover should be wiped free of any dirt and debris.

- Periodically clean injection/check valve assembly, especially when injecting fluids that calcify such as sodium hypochlorite. These lime deposits and other build ups can clog fitting, increase back pressure and interfere with check valve operation.

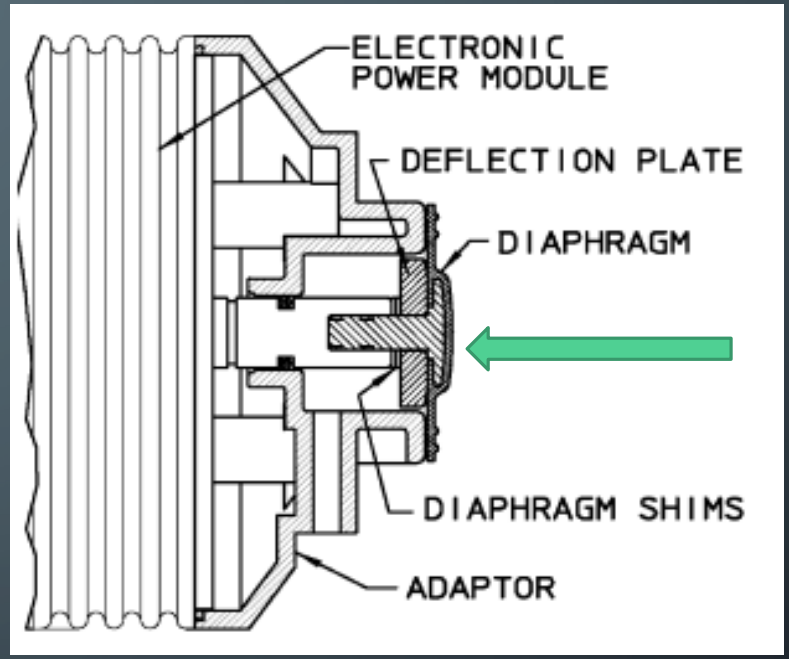
- https://youtu.be/OARJW2DHX3s

DIAPHRAGM METERING PUMP MAINTENANCE

DIAPHRAGM PUMP OPERATION

Diaphragm pumps have a different method of operation as compared to peristaltic. That being the case they have different wear points and maintenance needs.

Diaphragm pumps utilize a solenoid system to push out a measured dose of chemical while simultaneously drawing in the next dose.



DIAPHRAGM/VALVE INSPECTION PROCEDURE

Diaphragm Removal

Flush pump head and valve assemblies out by running pump with water or other suitable neutralizing solution. Wash outside of pump if chemical has dripped on pump. Set stroke length knob of pump to 0% and unplug pump.

Depressurize the system and disconnect tubing or piping from the pump. Remove the four pump head screws and then remove the pump head assembly.

Inspect diaphragm, if it is intended to be used again look for indications of the PTFE face being overstretched, (localized white areas) or the elastomer on the back of the diaphragm being worn. Excessive amounts of either condition require diaphragm replacement.

6.4 Valve Replacement

Flush pump to clean any chemical from pump head.

Unplug pump, release system pressure, and disconnect tubing or piping.

Unscrew valve cartridges and discard. Also remove o-rings down inside the pump head.

Install new valve cartridges with stamped letters reading from top to bottom, and the arrow pointing in the direction of flow. Hand-tighten only, do not use wrenches or pliers.

Reconnect tubing or piping and reinstall the pump.

Check for leaks around newly installed fittings.

The Diaphragm being the object in motion becomes the main wear point and subject to occasional failure.

When this occurs replacements parts or rebuild kits can be ordered.

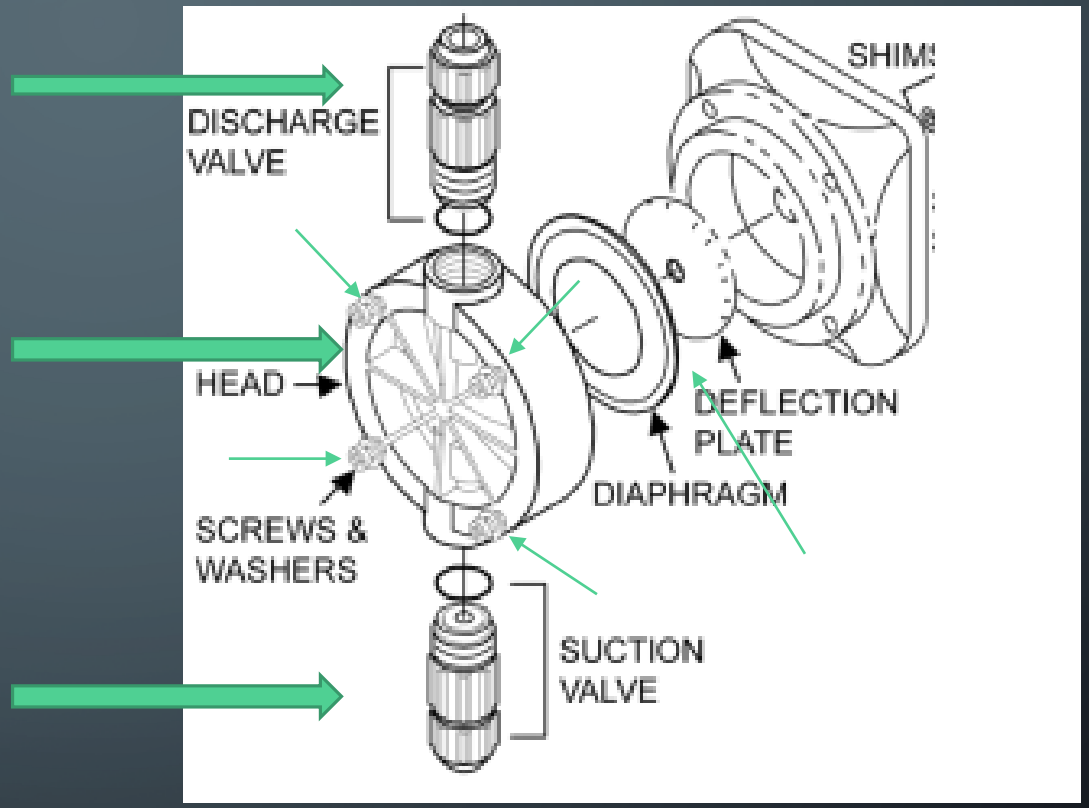
The diagram to the right is an example of a rebuild or KOP kit (keep on pumping).

A typical kit will come with a new head assembly.

New Valves for suction and discharge

Four New Mounting Screws

A new Diaphragm/deflection plate which screws in



MISCELLANEOUS MAINTENANCE POINTS

- There are a few other maintenance areas not inherent to the pump itself that can cause chemical leaks and/or damage to your pump.
- These areas include the suction strainer, suction and discharge tubing, and the injection check assembly.

SUCTION STRAINER

The suction strainer is the first step in the injection process. Its job is to strain out any impurities or particulates from the chemical being pumped. Over time they can become clogged Reducing the effective capacity of the pump. They are also typically equipped with a ball check to prevent the suction line from draining back into the tank. Making sure this device is clear and in an upright position is crucial to efficient chemical metering pump functionality.

CHEMICAL TUBING

An oft forgotten component of pump maintenance is the tubing itself. Over time the tubing, being in a chemically harsh environment and subject to temperature changes, can become brittle and prone to breakage. They can also become gummed up depending on the chemical being pumped, reducing effective capacity. It is recommended that these lines are replaced every one to two years.

INJECTION ASSEMBLIES

Much like the strainer assembly at the beginning of our pumping process, the injection point at the end of the line can become plugged with debris and chemical build up over time. It is recommended that these devices are periodically removed, inspected, and cleaned if necessary, to remove anything plugging the line. Failure to do so can prevent chemical feed and/or create pump damaging back pressure as it dead heads into the obstruction.


That's all Folks!