

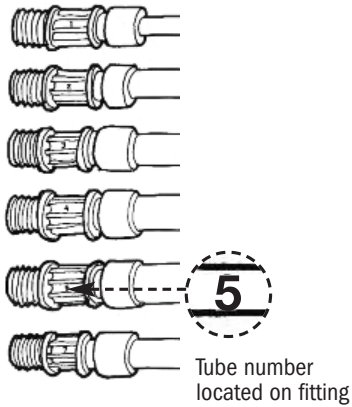
PUMP TUBE BASICS

The tube is the workhorse of the pump. It is perishable and will eventually stop functioning from natural wear or when it reaches the end of its service life. Indications of the end of service life are:

- Tube leaks
- Tube is fatigued causing a reduction or lack of output

The pump tube service life can be reduced by conditions of the application or the installation. These conditions are:

- Calcium or mineral deposits
- Sediment blockages
- Chemical incompatibility
- Corrosion
- Improper handling



PUMP TUBE PRESSURE RATING

PUMP TUBE	0-25 psi (0-1.7 bar)	26-100 psi (1.8-6.9 bar) Check valve required
#1	✓	✓
#2	✓	✓
#3	✓	
#4	✓	
#5	✓	
#7*		✓

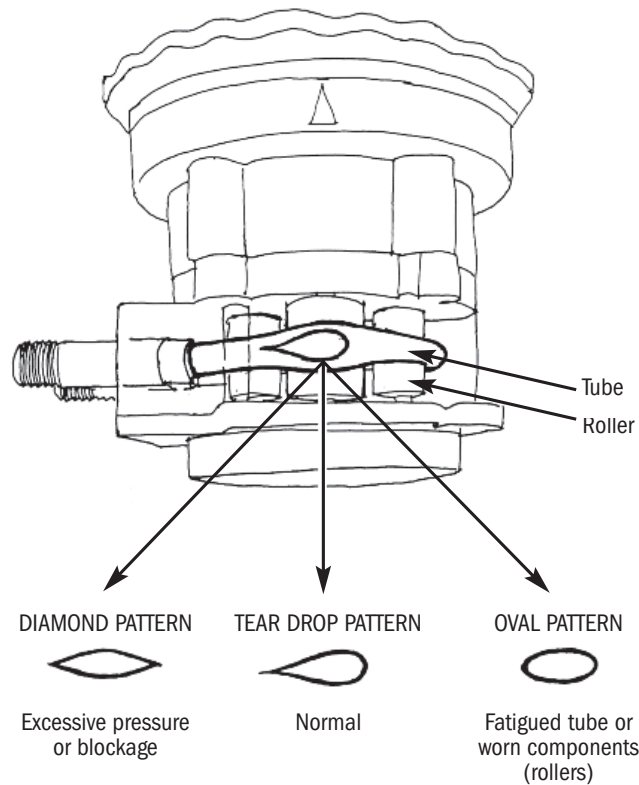
* Classic Single Head ONLY



For maximum pump tube life, always identify the reasons for the failure and correct the problem before a new tube is installed.

VISUAL REFERENCE

A diamond pattern that forms where the tube presses against the tube housing indicates excessive back pressure. Excessive back pressure can be caused by any blockage, a clogged duckbill or when the system pressure exceeds the pump tube pressure rating. An oval pattern indicates worn rollers and/or the pump tube has reached the end of its service life. Pump tubes can rupture without either pattern apparent.



The most common tube problems are from a lack of routine maintenance. Always establish an application specific maintenance schedule.

CONDITIONS THAT REDUCE TUBE LIFE

IMPROPER TUBE HANDLING

- Not following factory tube replacement instructions.
- Storing tubes in high ambient temperatures or long term exposure to direct sunlight weakens tube material.
- Prior to installation, pre-stretching, lubricating the tube and/or roller assembly or pinching during installation, compromises the tube material.
- Excessive pulling of the tube fitting, during installation, can result in compromising the material. Allow the pump to run the roller assembly in its collapsed position for approximately one minute to relax the tube as indicated in the tube replacement instructions.
- Using pliers to center or secure connections can damage ferrules. The connecting nut must be finger tightened only.
- Using thread seal tape prevents ferrules from seating properly into tube fitting and can cause leaks.
- Not allowing enough slack in the suction and discharge lines so the tube fittings can flex puts stress on the tube and fittings.



DO NOT use thread seal tape or pliers on pump tube threads.



CONDITIONS THAT REDUCE TUBE LIFE continued

CRACKED PUMP HEAD

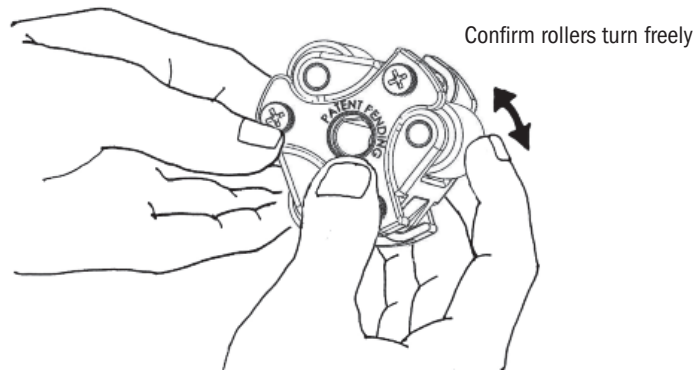
The tube housing and latches can crack from wear, long term chemical exposure or due to solution incompatibility with the housing material (refer to *Chemical Resistance Guide*).

SEIZED ROLLERS IN THE ROLLER ASSEMBLY

Corrosive chemicals that collect on the roller bushings, as a result of atmosphere or tube failure, can result in seizing the rollers.

Corrective Action

1. Confirm chemical compatibility with housing and pump tube material.
2. Review factory recommended vertical pump installation.
3. In the event of tube rupture, rinse the chemical residue from the housing and roller assembly with factory recommended cleaners.
4. If tube housing is cracked, replace.



Normal roller wear can cause a lack of output as a result of the rollers' inability to fully squeeze the tube.

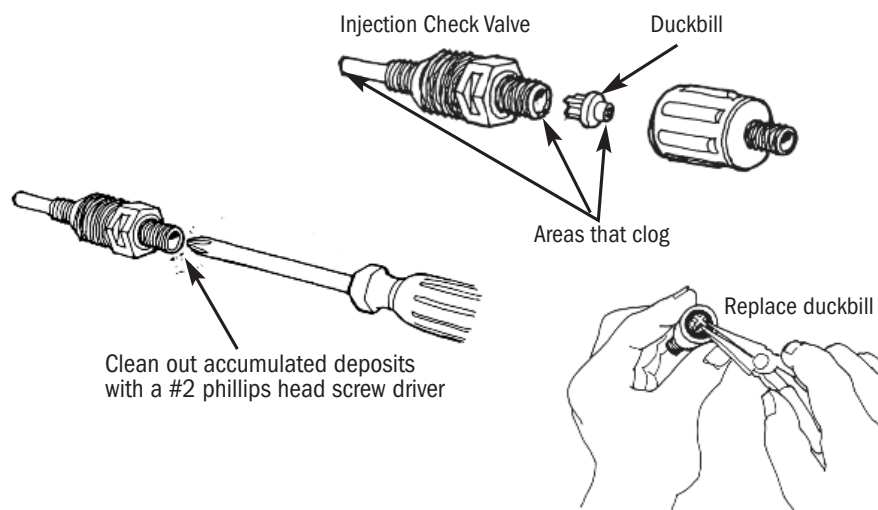
CONDITIONS THAT REDUCE TUBE LIFE continued

EXCESSIVE BACK PRESSURE AT THE POINT OF INJECTION

Calcium or mineral deposits in the injection fitting section of the check valve can cause blockage or restriction creating back pressure that exceeds the pump tube pressure rating.

Corrective Action

1. Insert a round shank screwdriver through injection fitting into the pipe to locate or break up accumulated deposits. If screwdriver can't be inserted, drill the deposit out of the injection fitting. Do not drill through the opposite pipe wall.
2. Replace duckbill.



EXCESSIVE BACK PRESSURE AT THE POINT OF INJECTION

Insoluble sediments or particulates drawn through the suction line from the bottom of the tank can cause blockage or restriction in the check valve duckbill. These solids and excessive pressure can damage the pump tube.

Corrective Action

1. Replace suction and discharge tubing and clean sediment from tank bottom.
2. Position weighted strainer 3" from tank bottom.
3. Replace duckbill.



At every tube change, trim approximately 1" off the end of both the suction and discharge lines before installing new ferrules. Replace duckbill (26-100 psi applications) and ferrules with every new tube.

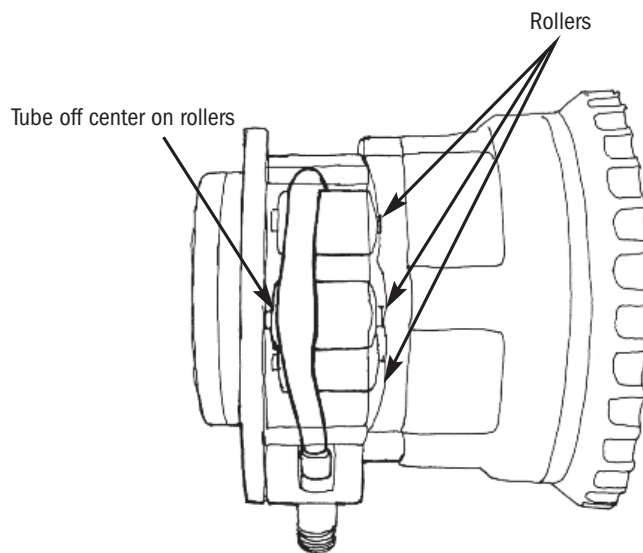
CONDITIONS THAT REDUCE TUBE LIFE continued

SPLIT ALONG SIDE OF THE TUBE

The tube rubbing against the edge of the tube housing can cause the side to split.

Corrective Action

Always follow the factory's tube replacement instructions which include centering the tube on the rollers.



The tube will not center if it twists during installation or if the rollers are worn. The tube can also twist if the connections are over-tightened; finger tighten only.



Refer to the Trouble Shooting guide in the *Classic Series Installation Manual* for more pump tube and pump head conditions and solutions.

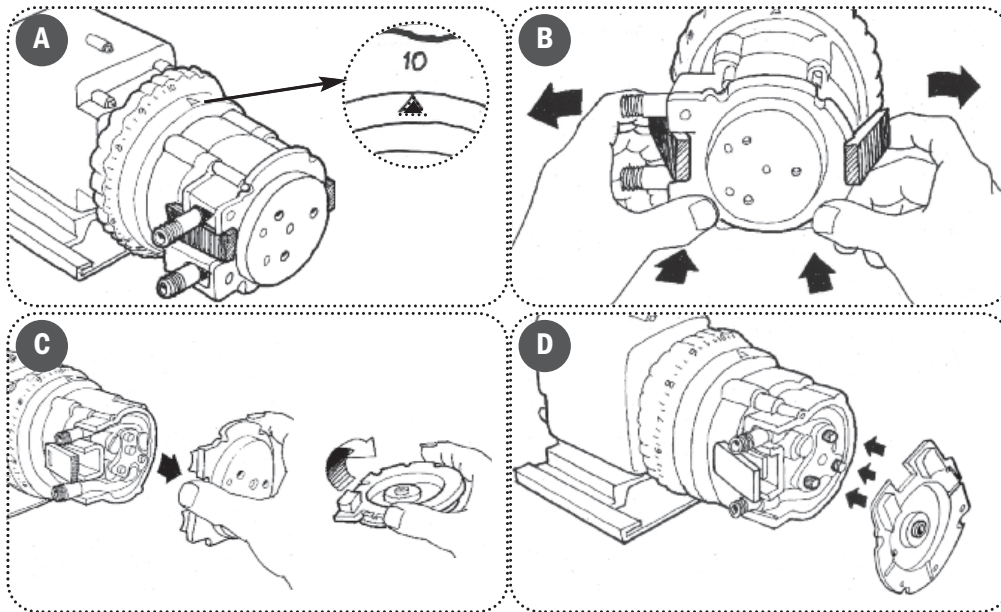
IMPORTANT TUBE INFORMATION

- Always follow factory tube replacement and centering instructions.
- Schedule a tube replacement at regular intervals according to the needs of the specific application.
- A used tube will have stretched approximately 3/4" and the new tube will appear to be stiff and short. Allow the pump to run the roller assembly in its collapsed position for approximately one minute to relax the tube as indicated in the tube replacement instructions.
- Replace ferrules with every tube change, ferrules are the seal between the tube fitting and the connecting nut.
- Only finger tighten the nut and ferrule. Over-tightening may result in a twisted tube, damaged fittings, crushed ferrules and air pick-up.
NOTE: A twisted tube will not center and can decrease tube life.
- For 26-100 psi applications, inspecting and replacing the duckbill at every tube change is recommended.
- Santoprene® pump tubes are not compatible with petroleum or oil-based products. Refer to the Chemical Resistance Chart in the *Catalog* for compatibility or call the factory.
- DO NOT allow tube fittings to turn inside the pump housing when connecting suction and discharge tubing. Tube will be forced off center towards cover and can wear a groove in the tube, leading to leaks.



For maximum tube life, always identify the reasons for the failure and correct the problem before a new tube is installed.

TUBE REPLACEMENT



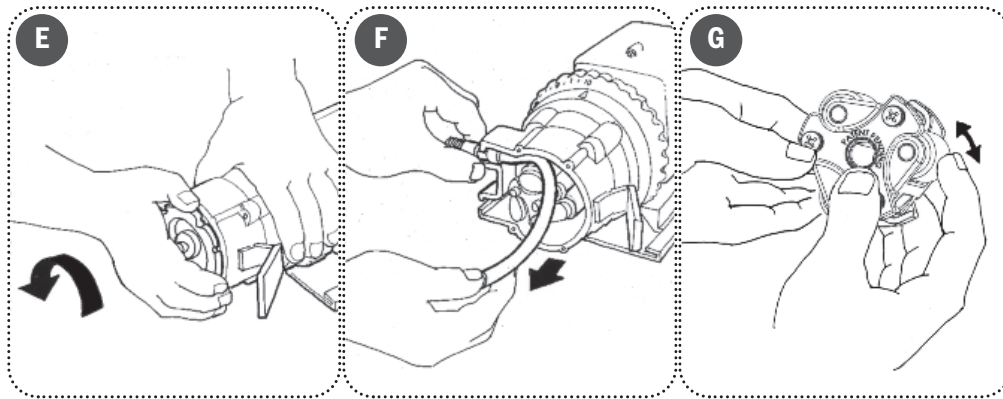
PREPARATION

1. Follow all safety precautions prior to tube replacement.
2. Prior to service, pump water or a compatible buffer solution through the pump and suction and discharge lines to remove chemical and avoid contact.

REMOVE THE PUMP TUBE

1. Turn the pump off and unplug the power cord. On the adjustable model, ensure that the feed rate control is set to 10. **Figure A**
2. Depressurize and disconnect the suction and discharge lines.
3. Open the back and front of the latches on both sides of the head. Carefully fold latches back to prevent contact with the cover. **Figure B**
For CE pump only: Remove the safety screw on cover.
4. Remove the tube housing cover and flip to use as a tool in the next step. **Figure C**
5. Align the center of the inverted cover with the center of the roller assembly so that the three holes on the face of the cover align with the three knurled lugs on the roller assembly. Position the cover feet near the tube fittings. **Figure D**
NOTE: The roller assembly needs to be collapsed to remove the tube.

TUBE REPLACEMENT continued

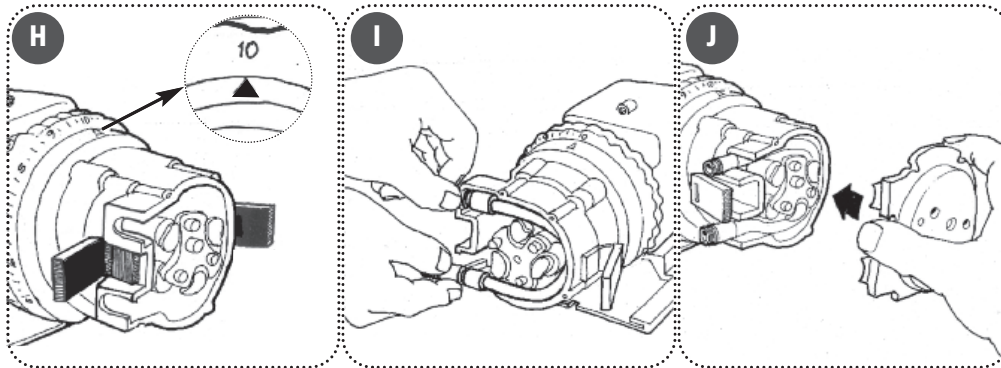


6. On the adjustable pump, hold the feed rate control securely. On the fixed output pump hold the pump securely. Use the tube housing cover as a wrench and quickly (snap) rotate the cover counter-clockwise to collapse the roller assembly. The tube will no longer be pressed against the tube housing wall. **Figure E**
NOTE: Counter-clockwise is viewed from facing the head of the pump.
7. Remove and discard the pump tube. **Figure F**
8. Remove the roller assembly, and the tube housing. On the adjustable pump also remove the shaft. Set them aside to reinstall later.
9. Use a non-citrus all-purpose cleaner to clean chemical residue from the tube housing, roller assembly and cover.
10. Check the housing, cover and roller assembly for cracks and replace if cracked.
11. Ensure the rollers turn freely. Replace the roller assembly if the rollers are seized or worn or if there is a reduction or lack of output from the pump. **Figure G**
12. Reinstall the clean tube housing. On an adjustable pump, also install the shaft into the feed rate control.
13. Apply AquaShield® to the shaft tip.
14. Install roller assembly.



Tube replacement instructions for pumps manufactured before May 2011 are found on the website in the Downloads section.

TUBE REPLACEMENT continued



INSTALL TUBE

IMPORTANT! DO NOT LUBRICATE PUMP TUBE OR ROLLER ASSEMBLY.

1. Ensure the power to the pump is off and the power cord is unplugged. On the adjustable model, ensure that the feed rate control is set to 10. **Figure H**
2. Place the new tube in the pump head; use your fingers to center it over the rollers. **Figure I**
3. Place the tube housing cover on the tube housing, affix the front latches to the cover lip and then press the latches back to secure. Be sure the cover is seated with the sleeve bearing on the shaft and is flush with the housing, before latching. **Figure J**

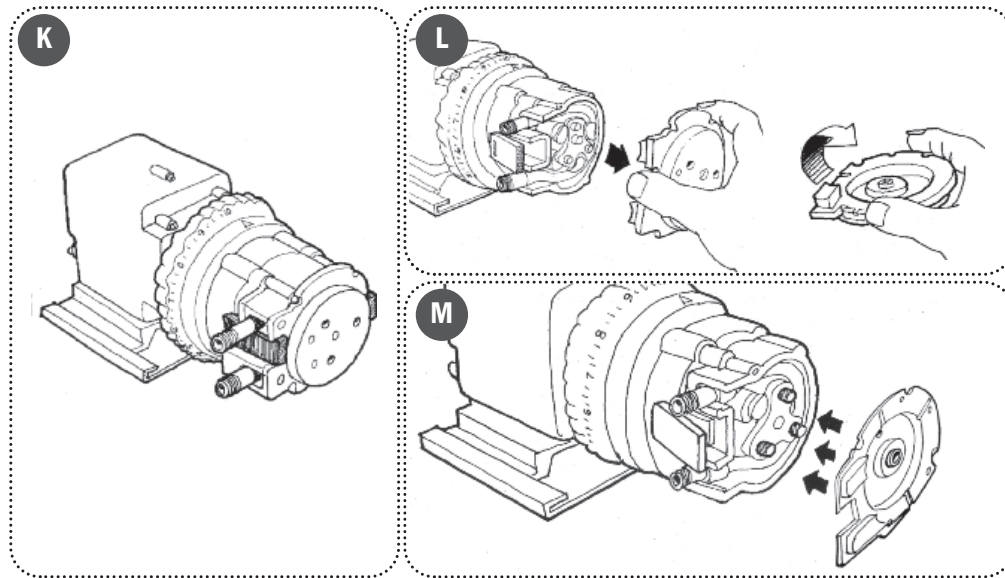


Identify the cause of tube failure prior to installing a new tube.



A used tube will have stretched approximately 3/4" and the new tube will appear to be stiff and short. Follow directions to allow rollers to stretch tube into place.

TUBE REPLACEMENT continued

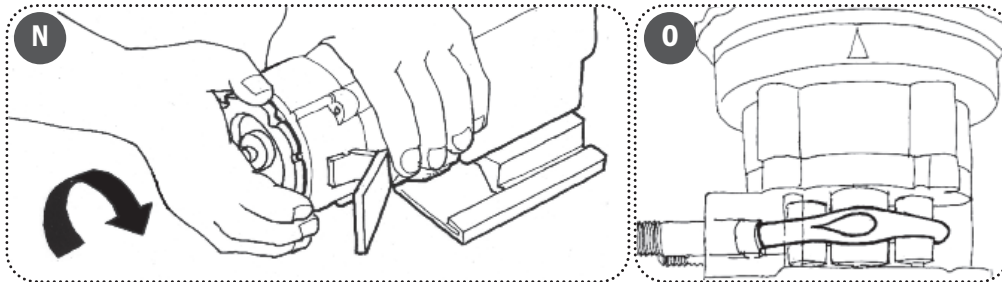


INSTALL TUBE continued

4. With the cover latched, plug the pump in and turn the power on. Allow the pump to run the roller assembly in its collapsed position for approximately one minute to relax the tube. **Figure K**
5. Turn the pump off and unplug the power cord.
6. Remove the tube housing cover and flip to use as a tool in the next step. **Figure L**
7. Align the center of the inverted cover with the center of the roller assembly so that the three holes on the face of the cover align with the three knurled lugs on the roller assembly. Position the cover feet near the bottom. **Figure M**

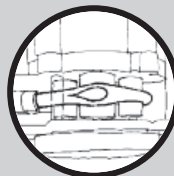
NOTE: The roller assembly needs to be expanded so the tube is pressed against the tube housing wall.

TUBE REPLACEMENT continued



EXPAND THE ROLLER ASSEMBLY – ADJUSTABLE MODEL

8. Expand roller assembly
 - Hold the feed rate control securely, use the cover as a wrench and quickly (snap) rotate the roller assembly clockwise to expand the roller assembly. The tube will be pressed against the tube housing wall. **Figure N & O**
- Proceed to step **9** on page 29.
- NOTE: Clockwise is viewed from facing the head of the pump.

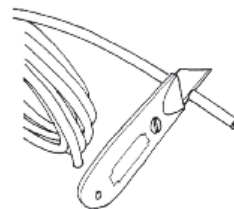


NEW PUMP HEAD DESIGN. Roller assembly collapses and expands. Before turning pump on, **CONFIRM ROLLER ASSEMBLY IS EXPANDED** and tube is pressed against housing wall.

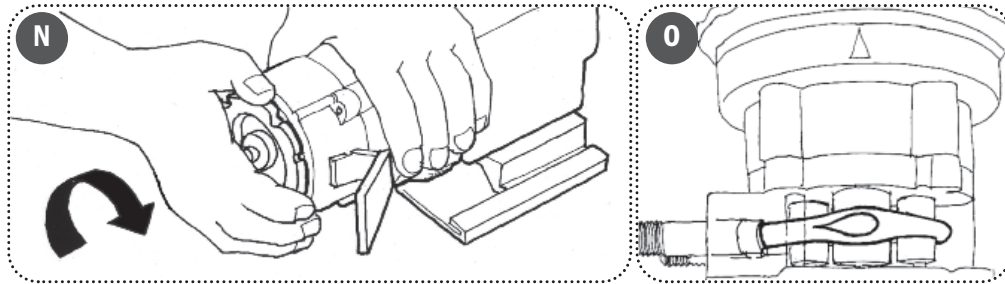
CAUTION: Use care when expanding roller assembly, excessive force can crack the hub and lead to failure of the roller assembly.



At every tube change, trim approximately 1" off the end of both the suction and discharge lines before installing new ferrules. Replace duckbill (26-100 psi applications) and ferrules with every new tube.



TUBE REPLACEMENT continued



EXPAND THE ROLLER ASSEMBLY

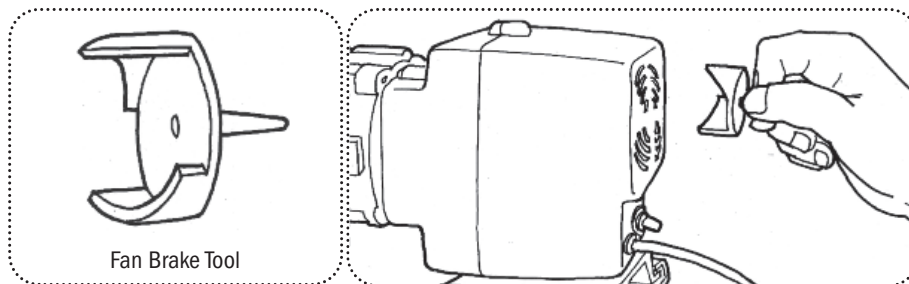
- FIXED OUTPUT MODEL (Manufactured before 4/29/11)

8. Expand roller assembly

 **WARNING** ONLY THE STENNER FAN BRAKE TOOL SHOULD BE USED FOR THIS STEP.

- a. Insert the fan brake tool into the vent in the rear of the motor housing. Refer to the figures below.

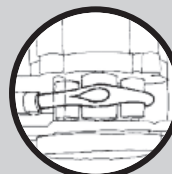
NOTE: The fixed output pump doesn't have a clutch so the fan brake keeps the shaft from rotating when expanding the roller assembly.



- b. Holding the pump securely, use the cover as a wrench and quickly (snap) rotate the roller assembly clockwise to expand the roller assembly. The tube will be pressed against the tube housing wall. **Figure N & O**

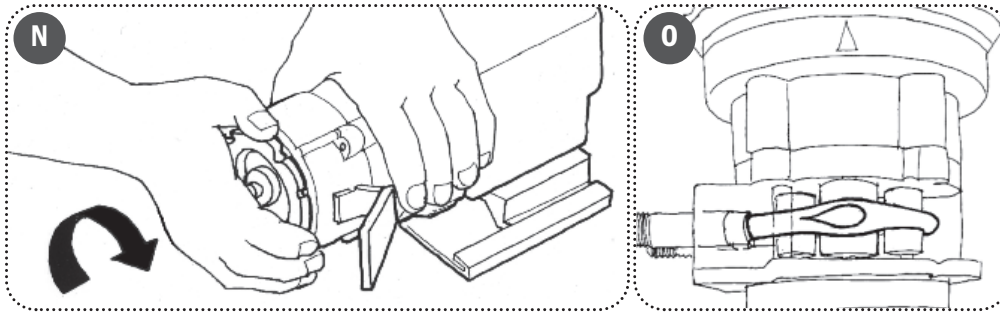
NOTE: Clockwise is viewed from facing the head of the pump.

- c. Remove the fan brake tool. Proceed to step 9 on page 29.



NEW PUMP HEAD DESIGN. Roller assembly collapses and expands. Before turning pump on, **CONFIRM ROLLER ASSEMBLY IS EXPANDED** and tube is pressed against housing wall. **CAUTION:** Use care when expanding roller assembly, excessive force can crack the hub and lead to failure of the roller assembly.

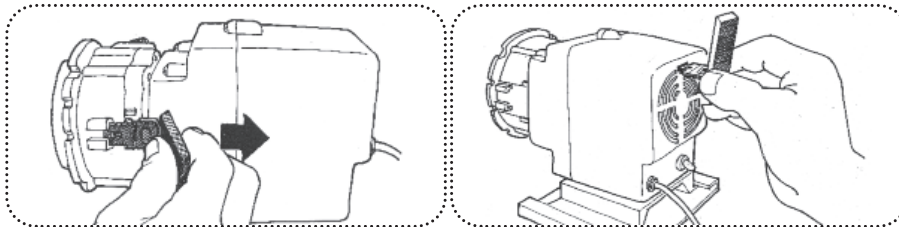
TUBE REPLACEMENT continued



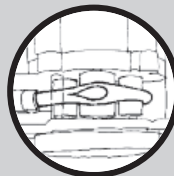
EXPAND THE ROLLER ASSEMBLY

– FIXED OUTPUT MODEL (Motor vent with key slot, manufactured after 4/29/11)

8. Expand roller assembly
 - a. Slide one latch out to remove it from the tube housing. Insert the latch end into the key slot in the vent in the rear of the motor housing. While pressing the latch into the rear of the motor, gently rotate the cover clockwise until it stops. Refer to the figures below.



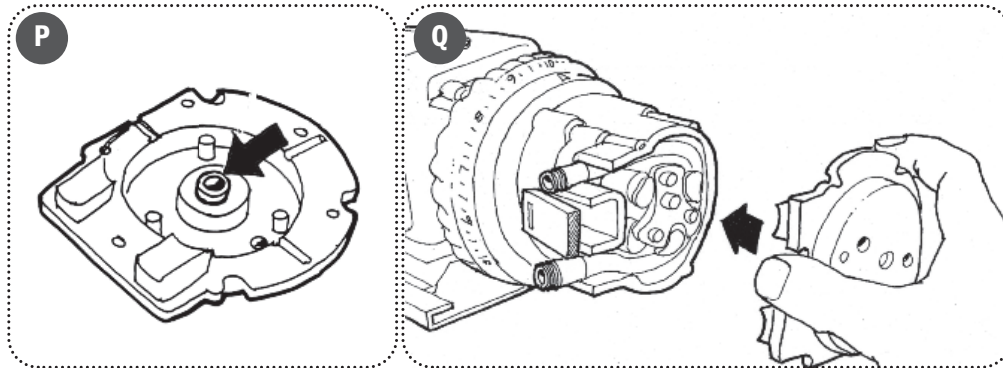
- b. Holding the pump securely, use the cover as a wrench and quickly (snap) rotate the roller assembly clockwise to expand the roller assembly. The tube will be pressed against the tube housing wall. **Figure N & O.**
NOTE: Clockwise is viewed from facing the head of the pump.
 - c. Remove the latch from the vent and re-attach it to the tube housing. Proceed to step 9 on page 29.



NEW PUMP HEAD DESIGN. Roller assembly collapses and expands. Before turning pump on, CONFIRM ROLLER ASSEMBLY IS EXPANDED and tube is pressed against housing wall.

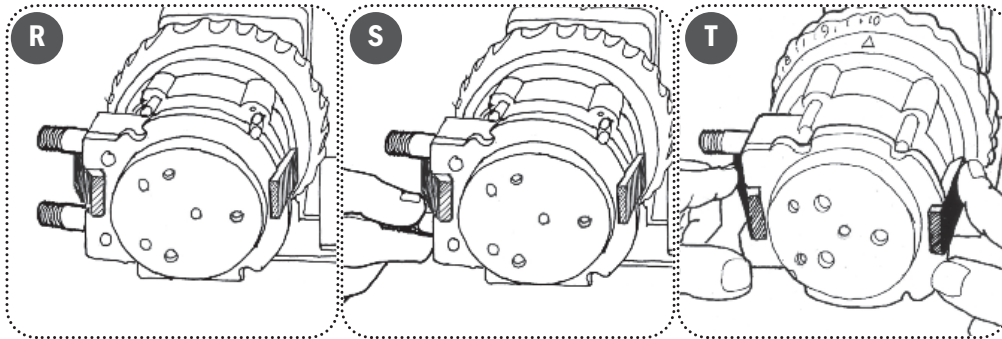
CAUTION: Use care when expanding roller assembly, excessive force can crack the hub and lead to failure of the roller assembly.

TUBE REPLACEMENT continued



9. Apply a small amount of AquaShield® to the cover bushing **ONLY**. **DO NOT** lubricate the pump tube. **Figure P**
10. Place the tube housing cover (feet first) on the tube housing, affix the front of the latches to the cover lip and then press the latches back to secure. Be sure the cover is seated with the sleeve bearing on the shaft and is flush with the housing, before latching. **Figure Q**

TUBE REPLACEMENT continued



CENTER THE TUBE

1. Ensure the pump is off. Lift the latch located between the tube fittings, leaving the end of the latch engaged with the lip on the tube housing cover. Leave the latch on the opposite side engaged. **Figure R**
2. Plug the pump in and turn it on. Turn the tube fitting on the suction side not more than 1/8 of a turn in the direction tube must move. **Figure S**
3. DO NOT let go of fitting until tube rides approximately in center of rollers.
4. Turn the pump off, let go of the fitting, and secure the latch between the fittings. **Figure T**
For CE pump only: Reinstall the safety screw on the cover.
5. Inspect the suction and discharge lines, point of injection, and check valve duckbill for blockages. Clean and/or replace as required.
6. Reconnect the suction and discharge lines. DO NOT allow tube fittings to turn inside the pump housing.
7. Turn the pump on and verify operation.