

## Phasing procedure for Cylinder Metering Pumps

“Phasing” is a term used to describe the adjustment of pressures at the start of dispensing a dual component adhesive. Commonly, material viscosities, rheologies, compressibility etc. are quite different. When these different components are forced under pressure into a mixing chamber, whether it is a static mix tube or a dynamic spinning mixer, these materials may behave differently at the beginning of each cycle. Sometimes one material may need to be pre-compressed to a certain degree to allow it to start out “on ratio” and blend with the other component.

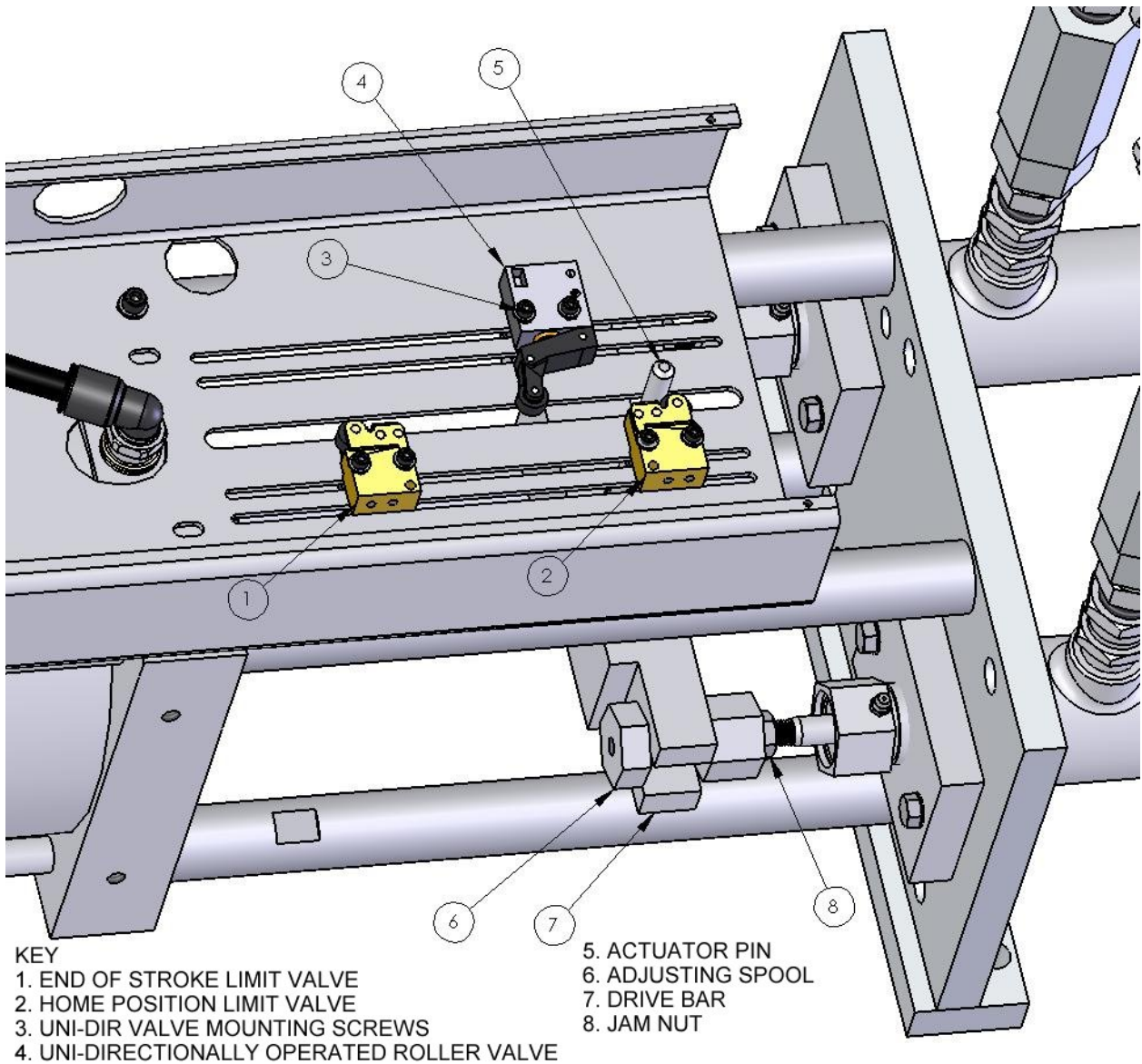
**Note: Before attempting to phase the machine, make sure main pressure seals and check valves are operating properly, see “pressure seal/check valve” test procedure in the manual.**

In a cylinder metering pump (CMP), each pump seal is simultaneously pulled into a pump housing. At rest (or “home position”), these seals are typically about 1-1/2” from the pump housing pressure tube. After traveling this 1-1/2” “recharge distance” the seals begin to come in contact with the pump housing, sealing off the inlet. At this point the uni-directionally operated, (double hinged) roller valve, (fig 1, #4) is actuated, thus sending a signal for the dispense valve to open. Also at this point is where the “phasing will need to be done. If two materials were identical, phasing would be accomplished by making sure both pumps are adjusted the same, (closing off the inlet at the same time). This also may be witnessed by watching the outlet fluid pressure gauges while dispensing, both pressures should start to rise together. If one side’s pressure lags, this would indicate compressibility in the lagging pump. This compressibility may be air trapped in the system (material has not purged out excess air), cycle machine until all air has been expelled. If this is not the problem, the rod of the pump that lags will need to be adjusted outward. This will make one seal come in contact with the pump housing first and “pre-compress” the material. The following is the procedure for setting the phasing of the two meters.

1. Make sure enough material has been run through to purge the air from the system, run pumps until air free material flow is achieved out of the dispense valve/manifold.
2. The position of the uni-directionally operated roller valve, (uni-dir) , (fig 1, #4) is typically factory set at the proper position. If the meter has been dis-assembled or adjusted, the position of the valve may need to be reset. Set the position of this valve as follows;
  - 2.1. Disconnect the air line marked “seal check”. This should be the air line coming from the uni-dir valve. With this line disconnected, the dispense valve will not open.
  - 2.2. Set the air pressure regulator, (fig 3, #1) at 15-20 psi.

2.3. Input a start signal, the machine should pull both seals into the pumps and stop after about 1-1/2" of travel.

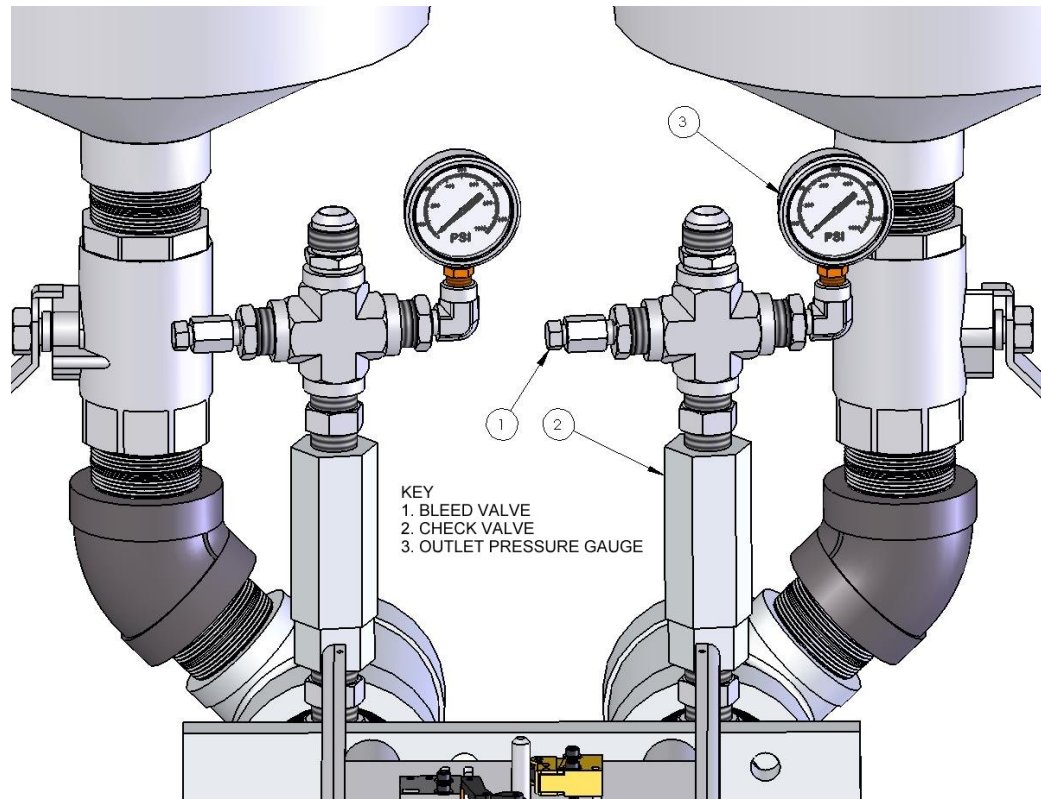
2.4. To hold this position, disconnect the air from the machine. This is the position where the uni-dir' valve should be actuated to open the dispense valve.



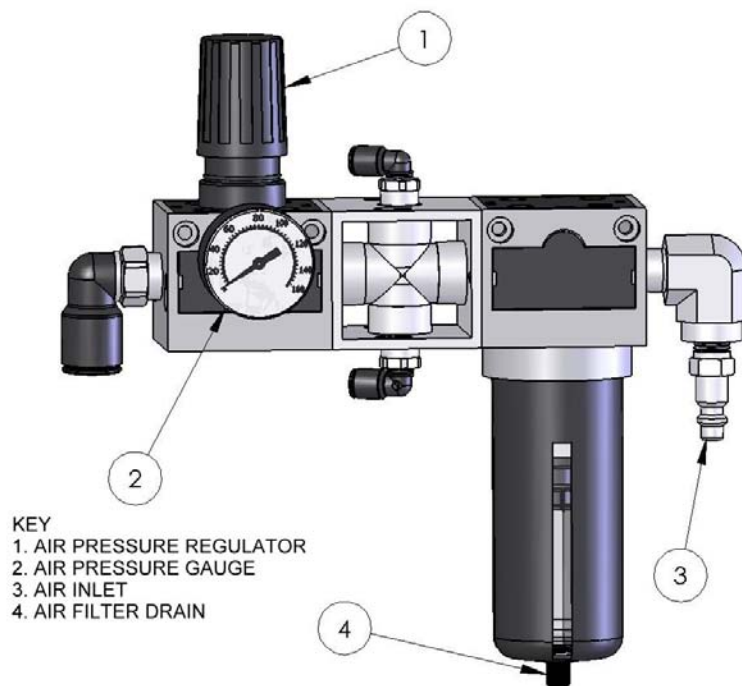
**Figure 1**

2.5. If the valve is not already at this position, loosen the two screws, (fig 1, #3) that hold the uni-dir' valve in place and slide along the mounting slot until the valve roller is being actuated by the actuator pin, (fig 1, #5). *Be careful not to move the valve too close to the actuator as this will cause the hinged arm to fatigue and or break.*

- 2.5.1. *Make sure the valve arm does not bind when the actuator travels on past.*
- 2.6. Reconnect the air and adjust the air pressure regulator, (fig 3, #1) to the desired setting/flow rate.
3. Dispense a small amount of material & watch it as it starts coming out of the dispense valve/manifold at the beginning of each stroke. If one material is lagging behind the other, adjust the pump that is lagging as follows.
  - 3.1. Loosen the jam nut, (fig 1, #8) that fastens the pump rod to the adjusting spool, (fig 1, #6) and turn the adjusting spool CW to pull the rod further out of the pump, (pull the seal inside the pump inlet closer to the pump housing).
  - 3.2. Turn the spool ½ turn at a time, taking a quick shot of material & watching the start of each cycle in between each adjustment until both materials start together. This will get the phasing very close. Excess difference of rod positions, (more than ½”) typically indicates air entrapment but also could be a worn pressure seal or malfunctioning check valve, see “seal check/check valve” test procedure.
    - 3.2.1. *If material pressures go up just prior to dispensing, or the machine stops before reaching the uni-dir position, this would indicate that the uni-dir valve adjusted too far into the stroke, (pressure is being built prior to dispense valve opening). Loosen and slide the uni-dir towards the pump or repeat steps 2.1-2.6.*
    - 3.2.2. *Adversely, if the pressures drop way off, (a small amount is somewhat typical) the uni-dir is opening the dispense valve too early, allowing the material to come out of the dispense valve before the pressure seals have reached the pump housing. Loosen the valve and move slightly away from the pump or repeat steps 2.1-2.6.*
4. For fine-tuning of the phasing, attach the desired mixer and dispense until the mixer is full of material. Then dispense a small amount of material a few times while watching the outlet pressure gauges, (fig 2, #3) at the beginning of each cycle. These pressures may be different but should start rising together. Adjust the pumps as described in step 3.2.1-3.2.2, until both pressures rise together.
  - 4.1. *Sometimes with materials of different colors, watching these materials go through the mixer will also be indicative of which material is leading/lagging and this may be an easier method to set the phasing.*
5. To test phasing adjustment, dispense small strips of material onto some aluminum foil or similar substrate, (cardboard or paper may wick out the catalyst and affect the results.) Typically a 1 to 1-1/2 foot long bead is sufficient in showing the start of each stroke. A soft spot in the middle of this strip is the result of a phasing problem. For real low viscosities, (little back pressure) by identifying which material is in the soft spot will help to determine which side is lagging.



**Figure 2**



**Figure 3**