

**Hydraulic Priming Procedure:**      **Pulsa Series**  
Flat Diaphragm  
Lost Motion Type (200/680/880)

**QUICK-START PRIMING INSTRUCTIONS**

(Note: small piston 0.25" and 0.38" users see last page)

1. Set stroke length to 100%
2. Shut pump down, follow applicable safety procedures as required
3. Manually retract the piston all the way back
4. Remove air bleed valve, fill pump head with appropriate hydraulic oil
- 5, 6. Use pipette/baster/funnel to purge air and complete oil fill
7. Cycle piston through several full strokes
8. Manually move the piston all the way forward
9. Replace air bleed valve (copper washer!)
10. Move the piston through several full strokes by manually turning the coupling
11. Verify smooth piston travel
12. Replace coupling guard

**Full Priming Instructions:**

(Note: small piston 0.25" and 0.38" users see last page)

1. Place stroke adjustment to 100% stroke setting. Always prime at 100% stroke setting on all pumps to allow the piston to cover it's full travel in both directions.
2. Shut down pump and remove coupling guard. Follow your facilities relative lockout and/or tagout and other safety procedures as applicable.
3. Rotate the motor coupling to manually retract piston to the full rearward position. You will need to remove the top cover from the pump to observe the piston position. When the piston is fully back, the return spring is fully extended. Also, when the piston is at full stroke forward or full stroke back you can feel a "dead spot" in the rotation of the motor coupling.
4. Remove the automatic or manual air bleed valve assembly from the pump head. Ensure that the small copper sealing washer under the bleed valve is not lost.

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5. Place a plastic pipette (turkey baster, funnel, etc.) into the threaded hole where the manual bleed/auto bleed valve assembly was removed. Try to seal the pipette or baster into the hole by turning it into the threads, so that it serves as an oil reservoir. This will allow air to evacuate the pump head on the forward stroke, and oil to be drawn in on the rearward stroke.
6. Fill pipette with same oil as being used in the gearbox.
7. Rotate the motor coupling by hand a few times to begin drawing oil into the pump head. Add oil to pipette as required to prevent air from being drawn in as the piston moves backward. After most of the air has escaped, you can turn on pump and run it to complete the evacuation of any trapped air bubbles. Always cycle the pump by hand at first, as large air bubbles can eject oil from the pipette quite forcefully. If the pump has a variable speed drive system, this can be utilized by starting the pump at a low speed and raising it gradually.
8. Shut off the pump and manually move the piston to full forward position.
9. Remove pipette and replace the auto bleed valve assembly in the pump head. Ensure that the small copper washer is in place below the valve.
10. Manually turn the motor coupling, slowly moving the piston through several full strokes. If additional oil is needed, it will be drawn automatically through the oil make-up valve.
11. Verify that the piston moves smoothly through the stroke range.
12. Replace the coupling cover and the priming procedure is complete.

## Model 680 Small Piston (0.25" and 0.38") Priming Notes

Model 680 pumps that utilize the smallest piston diameters as noted above present special challenges when performing a hydraulic priming procedure. These pumps are identified by their nameplate information, and also by noting that they utilize a manually operated air bleed valve as opposed to the automatic design used on other models.

The small piston pumps have a correspondingly small volume of oil in their hydraulic systems. The total volume of oil between the piston and diaphragm of these pumps can be less than 1 ounce. Therefore, they are especially sensitive to proper priming. Small bubbles of air that remain in the system will affect the pump's capacity. If the pump is overprimed, even a small amount of excess oil can cause stress and damage to the diaphragm rendering it unusable. The most common cause of overpriming is manually opening (pressing down) the make-up valve during priming, allowing excess oil into the hydraulic system.

To achieve proper prime on these pumps, proceed as follows:

1. Begin the priming process by following the standard procedure, steps 1 thru 7 **only**.
2. Proceed by manually positioning the piston fully **forward**, and then removing the pipette and replacing the manual air bleed components.
3. Rotate the motor coupling, and as the piston draws back, the proper amount of oil will draw through the make-up valve to balance the system. Cycle the piston slowly through several full strokes, ensuring that it does not bind.
4. Run the pump against pressure in the system.
5. Loosen the air bleed valve **slightly**, and allow a small amount of oil to "weep" out. This will clear any air trapped in this area.
6. Loosen the hydraulic bypass valve **slightly** until a small amount of oil weeps out. This will clear any air trapped under this valve assembly. Be sure to return the bypass valve to its original position.
7. Perform testing as required. If the pump does not achieve rated flow or pressure, repeat steps 5 and 6 carefully to relieve any trapped air.
8. **DO NOT press down on the make-up valve.** This will cause overpriming and lead to diaphragm damage. As you weep air and oil out of the system, the make-up valve will open automatically to allow replacement oil into the system.
9. Do not attempt to use an automatic air bleed valve on these pumps, the small volume of the hydraulic system does not allow them to operate properly.
10. Manual air bleed systems will need to be opened to weep every 5-10 days depending on conditions
11. The make-up valve generally does not require field adjustment.