

2.0 Pressure Vessel Glycol Fill Procedure

Operational Guidance

2.0 Pressure Vessel Glycol Fill Procedure

This procedure covers filling of the bubble chamber pressure vessel with its nominal charge of hydraulic fluid in the absence of the inner vessel assembly. Because there is no possibility of equipment damage, this procedure is classified as “Operational Guidance.”

- 1) Ensure that the hydraulic pressure cart is filled to an appropriate level with glycol and isolated (close MV-11).
- 2) Arrange the external plumbing appropriately.
 - a. The drain valve at the hydraulic cart (MV-13) should be connected to a flexible line with the tip-valve draw pipe (MV-24).
 - b. The top flange valve (MV-14) should be connected to a vacuum pump through a liquid trap (F-4).
- 3) Turn on the vacuum pump and *slowly*¹ crack open MV-14 while watching closely the position of the inner vessel.
- 4) Hold the vacuum at a level that does not cause the vessel to droop.
- 5) Open the bubble chamber isolation valve (MV-11) and the drain valve (MV-13).
- 6) Open the draw-pipe tip valve (MV-24) and begin to draw in glycol.
- 7) Raise the level of the glycol to near the 24” diameter top flange but stop (close off the chamber isolation valve, MV-11) a bit short, leaving a small void space at the full diameter of the pressure vessel. The object is to leave a large surface area for de-gassing.
- 8) Optionally raise the temperature of the glycol in the pressure vessel to near the operating temperature, 40°C.
- 9) If filling the vessel to backfill the hydraulic cart, continue to pump on the glycol until degassing is complete, then proceed with the cart filling procedure.
- 10) Once Cart Filling Procedure is complete, continue to pump on the glycol volume while manipulating MV-14 to bleed in glycol until the vessel is full.
- 11) When the fluid level extends out through the top flange and valve MV-14, close MV-14, and the draw-pipe tip valve (MV-24). Then close the drain valve (MV-13).

¹

Remember this is the place where you can break the vessel!

2.0 Pressure Vessel Glycol Fill Procedure

Operational Guidance

- 12) The chamber is now filled and degassed, but it is not stable because there is no pressure balancing mechanism to compensate for the contraction of the fluid when the chamber cools.
- 13) Open the hydraulic cart isolation valve (MV-10) and use the main hydraulic piston to set the inner vessel assembly near bellows neutral position.
- 14) [It may be possible to use pressure regulation to hold a 1-2 psig pressure so that the cart can manage thermal expansion/contraction compensation.]