



27850 Commercial Park Dr. • Tomball, TX 77375 • 1-(800)-879-3720

INSTALLATION AND ADJUSTMENT OF MODEL 790 PLUG VALVES

Revision	Date	Author	Change Description
6	03/15/23	HSM	Revision and formatting of "INSTRUCTIONS FOR INSTALLATION OF CHEMVALVE FULLY PLASTIC LINED PLUG VALVES MODELS – 790EB-150 AND 790EB-300," revision 7/18/16. Removed references to the old live load system.
7	04/26/23	HSM	Updated sections 1, 3, and 4.
8	10/3/23	HSM	Added sub-section on valve orientation.

Note: This manual is a controlled document. Copies distributed to customers and employees are considered uncontrolled unless noted otherwise. To verify the most current revision, please contact ChemValve.

1 SCOPE

- 1.1 These instructions apply to all ChemValve Model 790 plastic lined plug valves, including ANSI Class 150 and 300 valves. They reflect ChemValve's viewpoint on general best practices.
- 1.2 Because application environments and requirements vary a customer's own written procedures may supersede this document.
- 1.3 Section 4 defines ChemValve's recommendations for rail tank car applications.

2 VALVE INSTALLATION

2.1 Valve Orientation

- 2.1.1 A Model 790 valve with standard ports may be installed for flow in either direction. Orientation of the valve should be decided based on factors such as available space, method of actuation, and convenience of access and inspection.
- 2.1.2 A Model 790 valve which has a flow direction tag (e.g., a valve with one v-port seat or a seat notched for chlorine service) shall be installed in the orientation consistent with the flow direction tag.

2.2 Flange Protection

- 2.2.1 Keep the flange protector on the valve until it is ready to be installed, to prevent damage to the valve's sealing surfaces.
- 2.2.2 Flange protectors should be replaced after an inspection of the valve and when a valve is removed from service.

2.3 Flange Gaskets

- 2.3.1 A gasket between the valve and the mating pipe flange may be required depending upon the configuration of the installation.
- 2.3.2 For similar flange materials (e.g. a plastic lined metal pipe flange), gaskets are not required except when repeated connections and disconnections are made or to address a leak at the flange joint.
- 2.3.3 For dissimilar flange materials (e.g. a metal pipe flange), auxiliary TFE envelope gaskets must be used, such as Texolon® Encapsulated PTFE Flange Gaskets.

2.4 Flange Bolts and Nuts

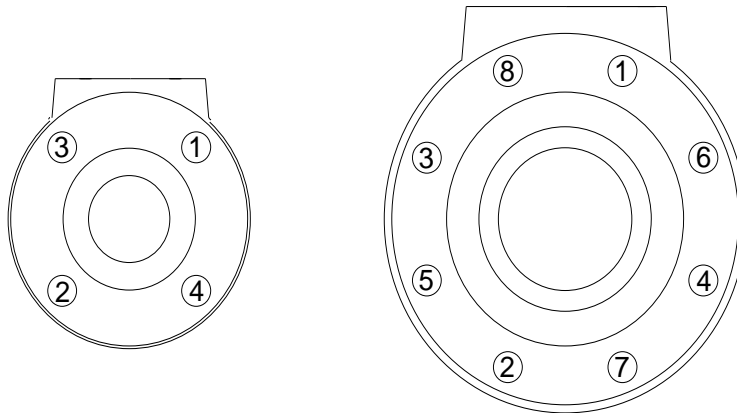
2.4.1 Apply a suitable lubricant to fastener threads and bearing surfaces.

2.4.2 Use a torque wrench when tightening the flange bolts.

2.4.3 Tighten the bolts in multiple passes using a cross-bolt pattern sequence and increasing torque values for each pass:

Pass	Torque
1	Finger tight
2	30% final
3	60% final
4	100% final

2.4.4 Cross-bolt pattern sequence for 4- and 8-hole flanges:



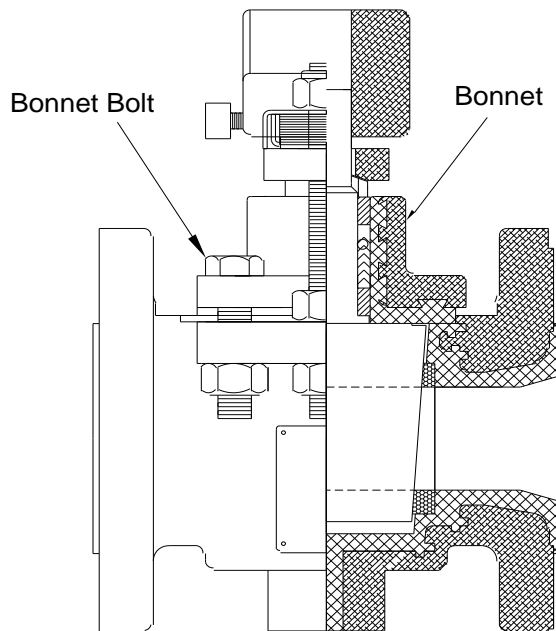
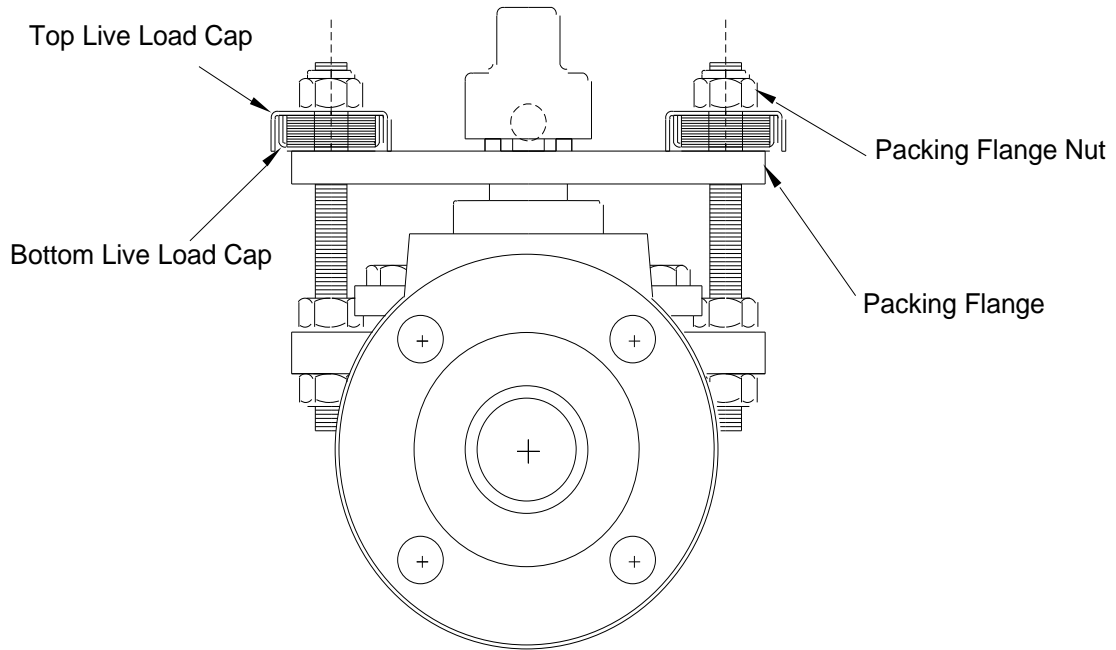
2.4.5 Final Torque Values (ft-lb)

Valve Size	LINER	
	PFA or GRPFA	PPL or PVDF
1"	10	20
1.5"	15	25
2"	25	40
3"	40	65
4"	40	65
6"	50	80
8"	70	100

- 2.4.6 After 24 hours and/or a complete temperature and pressure cycle, the flange bolts should be torqued again to the recommended values.
- 2.4.7 If a leak is observed at the flange joint with the bolts at recommended torque values, the bolts may be re-torqued to a higher value until the leak is stopped, but the torque shall not exceed the recommended torque of the pipe flange or 1.5X the recommended torque of the valve flange, whichever is lower.
- 2.4.8 If the leak cannot be stopped, the flange joint should be disassembled and auxiliary gaskets installed.

3 VALVE ADJUSTMENTS

3.1 Refer to the following illustrations for identification of parts. (Your valve may differ slightly from the example shown.)



3.2 Re-torque Bonnet Bolts

- 3.2.1 Due to relaxation of the plastic liner material with time, ChemValve recommends the customer re-torque the bonnet bolts at the time of installation.
- 3.2.2 Using a cross-bolt pattern, torque the bonnet bolts as follows:

Valve size	Bonnet Bolt torque (ft-lb)
1"	30
1.5"	38
2"	60
3"	98
4"	98
6"	120
8"	150

3.3 Adjust Packing Flanges

- 3.3.1 After valve installation the live load packing system should be inspected to verify there is no more than 1/16" of the yellow bottom cap showing at either one of the adjusting caps (when viewed from the side).
- 3.3.2 If more than 1/16" of the bottom cap is visible, the packing flange nuts should be tightened one quarter turn at a time, alternating between the two nuts, until there is less than 1/16" of bottom yellow cap visible. **Do not overtighten. If the black top live load cap is less than 1/16" from the packing flange or if it contacts the packing flange, immediately stop and make no further adjustments.**

3.4 Re-seat the plug

- 3.4.1 Rotate the plug 4 complete revolutions in each direction to allow the plug to reposition itself for tight shutoff.
- 3.4.2 It may be necessary to temporarily remove or move any handle or operating nut part which has rotation stops.
- 3.4.3 To move, loosen the bolt or set screw and move the part until it clears the rotation stops on the packing flange. After rotating the plug, move the part back so the 90 degree stops engage, apply thread locker (Vibra-Tite VC-3, Loctite Blue 242, or equivalent) to the bolt/set screw, and tighten.

4 Recommended Practices for Rail Tank Car Valves

- 4.1 ChemValve tests all valves for rail tank cars to verify bubble tight shut off.
- 4.2 For initial installation of a new valve the tank car facility may choose to omit the valve adjustments of section 3 and perform them only if needed to address a

bubble leak test failure.

- 4.3 If a valve is installed on a tank car after an extended period of storage and/or experiencing significant temperature variations during transportation or storage, it may occasionally be necessary to reposition the plug to compensate for plastic relaxation/movement and re-establish tight shutoff.
- 4.4 If a tank car valve fails a bubble leak test, ChemValve recommends the following steps in order:
- 4.5 Re-seat the plug following 3.4; repeat the bubble leak test. If the valve passes, stop. If it fails, continue with the next step.
- 4.6 Adjust the valve following 3.1 – 3.4; repeat the bubble leak test. If the valve passes, stop. If it fails, contact ChemValve.

5 IN-SERVICE INSPECTIONS

- 5.1 If for any reason a positive shut-off is not achieved or stem leakage occurs, perform the valve adjustment steps described in section 3. If the leak cannot be stopped contact ChemValve for further assistance at (800) 879-3720.
- 5.2 After the valve has been operational for 48 hours the live load system should be inspected and adjusted if necessary.
- 5.3 ChemValve recommends periodic inspection and adjustment of the live load system during the life of the valve. If the valve is frequently cycled or experiences frequent thermal cycles, inspections should occur a minimum of once per month.
- 5.4 If after several packing flange adjustments during the life of the valve, the bottom of the packing flange comes within 1/16” of the top of the valve bonnet, the valve should be scheduled to be replaced or repaired. (Once the packing flange hits the top of the bonnet, sealing forces will be reduced and the valve will be susceptible to leakage.)

6 VALVE REMOVAL

- 6.1 A valve should be allowed to cool to near ambient or ambient temperature before it is removed.
- 6.2 ChemValve recommends a valve not be removed when its temperature exceeds the following:

LINER	TEMP (°F)
GRPFA	200
PFA	200
PPL	120
PVDF	150

- 6.3 Each flange should be covered with a flange protector or faceplate immediately after removal regardless of the temperature.