



PREVCO Vacuum, N2 Backfill & Endcap Removal KIT

OWNERS MANUAL

PREVCO Subsea LLC
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Vacuum / Back-Fill / Endcap Removal Procedures

Contents:

- Vacuum Pump (120 VAC)
- Nitrogen Purging Regulator
- Nitrogen Bottle (40cu/ft)
- Gage / Valve Manifold Assembly
- Charging / Vacuum Hose
- Wrenches and fittings



Vacuum Leak Check Procedure (also see flow chart procedures):

1. Make sure the housing to be vacuumed/N2-filled is completely assembled with all the endcap fasteners in place for safety.
2. Remove the vent plug from the pressure vessel end cap.
3. Install the gage / valve manifold assembly into the vent plug port on the end cap.
4. Attach one end of the hose to the vacuum pump suction side (right side of pump facing the gages) and the other end to the gage / valve manifold assembly. **Warning! Remove plastic covers (if any) from the pump inlet and outlet to prevent injury.**
5. Open the valve on the gage / valve manifold assembly.
6. Turn on the vacuum pump and evacuate to the test vacuum level (usually to the maximum vacuum that the pump can obtain). Continue to run for at least 3 minutes after reaching the test vacuum level to allow any component off-gassing to stabilize (Be sure to check that your internal components can survive a vacuum and be aware of the effects of component off-gassing to the results of this test)
7. Once a vacuum has been obtained, close the valve on the gage / valve manifold assembly, turn off the vacuum pump and note the reading on the gage.
8. Wait 30 minutes, if readings are the same Proceed. If not you have a leak to debug, start this procedure over.

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Nitrogen Backfilling (also see flow chart procedures):

1. Assuming you've just completed the Vacuum Leak Check Procedure above and the housing remains under vacuum, then.
2. Remove the hose from the right side of the vacuum pump and leave it attached to the gage / valve manifold assembly.
3. Double check that the endcaps and all assembly hardware is fully assembled, and that the endcap closure method is secure and tight and be sure that your housing can support some internal pressure inside the housing (note, the endcaps closures on **PREVCO** housings are designed to withstand internal pressure for this purpose).
4. Ensure the nitrogen-purging regulator is securely tightened to the nitrogen bottle. (Start with the regulator adjusted to zero. Back out the pressure-adjusting handle on the regulator, counterclockwise.)
5. Attach the free end of the hose (was attached to the vacuum pump previously) to the regulator and remove hose from the manifold keeping valve closed.
6. Once the vacuum leak test procedure is completed satisfactorily, open the HP valve on the nitrogen source and slowly turn the pressure adjusting handle clockwise to purge the hose before attaching it to the gage / valve manifold assembly. (DANGER! use as low a pressure, as the regulator will allow ~5psi is best.)
7. Now attach the loose end of the hose to the gage / valve manifold assembly and tighten.
8. Slowly open the valve on the gage / valve manifold assembly and watch the gage as the vacuum decreases allowing nitrogen to fill the pressure vessel. (DANGER!! do not allow the nitrogen pressure inside the vessel to exceed a maximum of +5 psi.)
9. Close the valve on the gage / valve assembly once a positive pressure has been obtained. (**DANGER!! do not allow the pressure to exceed a maximum of 5 PSI.**)
10. Close the valve on the HP nitrogen source.
11. Remove the hose from the gage / valve manifold assembly.
12. With the valve closed, remove the gage / valve manifold assembly from the vent plug port on the end cap, and install and tighten the vent plug just after nitrogen finishes escaping from the pressure vessel.
13. Remove the hose from the regulator.
14. Stow all items in the storage case for future use.

Endcap Removal (Also see Flow chart procedures):

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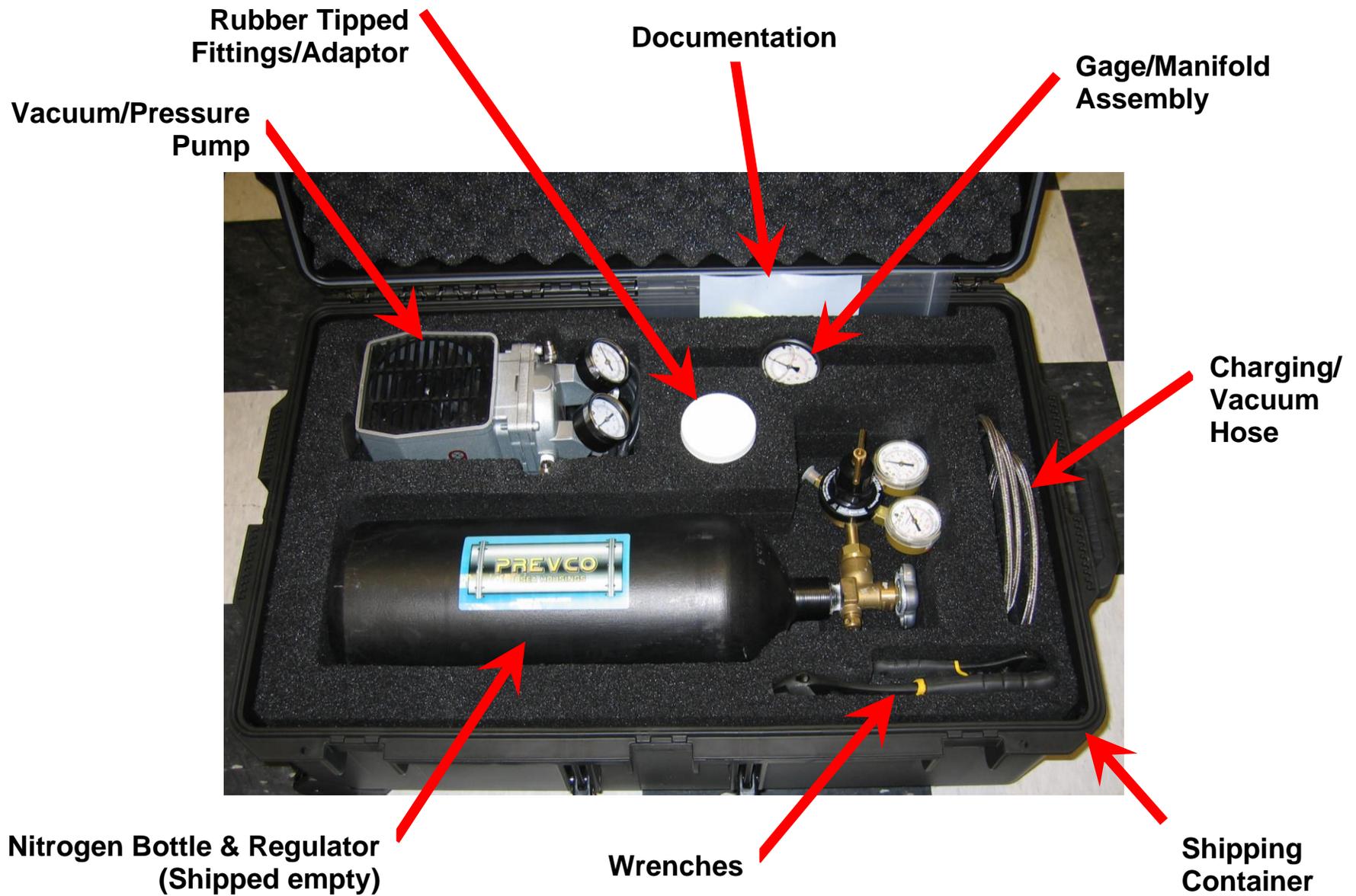
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1. Remove vent Plug to equalize the internal pressure of the housing to the external pressure and position the housing on its side (housing axis parallel to the ground. Position supports so that the housing will not roll, and the end cap will be supported as it is removed.
2. Remove and replace the endcap fasteners with longer bolts, (should be about ¼” longer than the endcap thickness)
3. Check that the other endcap is secured properly, be sure to check that the endcap closure is tight and in place
4. Loosen the endcap fasteners on the end to remove by about ¼”
5. Rig the vacuum kit hose to the pressure side of the pump (left side)
6. Attach the supplied rubber tipped nozzle to the free end of the hose.
7. Turn on the vacuum pump
8. Hand holding the nozzle, press it into the open vent port opening and make a temporary seal while air pressure is flowing into the housing.
9. Allow the internal pressure to increase but do not exceed 10PSI!
10. When the endcap pops out against the loosened bolts immediately remove the handheld nozzle.
11. Let the air inside the housing equalize with the outside ambient air pressure.
12. If the endcap is not ready to be pulled off by hand, then loosen the endcap fasteners by another ¼” and repeat the process (loosen bolts, apply air pressure with handheld rubber nozzle, endcap pops out remove pressure, allow to equalize).
13. Repeat as needed till endcap can be removed. If at any time during this process the end cap becomes misaligned and jammed, straighten it out by lightly tapping the high side back into alignment with a rubber hammer.
14. Turn off the vacuum pump
15. Remove fasteners and lift endcap away from tube

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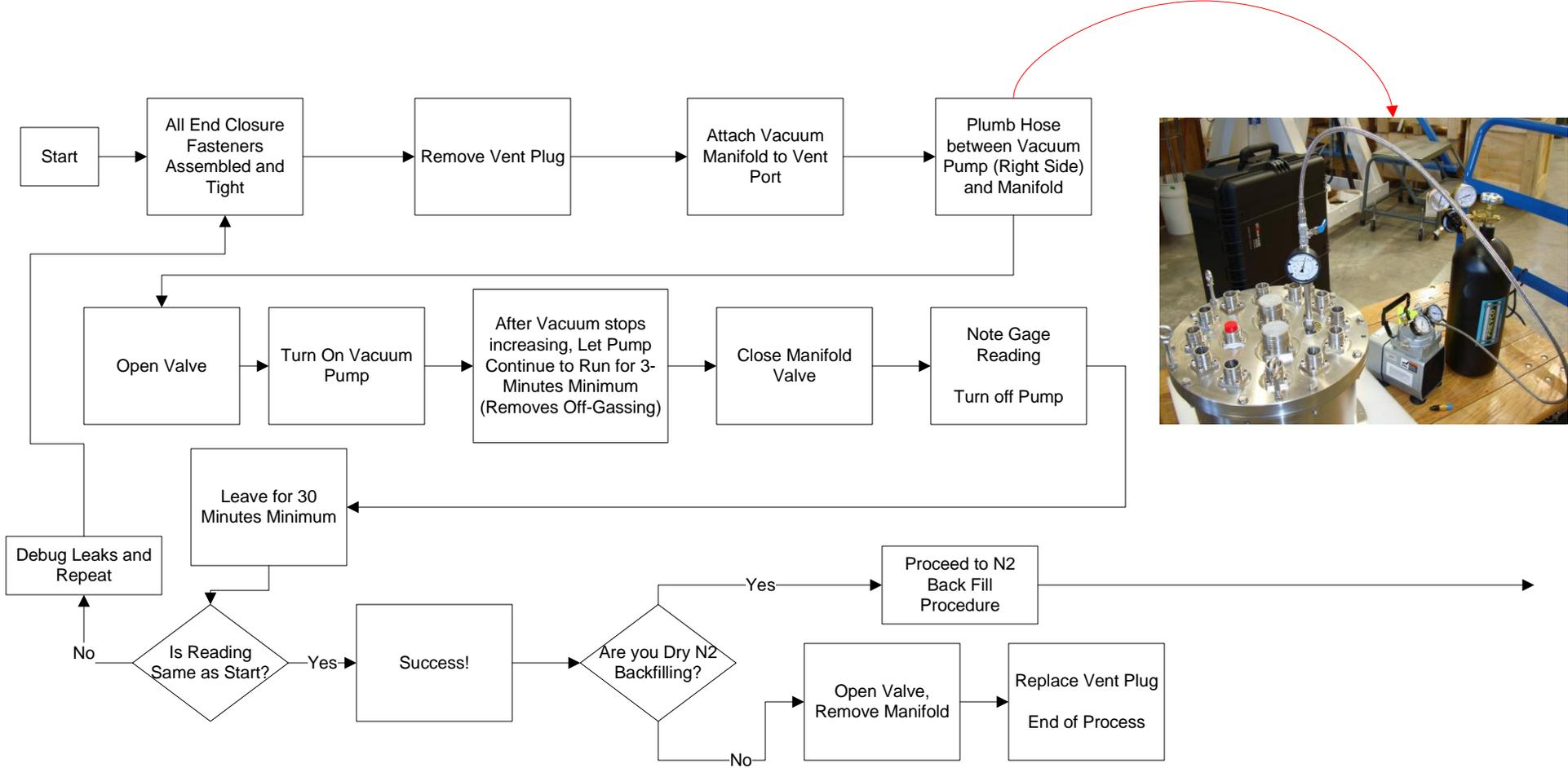
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Vacuum Leak Check Procedure

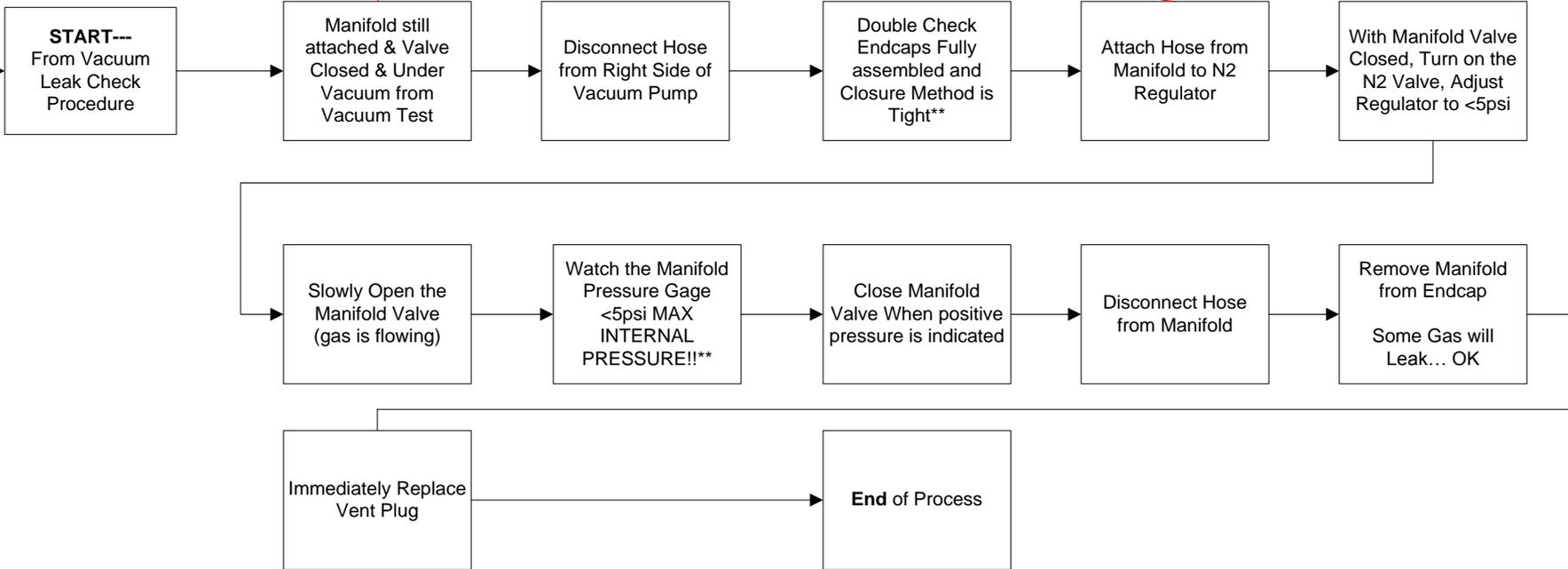
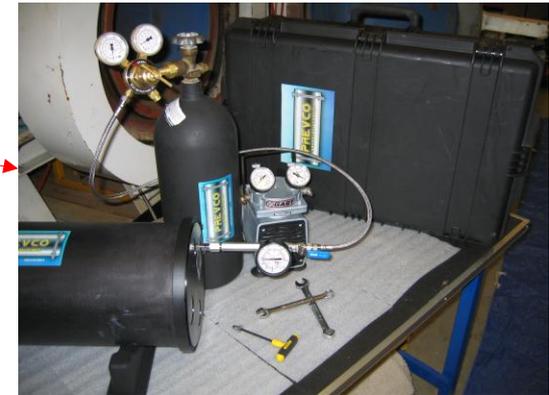
(Using PREVCO's Housing Support Kit)



****CAUTION! INTERNAL PRESSURE INSIDE AN ENCLOSURE CAUSES TREMENDOUS FORCES THAT CAN CAUSE DAMAGE OR INJURY... MAKE SURE ENDCAP CLOSURE IS PROPERLY INSTALLED AND TIGHT, DO NOT EXCEED 10PSI INTERNAL PRESSURE, PLACE ENCLOSURE IN A SAFE PLACE AND STAND AWAY FROM ENDS IN CASE OF RELEASE**

Dry Nitrogen Backfill Procedure

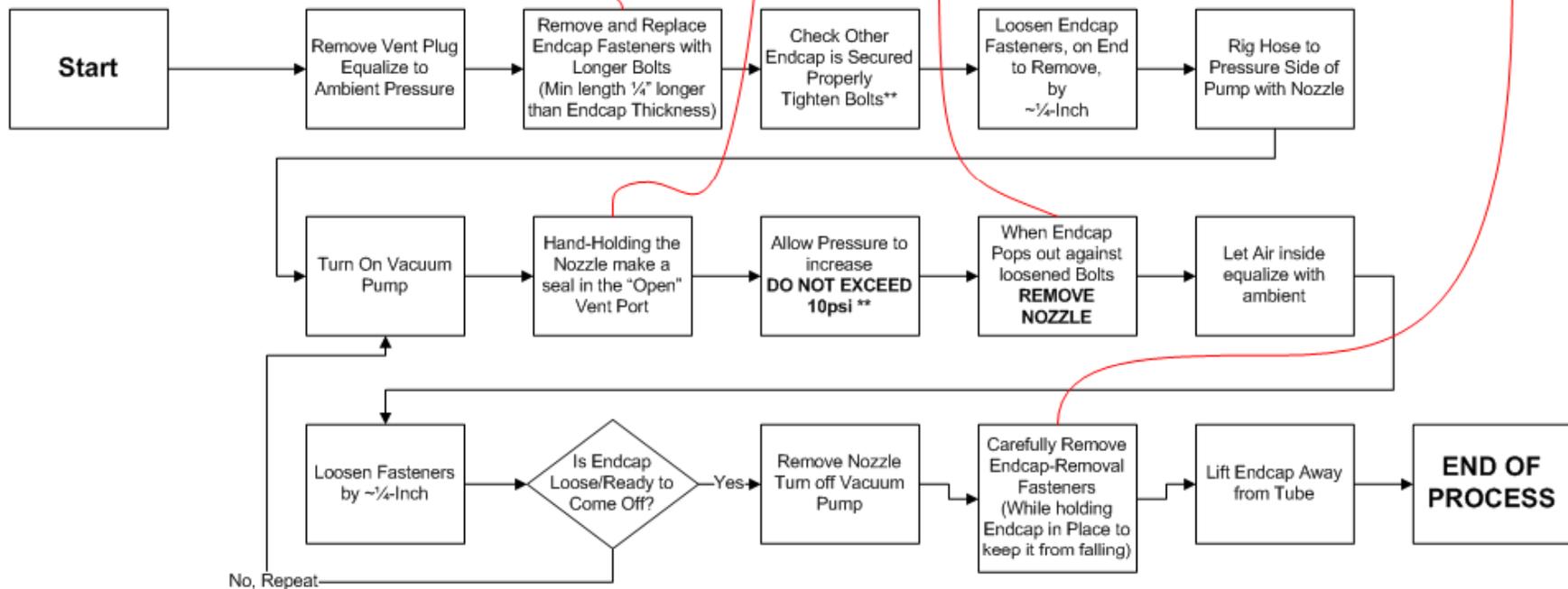
(Using PREVCO's Housing Support Kit)



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End Cap Removal

(Using PREVCO's Vacuum/Support Kit)



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