

DIY Alde Glycol Exchange for T@B Travel Trailers

(v1 introduced May 2021)

Overview

Cabin heat is provided by hot glycol circulating through a non-pressurized open loop. A circulator pump draws glycol from the reservoir and pushes it through the boiler body and on to a series of convectors before returning it to the reservoir.

This method of exchanging the glycol follows the normal flow of the system and uses an inexpensive hand pump to duplicate the fill function of Alde's proprietary service pump. The use of adapters within the expansion tank allows for glycol to be easily introduced under pressure without the need to disconnect any fittings or modify the system in any way. The adapters are constructed from readily available hardware and require limited skill to assemble. A schematic of the process is shown in Illustration 1.

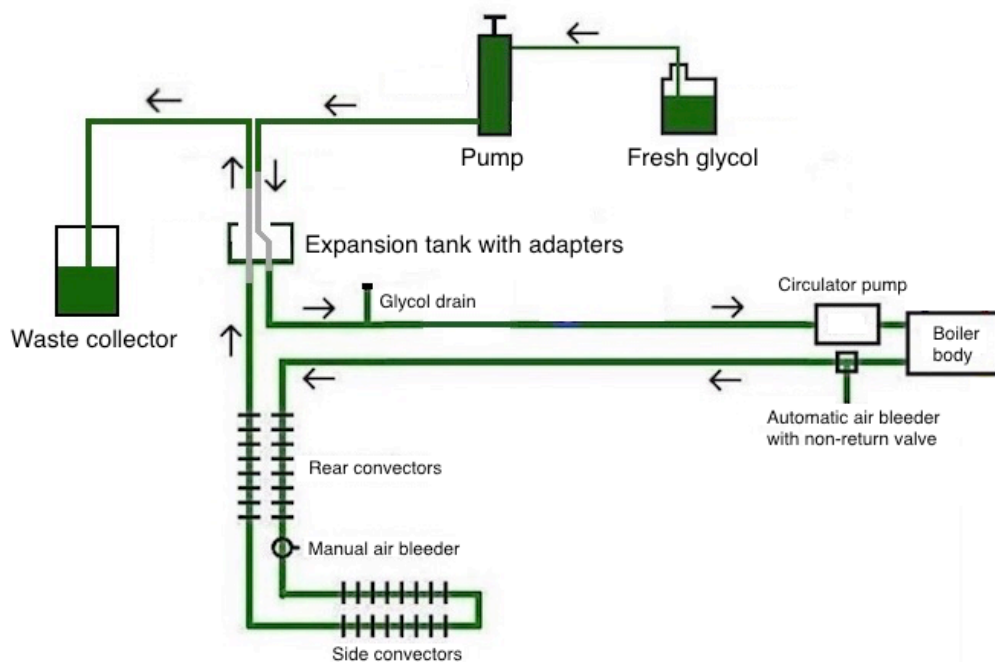


Illustration 1. Introduction of fresh glycol into the Alde system. Old glycol is forced under pressure out of the convectors and collected as waste. Schematic is based on a T@B 320 S but the process works the same in other models.

Tools and Supplies

Pump: A simple hand transfer pump such as the Performance Tool W1156 is sufficient. The pump features a clear body and can be disassembled for cleaning. Like many pumps, it is shipped with a viscous lubricant on the piston—this should be removed before use to avoid introducing it into the Alde. *SOURCE: Amazon.com and possibly others.*

Tubing: Three 4' (minimum) lengths of 1/2" OD x 3/8" ID clear tubing are required to draw the fresh glycol to the pump, connect the pump to the expansion tank, and connect the expansion tank to the waste collector. *SOURCE: Local hardware store. (NOTE: The pump listed above comes with two lengths of tubing).*

Adapters: These allow the tubing to connect to the openings in the bottom of the expansion tank (Illustration 2). Assembly instructions are at the end of this section. The adapters are constructed from:

- Two 3/8" OD x 20" solid toilet water supply lines: rigid but soft copper pipes that can be bent by hand without breaking or kinking. *SOURCE: Local plumbing supply store.*
- Two #2 drilled rubbers stoppers with 3/8" holes. *SOURCE: Local or online homebrew supply store or Amazon.com.*
- Two small (~1/2" diameter) screw-type hose clamps. *SOURCE: Local hardware store.*

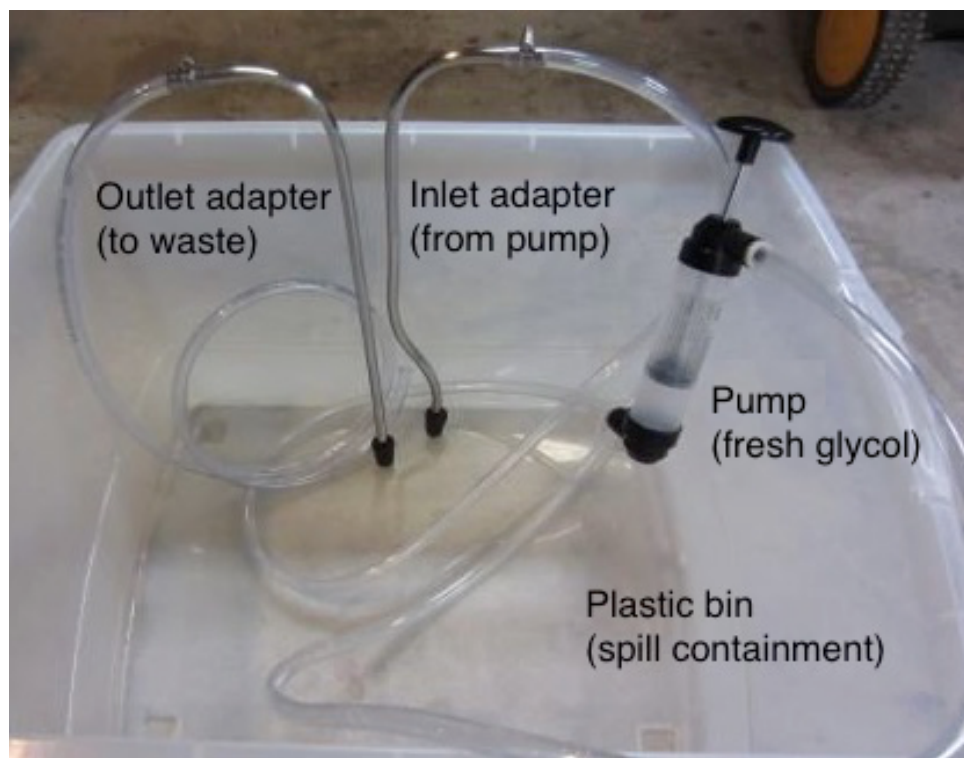


Illustration 2. The assembled glycol service pump. Adapters are constructed from 3/8" OD solid toilet water supply lines and #2 drilled stoppers.

Large plastic bin or tub: This is strongly recommended for spill containment, as some dribbling may occur when swapping tubing around. The bin should be large enough to contain a jug of fresh glycol and a waste bucket, and allow room for easy operation of the pump. *SOURCE: Any home goods store.*

New glycol: A minimum of three gallons are needed for servicing a 320. Four or more gallons will be required for a 400, depending on configuration. Sufficient fluid is needed for complete flushing and for topping up the expansion tank as needed. *SOURCE: Amazon.com for Century TF-1. Rohmer RG-RTU-50 still TBD.*

Hand tools: A screwdriver and pliers are needed to loosen and reinstall hose clamps. Tools for accessing the Alde expansion tank are also required; these may differ by model and year.

To construct the adapters and assemble the service pump:

1. Remove the flanges on the toilet water supply lines using a copper pipe cutter or hacksaw. Clean the cut ends to remove any burrs or loose debris.
2. On the INLET adapter, make a *gentle* 45-degree bend centered about 3" up from the bottom. Do the same thing—in the opposite direction—about 3" higher up. This will create a 2-1/2" offset in the adapter (Illustration 2). *NOTE: Don't stress over this. Work slowly to avoid kinking the pipe. Dimensions are approximate and if you make a mistake it can usually be corrected!*
3. On both the INLET and OUTLET adapters, make a *gentle* 90-degree bend near the top. Be sure to leave at least 10" below the bend so the adapters will fit completely in the expansion tank. (Illustration 2). *NOTE: The direction of the bend in the offset INLET adapter will depend on the specific location of your expansion tank!*
4. Slip a drilled #2 rubber stopper on the lower end of each adapter. The stoppers should fit snugly so they do not slide up the adapter when inserted into the expansion tank. If the fit is too loose, you can fashion a stop with several wraps of electrical tape on the pipe just above the stopper.
5. Secure a length of 3/8" ID tubing to the top of each adapter with a small screw-type hose clamp.
6. Attach the tubing from the INLET adapter to outlet of the pump. Attach the remaining length of 3/8" tubing to the inlet of the pump.

Glycol Exchange

It is not necessary to completely drain the system of old glycol prior to refilling. New fluid will be pumped in one end, forcing old fluid out the other. However, to facilitate use of the adapters, it is advised to drain the expansion tank using the existing Alde glycol drain.

(If you need to *fully* drain the system for other maintenance purposes, see Appendix A. If you need to flush the system with water or other treatment prior to refilling, see Appendix B.)

1. Place a 1-1/2 gallon (or larger) container under the Alde drain and remove the drain plug (Illustration 3). The contents of the expansion tank (1-2 pints) should drain.

The contents of the boiler body (about 7 pints) should also drain, though suction in the system can restrict this. Patience and jostling of the hoses near the Alde may help initiate the flow. While it is not strictly necessary to drain the boiler, doing so may help minimize mixing of old and new fluids when refilling.

Once draining is complete, replace the drain plug securely before proceeding.

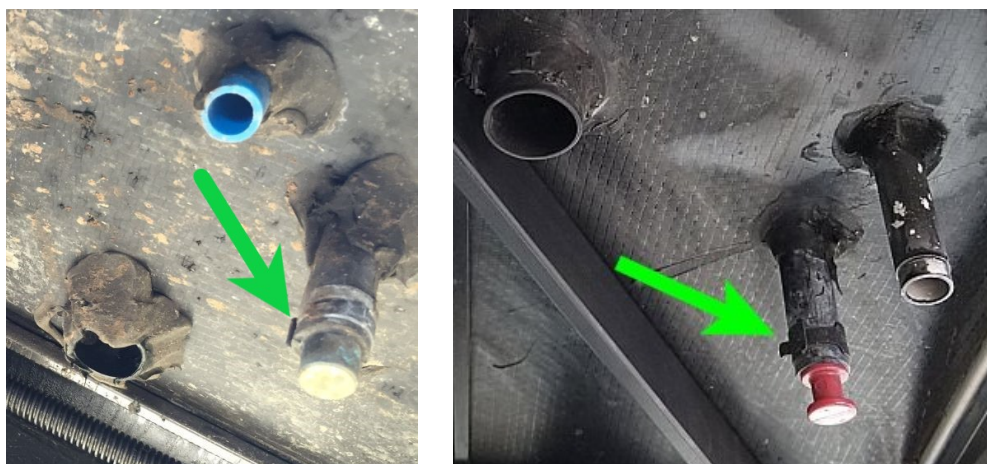


Illustration 3. Typical T@B Alde glycol drains. Older models have a brass plug (left), newer models have a red plastic plug (right). Both are secured with a hose clamp that can be loosened with pliers and slid up on the hose. *Leave the clamp on the hose so it does not escape and become a projectile!*

2. Set the containment bin and pump on a secure surface where the tubing and adapters are in reach of the expansion tank.
3. Insert the stopper of the INLET adapter firmly into the opening at the bottom of the expansion tank that is *offset* from the expansion tank cap. Insert the stopper of the OUTLET adapter firmly into the opening at the bottom of the expansion tank that is *directly below* the expansion tank cap (Illustration 4). *The adapters should stay in place while refilling the system. If they don't, a second set of hands may be needed to hold them secure.*



Illustration 4. The adapters in the expansion tank (below partition). If clearance above the tank is limited, the adapters can be shortened. The tubing to the INLET adapter is shown filled with glycol.

4. In the containment bin, place the hose to the pump inlet in a bottle of fresh glycol. Place the hose from the OUTLET adapter into a suitable container for waste collection (Illustration 5).



Illustration 5. The pump draws fresh fluid and pushes it through the system via the INLET adapter. Old fluid is forced out through the OUTLET adapter and into a waste collector (not shown).

5. Start pumping. (*NOTE: The pump listed here works better if operated with the handle at the bottom--experiment as needed.*) The pump will draw fresh fluid and force it into the system through the INLET adapter. Old glycol (and any trapped air) will be forced out of the system and into the waste collector through the OUTLET adapter. *Don't worry if a bit of air is introduced through the pump—this will find its way out when the circulator pump is activated in steps 9 and 10.*
6. Continue pumping, swapping out fresh glycol and waste containers as needed. For a 320, pump a *minimum* of two gallons of fresh glycol into the system. For a 400, pump a minimum of 3-4 gallons depending on configuration. (Pumping an extra quart or two will ensure maximum removal of the old fluid.)
7. Remove the adapters from the expansion tank. Top up the expansion tank with fresh glycol and replace the cap loosely to control any splashing during the next steps.
8. Adjust the circulator pump to its highest speed. On some models, adjustment is made with a small dial on the pump itself (Illustration 6). Pumps without a dial are adjusted remotely via the Alde digital control panel (Illustration 7).



Illustration 6. Alde glycol circulation pump with manual speed control dial. On some systems, pump speed may be controlled remotely from the digital control panel.

9. Ensure that both the propane and electric heaters are OFF (turning off the propane supply and unplugging the Alde from 120V power is advised). Activate the circulator pump by turning on the heat function and raising the thermostat on the analog control panel, or by setting the pump to continuous operation with the digital control panel (Illustration 7). *NOTE: If the air temperature is very warm, the thermostat on the analog control panel may not go high enough to activate the circulator pump.*

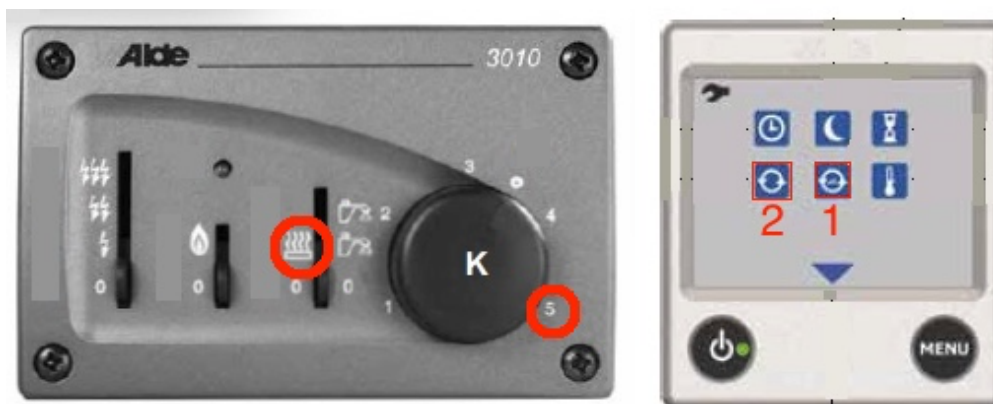


Illustration 7. On the analog control panel (left) the circulator pump is activated by turning on the heat function and raising the thermostat. On the digital control panel, pump functions are accessed from the Tools menu (right). Function #1 controls the pump speed (if so equipped) and function #2 sets the pump to continuous operation. *In either case, make sure all heat sources are turned off!*

10. Monitor the expansion tank closely. Vigorous circulation in the tank should be evident. Within a few seconds trapped air will escape into the tank and the glycol level in the tank will drop. Stop the circulator pump, and top up the tank again.
11. Repeat steps 9 and 10 until no more air escapes and the level in the tank stabilizes. Continue to circulate the glycol at high speed for several more minutes.
12. Stop the circulator pump and return it to its normal operating speed. Turn on the heaters (propane or electric) and resume circulation of the glycol. After 15-30 minutes (normal warm up time) ensure that the rubber hoses to and from the boiler are warm, and that heat can be felt at each convector. *If heat is not being distributed, there may still be air trapped in the system. You may need to employ the manual bleeding techniques described in the Alde operating manual.*
13. When satisfied that the system is operating properly, make a final check of the glycol level in the expansion tank. Add or remove fluid so that the level is between the MAX and MIN marks on the tank.

Appendix A: Complete System Drain

There is no need to drain the entire system for a simple fluid exchange. Complete draining is only required if you need to disconnect hoses from convectors for inspection or additional maintenance.

Removal of the Alde drain plug will drain glycol from the expansion tank and boiler core. However, high points in the system prevent the convector loops from draining without further intervention. Depending on model and configuration, up to half the glycol in the system may remain in the convector loop.

Trapped fluid may be expelled using air pressure to force it into the expansion tank where it can drain out via the regular Alde glycol drain.

1. After draining the expansion tank and boiler core (described previously) leave the Alde glycol drain plug removed.

If system suction prevented the boiler core from draining, carefully remove the glycol hose from the top of the Alde. (Like the glycol drain plug, the hose is secured with a metal spring-clamp that will need to be loosened and slid out of the way.) Work over a small spill pan and keep the end of the removed hose elevated to avoid spilling any excess glycol. Removing this hose will vent the boiler core and allow it to drain.

2. Disconnect the automatic air bleeder assembly and its associated non-return valve from the hose running to the convectors. (Like the glycol drain plug, the hose is secured with a metal spring-clamp that will need to be loosened and slid out of the way.) Work over a small spill pan and keep the end of the removed hose elevated to avoid spilling excess glycol. (Illustration 8).



Illustration 8. Disconnect the heater hose just below the air bleeder assembly (left). On some models, the fitting includes a non-return valve and should also be removed (right). Pressurizing this hose will push glycol out of the convector loop and into the expansion tank where it can drain.

3. Force air gently into the open end of the hose. (TIP: Your INLET adapter refitted with a #3 or #4 drilled stopper will allow you to use your pump for this purpose.) As the system pressurizes, glycol should flow into the expansion tank and then drain out through the Alde glycol drain. (TIP: Leave the cap of the expansion tank in place while doing this to prevent splashing.)
4. Repeat step 3 until no more glycol can be forced into the expansion tank. Reconnect the hose to the air bleeder assembly and (if necessary) reconnect the air bleeder assembly to the Alde.

This process should remove nearly all the glycol from the system. Towels or spill containment are still recommended if disconnecting any additional part of the convector loop.

Appendix B: System Flushing

The method used for filling can also be used to flush the system with water or other chemicals. When flushing, note that residual fluid may be difficult to remove entirely. Keep these additional considerations in mind:

- If the goal is complete removal (as when changing to a different glycol), a large amount of water will be required. Flush the system until the effluent from the system is absolutely clear.
- Completely draining the system (see Appendix A) prior to the final fill is advised. This may help reduce comingling of fluids and facilitate a complete exchange.
- Flushing extra glycol through the system during the final fill is advised to minimize any dilution from residual water.

Acknowledgements and Disclaimer

Thank you to all who contributed their thoughts, ideas, and innovations to the *Changing out the Alde fluid* discussion on the nüCamp T@B forum. For additional information and alternatives, see the entire discussion here:

<https://tab-rv.vanillacommunity.com/discussion/2665/changing-out-the-alde-fluid/p1>

Special thanks to gregndeb for designing the original adapters, tybladesmith for technical consult, and Tabaz for keeping me on task.

It is not possible to predict every scenario or plan for every contingency. Use or modify these protocols as you wish, at your own risk. Neither Truma/Alde, nüCamp, the author, nor any forum contributor bears any responsibility for damage you may cause to yourself or your camper.

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