

## **Installation of the Vanistan Heater Valve with Auto-bleed and Rod-cable, Version 8-20-25**

Please read this entire document before beginning.

### **Parts list:**

Heater control valve assembly including valve, frame, lever, radiator bleeder tube.

Control cable with cable housing bracket and lever coupling.

Plastic protective sleeve.

### *In hardware packet:*

#8 x 1/2" hex-head sheet metal screw

(2) #4-40 x 1/4" hex-head self-tapping screw (only one needed, an extra is included)

(2) M4 flat washers (ditto)

Cable strap clamp for valve frame

M6 x 20mm Allen socket head bolt

M6 flat washer

M6 nylock nut

M8 hollow banjo bolt

M8 banjo end fitting with tubing barb

(2) M8 copper sealing washers

Oetiker crimp clamp

### **Tools:**

Only ordinary small hand tools are required, plus an electric hand drill and a #38 (.101") drill bit, or a 2.5mm metric drill bit. If you don't have a number drill set or metric set, alternative methods using common fractional inch drills are explained in the cable attachment section, bottom of page 3.

*Notes:* All directions are from the driver's point of view; front is always toward the front of the vehicle, left is always toward the driver's left, etc. Outboard is away from the longitudinal centerline of the vehicle, inboard is toward the centerline.

*Caution:* The small stainless steel elbow fitting which attaches the clear tubing to the valve can be dislocated by rough handling, which could disturb its seals, so handle only the frame and the brass body of the valve and avoid exerting any pressure on the elbow or the tubing.

The picture below shows the new heater valve as it will be installed, the end at top of picture will point upward, the side in view will be rearward. Here the lever is seen in the fully closed position, its small tab is against the brass stop at bottom. Flow direction when installed will be top to bottom.



**Installation general:**

The heater control valve itself installs as a direct replacement for the stock valve, which is a routine job that will not be detailed here. It can be installed during a full cooling system drain, or without draining by clamping both heater hoses. In the latter case the air introduced will be purged on startup if the heater valve is left open.

Where this job differs is in identifying which side of the heater coolant circuit the valve is positioned, and the bleeder tube and control cable installations, so each of those aspects are detailed below.

Also, you must use the included control cable because the new valve's movement is stiffer. The original Vanagon cable is a thinner wire which will buckle when pushing this valve closed.

To prepare for this job, first remove the upper radiator grille, instrument cluster, and plastic lower center dash panel. The spare tire will need to be removed to access the heater valve from under the front of the van with a radiator installed, and the "clamshell" tire carrier can also be removed for easier access. With radiator removed, access is easy thru the front grille opening.

**Tip:** Access is tight installing the heater valve up in the body cowl, but can be opened up considerably by two means. One is to undo the four nuts that hold the radiator fan motor to its frame, and push the motor forward. Also, the gearshift cover box can be removed by undoing the four nuts that hold it up. This will not alter your gear shift adjustment when you put it back.

Also, it's much easier to connect the cable to the heater valve, then work the dash lever and make adjustments to ensure complete closure with the valve hanging free. Lastly, connect the hoses to the valve.

**Feed or return side of heater circuit?**

Vanagons generally came with the heater valve in the feed, or hot side, ignoring the convention of placing valves on the colder side of heating circuits for longer life. The radiator auto-bleeding feature of this heater valve will purge the radiator quickly and continuously if it is installed in the return hose, downstream of the heater core, whether the heater valve is open or not. These instructions describe the recommended installation in the return hose.

("What if I just install the valve in the heater feed side?": This can be done, but then it will only purge air from the radiator when the heater valve is fully open and rpms are over about 3000. So if want this to be as simple as possible, you can skip ahead and just install the new valve in place of the old one. It won't provide the convenience of fast-purging the radiator at a mere high idle, so it would be best to purge the radiator initially by one of the conventional processes, but the valve will afterward work to purge the radiator during normal driving.)

*First, identify the feed and return hoses:*

The easiest way is with the engine warm and idling, open the heater control valve and run the heater fan on high speed. Under the van, feel the surface temp of the two hoses just below the heater valve, the hotter one is feed, cooler hose is return.

Or you can trace the feed hose from the back of the van. On a wbx with the earlier 1.9 cooling system, the feed hose comes directly from a nipple on the forward end of the right cylinder head. That hose connects first to the tee where the rear underseat heater feed departs upward, and another hose continues from the tee to feed the front heater.

On a wbx with the late 2.1 cooling system, the feed hose comes from the coolant manifold just forward of the right cylinder head. This manifold is mounted on the forward side of the forward engine compartment bulkhead. Just like the 1.9 system, that hose goes first to the rear heater tee, then another hose goes on to feed the front heater.

**Installation in return hose:**

If you find your old heater valve is in the return hose, then you simply install this valve in its place, while also observing the cable and bleeder tube details.

But if your van has its old valve in the feed hose, as most do, there are two simple ways to alter the plumbing so the new valve is in the return hose instead.

One is to install the valve in the feed side just as the original valve was installed, and then just swap the feed and return hoses back at the two tees that connect the rear bench seat heater, and the new valve will now be on the return side of the front core. If you swap the hoses on the rear, engine side of the tees, flow direction will be reversed in both heater cores; if you swap on the front side of the tees, flow direction will be reversed in only the front core. This reversal has no effect on heater function, heater cores work the same regardless of flow direction. If you find that your rear heater control valve is on the feed side of the rear heater core, though, reversing flow direction will put it on the cooler return side, which will be beneficial to the life of that control valve.

On some vans, though, access to the rear heater tees can be quite cramped. For the alternative method you'll need a 5/8" (3/4" in PEX) hose barb coupling (brass, stainless, aluminum or nylon) and two more hose clamps (1"/ 25mm size range). You will remove the old valve and replace it with the coupling instead, then cut the opposite hose at about the same elevation and install the new heater valve in it.

### Control cable installation:

At the left end of the vent control levers assembly, remove the heater control cable, clamp and screw. Feed the new cable following the original cable route and into the oval rubber grommet on the center floor hump.

Then mount the cable housing by placing the bracket against the forward face of the lever frame and securing with the #8 x 1/2" hex head screw driven in from the front. A little free play is good to have here, so make the screw snug but not tight, and do not tighten the large nut that holds the plastic housing ferrule to the bracket.



The lever frame holds the cable at a downward angle toward the levers, but this needs to be altered for the rod to follow the lever path. Using a small pipe wrench as shown, or channel lock pliers, grip the far left edge of the frame base and bend it downward just a couple degrees. Test by sliding the cable rod in and out and see that it runs level with the top of the lever as it swings left and right.

**Tip:** You can sight thru the upper slot on the plastic lever fascia plate to see that the rod runs parallel with the top edge of the slot. Bend the frame more or less as needed.

The steel coupler that is pre-attached to the new cable rod connects to the dashboard control lever with the #4 self-tapping screw. For the screw to self-tap, the wire hole must be sized correctly with a #38 (0.101") or a 2.5mm drill. Work thru the access opening in the dash frame with the temp control lever positioned directly below. The resulting hole can still be used with the stock cable if reverting to original equipment.

(If you only have a fractional inch drill set, there are a few alternatives. The lever hole can be drilled to 1/8" and an M3 or #4 machine screw and nylock nut used. Or drill the lever to 7/64" and the coupler to 9/64" and a #6 x 1/4 or 3/8" long self-tapping screw can be used. And lastly, you can drill the lever to 1/8" and the coupler to 11/64", then use a #8 x 1/4 or 3/8" long self-tapping screw; this combo will be a better fit for hole threading than the #6 option. Screws can be panhead or flanged hex head like the #4 screw supplied. A suitable flat washer for the screw you choose should be placed between the lever and coupler. These items can be found at any hardware store.)



Using a 3/16" hex driver, it's a good idea to partially tap the #4 self-tapping screw into the drilled hole first to ensure it's straight, but stop while there's still some resistance to thread-cutting. Install the M4 flat washer on top of the lever as shown, then the coupling piece, and secure with the #4 screw, cutting the last bit of thread but not tightening the screw down hard, so the coupler can swivel (we include two #4 screws and washers because it's easy to dull the cutting threads, and tiny parts are easy to lose!).

**Tip:** Coat the washer with grease so it will stick in place, and use a scribe or piece of wire to guide it into place over the screw hole as shown. Use the same to center up the coupler and washer over the hole. Put a dab of grease on the #4 screw head so it sticks in the nut driver.

Swing the dash heater control lever thru its range to see that it runs the cable smoothly. See tip above about sighting thru dash opening.

**Tip:** If the top lever for defrost sags and interferes with the heater valve lever, use a wide-jawed vise grips to squeeze slightly at the bend shown below to elevate the lever tip, which should slide in contact with the top edge of the fascia slot.



Finally, swing the lever all the way left, then move it back right about 1/2" before attaching the cable to the new heater valve below. This is to ensure the valve will close completely before the dash lever comes to its stop.

#### **Valve Installation:**

**Tip:** It's easiest to attach the new cable to the valve and make any needed adjustments to ensure it closes completely first. Then run the bleeder tube up to the radiator bleed port, and finally install the valve in the hose run. See tips on page 2 for improving access.

As you prepare to attach the cable to the valve, first be sure the valve is fully closed with its lever against the stop (see picture page 1). Hook the Z-bend end of the cable into the lever. Place the cable strap clamp around the cable housing near its end, then push the M6 Allen bolt with flat washer thru the strap clamp and then thru the hole in the valve frame. Thread the M6 nylock nut onto the Allen bolt from the other side. Position the strap clamp on the frame up against the bent tab. There should be a little bit, about 1/8" or so, of the cable housing emerging from the strap clamp toward the lever, and be sure the lever is fully closed. Use the Allen bolt and nut to draw the strap clamp closed. Tighten the bolt and nut fully.





Check the cable adjustment by working the dash lever to open and close the valve a few times, then move the lever hard left as far as it will go. Go below and check that the valve's lever arm is fully closed against its stop. Alter the cable housing position at the valve to adjust as necessary.

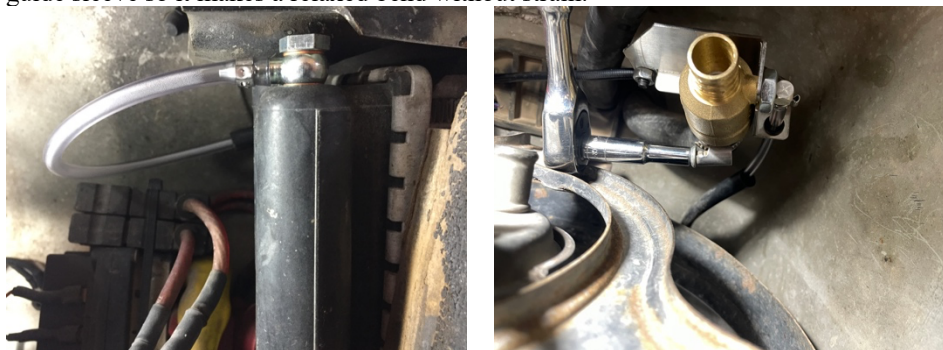
### **Bleeder tube routing:**

From the upper grille opening, insert the plastic protective sleeve in the gap behind the radiator on the right side near the top, as shown. The sleeve will act as a guide for the bleeder tube and will stay in place to protect the tube from chafing. When inserted, it should emerge and be visible from below near the top of the radiator fan cowling recess.



Insert the free end of the bleeder tubing into the guide sleeve from below, and feed it in. The tube will emerge from the guide sleeve at the top and have about 6" free length there.

To finish the bleeder tube, be sure to slide the small Oetiker crimp clamp onto the tube first. Then warm the tube very gently with a warm air blower for just a few seconds, just enough to soften it slightly, and push it onto the barbed end of the banjo fitting. If the tube becomes sticky to the touch, it's too hot and will be too soft to insert the barb, so let it cool and try again. After the tube is slid all the way onto the barb, let it cool, then move the crimp clamp over the barb and pinch the ear closed with pliers or end nippers. Attach the banjo fitting to the radiator bleed port, one copper washer on each side of the banjo eyelet, and tighten gently. Slide the bleeder tube in or out of the guide sleeve so it makes a relaxed bend without strain.



Push the heater hoses onto the valve and take care to position your hose clamps so they can't interfere with the cable and valve actuation lever.

**Temporary valve stiffness:**

This type of ball valve has a stiff action when new if left in one position for some time, but it will loosen up with use. Movement is much easier when the coolant is hot, so at first exercise the valve repeatedly when the engine is warmed up and it should become easier to work.

**Radiator bleeding function:**

When this valve is installed on the heater return side, it will purge the radiator continuously, somewhat more actively when the valve is closed. You may see air bubbles in the clear tube going both directions, this may seem paradoxical, but it's normal and you can relax and let it do its job.

After a complete coolant drain you can refill by any method, but it's no longer necessary to raise the liquid level in the radiator to expel all air before starting the engine. You can still do that if you prefer, but if you instead fill on level ground with the bleeder banjo bolt loosened, then close it and start the engine, there will be about a liter of air remaining in the top of the radiator, which will be purged in a short time by the heater valve bleed function (if you installed it in the heater return hose). Afterwards you merely have to be sure to top up the pressure tank to replace the displaced volume, and from then on maintain the reserve coolant level. No additional bleeding of the radiator should be required, until the next coolant change.

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