

Installation of the Vanistan Cabin Air Control Kit

This kit installs a cable-operated door in the Vanagon cabin fresh air inlet scoop, to control the amount of outside air that can enter the cabin ventilation system, especially at higher road speeds when ram effect causes an annoying pressurization of the venting system. In winter, the cabin heater will be more effective and quieter using low fan speeds when you can reduce outside frigid air mixing with the warmed air inside the cabin. In summer you will be able to stop hot air from diluting the cooling effect of the van's air conditioning system, if so equipped. The kit also includes a one-way passive flapper valve to be installed in one end of the air distribution box, supplying air to the fan when the fresh air inlet door is closed. A steel mesh screen covers the air inlet aperture to keep vermin out.

The inlet door is controlled by a push-pull cable with knob that is installed in the dashboard below the existing vent control levers. This operates the inlet door independently of the existing controls.

Parts list:

fresh air inlet door with foam seal attached
 (2) inlet door stainless sheet steel upper jambs, left and right
 (2) inlet door stainless sheet steel lower braces, left and right
 bell-crank rod with cable stop nut and M4 wire clamping bolt installed
 (2) steel screen panels, left and right
 cable housing with integrated mounting ferrule
 cable wire with integrated pull-knob
 poly cable guide tube 16"
 recirculating air flapper valve

In hardware packet:

cable housing mounting clamp
 (4) clip-nuts
 (3) #10 x 1/2" hex-head sheet metal screws
 (4) #6 x 1/2" hex-head sheet metal screws
 (2) #6 x 3/4" hex-head sheet metal screws
 (2) 1/8" thick spacer washers
 (2) 1/8" round push-on clips
 (2) 1/4" flat washers
 (2) 1/4" circlips
 (2) pieces 1/2 x 1/2 x 1.5" foam adhesive weatherstrip
 (2) pieces 1/16 x 3/4 x 1.5" foam adhesive weatherstrip
 (2) 1/4 by 5/16" plastic bushings
 (1) 3/8" hexnut with captive serrated washer for securing cable housing ferrule

Tools:

Medium flat screwdriver
 #2 Phillips screwdriver
 1/4" and 5/16" nutdrivers
 Needle nose visegrips or pliers
 Wirecutter
 Electric drill
 Right-angle drill drive adapter (optional but very helpful)
 7/64", 1/8" and 3/8" drill bits or stepped holecutter ("electrician's bit")
 2 1/8" hole saw
 center punch
 tape
 7 and 8mm open-end/box wrenches
 small-tip circlip pliers (optional)

Note: 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.

If your van has the '86-91 rectangular headlights assemblies, installation will be easier if they are removed first.

Install Inlet Door Assembly:

Remove the front upper grille and the plastic mesh air inlet screen cover. Remove the 4 plastic expanding inserts from the lower edge of the inlet air scoop if they remained behind.

Remove the backing paper and adhere the (2) pieces 1/2 x 1/2" foam weatherstrip to the finger-shaped end of both of the inlet door sheet steel upper jambs as shown below left. The foam strips should be placed on the top surface of each jamb (see pictures of jambs being installed) about 1/2" from the end of the finger, leaving about 1/16"-1/8" of the longer front edge of the steel piece exposed, the foam pieces may hang over the rear edge a bit. These will compress and fill the narrow opening left at each end of the scoop when the jambs are in place.

Adhere the (2) pieces 1/16 x 3/4" foam weatherstrip to the plain bent tab of both of the inlet door sheet steel lower braces as shown below center. Also snap the (2) 1/4 by 5/16" plastic bushings into the holes in the wedge shaped face of each brace.



On a flat surface, prepare the inlet door assembly as shown above right by placing the (2) 1/8" thick spacer washers on the inlet door hinge pins, one on each end. Insert the hinge pins into the 1/8" holes in the jambs, then push the (2) 1/8" round push-on clips onto the hinge pins, as shown below left. Don't push the clips on all the way, leave an 1/8" gap before they reach the surface of the jamb, so they allow some relative movement between the door and jambs, they are only there to keep the assembly together and make it easier to maneuver it into place within the cabin air inlet scoop.



Install three of the (4) clip-nuts over the furthest left, second from left, and furthest right holes in the bottom edge of the cabin air scoop, as shown above center.

Holding the inlet door assembly by the jambs, maneuver it up into the scoop. As shown above right, begin with the assembly held a bit left of center, raise it so the inlet door slips up behind the center grille bracket. Move the assembly rightward and guide the right jamb up into the end of the scoop while holding the left jamb lower and outside the scoop opening. Push the right jamb to nestle into the end of the scoop opening as shown below left, then push it upward to its final position as shown below center, until the rectangular bent tab at the rear edge of the upright portion of the jamb snaps into place just above the bent-over lower lip of the aperture up inside the scoop, as indicated by the yellow arrow below right.



The right jamb should hang loosely in place by itself, if it wants to fall out use some tape or have a helper hold it up in place temporarily.

Roll the upright portion of the left jamb rearward as shown below left, while swinging the assembly up into the scoop, then move it upward while rolling the upright portion forward again and swinging the curved back edge in along the curved lower edge of the scoop, as shown below center. As you bring it into final position, lower the outboard finger and nudge the 1/2" foam filler strip in below the body edge, as shown below right. Move the jamb into final position and push it up into the scoop until the bent tab snaps into place above the lower aperture lip just as the right jamb did.



The steel lower braces install with their bent tabs pointing outboard. Bring each one up to wedge into position below each jamb and with the bottom ovalled hole lined up above the appropriate clipnut. The picture below left shows the left brace being positioned. Note the very small tab along the top edge of each brace, this should line up with the small rectangular hole on the bottom face of the jamb. When in position, give the brace a sharp push with the heel of your hand or a plastic mallet to force the tab to snap into the rectangular hole, as shown below center. Start a #10 x 1/2" hex-head sheet metal screw in each brace's clipnut, then push the brace firmly upward while tightening the screw, as shown below right with the right side brace.



The jamb piece should be held in position where its forward long edge pushes up against and runs along the upper rim of the grille opening, just covering it from below.

Check the swing of the inlet door, when pressed closed the projecting foam strip along the top will make it want to spring partly open, but apart from that it must swing freely without binding. Make sure neither end drags against the jambs (the 1/8" thick washers are there to ensure a gap).



Optional: If you think the finger ends of the jambs need more support to stay in position, or need to be drawn upward to a tighter fit to the grille opening, hold each finger in the best position and drill with a 7/64" bit, using the hole in the finger end as a guide, up into the roof of the grille opening. With a right-angle drill adapter you can drill the hole straighter, but even without one it's OK if the hole is at a slight angle. Then use the (2) #6 x 3/4" hex-head sheet metal screws to fix the finger ends of the jambs in place.

Install Control Cable:

With center punch, mark where you will drill a hole for the cable to mount in the lower dash, as shown below left. Make sure the hole will be roughly centered left-to-right below the small switch panel, not further to the right under the lever fascia (where you can see a button blocking an unused hole in my dash). This is the position where the cable run will miss obstructions under the dash, like the brake booster vacuum pipe, that could put stress on the cable housing and make it difficult to move. Applying tape around the hole area before drilling will help protect the dash finish. Drill a 1/8" pilot hole, followed by the 3/8" drill (use of a stepped holecutter can produce a cleaner hole).



Behind the front grille to the left of the radiator is a 1/2" blind rubber grommet blocking an existing hole in the van firewall. Remove this grommet to expose the hole in the bodywork there that the control cable will go thru (shown at left with poly tube and cable). Insert the poly tube into the hole. You need to maneuver the tube thru the space under the dash until the tube is roughly aligned with the 3/8" hole you drilled.

Insert the end of the cable thru the 3/8" hole, only an inch or two. Reach under the dash edge and slip the 3/8" nut onto the cable end, serrated washer first, then guide the cable end and cable housing into the poly tube. Slide the cable on into the tube, and once the housing ferrule threads go thru the dash hole, slide the 3/8" nut onto the ferrule and thread the nut on. It's very hard to get a wrench on the nut from under the dash, but by holding that nut by hand you can tighten the plastic 22mm hex that is part of the cable ferrule. Make sure the cable knob can be moved in and out about 1.5" with little drag. The poly tube can remain in place, or you can remove it and fit a rubber grommet in the hole where the cable emerges.

Install Bellcrank Rod:

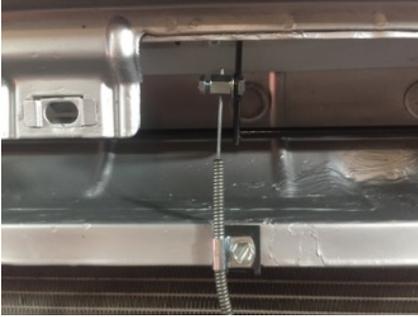
The bellcrank converts the up-down movement of the cable to the forward-backward movement required to control the inlet door. The control cable housing is clamped in place and the cable wire is the active element.

Push the inlet door shut and have a helper hold it there at the right end, or wad up a rag and stuff it into the right end of the scoop opening to hold the door closed. The left end of the bellcrank rod is the shorter segment of the long 1/4" rod. Move the bellcrank arm with the bent finger that operates the inlet door up into the grille opening and in front of the closed inlet door, as shown below left, then slip the tip of the 1/4" rod into the plastic bushing in the left brace. If needed, you can push a little against the outboard side of that brace to angle the brace inboard slightly to get the rod to slide into the bushing. Then insert the right end of the rod into the right side bushing, and as you slide it in further make sure the bent finger of the bellcrank arm slides in behind the bent rod on the face of the inlet door, as shown below center.



Gently push the bellcrank's cable attachment arm up and down to open and close the door, everything must move freely. Do not bend the bellcrank to force the door closed, instead find out where the drag is and make adjustments as necessary.

Put the free end of the cable wire up thru the wire stop nut until it projects out the top by 1/16-1/8". Use the 8mm open end wrench to gently hold the stop nut and with the 7mm wrench tighten the M4 bolt until it grips the cable wire, as shown above right. **Warning:** be careful not to twist the stop nut side to side with the wrenches or the brazed washer could break off from the bellcrank arm.



Slip the cable housing mounting clamp around the cable wire and slide it down around the cable housing, so that when it is screwed into place the cable housing lies to the right of the screw, as shown at left. Mount the cable clamp loosely to the clipnut with the last #10 x 1/2" hex-head sheet metal screw. Shift the bellcrank rod left or right so the cable stop nut is vertically aligned with the centerline of the cable.

Inside the cabin, push the cable knob all the way in, this will be the inlet door closed position. Back outside, hold the cable housing clamp level, to assure the cable exits the housing vertically, while you slide the cable housing upwards until the cable wire is pushing the inlet door fully closed. Tighten the cable clamp sheet metal screw.

Work the knob inside to be sure the inlet door is pushed closed when the knob is pushed in, make adjustments at the cable housing clamp until you are satisfied with the knob/door operation.



Optional: if the end of the cable housing is clamped vertically, the attachment to the cable will normally keep the bellcrank rod aligned laterally, but if you want to ensure it stays in place, you can use the (2) 1/4" flat washers and (2) 1/4" circlips to limit side to side movement. Just put a washer over the exposed 1/4" bellcrank rod on the outboard side of each brace, and using a small-tipped angled circlip pliers, put a circlip on the end of the rod. Adjust position to allow a small amount of lateral movement to ensure the rod never binds, and be sure the bellcrank cable arm is aligned to be straight above the cable centerline.

Install Screen Panels:

Note the left screen panel has a small cutout along the bottom edge for the cable clamp. Hold the screen in place as shown so the bent edges along the bottom and outboard end are pushed against the bottom rim of the scoop and the bent tab of the left brace, respectively. Check the fit of the screen against the center grille bracket and bend as needed to adjust for close fit there. Make sure the small cutout fits around the cable clamp. Then simply bend the bent edges to make them grip the scoop rim and the brace tab. Install the right screen panel similarly. Where the bottom bent-over edges overlap at the middle, push the last clipnut over both layers, as shown below center. That should be sufficient to keep the screens in place, but if you wish you can also use two of the #6 x 1/2" hex-head sheet metal screws to secure the screen to the brace tabs as shown below right.



Test inlet door operation again before reinstalling the radiator grille, and the headlights assemblies if they were removed.

Install Recirculating Air Flapper Valve:

Remove the glovebox and the dashboard end vent flex hose. Disconnect the wiper motor wire connector and tuck it out of the way. You can disconnect the vent control cable crossing this area if needed, it makes the job easier, but take care, the clip can fly off and be lost, and the old plastic can easily break at the clip mounting. It's best to leave it alone, but the cable is removed for clarity in these pictures.



Cut a piece of thin cardboard exactly 1 3/16" square as a pilot hole marking guide. Place the paper square flat onto the end face of the air distribution box, top edge butted up against the rim of the air box cover seam (green arrow far left picture), and left side of the rectangle butted against the embossed pin which is colored white (red arrow).

Positioned so, make a center punch mark at the bottom forward (lower-right as you are looking at it) corner of the square. Drill a 1/8" pilot hole, then cut out a circle with the

2 1/8" holesaw (your hole will probably look much better than the one in the picture, that hole was enlarged by hand after I cut it too small the first time!).

It's rather tight with the wiper motor nearby, so if you have a right-angle drill drive adapter you should use that so you can drill and hole-saw straight on. Hole-sawing at an angle will create a slightly oval hole. If it can't be avoided, you may have to use a round or half-round file, Dremel tool, cutting burr, etc. to round out the hole to allow the flapper valve body to fit. Trim and test the fit often until the smaller-diameter rim of the valve outer body just fits into the hole.

You will also need to remove the lower gusset around the airbox securing bolt (blue arrow) to allow the flapper valve body to seat flat. Trim the plastic down flat on the airbox face within about 1/8" of the edge of the hole you sawed out.

With light pressure applied the smaller diameter step of the valve outer body should pop into the hole with a tight enough fit to remain in place by itself. When inserting the valve, flip the flap open and hook an upper corner of the flap into the hole first, then the rest of it will slip thru easily. Make sure the hinge is at top and press the valve body into the hole.

Test that the flapper valve disc is able to swing inward freely until it is almost horizontal, and drops back down of its own weight when released. If it only swings in part way and jams, try rotating the valve body clockwise a bit so the hinge isn't exactly at the top, and test again. If the flapper still hangs up, it may be rubbing on a ridge feature that can be felt just inside the rearward edge of the sawn hole. Remove the valve assembly and use a half-round file thru the hole to file away a bit of the ridge. The flapper is already relieved a bit on that rearward edge, so you can also trim off another 1/16" of the flapper disc with scissors if necessary. Reinstall and test until the valve disc swings freely.

If the valve is too loose a fit to stay in place, use two of the #6 x 1/2" hex-head sheet metal screws thru the wire ears to secure it. These might not be needed at all if the fit is tight enough, use your own judgment. The screws will self-drill if you use a power screwdriver, or pilot drill with the 7/64" bit thru the wire ears. Tighten the screws very gently as the plastic will easily strip out.

You can test the flapper valve by turning the ignition on and running the fan with the inlet door closed; the flapper should swing inward, and close by gravity when the fan is switched off. When you open the inlet door and the van is moving, the flapper will be pushed closed by the ram air pressure.

Reconnect the vent control cable, if removed, the wiper motor connector, the dash vent duct hose, and reinstall the glovebox, and you're finished.

Safety warning: When it is necessary to defrost or defog the windshield and front door glass, it is always advisable to allow in some outside air, because recirculating inside air will become more and more humid, while drier outside air will remove fogging and icing from glass much faster.

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