

Corvair Vent Systems

All internal combustion engines require a vent system of some type to relieve the pressure buildup caused by leakage of cylinder gas past the piston rings and exhaust guides into the crankcase. As Corvair engines age, the amount of pressure buildup will naturally increase, necessitating regular maintenance of the vent system to minimize crankcase operating pressure. Too much pressure will cause oil to be forced out of the dipstick as well as out of any weak seals and gaskets. High crankcase pressure and blow-by through the vent system also causes engine pinging and poor performance.

There were two types of vent systems used on Corvairs over the years:

1960-1962 The first three model years were fitted with a road draft tube which simply allowed crankcase pressure to exit via a tube between the top cover and a hole in the lower right side bottom shroud. As the name suggests, air flow under the car helped the venting process. This tube has one 90 degree bend that will slowly plug up with sludge, thus requiring periodic cleaning. Use metered low pressure shop air (or a vacuum cleaner hose on the blow side) through the oil filler tube while you use a frayed speedometer cable to roto-rooter the tube. Nasty stuff comes out while you clean!

1963-1969 The second design was referred to as “Positive Crankcase Ventilation”. The PCV management burned the crankcase vapor instead of purging it to the atmosphere. Engine vacuum pulled crankcase vapor out of the crankcase and introduced it into the intake system via the carburetor balance tube on non-turbo cars and in to the intake after the carburetor in turbo equipped vehicles. Excess pressure that was beyond the capacity of the valve or orifice was vented into the air cleaner system. This system was applied as follows:

1. Use of a spring loaded PCV valve for both the '63 models and the '64 -'65 air conditioned models. See #3 below for turbo models.
2. Use of a fixed orifice in the '64 -'65 non air conditioned models with a single air cleaner and on all later years.
3. Turbo cars from '63 to '66 used a larger fixed orifice system with the relief also vented into the air cleaner (the '62 model had a road draft tube).

The Corvair system is not the same system that is utilized by other cars of the period plus newer cars. **Non-Corvairs** had a vent system that used engine vacuum under normal conditions to pull fresh air into the crankcase through a filtered opening and out again through a PCV valve; a “flow-through system”. Excessive blow-by on some cars from a worn engine or high RPM could reverse and vent to atmosphere through the fresh air inlet. There were several variations to the flow through system adapted over the years as emission controls evolved, but the Corvair PCV system remained unchanged except for the substitution of the fixed orifice for the PCV valve.

The second design ('63-'69) system requires more cleaning than the earlier road draft tube described above. The upper tube system can be removed from the lower tube (which is under the top shroud) by simply pulling it out. The o-ring may harden and make removal difficult but it will come out with light lube and twisting. Follow the same procedure as mentioned above for cleaning the tube below the top shroud. A little messy but be creative with a towel and eye protection as the junk is blown out. You must also clean the upper tubes and either the PCV valve or the fixed orifice – whichever you are working with.

PCV valves for Corvairs were provided a special calibration because of the low vacuum at idle. Most original valves are bad and most replacements fit but are not calibrated correctly. This causes idle problems and possible pinging. To check for this problem, simply pull off the hose from the carburetor side of the PCV valve while the engine is at idle and put your finger over that end of the valve. If your idle smoothes out or changes significantly, you have the potential for improvement. One solution that I use is to take any steel PCV valve, cut it apart to remove the spring and valve, weld it back together and weld the small end shut so that it can be drilled to 0.062 and used as a fixed orifice type of system – and it looks original. I have seen tech articles about drilling and tapping the end after welding and inserting a carburetor metering jet so you can do a more precise orifice calibration but I have not personally used that method.

If all your vent parts are clean, the metering of blow-by gas is correct, and you are still experiencing oil coming up the dipstick then check for diluted oil (gasoline), worn out piston rings and worn out valve guides. Old cars get enough blame for air pollution so fix the problems and avoid criticism for the following “shade tree” fixes:

- Welding an additional vent to the top of the oil filler cap and adding a hose to it.
- Removal of all of the upper venting and installation of a ¾” heater hose to the vent outlet at the top shroud.
- Adding STP in large quantities.
- Removal of the oil pan and cutting off enough of the dipstick tube to raise it above the level of the oil. This stops the oil from being pushed out of the dipstick.

Finally:

If you have an engine that runs perfect and does not blow oil out of the dipstick but has oil showing up around the vent exit in the air cleaner, you probably have a borderline dirty vent system or borderline excessive blow-by (or both). In the case of our Corvairs, the blow-by will pull oil with it as the velocity of the exit has to increase (Bernoulli's Principal). Be sure you have the correct oil (no 5W30) and clean vents; then try enlarging the fixed orifice. One of my own cars had oil in the air cleaner around the vent and after checking vent tubes for restriction I enlarged the fixed orifice to .068 which cured the problem.