

Cooling Fins.

The heads do the bulk of the cooling on the engine (later racing Porsches went to water cooled heads with no fins on the barrels), and the more air you can move over the heads, the better. Further, the castings often have enough flash on the fins that some areas will be completely blocked, especially on later castings as the molds wore. The better a job you do cleaning out the flash, the happier your engine will be. Here are the suggestions I've gotten on tools to clean the fins from VirtualVairs:

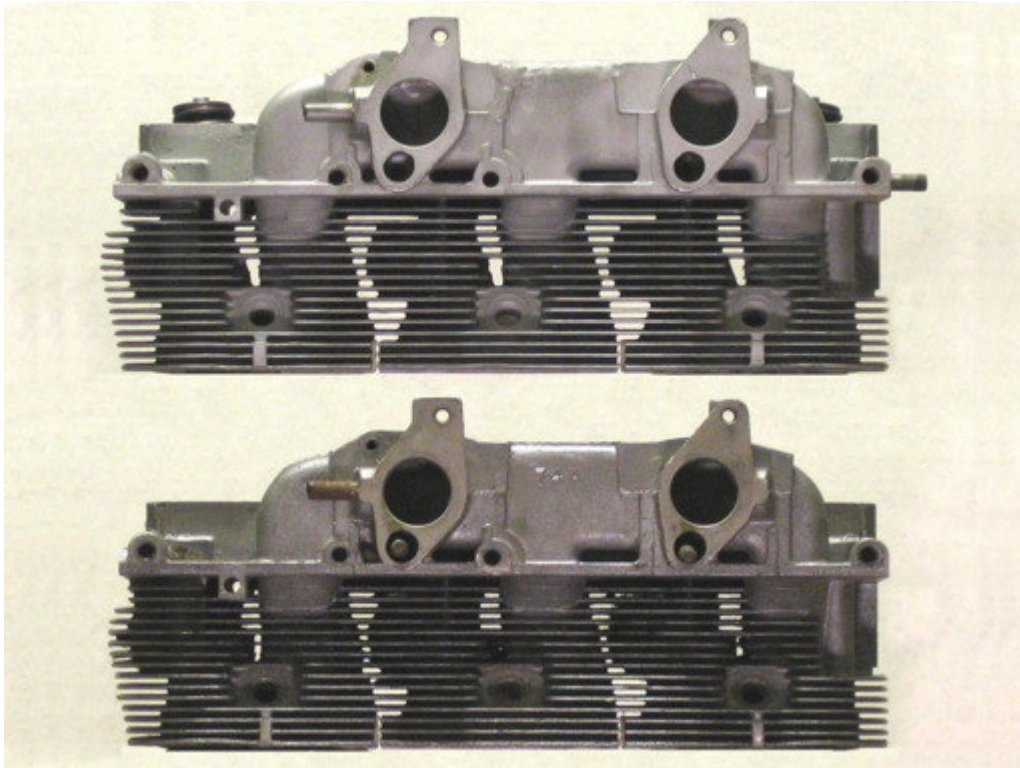
- Use one of the round carbide hacksaw blades and cut one end ring off (George Koenig).
- Use a keyhole saw (Barry Gershenfeld).
- 6" long drill bit in 7/64" or 1/8", you can find them at decent hardware stores (Larry Forman found them at Ace hardware).
- Sawzall or hacksaw blades trimmed to fit, you can get a handle from Stanley which will accept either flavor.

Bob Galli posted this regarding what areas to check when you're cleaning:

If no one has told you yet, the greatest cause of Corvair engine heating is due to casting flash in the fins in the heads. If you can, remove the top and bottom shrouds, and clean out the air passages in the heads. I use a keyhole saw, poke it down through each passage and saw to the end of the slot, turn the saw around and saw to the other end of the slot. It is difficult to do with the heads on, as you have the cyl studs and pushrod tubes in the way, but you can make out. You will see what is supposed to be a large hole through just above the spark plug. It may have a piece of flash passing through the middle of it. Knock it out, and go after it with a 3/8" rat tail file. This hole is supposed to supply the air to cool the top of the combustion chamber. This has three fins that are visible from below, and sometimes have a roof of flash over them, making them totally ineffective. I use a long screwdriver to pry this flash off. You may not be able to work on this because the exhaust manifolds may be in the way. I don't remember this part too well, as I do this with the heads off. This cleaning process is a must for anyone who has an FC or UltraVan. I have both. It will make your engine run at least 50 degrees cooler. From mid-spring to mid-fall, run with the bottom shrouds off.

See the [Corsa Tech Guide](#) for more info.

Here's a shot of two heads, the top one is after deflashing, courtesy of Roger Gault:



From The CORSA Tech Guide: Cylinder Head Cooling orville Eliason

Are your cylinder heads cooling as well as they could be? Most Corvair heads have been in service for more than thirty years, and the average owner feels that anything that old must be okay or it would never have made it all these years. Also, many people think that anything that is manufactured in a factory is perfect. This is false. Many things are properly designed, but quality control slippage and cost factors can change the final product considerably. The first Corvair heads were probably made with loving care and meticulously tested to prove that they would provide the proper amount of cooling, but once they were being produced by the thousands it was no longer possible to spend much labor on each head to ensure that they had the same cooling flow as the original test heads. How did these engines operate all those years with heads that had poor cooling characteristics? Let's just say that they muddled their way through. The entire engine was blamed.

One of the more common excuses was that air-cooled engines run hotter than the more conventional water-cooled engines. This in turn has led Corvair owners to believe that their overheat problems were designed into the engine and that they are there to stay. They fight the problems that heat causes such as detonation (pinging), valve seat dropout, low oil pressure, excessive engine wear, cooked seals with resultant oil leaks, and so on. They try to solve these problems with water injection, higher octane fuel, fuel additives, oil additives, finned oil pans and rocker covers, and add-on oil coolers. Their friends will also advise them to drive slower, take it easy on the hills, don't drive on hot days, and so on. All this masks the real problem. It is also expensive and takes a lot of the fun and utility out of driving your Corvair.

Let's consider the source of engine heat. The highest temperatures are found in the areas that surround the burning fuel. The aluminum cylinder heads collect a major amount of this heat and it is supposed to be dissipated by blower air passing through the aluminum fins. Here is the big rub. You will note that the key words are "passing through," not just sitting there and being superheated. I have been installing cylinder heads for many years and felt that they were in great shape when I put them on. They were bright and clean and I straightened any bent fins, looked for dirt and aluminum slag left over from the casting process, and then put them on. Over the years I have read and heard of many individual instances where Corvair owners finally traced their

problems to uneven airflow through the head cooling fins, and rectified the problem by cleaning out dirt, removing casting flash and imperfections. Tech information on engine rebuild always mentioned cleaning foreign material from the finned area of the heads. However, I never dreamed that it was such a widespread problem until I happened to compare a set of heads that I was removing to a set that I was installing. After a lot of peering into the finned areas, I finally realized that the set that I was installing had nowhere near the open flow-through area that my old heads had. I discovered that the blockage was caused when the heads were cast. The casting mold was made in two parts that came together in the center of the heads' finned areas, and sometimes these halves did not quite touch each other. When the aluminum was poured, the molten metal filled these tiny cavities and formed a thin wall across areas that are supposed to be airflow channels. These should all have been removed during the manufacturing process.

The Corvair manual mentions that you should clean the cooling fins. The funny thing is that they show a picture of a man striking a special tool with a hammer and say that he is removing casting flash or other foreign material. This tells me that Chevrolet knew that the heads were installed without the blockages being properly removed. This must have caused untold numbers of problems for Corvair owners.

I examined all of the different heads that I have accumulated over the years and I found that most of them had varying amounts of blockage. Some heads had an even worse problem: the two halves of the mold had not lined up. This left only half of a passage available even after the blockage was removed. The sneaky thing is that some of it looks like the design and not something that should be removed. This job is also self-perpetuating: the more blockage you remove, the sharper you get at spotting more. And keep in mind that having your heads reworked does not include this job.

I tried many different tools to remove this problem metal. I picked, pounded, hooked, and poked. I finally discovered that a carpenter's keyhole saw was just perfect. The teeth were just the right width to fit the area between the fins, and the blade comes to a point which is needed to get started in the small holes that must be opened up to their designed size. I ground my saw to an even sharper point on the back side. Of course this is not a metal cutting saw, but the aluminum is soft and the blockage is usually very thin. I used a small drill to get through where the fins were out of alignment, and then finished with the saw. Drill carefully; the intakes and exhausts don't need any extra holes in them. Also, wear safety glasses.

I am convinced that most Corvairs are being operated with cylinder heads that are not cooling as well as they could be. These fin areas can be checked and opened up quite easily in most cases, unless the mold halves were out of line. The perfect time is at overhaul but don't wait for that. It can be done with the top shroud off for blower bearing replacement, or from the bottom with the exhaust manifolds removed. The choke thermostats are also in the way and can be easily pried off. If you are resealing the engine, it is even easier with the pushrod tubes removed. You can make a preliminary check of the fins by just removing the bottom cooling shrouds, though you can see only a small number of the passages with the manifolds in place. You will need a bright light to see into the depth of the fins. Follow the outlines of the intake and exhaust passages that go through the heads' interior. They should form a smooth curved outline except in the area near the utermost fin. Any jogs in these lines are caused by flashing between the fins and should be removed. Just outboard of each spark plug you should find a hole that goes down through the head. Early model heads have a slot in one fin. Later heads have a larger area. This hole is especially important because it channels cooling air to a special cavity that is directly above the burning fuel at the top of each cylinder. Each cavity has special fins on the inner side to dissipate heat from this especially hot area. It is easy to see that if this area does not have the proper amount of cooling airflow, the adjacent cylinder will operate much hotter than it should. This causes detonation and hotter oil in the rocker area which in turn makes the whole engine run hotter. This rework can make an amazing difference. Once cooling is improved, timing can be advanced for more power and better mileage. I am sure the majority of Vairs on the road could enjoy improved performance and longer engine life if their owners would give their cylinder heads the keyhole saw treatment. (6/88)