



Tech: 4V Head Porting Tips

4V Head Porting Tips from the old Network 54 Forum

Grind that bump in the exhaust port away completely and gain about all the volume you can in the bowl without going crazy.

If I'm porting for the street I slab side the valve guide with a single cut, straight, hardened steel, 1/4 inch burr off the Forney rack. I haven't been able to find a carbide one like it. Of course the steel gets hot and only last for 2 bowls before its dulled, but they're cheap.

If you'll notice between the valve guide and the back wall there is a lump of material I finish this to a V shape with the V pointed toward the back of the valve head .I push the metal down with a round nose,cylindrical, 1/4 inch double cut carbide ,grind out a good deal of metal and don't "sharpen" the V too much , leave a little radius .

For racing it's nice to mill the guide boss out entirely, grind the area flat and smooth, and have a new guide pressed in. You'll gain a LOT of volume this way!

You can cut the head off of a stock valve and stick that in the milling machine and set up the cylinder head so that the stem will slip in and out of the guide easily then knuckle down all your jack screws and such and ,with an end mill, completely remove the offensive iron. That dimple where air injection would have went sits in the middle of a shallow basin which ford intended in their design. The idea was to create an area where turbulence would be created which would buy time to reduce HC emissions. As it turned out it wasn't needed, probably partly because the shallow valve angles worked better than anybody at the time expected them too! That is one of the BIG lessons that the 4v taught hot rodders during the pro stock era in which they were so dominant. -Joe

Mine could probably have been better if someone that was grinding on them knew a little more about how to make the short turn work. I did a little work to it, but I think a lot of my gain came from opening the port up. I was afraid of damaging the short turn, so I only took a little from it (rounded it off some), but I did widen it some at the point where it transitioned from port to bowl. When I looked at the actual port though, I decided a straight shot out had to be better (plus I saw where Kaase was doing that same thing to 429 SCJ heads), so I removed most of the head bolt bump from the side of the port. If you look at my ports now, it's straight into the bowl area, no bump in the port wall anymore. I don't know how much it actually helped, but since they flow what they do now, it must have helped some. -KidV

-----plan A -----

Bronze guide about 3" long and the portion that sticks into the bowl is cut to a taper on a lathe . It gets thinner the closer you get to the valve head . The guide boss that sticks into the bowl is milled away almost completely leaving only a little to do with a die grinder . When this is completed the roof will be FLAT throughout its length and width , well there is a slight arch upwards , but I'm trying to paint a picture here cause I don't have any real pictures of that head on my camera or my computer.

-----plan B -----

The V I was talking about is located between the guide boss and the back wall , the long turn, it's actually a lump in stock form and it gets in the way when you try to grind the guide boss to an airfoil shape.

You slab the sides of the valveguide and taper to an edge as it points toward the X flange. The lump (which is between the boss and the long turn) is ground down to a sort of V shape You work the bowl with the chamber pointed up and when you're done with the lump it will point at you as you look into the bowl. -Joe

Valve Guide Cutting Tool.

In regards to removing the guide material from the roof of the port, has anyone used a Spot Face Cutting tool with an arbor that uses the valve guide hole for a pilot.

I just picked up a set of 2v heads from the machine shop after getting them thermally cleaned and checked for cracks. The machinist showed me a spot face tool he said he would use to remove most of the guide boss material, and then finish with a die grinder. It looked like it would save a substantial amount of time in stead of using a grinder to remove all that material. -Michael Howard

Might be a spring seat cutter.. used in an unconventional way? check out compcams, crane for their spring seat cutters, maybe this is what your machinist is using?-Roo