

Sorry for the delay everyone, but I have just completed two weeks of “hell”. It all started with the new pushrod guides. After installing the heads on several engines, I noticed that there seemed to be too much side play at the contact point where the rocker arm touches the top of the valve. If you remember, I was very careful to make the pushrod guide plate with very close tolerances. The thickness of the material was also increased to help eliminate movement. Obviously there needs to be some clearance not only for hole in the pivot but also where the pivot contacts the inside of the rocker arm. Furthermore there is a mechanical advantage which allows for the tip of the rocker arm to move further than the heel. Is everyone still with me? Unfortunately this mechanical movement also allows for an exaggerated lateral movement of the tip. After some serious time and several sleepless nights, I went back to the prototype design and improved on it. I needed to make a forming jig which would insure every new bracket was identical. As you can see from the pictures the new rocker arm alignment bracket does not allow any lateral motion! In other words, there is no way the tip of the rocker arm can pivot from side to side. So, all the pushrod guide plates were removed and the new alignment brackets installed. The old pushrod guide plate was an improvement when I put it in - and an even bigger improvement when I took it out.

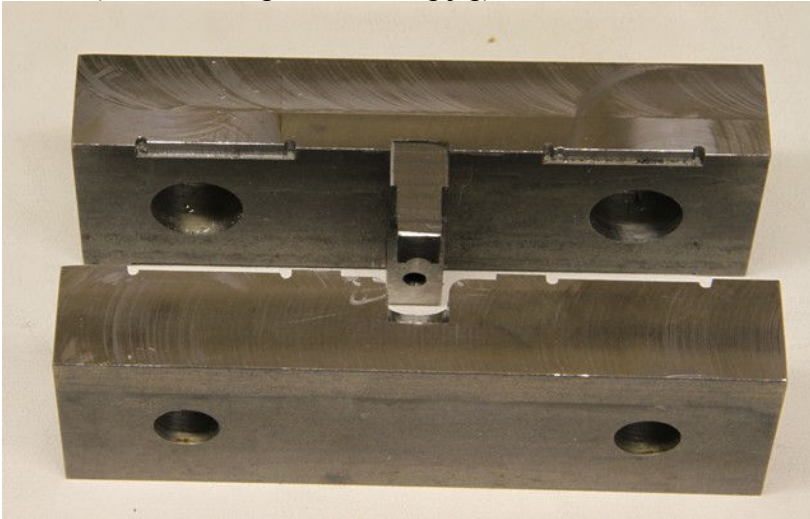
Assuming everything was going well, this seemed like a good time to install the timing gears and check everything for clearance and make sure all was working as planned, before 40 engines were completed. Once again, we all know what happens when you “assume”. This is a major area of concern, where problems soon developed. While rotating the engine by hand and using a dial indicator, it became obvious there was very little clearance between the edge of the intake valve and the top of the piston. Normally this would not be a problem, but if an engine was to over-rev and a valve would “float” it could come in contact with the piston. NOT GOOD! This was certainly not the problem on the prototype engine. Something had obviously changed. Hour after hour, I agonized as to what the problem could be and even more important – a solution. Remember, way back when I showed you a picture of the finished heads where all the valves had been lapped and ready for installation? Upon further examination, much to my disappointment and anguish, I discovered that when the valve guides were originally pressed into place, something happened which allowed to guides to press at a slightly off center. This meant that they were not concentric with the valve seat. Consequently, the valve was not aligned exactly with the valve seat. Is everyone following me so far? When I originally showed my employees how the properly lap the valves, I must have picked the only head where there was a perfect alignment between valve guide and valve seat. Once I was sure they were doing everything properly I went back to the daily requirement of running a small business and once again “assumed” everything to be OK. There was no need to remove the valves and check to see that everything was concentric. I would periodically do a vacuum check and also shine a very bright light into the exhaust port and each intake port to check for leaks. Did you ever get a very sick feeling in the pit of your stomach, when you found out where the problem was and then the stark realization of knowing what must be done to remedy the situation? The long and short of this is that every head had to have the intake seats removed and the valve guide pressed out. I then started the long

process of making all new valve guides and all new valve seats. Without further explanation, two very expensive carbide cutters, and almost three weeks later, there is now a perfect alignment and we are cutting new valve seats and re-lapping all the valves. This all goes back to one of my original statements, when I said that “this engine was very demanding and accepts nothing but perfection”. There was no contingency plan for problems like these. Time is my only enemy and is a lot like cancer, in that – it is insidious and never takes a break!

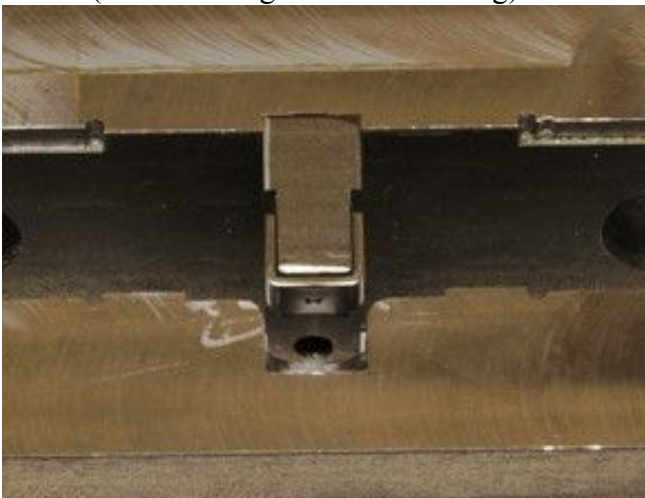
While the CNC lathe was making all the new valve guides and valve seats, the CNC machining center was completing the remainder of the intake manifolds. Life is never “dull” around the Conley shop.

For what it is worth and to everyone who is waiting for their engines, these new modifications and temporary setbacks, necessitated that cancel a short scheduled vacation to Tucson, Arizona for the Thanksgiving holiday. I will take a short break on Thursday and go to a nice restaurant with my son for dinner – then back to work!

Pic #1 (Rocker arm guide forming jig)



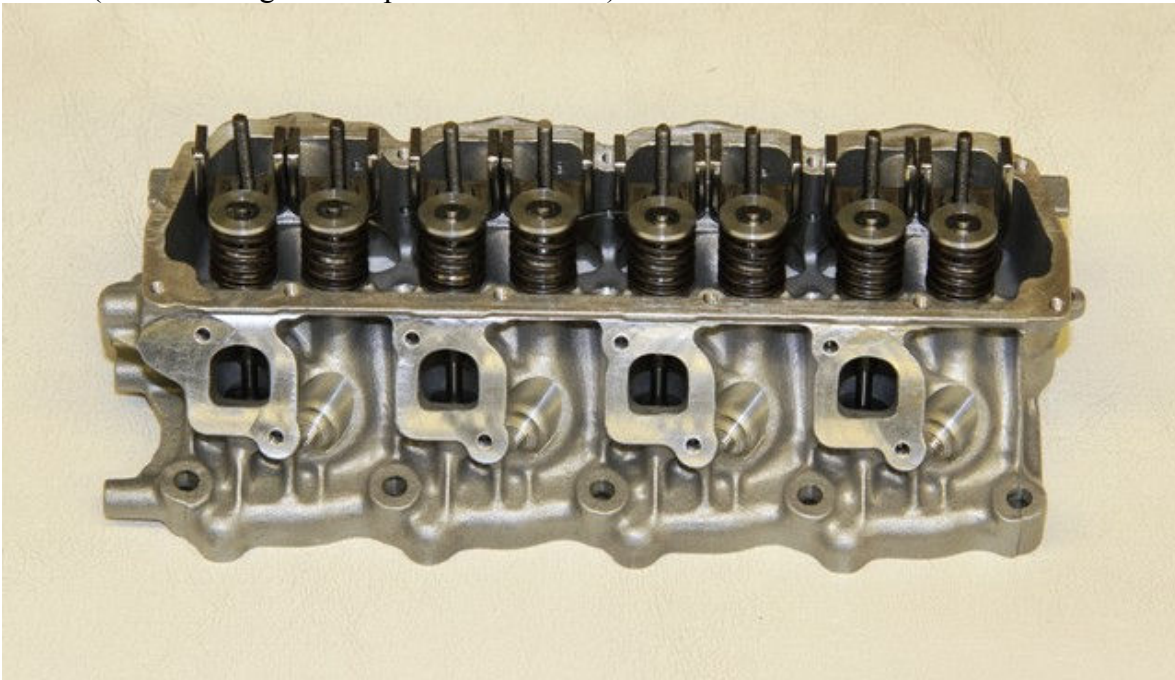
Pic #2 (Rocker arm guide after forming)



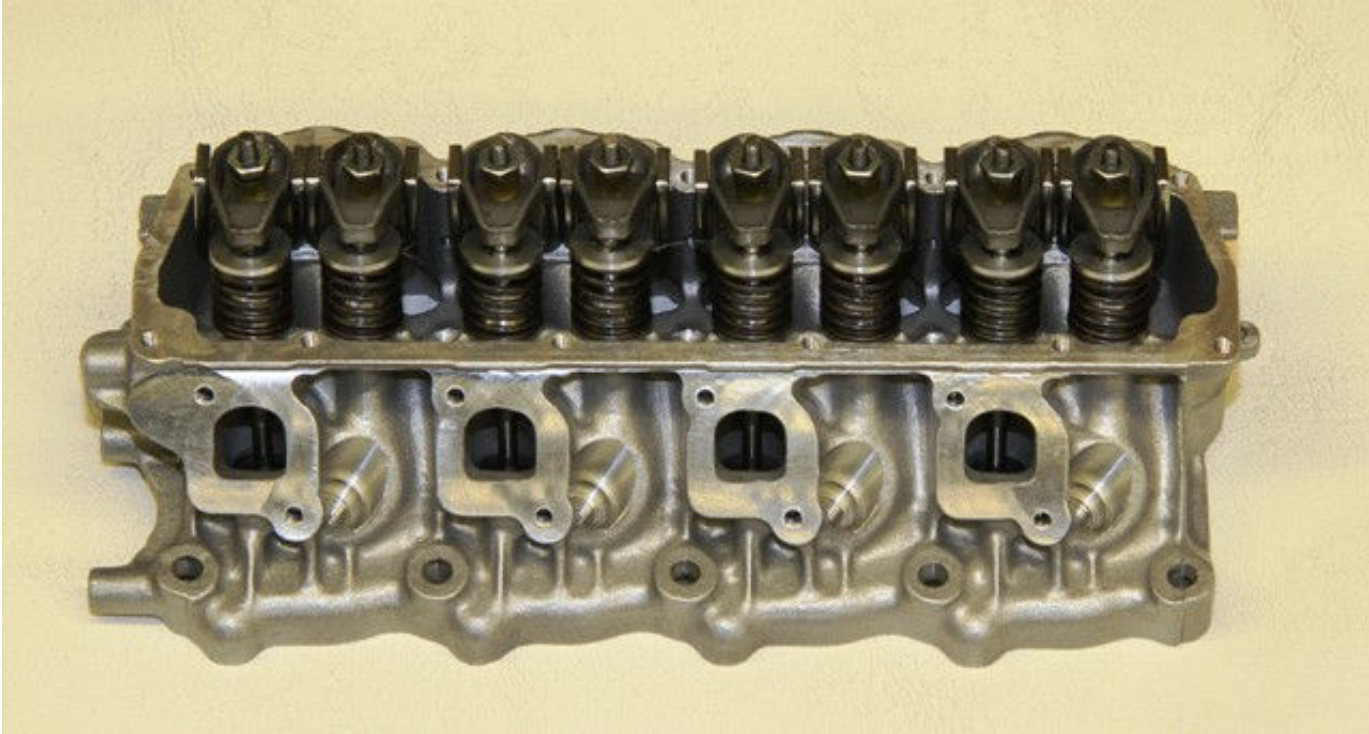
Pic #3 (Completed rocker arm guides)



Pic #4 (Rocker arm guides in place on the head)



Pic #5 (Rocker arm guides with sample rocker arms in place)



Pic #6 (Notice how rocker arms align with top of each valve)



Pic #7 (22 additional completed intake manifolds)



Pic #8 (New Valve guides)

