Another month has gone by and I am continuing to make some progress although the past two weeks have been rather deflating. What I mean by this is, that after all the design work, time, money and sleepless nights, the new fuel pump location had some problems. I should explain, the pump worked and is working flawlessly. When I engineered the pump to fit on the end of the dry sump, I always knew that there would need to be some motor mount modification. What I did not see is, the inlet and outlet of the pump went directly in the frame of my cars. In retrospect, it is obvious there would be some minor issues with the bracket on the frame, but I thought the engine set higher that what it did, which would allow clearance for the inlet and outlet. I hope everyone is following this. Anyway, the net result was, the pump had to be removed and and new location found. If you look closely at the front of the engine, you can immediately see, this was going to be a monumental task. To make a long story short, the alternator housing seemed to be the only choice for placement of the fuel pump. This being said, I spent the entire last weekend engineering and machining the two alternator housings halves to accept the fuel pump, bearing support, and shaft. Once again, this may not appear to be very complicated, but remember, there needs to be two ball bearings in parallel to accept the lateral load applied by the serpentine belt I am using. When all is said and done, I was able to squeeze "10 pounds of parts in a 1 pound package". Ha. Ha. The new pump location is far more user friendly, for input and output of the fuel lines. Sadly, all the time, money, and parts which were used in the original design, are now scrap. Keep in mind all of the jigs that were used to make the brass fuel lines are also scrap. It is very upsetting to know I was unable to see this potential problem. If that were not enough, remember, I have 70 engines which need to have the same changes. By Wednesday afternoon, everything concerning the fuel pump issues, should be back to "square one". I will put detailed pictures of the finished products in the next update.

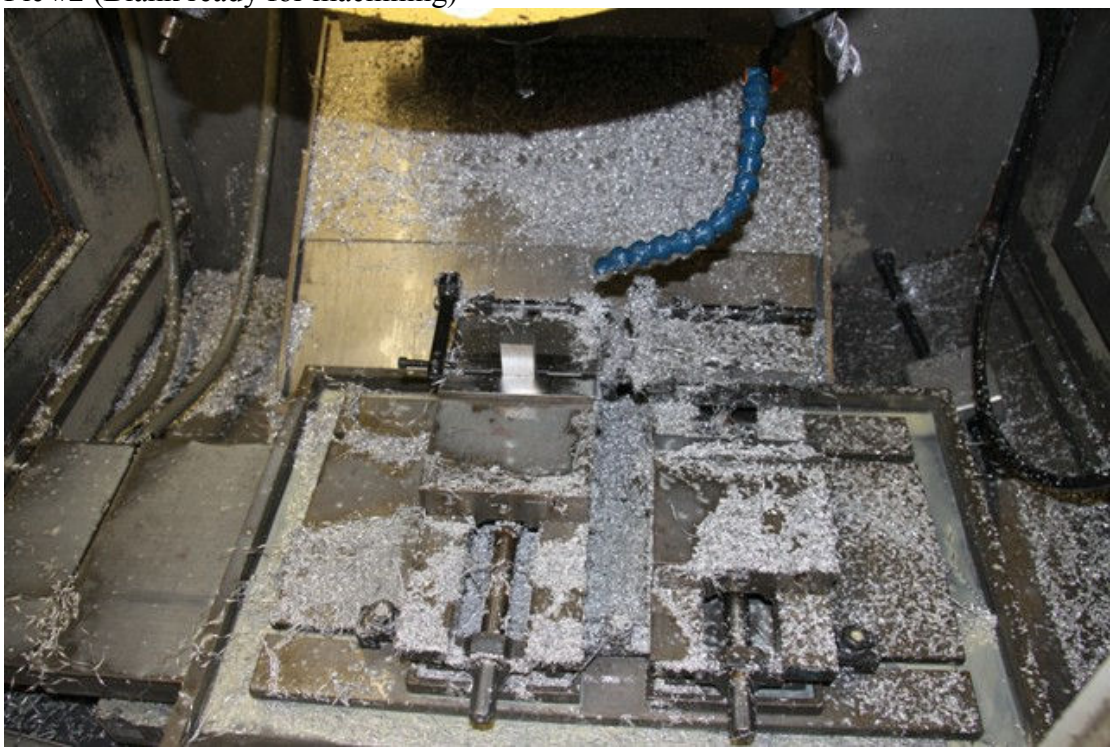
On a different note, while the pump difficulties were being addressed, I was very busy making supercharger impellers. This is quite important, because almost every engine will have a supercharger installed. I start out with a box of slugs, which were cut to the exact length. Because the finished impeller is about 3" long it is impossible to machine that length with deflection – even using a ¾" solid carbide end mill. The only way I can get a truly accurate outside profile is to make the impellers in two separate pieces. Once finished then a piece of steel tubing is pressed into each impeller lobe. This produces an almost perfectly concentric piece. Keep in mind the tolerances are very close and the impellers can never touch. I would like to take a minute explain, the program for producing each rotor has almost 9,000 bits of information. Each line of code may have 20+ different characters. Some typical lines of code may look something like this:

N30G1X-.2008Y.1325
N31 X-.2012Y.1328

This means the work piece will only moved .0004 in the X dimension and .0003 in the Y dimension. The total movement would be just 7 ten thousands. A human hair is about .002. If the minus sine was not put in properly, then the machine would try to move .4000 in the wrong direction. If there is just one digit out of place, then the net result could be catastrophic. To give you an example of what I am talking about, a G0 means rapid movement, whereas a G1 means feed rate. My machining center will travel up to 650 inches per minute. Just think of the consequences if a G0 was given when a G1 should have been used. So much for your programming exercise of the day!

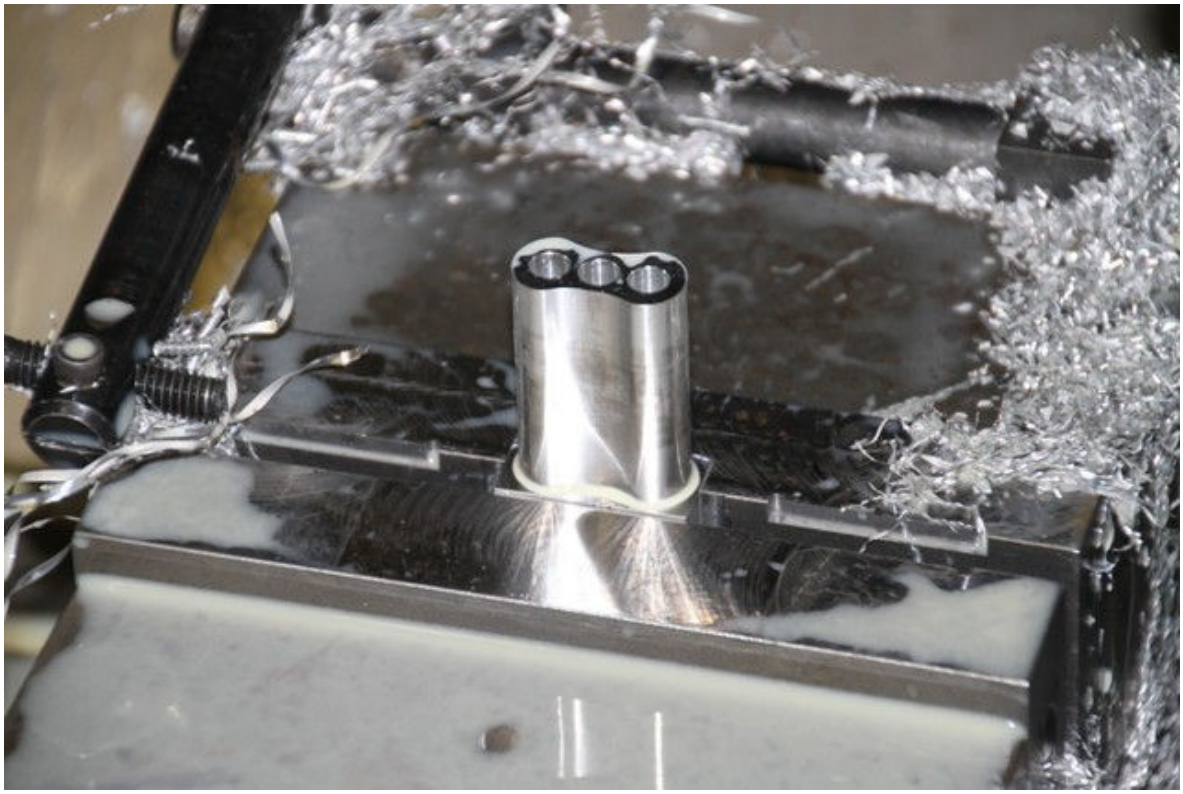
Pic # 1 (Aluminum blanks for supercharger impellers)

Pic #2 (Blank ready for machining)



Pic #3 (Completed impeller half)

Pic#4



Pic #5 (Completed impeller halves ready for further machining)