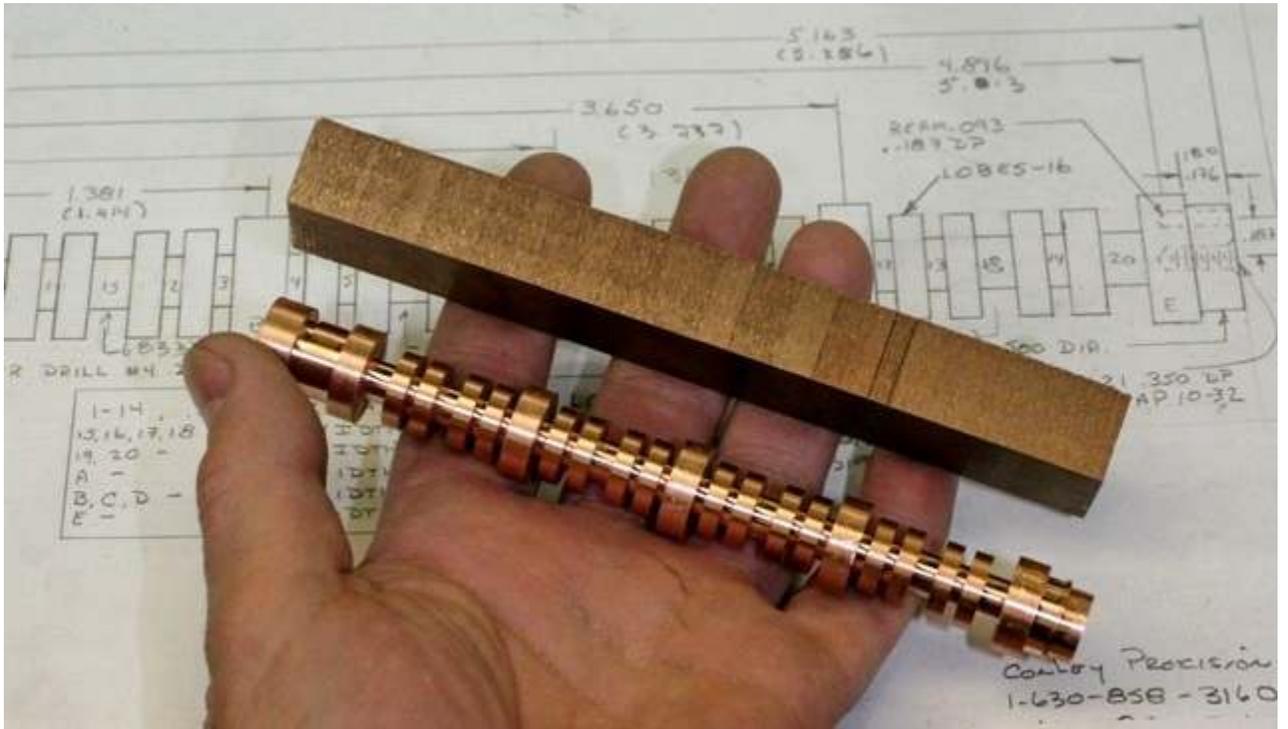


(23 March 2008)

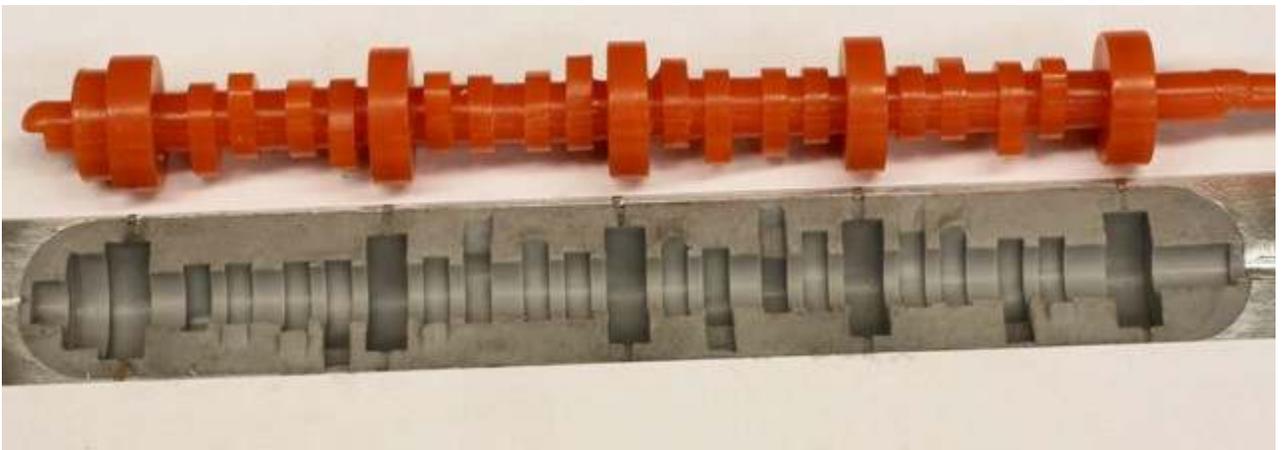
Pic #1



Pic #2



Pic #3



After evaluating the number of man-hours that was needed to finish a camshaft, I decided it was worth the effort to make a mold and have the camshafts cast. This not only allows me the flexibility to select different materials but also gives me the exact shape and placement of each lobe. Once the finished castings are in stock, I will only need to drill a couple of holes, tap one

end, and do a finish grind. If everything goes as expected, this extra effort should drastically reduce the time need to complete a finish part.

The process started with making a master blank (Pic #1). This process is not without its own set of problems. Because the wax shrinks as does the cast metal, I needed to allow for the different sizes. The combination of materials shrinks about .024 per inch. With the finished camshaft needing to be about 5.5" long the blank needed to be 5.632 long. If that were not complicated enough, the center line of each lobe and bearings had to be calculated. Add this to the different spacing between each lobe and the width of each bearing surface and lobe, it is easy to see the difficulties and how easy it would be to make a calculation mistake. These dimensions are all critical.

When the blank was finished, then all the lobe shapes need to be ground, once again allowing for shrinkage. Once I had the totally finished camshaft master ready, as seen in Pic #2, then the real time consuming and tedious work began. The "parting line" needed to be made. This is a line down the length of the camshaft that needed to be exactly in the center of each main bearing. The mold is in two pieces with half the cam profile in each side. Add to this difficulty, the parting line for each of the 16 lobes was on a different centerline. If this line is not calculated exactly then the wax will not come out of the mold. I chose to make the mold from Silicone that would flex and allow for a small miscalculation. When the mold base was finished then clay was used to make each parting line center. Not only did there need to be a parting line for each lobe and each bearing surface, but the spacing between each of these items must also be made. No body said that it was going to be easy. With the parting line on one side complete the the liquid Silicone was mixed, evacuated of any air bubbles and then poured into the cavity. After about 6 hours the mold was open and all the clay was removed from the opposite side, then the Silicone was poured into the other half. Pic #3 shows one half of the finished mold along with a finished wax impression. The waxes are at the foundry and with any luck, I made all the correct calculations. This took a lot of work and time, but I truly think it was worth the extra effort.