I think that this is an important time for everyone to see how all of the pieces are going together in just one component. Pictures #1, #2, and #3 are of the finished distributor. For those of you who were not around during that time in past history, or do not remember what a distributor was used for - it was a device that took high energy (generated from a coil) and made sure the spark plug was fired at the exact moment it was needed. Inside the distributor there was a rotor that had a brass contact at the end which came into close proximity to the corresponding contact and wire in the distributor cap. The high voltage was sent from the center of the cap and traveled to the end of the rotor, then through the cap, through the spark plug wire, and finally to the spark plug. All of this had to work in perfect harmony – and when it did everything worked as planned. If just one item were off, then the power of the engine suffered, or the engine could over heat, spark nock could happen, or the engine could even, what we called "backfire". Not so good. Now days everything is done electronically and is accomplished with the use of very accurate and extremely fast computers. Remember; back in the day when distributors were popular there were no computers. So much for today's lesson! Keep in mind none of the major parts for my distributors are commercially available. As you can see from picture #4 there is over 53 individual parts which are needed, just for the distributor. Even the spring clips (picture #5), which hold the distributor cap in place, had to be custom made. No problemo, just time. Look closely at these clips and try to imagine how you would make not only two, but now try to make 200, all of which must be identical. It is now quite evident why this engine is taking so long. Some individuals find that making just one distributor is an astronomical challenge, imagine trying to make 50+. Another problem with miniature distributors is the voltage does not scale down. There is still, 15K+ volts which must be dealt with. The material used for the upper part of the rotor (pictures #7 & #8) has to withstand and insulate this high voltage. It was purposely made in two separate pieces which allows the brass wire to be insulated as much as possible. Once again, this one component is made up of five individual parts. You will also notice the two recessed slots on either side of the Phenolic rotor, which allow for infinite adjustability. Although the rotor in my test engine worked just fine, I feel this modification was worth the extra effort and time.

Speaking of modifications, I often get letters and emails from customers asking "why are there so many changes"? The answer is quite simple - the test engine was only what is called a "proof of concept" which made sure all of my calculations, designs, and ideas were possible. When the engine was put into full production and each piece was thoroughly analyzed, it became apparent to me that there were better, faster, and more reliable ways of manufacturing each item. Every piece is examined, tested, proofed, and modified where necessary. Keep in mind I am trying to make an engine that is reliable and will offer many years of dependable service. Unfortunately, my engineering staff, which consists of me, is being taxed to the limit.

Alas, I digress, back to the narrative! In distributors of the past, a set of points were used to open and close the circuit and were replaced by a magnetic sensors, call Hall Effect. There is a rotating disc which has 8 Neodymium-Iron-Boron magnets which move past a sensor, which then opens and closes the circuit at the exact time it is needed.

Is everyone still with me? The reason that I chose this type of magnet is because it is the most powerful one available for the size that I needed. Picture #11 is not of a captain's wheel from a vintage sailing ship, but rather the rotating disc being readied for the magnets to be pressed into place. When finished, then each magnet is actually "Staked" into place. A special jig was designed for this operation and makes sure the magnets do not come out when the engine is running. If you look closely at the final picture, you will see what looks like a small + mark over the center of each magnet.

Pic #1 (Finished distributor)

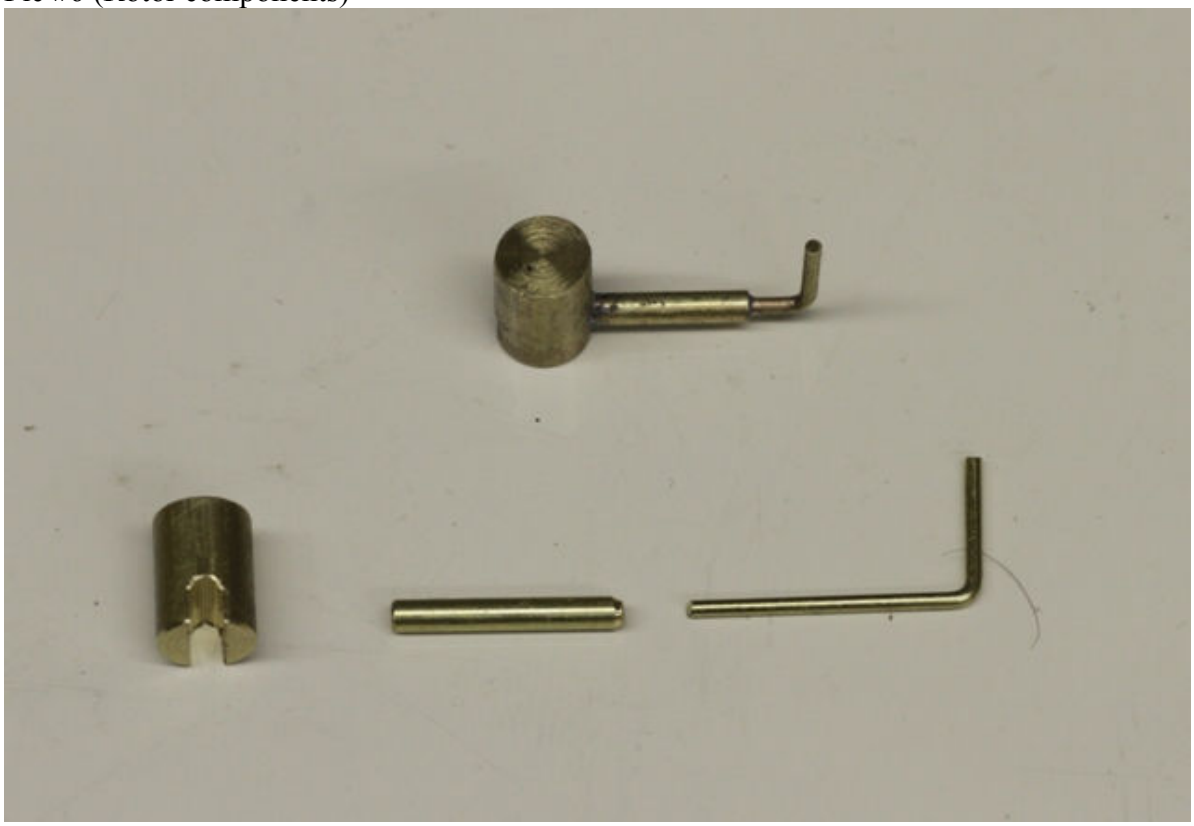
Pic #2 (Finished distributor)

Pic #3 (Finished distributor)

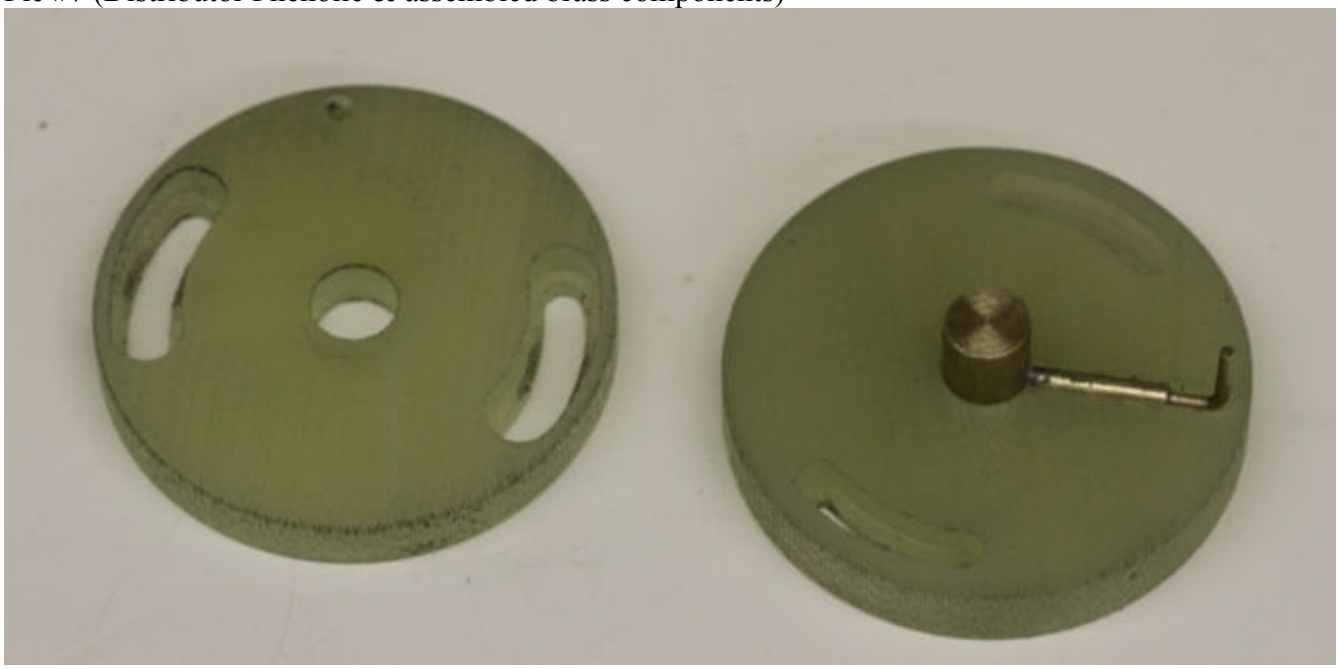
Pic #4 (Distributor parts)

Pic #5 (Distributor cap retention clips)

Pic #6 (Rotor components)



Pic #7 (Distributor Phenolic & assembled brass components)



Pic #8 (Distributor Phenolic rotor assembly)

Pic #9 (Neodymium-Iron-Boron magnets for use in aluminum rotor)

Pic #10 (Individual Neodymium-Iron-Boron magnet .062 dia. x .125 length)

Pic #11 (Pressing magnets into aluminum rotor)

Pic #12 (Staking magnets)

Pic #13 (Finished rotor)