

Magneto University
Or
Getting the Spark Back in Your Relationship (with your T)
By: Steve Shelton - Mulberry

The reward of a thing well done is having done it. – Ralph Waldo Emerson

I've never read a lot of Ralph's work although I remember something about if you come to a fork in the road take it...oh...wait...that wasn't him. Anyway, I don't know if he ever did a thing "well done" because I obviously wasn't paying attention in class, but at the very least he must have known someone who did. His little quote is the perfect description of the feeling one gets after graduating from Magneto University. But before you get too excited, MU doesn't have a football team or any cheerleaders, and has only one professor – Professor Keith Barrier. All the same, the day in class was worth more than all the days in classes any of us spent anywhere else.

Last year our editor Bill Robinson called saying one of his several T's had quit running on a tour. In the course of investigating the cause he first found a stripped fiber timing gear (shown on the right). Further investigation revealed considerable slop in the crank – forward



and rear movement was considerably more than it should have been. This led to finding that the third main bearing cap's thrust surface was worn and explained why it had long ago quit running on magneto. Having read Emerson's little quote somewhere along the line Bill decided to fix it right. Between the two of us we queried experts John Regan and Ron Patterson about how to proceed. The advice was that fixing the third main was do-able provided the new cap was made specifically to fit...not a generic cap. Other wise we ran the risk of flexing (bending) the crank with too much or too little bearing pressure on it. Bill carefully measured the journal and ordered a cap poured and bored to fit it. Problem one solved. Next we replaced the timing gear. Both of these jobs are easy if you have the engine out and torn down on the stand.

The bigger challenge awaited with the magneto. Bill came up with a tool of his own invention (see picture at right) to lift the transmission off and pulled it. After that he and John Zibell removed the coil ring and from the back of the engine block and then removed all the magnets from the transmission. Bill shipped the magnets to Ron Patterson who recharged them and shipped them back in a specially made crate. The coil ring went to "Total Re-coil" where it was, well, "totally re-coiled." Reports indicated that the magnets had been very weak and that the coil ring was just plain shot. It had a lot of insulation gone and the copper ribbon connecting the windings was broken in a place or two. While these key components were off being repaired Bill ordered parts for reassembly. These included new brass screws to mount the magnets, and the spacers that the magnets rest on as well as shims for the coil ring. We found the magnet holders to be ok, and having heard bad things about the reproductions opted to re-use them.



Having never embarked on anything quite so ambitious we decided we need professional help and called up Keith Barrier. We also called in two other students, John Zibell (already involved

in the tear-down), and Charlie Owen. After a few emails and phone calls we arranged to meet at Bill's shop and all convened there on a Saturday morning. All except for me, as usual, I was late.

By the time I had arrived the class had mounted the recently recharged magnets on the flywheel and had leveled them using a replica KR Wilson tool and a brass hammer. Remounting the magnets involved replacement of the brass screws and the little spacers. Once they were put back on, the class, under the watchful eye of Keith, rotated the KR Wilson tool to each magnet, tapping to compress the spacers with a brass hammer until they will all level to within about .002 of an inch. I arrived just in time to see this had been completed and asked Keith "how many times do you usually have to set the tranny to get the spacing right?" Keith's answer – "1 to 10 times." Boy was he right!

The spacing in question is the space between the magnets and the coil ring that they run next too. In order to get the right output that needs to be between .025 and .040 inches. If it gets wider than that the magneto doesn't work well and you end up with something like a true-fire system to make up for it.

We had the engine mounted on an engine stand, nose down, and the freshly rebuilt coil ring bolted down to it. We started with a set of brass shims under it based on measurements taken with the KR Wilson tool. The idea here is that the tool can get you set up correctly so that the gap is right and all you have to do is drop the tranny on and bolt it up. That may have been true in 1926 when all the parts were brand new but it didn't really work for us some 86 years later.

We lowered the tranny down and bolted it on using a special wrench Keith brought with him.



Then we measured with the feeler gages and found we were way off. Something like .060. So, unbolt (using the special wrench Keith brought – left), pull the tranny back off, unbolt the coil ring, add/remove shims, reassemble, remount transmission, measure, repeat as needed. In our case this was 7 times. The challenge is that the coil ring is mounted with four bolts that all sit above the center of the ring. So adding a shim to one corner to close the gap you measured on that side closes that gap but at the same time opens the gap on the other side. The mounting

configuration amplifies this issue, exaggerating the gap changes on the opposite side of the ring. We tried applying logic as best we could but it seemed like a trial and error drill. In the end we got very good measurements on our seventh remount. The engine is back in the car now running on coils as original and running very strong. John and I have assisted Bill as he performed this same job on two more engines now with equally good results. Like most things working on a T, we found this job to be more about the right tools, patience, and a basic understanding of the design and operation. But most of all its about finding a fellow T'er who has done it before and for that we have Professor Barrier to thank!

Magneto University class of 2010
Left to right – Steve Shelton, Keith Barrier, Bill Robinson, Charlie Owen, John Zibell.

