

# The Ignition Problem Never Mentioned

by Bill Schmidt

Published in the September 2011 edition of the Coastal Flyer,  
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I first got back into spark ignition systems for models in 1980 although I tried to do it as a kid in the fifties. I then invented the "SCHMIDT TRIGGER" in 1985 which is the most widely used transistor ignition in use today. See MA August 1985 for the original article. Through the years I've gained quite a bit of knowledge in the operation of model spark ignition systems and the problems that you can encounter. This isn't about dirty points and weak batteries but rather the other bug-a-boos that crop up in a spark ignition system that never gets any discussion and indeed most people don't understand.

Let's talk about degrees of dwell as related to the ignition points. The dwell angle is the number of degrees the crankshaft moves through with the points closed. Just put an ohmmeter across the points and turn the prop while imagining the number of degrees it travels with the points closed. If you aren't good at determining the dwell this way you can get very analytical and put a protractor on the crankshaft. If your engine is a low rpm type such as a Brown Jr., Atom .09, Bunch, Elf or even an early Ohlsson you can get away with a very low dwell time period of 60 – 70 degrees. To do so conserves the life / charge of your onboard batteries.

The Atom has about the shortest dwell period of any engine I've ever come across measuring about 30 – 35 degrees. Ray Arden who designed the Atom foresaw the fact that the models for the engine would be small and light and unable to carry much weight. Dan Calkin thought the same thing about his small, low power Elfs. Dan went so far as to wind his own special ign. coil to operate on only one pencil. I'd like to have one of those myself today. Insufficient dwell time results in a high speed stutter when the engine is peaked out. This same problem shows up when the batteries are low or the voltage is not enough for the job. When you get roughly above 10,000 rpm in your operational engine speed it becomes necessary to increase the dwell angle (duration) of the points to 90 – 120 degrees of crank rotation. Some McCoys and Doolings will require upwards of 180 degrees of dwell to obtain sufficient coil saturation time to avoid high speed stutter / miss. We're talking 13 to 16,000 rpm range in this case.

The Arden engines have a neat cam that gives an unnecessary 180 degrees of dwell that really eats up your onboard batteries. Go measure this for yourself. Why Ray Arden dropped the ball so badly here is a real mystery after his mindful design with the Atom. Arden engines do nicely in the 8 – 11,000 rpm range with 90 – 120 degrees of dwell. I have made new cams for my Arden engines to decrease the dwell problems that are more commonly known and recognized.

These are the don'ts that are mentioned in the literature that comes with the engine and are shown on the model plans. Use the right size wire. Solder, don't just wrap the connections in the

system. Never place the coil on or near a ferrous metal sheet or component. I had a Eureka moment with this one some years ago. The Cleveland Playboy Jr. and Baby plans show the coil banded tightly with the batteries. I think Joe Elgin had nothing to do with this diagram but we can't ask him about it now. The main reason I wrote the article is because of one of the most insidious and maddening things that can sneak up on you isn't mentioned much. If you encounter a high speed miss that isn't attributable to any of the above just look carefully at the riveted points on your timer. Is there a bit of black residue around the riveting?

Very close examination of the riveting will disclose a loose joint that results in poor electrical continuity at different speeds. The Brown Jr. Hurleman type timer with the under slung moving point ate me alive at one outing years ago. A Super Cyke moving point was nearly undetectable to me yesterday. DO NOT place the tungsten point on a piece of steel to pound the rivet tight again. The tungsten will shatter in many pieces. I clean the assy. in lacquer thinner and place the tungsten face down on an aluminum plate to reset the riveting. I then solder the rivet joint carefully and again clean the part with lacquer thinner. I know a lot of folks who won't fool with spark ignition and its many requirements, but for us who enjoy the thrill of its successful operation, keep these suggestions in mind. Best, Bill Schmidt