Service BULLETIN

Better Performance from Your Model T Spark Coils —

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Of the five 'basic' parts in the Model T ignition system which can cause problems (i.e. battery, magneto, timer, spark plugs and spark coils) the spark coil is the most elusive. Unless this part is properly functioning you can have poor engine operation and while you might believe the trouble is in the plugs, timer battery or magneto or any related section it very often is your coils. Correctly cleaned, aligned, spaced, and tested, coils will be trouble-free longer than the plugs and timer.

To assure yourself that your engine is getting a good hot spark at the plug points, take your present coils or purchase a set of new KW coils and from this point there are two ways to go. The first way is if you want to be sure of no high speed "fade-out" of the high tension voltage output of your spark coils is to install a .47mf or .5mf capacitor (600 volt) across the inside terminals (see figure 2). This is done by removing the wood side of the spark coil (the side held by a single brad or a staple) and scraping out or melting away, enough tar to install the capacitor. Solder the new capacitor in place — you don't need to remove the leads from the old capacitor. And it's not necessary to imbed the new capacitor in tar just make sure it can't shake in place. The tar and wooden or glass spacer blocks serve to hold the main coil and original capacitor in place. The tar also provides insulation to the high tension side of the spark coil and is an excellent moisture barrier.

The second way is to go ahead with the cleaning, aligning, spacing and testing and determine after this is done (and it will show when you make the adjustment test) if you need the added capacitor. Usually you don't need the additional capacitor. If in driving your T at speeds of 25-40 MPH the engine was erratic or if in testing your coils on a coil tester the ampere reading won't hold between 1.0 and 1.5 when rotated fast (first at idle speed, 750RPM approx, and then faster), this would usually indicate the orginal capacitor should be replaced as it is not holding the intermittent current sent to it (as the points make-and-break), and the necessary build-up of the high voltage output is not adequate.

Having selected one of the two ways to go above, and having made this initial internal modification (if desired) let's understand the electrical process which takes place in the spark coil first before getting into final adjustment and test. The Model T spark coil is an induction coil. In figure 2 the heavy coil is the primary coil (double wound coarse wire) wound around a soft iron core. The secondary coil is made up of a large number of turns of a fine gauge wire. Every time the battery current is sent through the timer roller or brush through the respective coil it energizes the soft iron core, turns it into a magnet sending lines of magnetic flux through the secondary coil and produces a current by magnetic induction. This induced current is at a very high voltage with low amperage. There is no actual electrical connection between the primary and secondary coils. While the capacitor is across the output sides of the two coils, the two circuits of the capacitor are internally separated and insul-

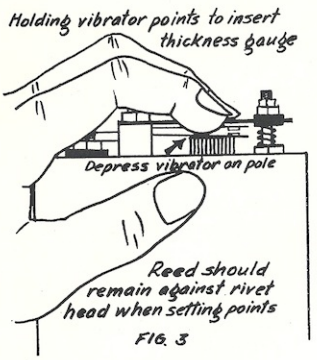

FIG. 3

the downward stroke until it "bottoms" on the rivet head providing a clean instant "break." This making-and-breaking produces the buzzing you hear. While a strong buzzing that snaps a bright blue spark at the plugs is desirable, well adjusted and "dressed" coil points which meet evenly should emit only points are made of tempten (a good conductor of very hard metal which resists heat, pitting, and burning) and you can have many miles of good ignition side engine performance with well adjusted coils.

Testing your newly adjusted spark coil is best done on a coil tester. If you don't own one some Model T friend has one and with this unit (which usually is the type made up from a T coil ring and magnet fly wheel with ampmeter) insert your spark coil for the magneto side test. Cranking (rotating this tester at the speed you would crank your car) will energize your coil and a current should flow with the ampmeter indicating the desired 1.3 ampere. This is the correct ampere reading. Often some adjustment is needed. If there is no reading at all and the coil leads are making positive contact (the three circular lead contacts — 2 on side No. 1 on bottom of the coil box (See Figure 2) then the vibrator has either not enough tension to fully return or there is too much tension down preventing the positive rise of points. By carefully "lifting" the back (a slight bending) of the vibrator at point x, (see figure 1) with a screwdriver you decrease the point tension and by "tapping" on the top of the vibrator at the back rivet, the point tension is increased. Just a slight amount of

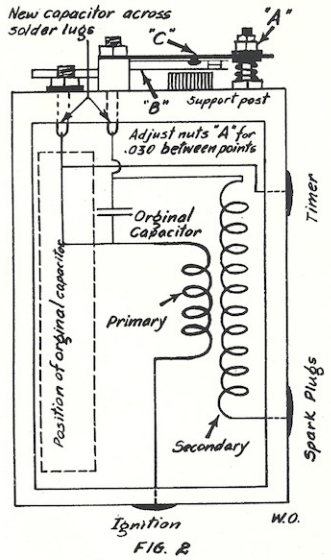

FIG. 2

this "lifting" or "tapping" will make the necessary adjustment.

You will notice the improved performance of your engine after setting your coil points and discover it's a task well worth the time and effort.

REFERENCE SOURCES:

Model T Owners Handbook
Floyd Clymers

The T Ignition System
Bruce McCalley

Automotive Electricity
Ray F. Kerns

Many years of T experience of this writer! ! !

ated. The capacitor (or condenser) receives the high voltage surge from the secondary coil when the points are open and stores it to provide inertia to the next secondary coil output.

To trace these two circuits we start through the primary coil (bottom contact) when the ignition switch is turned on to battery position a flow of positive current occurs when the roller or brush is in contact with a timer segment permitting that current to pass through to the engine and chassis to the ground cable connection of the negative side post on the battery completing this circuit. At the same time the high voltage output of the secondary coil flows from the respective spark coil through the spark plug wire (heavily insulated to prevent any loss of voltage to ground) to the center ceramic insulated electrode of the spark plug and it jumps the air gap between the points to the ground side point and completes its circuit to the grounded side of the secondary coil. This induced voltage being built up by the secondary coil is the critical function of the spark coil. The faster the coil points make and break during that instant the timer sends current to the primary coil (and at that same instant the secondary coil becomes charged) the higher the voltage output of the secondary coil becomes, and this makes a hot spark. This 8 to 10 thousand volts should have a current of 1.3 amps. Many of us have been shocked by this hot little coil, and while it certainly can "shake" you, it is not injurious due to its low amps.

The adjustment of the coil is basic to a clean hot spark at the plugs. Whether you have a new set of coils or a new set of coil points or an old set of tried and proven coils, to get the best performance from them, you should remove all the parts from the top of the spark coil and inspect the top. Clean-off wooden top surface, lightly "dress" with fine file or emory cloth the exposed top of the magnetic core and likewise do the points. Even new vibrator points should be so "dressed" as frequently the manufacturer coats these with clear varnish. Install the vibrator (Part"B") point, first centered on the studs with the hex nuts firm but not tight. (Note the hex nut thread is smaller on the support post.) Install the support post adjustment spring lower insulating washer, upper or stationary point (Part "C") without its hex nuts, the upper insulating washer and the larger hold-down hex nut. (Note some spark coils have additional metal washers be-

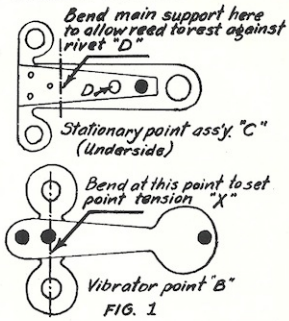

FIG. 1

low and above the insulating washers and they are there to prevent the insulating washers from distorting. Now screw the adjustment hex nut down and "eye-ball" a 1/32" clearance — approximately. Install the hex nuts on the stationary points and examine the top to bottom alignment of the coil to half points in both planes. Depress them to contact and adjust the vibrator and/or stationary points. This is done by depressing the vibrator as shown in figure 3 so it is flush on the magnetic pole face and setting the upper point by the adjusting nut being careful that when you have that exact .030 setting the upper follower reed is in the lower position seated against the head of the stop rivet. Lock the two hex nuts at point "A" for positive clearance. This follower reed must rest against the rivet which leaves it a .010 clearance (approx.) for contact travel. The follower reed allows positive point contact in the full return stroke of the vibrator (after "making") and follows the closed points in