

Talking A & B Cranks for T's

By Jim Cullinane, CA (and Carl Lake, OH)

From *Model T Stuff That is Beyond Belief*, Book 11, 2009

Got a phone call in January 2005 from a guy named Earl Lake who lives in Ohio somewhere about the advisability and the "how to" of putting a Ford Model "A" crankshaft in a Model "T" engine. He had called Charlie Yapp of the Secrets of Speed Society earlier after renewing his subscription to the SOSS magazine and Charlie referred him to me for a little over-the-back-neighbor's fence technical chitchat. I didn't record the conversation that lasted over an hour of exciting back and forth talk. But I'll try to recall here the salient points we covered since this is a very good question that probably occurs to a lot of "T" enthusiasts but stops right there without reaching a satisfactory answer. So here goes!

The "A", "B" and so-called "C" (counterbalanced) forged alloy steel crankshafts can be made to fit the Model "T" block but it is a major effort to do so. This means that it takes a long time, costs a lot of money and may not be entirely necessary. A lot of the answer lies in where you live, what car and total load the engine is to power and how fast you want to go and accelerate. Part of the answer is involved in the gearing of the car and whether you have added an auxiliary transmission and/or a two-speed rear end.

That said, focusing on the crankshaft only here, leads to the realization that only the FORD Model "A" and "B" crankshafts are practical replacements for the original "T" unit. The hard to find counterbalanced "C" version is not as practical to use in general although a few expert machinists have successfully done it in the past. All FORD crankshafts of the day were originally forged of excellent vanadium steel and performed quite well under normal circumstances. However, the "T" cranks were designed for 20 horsepower duty, were very spindly in design, bent and whipped back and forth and were subject to much abuse

in operation (such as lugging down at low engine speed and high load). Hence a lot of them developed general stress cracking or eventually broke.

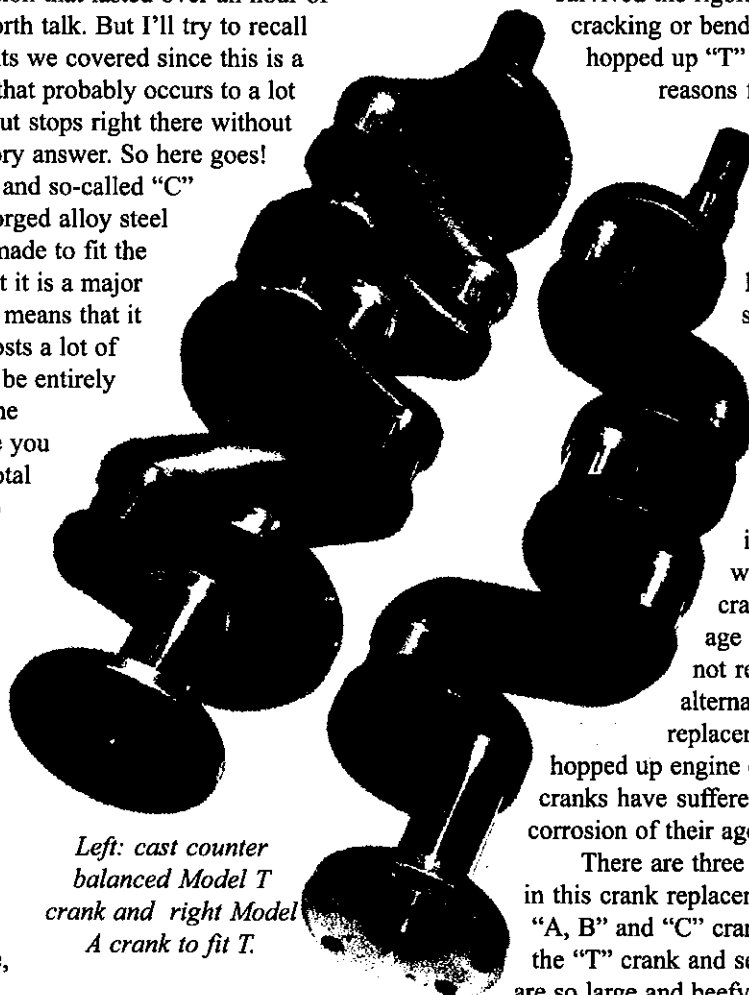
Hopping up engines with suspect "T" cranks in them was a risky approach and should not be attempted these days either. The "A", "B" and "C" were originally designed for the 40 to 50+ horsepower range and were much heavier duty, were very stiff and solid so they survived the rigors of hard use better without cracking or bending and were put to use in hopped up "T" engines later on. One of the

reasons for enlarging the cranks was

the use in heavier duty trucks that failed the old style skinny cranks. This was mostly due to lugging the engine under very high loading at low speed as in starting out from a stop up a grade on in mud or sand or over a bump. Other crankshafts of the period of similar size such as the Chevy 490 were heavier duty generally made of cast iron or cast semi-steel and were also very weak and full of cracks which got worse with old age and high loading. Hence it is not recommended that these alternative cranks be used for replacement of the "T" crank for any

hopped up engine especially now as these cranks have suffered long term intergranular corrosion of their age induced crack systems.

There are three major problems encountered in this crank replacement effort. First is that the "A, B" and "C" cranks are 1/2 inch longer than the "T" crank and second, the crank throw ends are so large and beefy that they interfere with the camshaft location and original splash oiling operation. And, three, the connecting rod thrust centers are displaced so that puts a new bending force in the rods and potentially can cause excessive wear on some of the connected parts. So, in order to fix the first problem, you have two choices; either move the whole crank forward proportionally from the rear main bearing or center the crank length about the center main bearing web between cylinders 2 and 3. The overall goal here is to retain the original thrust bearing feature of the rear main bearing



Left: cast counter balanced Model T crank and right Model A crank to fit T.

and web and keep the aft crankshaft drive flange in its normal position with the flywheel and tail-shaft and the attached "T" transmission. Any axial dimension changes within the "T" transmission and clutch zone is fraught with added trouble, so don't do it!

Selecting the first choice above causes the 4 connecting rods to be progressively offset forward relative to the rear end block web on the throw bearing and piston pin centers by approximately 1/8, 1/4, 3/8 and 1/2 inches, respectively. And the front end of the crankshaft must be shortened by about 1/2 inch to fit the front main bearing, seal, gear drive to the camshaft and generator (and distributor). A 1/2-inch con rod offset is not that big of a deal for relatively low speed lightly loaded engines, but is not very good for the very high horsepower, high-speed versions and a heavy right foot. The reason is that continued high offset bending couples on the misaligned connecting rods will eventually bend and/or break them due to accumulated fatigue failure. The connecting rod bearings and the piston pin bearings and the side-walls of the No. 1 cylinder and piston will be worn aggressively because it is the furthest out of power thrust alignment. Also the ends of all the crank throws must be ground down to clear the camshaft operating space the amount necessary for either the "T" cam or the heavier duty "A/B" cams. Then, the engine bottom pan cover oil dip troughs need to be pounded out forward in order to clear the large connecting rod dippers that are located in progressively further forward positions to match the new connecting rod positions. One of my high speed "T" racer engines is constructed this way and has performed quite well for about 20 years so far although I do not abuse the engine with continuous high-speed and high load operation.

Selecting the alternative method and to better balance the crank journal offsets, the rear flange must be cut off the crankshaft accurately and expertly welded back on about 1/4 inch closer in (toward the front). While the front end needs to be machined 1/4-inch shorter reproducing the necessary connective features up front as before.

The bearings are also offset as are the connecting rods on both ends (cylinders No. 1 and 4) but only about 1/4-inch for # 1 cylinder, about 1/8-inch for # 2 and 1/8-inch in the other direction for # 3 and 1/4-inch in that direction for # 4. Less connecting rod offset means less

unreacted fore and aft unbalanced bending couples are formed for better high-speed engine operation than the other way of doing the job. The basic problem is to get a perfect deep penetrating weld at the flange to crank face without any fore and aft wobble and without much radial run-out.

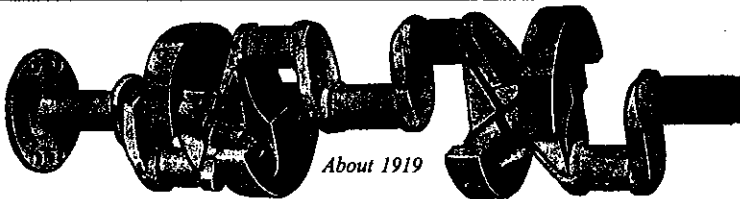
Fortunately for all of us, the advanced science of metal welding has improved drastically in the past 20 or so years, so this approach is currently the favored method for Model "T's" and is highly recommended. The trick, of course, is to pick a welder who really knows his stuff and will use an accurate lathe to position the parts in. In addition, the engine pan cover needs to be modified to assure proper noninterference between the rod end dippers and the oil retention cavities. This pan cover modification requires more space in the dipper troughs up front for dippers #1 and #2 cylinders and more space toward the rear for dippers #3 and #4.

In conclusion, putting these bigger, stronger

crankshafts in the "T" block will definitely allow you to produce more power and torque and attain much higher speeds. But, I've come to the conclusion after many years that if you have a good solid "T" crankshaft (Confirmed by Magnaflux and maybe X-Ray), there is no compelling reason to go to the extra expense of installing "A" or "B" cranks in your "T" engine. Except for

bragging rights, maybe! A well-built semi-race engine can be easily made to produce 50 to 60 HP with a good "T" crank, performance cam, light weight internals, enhanced splash oiling, higher compression ratio flathead (7:1 max), electronic ignition, professional balancing job, larger intake system and racing carburetor and larger exhaust system. Combining that with a lightweight car, a good rebuilt "T" transmission with proper clutch and bands and properly adapted multispeed auxiliary transmission or rear end will give you plenty of road performance at low cost and still retain very high reliability. This is the practical route I recommend.

There is only one rule you must follow if you go this direction. You must not lug the engine at high load and very low engine speed. If you do, you will break the crankshaft eventually and possibly throw a rod or two.



ABOUT 1919

DUNN COUNTERBALANCES are now recognized as a necessity by discriminating Ford Owners. Every set is guaranteed in actual performance to fulfill every claim we make for them. Tens of thousands satisfied customers, and this number constantly growing.

READ WHAT THESE MEN SAY

"About a year ago I purchased a set of your Counterbalances as a try out on our Ford Speedster, and have found them perfectly wonderful. They transform a Ford to as smooth and vibrationless a motor as the average six. Ship another set at once, for which enclosed find check."

Riley's Garage, Easton, Md.

In a letter from J. H. Elliott, South Heights, Pa., he says: "This is surely a wonderful motor to be placed under a Ford hood. It actually seems out of place. It is hard to differentiate between this and a six cylinder. The Counterbalances reduce vibration to almost an unbelievable extent. I never saw as flexible a four cylinder motor in my experience. It will fairly fly, and no vibration or noise. The pulling power is terrific."

These are only samples of letters that we are receiving almost daily. If you try them you will be in a position to say the same. You run no risk. We Refund Your Money If You Are Dissatisfied After 10 Days' Trial.

Price \$12.00 per set, Cash or C. O. D. Dealers and agents wanted everywhere. Write us, ordering sample set. We are Headquarters for SPEED SPECIALTIES.

DUNN COUNTERBALANCE CO., Ford Dept., Clarinda, Iowa
 JNO. F. RENNOLD, 1224 Broadway, N. Y. City.
 DUNN CR SALES CO., 1224 San Pedro St., Los Angeles, Cal.