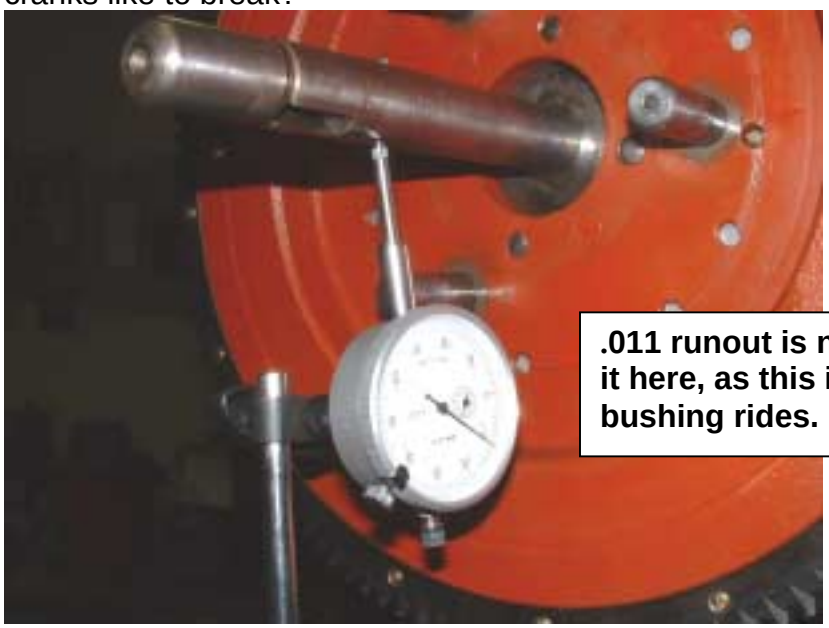
ALIGNING THE 4TH MAIN BEARING

This article is purely by accident. I had intended to submit a reproduction of the "Faithful Ford" oiler but I didn't get it finished in time. That one will have to be next time.

A month or so ago Ralph brought his balanced flywheel over to the house along with the transmission main shaft so we could ensure it was running concentric with the centerline of the crankshaft. It seems Ford wasn't as accurate in locating the dowel pins (or dowel pin holes) as they could have been. A little error here and another there all add up to a transmission centerline that doesn't actually match the centerline of the crankshaft (or even come close). I believe this is the reason some T's vibrate badly while others are as smooth as a sewing machine at all speeds. These out of alignment situations also rob power that should be delivered to the rear wheels.

The first thing we did was to check the runout on the transmission shaft before installing it. One light cut was taken on the mating surface to clean it up but it ran out fine. The crankshaft flange was trued when it was reground so it was good to go there. We then installed the shaft into the flywheel just like we were assembling the transmission and bolted the assembly to the crankshaft. We mounted a dial indicator to the block and found the total runout was in the neighborhood of .011! Think about it, that is five and a half thousands out of concentricity. If you add up the allowable bushing clearances in the brake drum, drive plate, and the forth main you can see that number is quickly exceeded. The force from this extra runout (flex) now is transmitted to the worst possible point, the flange of the crankshaft (3rd main bearing). Care to guess where T cranks like to break?



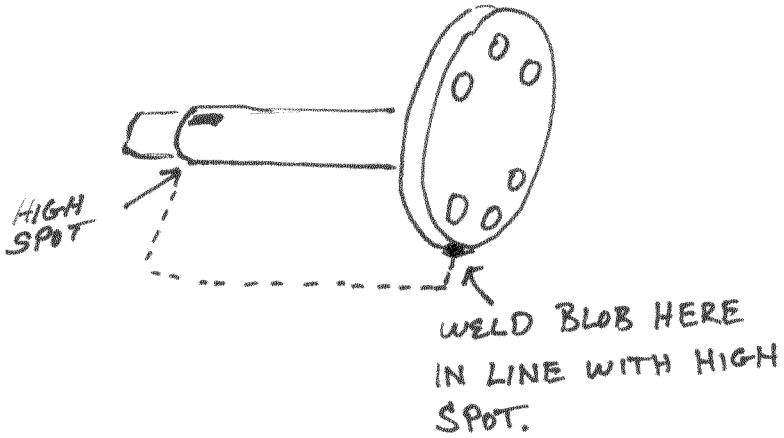
.011 runout is not unheard of. Check it here, as this is a surface where a bushing rides.

When doing this, you need to keep track of the relationship of the flywheel to the crankshaft and the transmission shaft to the flywheel. We were able to find a point where the total runout was .002, which means it was within .001 of being perfectly concentric with the crankshaft. This is within the added up clearances and should be acceptable and produce an engine that runs smoothly.

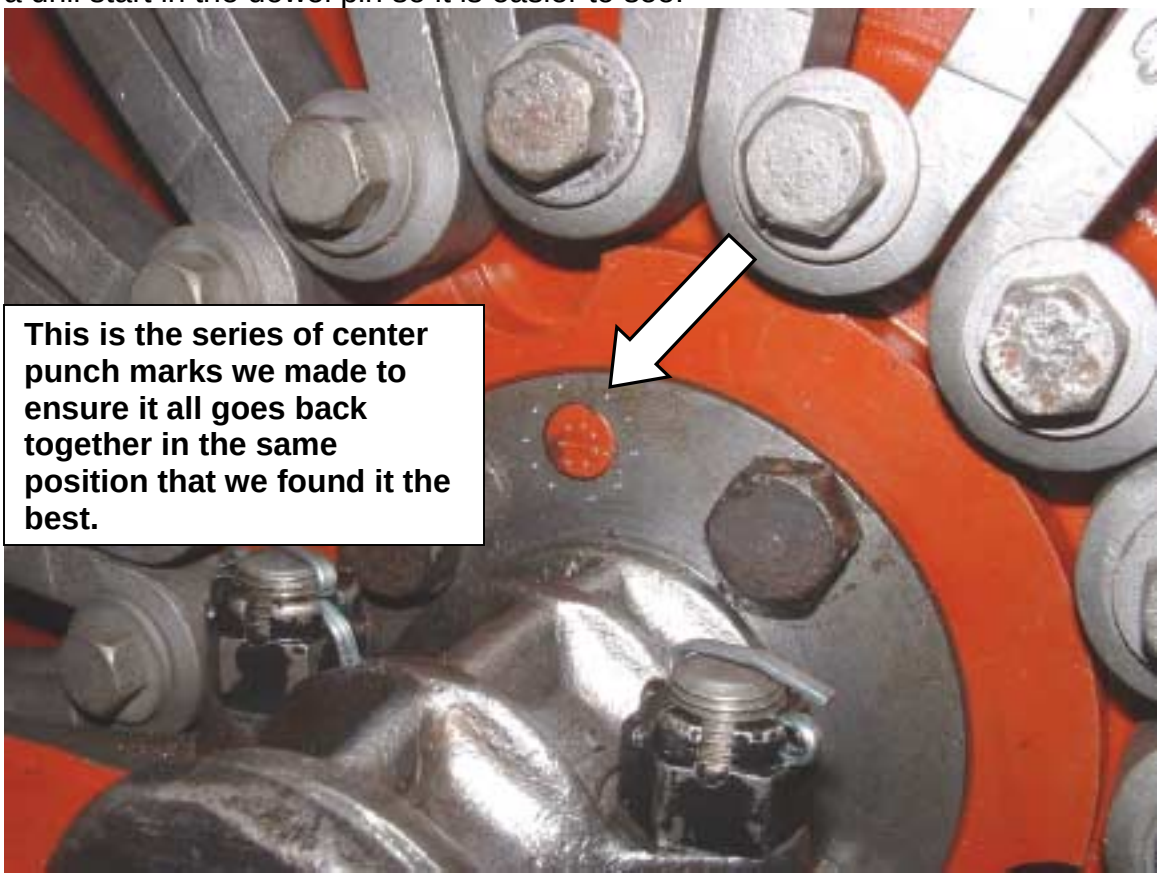
We attached a magnetic base directly to the block to do this check. Also, we put "feet" on the block in the form of bolts to protect the valves.

You really need the dial indicator fixed to the block in some manner, as all benches will flex giving you less than accurate readings otherwise.

If it cannot be brought into a reasonable form of alignment, it can be corrected with a welder and lathe. Mark the high spot of the shaft when located. Then, weld a small blob on the edge of the flange. Put the shaft in the lathe and turn it cutting the weld to only leave half the total runout. Put the shaft back into the flywheel (may require a rubber mallet), bolt it back up to the crankshaft and check it again.



Once you have found and corrected the out of alignment condition, do yourself a favor and match mark everything! The photo below shows how I marked it using a self-striking center punch. Both the crankshaft and flywheel are marked in this photo but the main shaft is also indexed. The next one I do I will probably make a drill start in the dowel pin so it is easier to see.



This is the series of center punch marks we made to ensure it all goes back together in the same position that we found it the best.

This is a bit of a pain as we bolted and unbolted the flywheel a bunch of times. We went ahead and assembled the transmission after facing the new triple gear bushings for the proper clearance. Ralph did a fine job of balancing everything even with the triple gears in place (notice they are numbered as to location). Here is hoping this runs well and with minimal vibration in his future speedster. If it doesn't, it isn't for a lack of trying! I just hope Ralph will wait at the top of the hill for the rest of us!

Gary