

Flywheel Housing Alignment Pt I

Those of you that do the final assembly and installation of your own engines after a rebuild have probably read and used the article written by John T. Shepherd of Arlington, Virginia. This article was written for the Restorer, January/February 1984, pages 10-15. The article was reprinted in the How to Restore Your Model A, volume 4, pages 10-15. **The information covered in the article is one of the most critical procedures for eliminating vibration in a Model A.** Misalignment of the transmission can not only produce vibration, but will also cause your transmission to jump out of high gear while driving down the road.

Over the twenty years since the article was published, several people have come up with variations of the procedure that made it simpler or less time consuming, or even better yet, more detailed for better results. Now don't take this wrong, John's willingness to produce this information for all Model A restorers to learn from is probably one of the best bits of information ever printed, but after 20 years it needs an update. I will pass on to you what I have learned from my own experience following the procedure in the article, plus what others have told me they have learned. First I would recommend you pull the article from your library and read it again so you understand what I am referring to below. If you don't have either publication I would suggest you buy a copy of the How to Restore Your Model A, volume 4. They are available through most Model A parts vendors or direct from MAFCA Headquarters.

One thing I learned was to forget the handy dandy crankshaft checker. Buy a dial indicator with a magnetic base. I made the crankshaft checker as described in figure 3 and it cost me over \$30.00 by the time I bought the material and had a local machine shop bend the bar and drill the holes. A magnetic based dial indicator is less than \$20.00 at Harbor Freight when on sale and not much more when every day priced. Learn to use it and if you have a problem just call or e-mail me and I'll give you a lesson. The magnetic base attaches to the crankshaft flange and the tip of the indicator is dialed in at zero on the edge of the flywheel housing and around you go reading the dial at different locations on the housing by turning the engine over from the crank nut with a 1-3/8" socket or the crank if it's not too tight because of the rebuild.

Next, and probably the most important, you need only to check the flywheel housing alignment from the pan rail up. The bell housing will pull the lower half into alignment when it is bolted up. The lower half of the flywheel housing can be moved fore and aft by hand pressure as you can prove by placing the dial indicator at the center of the bottom portion of the flywheel housing and give it a pull and a push. This brainstorm was the idea of engine builder, Mike Flanagan of Arizona. It can cut the alignment procedure time from as much as two days to as little as 20 minutes.

Always adjust using the ears on top of the flywheel housing, Mickey Mouse ears as Mike calls them, rather than shimming at the other four attaching bolts. The ears will move the flywheel housing where ever you want it without touching the other four bolts. A shim under the lower right hand bolt will cause a major oil leak at the rear of the cam shaft as it will break the seal of the gasket. before placing the gasket on the back of the block you should check the thickness to assure the gasket and the horseshoe shims you will place under the Mickey Mouse ears are of equal thickness. The horseshoe shims come in .010" thickness, but the paper gasket can be a completely different size. I have one that measures .016" and that's before the gasket sealer is applied. Using this combination will naturally warp the housing when the six attaching bolts are tightened. I use a used set of main bearing shims and cut them to the horseshoe shape. The main bearing shims are usually laminated in layers of .003" so two under each ear to go with the .010" will give you a better starting point than just using the gasket and the .010" shims. The Ford Service Bulletins on page 218 states the housing should be within .006" with the crankshaft flange. By using the .003" shims you can bring the housing into perfect alignment with a little time and patience. If .006" is OK then perfect must be better.

The dial indicator with the magnetic base should also be used to verify that the centerline of the crankshaft is centered in the inside step machined in the flywheel housing. This is done by securing the magnet to the crankshaft flange and setting the indicator point on the inside surface of the step and turn the engine over checking the reading in several places. If the Babbitt shop centered the crankshaft and the flywheel housing is not warped or out of round the readings should be within .005". If more than .005" you will need to try another flywheel housing and go through the above steps again. If the readings indicate the second housing is out the same as the first then the bearings were not align bored properly and you will have a misalignment of the crankshaft and transmission input shaft causing the unwanted vibration. If all checks OK then the next step would be to attach the flywheel and use your dial indicator to check the clutch surface for wobble. Anything over .005" should be addressed by checking for debris or burrs on the crankshaft flange or the mating surface on the flywheel. If both are clean and smooth then you should replace the flywheel.

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I spent approx 2 hours setting up my flywheel housing on my engine, having lightened the flywheel (I will write up a story as Pt 2), so it was good time to get all under control and to attempt to eliminate possible vibration issues, it was fiddly, but so very necessary. The engine is much better, I still have harmonics at given engine RPM.s but that is another story. Editor