

Charley's Steering Box

The article I wrote in early November about working on the steering box from Charley, my '29 Tudor, ended like this: "Now the upper race slides easily (almost) into the housing and I can finally get to finishing Charley's steering. Tomorrow. Maybe. And then it will be on to other adventures. Perhaps now I'll remember that, when restoring a Model A, everything takes MUCH longer than you expect." Little did I know just how true that last statement is! This is a summary of a longer article that related my trials assembling and adjusting the steering box "according to the book."

For those of you who don't know me, I make up what I lack in Model A knowledge and experience with enthusiasm. And I have a LOT of enthusiasm, which is a good thing because... well, never mind. So I set out to adjust the steering box. My two references were Les Andrews' "Model A Ford Mechanics Handbook" and Jim Schild's "Restorer's Model A Shop Manual." Both were very helpful, but neither provided enough information so that someone with my very limited experience could do the job properly. In addition to "me," there were three problems:

1. Terminology in the books was confusing, making following the instructions much harder than it had to be.
2. Both books seemed to assume that you had a perfectly aligned worm gear on the steering shaft. Mine was a rebuilt unit that was about 1/8 turn off from center. Not a big deal, but when you don't really know, it's cause for question.
3. Neither book mentioned how much easier it would be if you had some way to hold the box still so it doesn't want to run all over your bench while adjusting it!

Fortunately, our club has a few folks who are willing to share their time and experience, and there is a wealth of advice available on the Internet. The end result of all this is that it took me a total of about 20 hours or so to wrestle with the steering adjustment, but I finally got it about perfect. If I had known then what I know now, I imagine that the total adjustment time would have been just a couple of hours at most.

The long version of this article includes a detailed accounting of steps for adjusting the steering box, along with an annotated diagram that should make things a bit clearer than the ones from the books I used. But here is the general idea:



Steering box mounted in jig made from old motorcycle brake disk. (Yes I repainted the box after all this was over!)

Once both the steering shaft and the sector gear are in the box with all nuts tightened and end play removed, loosen the sector housing nuts enough to make adjustments without actually changing the mesh of the sector gear with the worm. Then adjust the gear lash so that it is equal at one-half turn either side of center. After that, adjust the gear mesh to zero at the center of the worm. Then check the gear lash. If it still is not equal, loosen the mesh depth adjustment, readjust the lash, then tighten the mesh depth to remove all lash at worm center. Repeat this process, alternately adjusting lash and mesh, until you get it right. "Right" is

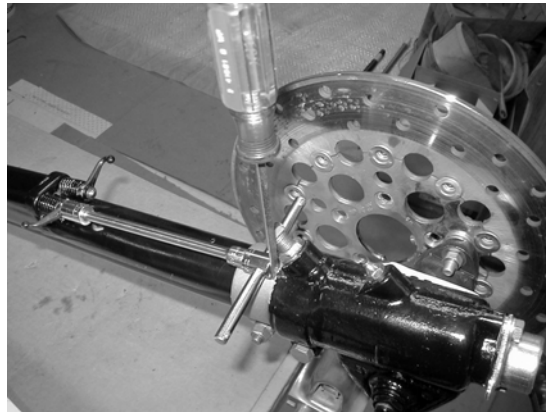
when there is no lash and tight mesh at the center of the worm, and as little lash as possible throughout the steering shaft rotation on either side of center and the amount of lash is balanced from side to side. This alternate adjustment process is necessary because what feels like balanced lash when the sector gear mesh isn't tight will undoubtedly be somewhat off when you tighten the gear mesh. Finally, end the process by tightening all the nuts.

All of that may be obvious to others, but it wasn't to me until I understood it clearly. Only when I figured out the general process could actually get the individual steps to work!

One key to making this process a whole lot simpler was having either a frame or a jig into which you can mount the steering box so it will stay still while you are working on it. What I used was an old motorcycle brake disk. It had half-a-zillion holes in it and three of them were almost perfect for mounting the steering box. See the photo. (A BIG thanks to Pete Crosby for advising me to mount the box on something. Without this simple tip, I'm sure I would still be out in my garage cussing!)

After I got the box adjusted, it was time to finish assembling the steering column. Of course, there were surprises there, too. These three are the more notable:

1. The reproduction control rods don't have the same dimensional control as the originals and had to be ground down to fit the holes in the upper bushing, the steering column, and the control arms.
2. Nowhere does it tell someone like me (remember, lots of enthusiasm but next to no real experience) that the *control rods are "handed."* One is *only* for the spark and one *only* for the throttle. And, of course, the first time assembling things I was on the "butter-side-down" side of the bet... they were backwards.



The "Craftsman® 1/4" T-Bar Model A Control Arm Installation" tool in use.

1. There isn't any easy way for one person to compress the springs, align the holes in the control arms with the holes in the control rods, and install the pins. And this meant I had to improvise another set of hands. I discovered that the T-bar and extension that came with my Craftsman® 1/4" socket set made an almost perfect persuader. It fit nicely between the end of the control arm and the body of the steering box (see the photo) and allowed me to compress the springs so that I could install the pins.

Anyway, after a few more hours of filing, sanding, grinding (and cussing), I was finally done. It took a lot longer than I (or anyone else I know) expected, but I think the job is done right. Now I hope that the repro steering wheel I bought three years ago fits as nicely on the shaft as I expect. Time will tell. But I'll be prepared if it doesn't because, by now, I am beginning to really appreciate that *everything always takes longer than it should!*

Roger Dean

Editors note:

If you would like more information about Roger's restoration of Charlie, he has written a more in depth article on restoring the steering column. You can contact him direct or Email at Roger@ProposalHelp.com.