2/3/2007 rev .1

Here is a brief overview of what I did to straighten the axles I have.

I have 4 axels to play with and they are all earlier Ford script and with AA marking. The AA and EE are metal type designations from Ford. The crankshaft is made from EE type steel.

Ford specs show the angle on both the holes should be 7 degrees.

KRW has a nice tool that uses tapers to center rods. The rods should be parallel when sighting across the axel. There was also a gauge that you put on the rods to check the angle. You can look this up in the Service Bulletins. These tools were made by other manufacturers so keep your eyes open.

I made some rods loosely based on the KRW rods. The rods can be drill rod, but I had access to a bunch of rods stripped from some old dot matrix printers. The inserts for the axel holes were made from the emergency brake cross shaft of the A. I had one someone torched the ends to get it out. Guy a little FYI, the Ebrake shaft ends are held on with taper pins and they come out easy. Making the tapered universal fit rod centers was my original goal, but I would have to teach myself how to do that and time is a factor. What I did is much quicker and the resulting error from a little imperfect fit is not a factor based on some calculations I did.

It turns out that the king pin holes are the same diameter as the Ebrake shaft. I have a lathe and turned down the Ebrake shafts to fit the perch holes and bored all the shaft holes on center. Pretty easy stuff to do on a lathe. As I pointed out, a perfect fit is not required. The holes will vary some in size because of wear due to improper installed parts.

You can tell gross problems by looking down the axle. It should look pretty straight down the sides. You can also take a long straight edge like that box aluminum tube I am using to get an idea of how bad the axel is. Also you will see there is a 'seam' running the length of the top of the axel. This should be straight. As you can see I have a pretty good length of rectangular stock that I could use to guage this center line.



Now what I am doing is not super accurate, but in checking the errors I have found I can get the axel very close to straight. The plugs I put into the holes are not super tight, but they are close enough to do the job. I figured out that the errors were only fractions of a degree even thought they seemed wobbly.

The best way to see how the axle was is to put the rods in and step back. You can see twisting and you can see bends. By using the square aluminum tubing I was able to quantify just how bad the bend was. You can see in the one picture I (ignore the clamp I did it by hand) would put the tube between the rods at one end. If the axle were correct than the tubing would be resting on the edge of the rod at the other end. You must do this for both sides. Most of the bending seems to be at the perch hole area, which makes sense.

You can also see were the bends are in the axel with the square tubing. You will find the sides of the axel are smooth enough to guage about where the bends are. You put the tubing against the side and look for where the rocking pivot point is. That is where you want to do the bending. Please do not think that you can straighten the axle using the sides of the axle. After I had the axles straight according to the rods I went back and tried a straight edge on the sides. The straight edge indicated some bends. I had originally thought that I could straighten the axles with a straight edge on the sides. After

much thought I decided against that technique. I felt the forging surface was not smooth enough and there was too much opportunity for a bump in the area of the spring perch. When I found a large supply of straight rods a hobby machinist friend had stashed away I decided to try to make the rods. I am very happy I made the rods as I feel they work very well.

I am using a basic 10 ton press to do the bending. I found that 5 or 6 pumps after the ram touched the axle did a little movement. Once I got the hang of it I would do my pumps and check and repeat. Notice the rectangular piece of metal I am using to distribute the force. It is just a piece of random scrap I had laying around.



I was worried how I was going to remove a twist in one axle. I went ahead with trying to remove the bend and I found the one twist I had went away when I worked on the straightening. Notice that I am pressing the inward side of the perch area. The bends are all in this area and it make sense. The perch and inward are stabilized by the wishbone. From the perch out you have a level that is taking all the abuse of road and what ever large objects a driver happens to hit.

Now for the angle measurement. You can see I made my "level" edge by spacing out from the top with the rectangular stock I had and a straight edge. Then I used an angle guage. I spaced down from the rod with another steel block. I was reading about 8 degrees.



In some discussions with another model A person I found that one type of axle tended to be more accurate at 7 degrees. All the axles I have were between 7.5 and 8 degrees. I figure this is close enough for the A. Both rods on one side should be parallel and at the 7 degree angle. I choose to not change this angle as I feel it is not far enough off to worry about. Given the fact all axles were about the same angle I also wonder if that is not close to the angle they were made with at the factory.

One other problem I ran into. One axel I did my 5 pumps on and it REALLY bent a lot. It appears that this axel may have been repaired in the past. Obviously, heat was used and the axel would not work well on a car to be driven.

This next picture will give you idea of how far off an axle can be. Notice that the 'straight' edge on top does not go down the middle of the spindle hole.



Here is the same axle after straightening with lines to show how it was.



I am hoping to get the other type of axle someday. The other kind is marked with an EE if I remember correctly. I would also like to get my hands on a NOS axle. Then I could really see how good my techniques are and I would really like to put it on my car too.