

A20 Axle Bearing/Seal replacement.

Hello Ford axle fans...you, the racers...you guys with 9 inch ford housings under your racecar. Well here is a simple pictorial "how to" lecture on removing and replacing A20 style axle bearing kits. *This article assumes you have removed your axle from the housing and you have determined that the bearing and seal must be replaced.*



The above shows the A20 assembly (bearing, race and seal), 2 axle flange retainers and two bearing retainers.

Listen for the "pop":

Cut the retainer (this is not a sleeve, not a spacer) a bearing retainer. It is a true retainer in the fact that it will damn near uninstall itself. Yes you only have to cut it properly with a good 1/16 or .045 high-speed cut off wheel. *We, Gary and I, use Bauer brand wheels that are available at Harbor Freight.*

Make your cut at 45 degrees across the axle bearing retainer as shown below. You will hear the retainer "pop" as it can no longer hold the bearing in place. This "pop" comes somewhere around $\frac{3}{4}$ into the cut. You do not have to, and never should you, score the axle shaft itself. Just take your time and prepare for the "pop". Turn down that terrible music you are listening too. Hear the pop - see the crack!!



Now, using a cold chisel or small pry bar, slide the retainer back on the shaft away from the bearing.

Remove the bearing:

You must remove the bearing itself. You can press the bearing off the shaft if you have a press that can handle the length of the axle. You will need the proper dies to do this. However, you can use an alternative method...since the bearing is going to be replaced, you might as well destroy it now.

If the bearing is a one piece (roller bearing) which slides out of the axle housing end with the race, you will cut through the race and into the bearing assembly. Chances are the race is already off the bearing and you only have to cut the inner race. In tapered sets, the outer race remains are still inside the axle end cup. If the bearing was installed as a set, the axle bearing race is located inside the axle end. You should remove the race now. Use a "slide hammer" to remove the race. This will not take much labor. In some cases you can pry the race free with a simple flat-blade screwdriver bent at a 90 degree angle in the shape of an "L"...use caution not to score the axle end surface. *Remember, you cannot replace a tapered outer race without the bearing assembly and seal. These are sold as "matched sets" for best performance.*



Remove the inner race:

Now that the race is free and the retainer is off the axle shaft, remove the bearing, inner race and seal. Keep in mind, if the axle is from the 70's or earlier, chances are this will be a roller bearing assembly. Just as easy to remove, but not as pretty. Cut through the outer race and into the roller cage. Remove the ball bearings and save them for the kids to play with. Now remove the bearing cage and "pie cut" the inside race. This will allow you to use a wedge chisel to break the race free. Applying some heat may help, but I do not find that necessary. Once the race rotates around the

shaft, use the chisel and, with a hammer, bump it off the shaft...should slide off like butter from a knife.



This is an older style Ford 9 inch axle. The roller bearing assemblies are very easy to remove. That explains why they should not be used in race cars. I will explain as we move along.

Note: You should use your caliper now and note the outside diameter of the axle shaft. The A20 bearing kits come in a couple of different styles. Get in touch with your supplier...Timken and National both have great websites. *If you run into some "computer GURU" at your local box-store parts house, forget it...go back to your shop, get your shit together and call someone who can actually help!!* You will get all the advice, and the parts you need from Speedway Motors or www.QuickPerformance.com.

One must be reminded that tapered bearing sets handle axle side load much better than OEM roller bearings. You can easily see why racers break roller bearing axle shafts. But replacing axle ends can be a frustrating job and costly as well. *I have seen the results of a poor repair, and believe me when I tell you I would not drive the car on the street let alone on a race track.* Please keep in mind, some shops charge as much as \$400.00 to convert axle ends and easily \$250.00 to repair one side. However, in the long run, you increase your chances to finish the race by as much as 65% when you race with tapered bearings...even more so using the A20 style kits.

Roller axle bearing removal:

You have seen most of the images above. The important facts are the cuts and the angles. The roller bearing cage is much heavier than the taper cage so using a pair of side cutters is not recommended. I suggest two cuts between the roller balls and these will drop out. Once the cage is removed all other axle components can be slid back towards the spline end. This makes the "pie cut" easy to follow. Your installation will be similar to the A20 installation but you will be replacing these bearings with tapered units, so discard any parts that remain. You will receive new "flange" retainers in the kit. *Don't forget...use your caliper on the axle shaft where the bearing will be seated. Keep notes of the shaft OD.*

Tapered bearing removal:



The tapered bearing race will be the ball-buster. These have seals and retainer flanges that will get in the way of your cuts at the inner race. In this case I should have eye-balled the retainer flange and removed it first. These flanges are available at any parts house and in cases like this I would never trust this flange to hold so much as my pants on!! *So, off with these ahead of time and doing so will make the inner race removal a piece of cake.*

Again 45 degree cuts and if required go in at a shallow angle. This will give you room if you plan to save the retainer flange. The problem with these cuts, they can score the shaft so be sure the price of sparing the retainer is worth the price of replacing the axle. Learn these lessons well...a penny saved could cost you a lot of extra bucks!!!

A20 style bearing removal:

This is the easiest of all because the axle flange retainer is removable. With this out of the way you only have to concentrate on angle and depth. You may not need a "pie cut" or a skewed angle cut using your grinder. This will make a much neater removal.

Continued...

Take your time!! First, push the outer seal toward the axle flange. Now “pop” the axle retainer as explained above. Next make two cuts into the tapered cage; one about 180 degrees from the other. The cage will fall off the inner race. Now



clean up all surfaces and prepare to cut the inner race.

This race does not, will not, “pop off” like the retainer, so do one 45 degree cut and check depth. It may be easier to make a second or third cut along the same plane. There is no rush here, so take it easy and be sure you do not score the axle shaft. *Once you have enough material removed to work on, “chisel-bump” the race. Use your cold chisel and hammer...you will want to spin the race around the shaft before bumping it toward the spline end (removal).* If the race spins around the shaft, it will slide off easily. If you force the race by over powering the chisel at this angle, chances are your chisel will slip off the race and you may gouge the retainer area on the shaft. Manage to rotate the race halfway around the shaft before “bumping” it along the retainer

edge. Ok look over your work. Do not leave any filings behind to destroy the new bearing.



Here is a tip, use an old water hose clamp to protect your axle shaft surface while cutting into the inner race.

Again, before you attempt to chisel off the race, make sure it can be spun around the shaft (not off). When the race rotates it is free and can be removed easily. Now remove the seal, all the junk and clean up the axle. Preparation for installing the new bearing is important. Finish up with a piece of Emory Cloth and wipe everything down with brake clean or acetone.

Install the new bearing kit:



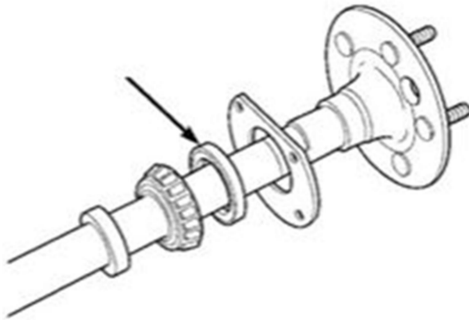
First...remove the seal from your kit. Slide the new seal onto the shaft and push it all the way toward the axle flange. Make sure the “open end” faces away from the flange. If you have a decent press in your shop, leave the kit intact, be certain the seal is aligned as shown in previous illustrations. The A20 kit installs with the “outer race” on the bearing. *Please refer to my article “Replace the Axle End”.*

The first point I want to get across to you...the bearing assembly is pressed on before the axle retainer. I mention “pressed on” because using a length of schedule 40 pipe and a 10 pound sledge is not what I call a press. These kits are not cheap. Do not consider using “big hammer” mentality at this stage in the process.

If you do not have access to a decent press, I suggest you research your local businesses and find a dealer or shop that will press on the new kit for a reasonable fee.

We own an old style mechanical 30 ton Weaver. This will do the job, however we must design a way to properly hold the axle as we press down on the flange end. The seal may be crushed if we do not take care.

Appendix:



Here is a simple illustration of components and how they are arranged on the axle. From left to right, bearing retainer, bearing assembly, seal and axle flange retainer. The bearing race remains inside your housing. The arrow points to the seal. The A20 set, the seal is integrated into the system. Anytime you remove the axle, you should use RTV on the seal when you reinstall.

A20 kits are manufactured by National and Timken. North Coast also manufactures the bearing without the seal. Quick Performance Axle sells the complete kits, axle ends and axle retainers.

In closing...this advice is totally free to use. You can decide not to attempt the repair yourself, or you can follow these instructions to remove your old parts, inspect your axle and have someone at a reputable shop install the bearing set. Either way this did not cost you anything beyond a little time. Time to read...read!! We all were taught to read, that does not mean we comprehend or understand. If this article does not help you repair your axle, try one of the social media websites where you will be deluged with "moronisms" and political correctness. Otherwise you can simply pay out of your backside where I assume you keep your wallet. Above all, I did not ask for a donation, your email address, nor did I insist you enter a credit card number. So don't call your attorney if you screw up your axles...

Church,
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