

A Broken Rear Axle Shaft

by Tom Endy

A repair made on the car without removing the rear end:

It is not unusual for a Model A Ford to suffer a broken rear axle shaft. When it happens the break is usually right at the key slot, and it is definitely a show stopper. Many Model A Ford enthusiasts know how to remove the rear end from the car and completely disassemble it. If you restored the car, you probably had the whole works apart at one time. But, if all you want to do is replace the broken axle shaft, you don't have to remove the rear end from the car and you don't have to completely disassemble it. There is a short cut that can be taken if you are sure that the fault is limited to only a broken axle shaft. This article will describe how the axle shaft can be replaced with a minimal amount of disassembly.

Preparation:

You will need a good safe spring spreader, a hub puller, a jack, and a set of hardy jack stands. Drain the oil from the banjo. Do not remove the floor boards or disassemble the U-joint housing. Jack up the rear of the car and set the frame on the jack stands just forward of the axle housings. Leave the jack in place supporting the banjo, but slightly to the right so that it will clear the edge of the left axle housing. Remove both rear wheels and both rear brake drums (you will need the hub puller). Be sure to remove both axle shaft keys. Do not do any more disassembly to the right side (passenger side) of the rear axle.

Disassembly on the car:

Insert the spring spreader and remove only the left (driver's side) spring shackle. Remove the left shock arm and both left brake rods from the left backing plate. Unbolt the left brake rod anti rattle springs from the radius rod. Remove the left rear radius rod by unbolting the two forward bolts at the left backing plate and by removing the nut from the bolt up at the front of the torque tube where both radius rods are held together. This is why the nut is supposed to be on the left side of the torque tube and the bolt head on the right side. Lower the jack slightly to clear the left axle housing away from the rear spring. Remove the ten bolts that secure the left axle housing to the banjo. Pull the left rear axle housing clear of the car with the backing plate still attached to it. With the left axle housing removed, pull the entire axle shaft and differential assembly out of the rear end housing. Both right and left axle shafts, the carrier assembly, and the ring gear will come out as a complete assembly. Take the assembly to a work bench and disassemble the carrier to replace the broken axle shaft.

Disassembly of the carrier:

Center punch both halves of the carrier so that you can reassemble it exactly as it was. Remove the safety wire and the 9 carrier bolts and nuts. Remove and replace the damaged axle shaft. Reassemble the carrier assembly just as you took it apart. Torque the carrier nuts and bolts to 30-35 ft. lbs., and reinstall safety wire. The carrier assembly is ready to be reinstalled in the axle housing.

Axle shaft oil seal replacement:

At this point of the disassembly both axle shaft seals can easily be replaced if desired. Reach in the hub openings of both axle housings with a long screwdriver and knock out both of the old seals. A special seal installation tool that screws onto a length of pipe will be required to install the new seals.

Banjo gaskets:

It is important to take special note of the quantity and total thickness of gaskets that were installed between the left axle housing and the banjo. If possible, measure the total thickness with a micrometer. It is extremely important that you reinstall the left axle housing with the same total thickness of gaskets. The total gasket thickness determines the carrier bearing preload and ring and pinion backlash that was set (if it was) the last time the rear end was overhauled. If you only install a single .010 gasket back on the left side, the carrier bearing preload may be too tight and you chance burning out both carrier bearings when you are back on the road.

Reassembly of the rear axle:

Reinstall the axle shaft and differential assembly back into the banjo and right axle housing that is still attached to the car. The ring gear should be toward the left side of the car. Make sure that the ring gear is properly engaged with the pinion gear before you reinstall the left axle housing. Install the proper thickness banjo gasket on the left side of the banjo and install the housing (the left backing plate is still attached). Torque the ten banjo bolts to 30-35 ft lbs. Reinstall the left radius rod to the backing plate and connect it to the bolt and nut at the front of the torque tube. Reinstall the rear spring to the left axle housing and insert the shackles. Install the two shackle nuts, but only snug tighten them. The shackle bar must have some amount of movement. Install cotter pins in the shackle nuts. Reinstall both left rear brake rods and the shock arm. Reattach the brake rod anti rattle springs. Remove the spring spreader.

Finish:

Install new axle shaft keys on both sides to preclude breaking another axle shaft. Install the brake drums and torque both rear axle shaft nuts to 90-100 ft lbs. and install the cotter pins. Install both wheels and torque the lug nuts to 60 ft. lbs. **Remember to put oil in the banjo housing.**