

Model A Carrier Repair

by Tom Endy

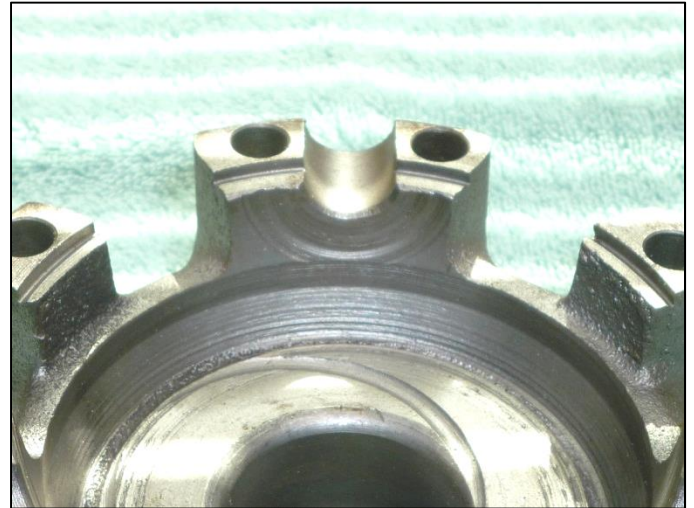
The carrier, which is part of the differential in the rear axle assembly, is often found in a state of disrepair. Reproductions are not available, so if you have one that is damaged you need to find an original that is serviceable or figure out how to repair the one you have.



The carrier has the ring gear attached to the left side. The spider gears are inside the two carrier halves. A rear axle shaft will protrude from each side. There is a carrier bearing on each side that is mounted to the hubs with an interference press fit. The carrier bearings must be set up against their races with a pre-load of 20 inch pounds.

There are two different failure modes. One is caused by in-service wear. The inside area of the carrier can become worn from the backside of the three spider gears rubbing against it. The wear can cut an indentation as much as $1/16$ " deep. There is no repair for this that I am aware of. The only resolve is to discard the carrier and find a better one.

There is always some amount of wear in this area. That is why it is important to mark the carrier before you separate the two halves so it can go back together with the wear patterns lined up.



Service wear can be seen where the back side of a spider gear rotates against the carrier just below the two bolt holes at center.

The second failure mode is self-induced. Generations of "mechanics" attempting to rebuild the differential with no knowledge of carrier bearing pre-load have put rear axle assemblies together with a single gasket on each side of the banjo instead of selecting quantity and thickness of gaskets to establish the pre-load. In many cases they ended up with the carrier bearings locked. Henry's forty horses will unlock them. However the unlocking process causes the bearings to spin on their mounts and the result is the rear is not riding on bearings 100% of the time. Metal is worn away on the hubs such that a replacement bearing will not press on with an interference press fit. This is the predominant failure mode. Around 80% of rear axle assemblies disassembled for overhaul exhibit one or both of the carrier bearings spun on their mounts.

There is a repair for this failure. The hubs can be knurled to raise the metal so that the replacement bearings will press on with an interference press fit.

The carrier shown in these photos is the later version. The version used on the early cars was slightly different. The early carrier halves are not interchangeable with the later carrier halves.



The hub in the photo has been knurled. The bearing stop was also machined to true it up as it also had metal indiscriminately machined off. A .005 cut is made and will have to be replaced with a .005 shim. An additional cut was made below the stop that is a nominal 1/16" deep and 1/4" wide. The purpose of this cut is to provide more access under the bearing to install a bearing puller if the new bearing has to be removed to install additional shims. Note the three punch marks where some mechanic of yesteryear attempted to provide a form of knurling.



A .005 shim is installed before the new bearing is pressed on. Bratton's Antique Auto stocks the .005 shims.

The photo on the right shows the bearing puller installed to pull the new bearing back off. The second cut taken to the base of the carrier hub provides more room so that the tool does not slip off and damage the bearing.



A new bearing is pressed on. The shim can be seen under the bearing. Note the second cut taken at the base of the hub will allow more room under the bearing for a bearing puller if additional shims are required.



A bearing puller such as this is used to pull a bearing off of the hub without damaging the bearing. This is important if you are removing a new bearing that you intend to reinstall.

