Differential Vent

by Tom Endy December 2023

The Model A Ford differential does not have a vent valve. It is believed that one is not needed due to the large volume provided by the two axle housings and the torque tube. The torque tube especially provides a large volume to dissipate any pressure build up. However, in recent years many Model A owners have installed a Mitchell overdrive that eliminates the torque tube. The overdrive itself has a vent valve, but it only vents the overdrive, the differential is sealed off from the overdrive and some owners have reported an oil leak from the differential around the banjo after installing the overdrive.

Many Model A's on the road today have both rear axle grease seals totally shot and it affords plenty of pressure venting. It should be noted that the axle seals located at the outboard end of each axle housing are grease seals, not oil seals. Differential oil does not travel out to the seals. The seals are there to direct grease to the wheel bearings and prevent the grease from migrating into the axle housings. Model A's that have had the seals replaced in recent years could be what is contributing to non-venting of a differential after an overdrive installation.

One Model A owner who installed a Mitchell overdrive and encountered an oil leak around the banjo installed a vent valve in the left axle housing and reported it stopped the leak.

The vent used was an Alemite 304810 air vent valve. 1/8" PTF. Overall length 1.0 inches, shank length 0.19 inches. Available from Amazon, cost is about $6.

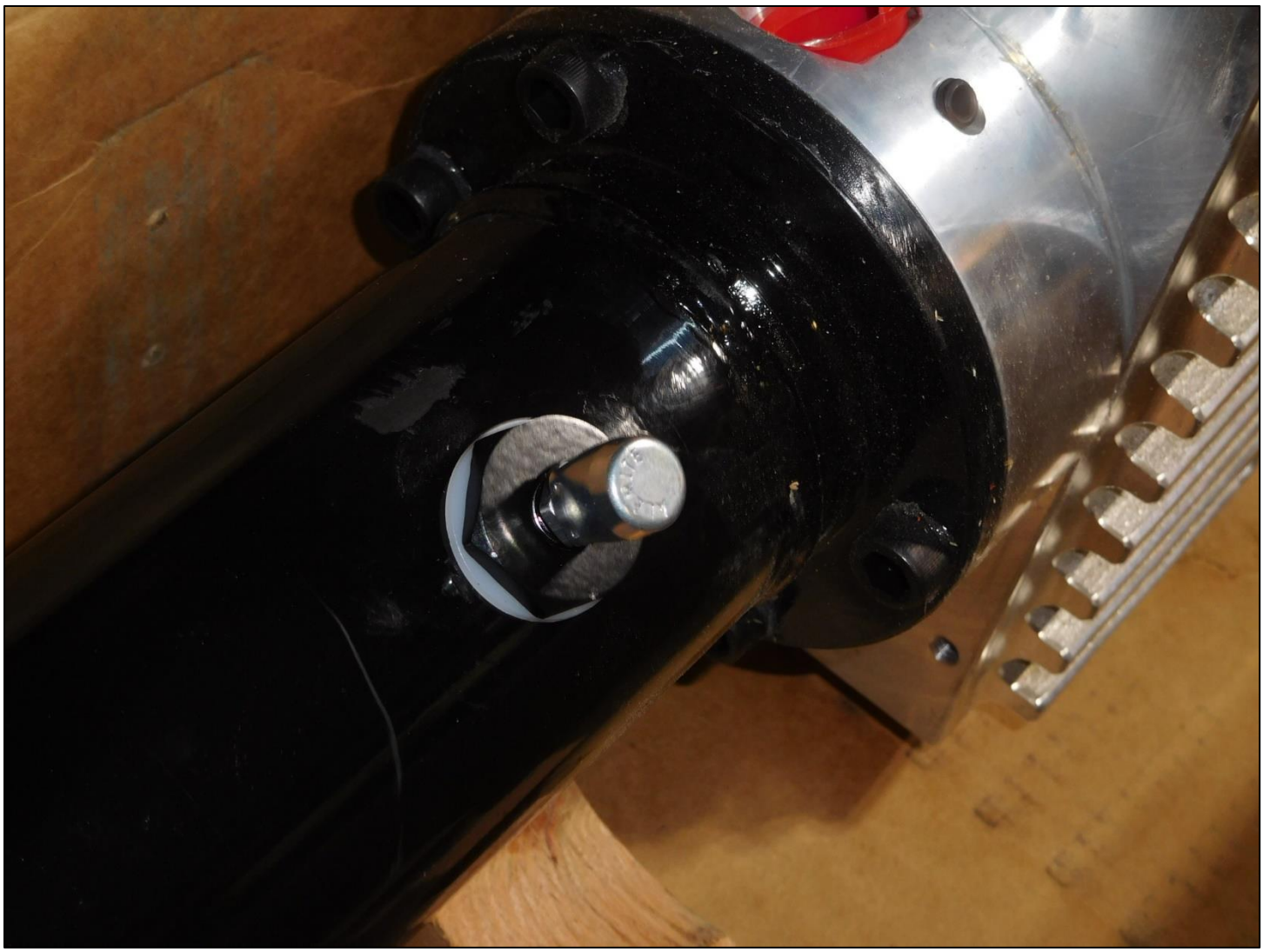
The vent valve was installed on the top of the left axle housing a few inches from the banjo flange. The owner coated the drill bit and tap with grease to minimize any metal chips falling into the axle housing. The photo at left shows the installation.

Another approach to venting the differential was offered by someone on fordbarn. There is a plug on the Mitchell overdrive rear tube just behind the overdrive transmission housing for the purpose of providing access to a grease fitting on the rear spline coupler. The idea is to install the Alemite vent valve in the plug.

With that in mind, I acquired some extra plugs from the Mitchell company and drilled and tapped them for the Alemite vent valve and my grandson installed one in his 1930 Tudor. The Tudor has a Mitchell overdrive installed and the differential was overhauled and new axle seals installed during the restoration. The banjo was exhibiting an oil leak around the flange where the overdrive bolts on. The flange has a gasket installed and each of the six bolts was torqued to 35 ft. lbs. before safety wiring. The leak was very slight, but it was still there. The location of the vent valve in the aft overdrive tube is in an area where no oil should be present as it is some distance from the banjo and there is an oil seal at the rear of the overdrive transmission housing.

A hole was drilled through the center of the plug using an 11\32” drill bit. The hole was tapped using a 1\8-27 NPT pipe tap.

A vent valve is shown installed in the Mitchell overdrive rear plug. The Mitchell plug can be a one inch hex or a one and an eighth inch hex. The threads are all the same. Both hex sizes have been found in a Mitchell overdrive.

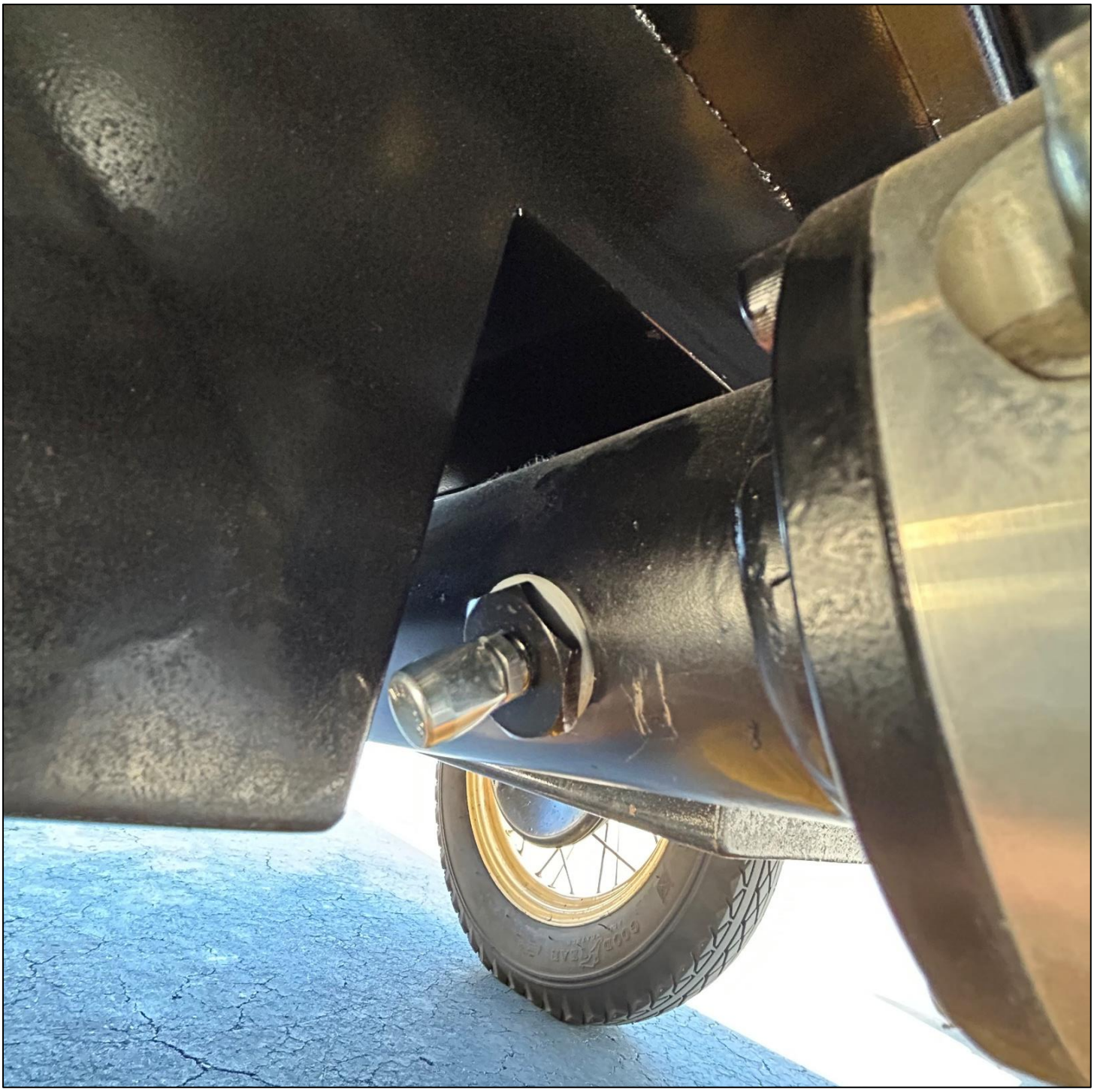


A vent valve and Mitchell plug shown temporarily installed in an overdrive still in the box.

The Mitchell Company advised me that they have drilled a 1\16 inch hole through the center of the rear plug on several installations to vent the differential. The concern though it that water could enter through the hole if the car is driven in a rain storm. The Alemite vent valve may offer a better solution.

An alternate solution would be to install an Alemite vent valve directly in the rear tube of the overdrive. It should be placed at the top of the tube a couple inches behind the overdrive transmission. This should be done before installation in the car with the rear tube temporarily removed to prevent chips from falling into it. It would be prudent to contact the Mitchell Company beforehand to make sure it does not violate the warranty.

It should be noted that the Model A differential vents through the two pinion bearings into the rear overdrive tube.



A vent valve and Mitchell plug shown installed in the Mitchell overdrive in my grandson's 1930 Tudor. The overdrive is a Victoria configuration that has the overdrive housing 4.5 inched forward and was selected to accommodate a Tudor basement. The basement installation can be seen in the photo surrounding the overdrive rear tube. There is a tunnel through the basement the overdrive rear tube travels through The vent valve easily clears the basement tunnel.

My grandson drives the Tudor to school daily and after a couple weeks of observation it is reported there is no oil exiting the vent valve.