

Mitchell Overdrive One Day Installation

by Tom Endy 2019

Three of us local Model A guys (Bryan Thompson, Larry McKinney, and Tom Endy, known as the BLT guys) have installed a good number of Mitchell overdrives in Model A Fords over the past few years. We believe we have it down to a science. Each of us has an assigned task and we go about it with little fanfare. We can usually complete an installation from start to finish is about four hours. We usually roll the car into position about 9 AM on a Saturday morning and are driving it around the neighborhood with the overdrive installed sometime shortly after 1 PM.

We ask for no payment, and will accept none; however, we suggest a donation be made to the Model A Ford Youth Restoration Program.

Two factors help expedite the task. First, we know exactly what we are doing, so there is no lost motion. Second, we have some excellent specialized tools. We have a set of very tall jack stands to set the rear of the frame on to provide adequate room to maneuver under the car. We have a rolling cradle we place under the rear of the car that we can drop the removed rear axle assembly into once it is unhooked from the car. We have a pinion gear assembly puller that is the daddy of them all. It will remove the tightest of pinion assemblies without fail. We have the proper tools to remove the pinion from the drive shaft. We also have the proper tools to press the pinion gear assembly with the Mitchell stub shaft back into the banjo.



The Mitchell overdrive

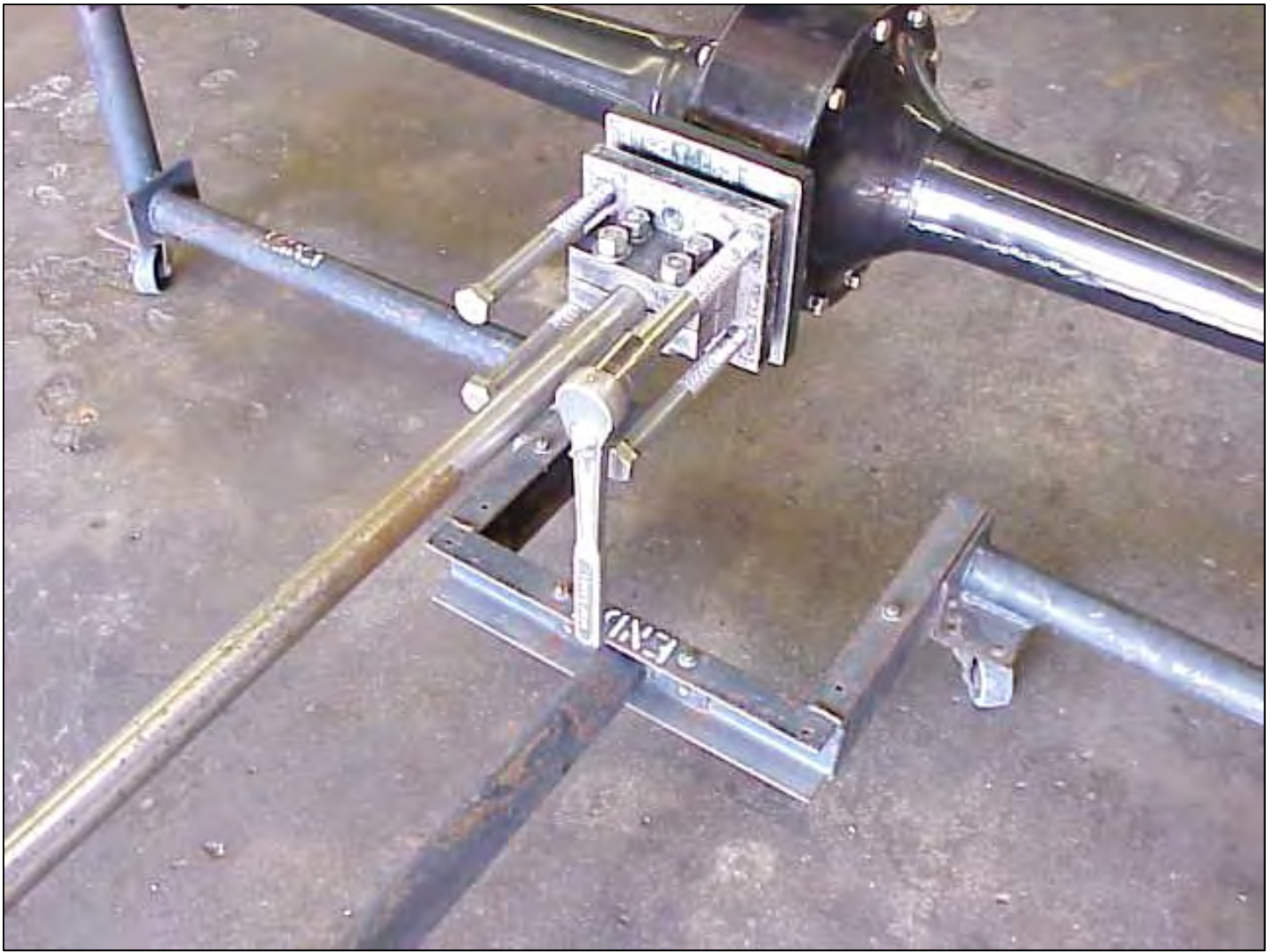




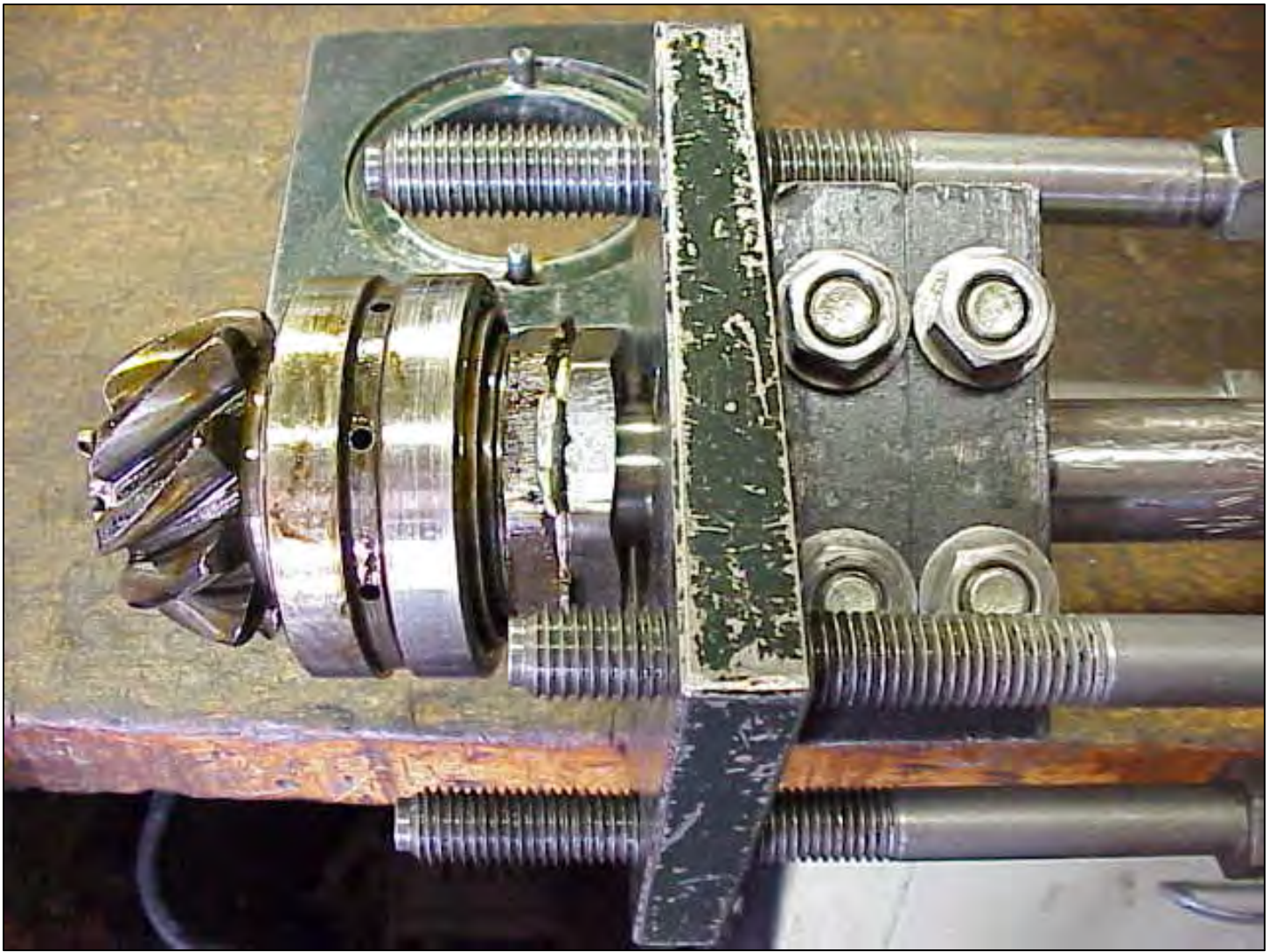
A Model A Ford has been positioned on the tall jack stands. The rear wheels have been removed. The rolling cradle has been positioned beneath the rear of the car and the spring spreader has been installed. The rear axle assembly is ready to come out. Once the cradle is fully under the car a floor jack will be placed under the banjo.



The rear axle assembly has been removed from the car. The torque tube is ready to come off. The rear spring is still attached to the frame of the car with the spring spreader still installed.



The torque tube has been removed and discarded. The pinion assembly and drive shaft are being removed from the banjo with the pinion gear assembly puller.

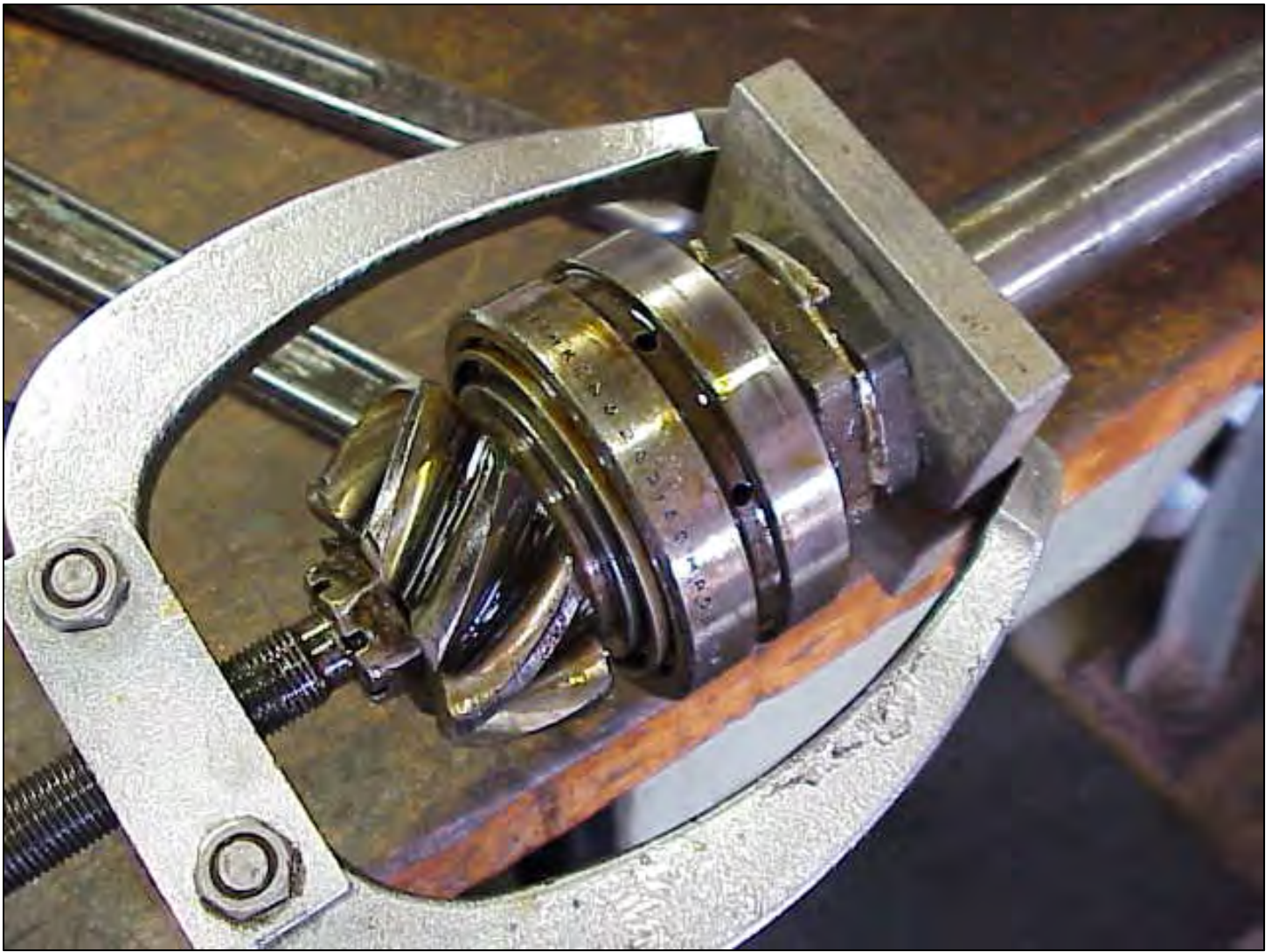


The pinion gear assembly has been pulled from the banjo without disturbing the preload on the two pinion bearings.



The cotter pin will be removed from the end of the drive shaft and the nut loosened and backed off about 1/8".

It is important that during an installation the cotter pin legs be bent down along the side of the nut and not over the end of the drive shaft. The reason being, there is not a lot of clearance between the end of the nut and the rotating carrier. This is especially true with after-market ring & pinion gears and overdrive stub shafts.



The pinion assembly is removed from the drive shaft with a puller tool without disturbing the pre-load on the pinion bearings. The puller is tightened against the block of steel that has a hole in it to allow it to slide over the drive shaft and up against the pinion assembly. The end of the puller is hit with a hammer to dislodge the pinion assembly from the tapered shaft.



The pinion assembly has been removed from the drive shaft without disturbing the bearing pre-load.



The Mitchell stub shaft is ready to be installed into the removed pinion gear assembly. The nut will be torqued to 100 ft. lbs.

There are three different Mitchell stub shafts produced for the Model A Ford. The standard length fits most Model A's. The Victoria and A-400 require a stub shaft that is 4.5 inches longer in order to position the overdrive further forward to clear the dropped rear floor pan. The 1931 slant window town sedans have a floor pan under the front seat for tool storage. The stub shaft for this car is several inches shorter to position the overdrive further back to clear the floor pan.



The pinion gear assembly attached to the Mitchell stub shaft is being reinstalled into the banjo using a puller-in tool. By tightening the nuts on the threaded studs evenly it will seat the pinion assembly into the banjo.



The Mitchell overdrive has been installed onto the rear axle assembly and it is ready to go back into the car. A floor jack can be seen behind the rear axle assembly. It has a fixture on it that fits directly under the banjo and captures both axle housings. The U-shape structure on the rolling cradle allows the jack to be positioned directly under the banjo.



A template was used to locate the slot in the floor board for the overdrive shift lever to protrude through. The shifting mechanism can be adjusted to provide desired fore and aft positioning of the shift lever.

The problems that are often encountered:

The four hour installation time is based on the Model A being correct and not molested as often found. People have done some strange things to these cars over the years. Quite often we found it necessary to overcome some of these problems and this adds time to the task.

The Rear Spring:

On several occasions we found someone had removed several leafs from the spring without considering the U-bolt spacer size and we found the spring hanging loose and rattling around. This required finding the proper spring for the car. We have also found the spacers installed up-side-down and had to be corrected. It is also possible to find the spring with broken leafs. We have not encountered that one yet.

Frozen Rear Shackles:

On occasion rear shackles have been found frozen in place due to lack of lubrication. Extra time and effort has to be expended to remove them. Some are so badly worn replacement is required.

Incorrect Shackles:

Back during the J. C. Whitney era a type of shackle was produced that had rubber bushings instead of steel. They consist of two individual shafts with a jam nut on each end. There is no lubrication. They are a disaster. Usually when encountered the rubber bushings are all torn up. It is difficult to get them apart and even worse to put them back together. The prudent thing to do is replace them; however, that is a time consuming task. In order to install steel bushings in the axle housings the backing plates and rear brakes have to come off in order to get a straight shot at driving the new bushings in.

Bearing Pre-load or Failure:

The pinion bearings can be found loose due to the two large nuts backing off. This destroys any pre-load and must be corrected. Once the pinion gear assembly is installed on the Mitchell stub shaft the shaft can be clamped in a vice and the pre-load reset by adjusting the two nuts. I am able to set the pre-load by feel. However, due to worn rough bearings it may not be as accurate as with new bearings. In fact the bearings and race may be so shot that it is prudent to replace them. This we can accommodate, however there is a fee for the new bearings. It also should be considered that the bearings and races on the carrier are probably in the same condition. Nothing can be done about that as it would require a disassembly of the entire rear axle assembly; essentially an overhaul of the entire rear.

Show Stoppers:

If it is discovered that teeth have been broken off either the ring or pinion gear the installation of the Mitchell overdrive must be halted and the entire rear axle assembly disassembled for an overhaul. A new ring and pinion will be required, along with new bearings and races and a clean out of all broken teeth and debris inside the housings.

Prudence:

Before anticipating installing a Mitchell overdrive the owner should consider the overall condition of the car. If it is a recently restored car or a driver that has been on the road a while and driven regularly without problems chances are good that few problems will be uncounted during a Mitchell overdrive installation. Installation into a recently purchased car the new owner knows little about is a chancy proposition. It would then be best to consider having the rear axle assembly overhauled before proceeding.