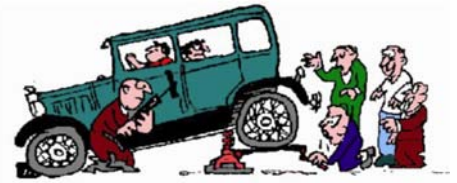




## From the Garage -

by Paul Hunter



### Transmission Prudence by Tom Endy

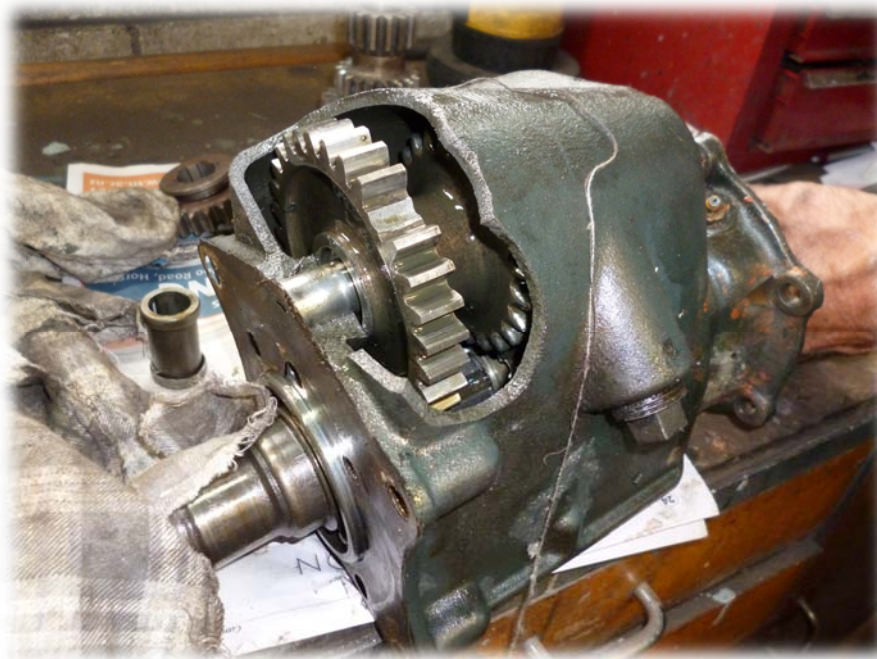
For a number of years I have been overhauling Model A Ford transmissions for an auto repair shop. Most of the time the customer request is to "go through it". In most cases it is a functioning transmission, not a failed one. I usually ask the questions, "has it been jumping out of gear, and or has it been noisy"? Since there is not a defined description of what "go through it" means, I had to establish one. I considered the financial aspect, the use that a Model A Ford is generally put to, and most important, the development of a policy that is broad enough to satisfy everyone.

#### Cost and Quality:

Cost is probably the most important consideration. You can easily spend around \$600. in new parts alone if you replaced everything in the housing. Not only is this not the prudent thing to do from a cost stand point, there is also the quality of reproduction parts to consider. My own opinion is that good serviceable used original gears are preferable to new reproduction gears.

#### The minimum new parts list (MNPL):

Early on I established a minimum new parts list. It is difficult sometimes to tell if a bearing is serviceable. For this reason I believe it is essential to replace all five bearings 100% of the time. I obtain all of my new parts from Bratton's Antique Auto (*Errol McAlpine from Veteran and Vintage Spares can assist you with your needs Editor*) I order the lower cost foreign made roller and ball bearings. They are good quality and I have never had a problem with them. I also order the two ball bearings with oil seals and remove the seal from each inboard side to allow lubrication to reach the bearing. Bratton's also stocks a cluster and idler shaft that have been machined with a groove for an O-ring installation at the back end of each shaft. This modification will prevent oil from leaking out around the shafts. Another part I replace is the front ball bearing shaft retainer. This is the "C" shaped holding device Henry came up with, which was not his best idea. I replace it with a sleeve and snap ring Bratton's also stocks. I also replace the key ring looking spacer that goes on the front end of the later main shaft. It's purpose is to hold the front input shaft roller bearing in place. Usually you will find the front end of the spacer worn flat where it was in contact with the roller bearing. You can turn it around if it is not worn too much, but they are cheap, so I replace them.



*A Drivers tooth ache, that even a top tooth surgeon could not fix - ouch!*

# Transmission Prudence - continued

## The inspection:

The first thing I look at when I take a transmission apart is the bearing surface on the front end of the main shaft (A7060) and the bearing surface inside the back end of the input shaft (A7017-B). If the finish of either one of these bearing surfaces are pitted, galled, or damaged even slightly, it is reason for rejection of either part. These are bearing surfaces that the front roller bearing rides on and they must be in good condition. The next thing I look at is the condition of the teeth on the individual gears. Often you will find the teeth pitted where some of the finish on the teeth has fallen away. Here is where the question, "was the transmission noisy" is important. If the answer was no, and the pitting is not severe you can get away with re-using it. The owner is probably not going to put 100,000 miles on it. If any gear has teeth that are severely worn, chipped, or broken, I would replace the gear. It is important to note that when the transmission is operating in high gear it is a straight through drive. There is no "gearing" going on. The gears that are in mesh on the cluster gear are just going along for the ride with no load on them. Noise in high gear is usually caused by a faulty bearing.

## A flat nose:

Another thing to look at closely is the front end of the input shaft. This portion of the shaft fits inside the pilot bearing that is installed in the center of the flywheel. In reality it should have no wear on it since it is supposed to turn with the bearing. However, when the bearing starts to fail the shaft will slip inside the bearing and cause the shaft end to become worn and grooved. It is best to have a new pilot bearing handy to use to check the fit. The shaft can be repaired by machining it down and pressing a sleeve on and machining it to fit. It is also a good idea to replace the pilot bearing in the flywheel anytime you have the transmission out of the car. Surprisingly I have found a number of shafts with the end mushroomed, instead of worn, such that they would not fit into a new bearing. When this is the case you will have difficulty installing the transmission in the car if you replaced the pilot bearing. The remedy is to machine the end of the shaft slightly. It is not clear to me what causes the mushrooming. I suspect it has something to do with the rear end being loose and slamming forward against the U-joint and transferring the force to the end of the pilot shaft.

## Mix and match:

I have had no problem with mixing and matching used gears in a transmission. If I am replacing either of the two slider gears I try several on the main shaft and select the ones that appear to fit the tightest. This is because of Henry's service bulletin that talks about hand selecting these parts so they won't jump out of gear. I don't fully subscribed to that service bulletin, I think it was released on a day when Henry wasn't there. However, it doesn't hurt to try to get a good tight fit if possible.

## Accuracy in the work place:

It is very important that the transmission be assembled correctly. There are only a few parts that can be installed backwards or incorrectly. However, I find them that way all the time. Howard Barnes drawings in Bratton's catalog has an excellent exploded view parts diagram that even the most inexperienced mechanic should be able to follow.

## Keep it oiled:

I have come to believe that the kind of oil put in a transmission will affect the performance. Henry designed the transmission to use what he called 600W oil. I don't think anyone today knows for sure just what that was. Each Model A store seems to sell something different, even though they call it 600W oil. The oil I use I get from Bratton's. I believe it is Shell Valvata gear oil with a small percentage of STP added. It is a very heavy, stringy oil and clings well to the gears, and more important to the slider on the main shaft, which I believe aids in preventing jumping out of gear.

## Editors Note:

### Model A Ford Capacities - gearbox- differential

*Add just enough fluid to the differential to bring the level to just below the opening. A good gauge is to insert your little finger to the first joint and it should have fluid on it when removed. The same goes for the transmission. Remove the filler plug on the side and fill with fluid until it comes up to just below the opening.*

*Everything I've found indicates 600W was mineral based gear oil, early Model T data talks about 600W Steam Cylinder Oil, which research showed having a viscosity of ISO600/ 680. ISO 320 is equivalent to SAE 85W140, ISO 460 is equivalent to SAE 140, ISO 680-1000 is equivalent to SAE 250.*

*The following are the ISO 600/680 equivalents available in New Zealand:*

*Mobil: Mobilgear 600 XP 680, BP: Energol GR-XP 680, Fuchs: Renolin CLP Gear Oil 680, Penrite SAE 250*

*We have club members using oil weights from SAE 85 – SAE250, with everyone having their beliefs about the performance of their oil weight choice, talk to your fellow club members for their thoughts and views.*