

Workshop

Jim Richardson

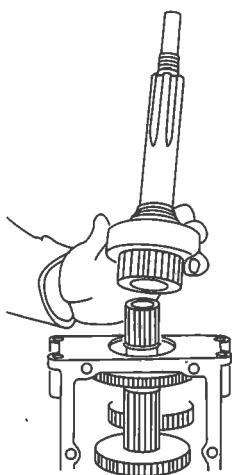
Model A Ford gearboxes are models of simplicity. It is actually more work to get the transmission out of the car than it is to overhaul it. To remove it you will need to pull the rear axle assembly, detach the U-joint, then remove the transmission and bellhousing assembly from the back of the engine. Make sure the car is properly supported at the frame on sturdy stands before getting under it, and work carefully. Once you have the transmission out, scrape any caked on filth off it with a putty knife. Then wash it down with solvent or a strong solution of washing up detergent and hot water to remove dirt or grease before opening it up.

Disassembly

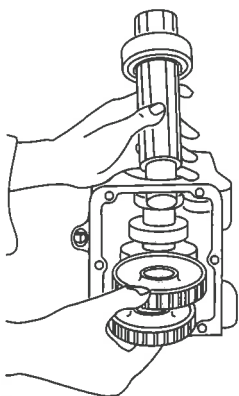
Remove the bellhousing. Next, unbolt the shift tower and set it aside. Now, from inside the bellhousing, remove the four bolts holding it to the transmission. The front bearing of the transmission is held in place by the bellhousing on a Model A. Other makes often used a retaining ring, or clip for this purpose.

Pull the clutch shaft

Scrape or peel away the old gasket, then pull the clutch shaft out through the front of the box. Wash it with solvent and set it aside.



1. Bellhousing holds the front bearing in place on Model A. After you remove the bellhousing, peel or scrape the old gasket away, then lift out the clutchshaft.



2. On the back of the transmission, remove the U joint cover which acts as the rear bearing retainer as well. Scrape off the old gasket. Now pull the mainshaft out from the rear. Lift the low-and-reverse, and second-and-high slider gears out of the case.

Remove the mainshaft

On the back of the transmission, remove the four bolts attaching the universal joint cover in place, then lift it off. The universal joint cover acts as the retainer for the output shaft bearing. Scrape, or peel off the gasket. The mainshaft can now be pulled from the transmission. The low and reverse gear, and the second and high gear, can now be removed from the case.

Remove the countershaft

On the rear of the transmission case is a retainer holding the countershaft and reverse idler shaft in place. Remove its retaining bolt and lift it away. Now, using a hammer and brass, or plastic drift, tap the countershaft out, working from the rear of the case. The front hole for the countershaft is .001" larger than the one at the rear in order to allow the countershaft to be removed, so don't try to drive the countershaft from front to back. You'll damage your gearbox if you do.

Pull the cluster gear

Just as on many other, later transmissions, the cluster gear, (or countershaft gear assembly) is cast in one piece. Once the countershaft is removed, the cluster gear can be lifted out of the case. Remove the thrust washers and roller bearings from its ends. Remove the reverse idler gear. Pull the reverse idler gear shaft out the rear of the transmission case. Lift out the reverse idler gear.

Inspection and repair

Check the gears. Wash all of your transmission's parts thoroughly with cleaning solvent or kerosene and lay them out in sequence. Check the gears for pitting, grooves, and missing or chipped teeth. Also make sure their teeth aren't knife-edged from wear, rounded, or bent. If you find any of these problems, replace the bad gear or gear assembly. If a few teeth only have minor burrs, you can dress them with a knife sharpening stone or fine file.

If you must replace the low and reverse, or the second and high gears you will need to purchase them together with a new mainshaft because these items are selectively matched to each other and are machined to tight tolerances. The clearance between the gears and their

GEARING UP

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shaft must be no more than .002" for proper operation. You can roughly check this tolerance by lubricating the gears and shaft, then holding the shaft upright and sliding the gears onto it. They should just slide of their own weight, or require a little help. If they slip down instantly, they're too loose. Take them back and get a better set.

Inspect the bearings

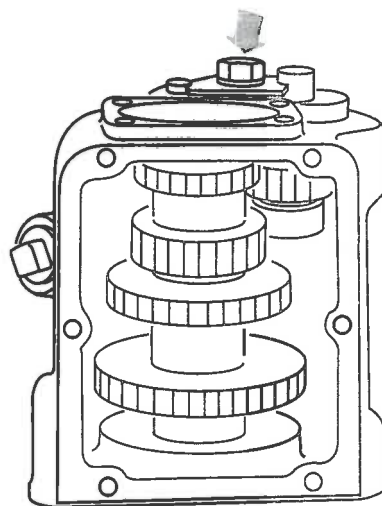
If any of your transmission's bearings are pitted, galled, or discoloured, replace them. If they look okay, put a little light oil on them and turn the bearing slowly. If you feel a catch, or the bearings are not silky smooth, or are loose in their cages, replace them with new bearings. If the bearings on your mainshaft or clutchshaft are bad, have a local machine shop remove the old ones with a bearing press and install new ones.

Check the thrust washers and shafts

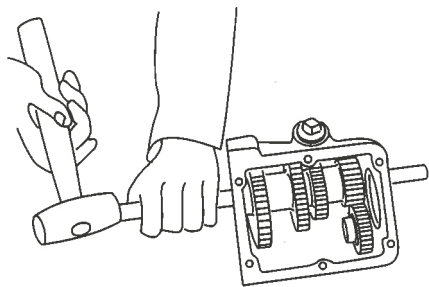
If your thrust washers are rough, worn thin or deformed, replace them only with washers that are the exact same thickness. Look at all the shafts in your transmission. If any are grooved or worn, replace them as well.

Look over the shift tower assembly

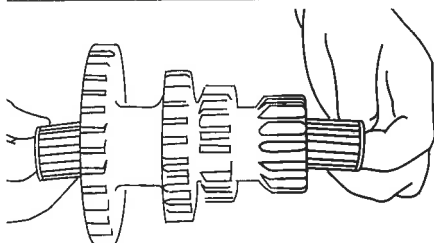
Make sure the shifting forks are not bent and that they are not badly worn. If they are, replace them. Also check the detent assembly to make sure it is functioning properly and smoothly. Finally, make sure the tension spring on the shifter is sound and not fatigued.



3. On the back of the transmission case a flat retainer holds the countershaft and reverse idler shaft in place. Unbolt it.



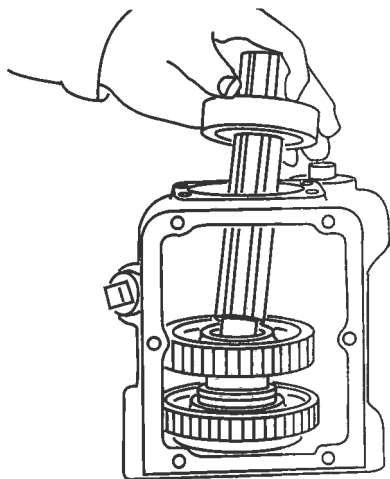
- 4.** Drive the countershaft out from the rear of the case using a hammer and brass or plastic drift. Lift out the cluster gear.



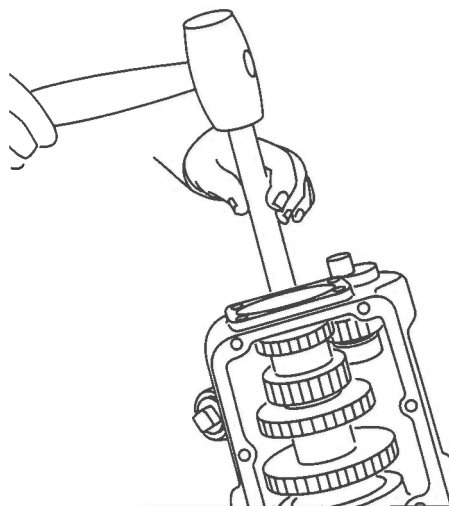
- 5.** Pull the small needle bearings out of the ends of the cluster gear assembly, then clean them with solvent and look them over. If they are worn, pitted, loose or burned, replace them.

Assembly

After careful inspection and repair or replacement of any bad parts, carefully go over your work area using a vacuum cleaner. One small bit of grit will ruin a bearing or pit a gear, so make sure your bench, and your parts are surgically clean before beginning reassembly. Now coat all of the internal parts of your transmission with 90wt gear lube and wipe off the excess. Finally, make sure your transmission case is clean. And make sure to dress any small burrs on the shaft holes using a fine file.



- 6.** Smear a little grease on the cluster gear thrust washers and paste them in place at the proper holes in the case. Put the roller bearings back in the cluster gear. Now place the cluster gear in the case so the small gear is at the rear and is meshed with the reverse idler gear. Finally, slide in the countershaft.



- 7.** Place the transmission on your bench front end down. Now place the second-and-high slider gear in the case with its shifting collar up. Align it with the mainshaft hole in the case. Now place the low-and-reverse gear on top of it with its shifting collar down. Slip in the mainshaft from the rear until its bearing seats.

Put in the reverse idler gear

Place the reverse idler gear behind its cast lobe with the flush side of the gear facing the rear of the transmission case. Insert the reverse idler shaft so its flat side faces the countershaft hole.

Install the countershaft

Paste the cluster gear thrust washers in place using a little wheel bearing grease. Carefully align them with the holes in the case. Slip the cluster gear roller bearings in its ends. The longer bearing goes into the end with the small gear on it. Now place the cluster gear in the transmission so the small gear is at the rear, making sure it is meshed with the reverse idler gear.

Slide the countershaft through the front of the transmission case past the thrust washers, through the countershaft, and into the hole at the back of the case. Make sure the flattened area on the end of the countershaft is facing the reverse idler shaft. Tap the shaft home using a soft brass hammer. Now install the flat retainer for the countershaft and reverse idler shaft and tighten its bolt securely.

Install the mainshaft

Place the transmission on your workbench front end down. Put the second-and-high slider gear in the case shifting collar up. Align it carefully with the mainshaft hole. Now put the low-and-reverse idler gear on top of it with its shifting collar down, or facing the shifting collar of the second-and-high slider gear. Make sure its spline teeth are aligned with the gear below.

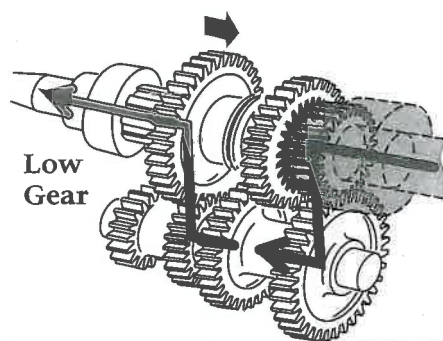
Now slide the mainshaft in from the rear of the case until its bearing seats. Next, smear a little sealant on both sides of the gasket for the U joint cover and put it in place. Next, bolt on the U joint cover with its lube fitting facing downward. Tighten the bolts evenly and securely, then wire them in place.

Attach the bell housing

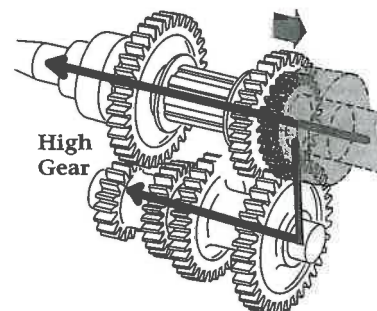
Coat front end gasket with sealer and paste it in place. Now position the bellhousing on the front of the bellhousing case and tighten it down evenly.

Reinstall the transmission

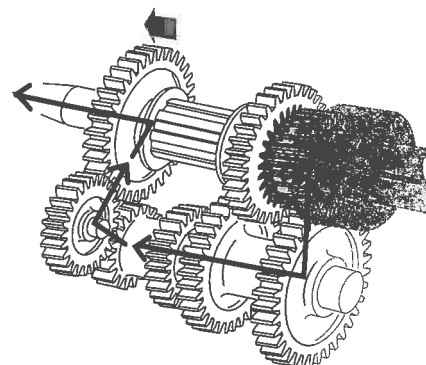
Cover the top of the transmission with cardboard and bolt it in place so dirt won't get into the gears. Install the transmission. Pour in the proper amount of gear lube. Coat the shift tower gasket with sealer, then carefully place it on top of the transmission. Install the shift tower making sure its shifting forks are seated in the shifting collars of the slider gears. Tighten its bolts down evenly. Pop the floorboards back in and take the car out for a test drive. That's all there is to it. Your rebuilt transmission should shift like new, with no wailing, and if you take care to double-clutch and match rpm, no knocking of teeth either. ■



- 8.** Here's how low gear works to give you the proper reduction.



- 9.** This is high gear, or direct drive. Some later transmissions have a fourth, overdrive gear as well.



- 10.** Reverse, uses the extra idler gear in the rear to reverse the direction of rotation.