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BEEFY COGS?

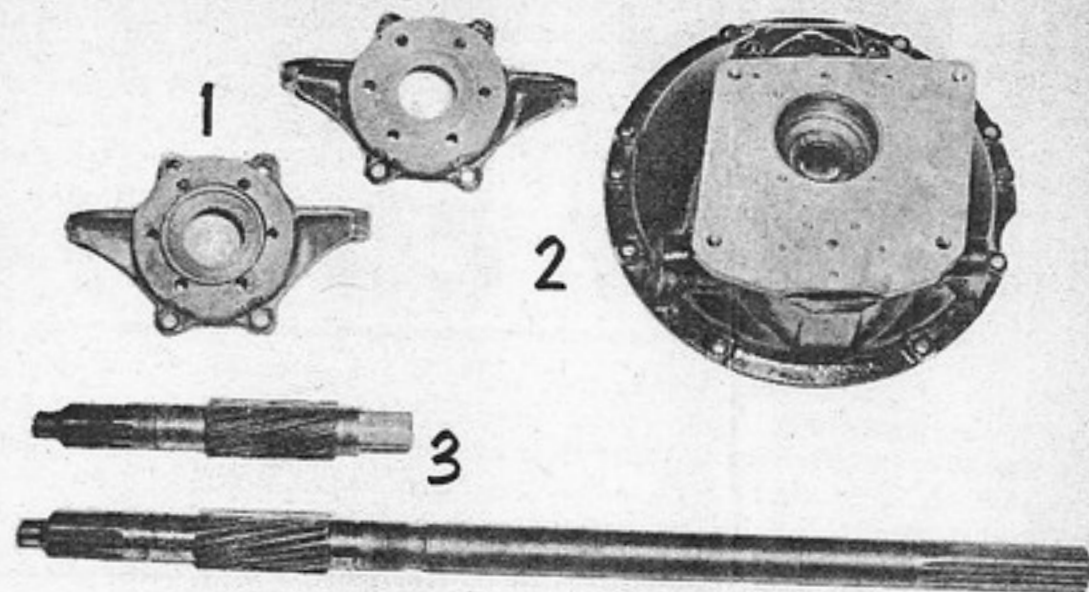
If all your souping makes the gearbox groan, here's a powerful, permanent tranquilizer.

SINCE THE ADVENT of the "stick in a late ohv go'er-type engine" philosophy, many a rodder has wished he had a heavier gearbox to back up that brute horsepower under the hood. Many Ford and other stock transmissions have been twisted to pieces by hairy engines for which they were not designed. One possible solution has been the installation of Cad, LaSalle, Buick, Packard and other transmissions whose heavy gears are more suitable to the output of late-model ohv engines. In most cases, this necessitates changing the box from open shaft drive to Ford torque tube drive. Also the coupling of the transmission to the engine must be worked out. This can be done by several means.

One means is buying the necessary parts sold in kit form by various manufacturers and speed accessory shops. Another is to make the adapting components yourself, as many an enthusiast

has done. This article is intended to help the rodder who wants to do either or both of two things: A. Install a Cad or LaSalle transmission on a late model overhead valve engine which has previously been adapted to a Ford transmission and driveline; or B. Hook up a Cad or LaSalle transmission to a Ford driveline.

Let's first cover section B. The materials required to change the Cad or LaSalle transmission from open drive to Ford drive shaft are 1. A transmission either side or top shift. 2. A rear bearing retainer and transmission mount plate from a Ford transmission up to 1948 (Ford part No. 21A 7055). 3. A Ford Universal joint up to '48 (it is best to use a brand new joint when milling the splines on the shortened Cad rear shaft. A used joint is quite likely to be oversize on the spline width and will make it impossible to replace joints without reworking the splines).



Parts needed to couple a Cad gearbox to a Ford torque tube: 1. Stock Ford rear bearing retainer machined to accept Cad bearing ring. 2. Plate adapts the Cad box to any engine already fixed for early Ford transmission. 3. Shortened and resplined Cad mainshaft.

Dismantle the Cad or LaSalle transmission and remove the rear main shaft. This is the first piece to be altered to fit the Ford drive line. Measure approximately 1-9/16 inches from the rear bearing journal and saw through at this point (do not burn this off as it will make the shaft extremely hard to machine). Chuck the shaft in a lathe making sure the journal surfaces are running true with each other and face the rear section off to the dimensions shown on the drawing on Page 64. Center and drill with a tap drill for 3/8-inch x 24 thread 1-1/2 inches deep. Be sure enough center is left to enable placing the shaft between centers.

The next step is to turn the shaft to the diameter of the Ford splines. This operation requires a carbide-tip tool as the shaft is surface-hardened. It is also best to turn off the bearing journal up

to the undercut as it is necessary to mill into this area to get full spline depth. If the bearing surface is left intact it will ruin the milling cutter due to hardened surface. This journal may be replaced with a bushing pressed on and turned to the proper inside diameter of the Cad rear bearing.

The next step is to mill the spline to accept the Ford universal joint. Upon completion of this your shaft is ready to replace in the transmission.

This unit must be altered to fit snugly over the protruding lip and bearing ring of the Cad transmission. The piece should be chucked in a lathe, trued-up and bored to the dimensions shown on the included drawing (be sure to check the fit of the bearing before removing the piece from the lathe and make sure the retaining ring is flush in the housing). You will notice that the new re-

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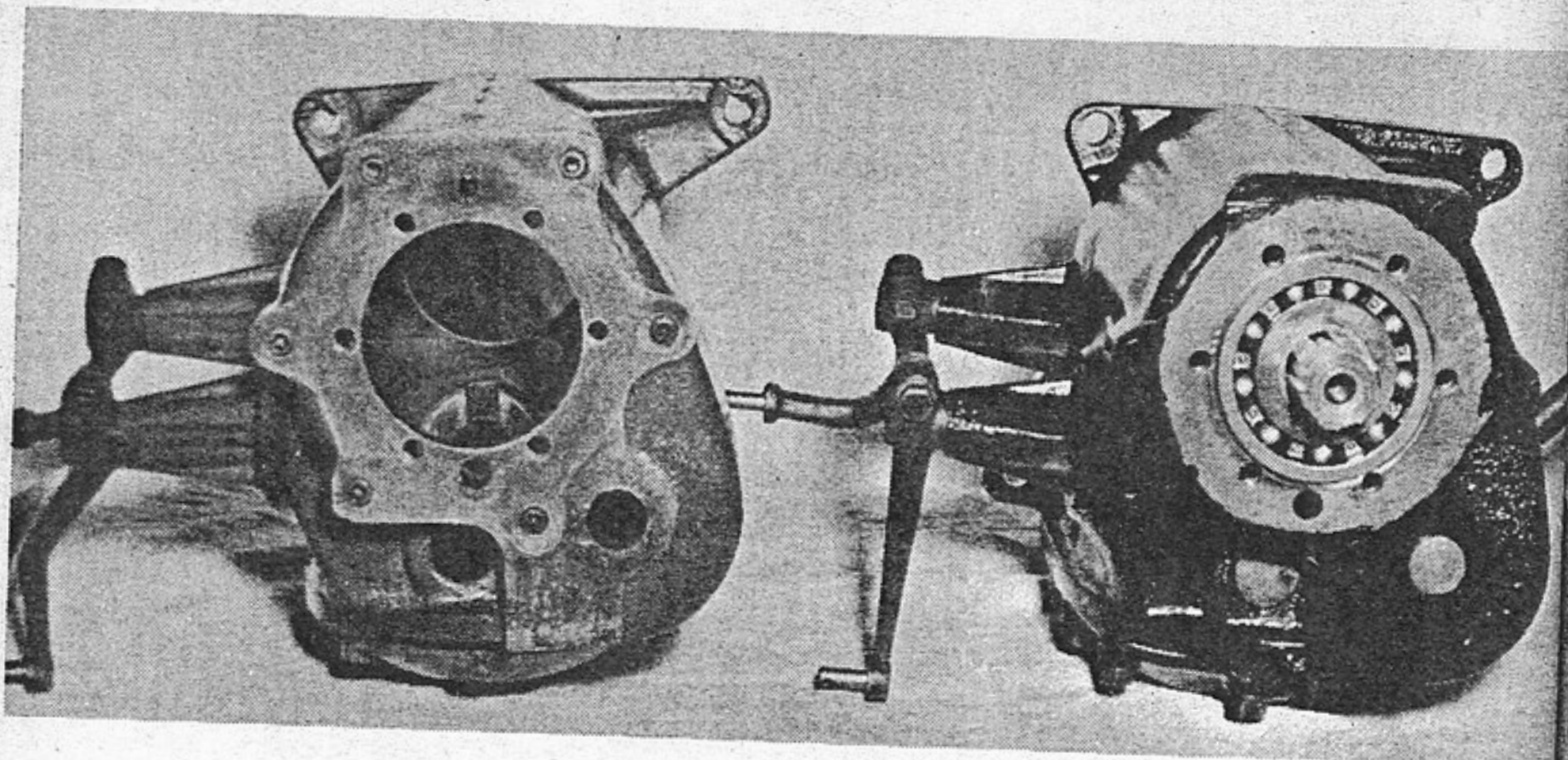
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The old rear housing boltholes of the Cad are plugged and new holes drilled and tapped to take the Ford retainer. Right: The old holes here were plugged using the original bolts, which were then cut off and filed flush.

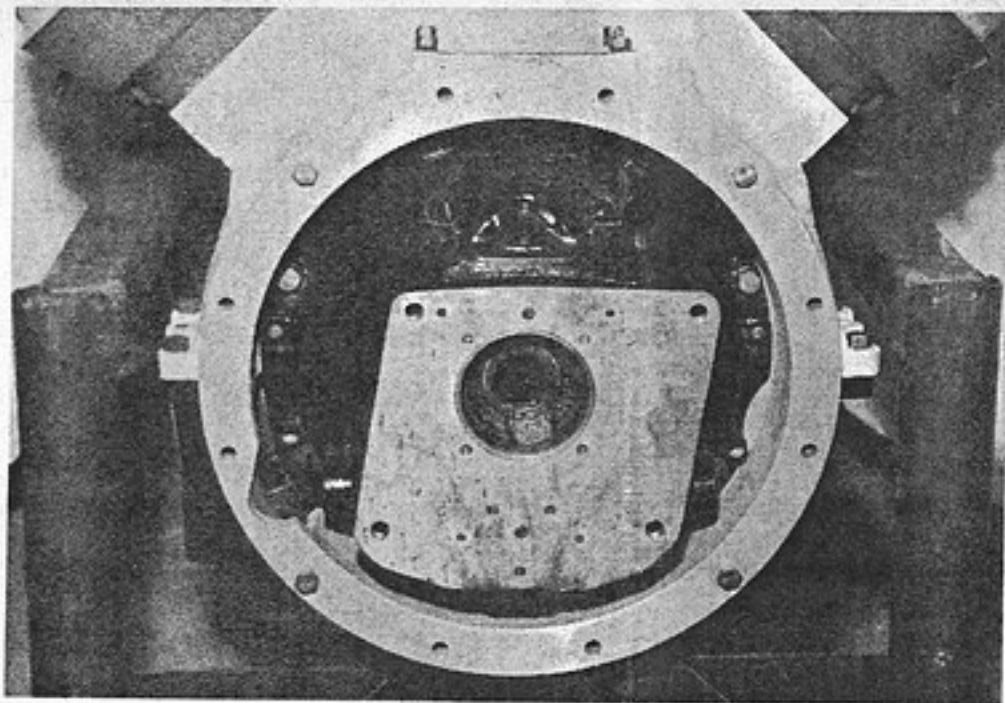
taining ring counter-bore covers part of the holes for the housing mounting bolts. With the ring on the bearing push it into the housing and from the opposite side scribe the areas that cover these mounting holes. Then carefully grind these areas off the retaining ring. This completes the necessary modifications to the rear transmission mounting.

TRANSMISSION CASE

The removal of the rear housing from the Cad transmission will necessitate the plugging of the original-mounting bolt holes. This may be done in several ways. On transmissions having studs in these holes, remove the studs, coat the threads with Permatex and screw them in tightly. Then saw off the studs and file them flush with the rear of the transmission case. For those cases not having studs, you may use a short bolt (making

sure that it does not protrude into the inside of the case) and treat them as stated above; or you may use headless Allen set screws coated with Permatex.

The next step is to transfer the bolt pattern of the Ford transmission mount to the Cad case. Put the Cad rear bearing in the transmission case and place the Ford mount on top of it. Square up the ears on the Ford mount with the machined surface on the bottom of the Cad transmission case where the lower cover is fastened. Clamp the housing to the case so it will not move and transfer the bolt pattern by spotting the holes with a drill of the same size of the holes in the Ford mount. Once the holes are spotted, remove the Ford mount and rear bearing and drill and tap for 3/8-inch x 16 thread bolts. Thoroughly clean the case and assemble your transmission. It is now ready to bolt to a Ford torque tube.



This Chrysler is fitted with a commercial adapter that mates it with an early Ford box. New plate permits using Cad box without changing original adapter.

Now to handle the coupling of the front end of the Cad transmission to an engine which has been mated (by of an adapter plate or housing) with an early (up to '48) Ford transmission. In this case the engine was a '53 Chrysler which had originally been altered via a Cyclone bell housing adapted to take the early Ford transmission. The owner decided to use the heavier Cad transmission and not wishing to lay out the cash for another bell housing adapter, made his own. The problem here was to provide a mounting for not only the transmission, but also for the clutch, throw out fork and bearing.

In this instance, the transmission case from the '39 Ford was cut off (do not burn) approximately 1/16-inch behind the front wall of the transmission. Then the case was bolted to the plate of a lathe and faced off flush with the front-wall of the transmission.

Next step is to measure the length of the Ford transmission from the front of the bell housing to the end of the front drive shaft. Now slip the front half of the Ford transmission case over the Cad front shaft and measure the same distance from the end of the shaft to the end of the case. The width of the gap between the Ford transmission case and the Cad case is the thickness of the plate that you will need to add.

MAKING THE PLATE

Lay your Cad transmission case on a piece of cardboard and draw an outline of the front of the transmission to it. Now cut out a piece of plate a little larger than the pattern (it can always be trimmed off later).

This plate should be surface ground to the required thickness, but if cost is a factor it may be turned down on a lathe

making sure both sides are parallel. Again lay your cardboard pattern on it and mark out the approximate location of the Cad front bearing hole. Chuck the plate in a lathe and bore this out to a snug fit on the Cad front bearing and retaining ring (you will note these are the same diameter as the rear Cad bearings and also the same diameter as the Ford front transmission bearing making it simple to line up the plate and the transmission cases for center).

First, using the Cad front bearing as a line-up jig, place the plate on the back of the Ford bell housing, square it up with the dowel pin holes by eye. Then, working from the inside of the bell housing, spot the plate for its mounting bolts by drilling through the four bolts which hold the Ford throw out bearing pilot to the bell housing. Also drill through other places where the case is solid enough to warrant the stress of a bolt (in this case the plate was mounted via 8-5/16-inch x 18 threads bolts and 4-1/4-inch x 20 thread cap screws. The plate was also doweled into position by 2-5/16-inch steel dowels).

Drill and tap the plate and bolt it into position, making sure to file all protruding bolts flush.

Again, using the front bearing as a line-up jig, place the Cad transmission case on top of the plate. Square-up the machined surface on the bottom of the case on top of the plate. Square-up the Ford bellhousing and clamp the transmission into position.

Transfer the mounting holes for the Cad transmission with a scribe. Remove the case and drill and tap the holes for 1/2-inch x 13 thread. Now the plate may be removed from the Ford case and trimmed to fit the Cad transmission. Re-bolt the plate to the Ford case (be sure

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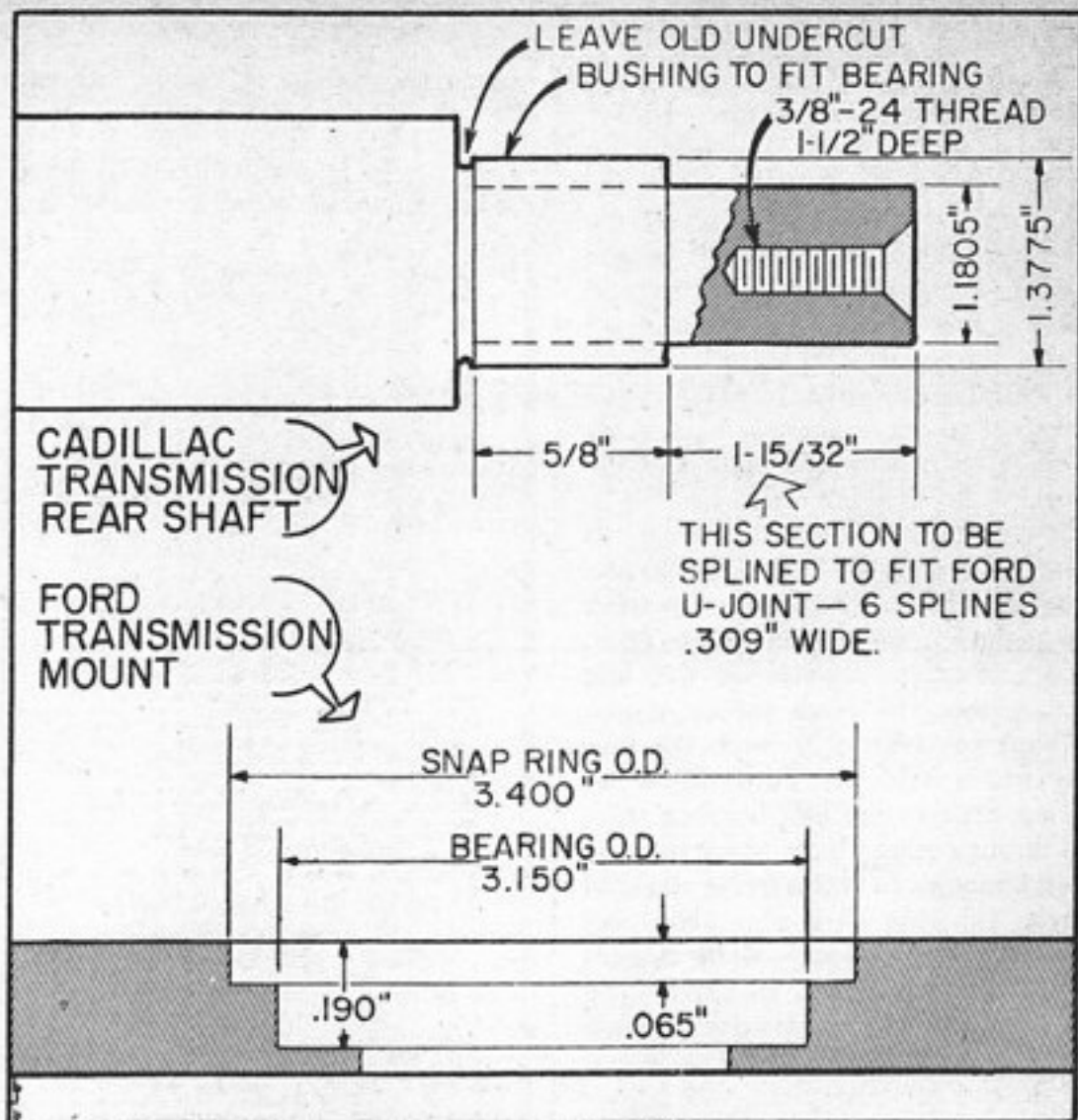
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These dimensioned drawings show how the Cad rear transmission shaft is machined to fit it to the Ford transmission mount. Careful tolerances are needed.

to include the throw-out bearing pilot) and bolt the whole assembly to your Cad transmission. It should now be ready to install in the engine. The pilot bearing journal on the Cad front shaft may be either bushed or turned down to fit your present pilot bearing (in this case it was turned down to fit the Ford pilot bearing used with the original adapter).

One word of caution—this transmission will not just *slip* into the place

formerly occupied by the Ford box as the assembled unit is approximately three inches longer than the Ford box. This means that some moving of parts or shortening of the driveshaft is necessary.

As you can see, it is not a simple matter to install the Cad transmission but the results are well-justified by the trouble-free service it delivers, and the fantastic amount of punishment it can absorb without complaint. •