INSTRUCTIONS

910-28905
916-28901

Adapts '49-'53 Ford/Mercury Flatheads to Late Model, Ford C4 or AOD Automatic Transmissions

WARNING — THIS KIT MUST BE USED WITH EITHER AN ORIGINAL FORD ENGINE BLOCK PLATE OR OUR 910-29012 PLATE. FAILURE TO INSTALL THIS PLATE MAY CAUSE DAMAGE TO TRANSMISSION DUE TO INADEQUATE CLEARANCE BETWEEN CONVERTER AND FRONT PUMP

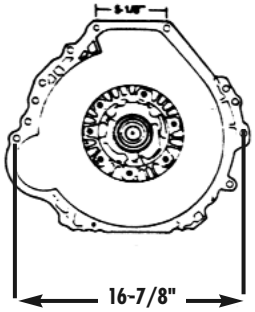
FORD C4 TRANSMISSION IDENTIFICATION GUIDE

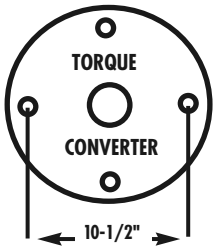
The C4 transmission was manufactured with two different case styles: the early stepped case or the late flared case. Note the difference where the bellhousing attaches to the trans case. The bellhousings are NOT interchangeable.

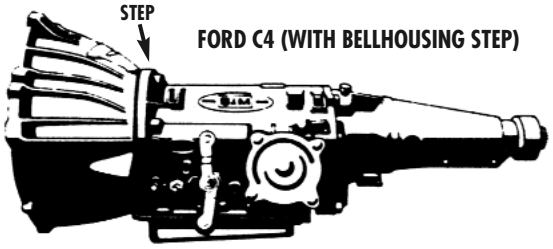
The early case was available with the small (157 tooth) or large (164 tooth) flywheel. The late case uses the 164 toothed flywheel. If you are using a 1980-1992 AOD (overdrive transmission), use the 164 kit. The easiest way to determine if your trans uses the large or small flywheel is to measure from the lower block mounting hole on the driver's side of the bellhousing to the top starter bolt hole on the passenger's side of the bellhousing.

ASSEMBLY INSTRUCTIONS - FOLLOW STEP BY STEP

EARLY CASE — 157 TOOTH FLYWHEEL

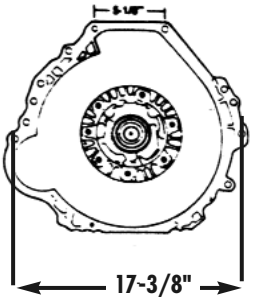


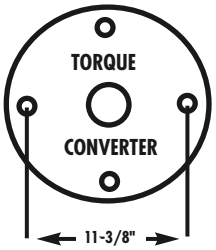


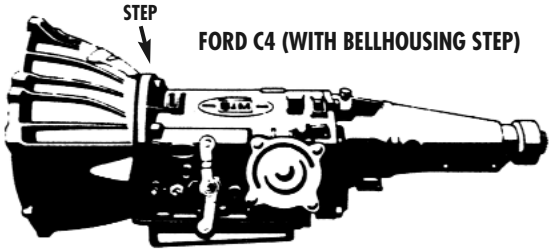


DIPSTICK ENTERS TRANSMISSION CASE
FLYWHEEL DIAMETER 13-5/16"

EARLY CASE — 164 TOOTH FLYWHEEL

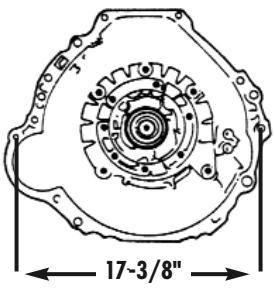


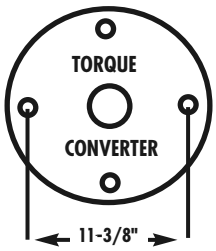


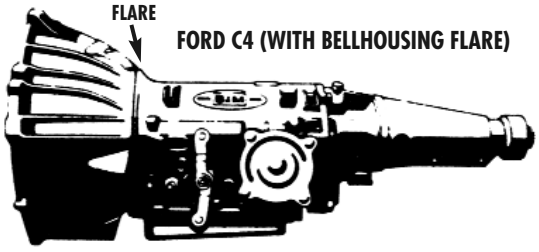


DIPSTICK ENTERS TRANSMISSION CASE
FLYWHEEL DIAMETER 14-1/4"

LATE CASE — 164 TOOTH FLYWHEEL







DIPSTICK ENTERS TRANSMISSION PAN
FLYWHEEL DIAMETER 14-1/4"

C4 To Flathead Conversion

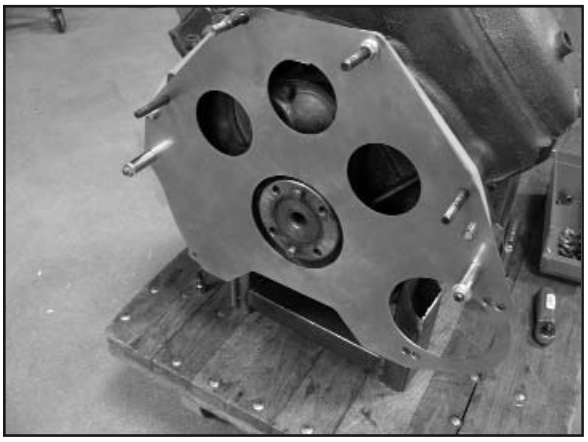
Remove the stock transmission, bellhousing, clutch, flywheel, and associated clutch linkage from the flathead. Clean the bellhousing mount flange of the block with a scraper or sanding block and solvent. Make sure that it is free of nicks, dings, or any foreign matter. Also clean the crank hub and inspect closely for any nicks or burrs that would cause the flywheel to seat incorrectly. Dress any burrs with a small file if needed and clean with solvent and compressed air to assure a precise mating surface.

INSTALL THE ADAPTER

The two lower holes of the bellhousing mount flange on the block must be drilled out to 13/32” to accommodate the forward studs of the transmission adapter plate.

Secure the adapter plate to the engine with the supplied flat head screws. Note that one screw has the head turned down to clear the adjacent trans stud (@ approximately the 2 O’clock position. Also use 2 ea 3/8” nuts on the lower studs to secure to the block.

Install the supplied block plate on the studs of the adapter plate and temporarily secure with 3 nuts. This .060” thick plate can either be an Ford plate or our p/n 910-29012 plate and must be used in order to obtain the proper clearance for the torque converter.



Using a straight edge (a length of ¼”x1” flat stock works well) make sure that the block plate is absolutely flat. Depth measurements will be taken off of this surface and it is critical that the plate is not bent or distorted.

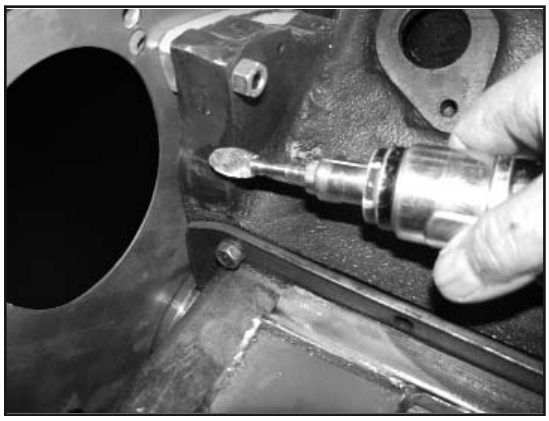
Using your straight edge and a machinist rule or caliper, take a depth check from the block plate to the crank hub. This dimension should be .150” +/- .020. (be sure to subtract the width of your straight edge from the indicated dimension) If this dimension is out of limits, check that the adapter is correctly seated, or if there is excessive end play of the crankshaft due to worn main bearings.

PREPARE STARTER FOR INSTALLATION

This kit requires the use of a starter snout with a special offset (included with your kit) that must be installed onto an early 70’s Ford starter from a 289/302 small block V8. This starter was commonly used in many cars and light trucks of the era. One can be sourced from a parts store or the salvage yard. If you use a salvage item we recommend that you have new brushes and bushings installed to assure years of dependable service. Or purchase our rebuilt starter 910-67449.

NOTE: If you purchased a kit that includes a complete starter assembly (or purchased our rebuilt starter p/n 910-67449) continue with next step. If your kit included only the front starter nose snout please follow the steps on the sheet titled “REPLACING THE STARTER SNOUT” before continuing.

WARNING: USE EYE AND FACE PROTECTION FOR FOLLOWING STEPS! Minor grinding on the block is required in order for the starter to fit the flathead block. Make sure the torque converter is installed to prevent debris from entering the trans.



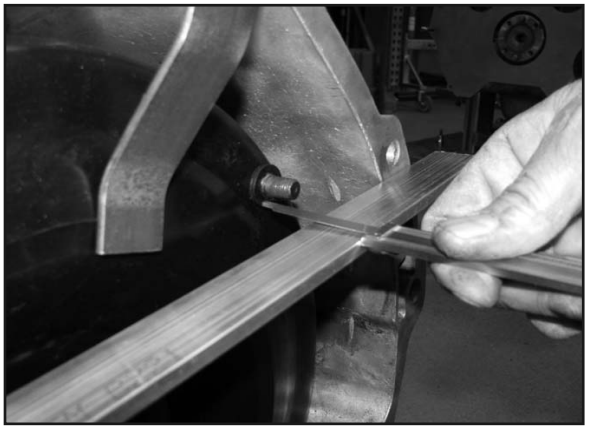
With the block plate in position, temporarily install the transmission on the engine without the flywheel. Hold the starter in position and note where it contacts the engine block. Using a die grinder or 4” angle grinder, grind 1/16” to 1/8” off of the block in an arc equivalent to the diameter of the starter body.

Take your time and grind only as much material as required for clearance. You may also need to grind a small amount of material from the starter body. Try to strike a balance so that equal amounts of material are removed from either component. On the small 157 tooth flywheel it may also be necessary to grind or slightly bend the oil pan rail in order to achieve adequate clearance. When complete, remove starter and trans from engine.

CHECKING TORQUE CONVERTER FOR PROPER ENGAGEMENT

CAUTION: There must be a minimum of 1/16” clearance between the flexplate and the torque converter when assembled to allow for converter expansion and crankshaft end play. There must be a maximum of 3/16” clearance to assure that the converter remains engaged in the front pump in order for the transmission to operate properly. Immediate transmission damage can occur if you do not have the proper end play clearance!

If you are using a complete transmission assembly purchased from Speedway or another reputable company, there is normally a support strap installed to keep the torque converter properly engaged during shipping. Leave this strap in place to take the following dimensions.

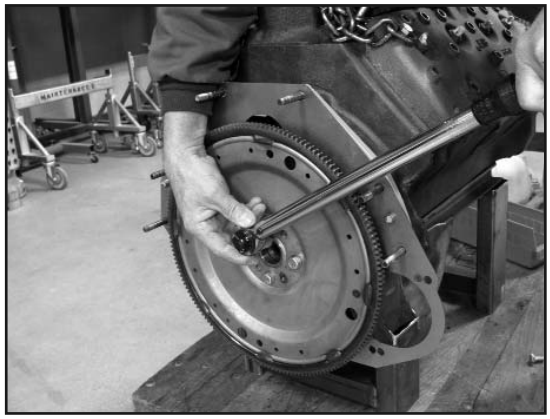


Again, using the straight edge and a caliper or machinists rule measure from the mount flange surface of the bellhousing in to the base of the torque converter stud (be sure to subtract the thickness of your straight edge). This dimension **must be** between 7/8”-1”. If the dimension is less than 7/8”, loosen the retainer strap and remove the torque converter check for cause of interference, and reinstall the torque converter making sure it is properly engaged in the transmission. When the depth spec is met write down the dimension on a piece of paper. This is dimension “A”.

Remove your new flywheel from the package. Check the transmission ID guide to verify the dimensions of the bellhousing, flywheel, and torque converter to make sure that all of the components to be used are compatible. Use compressed air to clean any debris or packing material from the flywheel. Closely inspect the center hub to make sure it is free of nicks or dings that would cause improper seating on the crankshaft hub. Remove the torque converter retainer strap from the trans and install the flexplate onto the torque converter (crank hub adapter facing forward)

Check that the pilot hub of the torque converter fits properly in the center hub of the flywheel. If it is too tight, remove any rust or paint and Apply a small dab of grease to the center of the hub to make sure converter pilot does not bind. Also check that all 4 converter studs and the converter drain plug are aligned properly.

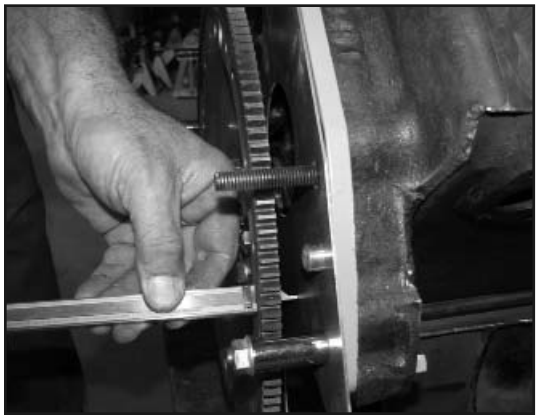
Install flywheel on engine. Again, make sure the mating surfaces of the flywheel and crank hub are clean and free of nicks or burrs. Look closely at the flywheel. Note that there are 4 holes in the center hub that are drilled through and 2 additional holes 180° apart. Align the 2 holes with the crankshaft dowel pins and use the 4 included bolts to secure the flywheel to the crank.



The hub fits the crank tightly and you will have to pull the flywheel on using the bolts. Do not use a hammer to seat the flywheel as you could damage the crank main bearings. Snug the bolts down in an alternating pattern until the flywheel is completely seated. Torque bolts to 50 ft. lb.

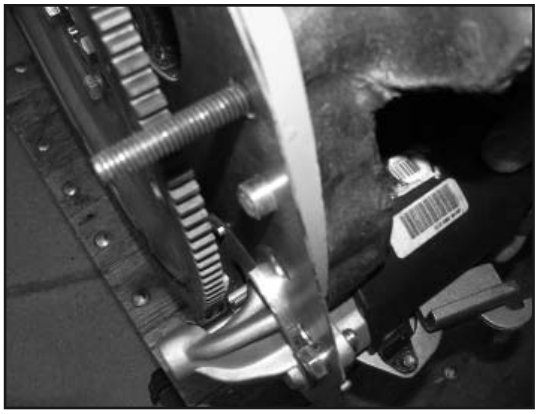
With the flywheel torqued in place and the block plate temporarily secured with 3 nuts use your machinists rule or caliper to take a measurement from the aft face of the block plate to the aft face of the flywheel @ the torque converter mount holes. Now, rotate the crankshaft ½ turn and take another measurement. If the difference between the 2 is greater than .030 make sure that the fly-wheel is seated to the crankshaft properly. Take an average of these two dimensions and write down this number as dimension “B”.

Dimension “A” (taken previously) must be grater than dimension “B”. Subtract dim B from dim A, the result is the minimum stacking clearance for the torque converter. As an example, the dimensions taken on this specific engine and transmission during assembly for this instruction sheet are as follows:
Dim “A”- converter depth check .935”
Dim “B”- flywheel protrusion - .870”
Torque converter clearance = .065”

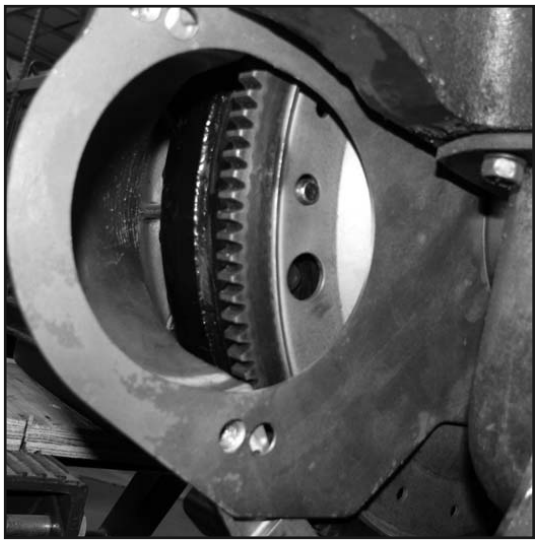


In some situations, like when using the old style case and small 157 tooth flywheel, the converter clearance dimension may exceed the stacking limit. In this case, remove the block plate and go through the dimensional checks again. In some very rare applications if the dimension is less than minimum it may be necessary to install 2 block plates.

The final dimension check is for the starter drive engagement depth. With the flywheel installed and the block plate secured to the adapter, measure from the starter mating surface (the forward side of the block plate) to the front of the ring gear teeth. This dimension must be greater than .625 (5/8”).

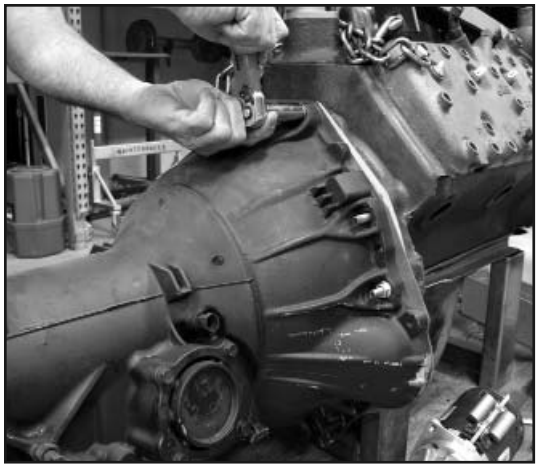


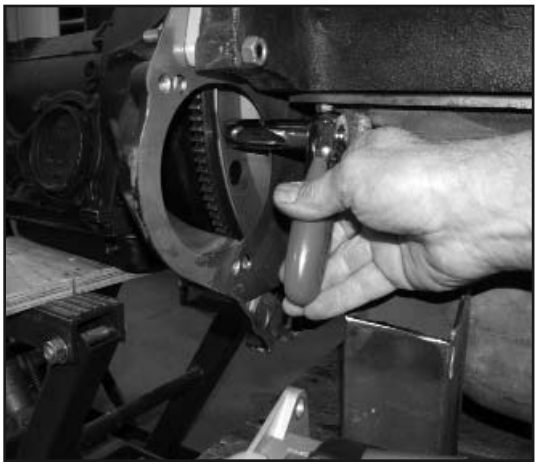
NOTE: at this time you might choose to do a visual check of the starter engagement. Position the starter up to the engine using the block plate to establish it’s position. Do not allow the starter to hang on the block plate and bend it, insert a couple of bolts and note relationship of starter drive teeth and ring gear. Prior to installing the transmission, remove the torque converter retainer, if so equipped. Also remove the 3 nuts temporarily securing the block plate to the adapter.



Rotate the flywheel so that one of the torque converter stud holes and the drain plug hole are lined up with the starter cutout in the block plate. Rotate torque converter on trans to place the drain plug and stud in the starter pocket area. Position the trans on the studs of the adapter plate and install 2 nuts, but do not tighten. Support the trans with a jack, do not allow it to hang on the studs.

Carefully reach into the starter pocket to manipulate the torque converter so that the stud is aligned with the hole in the flexplate. There should be approximately ¼" clearance between the transmission and the block when the stud protrudes through the hole in the flexplate. Now, you can slide the trans forward to seat the bellhousing onto the adapter. Install all six nuts and washers and begin to tighten them while wiggling the torque converter back and forth. When all of the bolts are snug you should still be able to move the torque converter slightly. If converter is bound up, loosen bellhousing bolts 1 turn, then rotate crankshaft ½ turn and try again.





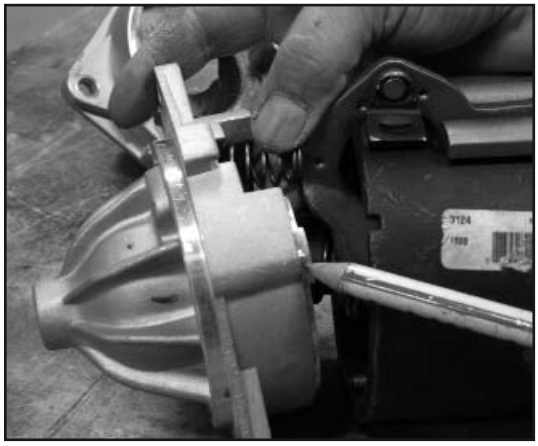
Tighten bellhousing nuts to 35 ft lbs and start a nut on the torque converter stud. Run nut down but do not tighten. Rotate crank and install the next converter nut, repeat until you have all 4 started, then torque to 35 ft lbs. Install starter to complete the job.

REPLACING THE STARTER SNOUT

To replace the starter drive snout place starter on bench and loosen the 2 through bolts on the rear retainer plate. It is not necessary to completely remove the screws, simply pull them out about 1” making certain not to pull the retainer plate away from the starter body. Carefully remove the front starter drive snout (it may require a light tap with a hammer if it is rusted in place) using extreme care not to pull the starter drive and armature out of the starter body (the brushes can become dislodged, cocked, or damaged).

Note the retainer and cup washer on the end of the armature shaft. Leave the retainer C clip and cup washer on the shaft unless you are going to replace the starter drive. If there are any additional shim washers remove them and set aside for later.

Ford used several different starter drives with this starter body, depending on application. If the starter drive teeth are too long the starter will not disengage when the engine is started and severe damage will result. Make certain that you are using the short (2.850” overall length) starter drive like the one on the left from a late 70’s Fairmont 6 cylinder engine.



Apply a dab of grease to the end of the armature shaft and install the new snout over the shaft and starter drive, making certain that the return spring is inserted correctly. Align the dowel pin with the recess in the starter case and reinstall bolts.

Stand starter up onto the base plate. Check the clearance between the cup washer and the starter snout. If the gap exceeds the thickness of one of the shim washers, remove starter snout bolts and install one of the previously removed shim washers. Reassemble and check end play.

IMPORTANT

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