# The 164 Cubic Inch Engine Clutch Assembly Differences vs. the Earlier 140-145 Cubic Inch Engine.

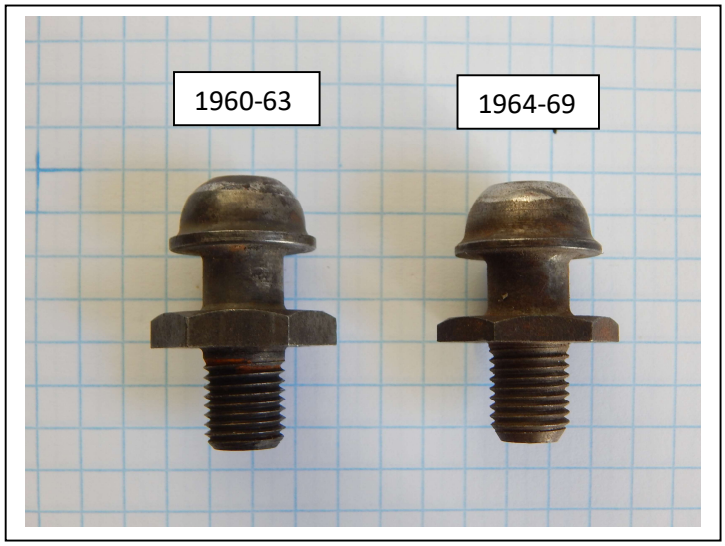
By Bob Nichols – Effective July 25, 2022

The larger 164 cubic inch engine is a popular unit to install in 1960-63 Corvairs. One issue is what clutch assembly parts to use. The 1960 engine was 140 cubic inches and was increased to 145 cubic inches in 1961 (to claim it was larger than the standard Ford Falcon engine). For model year 1964 the Corvair engine was increased to 164 cubic inches which remained unchanged through the 1969 model year. The 164 cubic inch engines used a revised clutch assembly.

**140-145 C.I. vs. 164 C.I. ENGINE CLUTCH ASSEMBLY –** The early Corvair's transitioned from mild mannered economy car to "sporty" car. The optional engines, with increased horsepower, could easily attain the maximum recommended RPM (redline RPM) before the driver upshifted the manual transmission. This revealed a problem with the Corvair clutch assembly. When shifting to the next gear at high RPM, the clutch pressure plate force was reduced by centrifugal force resulting in poor clutch engagement. The 164 cubic inch engine clutch assembly was redesigned to improve pressure plate action and engagement of the clutch disk at higher RPM.

**THE REDESIGN –** The 1964 model redesign of the 1960-63 clutch assembly was used through model year 1969. A review of online comments and conversations with Corvair folks indicates there are different opinions about what was changed. After some investigating a list of the 1964-69 clutch changes with respect to the 1960-63 clutch is in the following:

- **Crankshaft Gear –** The crankshaft gear was revised for the 1964 model year and used through 1969. The change affected the crankshaft seal and flywheel position.
- **Bellhousing –** The bellhousing was revised for the 1964 model year to relocate the crankshaft seal and accommodate the flywheel position per the revised crankshaft gear. The 1960-63 bellhousing casting number is 6256583. The 1964-69 bellhousing casting number is 3832176.
- **Clutch Release Fork Pivot, (bellhousing) –** the pivot ball for the clutch release fork is different and the change is subtle. Refer to illustration.



- **Flywheel –T**he Corvair flywheel is a three-piece unit to provide harmonic damping for crankshaft longevity. The 1960-63 flywheel clutch contact surface is flat from side to side. The 1964-69 flywheel was revised so the area the clutch disk contacts is recessed compared to the surrounding area the pressure plate bolts to. This accommodates the revised pressure plate. The 1964-69 flywheel is commonly referred to as the "stepped flywheel" due to its appearance.
- **Pressure Plate –** The pressure plate diaphragm springs are visually different. The 1960-63 model year pressure plate diaphragm is referred to as the straight finger type. The 1964–69 pressure plate diaphragm is referred to as the bent finger type. NOTE: the 140HP, and 180 HP turbo, engine pressure plate is geometrically the same as the one used on 1964-69 model year engines with lower horsepower ratings, but has a greater mass (larger casting) to promote smoother starts when engaging the clutch from a stop.
- **Clutch release bearing (throw out bearing)** – The 1960-63 model clutch release bearing (commonly called a throw out bearing) is different compared to the 1964–69 clutch release bearing. Clark's catalog and the Corvair shop manual mention a difference in depth. The critical difference is the bearing surface that contacts the pressure plate diaphragm fingers. The 1960-63 model year pressure plate diaphragm has "flat fingers" that require the clutch release bearing contact surface to have a rounded or convex surface to maintain proper contact as the bearing depresses the diaphragm spring fingers.
  The 1964-69 clutch release bearing has a flat surface that is compatible with the pressure plate diaphragm bent fingers during their depression.

  See illustration from public posting.

**"I can make it work" ---** Over the years a few folks have come up with "modifications" that are claimed to allow the mis-matching of clutch related components. Without detailed measurements it's difficult to say how well the "modifications" worked.

**Bottom line ----** if you want the clutch to work correctly use the correct combination of parts! Additionally, this avoids confusion during future repairs when the "modification" details are lost or forgotten. The person making repairs won't be confronted with a "kludge" that requires them to guess what parts are required to make repairs.

**140 H.P. Engine Swap -** The 140HP engine was introduced in the 1965 model year, standard on the Corsa and optional in the other models. Installing a 140HP engine in all models and years of Corvairs has become a popular modification. When considering the purchase of a 1960-63 model year Corvair with a 140HP engine installed it is suggested that you ensure the bellhousing, flywheel, pressure plate, and clutch release bearing are the type used with the 140HP engine.

**Problem with 1960-63 bellhousings on 164 C.I. engines** – On more than one occasion it has been noted that installing a 1960-63 bellhousing on a larger 164 cubic inch engine has resulted in the flywheel contacting the bellhousing to engine bolts during engine operation. This is likely due to the different flywheel position on the 164 cubic inch engines that causes the flywheel to be closer to the bolts of the 1960-63 bellhousing.

**Problem with 1964-69 bellhousing on 140 and 145 C.I. engines –** It has been reported that this causes the crankshaft seal to fail. The cause is the position of the 140 and 145 cubic engine crankshaft gear sealing area with respect 1964-69 bellhousing seal position. Clark's Corvair sells a shim to move the seal in the bellhousing to correct the problem, but it is more appropriate to use the correct bellhousing and clutch fork pivot.