Forward Clutch Piston Identification and Interchange

Early Cast Aluminum Forward Clutch Pistons

From 1964 to 1973, all TH400 transmissions were built with the early cast aluminum forward clutch piston. With the introduction of the stamped steel forward clutch piston in 1974, its use continued on certain models until the end of the 1984 model year, when it was replaced with the late cast aluminum forward clutch piston. The early cast aluminum forward clutch piston is easily identified by its wide piston work surface. See Figure 3-60. There are two basic castings of the early aluminum forward clutch piston. They are commonly referred to as thick or thin. The thick piston was used with a four clutch calibration, and the thin piston with a five clutch calibration. The front or rear face of the piston is cast with a part number. The part number is relative to its identity as a thick or thin casting. In some applications a piston with a given part number will be installed as cast. In others, this same piston will have its work surface machined prior to installation, altering the pistons overall work surface height. In these cases, there will be a number stamped into the rear face of the piston to designate the exact dimension of the overall work surface height after machining. The early cast aluminum forward clutch piston is the preferred piston for heavy duty and high performance applications.

FIGURE 3-60
Stamped Steel Forward Clutch Pistons

For the 1974 model year, GM added a stamped steel forward clutch piston and apply ring to the TH400 as a cost saving measure, while continuing the use of the early cast aluminum forward clutch piston on certain models. The stamped steel forward clutch piston was used until the end of the 1984 model year, at which time it was discontinued. The stamped steel forward clutch piston is comprised of a series of stamped steel components, and a stamped steel apply ring that installs in a recess in the front face of the piston. The apply rings are selective so that the necessary overall work surface height can be achieved with various clutch pack calibrations. The outside diameter of the apply ring is stamped with a number that designates the pistons overall work surface height. There are straight and corrugated style apply rings. The corrugated apply ring, like the one shown in Figure 3-61, is preferred due to its increased stability. When servicing or assembling a transmission for standard duty service it is ok to use the stamped steel forward clutch piston. For heavy duty or high performance applications, its use is not recommended. With increased line pressure, the stamped steel forward clutch piston suffers from deflection, piston blowout, and poor transmission of clutch apply pressure to the clutch pack.

FIGURE 3-61

Late Cast Aluminum Forward Clutch Piston
For the 1985 model year, GM discontinued the waved plate in the forward clutch housing and replaced it with the dished plate. This resulted in the creation of the late cast aluminum forward clutch piston. Revisions were made to the work surface of the piston to accommodate the dished plate. This piston was used until the end of the 1993 model year. The late cast aluminum forward clutch piston is easily identified by its narrow piston work surface. See Figure 3-62. There are two basic “thin castings” of the late forward clutch piston, and both were used with a five clutch calibration. The front or rear face of the piston is cast with a part number.

FIGURE 3-62

Foreign Cast Aluminum Forward Clutch Piston
These extremely rare cast aluminum forward clutch pistons are found in some Jaguar, Rolls Royce, and Bentley versions of the TH400 transmission. See Figure. It is my guess that these parts were cast in either England or France as they do not bear the typical casting identification common with the standard clutch pistons. Note the narrow work surface similar to that used with a dished plate, although these pistons were in use in a time period prior to the existence of the TH400 dished plate.

FIGURE 3-
Forward Clutch Piston Interchange Summary

All types of production TH400 forward clutch pistons are fully interchangeable, providing proper forward clutch pack end clearance is obtained.
All production TH400 direct clutch pistons, with or without a checkball, may be installed in the forward clutch housing, providing proper forward clutch pack end clearance is obtained.

Installing 4L80E Clutch Pistons in the TH400 Forward Clutch Housing
This information is provided to allow successful interchange of 4L80E clutch pistons into the TH400 forward clutch housing. There are early and late design 4L80E forward and direct clutch pistons. The early design pistons are cast aluminum and were installed in 1991-1995 models. The late design pistons are a heavy duty stamped steel with bonded rubber seals and were installed in 1996 and up models. The cast aluminum type is very similar in appearance to the late TH400 cast aluminum clutch pistons, and features the same narrow work surface.

The heavy duty stamped steel type varies greatly in appearance to the TH400 stamped steel clutch pistons, and features the lip seals as an integral part of the piston. Both types are shown in Figure 3-63. The center lip seal counterbore in the rear of all 4L80E forward clutch pistons measures @ 3.400”. The center lip seal counterbore in the rear of all TH400 forward clutch pistons measures @ 3.750”. See the comparison in Figure 3-64. Because of this, no 4L80E forward clutch piston can be installed in a TH400 forward clutch housing, as it will not clear the lip seal boss. The center lip seal counterbore in the rear of all 4L80E direct clutch pistons is the same as the TH400. This means you can install any 4L80E direct clutch piston into any TH400 forward clutch housing as long as the piston overall work surface height is no less than .575”. Be sure to measure the piston before installation as there are 4L80E direct clutch pistons that are shorter than .570”.

Note that unlike the TH400 forward clutch piston, the 4L80E direct clutch piston is void of release spring pockets. See Figure 3-65. When installing a 4L80E direct clutch piston you must install the 4L80E release spring assembly. This is a one piece design. It consists of 16 clutch release springs installed between two stamped steel retainers. The springs are crimped to the upper retainer and are slip fit over locating tabs on the lower retainer. To fit the 4L80E release spring assembly to any aluminum TH400 direct clutch piston, simply remove and discard the lower retainer from the assembly with a small screwdriver. Production and modified assemblies are shown in Figure 3-66.