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Allison 1000 Converters The Next Generation

The Allison 1000 converter has evolved considerably throughout its existence. By the end of the 2007 model year there had been five (5) different generations of this converter. The chart in Figure 1 lists the part name, stall torque ratio, part number and color ID code for the first five generations of this converter (Transmission Digest article, November 2007).

Figure 1

Part Name	Stall/Torque Ratio	1st	2nd	3rd	4th	5th	Color
TC-210	2.06:1	29534832	29538197	29538531	29538531	29543015	Orange
TC-211	2.01:1	29530318	29538348	29538529	29541293	29543003	Green
TC-221	1.75:1	29530317	29538347	29538528	29540484	29543017	Black
TC-222	1.63:1	29537302	29538349	29538530	29540520	29543016	White

Figure 2 - 6th Generation Cover



Figure 3 - 5th Generation Cover



The sixth generation of Allison 1000 converters was introduced at the beginning of the 2008 model year. There are still four basic configurations of this converter (TC-210, TC-211, TC-221, and TC-222). Each configuration has a different stall torque ratio and "K" factor.

The outward appearance of the sixth generation is the same as the fifth generation, and they also use the same four part numbers

and ID colors on the bar code label. This is unique because anytime a revision was made to the converter in the first five generations, a new part number was assigned.

The sixth generation has the same bolt pattern and overall height, as well as the same pilot and hub diameters as the fifth

generation. Despite all of the external similarities, the impeller and piston/damper assembly are the only two parts that can be interchanged without any modifications. Many of the other parts are very similar to the earlier version of this converter, but would require some sort of shim, spacer, or machining to be interchanged. The cover for example, looks the same from the outside and even has the same barcode and part number; however, it has a different machined profile where the thrust washer rides (Figures 2 and 3).

The thrust washer for the 2008 and newer converters no longer has the locating step and is .050" thicker than the 2006 and 2007 fifth generation models. The thicker thrust washer is necessary to maintain the proper end play and overall height because the thrust washer cavity in the 2008 cover is .050" deeper than in the 2006-2007 models. Since the fifth and sixth generation covers have the same part number, special care must be taken when interchanging parts. Remember, the two covers will interchange as long as the proper thrust washer is used (Figure 4).

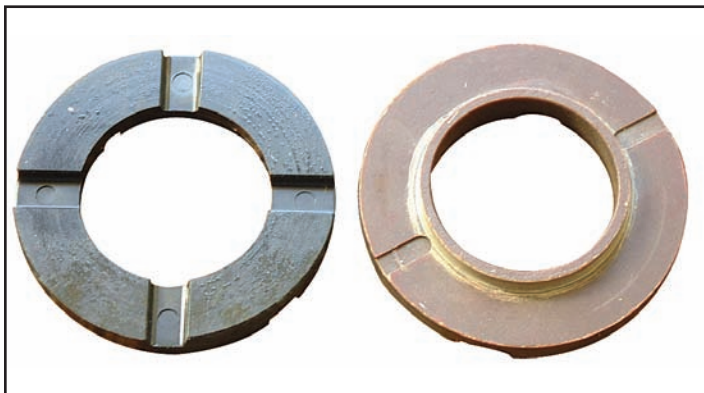
The turbine is the same for both the fifth and sixth generations. There is a minor difference

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Figure 4 - 6th Generation (left) & 5th Generation Thrust Washers



in the turbine hubs. The cross section of the turbine hub from the thrust washer surface on the cover side to the bearing surface on the stator side is the same on both fifth and sixth generations. The 2006-2007 turbine hubs have a machined groove that is used to retain the enclosed bearing (Figure 5). The inner race of the enclosed bearing is designed to fit into the retaining groove of the turbine hub. This groove was eliminated in the 2008 model when the enclosed bearing was replaced with an open bearing. If you are using a 2006-2007 fifth generation bearing on a 2008 turbine hub, you may consider machining a groove into the hub so that stress is not put on the inner race of the enclosed bearing.

Figure 5 - 5th Generation Turbine Hub



The stator and corresponding bearings and shims are where you will find the biggest differences between the two generations. The impeller side bearings both have the same 2.650" I.D. and both rest against a .030" thick shim with three internal tangs. Both

bearings are enclosed, and the only way to tell them apart is by measuring the thickness. The 2006-2007 bearing is .220" thick and the 2008 bearing is .250" thick. The turbine side bearings are easier to identify. The 2008 uses a .188" thick open bearing, and the 2006-2007 uses a .220" thick enclosed bearing. The turbine side bearing shims are also different. The 2008 is .045" thick and the 2006-2007 is .030" thick. The stators are also different, to compensate for the difference in bearing thicknesses. The recess for the impeller side bearing is .040" deep on the 2008 stators and only .010" deep on the 2006-2007 stators. The depth of the recess is the best method for identifying the stators (Figures 6a and 6b).

Allison 1000 Fifth and Sixth Generations Interchange Rules

1. The impellers and piston/damper assemblies will interchange without modification.
2. The covers will interchange if used with the correct thrust washer (end play issues or possible thrust washer breakage can result if mismatched).

Figure 6a - 6th Generation .040" Recess

3. The 2006-2007 5th generation turbine assembly can be used with either the 5th or 6th generation stator assemblies. If a 2006-2007 stator assembly is used with a 2008 turbine hub, a retaining groove should be machined into the turbine hub to prevent the bearing race from cracking.



4. The stators, with corresponding bearings and shims, may be interchanged if kept as a matched set. Mix-matching any one of these parts will cause a lot of grief.



Also remember that there are two different impellers and three different stators. They must be matched correctly to get the proper stall torque ratio and K factor.

Ed Lee is a Sonnax Technical Specialist who writes on issues of interest to torque converter rebuilders.

Sonnax supports the Torque Converter Rebuilders Association. Learn more about the group at www.tcraonline.com.