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Technical Information For The Collision Industry

FLUIDS FOR CONSTANTLY VARIABLE TRANSMISSIONS

In the 1930s, the first stepped automatic transmission was offered by General Motors, followed in the 1980s by Subaru offering one of the first constantly variable transmissions (CVT). Since the 1980s, CVT applications have diminished, only to resurge in the past few years. This is due in part to consumer demand for smoother shifting vehicles, better fuel economy (see Figure 1), and a transmission that is more efficient in using power developed by the engine than traditional automatic stepped transmissions. CVTs require a special transmission fluid, specific to each vehicle maker. According to the Nissan Owner's Manual for a 2005 Nissan Murano, "Using transmission fluid other than Genuine NISSAN CVT Fluid NS-2 will damage the CVT transmission, which is not covered by the NISSAN new vehicle warranty." Other vehicle makers have similar statements.

THE FIRST AUTOMATIC TRANSMISSION

In 1938, General Motors introduced the first automatic transmission, and then other vehicle makers began introducing their own design. Following the development of the automatic transmission came the requirement of specific transmission fluids for nearly every vehicle maker. Some common types used through the 1960s and 1970s were the Ford Type-F, Mercon, and Dexron just to name some of the more common types.

As automatic transmissions evolved, so did the fluids that were recommended in different vehicle applications within a specific vehicle brand. In some situations, (see the charts in Figures 2, 3, and 4) vehicle makers may have had multiple fluids that were available during a given time frame, but designed only for use in specific transmissions.

CVTS

In 1989, the Subaru Justy GL became the first production vehicle in the U.S. to offer a CVT. Basically, a CVT uses a steel drive-band that rides on two constantly variable cones or sheaves (see Figure 5). Aside from the steel band, a CVT is very similar to a traditional automatic transmission, but without the noticeable shift points (see Figure 6). The smooth unnoticeable shifting occurs by the way a CVT functions. A CVT allows the engine to accelerate up to an optimum rpm, and at that point, the transmission engages. With the transmission engaged and the engine rpm at a predetermined point, one set of the drive cones, or sheaves, open as the other set closes. During acceleration, this changes the speed of the drive belt. Yet, while the engine rpm remains fairly constant, the transmission shifts through its gears and the drive cones constantly change to maintain a steady engine rpm and seemingly unnoticeable shifts.

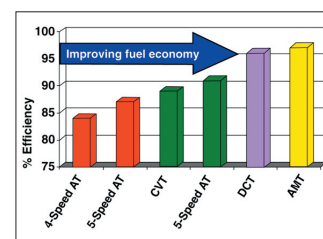


Figure 1 – CVTs offer improved efficiency over stepped 4- and 5-speed automatic transmissions. Chart courtesy of Dr. Z. George Zhang, Valvoline, a Division of Ashland Inc.

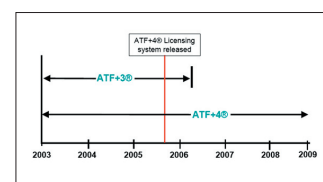


Figure 2 – This is the automatic transmission fluid usage timeline for the Chrysler Group. Chart courtesy of Dr. Z. George Zhang, Valvoline, a Division of Ashland Inc.

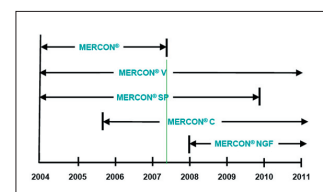


Figure 3 – This is the automatic transmission fluid usage timeline for Ford. Chart courtesy of Dr. Z. George Zhang, Valvoline, a Division of Ashland Inc.

