Automatic transmission temperature

An automatic transmission creates a lot of internal heat through friction: the friction of the fluid churning inside the torque converter, friction created when the clutch plates engage, and the normal friction created by gears and bearings carrying their loads.
It doesn't take long for the automatic transmission fluid (ATF) to heat up once the vehicle is in motion. Normal driving will raise fluid temperatures to 80 degrees C., which is the usual temperature range at which most fluids are designed to operate. If fluid temperatures can be held to 80 degrees C., ATF will last almost indefinitely -- say up to 160,000 Km. But if the fluid temperature goes much higher, the life of the fluid begins to plummet. The problem is even normal driving can push fluid temperatures well beyond safe limits. And once that happens, the trouble begins.

At elevated operating temperatures, ATF oxidizes, turns brown and takes on a smell like burnt toast. As heat destroys the fluid's lubricating qualities and friction characteristics, varnish begins to form on internal parts (such as the valve body) which interferes with the operation of the transmission. If the temperature gets above 120 degrees C., rubber seals begin to harden, which leads to leaks and pressure losses. At higher temperatures the transmission begins to slip, which only aggravates overheating even more. Eventually the clutches burn out and the transmission calls it quits. The only way to repair the damage now is with an overhaul.

As a rule of thumb, every 10 degree increase in operating temperature above 80 degrees C. cuts the life of the fluid in half!
At 90 degrees C., for instance, fluid life is reduced to 80,000 km. At 105 degrees, which is commonly encountered in many transmissions, the fluid is only good for about 40,000 Km. At 115 degrees C., the fluid won't go much over 16,000Km. Add another 10 degrees, and life expectancy drops to 8,000 Km. Go 150 degrees C., and 1,600 to 2,400 Km is about all you'll get before the transmission burns up.

If you think this is propaganda put forth by the suppliers of ATF to sell more fluid, think again. According to the Automatic Transmission Rebuilders Association, 90% of ALL transmission failures are caused by overheating. And most of these can be blamed on worn out fluid that should have been replaced.

On most vehicles, the automatic transmission fluid is cooled by a small heat exchanger inside the bottom or end tank of the radiator. Hot ATF from the transmission circulates through a short loop of pipe and is thus "cooled." Cooling is a relative term here, however, because the radiator itself may be running at anywhere from 82 to 105 degrees C.!

Tests have shown that the typical original equipment oil cooler is marginal at best. ATF that enters the radiator cooler at 150 degrees C. leaves at 115 to 135 degrees C., which is only a 10 to 20% drop in temperature, and is nowhere good enough for extended fluid life.
Any number of things can push ATF temperatures beyond the system's ability to maintain safe limits: towing a trailer, mountain driving, driving at sustained high speeds during hot weather, stop-and-go driving in city traffic, "rocking" an automatic transmission from drive to reverse to free a tire from mud or snow, etc. Problems in the cooling system itself such as a low coolant level, a defective cooling fan, fan clutch, thermostat or water pump, an obstructed radiator, etc., will also diminish ATF cooling efficiency. In some cases, transmission overheating can even lead to engine coolant overheating! That's why there's a good demand for auxiliary add-on transmission coolers.

Source:
http://www.4x4community.co.za/