High-torque DCTs

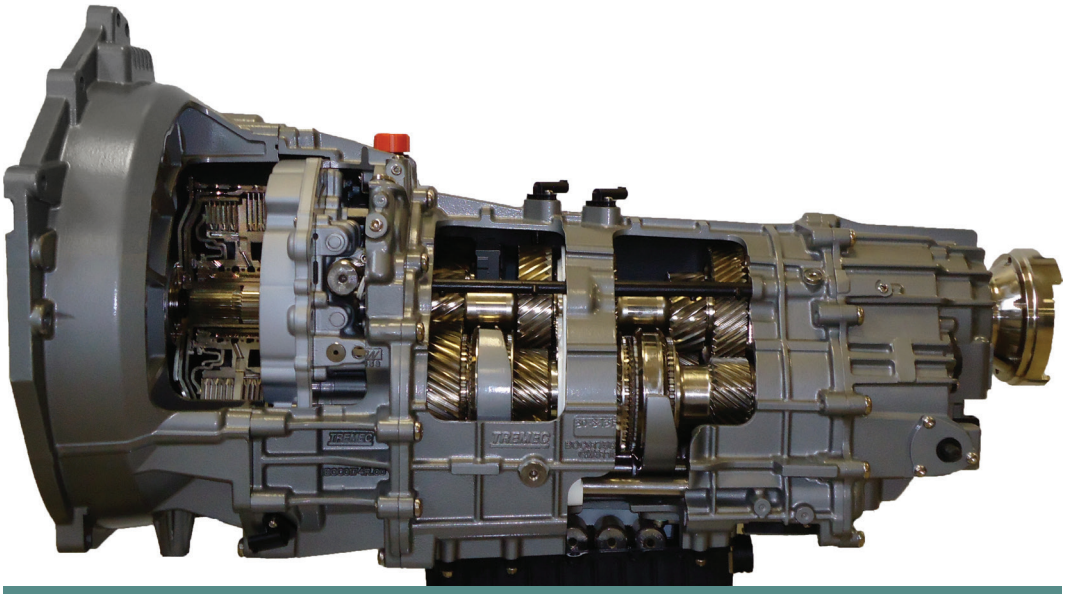
Performance mechatronic systems provide multi-mode, tunable launch and shift profiles for high-end luxury and sports cars

As the industry continues to develop new concepts and refinements for automated drivetrains, global demand for automated transmissions continues to grow. Tremec, benefiting already from a strong leadership in the market of high-torque manual transmissions, is well prepared to satisfy the need for ultimate shift performance and control with its recent family of high-torque dual clutch transmissions.

All subsystems and components within this family were precisely designed to assure maximum performance of the complete transmission system. The system is optimized by unique friction material, efficient hydraulics, low-leak solenoids, plus a transmission control unit equipped with sophisticated, application-specific software.

The Tremec TR-9007 DCT is a 7-speed DCT with a torque capacity of 900Nm. Mated with the TR-C75 transmission control unit, torque control is guaranteed to be fast, precise and repeatable. Built around a new high-performance multi-core microcontroller, the TCU easily handles the computationally intensive application software and supports an advanced system safety architecture.

The new solenoid valves offer improvements in range and energy use



Tremec's TR-9007 is a 7-speed DCT with a torque capacity of 900Nm, a suitable fit for high-performance applications

Brand-specific

One of the great opportunities that exists with a dual-clutch transmission is the ability to create brand-specific shift profiles, ranging from imperceptible limousine-like shifts to ferocious "F1"-style shifts. Basically, the feeling of any maneuver depends on the way torque is transferred to the wheels. The Tremec DCT technology opens up an array of custom options.

In order to create the desired feeling during launch and shifting, Tremec software generates, in real time, the desired torque for the engine and clutches, depending on various input and driving conditions and the maneuver being executed (launch/creeping, up/down shifting, sport/comfort-mode). The virtual torque chain converts these torque targets using model-based torque maps and pressure control algorithms into an electrical target for the clutch control valves.

Tremec's new generation of solenoid valves offer a number of improvements compared with the already excellent current generation, which is used in some of Europe's finest supercars. These improvements ensure further advances in terms of energy use, application range and robustness.

The TR-9007 DCT uses a single fluid throughout the complete transmission, with high-performance DCT fluid for hydraulic clutch and shift actuation, gear lubrication and system cooling. In addition to the cost and construction advantages, this enables the gear train to use forced lubrication without the need for a separate, energy-consuming pump.

Driving demands

In DCT transmission applications, there are certain maneuvers that can create extremely demanding requirements on the clutch system. Multiple high-performance launches, hill starts and other driving situations can all put high thermal loads on the clutch. For these instances, the Tremec DCT software includes a thermal management module that maintains vehicle performance while ensuring clutch thermal limits are not exceeded.

The combination of the high-performance TRC-75 controller, sophisticated software and calibration capabilities, plus the mechatronic subsystems in the TR-9007 DCT transmission, make Tremec the best choice for a high-performance automated transmission project. The Tremec toolkit enables the OEM to tune every maneuver for brand-unique feel and performance.