



Raptor's All-New Terrain Management System Enabled by Cutting-Edge AWD/4WD Transfer Case

- All-new 2017 F-150 Raptor features a cutting-edge transfer case that merges all-wheel drive and four-wheel drive capabilities for handling virtually any situation – including sport, weather, four-high desert and four-low locked off-road driving
- Controlled automatically via all-new Terrain Management System™, or manually by the 4x4 switch, innovative transfer case offers an electronically controlled clutch-based, on-demand system that delivers outstanding performance – for confidence whether on-road or off
- Specially designed transfer case employs an electronic shift-on-the-fly system featuring mechanical locks to tackle all types of terrain for serious off-road performance – including over 4,000 km of off-road competition testing

When the all-new F-150 Raptor first hit showrooms, few could foresee the extent of the innovations beyond its high-output engine and new skin. Along with all the power and agility gains comes the most advanced drive mode system in its class* – a cutting-edge Terrain Management System™. It is enabled by an all-new dual-mode transfer case that incorporates both all-wheel drive and four-wheel drive systems and electronic lockers to deliver the ultimate multi-terrain experience.

To give Raptor drivers more performance and capability both on-road and off, Ford Performance engineers developed this all-new transfer case to manage the distribution of power between front and rear wheels. Key to that is clutch-based, on-demand all-wheel drive capability for everyday driving, including all-weather mode, while also providing a mechanically locked, durable four-wheel drive system for confidence in severe off-road driving environments.

When combined with the non-sequential 10-speed transmission and high-output EcoBoost® engine, Raptor can deliver its 421 PS** and 678 Nm** of torque more efficiently for the ultimate driving experience – whether you're on the road or way, way off.

"Raptor's transfer case provides the best of both worlds, with the natural benefits from all-wheel drive, such as increased traction in rain and snow, as well as extreme off-road capability that comes with a mechanically locked system," says Tony Greco, Ford F-150 Raptor programme manager.

Typically, four-wheel drive options for trucks come in two transfer case varieties – on-demand systems that employ a clutch to transfer torque to the front driveline, similar to how all-wheel drive setups work, or electronic shift-on-the-fly systems that use mechanical locks to couple the front and rear driveshafts.

Ford engineers sought to enhance the daily driving experience of Raptor while preserving its ultimate off-road performance. With the clutch-based feature of the transfer case, drivers can travel on-road using the 4x4 auto setting, which delivers the benefit of four-wheel drive without the repercussions of component damage or driveline binding – something that can occur when drivers try to use mechanically locked systems on high-traction surfaces like pavement.

Ford fine-tuned the calibration of 4x4 auto depending on road surface conditions, so the transfer case can vary the clutch torque to suit the environment. For example, when the driver selects weather mode via the Terrain Management System, it's tuned for slippery surfaces, while sport mode is tuned to feature more of a rear bias that can provide a fun driving experience, including better acceleration and on-road performance.

When Raptor is operating off-road, its electronic shift-on-the-fly system is still available in the form of 4x4 high and 4x4 low – enabling drivers to navigate harsh terrain with confidence and added

robustness. In mud/sand mode and Baja mode, the transfer case shifts into 4x4 high, making it optimal for tackling trails and loose or soft ground – as well as engaging in high-speed desert runs. In rock crawl mode, the transfer case employs 4x4 low, enabling intense off-road driving and rock climbing at low speeds, while using an additional gear reduction ratio to provide enhanced capability with improved powertrain response.

In all cases that involve severe environments or conditions, the transfer case delivers flexibility for elite performance. While the Terrain Management System is designed with default 4x4 settings, drivers can manually override the settings to further fine-tune the system for a different experience.

The system was performance-tested in approximately 4,000 kilometres of competition testing in the 2016 Best in the Desert series, completing the 1,368-km SCORE Baja 1000 to conclude the season. In the end, Greg Foutz Motorsports team members drove the truck another almost 650 km back to their headquarters in Arizona.

**Class is full-size pickups under 3,855 kilogrammes. GVWR based on Ford segmentation*

*** Per Gulf Standardisation Organisation (GSO) ratings.*

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