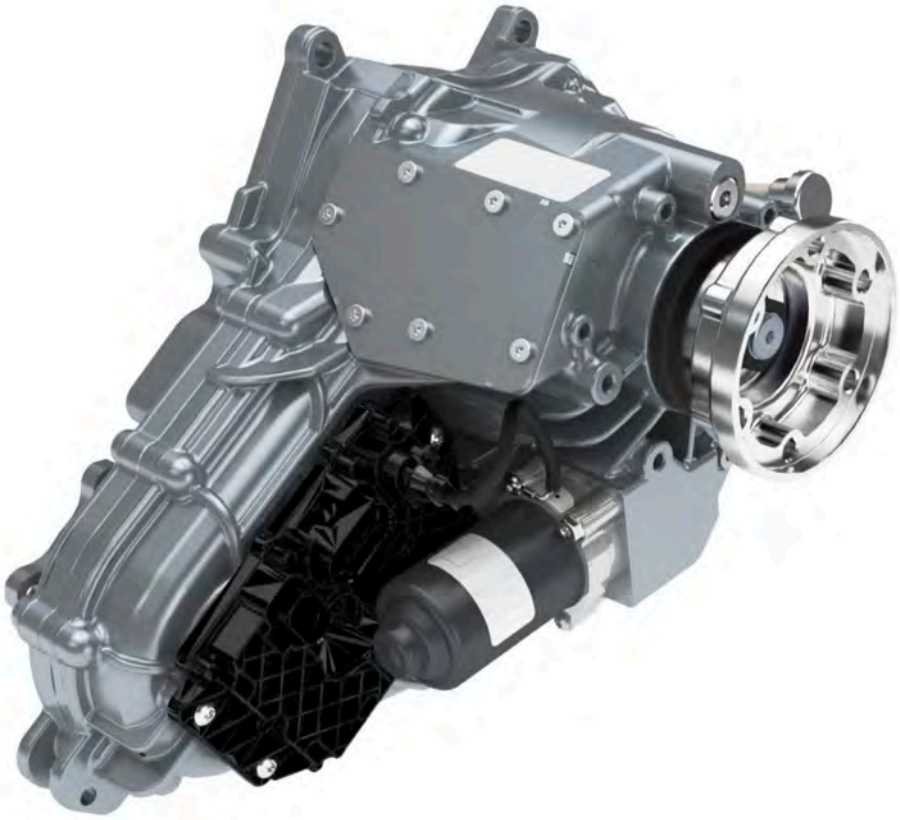
Intelligent Driveline Dynamics



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The AWD system features Intelligent Driveline Dynamics (IDD), a control system developed in-house to exploit the maximum benefits of the AWD system without any compromise to vehicle dynamics. IDD uses the TCM, ECM, Transfer Case Control Module (TCCM) and Dynamic Stability Control (DSC) systems to provide optimum torque distribution. The IDD control software is located in the TCCM.

The Intelligent Driveline Dynamics (IDD) system is a technology that controls the distribution of drive torque to all four wheels. The system utilizes the transfer case to control the distribution of torque between the front to rear and left to right rear wheels.

The IDD controller monitors vehicle behavior, driver input and road surface conditions 10 times per second and optimizes torque distribution every 200 milliseconds to deliver maximum traction performance, stability and yaw control.

The system comprises a torque distribution controller based on driver demanded torque, lateral acceleration and vehicle speed, which is configured to give the desired on-power handling balance. A traction controller responds to slip between the front and rear axles to ensure maximum traction performance.

Operation

There are two stages of operation. The first stage is pre-emptive. In this stage, the vehicle systems are evaluating road surface conditions and assessing the level of traction.

The second stage is reactive. This is where the vehicle is maneuvering and traction becomes lost. The torque can be transferred to the required axle and blended with other vehicle systems to maintain traction and vehicle stability.

Torque on Demand Benefits:

- Enables driveline disconnection for improved fuel economy
- Full traction capability when required
- Supports a Wide range of vehicle handling characteristics.

Over-Temperature Protection

Phase One – Center clutch pack closed, fixed all wheel drive. This is done to reduce clutch plate drag as the plates will not be able to slip; when temperature has reduced the full functionality will be restored.

Phase Two – Center clutch pack opens full, fixed rear wheel drive. This is done to reduce load on the clutch pack and circulate the fluid to add cooling; when the temperature has reduced to the normal operating temperature the TCCM restores normal functionality.