

Four-Wheel Drive Systems - Overview

Electronic Shift-On-The-Fly (ESOF) System

The Electronic Shift-On-The-Fly (ESOF) system consists of the following components:

- MSS
- TCCM
- IWE solenoid
- IWEs
- 4WD mode indicators and messages in the IPC message center
- Transfer case assembly (includes shift motor and synchronization clutch)
- Wheel speed signals from the ABS via HS-CAN

Vehicles equipped with an Electronic Shift On-The-Fly (ESOF) system allow the operator to choose between 2-Wheel Drive (2WD) (2H) and 2 4WD modes. The transfer case is shifted electronically based on the MSS position. Under normal driving conditions, the transfer case is in 2WD (2H), but when desired, the operator may shift into 4WD high (4H) or 4WD low (4L). The operator can shift between 2WD (2H) and 4WD high (4H) at any speed. When shifting into or out of 4WD low (4L) range, the TCCM requires that the vehicle speed is less than 5 km/h (3 mph) and the transmission in NEUTRAL. The transfer case is equipped with an electronically controlled clutch which is located inside the case. This clutch is used to synchronize the speed of the front driveline with the rear driveline during 2WD (2H) to 4WD high (4H) shifts.

2-Speed Torque-On-Demand

The 2-speed torque-on-demand system consists of the following components:

- MSS
- TCCM
- IWE solenoid
- IWEs
- 4WD mode indicators and messages in the IPC message center
- Transfer case assembly (includes shift motor and synchronization clutch)
- Wheel speed signals from the ABS via HS-CAN

Vehicles equipped with the 2-speed torque-on-demand system allow the operator to choose between 2WD and 3 different 4WD modes. The transfer case is shifted electronically based on the MSS position. Under normal driving conditions, the unit is in 2WD (2H), but when desired, the operator may shift into 4WD AUTO (4A), 4WD high (4H), or 4WD low (4L). When shifting into or out of 4WD (4L) range, the TCCM requires that the vehicle speed is less than 5 km/h (3 mph) and the transmission is in NEUTRAL.

The transfer case is equipped with an electronically controlled high capacity clutch which is located inside the transfer case. The clutch provides torque to the front driveline in all 4WD modes.

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