

Front Drive Axle and Differential

The 6.5-inch ring gear rear differential axle has 3.31, 3.58 and 3.73 gear ratio versions.

Front Drive Axle and Differential

The front drive axle consists of:

- A cast-aluminum center section, a removable cast-aluminum differential housing cover
- Integral-type housing hypoid gear design (center of the pinion set below the centerline of the ring gear). Two opposed tapered roller bearings support the drive pinion in the axle housing
- A drive pinion collapsible spacer, located on the pinion shaft, maintains pinion bearing preload. The pinion nut adjusts the preload
- Differential bearing shims, located between the differential bearing cups and the axle housing, adjust the differential bearing preload and the ring gear backlash
- A differential case, a 1-piece design with 2 openings to allow for assembly of the internal components and lubricant flow. Two opposed tapered roller bearings (differential bearings) support the differential case in the axle housing. Removable differential bearing caps retain the differential assembly in the axle housing
- The bar code tag located on the RH side differential assembly contains the axle information

The front drive axle receives input from the transfer case by way of the front driveshaft. Rotational torque is transferred through the drive pinion to the ring gear, which in turn drives the differential case. Inside the differential case are the pinion gears which rotate on the stationary pinion shaft and the side gears which are splined to the axle shafts. The differential assembly is a gear arrangement that allows the drive wheels to be driven at different speeds and divides the input torque of the pinion gear between the axle halfshafts. The front axle transmits torque only and carries no vehicle load. CV-joints located at each end of the halfshafts allow the axle to remain stationary in relationship to front wheels, yet articulate at the knuckle. These CV-joints permit the wheels to be driven and turned at the same time.

Front Axle Disconnect Actuator (FADA)

The FADA (Front Axle Disconnect Actuator) is located between the LH halfshaft and the front differential side gear. The FADA (Front Axle Disconnect Actuator) is routed through engine oil pan and bolted to the same. The FADA (Front Axle Disconnect Actuator) is integrated with front differential assembly with the help of intermediate shaft link. When commanded, by the DLCM (Driveline Control Module), the FADA (Front Axle Disconnect Actuator) transfers torque from the front drive axle, through the intermediate shaft to the LH halfshaft, providing AWD Functionality.

FADA (Front Axle Disconnect Actuator) consists of following components

- Electromagnetic field coil
- Armature cam
- Clutch ring
- Latching mechanism
- Intermediate shaft
- Housing
- Motor

An electromagnetic coil governs the armature cam and clutch ring. The latching mechanism holds the clutch ring in the connected or disconnected position. The latching mechanism allows the coil to be de-energized after the shift. Coil energizers and draws it towards the armature cam. The motor provides 1 of 5 duty on the front axle disconnect monitor circuit. In cold temperatures (below 3Â°C) and with the vehicle windscreen wipers on maximum speed, the DLCM (Driveline Control Module) may command the FADA (Front Axle Disconnect Actuator) to be connected, in line with a transfer case clutch engagement. The FADA (Front Axle Disconnect Actuator) requires intermediate shaft rotation to engage / disengage.