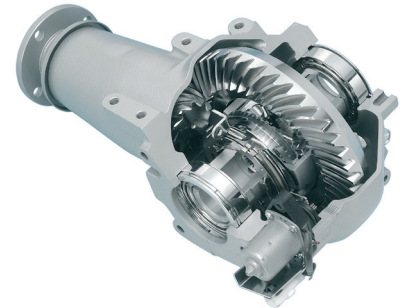




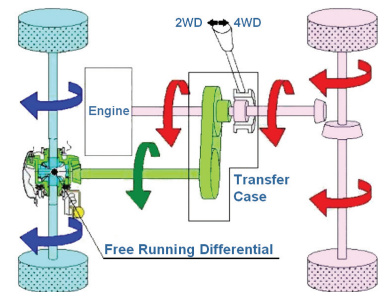
Free Running Differential (FRRD®)

GKN Driveline's compact Free Running Differential (FRRD®) is proven as a disconnect system offering significant fuel economy benefits in four-wheel-drive applications. The FRRD® is the most reliable and packageable selectable driveline disconnect system.



Benefits

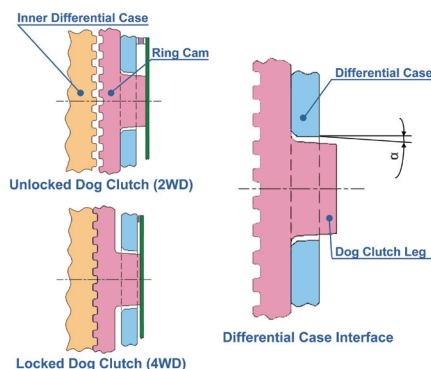
- > Lowest system complexity for disconnecting a secondary driveline
- > Easily packages into most axles with only minor changes to the carrier
- > No NVH or differential gear wear since no speed difference occurs across the gear set
- > No special oil or friction modifier required
- > Simple and reliable actuation system
- > In production since 1996



Normally rotating front driveline and Transfer Case components (shown in green) are stationary during 2WD mode

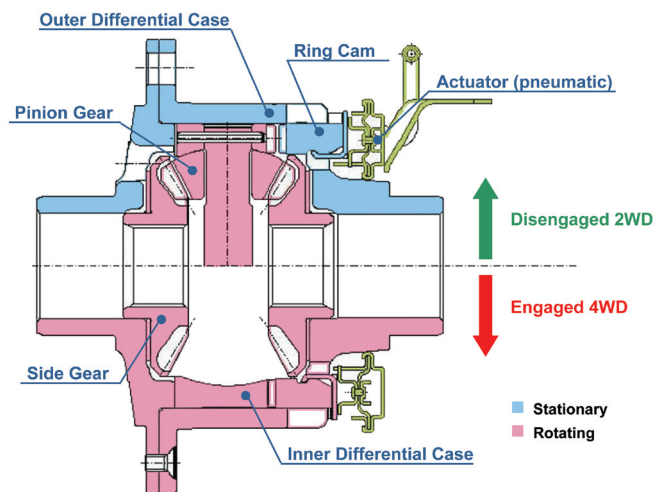
Operating Principle

- > The inner differential case containing the pinion gears is interconnected to the outer differential case by a cam ring (dog tooth clutch)
- > An actuator (pneumatic type or shift motor type) pushes the cam ring into the inner differential case
- > The opposing dog tooth profiles engage and directly lock the inner differential case to the outer differential case
- > The specific interface geometry between the drive cam and differential case assures a dog tooth clutch engagement under all loads
- > In the disengaged position (2WD), the inner differential case rotates freely inside the outer differential case
- > In the engaged position (4WD), the inner differential case is locked to the outer differential case



Technical Features

- > Pneumatic actuation is achieved by a remotely mounted electronic air pump
- > Shift motor actuation is achieved by an electric motor driven cam plate
- > Actuation can be by manual switch or automatically via an Electronic Control Unit (ECU)
- > Optional position sensor provides mode confirmation to driver and ECU
- > Locking can occur at any vehicle speed



For further information please contact:

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