

## Double Row Taper Roller Bearing Wheel-end System in Rigid Rear Drive Axle in Heavy Duty SUV Passenger Vehicle

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**Abstract :** In today's highly competitive passenger vehicle market, comfortable driving experience is one of the key parameters significantly weighed by the customer. Smooth ride and handling of the vehicle with exceptionally reliable wheel end solution is a paramount requirement in passenger Sports Utility Vehicle (SUV) vehicles subjected to challenging terrains and loads with rigid rear drive axle configuration. Traditional wheel-end bearing systems in passenger segment rigid rear drive axle utilizes the semi-floating layout, which imparts vertical bending loads and torsion to the axle shafts. The wheel-end bearing is usually a Single or Double Row Deep-Groove Ball Bearing (DRDGBB) or Double Row Angular Contact Ball Bearing (DRACBB). This solution is cost effective and simple in architecture. However, it lacks effectiveness against the heavy loads subjected to a SUV vehicle, especially the axial thrust at high-speed cornering. This paper describes the solution of Double Row Taper Roller Bearing (DRTRB) wheel-end for a SUV vehicle in the rigid rear drive axle and improvement in terms of maximizing its load carrying capacity along with better reliability in terms of axial thrust in high-speed cornering. It describes the advantage of geometry of DRTRB over DRDGBB and DRACBB highlighting contact and load flow. The paper also highlights the vehicle level considerations affecting the B10 life of the bearing system for better selection of the DRTRB wheel-ends systems. This paper also describes real time vehicle level results along with theoretical improvements.

**Keywords :** axial thrust, b10 life, deep-groove ball bearing, taper roller bearing, semi-floating layout.

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