



Product

Custom Needle Bearings

Application

Pickup Truck Door Checker

Highlights

- Custom needle roller bearing solution
- Integrated seals for contamination protection
- Machined knurls for snug fit
- Zinc plating and grease added for enhanced corrosion protection
- High-strength materials and deep-case heat treatment
- Kilian engineering input into hinge system design

Very late in the development cycle, a major U.S. automotive manufacturer contacted Kilian for a special door hinge bearing assembly that was needed for their newly designed pickup trucks. The bearing allows the truck doors to open smoothly, with minimum effort as it “clicks through” the range of motion, from “full-close”, to “halfway”, to “full-open”. The originally specified bushing-style bearing design was failing durability tests and door efforts were too high.

Kilian engineers quickly developed a design based on a successful similar bearing used in a tailgate application. High-strength materials with a deep-case heat treatment were selected to withstand the high system loads. Interestingly, during initial prototype system testing, Kilian recommended changes to the way mating components interfaced with the Kilian bearings. These changes were implemented which further improved overall system performance.

Kilian developed the custom bearing solution utilizing needle rollers for this high-load application. Materials were specifically selected for each of the bearing components to optimize durability and system loading. Seals were integrated to protect the bearings from outside contamination.

Significant development was required on the integral rivet, which allows our customer to easily install the bearing assembly into the stamped bracket. The rivet must stay securely fastened on the bracket, even after thousands of cycles and inherent vibration in driving the vehicle. Kilian engineers developed a unique knurl that held the assembly snug, but did not create any chips as it was pressed into the stamping. This allowed the bearing to mount flush against the bracket.

Zinc-nickel plating and grease were added for enhanced corrosion protection and smooth rolling performance. Extensive life cycle testing was performed at Kilian and the customer to ensure long lasting reliability.

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