

Tapered Roller Bearings

for axle drive pinions



JTEKT CORPORATION

CAT.NO.B1006E-1

Tapered roller bearings for axle drive pinions

Drive pinion bearings support the drive pinion gear shaft of the hypoid gear, which facilitates a 90° directional change of the driving force transmitted from the propeller shaft. This bearing is used in pairs to simultaneously ensure smooth rotation and the rigidity of gear meshing points.

Compact & Lightweight, Low-torque, High-capacity & High-durability. JTEKT's TRBs support enhancement of vehicle's environmental performance.

In automobile axles, various stresses are caused by acceleration, deceleration, and cornering forces in

a complex manner from all directions. They're truly a key mechanical part of every vehicle. In response to the demand for ever more advanced bearings that support drive pinions, JTEKT goes one step beyond making proposals. Every elemental technology imaginable is rethought from scratch to ensure products with unequalled levels of low friction loss and high capacity.



Tapered roller bearing development timeline (for automobile drivelines)



Tapered Roller Bearings Torque reduction technologies LFT



Performance

"Recommended" models significantly contribute to torque reduction compared to standard TRBs.

For axle drive pinion application, we are pleased to 100% propose a model specially designed for that purpose as a recommended model. In addition, we can offer LFT-III as its option since LFT-III has a premium specification including the control of lubricating oil flow.





Tapered Roller Bearings **KE Bearing-Embodiment of Size/Weight Reduction Technologies** Significant extension of service life with contaminated oil by adopting JTEKT's own Effective to surface originated flaking which occurs when lubricated by contaminated oil Relationship between bearing surface hardness and service life with contaminated oil 200 150 8 Flaking Initated From Sub - Surface .∰ 100 •% 50 00 000 64 62 60 66 Foreign matter hardness at time of testing Surface hardness (HRC) Relationship between the amount of retained austenite and Weibull slope with contaminated oil Material defect at maximum shear stress depth Optimized matrix C% Optimized surface hardness 0 of rolling element Ω 10 20 30 40 50 Retained austenite yR (%) Contribution to fuel Weight reductions economy enhancement Equivalent service life Approx. 25% lighte Standard bearing KE bearing Φ 40 ×Φ **80** ×19.75 Φ 40 ×Φ **68** ×19

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Example Technology Review

CAE analysis

JTEKT's design and development are conducted utilizing the latest equipment in an advanced CAE environment.

As JTEKT developed its own high-precision tapered roller bearing's torque calculation formula based on accumulated data, research and analysis, rotational torque can be easily obtained and used for examination.

JTEKT considers the rigidity of whole axle system, which supports the axle, bearing service life, contact stress, etc. and propose the best TRBs for your applications.



Calculation is possible as axle system.

Service life calculation



Deflection of pinion gear's meshing point 0.3



Surface pressure calculation





Simulation test equipment

In response to customers' requests, we conduct evaluations utilizing various vehicle driving conditions.

At JTEKT, prior to evaluations in actual vehicles, evaluations simulating various driving conditions are possible (such as oil flow check and torque loss measurement), which enables the reduction of development and evaluation periods.

Simulation of mountain road driving, high-speed cornering, driving in urban areas, etc.





Example Evaluation

CAE analysis result is verified by using an actual final reduction gear unit with an actual drive pinion.





Testing methods:

"Pinion bearing torque measurement results" for torque reduction and "Oil temperature measurement results of differential gears" for temperature rise.

Global Technical Support (Bearing Development Bases)

Technical centers located around the world ensure quick response and technical support for customers' needs.



Iga Proving Ground Enables Testing / Evaluations Simulating Roads Worldwide

Fully utilizing our knowledge as a world-leading systems supplier, JTEKT conducts driving evaluations and analyses of products installed in vehicles. We exhaustively pursue the highest standards in product safety and operation on a test course capable of simulating various road and weather conditions around the world. As a total systems supplier, our highest value is to provide our customers with products that deliver outstanding performance and the best quality that help to make automobiles that are more than just fun to drive.



Recommended Series Bearing Numbers

Please select from the recommended bearing numbers when considering axle drive pinion bearings.

| Boundary dimensions (mm) | | | | | | | load ing N) | Fatigue load limit (kN) | bearing number | ABMA bearing | Load center position (mm) | Constant | Axial load factor | | (Reference) Mass |
|-----------------------------|--------|---------|--------|--------|--------|------|-------------------|-------------------------------|-------------------|-----------------|---------------------------------|----------|----------------------|------|---------------------|
| No. | d | D | T | В | С | Cr | Cor | Cu | | number | а | е | Y1 | Y0 | (Kg) |
| 1 | 30 | 72 | 20.750 | 19 | 14 | 71.2 | 55.6 | 8.10 | KEST3072CLFT | | 18.6 | 0.55 | 1.10 | 0.60 | 0.381 |
| 2 | 33.338 | 68.263 | 22.225 | 22.225 | 15.25 | 66.1 | 62.2 | 8.70 | KESTD3368LFT | M88048/10 | 21.8 | 0.70 | 0.86 | 0.47 | 0.361 |
| 3 | 34.925 | 72.233 | 23.579 | 23.106 | 15.463 | 78.8 | 75.0 | 10.6 | KESTR3572LFTYR1 | HM88649/10 | 22.0 | 0.70 | 0.86 | 0.47 | 0.428 |
| 4 | 35 | 80 | 29.000 | 27.2 | 20 | 100 | 96.4 | 13.8 | KESTN3580LFT | | 24.8 | 0.50 | 1.20 | 0.66 | 0.694 |
| 5 | 36.513 | 79.375 | 29.370 | 27.2 | 20.4 | 100 | 96.4 | 13.8 | KESTA3779LFT | HM89249/10 | 25.6 | 0.67 | 0.90 | 0.49 | 0.664 |
| 6 | 40 | 90 | 26.500 | 26 | 18.5 | 110 | 106 | 15.7 | KESTJ4090LFT | | 25.4 | 0.62 | 0.97 | 0.53 | 0.806 |
| 7 | 41.275 | 82.550 | 26.543 | 25.654 | 18 | 85.8 | 75.3 | 11.0 | KEST4183YR1LFT | M802048/11 | 27.3 | 0.72 | 0.84 | 0.46 | 0.601 |
| 8 | 41.275 | 90.000 | 30.006 | 30.006 | 21 | 112 | 112 | 16.2 | KEST4190LFTUR4 | HM803146/10 | 29.0 | 0.70 | 0.86 | 0.47 | 0.866 |
| 9 | 45 | 100 | 38.000 | 36.5 | 27.5 | 164 | 183 | 25.6 | KETRD091004UR4 | | 34.5 | 0.76 | 0.79 | 0.43 | 1.46 |
| 10 | 47.625 | 95.250 | 30.162 | 29.37 | 20.5 | 127 | 133 | 19.4 | KESTA4895-1LFTUR4 | HM804846/10 | 29.2 | 0.70 | 0.86 | 0.47 | 0.945 |
| 11 | 50.800 | 104.775 | 36.512 | 34 | 25.5 | 171 | 177 | 26.1 | KETRD101004UR4 | HM807046/10 | 33.1 | 0.67 | 0.90 | 0.49 | 1.41 |



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Boundary dimensions can be changed upon request. For details, please contact the nearest JTEKT sales office.





JTEKT Corporation WEB site

https://www.jtekt.co.jp/e/



JTEKT Bearing WEB site

https://koyo.jtekt.co.jp/en/



JTEKT Overseas hubs

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