

Agricultural and Construction Equipment



For superior strength and durability in all environments

Heavy machinery in the agriculture and construction industry supports economic growth and infrastructure, and is indispensable in daily life. JTEKT's highly functional products contribute to ensuring long service life in severe conditions and improving reliability.



**JTEKT products
supporting heavy machinery in
agriculture and construction**

**Under such severe conditions, JTEKT responds with
No.1 & Only One technologies.**

Responding to Needs with No.1 & Only One Technologies

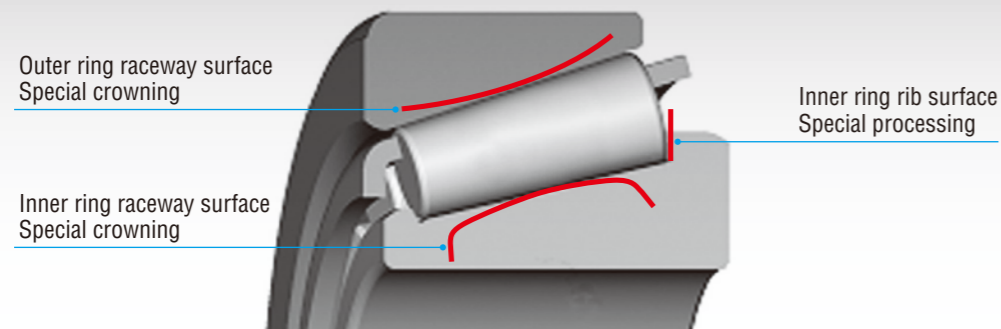
With a manufacturing history of more than 90 years, JTEKT clearly understands the needs of its customers, promptly delivering the reliability and product competitiveness required, and backs it up with a global support system.



JTEKT products responding to agricultural/ construction machinery needs ①

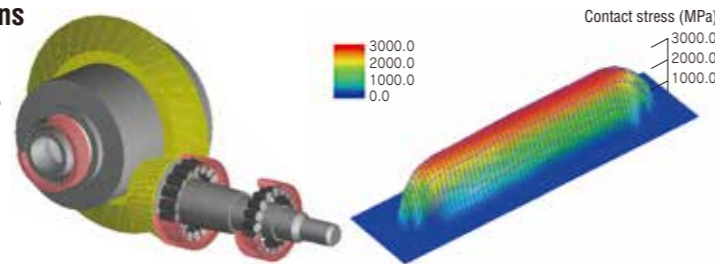
Optimum design technologies

High performance tapered roller bearing

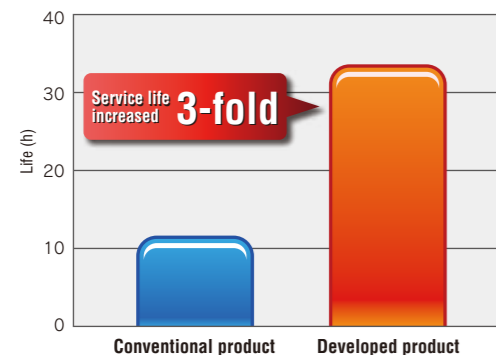


Improved durability (edge stress mitigated by misalignment shaft and low temperature rise)

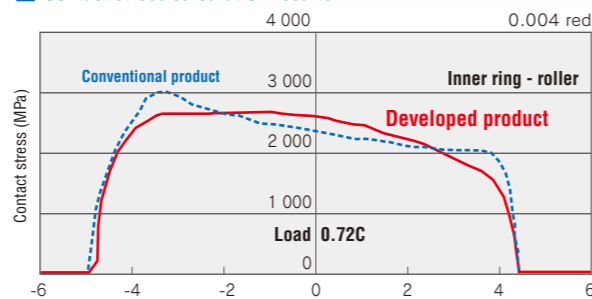
- Due to optimization of inner specifications and special crowning of bearing ring, bearing force improved by misalignment.



Misalignment durability life evaluation results

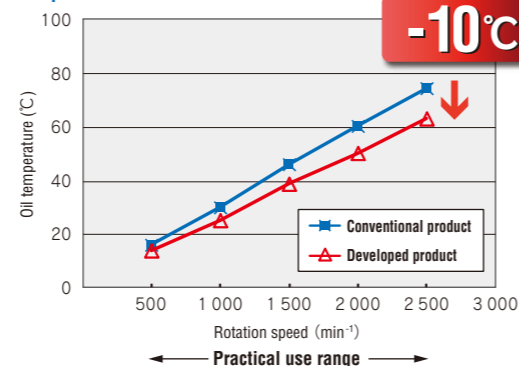


Contact stress calculation results



- Due to special processing of inner ring rib and special crowning of bearing ring, low temperature rise is achieved. Bearing endurance is also improved by oil film formation

Temperature rise evaluation results



Material/heat treatment technologies

KE heat treatment

(KE:Koyo Extra-life Bearing)

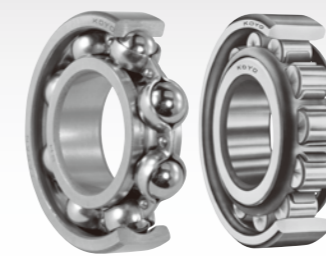
- Apply to case-hardened steel



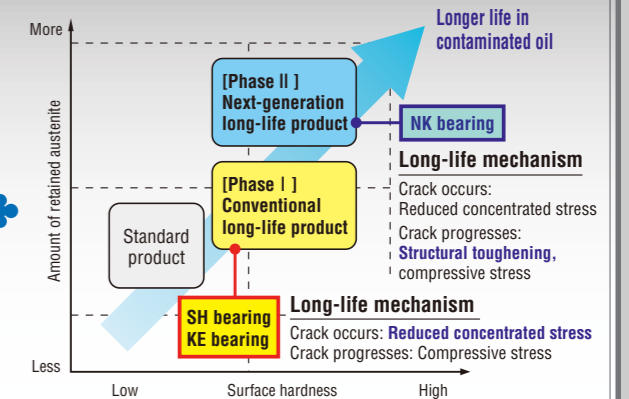
SH heat treatment

(SH:Special Heat Bearing)

- Apply to bearing steel

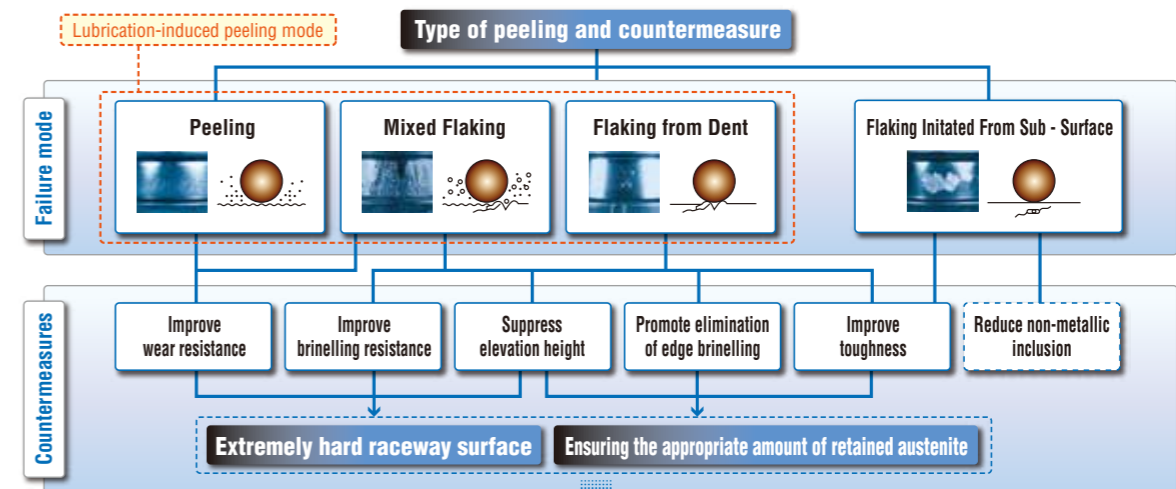


Next-generation long-life bearing NK bearing



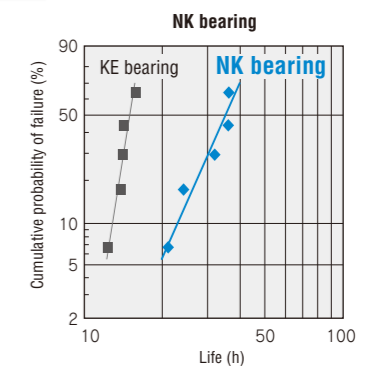
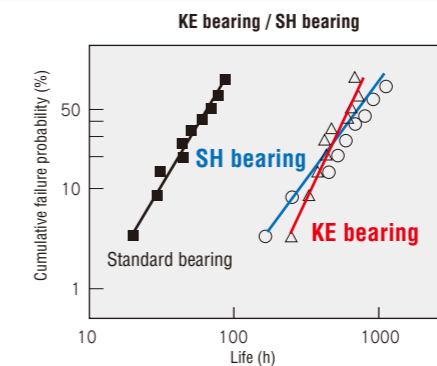
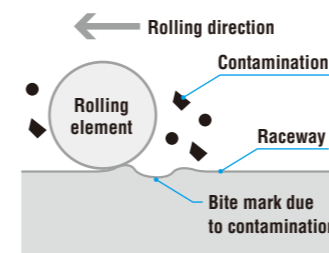
Development concept of long life bearing material

- Special heat treatment realizes extremely hard raceway surface and optimization of residual austenite achieves long life. Especially, superior performance in contaminated oil.



KE bearing / SH bearing

Next-generation long-life bearing NK bearing



Life test result of NK bearing in contaminated oil

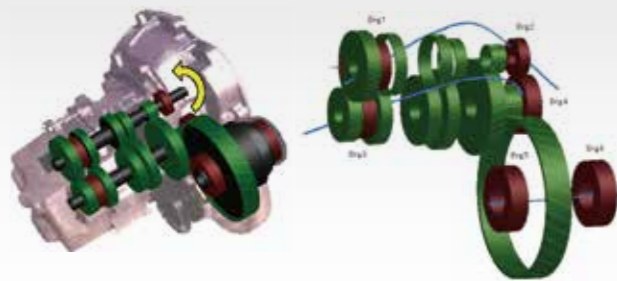
JTEKT products responding to agricultural/ construction machinery needs ②

Analysis technologies

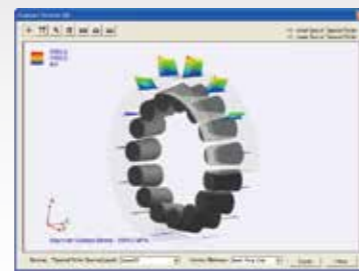
Verify validity of optimum design

- (1) In-house developed shaft system analysis software "SSAP (Shaft System Analysis Program)" and (2) CAE analysis software, this combination realizes the optimum design considering the rigidity of peripheral parts. Validity is verified through benchmark evaluation tests (including simulation), and X-ray and ultrasound analysis.

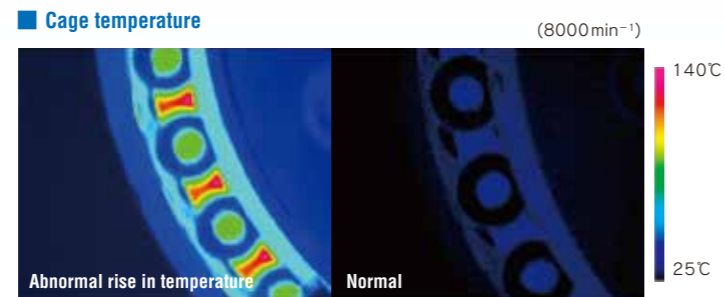
[Shaft system rigidity analysis]



[Contact stress analysis]



[Inner temperature measurement results]



Large-sized Bearing Technology Development Center

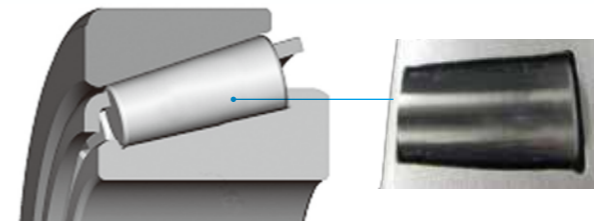
- JTEKT has established and started operation of the Large-size Bearing Technology Development Center, where large-sized bearings used in industrial machinery are evaluated and analyzed. Previously, large bearings were manually inspected and then put into the actual machinery for basic evaluation. However, the newly established development center enables more detailed evaluation by reproducing environments close to those of actual use.



Surface reforming technology

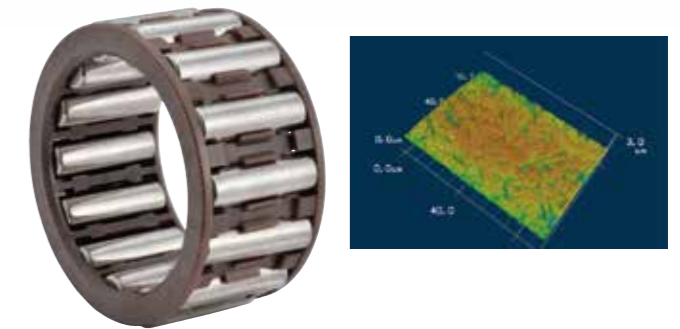
Special coating process

- 3 times better durability to that of non-coated product



Cage and roller (C&R) in response to poor lubrication

- Roller surface roughness optimized for improved oil film retention



JHS Series Spherical Roller Bearings

(JHS : JTEKT Hyper Strong)

JHS Series Spherical Roller Bearings are satisfying the demanding needs of our customers. Manufactured using innovative materials, an optimal internal design and a standardized dimension stabilizing treatment, these bearings have a longer service life, faster rotation speed, enhanced axial load performance and can be used in high-temperature applications.

Innovative materials/Optimal internal design/High-temperature applications supported

Outer ring

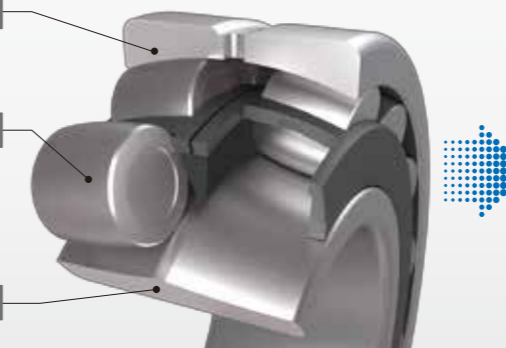
- JTEKT specification steel

Roller

- Roller maximized
- Number of rollers increased
- Roller position stabilized

Inner ring

- JTEKT specification steel



Bearing composition diagram

Longer service life

Max. **4-fold**
compared to our existing products

Axial load performance

Max. **20%UP**
compared to our existing products

Speed increased

Permissible rotation speed
Max. **25%UP**
compared to our existing products

High-temp use

up to **200°C**

Propeller shaft for construction machinery

Maintenance hours reduced by improving cross bearing life and seal performance.



Long-interval greasing cross bearing

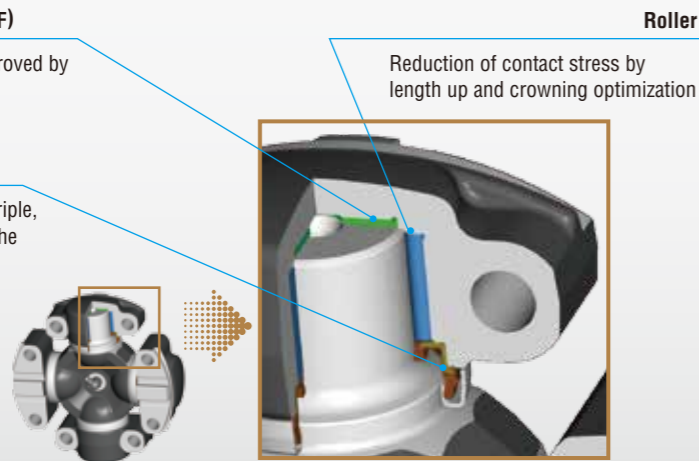
Greasing interval increased **10-fold**

Thrust washer (PA66+GF)

Abrasion resistance improved by adding glass fiber

Oil seal

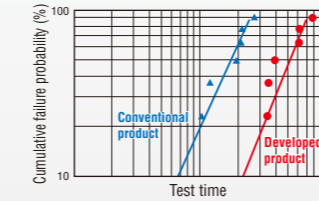
Seal lip from double to triple, and the optimization of the shape and position



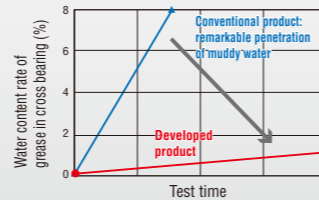
Roller

Reduction of contact stress by length up and crowning optimization

Cross bearing life test results



Cross bearing muddy water resistance test results



Spline seal structure of muddy water resistance improvement

Muddy water resistance improved **5-fold**

Vent (dedicated to exhaust)/O ring

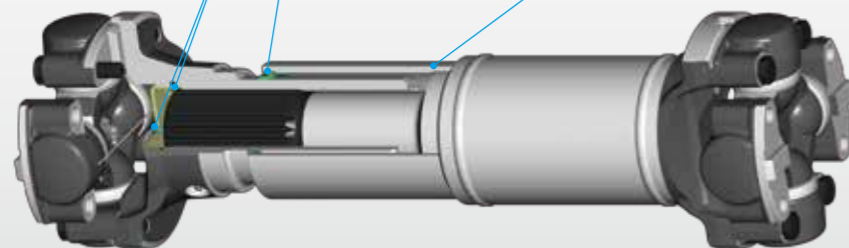
Prevent suction of muddy water when spline sliding

Oil seal

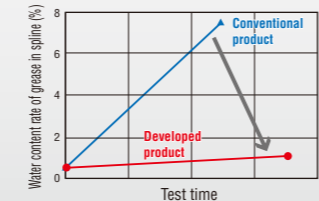
Rigidity of seal lip increased by changing material, from NBR to polyurethane rubber

Cover tube

Function of labyrinth achieved by extending the distance between seal and spline



Spline muddy water resistance test results



Oil seal

Seal technologies responding customers' needs for a variety of applications.



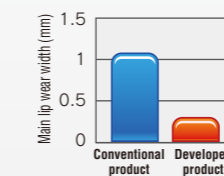
Muddy water resistance technology

Lip wear width **reduced 60%**

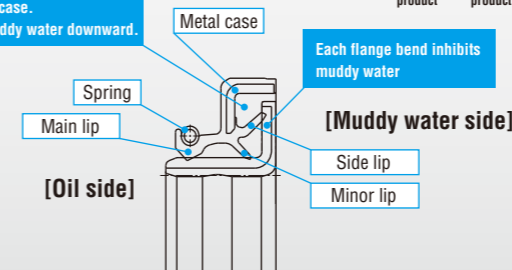
Features

Side lip added to axle oil seal, creating multi-structured lip that prevents muddy water inclusion/oil leakage when traveling.

Muddy water resistance performance results using actual car



Tab formed using side lip and metal case. Directs muddy water downward.



Each flange bend inhibits muddy water

[Muddy water side]

[Oil side]

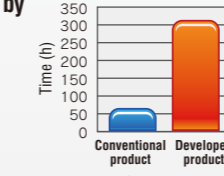
Sealing performance improvement technology

Service life increased **5-fold**

Features

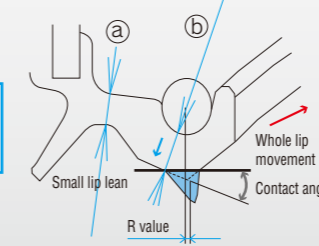
Stable sealing performance maintained by optimizing design optimized and changing the rubber material that inhibits lip torsion caused by sudden servo motor acceleration/deceleration.

Service life increased



Design optimization

Composition ratio (b/a): Large Contact angle, R value: Standard



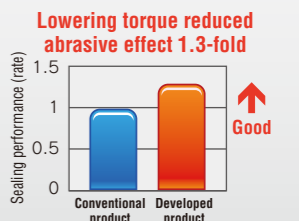
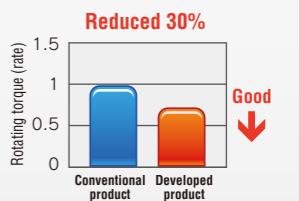
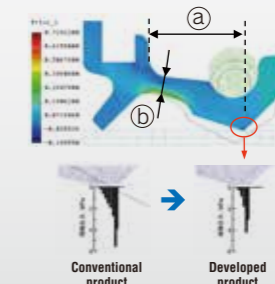
Low-torque technology

Rotating torque **reduced 30%**

Features

Low-torque oil seal for engine/transmission contributes to reducing fuel consumption

Lip length (a) and hip thickness (b) optimized, lowering strain force and abrasiveness



Low temperature technology

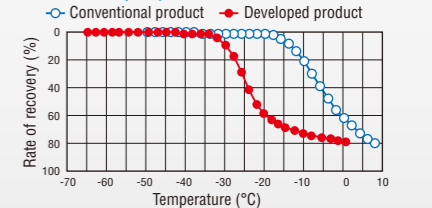
Low temperature performance improved **2-fold**

Features

Sealing performance of hydraulic pump and other parts improved by enhancing low-temperature dynamic run out followability.

Low-temperature environment
-15°C
↓
-30°C

10% recovery temperature at time of 50% extension rate



Rubber material abrasion characteristics Lip sliding part after abrasion (dry) test



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



JTEKT Bearing WEB site

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



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