

**Koyo**®

Product Information for  
Agricultural and Construction Equipment



**JTEKT**

JTEKT CORPORATION

# For superior strength and durability in all environments

Heavy machinery in the agriculture and construction 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.

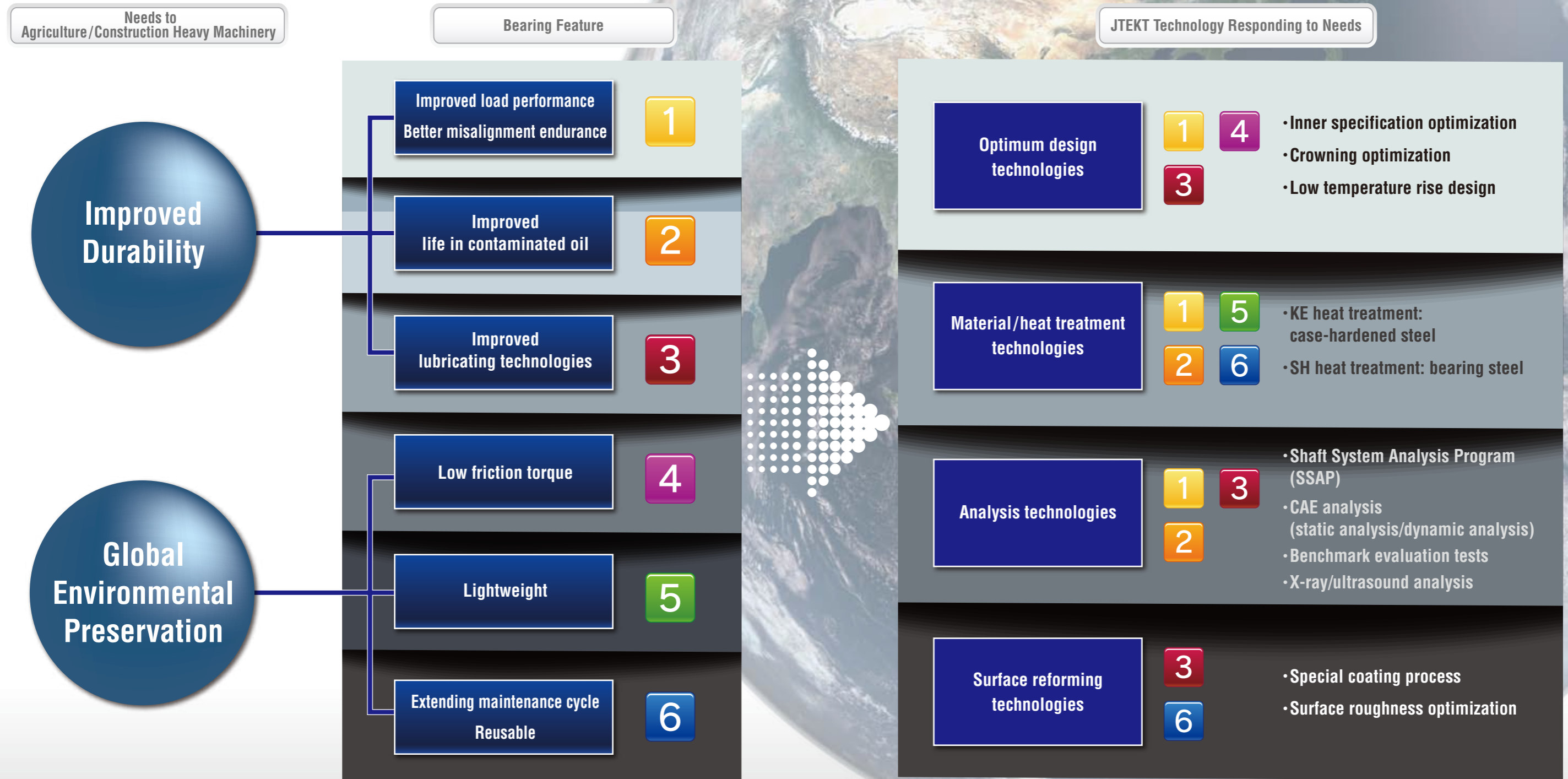


**JTEKT products  
supporting heavy machinery in  
agriculture and construction**

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

# Responding to Needs with No.1 & Only One Technologies

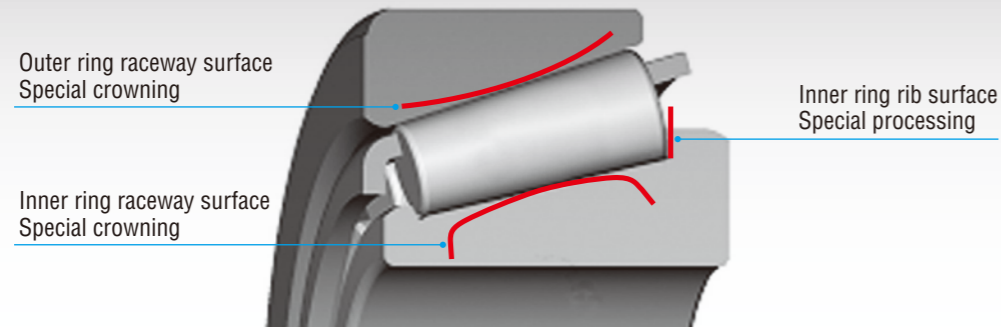
With a manufacturing history of more than 90 years, JTEKT clearly understands the needs of its customers, promptly delivers the reliability and product competitiveness required, and backs it up with a global support system.



# JTEKT products responding to agricultural/ construction machinery needs ①

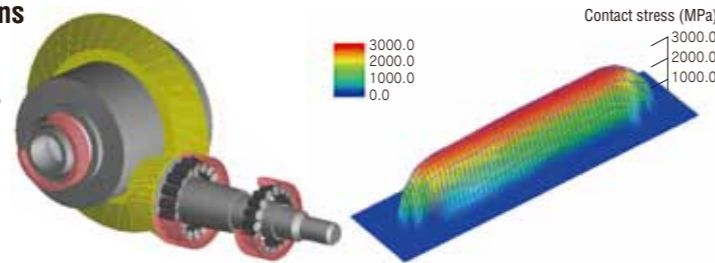
## Optimum design technologies

### High performance tapered roller bearing

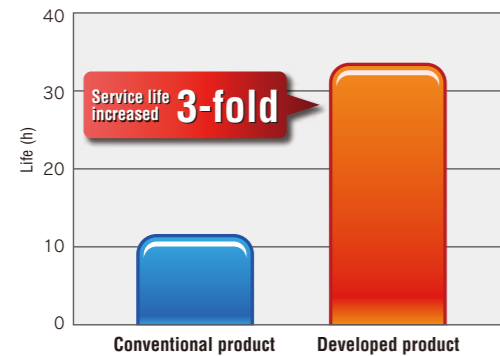


### Improved durability (edge stress mitigated by misalignment shaft and low temperature rise)

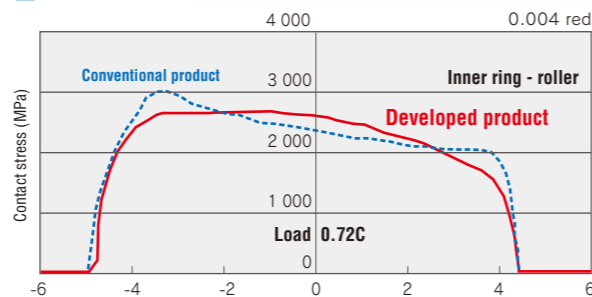
- Due to optimization of inner specifications and special crowning of bearing ring, bearing force improved by misalignment.



#### Misalignment durability life evaluation results

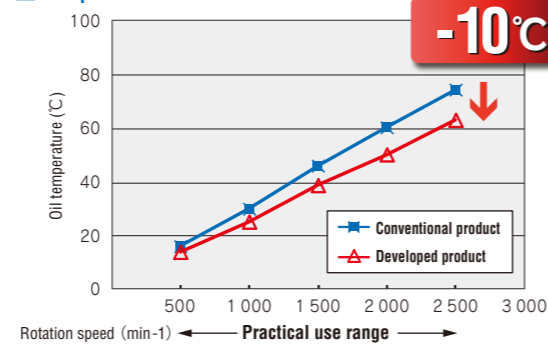


#### Contact stress calculation results



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

#### Temperature rise evaluation results



## Material/heat treatment technologies

### KE heat treatment

(KE:Koyo Extra-life Bearing)

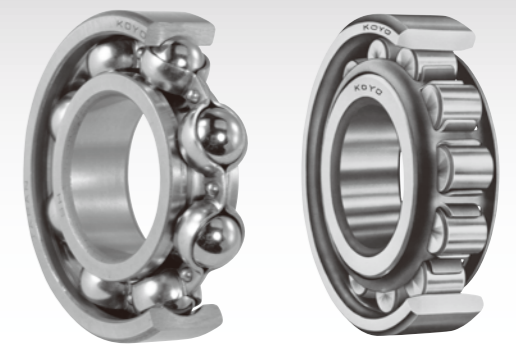
- Apply to case-hardened steel



### SH heat treatment

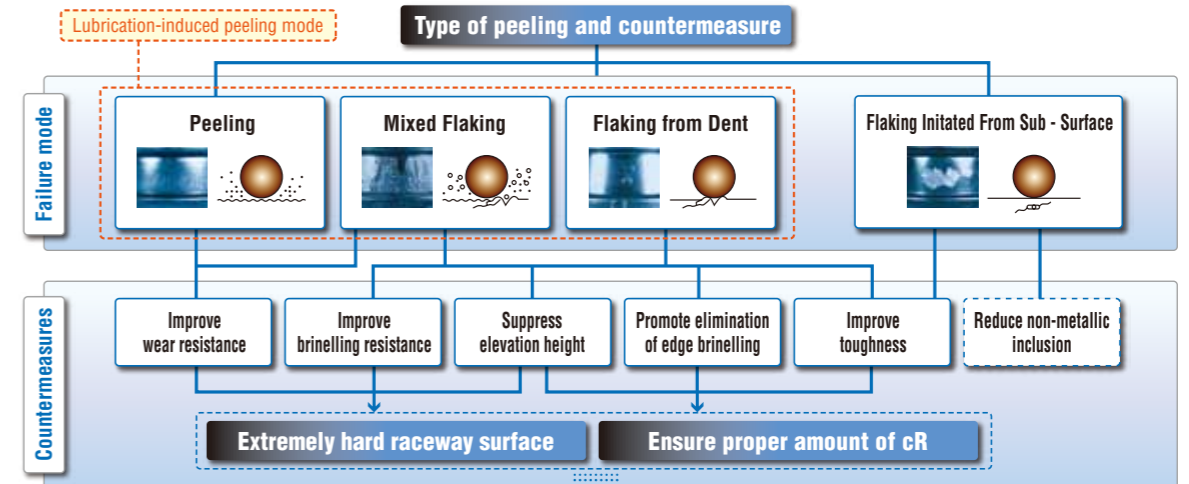
(SH:Special Heat Bearing)

- Apply to bearing steel

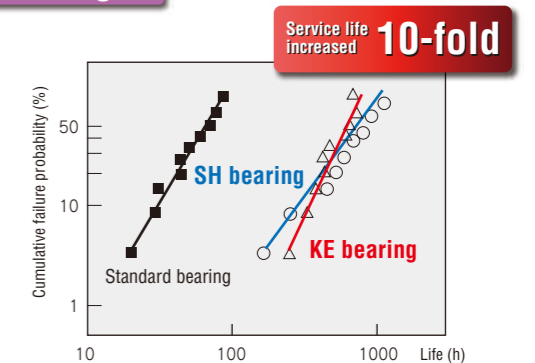
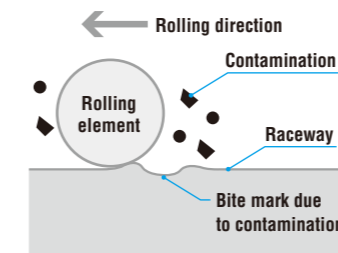


### KE heat treatment/SH heat treatment

- 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



KE:Koyo Extra-life Bearing SH:Special Heat Bearing

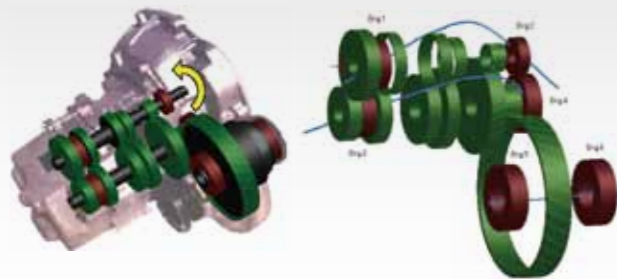
# JTEKT products responding to agricultural/ construction machinery needs ②

## Analysis technologies

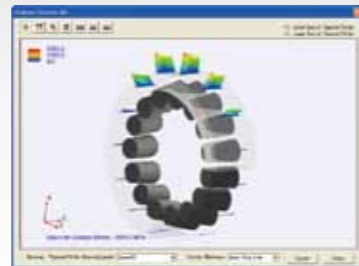
### Verify validity of optimum design

- Fully utilizing the Shaft System Analysis Program (SSAP) developed by JTEKT and CAE analysis, an optimum design that gives peripheral components additional rigidity has been achieved. Validity is verified through benchmark evaluation tests (including simulation), and X-ray and ultrasound analysis.

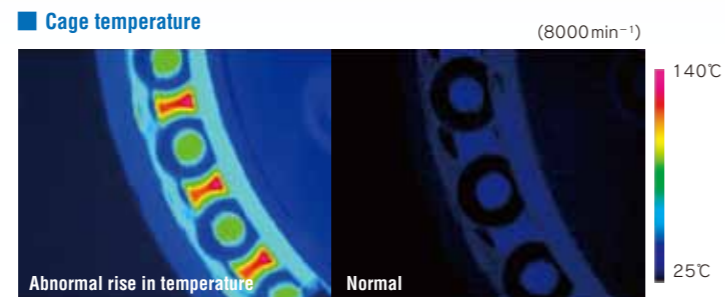
#### 【Shaft system rigidity analysis】



#### 【Contact stress analysis】



#### 【Inner temperature measurement results】



## Large-sized Bearing Technology Development Center

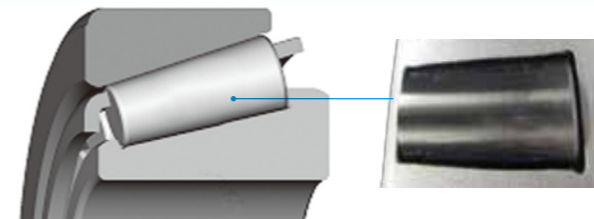
- JTEKT has established and started operation of the Large-size Bearing Technology Development Center, where large-sized bearings used in industrial machinery are evaluated and analyzed. Until now, large bearings were manually inspected and then put into the actual machinery for basic evaluations. However,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



## Surface reforming technology

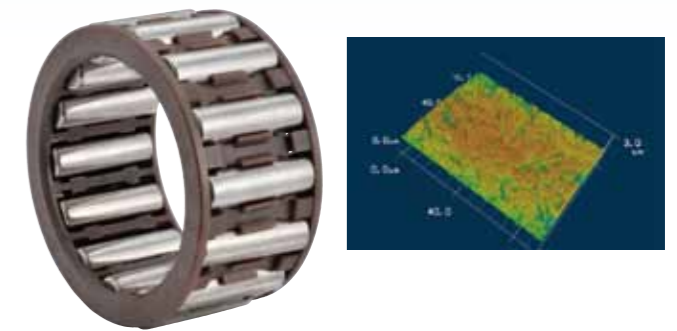
### Special coating process

- Durability 3-fold 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 satisfy 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

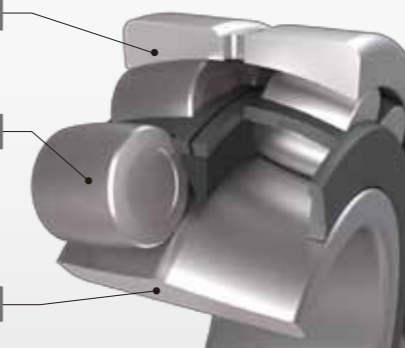
- JTEKT specification steel

#### 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

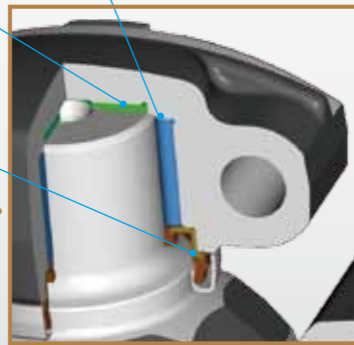
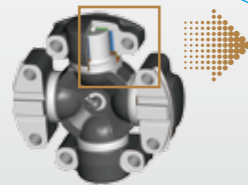
Greasing interval increased **10-fold**

#### Thrust washer (PA66+GF)

Abrasion resistance improved by adding glass fiber

#### Oil seal

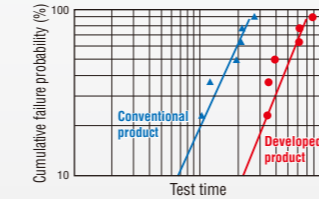
Seal lip from double to triple, and the optimization of the shape and position



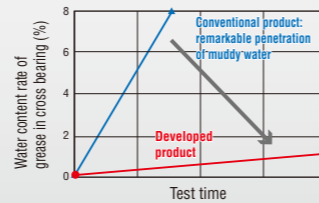
#### Roller

Reduction of contact stress by length up and crowning optimization

#### Cross bearing life test results



#### Cross bearing muddy water resistance test results



## Oil seal

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



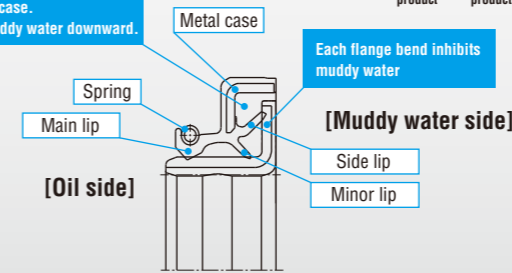
### Muddy water resistance technology

Lip wear width **reduced 60%**

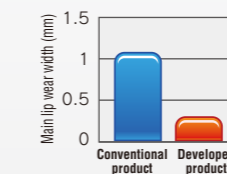
#### Features

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

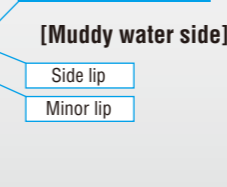
Tub formed using side lip and metal case. Directs muddy water downward.



#### Muddy water resistance performance results using actual car



#### Each flange bend inhibits muddy water



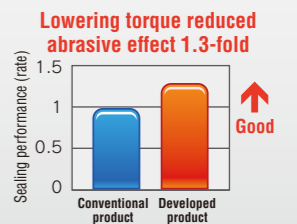
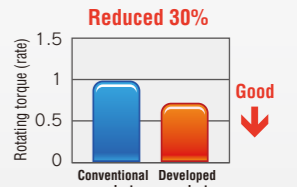
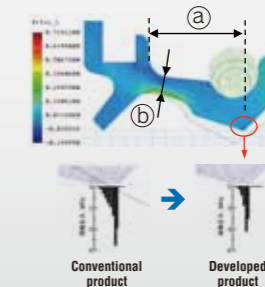
### Low-torque technology

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

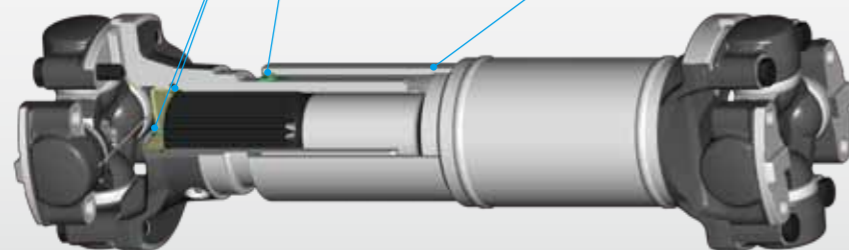


### Spline seal structure of muddy water resistance improvement

Muddy water resistance improved **5-fold**

#### Vent (dedicated to exhaust)/O ring

Prevent suction of muddy water when spline sliding



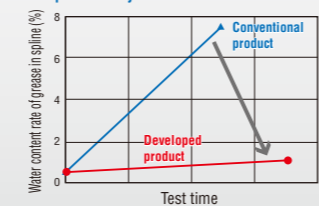
#### Oil seal

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

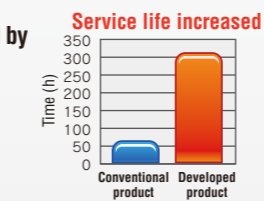


### Sealing performance improvement technology

Service life increased **5-fold**

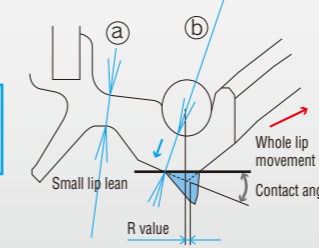
#### Features

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



#### Design optimization

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



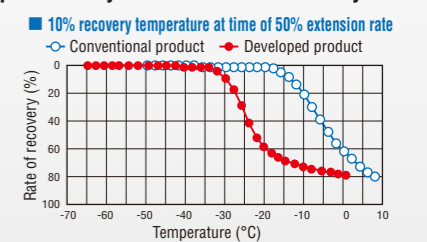
### Low temperature technology

Low temperature performance improved **2-fold**

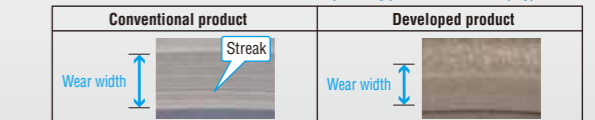
#### Features

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

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



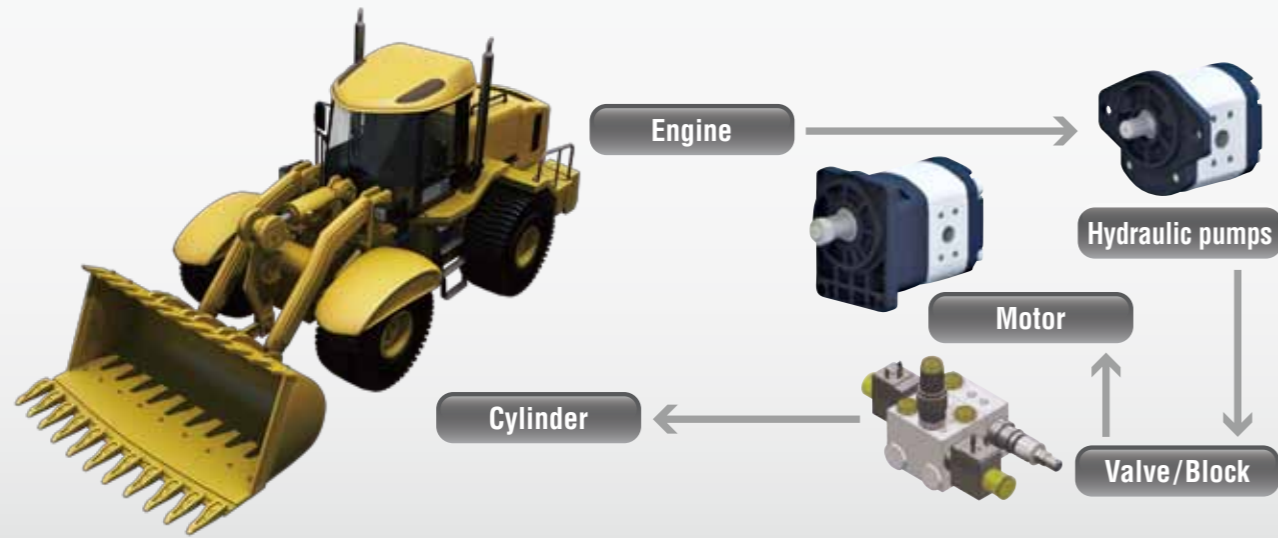
#### Rubber material abrasion characteristics Lip sliding part after abrasion (dry) test



## Hydraulic Components



With a standard lineup by highly efficient external gear pump technologies, JTEKT hydraulic systems are built to respond to customer's requirements and specific needs.



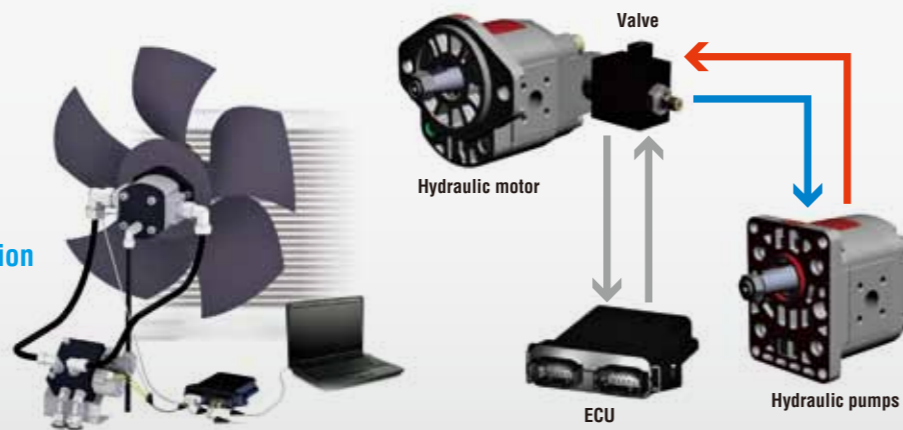
## Cooling fan system with hydraulic motor control (HMC)

(HMC system)

Hydraulic control of fan speed ensures optimized cooling conditions for the engine and radiator.

### Features

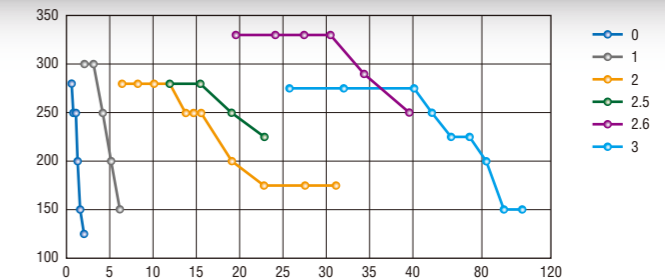
- Fuel consumption reduced
- Low noise
- On-demand cooling possible by setting various parameters
- Downsizing and Weight reduction
- Fan-stop and Reverse function



## Hydraulic (external gear) pump/motor lineup

	Model	Basic Displacement	Max. Pressure	
Hydraulic (external gear) pumps	6 series 43 models	0.25-100cc/rev	33Mp	Series 0 Series 1 Series 2 & 2.5 Series 2.6 Series 3
Hydraulic (external gear) motors	4 series 29 models	0.25-100cc/rev	25Mp	Series 0 Series 1 Series 2 & 2.5 Series 3

With a basic displacement of 0.25-100cc/rev and maximum operating pressure of up to 33MPa, wide-range products can be provided to customer's needs.



## Electric pump set/power pack lineup

	Model	Flow Rate	Output Power	
Electric pump set (Micro/Mini)	DC Type	0.4-25 L/min	400-4000 W	
	AC Type	1-25 L/min	550-4000 W	
Power pack (Micro/Mini)	DC Type	0.4-25 L/min	400-4000 W	
	AC Type	0.4-25 L/min	550-4000 W	

## Valve/Block lineup

Valve	Pilot poppet Solenoid valves		Spool solenoid valves	
Block	BAF Associative Function Blocks for in-Line mounting		MBS Modular Block System	

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



Global Technical support



Europe (5 bases)



China / Southeast Asia (2 bases)



Japan (4 bases)



Americas (2 bases)

■ European Region

- The Netherlands (Almere)
- Germany (Munich)
- Germany (Künsebeck)
- France (Colmar)
- The Czech (Brno)

■ ASEAN Region

- China (WUXI)
- Thailand (Bangkok)

■ JAPAN Region

- W-TEC (Osaka)
- C-TEC (Aichi)
- T-TEC (Kanagawa)
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■ North America Region

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## Value & Technology



**JTEKT**

**Koyo** | **TOYODA**

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