

Koyo[®]

The 3rd generation
BALL HUB UNITS

JTEKT

JTEKT CORPORATION

CAT.NO.B1004E

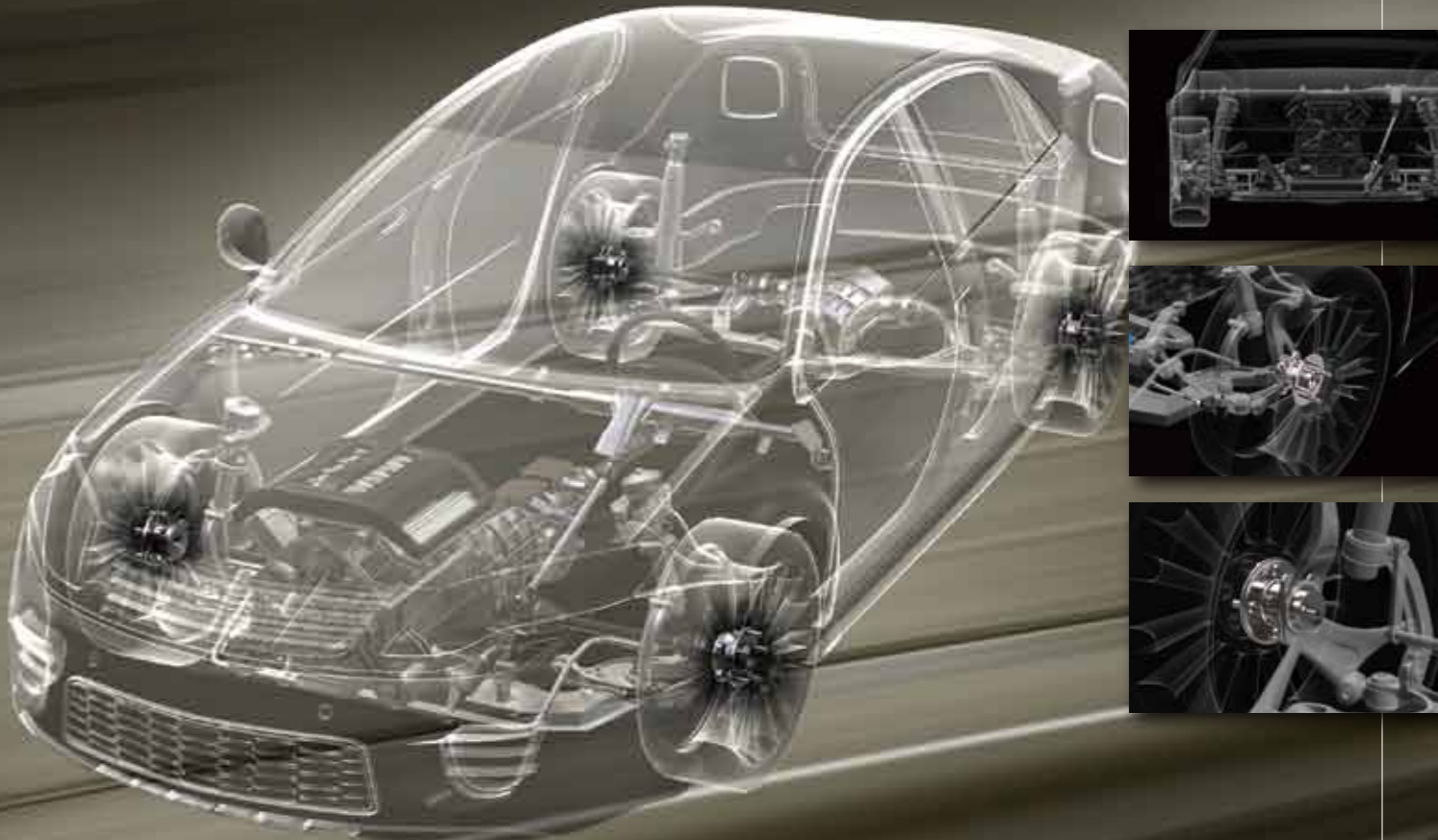
Refined Technologies and Products for Roads Worldwide Market leading and environment-friendly hub units contributing to vehicle performance and safety on roads worldwide

Hub Units - What they are and how they work

Hub units are wheel bearings combined with various peripheral parts, which in a single component play a vital role in supporting vehicle motion. JTEKT produces two types, both of which feature high precision and durability: one supports vehicle weight while delivering smooth rotation, and the other does that as well as assisting in the transmission of the driving force from the engine to the wheel. Beginning with the consideration of the car's overall construction to the environmental impact of our manufacturing techniques, JTEKT hub units are built to be lightweight with low rotating friction to enhance fuel efficiency, while maintaining the strength and rigidity that ensures optimal driving performance.

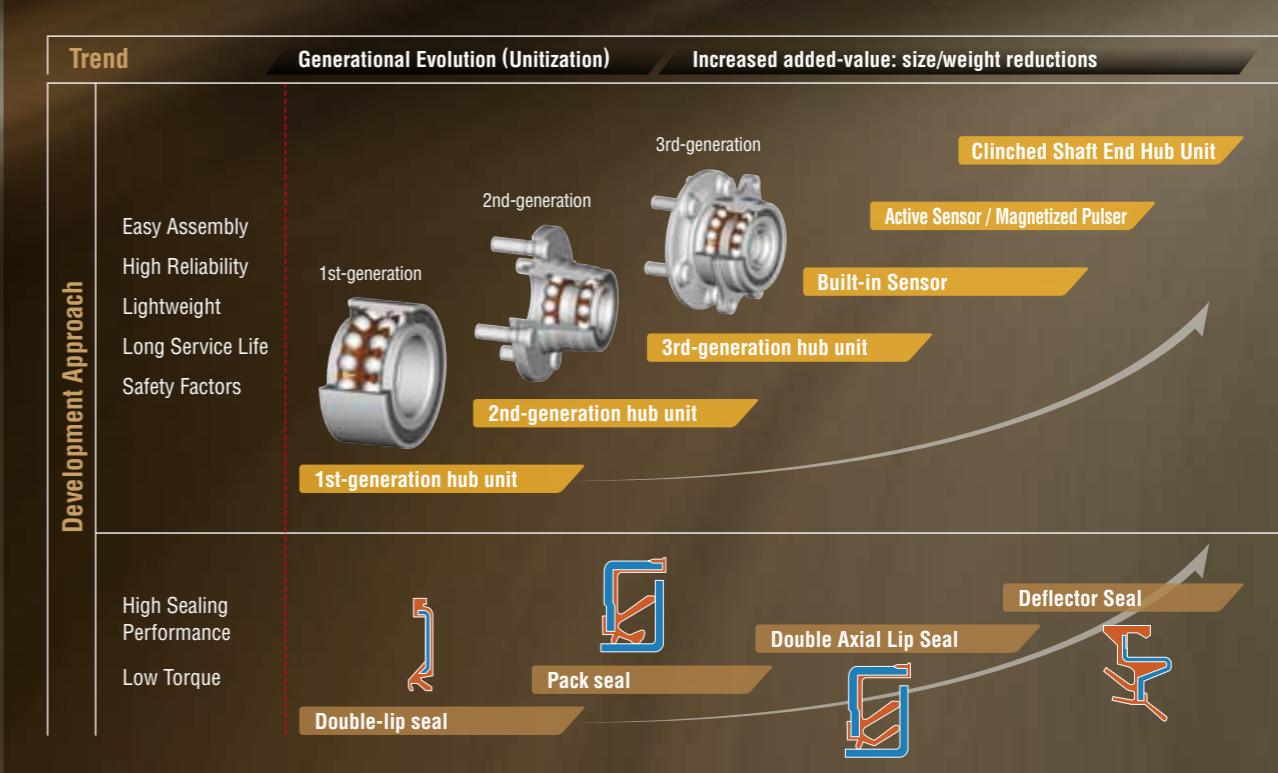
The 3rd generation

BALL HUB UNITS



JTEKT hub units have evolved from the conventional 1st-generation design to the current advanced 3rd-generation configuration, which we most recommend to customers, by integrating flanges that facilitate their installation to vehicles.

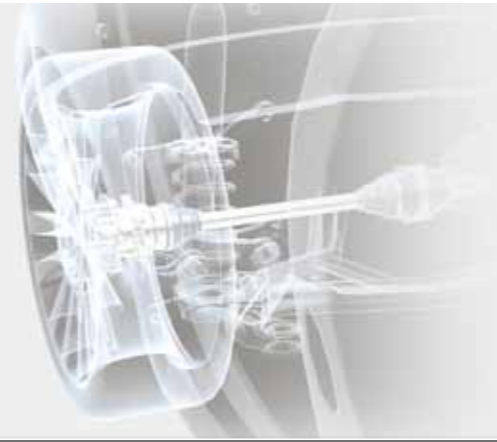
1st-generation: Two single rows integrated into a double-row unit 2nd-generation: Integrated one flange on outer ring 3rd-generation: Also inner ring integrated with flange



In parallel with the evolution of automobiles, JTEKT hub units have been widely adopted by not only automotive manufacturers in Japan, but manufacturers around the world.

JTEKT Hub Units Support Vehicles on Every Road around the World

Eco-friendly measures taken at all stages
— from initial design to manufacturing to daily driving



Hub Unit Recommendations

Features / Selection

- Fuel Efficiency / Performance** Simultaneous achievement of weight reduction (= fuel efficiency) and increased strength/rigidity (= driving performance) at a high level
- High Reliability** High reliability ensured, even in severe environments such as driving on muddy roads
- High Capacity** High-capacity bearing design enabled by maximizing the use of allowable space
- Recommended set-up** Recommended specifications are set according to vehicle segment (axle load)

Recommended hub units according to axle load

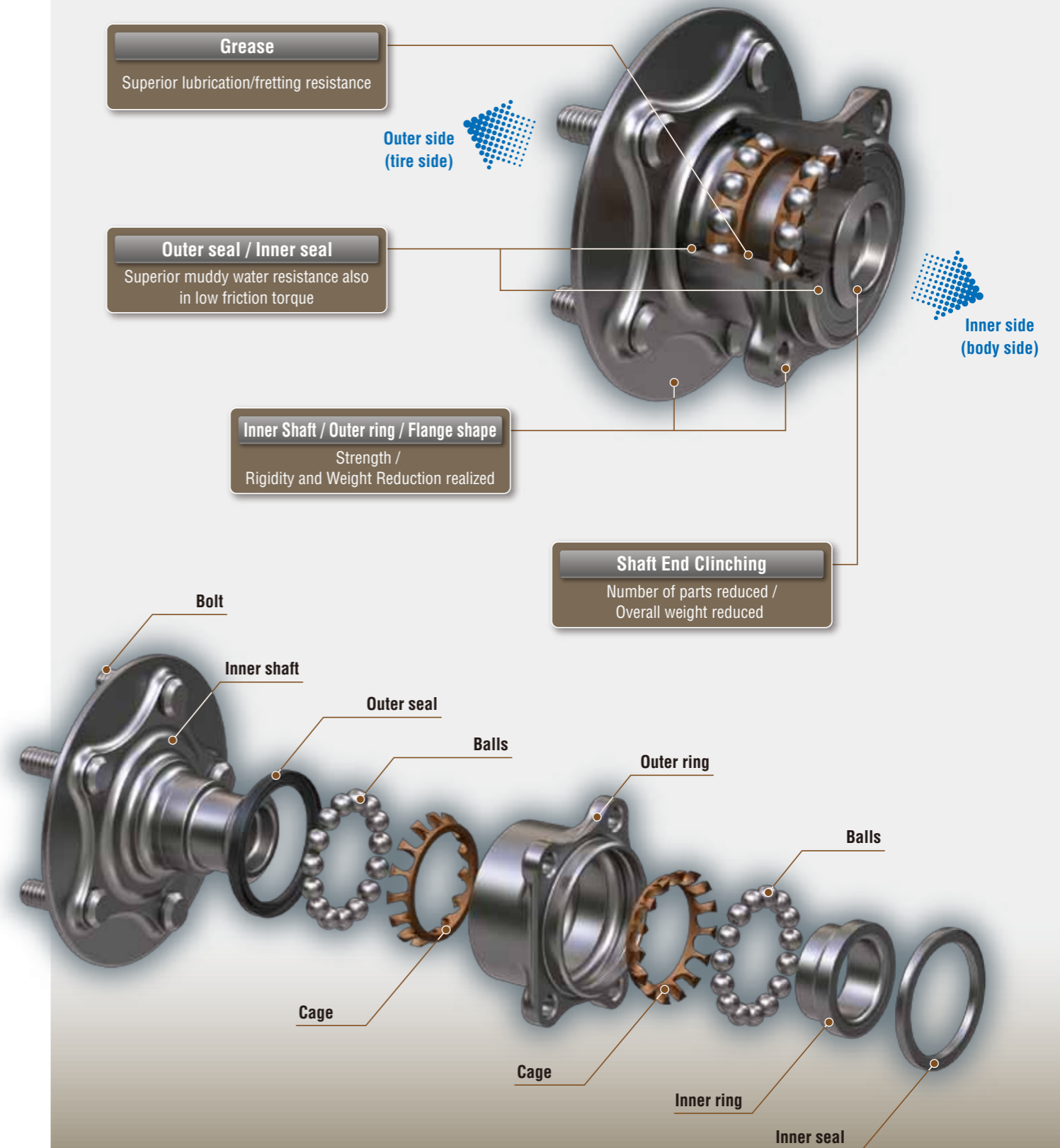
Axle load [kN]	3	4	5	6	7	8	9	10	11	12	13
Driving wheel	① 3DACF032D-1	② 3DACF035D-4	③ 3DACF038D-15	④ 3DACF038D-33	⑤ 3DACF041D-3	⑥ 3DACF044D-10					
Driven wheel	① 3DACF022F-1	② 3DACF023F-2	③ 3DACF026F-52	④ 3DACF027F-12	⑤ 3DACF031F-1	⑥ 3DACF033F-7					
Vehicle class	UA / A 	B 	C 	D 	E 	F 	SUV / P-UP 				

*Please use this table together with "Recommended hub unit numbers" on pages 9 and 10.

- Modifications** The flange design can be modified to suit installations to customer's vehicles

3rd-generation evolution

Structure *Example: Hub unit for driving wheel



Materials Selection

Properties required for bearing ring / ball materials

High Reliability

Excellent rolling fatigue life

High Abrasion Resistance



JTEKT Hub Unit Materials

Use for hub unit bearings/structural parts ○: Yes --: No

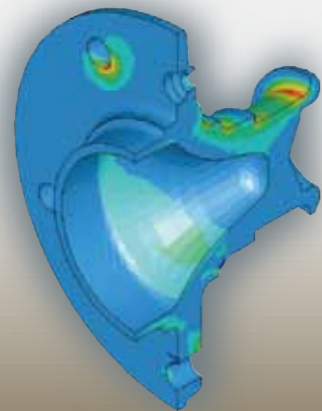
	Outer ring	Inner ring	Inner shaft	Ball	
Carbon steels for machine structural use	○	--	○	--	Carbon steel with good forging performance and high-frequency quenching of races. High-quality material with low non-metallic inclusions and superior characteristics not only in rolling fatigue service life, but also rotation bend fatigue strength and impact resistance.
High carbon chromium bearing steels	○ <small>1st generation</small>	○	--	○	Most commonly used material for standard bearings; high quality with low non-metallic inclusions.

Inner Shaft / Outer Ring / Flange Shape

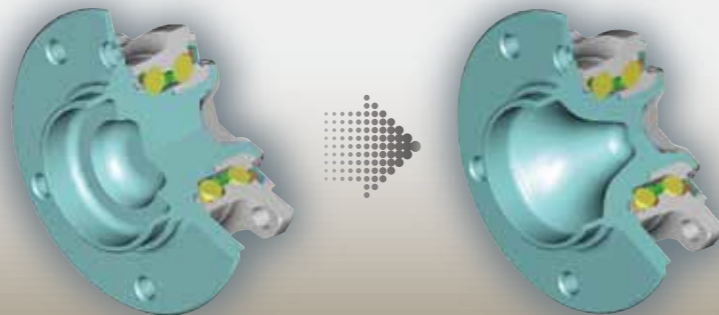
CAE analysis is used to obtain a design that achieves both of the seemingly contradictory goals of increased strength / rigidity and reduced weight.

Theoretical results are then verified with actual use on an original and rigorous test course developed by JTEKT.

[Example of inner shaft analysis]



[Example of assembled unit weight reduction]



Grease

Grease is injected into the hub unit as a lubricant to maintain bearing function.

As standard, JTEKT uses grease with superior quick-acting lubricating performance and superior fretting resistance.

	Grease Service Life	Fretting Resistance	Seizure Resistance	Low friction torque	Operating Temperature Range
Conventional Product	★	★	★	★	0~150°C
Mineral-oil Urea Grease (standard)	★★★	★★★	★★★	★★★	-30~150°C

Outer Seal / Inner Seal

The seals are among the most important components supporting hub unit functions and their technical performance continues to increase in keeping with the evolution of the hub unit.

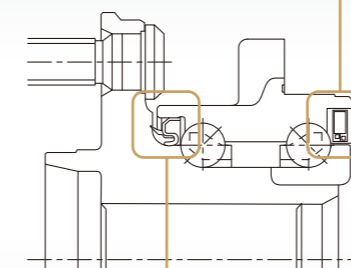
JTEKT seals ensure low friction torque and superior muddy water resistance.

Structural map of assembly

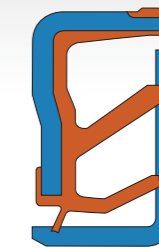
Standard product

Low-torque spec. product

Inner Side (Body Side)
Inner seal used here

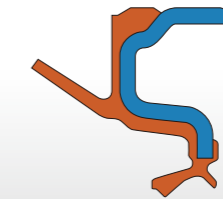


Reduce torque : **Reduced 30%**
Muddy Water Resistance : **1.4-fold**
※ Compared to standard product

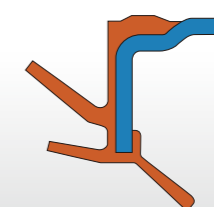


Deflector Seal
Simultaneous low friction torque and highly reliability, with excellent resistance to muddy water, environmental conditions (NaCl) and extremely low temperatures

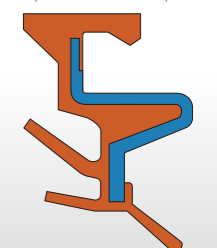
Outer Side (Tire Side)
Outer seal used here



Reduce torque : **Reduced 30%**
Muddy Water Resistance : **1.4-fold**
※ Compared to standard product



Reduce torque : **Reduced 50%**
Muddy Water Resistance : **5-fold**
※ Compared to standard product



Number of Parts Reduced /
Weight Reduced

Shaft End Clinching

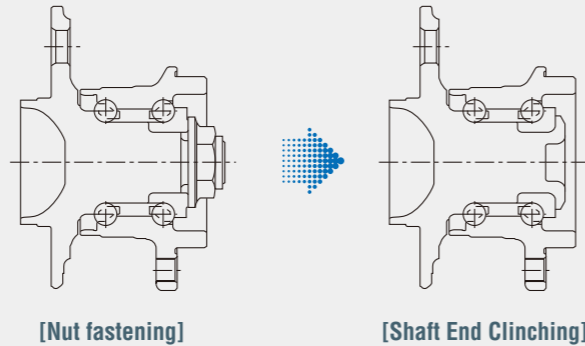
Fixed inner ring configuration proposed for 3rd-generation hub unit.

Hub Unit for Non-Driven Wheel

→ Compared to the conventional nut fastening method, clinching the shaft end provides weight- and space-saving benefits.

Hub unit for Driven Wheel

→ In addition to weight- and space-saving benefits, the need for torque management (axial force) of nut fastening at the time of installing unit in the vehicle is eliminated, thereby simplifying assembly.



Assembly work simplified

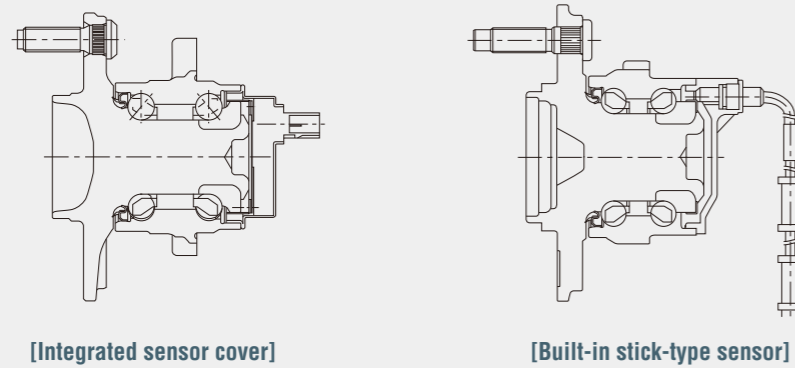
ABS Sensor (option)

JTEKT 3rd-generation hub units with built-in ABS sensor and magnetized pulser provide the following benefits.

Space savings

Controlled air gap for magnetized pulser and sensor

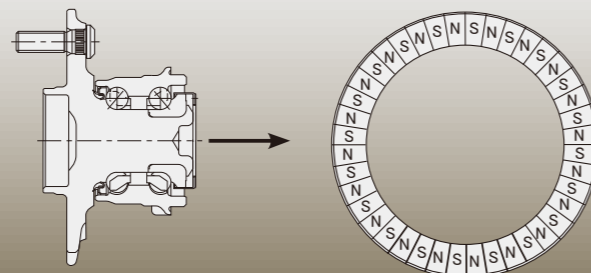
Adhesion of foreign substances prevented; high ABS signal reliability



Magnetized pulser

Changes in magnetic flux density accompanying wheel rotation are detected by a sensor and converted to wheel rpm.

The magnetized pulser is a multipolar magnet applied to a pulser ring: a rubber composite is filled with magnetic material and then segments are alternately magnetized with North and South poles, taking the bearing rotation shaft as the point of origin. Using the magnetized pulser enables more reliable detection of wheel speed.



Global Technical Support (Bearing Development Bases)



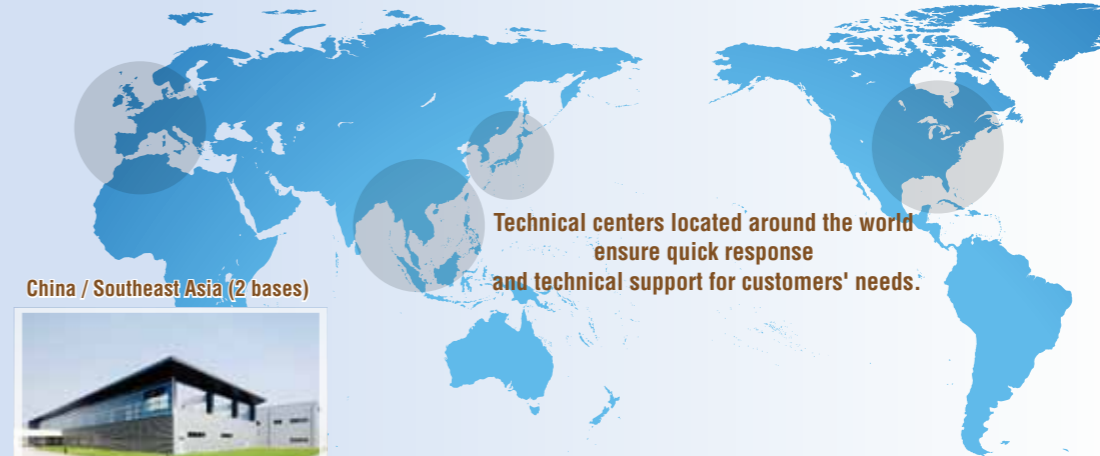
Europe (5 bases)



Japan (4 bases)



Americas (2 bases)



China / Southeast Asia (2 bases)



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.

A Straight-line Course



B Winding Course



JTEKT Iga Proving Ground

- Site area: 500,000m²
- Course area: 170,000m²
- Combined circuit length: 2,200m
- Dynamics pad area: 54,000m²

D Fording Course



E Dynamics Pad



F Noise Evaluation Course



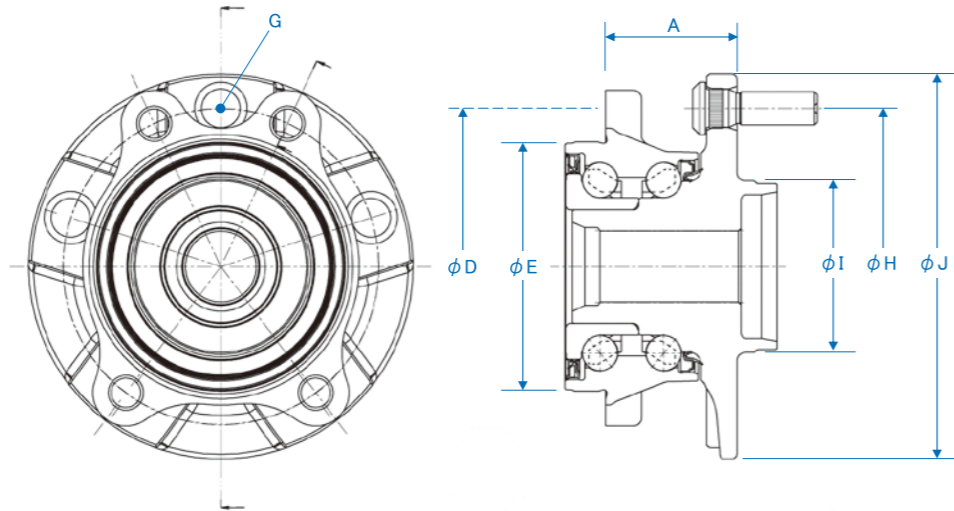
C Administration / Maintenance Building



Recommended hub unit Numbers

Hub Unit List

For Driving Wheel



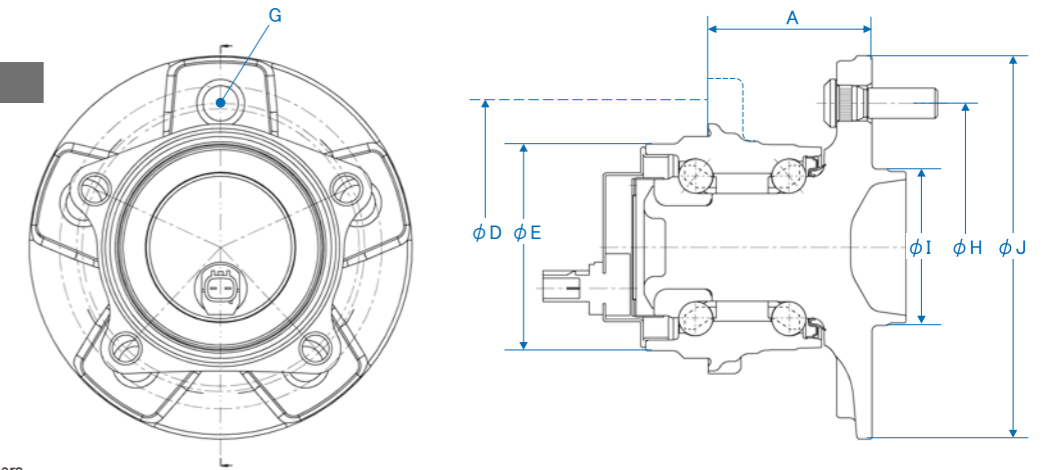
Recommended hub unit Numbers

Type	JTEK Recommended model	Basic hub unit No.	Basic Installation Specifications						
			A: Unit Width	Vehicle-side Installation Dimensions		Wheel-side Installation Dimensions			
				D: Installation Hole P.C.D.	E: Spigot Outer Diameter	G: No. of bolts	H: Hub Bolt P.C.D.	I: Spigot Outer Diameter	J: Flange Outer Diameter
Driving Wheel	①	3DACF032D-1	59.4	92	63	4	100	61	136
	②	3DACF035D-4	38.4	93	70	4	100	60	120
		3DACF037D-14	60	95	74	5	100	55	135
		3DACF037D-2	72	110	84	5	114.3	62	152
		3DACF037D-4	60	95	74	4	100	55	135
		3DACF037D-8	69	110	84	5	114.3	62	152
		3DACF037D-9	66	95	74	5	100	55	135
		3DACF038D-1	69	106	84	5	114.3	62	152
	③	3DACF038D-15	47	109	84	5	100	55	125
	④	3DACF038D-33	43.2	115.5	79.4	5	100	55	125
		3DACF038DB-2	42	103	78	5	100	55	125
	⑤	3DACF041D-3	47.5	114	90	5	114.3	62	139
		3DACF041D-6	65	110	87	5	114.3	62	152
	⑥	3DACF044D-10	47.5	114	90	5	114.3	62	139
		3DACF044D-14	68.9	112.5	87.4	5	120	62	158
		3DACF044D-16	67.5	109.8	84	5	114.3	62	154
		3DACF044D-9	67.5	109.8	84	5	114.3	62	154
		3DACF044DC	67.5	112	84	5	114.3	62	154

※ For dimensions not listed, please contact us.

Hub Unit List

For Driven Wheel



Recommended hub unit Numbers

Type	JTEK Recommended model	Basic hub unit No.	Basic Installation Specifications						
			A: Unit Width	Vehicle-side Installation Dimensions		Wheel-side Installation Dimensions			
				D: Installation Hole P.C.D.	E: Spigot Outer Diameter	G: No. of bolts	H: Hub Bolt P.C.D.	I: Spigot Outer Diameter	J: Flange Outer Diameter
Driven Wheel	①	3 DACF 022 F-1	52.5	82	56	4	100	55	133
	②	3 DACF 023 F-2	55.5	92	67	4	100	55	135
		3 DACF 026 F-15	74.5	99	74	5	114.3	62	152
		3 DACF 026 F-16	74.5	99	74	5	114.3	62	152
		3 DACF 026 F-17	69	106	84	5	114.3	62	152
		3 DACF 026 F-20	54.5	93	74	4	100	55	135
		3 DACF 026 F-23	54.5	92	67	4	100	55	135
		3 DACF 026 F-23	54.5	92	67	4	100	55	135
		3 DACF 026 F-24	60	95	74	4	100	55	135
		3 DACF 026 F-37	60	95	74	5	100	55	135
		3 DACF 026 F-39	60	95	74	4	100	55	135
		3 DACF 026 F-47	60	95	74	5	100	55	135
	③	3 DACF 026 F-52	60	95	74	4	100	55	135
		3 DACF 026 F-6	55.5	92	67	4	100	55	125
		3 DACF 026 F-7	54.5	93	74	4	100	55	135
		3 DACF 027 F-10	54.5	93	74	5	100	55	135
		3 DACF 027 F-11	60	95	74	5	114.3	62	152
	④	3 DACF 027 F-12	60	97	76	5	114.3	62	152
		3 DACF 027 F-13	60	99	74	5	100	55	135
		3 DACF 027 F-14	65	112	74	5	114.3	62	150
		3 DACF 027 F-15	65	112	74	5	114.3	62	150
		3 DACF 027 F-19	64	95	74	5	114.3	62	152
		3 DACF 027 F-26	57	102	74	5	114.3	62	140
		3 DACF 027 F-28	60	97	76	5	100	55	135
		3 DACF 027 F-29	74.5	99	74	5	114.3	62	152
		3 DACF 027 F-30	67.5	99	74	5	114.3	62	152
		3 DACF 027 F-8	55	112	74	5	114.3	62	140
	⑤	3 DACF 031 F-1	42	110	78	5	120	62	158
	⑥	3 DACF 033 F-7	65	110	87	5	114.3	62	152

※ For dimensions not listed, please contact us.

The 3rd generation

BALL HUB UNITS

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Value & Technology



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