

KS

KOREAN INDUSTRIAL STANDARD

Bicycles-Hubs

KS R 8023 : 1998

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Bicycles-Hubs

1. Scope

This Korean Industrial Standard specifies hubs to be used for bicycles for general use and bicycles for young children defined in **KS R 8002**.

Remark The units and numerical values given in { } in this standard are in accordance with the conventional unit system.

2. Normative References

The standards given in the Attached Table contain provisions which, through reference in this text, constitute provisions of this standard. The most recent editions of the standards shall be applied.

3. Classification

Hubs shall be classified by its usage as given in Table 1.

Table 1. Classification of Hubs

Classification	Usage	No. of Attached Fig.
Ordinary front hub	For front wheel	1 a)
Front quick release hub		2 a)
Front brake hub		3 a)
Hub dynamo ⁽¹⁾		7
Ordinary rear hub	For rear wheel	1 b)
Rear quick release hub		2 b)
Rear brake hub		3 b)
Hub gear		4
Unit hub		5
Coaster brake hub		6

Note ⁽¹⁾ A hub combined electricity generating function.

4. Names of Parts

Names of parts and examples of materials mainly used are shown in Attached Figs. 1 to 7.

5. Strength

- a) For the hubs of which any parts are integrated by joining or pressed fit, each connection shall withstand torque of not less than $10 \text{ N} \cdot \text{m}$ ($100 \text{ kgf} \cdot \text{cm}$) for ordinary front hub or $35 \text{ N} \cdot \text{m}$ ($350 \text{ kgf} \cdot \text{cm}$) for other hubs. this should not apply to those of hub cups.
- b) The strength of control cables used for brake hub and for hub gear shall be in accordance with the provisions of **KS R 8017** and **KS R 8045** respectively.
- c) For a hub gear, coaster brake hub and unit hub, when fixing the hub shall at the flanges, a torque of $200 \text{ N} \cdot \text{m}$ ($2000 \text{ kgf} \cdot \text{cm}$) ($100 \text{ N} \cdot \text{m}$ ($1000 \text{ kgf} \cdot \text{cm}$) for young children use) is applied on the driver, outer ring or combined hub cog⁽²⁾ in the driving direction, there shall be no fracture of any part. As to one having combined hub cog of less than 20 teeth, fixing the hub shall at the flanges, a chain engaged with the hub cog shall be pulled by a force of 5 kN (500 kgf) (2 kN (200 kgf) for young children use)) in the driving direction.

The hub gear shall comply with these regulations at every ratio of transmission.

Note ⁽²⁾ A component integrated an outer ring and a hub cog.

- d) For a coaster brake hub, when the hub axle and the brake arm are fixed respectively, and a torque of $150 \text{ N} \cdot \text{m}$ ($1500 \text{ kgf} \cdot \text{cm}$) is applied on the driver in the driving direction, there shall be no fractures on the braking part or the like.
- e) For a quick release hub, when operating the camlever on the locking position, a operation force of 250 N (25 kgf) is applied at a point of 5 mm from the tip end of camlever in the closing direction, there shall be no fractures or visible permanent deformation of any part.

6. Hardness

The hardness of each part of hubs shall be as given in Table 2.

Table 2.

Parts or portion	Hardness
Ball race of hub cone ⁽³⁾	HRC 52 min.
Pawl of hub gear and unit hub	HRA 75 min.
Ball race of hub cup or corresponding part ⁽³⁾	HRA 72 min.
Ball race of outer ring combined hub cog	HRA 65 min.
Tooth of combined hub cog	HRA 70 min.
Ratchet part, annulus, sun gear and planet pinion of hub gear	HRA 72 min.
Clutch cone, brake cone, screw cone and brake holder of coaster hub brake	
Ratchet part of outer ring and combined hub cog	
hub flange	HRC 35 max.

Note ⁽³⁾ Those using roller bearing units shall be according to KS B 2016.

7. Performance

- a) The rotation of hubs shall be smooth, and there shall be no visible plays between the hub axle and the hub shell.
- b) The vertical run-out at the flange periphery and the lateral run-out at a position between the flange periphery and spoke hole, measured while fixing the hub axle, and the hub shall is rotated, shall be as given in Table 3.

Table 3.

Unit : mm

Classification	Vertical run-out	Lateral run-out
Brake hub	0.8 max. ⁽⁴⁾	0.6 max.
Hub gear and hub dynamo ⁽⁵⁾	0.6 max.	0.6 max.
Other hubs	0.3 max.	0.5 max.

Notes ⁽⁴⁾ Vertical run-out at the flange periphery of brake drum.

⁽⁵⁾ Excepting those non-ferrous casting of not machined surface.

- c) For rear hubs having freewheel assembling threads or brake assembling threads, the vertical run-out and lateral run-out measured as shown in Fig. 1, shall not exceed 0.3 mm at the measuring portions respectively.

Unit : mm

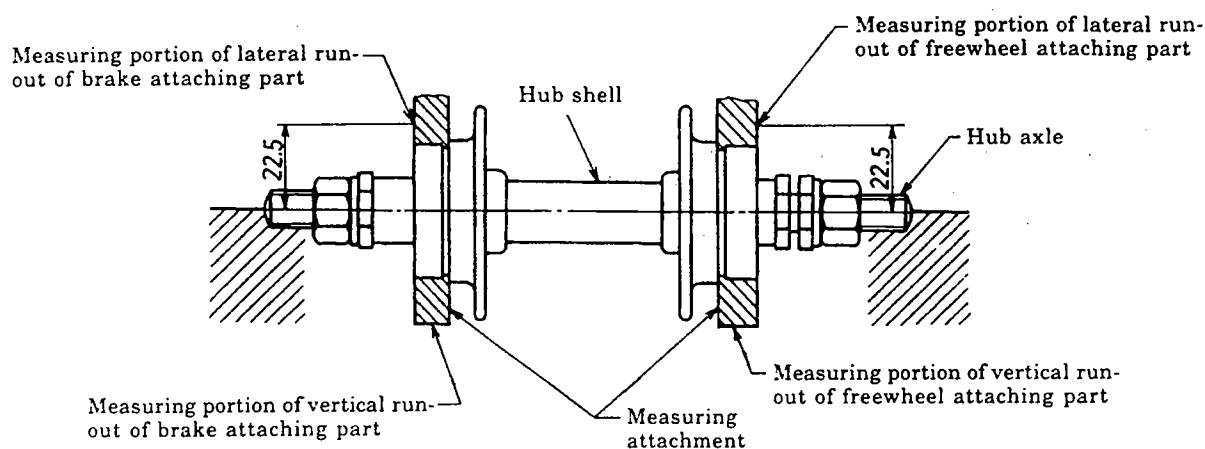


Fig.1 Run-Outs Measuring of Freewheel Attaching and Brake Attaching Parts

- d) The run-out of each part shall be as given in Table 4 for the unit hub, and Table 5 for the hub gear and the coaster brake hub.

Table 4. Run-Out Tolerances of Outer Ring and Combined Hub Cog of Unit Hub

Unit : mm

Division		Measuring portion	Fixing hub axle and hub shell, rotate outer ring or combined hub cog		Fixing hub axle, rotate hub shell, with outer ring or combined hub cog		Sum of both measured values	
			Lateral run-out	Vertical run-out	Lateral run-out	Vertical run-out	Lateral run-out	Vertical run-out
Outer ring	With hub cog	Tooth bottom part	0.3 max.	0.4 max.	0.3 max.	0.4 max.	0.5 max.	0.7 max.
	Without hub cog	The portion shown in Fig 2						
Combined hub cog		Tooth bottom part	0.4 max.		0.4 max.	0.3 max.	0.7 max.	0.6 max.

Unit : mm

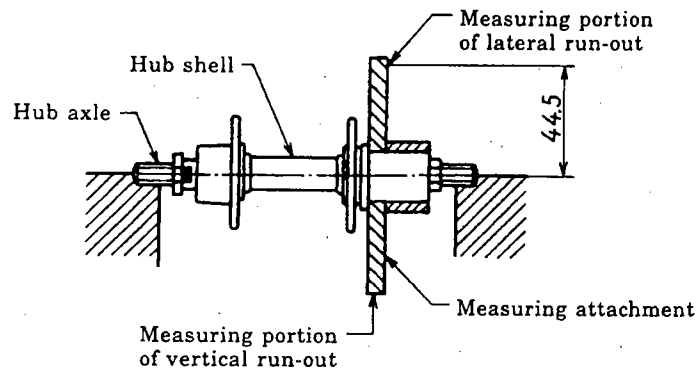


Fig.2 Run-Out Measuring of Outer Ring

Table 5. Run-Out Tolerances of Driver of Hub Gear and Coaster Brake Hub

Unit : mm

Division		Measuring portion	Lateral run-out	Vertical run-out
Driver	With hub cog	Tooth bottom part	0.4 max.	0.4 max.
	Without hub cog	The portion shown in Fig 3.		

Remark The run-outs shall be measured attaching a measuring attachment on the driver without hub cog, while fixing the hub axle, rotate the hub cog or the measuring attachment along with the hub shell. For the coaster brake hub, these shall be, fixing the hub axle, rotating in the driving direction.

Unit : mm

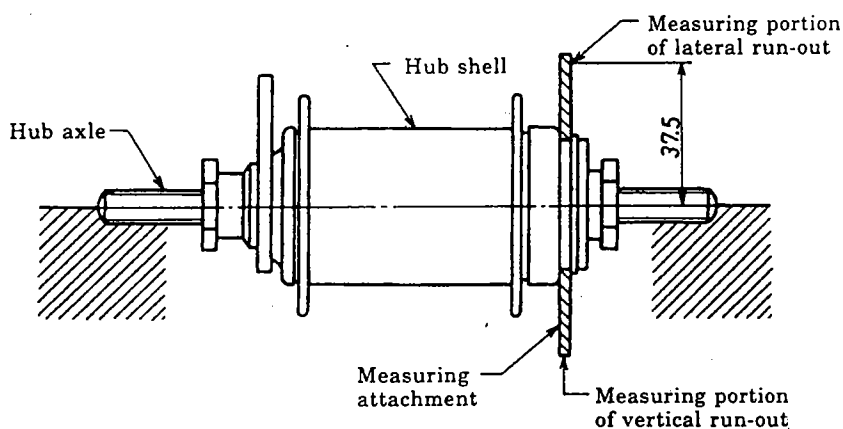


Fig.3 Measuring of Driver Run-Out

- e) Coaxial difference between the outer circumference axis and the thread hole axis of hub cone, measure as shown in fig. 4, shall not exceed 0.3 mm.

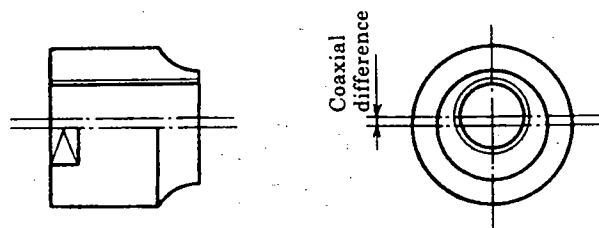


Fig.4 Coaxial Difference between Outer Circumference Axis and Thread Hole Axis of Hub Cone

- f) For rear hubs, when the hub axle is fixed, and the hub body, loaded with a mass of 120 kg, is rotated for 40000 revolutions at a rate of 250 cycles per minute, there shall be no flaking, visible wearing or other harmful defects on the ball races or other parts contacting surfaces.
- g) For a unit hub, when the inner ring or hub shall is fixed, and the outer ring or combined hub cog is rotated for 50000 revolutions at a rate of 250 cycles per minute, there shall be no glossiness not less than 25 % of the steel ball diameter, depression, or other harmful defects on the ball races.
- h) Breaking function of coaster brake hub shall commence to be effective within $\frac{1}{3}$ of opposite turning of the driver and be released by turning in driving direction.
- i) The free play of unit hub measured at the side face of hub cog tooth bottom, when the hub shall is fixed and the hub cog is moved by a force in the axial direction, shall not exceed 0.3 mm. For one without hub cog, the measurement shall be taken at 30 mm in radius of the hub.
- j) Performance of the quick release hub shall be as follows. In those cases, the camlever operation force shall be applied at a point of 5 mm from the tip end.
- 1) For fixing a wheel to the frame by closing of the camlever, the operation force required to obtain a suitable wheel retention shall be 200 N {20 kgf} or less.
 - 2) The wheel to frame retentions of front and rear wheels with quick release hubs shall be in accordance with 5.5.5 of **KS R 8008**. The measurement of the wheel retention may be alternated to a measurement of the operation force of the camlever locking under the agreement between the parties concerned with delivery.
 - 3) The operation force of the camlever in locking position required for releasing the wheel clamping shall be not less than 50 N {5 kgf}.

8. Construction

- a) Spoke holes on the right and left flanges shall be located as alternatively deviated

each half pitch. However, any suitable deviation may be taken according to type or size of the flange or shape of the spoke hole

- b) The spoke holes shall be chamfered, excepting on non-ferrous made.
- c) The hub gear shall be capable of gear shifting securely and actuating smoothly in an assembly as use.
- d) The coaster brake hub, in an assembly as using, shall comply with the specifications for braking performance of **KS R 8008** or **KS R 8043**.
- e) The brake hub shall have a construction to comply with the specifications for performance of brakes working on hub part of **KS R 8017**.
- f) The performance and construction concerned electricity generating function of hub dynamo shall comply with the specifications of **KS C 8106**.
- g) For the hub with hub cog, a hub cog complying with the specifications of **KS R 8022** shall be used.
- h) Steel balls used for hubs shall be those which comply with the specifications of **KS B 2001** or **KS R 8013**.
- i) The quick release hub shall be adjustable to allow setting for correct tightness of wheel.

Further, the camlever shall have means that clearly indicate whether the mechanism is in the open or locked position.

9. Shape and Dimensions

Examples of shapes and principal dimensions are shown in Attached Figs. 1 to 6, and the dimensions of spoke holes in Table 6. Whereof dimensions without indication of tolerances are recommended dimensions.

The screw threads shall generally be in accordance with **KS B 0224**. Those according to **KS B 0201** or **KS B 0204** may be used, and the dimensional limits and tolerances shall generally be 6H • 6g specified in **KS B 0211** and **KS B 0214** or upward.

Further, the freewheel assembling threads shall be in accordance with Annex to **KS R 8022**. While BC 1.37 of **KS B 0224** may be used depending upon agreement between the parties concerned with delivery.

The brake assembling threads also may be used of Annex to **KS R 8022** depending upon agreement between the parties concerned with delivery.