

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS D 9302 : 2019

(JBPI/JSA)

Bicycles for young children

ICS 43.150;97.190

Reference number : **JIS D 9302 : 2019 (E)**

PROTECTED BY COPYRIGHT

 **Documents**
Document Sharing Hub

39 S

Date of Establishment: 1979-03-01

Date of Revision: 2019-02-20

Date of Public Notice in Official Gazette: 2019-02-20

Investigated by: Japanese Industrial Standards Committee

Standards Board for ISO area

Technical Committee on Consumer Life Products

JIS D 9302:2019, First English edition published in 2019-09

Translated and published by: Japanese Standards Association
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 2019

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

PROTECTED BY COPYRIGHT

Contents

	Page
Introduction	1
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Principal dimensions and components	2
4.1 Principal dimensions	2
4.2 Components	2
5 Safety (including performance, construction, and shape and dimensions)	3
5.1 General	3
5.2 Braking device	5
5.3 Steering	7
5.4 Body unit	9
5.5 Running device	9
5.6 Driving device	11
5.7 Seating device	12
5.8 Protective device	13
5.9 Standing device	14
5.10 Carriers	14
5.11 Reflex reflector	15
5.12 Warning device	16
5.13 Auxiliary device	16
6 Test methods	16
6.1 Test methods for brakes	16
6.2 Test methods for steering device	21
6.3 Test methods for body unit	26
6.4 Test methods for running device	32
6.5 Test methods for driving device	36
6.6 Test methods for seating device	39
6.7 Test of marking	41
7 Inspection	42
8 Marking	43
8.1 Marking on product	43
8.2 Durability of marking	43
9 Instruction manual	43
10 Product information for customers	46

Annex A (informative) Steering geometry 47

Annex B (informative) Verification of free fall velocity 48

Annex JA (normative) Interchangeable dimensions of bicycle parts 49

Annex JB (informative) Comparison table between JIS and corresponding
International Standard 67

Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Bicycle Promotion Institute (JBPI)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS D 9302:2008** is replaced with this Standard.

This **JIS** document is protected by the Copyright Law.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, applications for a patent after opening to the public or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, applications for a patent after opening to the public or utility model rights.

Blank

Bicycles for young children

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 8098:2014**, Edition 3, with some changes in the technical contents to reflect unique conditions in Japan including Japanese laws and regulations, as the **ISO** Standard explicitly states that requirements for bicycles for use on public roads are left to national regulations.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JB. Annex JA contains unique contents to **JIS** not given in the corresponding International Standard.

1 Scope

This Standard specifies requirements for bicycles for young children as defined in **JIS D 9111** (hereafter referred to as bicycles).

NOTE The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 8098:2014 *Cycles—Safety requirements for bicycles for young children* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standards and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

- JIS A 1481-2 *Determination of asbestos in building material products—Part 2: Sampling and qualitative analysis for judgement of existence of containing asbestos*
- JIS B 0205-1 *ISO general purpose metric screw threads—Part 1: Basic profile*
- JIS B 0205-2 *ISO general purpose metric screw threads—Part 2: General plan*
- JIS B 0205-3 *ISO general purpose metric screw threads—Part 3: Selected sizes for screws, bolts and nuts*
- JIS B 0205-4 *ISO general purpose metric screw threads—Part 4: Basic dimensions*
- JIS B 0209-1 *ISO general purpose metric screw threads—Tolerances—Part 1: Principles and basic data*
- JIS B 0209-2 *ISO general purpose metric screw threads—Tolerances—Part 2: Limits of sizes for general purpose external and internal screw threads—Medium quality*

JIS B 0209-3 *ISO general purpose metric screw threads—Tolerances—Part 3: Deviations for constructional screw threads*

JIS B 0225 *Cycles—Screw threads*

JIS D 9111 *Cycles—Classification, terminology and essential characteristics*

JIS D 9417 *Bicycles—Chains*

JIS D 9422 *Tire valves for bicycles*

JIS D 9451 *Bicycles—Bells*

JIS D 9452 *Cycles—Reflex reflectors*

NOTE Corresponding International Standard: ISO 6742-2:2015 *Cycles—Lighting and retro-reflective devices—Part 2: Retro-reflective devices* (MOD)

JIS D 9453 *Bicycles—Luggage carriers and stands*

NOTE Corresponding International Standard: ISO 11243:1994 *Cycles—Luggage carriers for bicycles—Concepts, classification and testing* (MOD)

JIS G 4303 *Stainless steel bars*

JIS R 6252 *Abrasive papers*

JIS R 6253 *Waterproof abrasive papers*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS D 9111**, and the following apply.

3.1

stabilizers

small removable auxiliary wheels fitted to both sides of the wheels to enable the rider to balance and to prevent falls

4 Principal dimensions and components

4.1 Principal dimensions

The length, width (including that of stabilizers) and maximum saddle height of bicycles shall be in accordance with Clause 4 of **JIS D 9111**.

4.2 Components

The components of the bicycle shall be as follows.

- a) The parts to constitute the bicycle shall be selected from Table 2 in **JIS D 9111** based on functional and safety needs.

Interchangeable dimensions of the bicycle parts are given in Annex JA.

- b) The parts used for bicycles shall be in accordance with the Japanese Industrial Standards given in Table 2 in **JIS D 9111**, or at least equivalent thereto in quality. When using those parts specified in the said table for which no Japanese Industrial Standard exists, it shall be ensured that they have a quality that satisfies the functional and safety requirements of the bicycle.

- | | |
|----|--|
| c) | The screw threads other than those specified in JIS B 0225 or Annex of JIS D 9422 shall be in accordance with JIS B 0205-1 to JIS B 0205-4 , and the tolerance class 6H/6g or finer as specified in JIS B 0209-1 to JIS B 0209-3 . |
|----|--|

5 Safety (including performance, construction, and shape and dimensions)

5.1 General

5.1.1 General test conditions

5.1.1.1 Definition of brake tests

Brake tests to which accuracy requirements apply, as in **5.1.1.4**, are those specified in **6.1.2** to **6.1.5**.

5.1.1.2 Definition of strength tests

Strength tests to which accuracy requirements apply, as in **5.1.1.4**, are those involving static, impact, or fatigue loading as specified in **6.1** to **6.6**.

5.1.1.3 Number and conditions of samples for strength tests

In general, for static, impact and fatigue tests, each test shall be conducted on a new test sample, but if only one sample is available, it is permissible to conduct all of the tests on the same sample with the sequence of testing being fatigue, static and impact.

When more than one test is conducted on the same sample, the test sequence shall be clearly recorded in the test report or record of testing. It should be noted that if more than one test is conducted on the same sample, earlier test can influence the results of subsequent tests. Also, if a sample fails when it has been subjected to more than one test, a direct comparison with single testing is not possible.

In all strength tests, specimens shall be in the fully finished condition.

It is permitted to carry out tests with dummy assemblies such as a fork or handlebar when carrying out frame or handlebar stem tests.

5.1.1.4 Tolerances for brake and strength tests

Unless stated otherwise, accuracy tolerances based on the nominal values shall be as follows:

— Forces and torques	$^{+5}_0 \%$
— Masses and weights	$\pm 1 \%$
— Dimensions	$\pm 1 \text{ mm}$
— Angles	$\pm 1^\circ$
— Time durations	$\pm 5 \text{ s}$
— Temperatures	$\pm 2^\circ \text{C}$
— Pressures	$\pm 5 \%$

5.1.1.5 General rules of fatigue tests

The force for fatigue tests is to be applied and released progressively, not to exceed 10 Hz. The tightness of fasteners according to manufacturer's recommended torque can be re-checked not later than 1 000 test cycles to allow for the initial settling of the component assembly. (This is considered applicable to all components, where fasteners are present for clamping.) The test bench shall be qualified to meet dynamic requirements of 5.1.1.4.

NOTE Examples of suitable methods are listed in **ASTM E467**.

5.1.1.6 General rules of impact tests

For all vertical impact test, the striker shall be guided in such a way that the efficiency will allow a value of at least 95 % of the free velocity.

NOTE See Annex B.

5.1.1.7 Plastic material test ambient temperature

All strength tests involving any plastic materials shall be pre-conditioned for two hours and tested at an ambient temperature of $23\text{ °C} \pm 5\text{ °C}$.

5.1.2 Sharp edges

Exposed edges that could come into contact with the rider's hands, legs etc., during normal riding or normal handling and normal maintenance shall not be sharp, e.g. deburred, broken, rolled or processed with comparable techniques. Further, the ends of brake levers, kickstand or other parts shall be rounded, or covered with a cap etc. not easily removable.

NOTE See **JIS B 0051**.

5.1.3 Protrusions

These requirements are intended to address the hazards associated with the users of bicycles falling on projections or rigid components (e.g. handlebars, levers) on a bicycle possibly causing internal injury or skin puncture.

Tubes and rigid components in the form of projections which constitute a puncture hazard to the rider should be protected. The size and shape of the end protection has not been stipulated, but an adequate shape shall be given to avoid puncturing of the body. Screw threads which constitute a puncture hazard shall be limited to a protrusion length of one major diameter of the screw beyond the internally threaded mating part (e.g. nut).

These requirements do not apply to structural or external protrusions provided for functional purposes, those for adjustment such as chain adjusters, or those covered with a cap etc.

5.1.4 Cables

For those brake cables or derailleur cables where the inner cable is protruding outside the casing, the cable end shall either be protected with a cap that shall withstand a removal force of 20 N or be otherwise treated to prevent unraveling.

5.1.5 Safety and strength of fasteners

5.1.5.1 Safety of screws

Any screws used to attach suspension mechanisms, generators, brake mechanisms and mudguards to the frame or the front fork shall be provided with suitable locking devices (e.g. spring washers, lock washers, lock nuts, nylon nuts and adhesives). Fitting screws for hub generators are exempt from this requirement. Fasteners used for fitting the hub brake or the disc brake should be heat resistant.

NOTE See **JIS B 1051** for mechanical properties of bolts.

5.1.5.2 Strength of screws

Screws for fastening the handlebar, handlebar stem, bar end, saddle and seat post shall not break when fastened with a torque 120 % of the recommended value of the manufacturer (maximum value if it is a recommended range) [see **9 k) 3)**].

5.1.6 Crack detection methods

Standardised methods should be used to emphasize the presence of cracks where visible cracks are specified as criteria of failure in tests specified in this Standard.

NOTE For example, suitable dye-penetrant methods are specified in **JIS Z 2343-1** to **JIS Z 2343-4**.

5.2 Braking device

5.2.1 Braking system

Bicycles shall be equipped with at least two independently actuated braking systems, one system operating on the front wheel and one on the rear. Brake-blocks containing asbestos shall not be permitted.

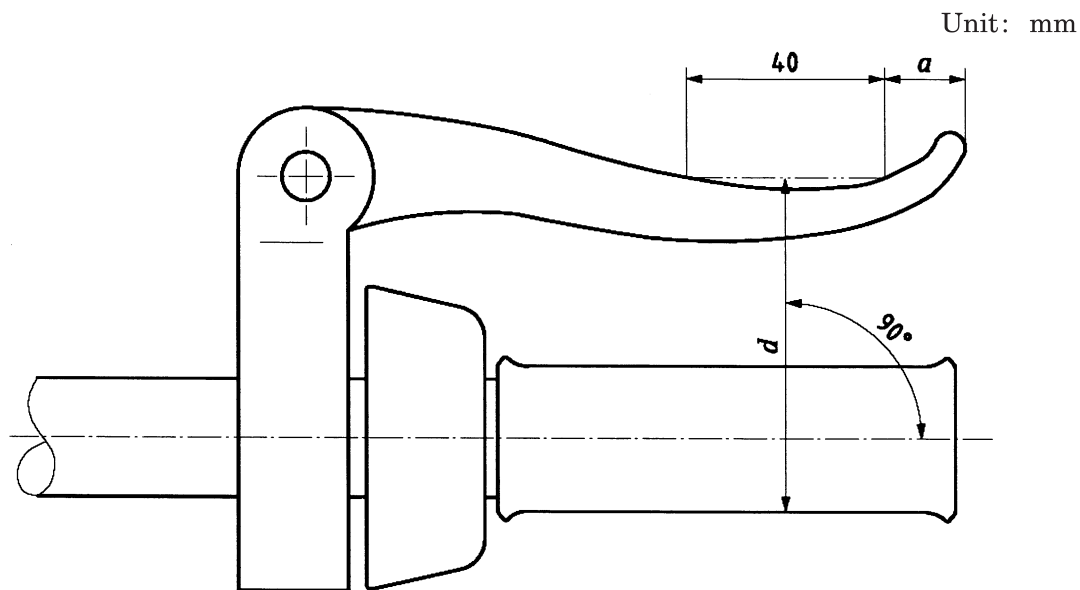
Asbestos content shall be determined as specified in Clause 7 of **JIS A 1481-2**.

5.2.2 Hand-operated brakes

The hand-operated brake shall be as follows.

- a) **Brake-lever position** Generally, the front brake lever shall be positioned on the right side of the handlebar and the rear brake lever, on the left side.
- b) **Brake-lever grip dimension** The distance d between the outer surfaces of the brake lever and the grip (or handlebar, or other covering), when measured in accordance with **6.1.1**, shall not exceed 75 mm over a minimum length of 40 mm as shown in Figure 1.

Adjustable brake levers may be adjusted to meet the specified dimension.



- a* distance between the last part of the lever intended for contact with the rider's fingers and the end of the lever
- d* brake-lever grip dimension

Figure 1 Brake-lever grip dimension

- c) **Attachment of friction material** The brake block, lining, etc. shall be securely attached to the brake block holder, brake lining shoe or the like, and when subjected to the rocking test in **6.1.3**, it shall not come off the holder, shoe, etc. or generate cracks. Further, after completion of the rocking test, the brake system shall meet the requirements in **5.2.4 a)** and **5.2.5 a)**.
- d) **Brake adjustment** The brake adjustment shall be as follows.
- 1) Brake assemblies shall be so constructed as capable of adjustment to maintain the braking force where the brake block, brake lining, etc. have worn or the brake cable have lengthened, and each brake shall be capable of adjustment with or without the use of a tool to an efficient operating position until the friction material has worn to the point of requiring replacement as recommended in the manufacturer's instruction. If brake adjustment can be achieved without the use of a tool, the adjuster shall be designed to prevent for incorrect use or incorrect operation.
 - 2) When the brake block, brake lining, etc. are correctly adjusted, and when the brake lever is gripped to simulate actual use, the brake block, lining, etc. shall not contact anything other than the intended braking surface.

5.2.3 Back-pedal brakes

Back-pedal brakes shall be actuated by the rider's foot pedalling in the opposite direction to the drive force. The brake mechanism shall function at a reversed angle of the chainwheels and cranks not exceeding 60°, and shall be released as soon as the rider's foot starts pedalling in the driving direction.

The measurement shall be taken with the crank held against each position with a pedal force of at least 140 N. The force shall be maintained for 1 min in each position.

5.2.4 Strength of brakes

The strength of brakes shall be as follows.

- a) **Hand-operated brake** When tested by the method described in **6.1.4.1**, there shall be no failure of the braking-system or of any component thereof.
- b) **Back-pedal brake** When tested by the method described in **6.1.4.2**, there shall be no failure of the back pedal braking system or any component thereof.

5.2.5 Braking performance

The braking performance shall be as follows.

- a) When tested in accordance with **6.1.5.1**, the average braking force of hand operated braking systems shall increase progressively as the lever force is increased in steps of 10 N from 40 N to 80 N. The braking forces, with the appropriate lever forces, shall conform to Table 1.

For front brakes, the minimum and maximum braking forces, and for rear brakes, the minimum braking forces shall conform to Table 1.

Table 1 Braking force of hand-operated brake

Unit: N

Brake lever input force	Braking force at the tyre	
	min.	max. (front brake only)
40	40	100
60	50	140
80	60	180

- b) When tested in accordance with **6.1.5.2**, the average braking force of back-pedal braking systems transmitted to the rear wheel shall increase progressively as the pedal force is increased in steps of 20 N from 20 N to 100 N. The braking force shall be at least 50 % of the pedal force.

5.3 Steering

5.3.1 Steering stability

The steering stability shall be as follows.

- a) The steering shall exhibit no tight spots, stiffness or slackness in the bearings.
- b) A minimum of 25 % of the total mass of the bicycle and rider¹⁾ shall act on the front wheel when the rider is holding the handlebar grips and sitting on the saddle, with the saddle and rider in their most rearward positions.

NOTE Recommendations for steering geometry are given in Annex A.

Note ¹⁾ The suitable rider weight indicated in the instruction manual.

- c) The steering shall be free to turn through at least 60° either side of the straight-ahead position, but not more than 180°.

5.3.2 Handlebar and grips

The handlebar and handlebar grips shall be as follows.

- a) The handlebar (including grips) shall have an overall width between 350 mm and 550 mm. The circumference of the part of the handlebar grips grasped by rider's fingers shall be 53 mm to 95 mm.
- b) When the handlebars are assembled to the minimum insertion-depth mark and the saddle is lowered to the lowest position specified by the manufacturer, the vertical distance between the top of the handlebar grips and the saddle surface shall not exceed 400 mm.
- c) The ends of the handlebars shall be fitted with handlebar grips, end caps or other similar covering. The handlebar grips and end caps shall withstand removal force when tested according to **6.2.1.1** and **6.2.1.2**.
- d) The handlebar stem shall be provided with one of the two following alternative means of ensuring a safe insertion depth into the fork steerer.
 - 1) It shall contain a permanent mark that clearly indicates the minimum insertion depth of the handlebar stem into the fork steerer. The mark shall be located not less than 2.5 times the external diameter of the handlebar stem from the bottom of the handlebar stem, and there shall be at least one stem diameter's length of contiguous circumferential stem material below the mark.
 - 2) It shall incorporate a permanent stop or be so constructed to prevent it from being drawn out of the fork steerer such as to leave the insertion less than the amount specified in 1) above.

5.3.3 Strength and durability of steering device

5.3.3.1 Lateral bending strength of handlebar and stem

When the test described in **6.2.2** is performed, the handlebar or stem shall be free from cracking or fracture and the permanent set measured at the point of application of the test force shall not exceed 20 mm per 100 mm of the free stem length.

5.3.3.2 Forward bending strength of handlebar stem

When the test described in **6.2.3** is performed, the handlebar or stem shall be free from cracking or fracture and the permanent set measured at the point of application of the test force shall not exceed 20 mm per 100 mm of the free stem length.

5.3.3.3 Torsional security of handlebar and handlebar stem

The handlebar shall not move in relation to the handlebar stem when tested in accordance with **6.2.4**.

5.3.3.4 Torsional security of handlebar stem and fork steerer

The handlebar stem shall not move in relation to the fork steerer when tested in accordance with **6.2.5**.

5.3.3.5 Fatigue strength of handlebar and stem

5.3.3.5.1 General

Handlebar stems can influence test failure of handlebars and for this reason, a handlebar and handlebar stem are always to be tested as an assembly. Conduct the test in two stages on the same assembly as follows.

5.3.3.5.2 Requirement for stage 1 and stage 2

When tested by the method described in 6.2.6.1 and 6.2.6.2, the handlebar and stem assembly shall be free from visible cracks or fractures in any of its parts.

5.4 Body unit

5.4.1 Frames

5.4.1.1 Impact strength of frame and front fork (falling mass)

When tested by the method described in 6.3.1, the frame/fork assembly shall be free from visible cracks or fractures in any of its parts. The permanent set measured between the wheel axles (measured as the wheelbase, see Figure 19) shall not exceed 20 mm.

5.4.1.2 Impact strength of frame and front fork (falling frame)

When tested by the method described in 6.3.2, the frame/fork assembly shall be free from visible cracks or fractures in any of its parts. The permanent set measured after the second fall between the axes of the wheel axles, i.e. measured as the wheelbase, shall not exceed 20 mm.

5.4.1.3 Fatigue strength of frame assembly with pedalling forces

When the test described in 6.3.3 is performed, there shall be no visible cracks or fractures in any part of the frame, and no failure of the suspension mechanism.

5.4.2 Front fork

5.4.2.1 Construction

The slots or other receptors for the front axle in the front fork shall be aligned so that when the axle or cones firmly abut the top face, the front wheel is central within the fork.

5.4.2.2 Fatigue strength of front fork

When tested by the method described in 6.3.4, the front fork shall be free from fractures or visible cracks in any of its parts.

5.5 Running device

5.5.1 Wheels and tyres

5.5.1.1 Rotational accuracy of wheels

- a) **Radial run-out** The run-out shall not exceed 2 mm when measured at a suitable point along the rim as shown in 6.4.1.

- b) **Lateral run-out** The run-out shall not exceed 2 mm when measured parallel to the hub axle at a suitable point along the rim as shown in **6.4.1**.

5.5.1.2 Wheel/tyre assembly clearance

Alignment of the wheel assembly in a bicycle shall allow not less than 6 mm clearance between the tyre and any frame or fork element or a mudguard and its attachment bolts.

5.5.1.3 Wheel strength

When a fully-assembled wheel fitted with a tyre is tested by the method described in **6.4.2**, there shall be no failure of any of the components of the wheel, or the permanent set, measured at the point of application of the force on the rim, shall not exceed 1.5 mm.

5.5.1.4 Wheel retention

5.5.1.4.1 General

Wheels shall be secured to the bicycle frame and fork such that when adjusted to the manufacturer's recommendations they comply with **5.5.1.4.2**. Where agreed between the parties concerned with delivery, this measurement may be substituted with a measurement of the wheel nut clamping torque based on clearly correlative data.

Wheel nuts shall have a minimum removal torque of 70 % of the manufacturer's recommended tightening torque.

If no recommended torque is indicated by the manufacturer, the tightening torque shall be 20 N·m for front wheel nuts and 30 N·m for rear wheel nuts.

5.5.1.4.2 Wheel retention with retention device secured

When wheels are tested by the method described in **6.4.3**, there shall be no relative motion between the hub axle and the front fork or the frame.

5.5.1.4.3 Wheel retention with retention device unsecured

When tested by the method described in **6.4.4**, the wheel shall not detach from the fork.

5.5.2 Quick-release mechanism

The bicycles shall not be provided with quick-release mechanism.

5.5.3 Rims, tyres and tubes

5.5.3.1 Indicated inflation pressure

The standard inflation pressure or maximum inflation pressure shall be marked indelibly on the sidewall of the tyre so as to be readily visible when the tyre is assembled on the wheel. Non-pneumatic tyres are excluded from this requirement.

NOTE It is recommended that the minimum inflation pressure specified by the manufacturer also be marked.

5.5.3.2 Tyre and rim compatibility

When inflated to an inflation pressure higher by 100 kPa (gauge pressure) than the indicated inflation pressure for a period of 5 min, the tyre shall remain intact on the rim.

5.5.4 Stabilizers

5.5.4.1 Mounting and dismounting

It shall be possible to fit or remove the stabilizers without releasing the fixing of the rear wheel axle.

5.5.4.2 Dimensions

The dimensions of stabilizers shall be such that:

- a) the horizontal distance between the vertical plane through the centreline of each stabilizer wheel and the vertical plane through the centreline of the rear wheel is at least 175 mm;
- b) the clearance between each stabilizer wheel and the ground shall not exceed 25 mm with the bicycle supported upright without the rider as shown in Figure 2. The tyre shall have been inflated to the indicated inflation pressure.

Unit: mm

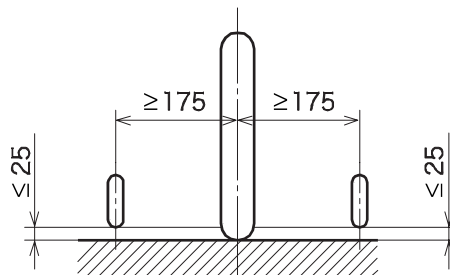


Figure 2 Clearance between stabilizer wheels and the ground

5.5.4.3 Strength of stabilizers

The strength of stabilizers shall be as follows.

- a) The deflection under load and permanent set shall not exceed 25 mm and 15 mm, respectively, when determined by the vertical load test specified in **6.4.5.1**.
- b) The permanent set shall not exceed 15 mm when determined by the longitudinal load test specified in **6.4.5.2**. No component of the stabilizer assembly shall fracture in the test.

5.6 Driving device

5.6.1 Pedal tread

The pedal tread shall be as follows.

- a) The tread surface of a pedal shall be secured against movement within the pedal assembly. The pedal shall turn freely on its axle.
- b) The pedal shall have
 - 1) tread surfaces on the top and bottom surfaces of the pedal, or
 - 2) a definite preferred position that automatically presents the tread surface to the rider's foot, if it has only one tread surface.

- c) Pedals designed with shoe-retention devices (e.g. toe strap or toe clip, and binding pedals) shall not be used.
- d) Folding pedals shall not be used.

5.6.2 Pedal clearance

The pedal clearance, evaluated by both ground clearance and toe clearance, shall be as follows.

For the purpose of these requirements, the tyres shall be inflated to the indicated inflation pressure (if in a range, the maximum value).

- a) **Ground clearance** With any stabilizers removed, bicycles shall have at least 23° ground clearance (see Figure 15 in **JIS D 9111**).
- b) **Toe clearance** Bicycles shall have at least 89 mm toe clearance (see Figure 16 in **JIS D 9111**).

5.6.3 Static strength of driving device

No component of the driving device shall significantly deform or fracture when tested in accordance with **6.5.1**. Drive capability shall not be lost.

5.6.4 Impact strength of pedals

When pedals are tested by the method described in **6.5.2**, there shall be no fractures of any part of the pedal body, the pedal-spindle or any failure of the bearing system.

5.6.5 Dynamic durability of pedals

When pedals are tested by the method described in **6.5.3**, there shall be no fractures or visible cracking of any part of the pedal or any failure of the bearing system.

5.6.6 Fatigue strength of crank assembly

When the crank assembly is tested by the method described in **6.5.4**, there shall be no fractures or visible cracks in the crank assembly, or loosening of the chain wheel from the crank.

5.6.7 Chains

The chains shall be stretched with neither visible slackening nor over tightening, and function smoothly. Performance requirements for chains are specified in **JIS D 9417**.

As required, chain adjuster can be attached to the rear axle fixing part.

5.7 Seating device

5.7.1 Saddle dimensions

No part of the saddle, saddle supports, or accessories to the saddle shall be more than 125 mm above the top saddle surface.

5.7.2 Minimum insertion-depth mark or positive stop on seat-post

The seat-post shall be provided with one of the two following alternative means of ensuring a safe insertion-depth into the frame:

- a) it shall contain a permanent mark of length not less than the external diameter of the seat-post that clearly indicates the minimum insertion-depth mark of the post into the frame. For a circular cross-section, the mark shall be located not less than two diameters of the post from the bottom of the post. For a non-circular cross-section, the insertion-depth mark shall be located not less than 65 mm from the bottom of the post (i.e. where the seat-post has its full cross-section).
- b) it shall incorporate a permanent stop to prevent it from being drawn out of the frame such as to leave the insertion less than the amount specified in **a)** above.

5.7.3 Saddle and seat-post security

When the test described in **6.6.1** is performed, there shall be no visible deformation or fractures in any part of the saddle or seat, or movement of the saddle (including any part equivalent to a saddle) in any direction with respect to the post, or of the post with respect to the frame.

5.7.4 Static strength of saddle

When the saddle is tested by the method described in **6.6.2**, there shall be no disengagement of the saddle top or plastic moulding from the saddle base, or disengagement of the base wire or coil spring from the engagement part, or no cracking or permanent distortion of the saddle assembly.

5.7.5 Fatigue strength of saddle and seat-post assembly

When the saddle and seat-post assembly is tested by the method described in **6.6.3**, there shall be no fractures or visible cracks in the seat-post, in the saddle or in the clamp.

5.8 Protective device

Bicycles shall have a protective device described in **a)** or **b)** in the following, in order to protect against the entrapment of clothing or body parts.

- a) Bicycles shall be equipped with a chain-guard as shown in Figure 3 a) that fully shields the outside and inside faces and edge of the chain wheel and junctions of the chain and chain wheel, and inside and outside faces and edge of the chain and free wheel.
- b) Bicycles shall be equipped with a chain-guard as shown in Figure 3 b) that fully shields the outside and inside faces and edge of the chain wheel and junctions of the chain and chain wheel, and outside face and edge of the chain and free wheel.

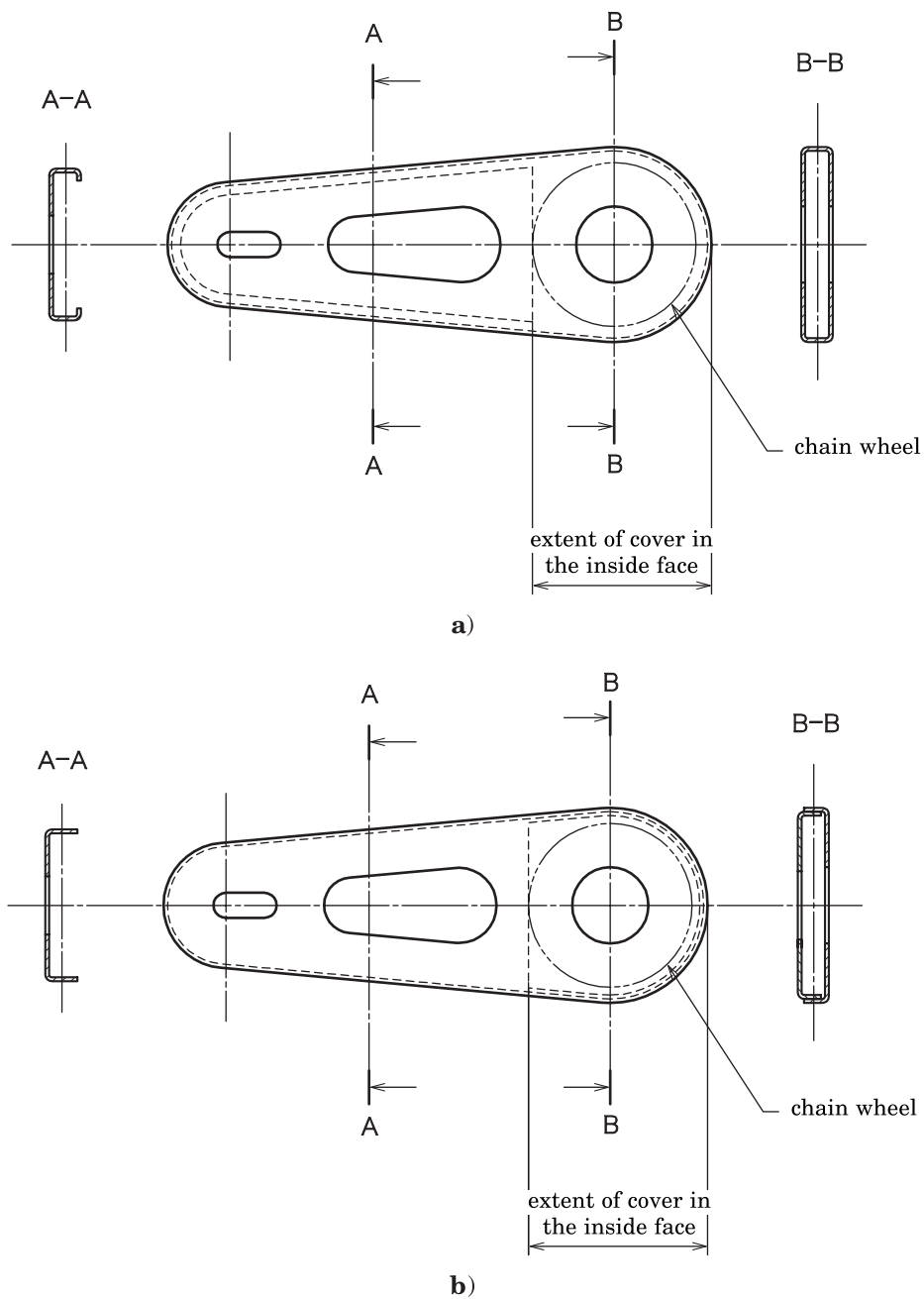


Figure 3 Chain-guard

5.9 Standing device

If a kickstand is provided, it shall allow easy use by intended users and when in use, shall stably support the bicycle without easily collapsing.

5.10 Carriers

The carriers shall be as follows.

- If luggage carriers are provided, they shall comply with **JIS D 9453**.
- The bicycle shall be designed to be stable with a luggage carrier loaded with the maximum permissible load.

5.11 Reflex reflector

A bicycle shall be equipped with a front reflector or reflective tape, rear reflector, pedal reflectors, side reflectors, etc. The performance of these reflex reflectors shall comply with **JIS D 9452**. The provision and attachment of the reflex reflectors shall be as follows.

- a) **Front reflector or reflective tape** The front reflector or reflective tape shall be as follows.
 - 1) The colour of the reflected light from the front reflector shall be white.
 - 2) The front reflector shall be mounted at a position higher than the front wheel axle and oriented in a way that the whole lens surface can be viewed from the front.
 - 3) A reflective tape may be used for a front reflector.
- b) **Rear reflector** The rear reflector shall be as follows.
 - 1) The colour of the reflected light from the rear reflector shall be red.
 - 2) The rear reflector shall be mounted with its topmost point higher than the rear wheel axle.
 - 3) The optical axis or main optical axis of the rear reflector shall be parallel to the travelling direction of the bicycle, with no horizontal or vertical tilt exceeding 5°.
 - 4) When, with the rear reflector in the orientation in which it is designed to be used, a load of 70 N (or 50 N, if the reflector is mounted on a mudguard) is applied to the reflector for 30 s in the most influential direction, the change in orientation of the reflector surface after this loading shall be less than 15°, and with the load removed, less than 5°. Further, this loading shall cause no fracture or other visible defects on any part of the reflector.
- c) **Pedal reflectors** The pedal reflectors shall be as follows.
 - 1) The colour of the reflected light from the pedal reflectors shall be yellow.
 - 2) The pedal reflectors shall be provided on both the front and rear surfaces of the pedal.
 - 3) The surface of the pedal reflector lens shall be sufficiently recessed from the edge of the pedal or the reflector housing.
- d) **Side reflectors etc.** The side reflectors etc. shall be as follows.
 - 1) The bicycle shall be equipped with side reflectors or reflective devices (reflective material such as reflective tape), positioned in such a way that their reflective light can be viewed from both sides.
 - 2) All the reflective elements of the side reflector etc. shall be of the same colour, and the reflected light shall be white or yellow.
 - 3) If the bicycle tyre is provided with a retro-reflecting annuli, the instruction manual shall include the caution on deterioration of tyres as well as instruction for exchanges.

5.12 Warning device

Bicycles shall be equipped with a bell or buzzer, of which the trigger, lever or switch shall be located at a position easily reachable during riding. Performance requirements for bells are specified in **JIS D 9451**.

5.13 Auxiliary device

When bicycles are equipped with locks, the locking and unlocking operations shall be smooth.

- a) Any key-operated lock shall be constructed so that the lock is unlocked by rotating or moving the cylinder by means of a key but not unlocked easily by a key which is not dedicated to the lock.
- b) Bicycles equipped with a side lock shall be provided with a means of preventing turning and slipping of the lock.

A side lock shall never be used by itself; it should always be used in combination with other lock(s).

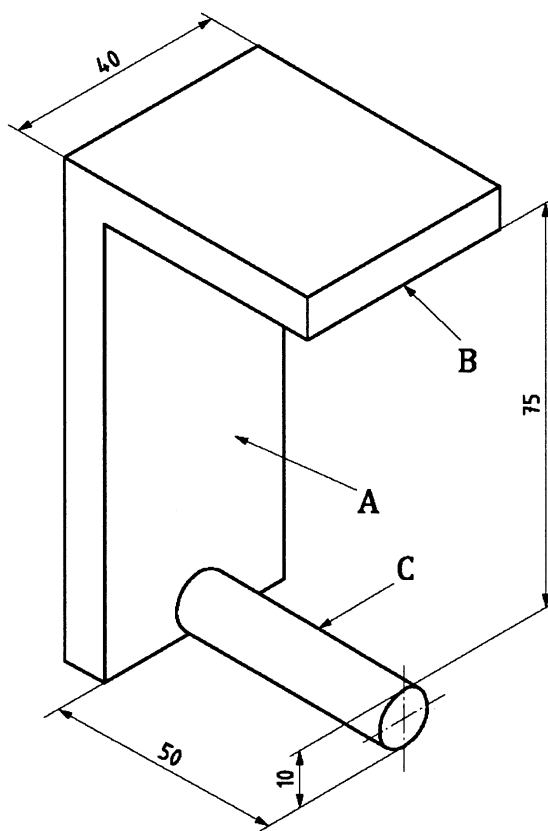
6 Test methods

6.1 Test methods for brakes

6.1.1 Measurement of brake-lever grip dimension

Fit the gauge illustrated in Figure 4 over the handlebar-grip (the handlebar, if the handlebar grip is not fitted by the manufacturer) and the brake lever as shown in Figure 5 so that the face A is in contact with the handlebar grip/handlebar and the side of the brake lever. Ensure that the face B is in uninterrupted contact with the part of the brake lever which is intended for contact with the rider's fingers and that the gauge does not cause any movement of the brake lever towards the handlebar or handlebargrip. Measure the distance a , the distance between the last part of the lever intended for contact with the rider's fingers and the end of the lever. This measurement shall be made on a completed bicycle.

Unit: mm



- A face A
- B face B
- C rod

Figure 4 Brake-lever grip dimension gauge

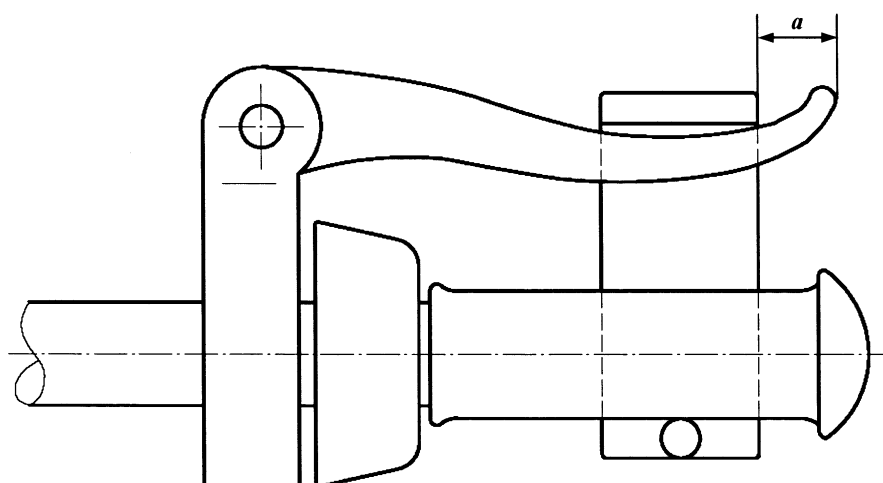


Figure 5 Method of fitting the gauge to the brake lever and handlebar

6.1.2 Position of applied force for brake levers

For the purposes of all braking tests in this Standard the test force shall be applied at a distance, b , which is equal to either dimension a (see Figure 5) as determined in 6.1.1 or 25 mm from the free end of the brake lever, whichever is the greater (see Figure 6).

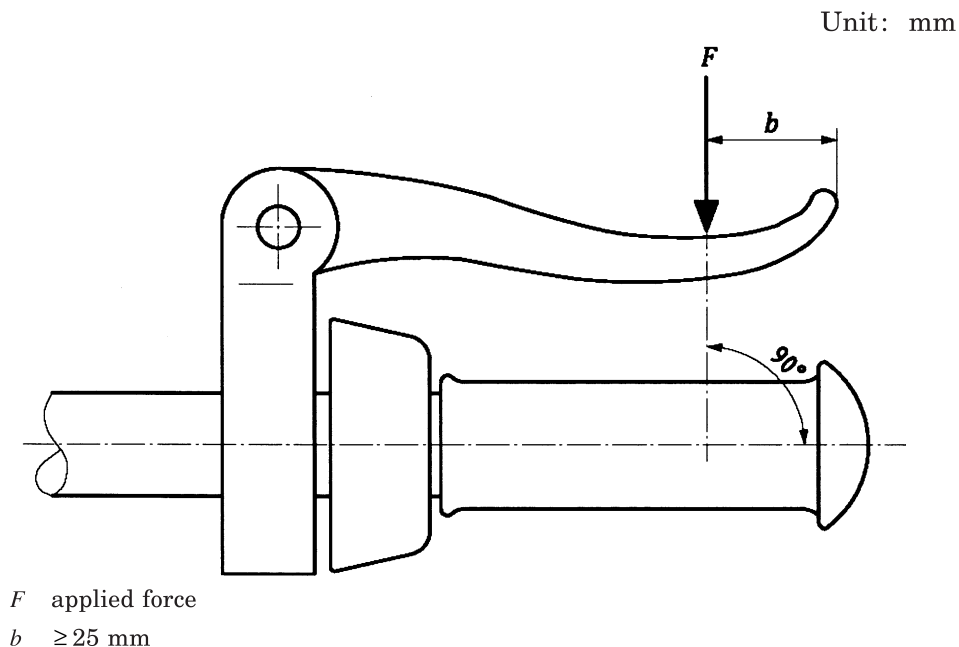


Figure 6 Position of applied force on brake lever

6.1.3 Brake security test

Conduct the test on a fully assembled bicycle with the brakes adjusted to a correct position with a rider of 30 kg weight or a bag filled with sand or lead shots of 30 kg mass on the saddle. Actuate each brake lever with a force of 130 N applied at the point as specified in 6.1.2. Maintain this force while subjecting the bicycle to five forward and five rearward movements, each of which is not less than 75 mm in distance, on a dry, flat pavement. Examine the bicycle for dislodgement or cracking of the brake block, brake lining or other parts.

The tyre shall have been inflated to the indicated inflation pressure.

6.1.4 Fatigue test of brakes

6.1.4.1 Hand-operated brake

For a bicycle equipped with a hand-operated brake, after ensuring that the brake system is correctly adjusted, apply a force, F , of 300 N²⁾ to the brake lever at a point specified in 6.1.2 in a direction normal to the handlebar grip surface or its equivalent part in the plane of travel of the lever for a total of 10 times. Examine the brake system and its individual components for abnormalities.

Note ²⁾ If a force, F , 300 N or smaller has brought the cable brake lever into contact with the handlebar grip surface or its equivalent part, or made the rod brake lever level with the upper handlebar surface, the test may be performed with that force.