BRITISH STANDARD

BS EN 14765:2005 +A1:2008
Incorporating corrigendum May 2006

Bicycles for young children — Safety requirements and test methods

ICS 43.150; 97.190

BSI British Standards

National foreword

This British Standard is the UK implementation of EN 14765:2005+A1:2008, incorporating corrigendum May 2006. It supersedes BS EN 14765:2005 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by [A1] 〈A1〉.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by CEN corrigendum May 2006 is indicated in the text by [AC] 〈AC〉.

The UK participation in its preparation was entrusted to Technical Committee GME/25, Cycles.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 May 2006

ISBN 978 0 580 59268 3

Amendments/corrigenda issued since publication

Amd. No.	Date	Comments
16451 Corrigendum No. 1	August 2006	Addition of supersession details and correction of BS implementation date and implementation of CEN corrigendum May 2006
	May 2008	Implementation of CEN amendment A1:2008

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14765:2005+A1

February 2008

ICS 43.150; 97.190

Supersedes EN 14765:2005

English Version

Bicycles for young children - Safety requirements and test methods

Bicyclettes pour jeunes enfants - Exigences de sécurité et méthodes d'essai

Kinderfahrräder - Sicherheitstechnische Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 7 October 2005 and includes Amendment 1 approved by CEN on 26 December 2007 and Corrigendum 1 issued by CEN on 3 May 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 14765:2005+A1:2008: E

Contents

page

Foreword 4

Introduction 5

1 Scope 6

2 Normative references 6

3 Terms and definitions 6

4 Requirements and test methods 7
4.1 Brake tests and strength tests – special requirements 7
4.1.1 Definition of brake tests 7
4.1.2 Definition of strength tests 7
4.1.3 Numbers and condition of specimens for the strength tests 7
4.1.4 Accuracy tolerances of test conditions for brake tests and strength tests 8
4.2 Toxicity 8
4.3 Sharp edges 8
4.4 Security and strength of safety-related fasteners 8
4.4.1 Security of screws 8
4.4.2 Minimum failure torque 8
4.4.3 Quick-release devices 8
4.4.4 Foot location devices 8
4.5 Crack detection methods 9
4.6 Protrusions 9
4.6.1 Requirement 9
4.6.2 Test method 10
4.7 Brakes 11
4.7.1 Braking-systems 11
4.7.2 Hand-operated brakes 11
4.7.3 Attachment of brake assembly and cable requirements 14
4.7.4 Brake-block and brake-pad assemblies — security test 14
4.7.5 Brake adjustment 14
4.7.6 Back-pedal brake 15
4.7.7 Braking-system — strength tests 15
4.7.8 Braking performance 18
4.8 Steering 19
4.8.1 Handlebar — dimensions and end fittings 19
4.8.2 Handlebar grips 19
4.8.3 Handlebar-stem — insertion depth mark or positive stop 20
4.8.4 Steering stability 20
4.8.5 Steering assembly — static strength and security tests 20
4.8.6 Handlebar and stem assembly – fatigue test 24
4.9 Frames 26
4.9.1 Frame and front fork assembly – impact test (falling mass) 26
4.9.2 Frame and front fork assembly – impact test (falling frame) 28
4.10 Front fork 29
4.10.1 General 29
4.10.2 Front fork – bending fatigue test 29
4.11 Wheels 29
4.11.1 Rotational accuracy 29
4.11.2 Wheel/tyre assembly – clearance 31
4.11.3 Wheel/tyre assembly – static strength test 31
4.11.4 Wheel retention 31

4.12 Rims, tyres and tubes 32
4.12.1 Tyre inflation pressure 32
4.12.2 Tyre and rim compatibility 32
4.13 Pedals and pedal/crank drive system 33
4.13.1 Pedal tread 33
4.13.2 Pedal clearance 33
4.13.3 Pedal-spindle impact test 34
4.13.4 Pedal/pedal-spindle —dynamic durability test 35
4.13.5 Drive system static strength test 36
4.13.6 Crank assembly — fatigue tests 37
4.14 Saddles and seat-pillars 38
4.14.1 Limiting dimensions 38
4.14.2 Seat-pillar – insertion-depth mark or positive stop 38
4.14.3 Saddle and seat pillar – security test 39
4.14.4 Saddle — static strength test 39
4.14.5 Seat-pillar — fatigue test 40
4.15 Chain-guard 41
4.16 Stabilizers 42
4.16.1 Mounting and dismounting 42
4.16.2 Dimensions 42
4.16.3 Vertical load test 42
4.16.4 Longitudinal load test 43
4.17 Luggage carriers 44
4.18 Lighting systems and reflectors 44
4.18.1 Lighting and reflectors 44
4.18.2 Wiring harness 44
4.18.3 Warning device 44

5 Instructions 44

6 Marking 45
6.1 Requirement 45
6.2 Durability test 46
6.2.1 Requirement 46
6.2.2 Test method 46

Annex A (informative) Steering geometry 47

Bibliography 48

Foreword

This document (EN 14765:2005+A1:2008) has been prepared by Technical Committee CEN/TC 333 “Cycles”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2008 and conflicting national standards shall be withdrawn at the latest by August 2008.

This document includes Amendment 1 approved by CEN on 2007-12-26 and the Corrigendum issued in 2006.

This document supersedes EN 14765:2005.

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1⟩ ⟨A1].

The modifications of the related CEN Corrigendum have been implemented at the appropriate places in the text and are indicated by the tags [AC⟩ ⟨AC].

This European Standard is one of a series, dealing with cycles.

European Standards in this series are:

EN 14764	*City and trekking bicycles — Safety requirements and test methods*
[A1⟩ prEN 15532	*Cycles —Terminology* ⟨A1]
EN 14766	*Mountain-bicycles — Safety requirements and test methods*
EN 14781	*Racing bicycles — Safety requirements and test methods*
[A1⟩ EN 14872 ⟨A1]	*Bicycles — Accessories for bicycles — Luggage carriers*
prEN 15194	*Cycles — Electrically power assisted cycles — EPAC bicycle*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This European Standard has been developed in response to demand throughout Europe, and the aim has been to ensure that bicycles manufactured in compliance with it will be as safe as is practically possible. The tests have been designed to ensure the strength and durability of individual parts as well as of the bicycle as a whole, demanding high quality throughout and consideration of safety aspects from the design stage onwards.

If the bicycle is intended for the use on public roads, national traffic regulations apply.

The scope has been limited to safety considerations, and has specifically avoided standardisation of components.

No requirements on lighting equipment, reflectors and warning devices are specified in this European Standard, due to the existence of several different national regulations applicable in the European countries.

1 Scope

This European Standard specifies safety and performance requirements and test methods for bicycles for young children, in respect of the design, assembly and testing of bicycles and sub-assemblies. Guidelines for instructions on the use and care of bicycles are also provided.

This European Standard applies to bicycles with a maximum saddle height of more than 435 mm and less than 635 mm (typical rider weight of 30 kg), and propelled by a transmitted drive to the rear wheel.

This European Standard does not apply to special bicycles intended for stunting (e.g. BMX bicycles).

NOTE For bicycles with a maximum saddle height of 435 mm see EN 71 and for bicycles with a saddle height of 635 mm or more see prEN 14764.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 71-3, *Safety of toys — Part 3: Migration of certain elements*

〉A1〈 EN 14872 〉A1〈, *Bicycles — Accessories for bicycles — Luggage carriers*

ISO 1101, *Geometrical Product Specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 5775-1, *Bicycle tyres and rims — Part 1: Tyre designations and dimensions*

ISO 5775-2, *Bicycle tyres and rims — Part 2: Rims*

ISO 7636, *Bells for bicycles and mopeds — Technical specifications*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
cycle
any vehicle that has at least two wheels and is propelled solely or mainly by the muscular energy of the person on that vehicle, in particular by means of pedals

3.2
bicycle
two-wheeled cycle

3.3
maximum saddle height
vertical distance from the ground to the top of the seat surface, measured with the seat in a horizontal position with the seat pillar set to the minimum insertion depth

[EN 71]

3.4
braking force
tangential rearward force between the tyre and the ground or the tyre and the drum or belt of the test machine

3.5
pedal tread surface
surface of a pedal that is presented to the underside of the foot

3.6
toe-strap
device to securely locate a rider's shoe on a pedal

3.7
toe-clip
device attached to the pedal to grip the toe end of the rider's shoe but permitting withdrawal of the shoe

3.8
maximum inflation pressure
maximum tyre pressure recommended by the tyre manufacturer for a safe and efficient performance

3.9
stabilizers
removable auxiliary wheels fitted to enable the rider to balance

3.10
crank assembly
for fatigue testing it consists of the two cranks, the pedal-spindles or adaptors, the bottom-bracket spindle, and the first component of the drive system, e.g. the chain-wheel cluster

3.11
exposed protrusion
protrusion which through its location and rigidity could present a hazard to the rider either through heavy contact with it in normal use or should the rider fall onto it in an accident

3.12
quick-release devices
device to fix or release a part without the use of a tool

3.13
visible crack
crack which results from a test where that crack is visible to the naked eye

4 Requirements and test methods

4.1 Brake tests and strength tests – special requirements

4.1.1 Definition of brake tests

Brake tests to which accuracy requirements apply, as in 4.1.4, are those specified in 4.7.2.2.3 to 4.7.8.4 inclusive.

4.1.2 Definition of strength tests

Strength tests to which accuracy requirements apply, as in 4.1.4, are those involving static, impact or fatigue loading as specified in 4.8 to 4.14 inclusive and 4.16.

4.1.3 Numbers and condition of specimens for the 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.

NOTE 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.

4.1.4 Accuracy tolerances of test conditions for brake tests and strength tests

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

Forces and torques	0/+5 %
Masses and weights	± 1 %
Dimensions	± 1 mm
Angles	± 1°
Time duration	± 5 s
Temperatures	± 2 °C
Pressures	± 5 %

4.2 Toxicity

The following items which come into intimate contact with the rider (i.e. causing any hazard due to sucking or licking) shall comply with the requirements of EN 71-3:

- all paints;

- handlebar handgrips;

- surface of the saddle.

4.3 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.

4.4 Security and strength of safety-related fasteners

4.4.1 Security of screws

Any screws used in the assembly of suspension systems or screws used to attach e.g. generators, brake-mechanisms and mud-guards to the frame or fork or handlebar shall be provided with suitable locking devices, e.g., lock-washers, lock-nuts, or stiff nuts.

4.4.2 Minimum failure torque

The minimum failure torque of bolted joints for the fastening of handlebars, handlebar-stems, bar-ends, seats and seat-pillars shall be at least 50 % greater than the manufacturer's recommended tightening torque.

4.4.3 Quick-release devices

No quick-release devices of any type shall be used.

4.4.4 Foot location devices

Toe-straps and toe-clips shall not be fitted.

4.5 Crack detection methods

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

NOTE For example, suitable dye-penetrant methods are specified in ISO 3452.

4.6 Protrusions

4.6.1 Requirement

4.6.1.1 Exposed protrusions

Any rigid exposed protrusion longer than 8 mm (see *L* in Figure 1) after assembly except:

a) the front gear-change mechanism at the chain wheel;

b) the gear-change mechanism at the rear wheel;

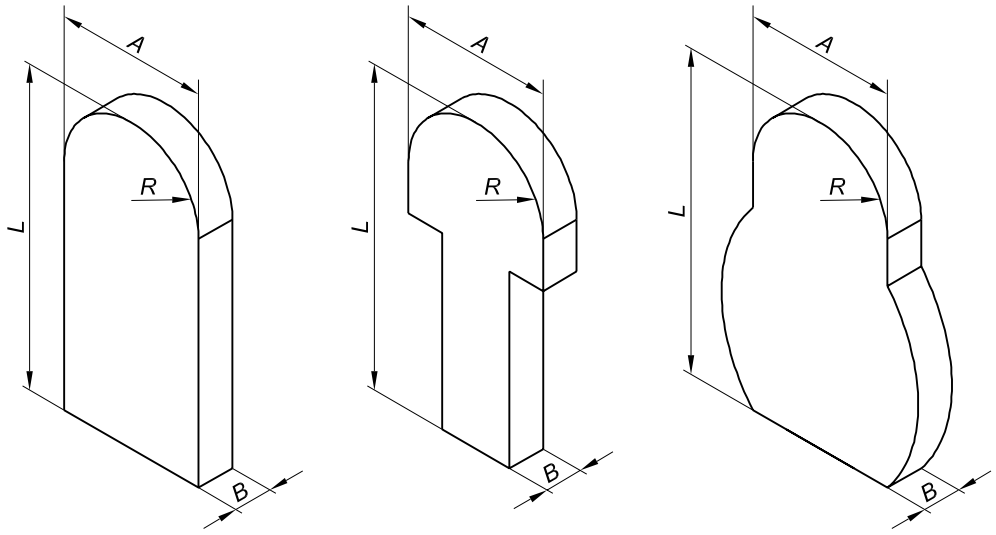
c) the rim-brake mechanism at the front and rear wheels;

d) a lamp-bracket fitted on the head-tube;

e) reflectors.

shall terminate in a radius, *R* (see Figure 1), of not less than 6,3 mm. Such protrusions shall have a major end dimension, *A*, not less than 12,7 mm and a minor dimension, *B*, not less than 3,2 mm.

Dimensions in millimetres



$R \geq 6,3$ $A \geq 12,7$ $B \geq 3,2$

Figure 1 — Examples of minimum dimensions of exposed protrusions

4.6.1.2 Exclusion zone, protective devices and screw threads

There shall be no protrusions on the top tube of a bicycle frame between the saddle and a point 300 mm forward of the saddle, with the exception that control cables no greater than 6,4 mm in diameter and cable clamps made from material no thicker than 4,8 mm may be attached to the top tube.

Foam pads attached to the bicycle frame to act as protective cushions are permitted, provided that the bicycle meets the requirements for protrusions when the pads are removed.

A screw thread that is an exposed protrusion shall be limited to a protrusion length of one major diameter of the screw beyond the internally threaded mating part.

4.6.2 Test method

Conduct the test with a protrusion test cylinder (which simulates a limb) having the dimensions shown in Figure 2.

Dimensions in millimetres

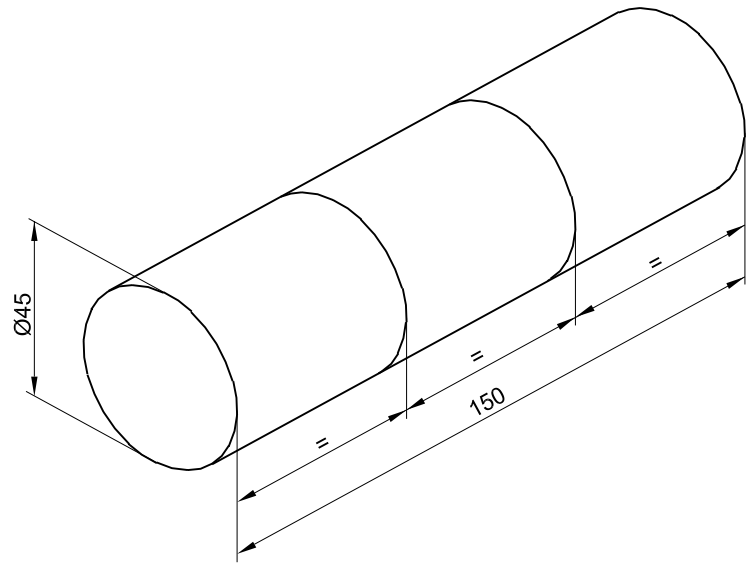
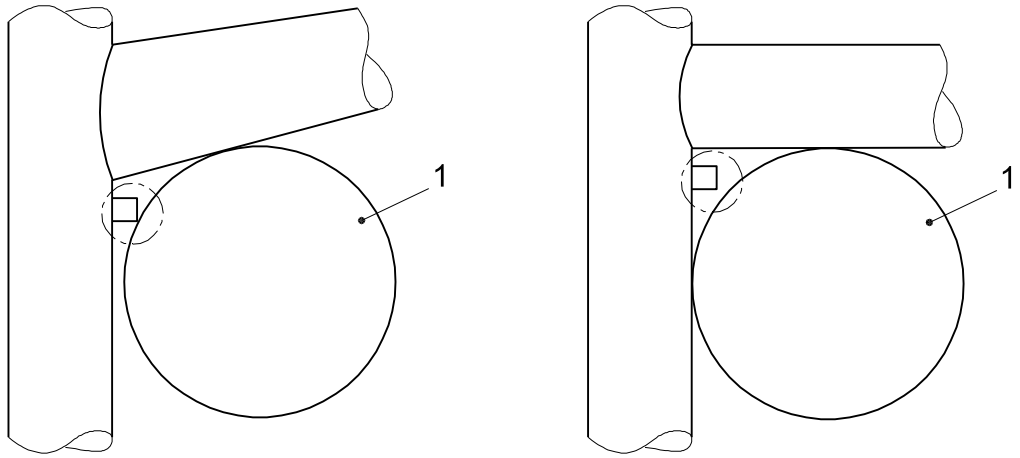


Figure 2 — Exposed protrusion test cylinder

Manoeuvre the test cylinder in all possible attitudes towards any rigid protrusion on the bicycle. If the central 50 mm long section of the cylinder contacts the protrusion, that protrusion shall be considered to be an exposed protrusion and it shall comply with 4.6.1.1.

Examples of protrusions that need and do not need to comply with the requirements are shown in Figure 3.



a) needs to comply b) does not need to comply

Key

1 Test cylinder

Figure 3 — Examples of protrusions

4.7 Brakes

4.7.1 Braking-systems

[A1] Bicycles, whether or not fitted with a fixed transmitted drive, shall be equipped with at least two independent braking systems, one system operating on the front wheel and one on the rear. The decision on whether the rear braking system is operated by the rider's hand or foot should be made in accordance with the legislation, custom or preference of the country to which the bicycle is to be supplied.

Brake-blocks containing asbestos shall not be permitted. [A1]

4.7.2 Hand-operated brakes

4.7.2.1 Brake-lever position

The hand-brake levers for front and rear brakes shall be positioned according to the legislation or custom and practice of the country in which the bicycle is to be sold, and the bicycle manufacturer shall state in the users instruction manual which lever operates the front brake and which operates the rear brake (see also Clause 5 k)).

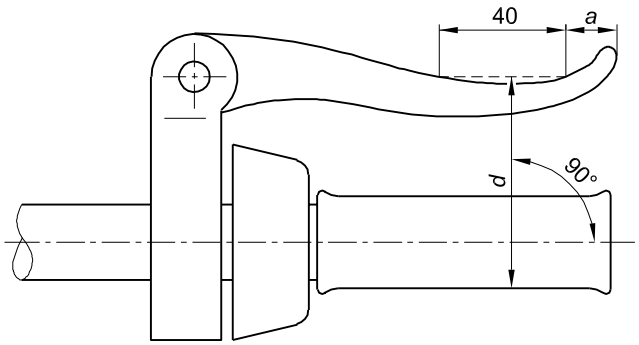
4.7.2.2 Brake-lever grip dimensions

4.7.2.2.1 Requirement

The maximum grip dimension, d, measured between the outer surfaces of the brake-lever and the handlebar, or the handlebar-grip or any other covering where present, shall not exceed 75 mm over a distance of 40 mm as shown in Figure 4. For dimension a see 4.7.2.2.2.

NOTE The range of adjustment on the brake-lever should permit these dimensions to be obtained.

Dimension in millimetres



Key

a Distance between the last part of the lever intended for contact with the rider's fingers and the end of the lever

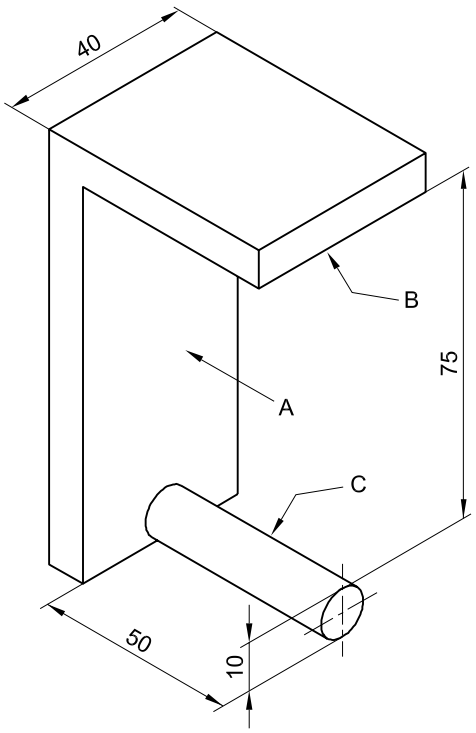
d Maximum grip dimension

Figure 4 — Handbrake-lever grip dimensions

4.7.2.2.2 Test method

Fit the gauge illustrated in Figure 5 over the handlebar and handlebar-grip and the brake-lever as shown in Figure 6 so that the face A is in contact with the handlebar grip 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 handlebar-grip. 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 (see 4.7.2.2.1 and 4.7.2.3).

Dimension in millimetres



Key

A = Face A

B = Face B

C = Rod

Figure 5 — Handbrake-lever grip dimension gauge

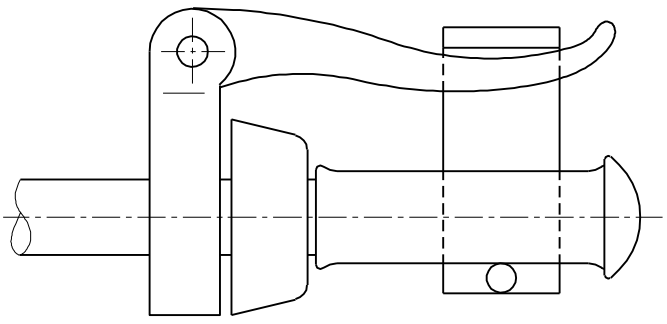
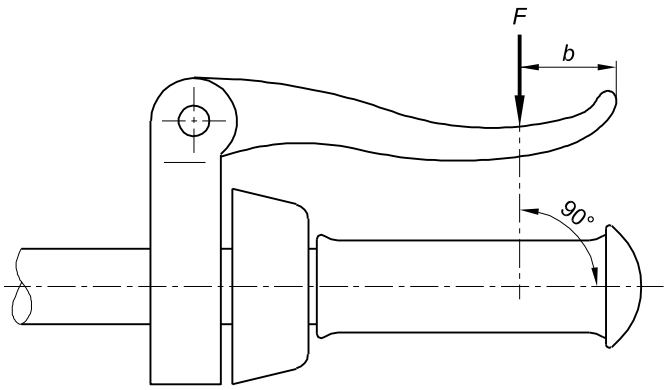


Figure 6 — Method of fitting the gauge to the handbrake-lever and handlebar (minimum grip length is shown)

4.7.2.3 Handbrake levers — position of applied force

For the purposes of all braking tests in this European Standard the test force shall be applied at a distance, b, which is equal to either dimension a as determined in 4.7.2.2.2 or 25 mm from the free end of the brake-lever, whichever is the greater (see Figure 7).



Key

F Applied force

$b \geq 25$ mm

Figure 7 — Position of applied force on handbrake-lever

4.7.3 Attachment of brake assembly and cable requirements

Cable pinch-bolts shall not sever any of the cable strands when assembled to the manufacturer's instructions. In the event of a cable failing, no part of the brake mechanism shall inadvertently inhibit the rotation of the wheel.

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 unravelling.

The inner cable shall be protected from corrosion, e.g., by a suitable impervious liner to the outer casing. Also, either the inner cable shall have a low-friction coating or the outer casing shall have a low-friction lining.

NOTE See 4.4 in relation to fasteners.

4.7.4 Brake-block and brake-pad assemblies — security test

4.7.4.1 Requirement

The friction material shall be securely attached to the holder, backing-plate, or shoe and there shall be no failure of the assembly when tested by the method specified in 4.7.4.2. The brake system shall be capable of meeting the strength test specified in 4.7.7 and the braking performance specified in 4.7.8.

4.7.4.2 Test method

Conduct the test on a fully assembled bicycle with the brakes adjusted to a correct position with a rider or equivalent mass on the saddle. The combined mass of the bicycle and rider (or equivalent mass) shall be 30 kg.

Actuate each brake-lever with a force of 130 N applied at the point as specified in 4.7.2.2.3 or a force sufficient to bring the brake-lever into contact with the handlebar grip, whichever is the lesser. Maintain this force whilst subjecting the bicycle to five forward and five rearward movements, each of which is not less than 75 mm distance.

4.7.5 Brake adjustment

Each brake shall be capable of adjustment 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 instructions. Also, when correctly adjusted, the friction material shall not contact anything other than the intended braking surface.

4.7.6 Back-pedal brake

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 independently of any drive gear positions or adjustments. The differential between the drive and brake positions of the crank shall not exceed 60°.

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.

4.7.7 Braking-system — strength tests

4.7.7.1 Hand-operated brake — requirement

When tested by the method described in 4.7.7.2, there shall be no failure of the braking-system or of any component thereof.

4.7.7.2 Hand-operated brake — test method

Conduct the test on a fully assembled bicycle. After it has been ensured that the braking system is adjusted according to the recommendations in the manufacturer's instructions, apply a force at the point specified in 4.7.2.2.3 and normal to the axis of handlebar in the grip area in the plane of travel of the lever, as shown in Figure 7. The force shall be 300 N, or such lesser force as is required to bring as is required to bring

a) a cable-brake lever into contact with the handlebar grip or the handlebar where the manufacturer does not fit a grip, or

b) a rod-operated brake lever level with the upper handlebar grip surface.

Repeat the test for a total of 10 times on each handbrake lever.

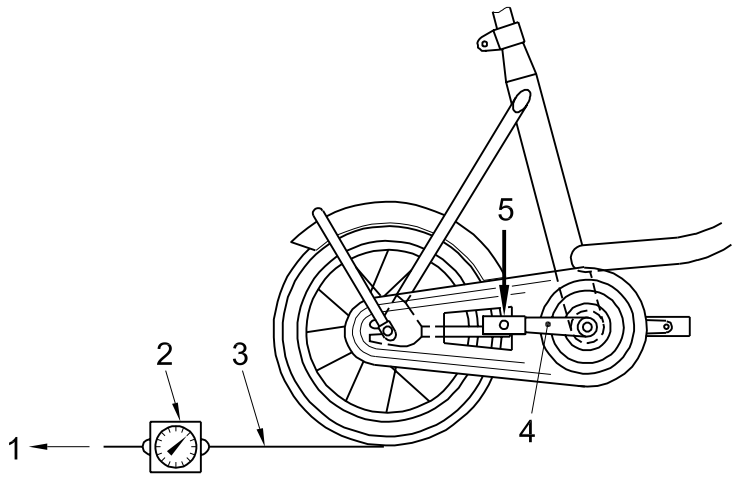
4.7.7.3 Back-pedal brake — requirement

When tested by the method described in 4.7.7.4, there shall be no failure of the back pedal braking system or any component thereof.

4.7.7.4 Back-pedal brake — test method

Conduct this test on a fully assembled bicycle. Ensure that the braking system is adjusted according to the recommendations in the manufacturer's instructions, and that a pedal crank is in a horizontal position (see Figure 8 a) and b)). Gradually apply a vertical force of 600 N. Gradually apply a vertical force of 600 N to the centre of the pedal axe, and maintain for one minute.

Perform the test ten times.



Key

1 Applied force on wheel (braking force)

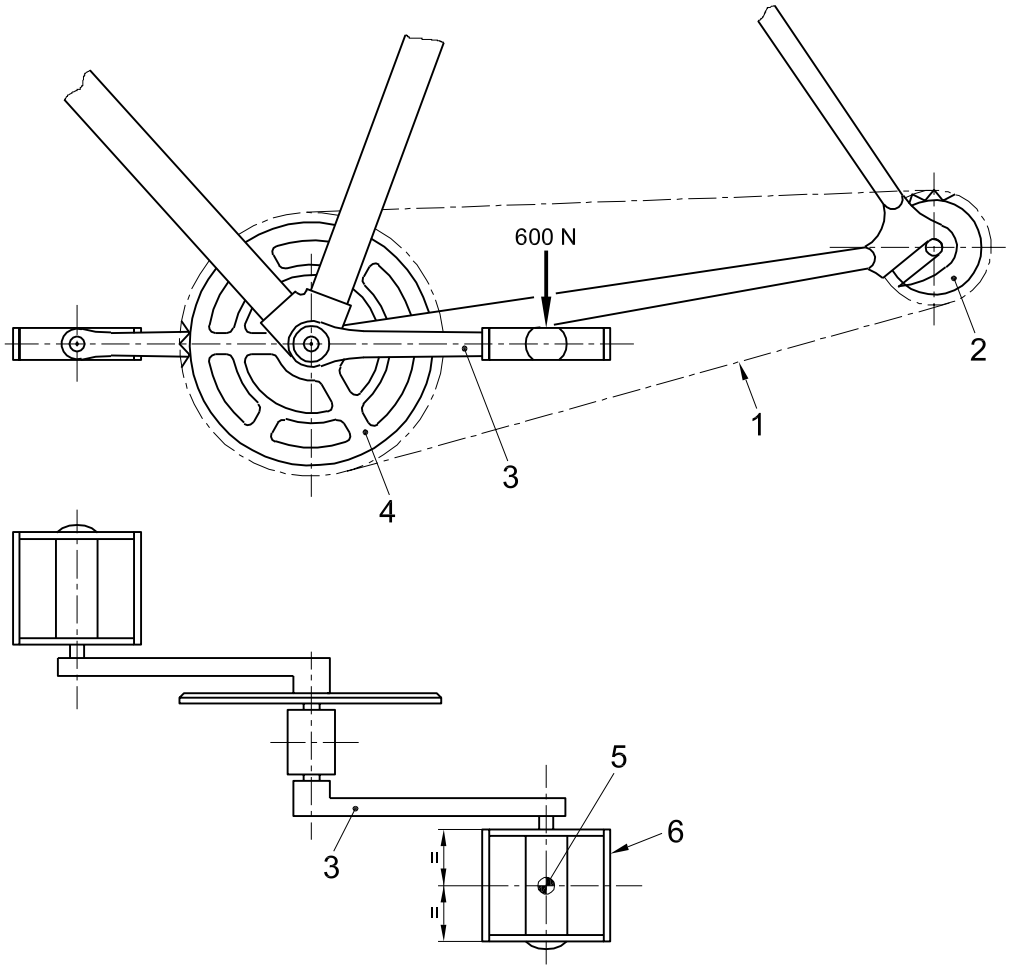
2 Force measuring device

3 Suitable webbing wrapped around wheel circumference

4 Right hand crank

5 Direction of applied force on pedal (see 4.7.7.4 and 4.7.8.4)

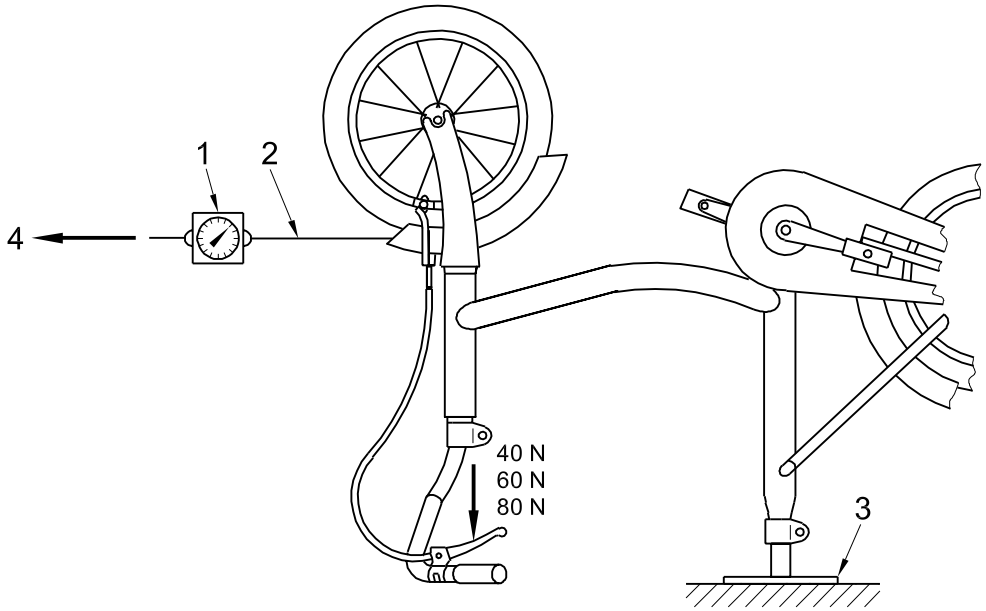
Figure 8 a) — Measurement of braking force from back-pedal brake



Key

1 Chain
2 Hub sprocket
3 Left crank
4 Cycle chain-wheel and pedal crank
5 Point of force application
6 Pedal

Figure 8 b) — Back pedal brake test



Key

1 Force measuring device
2 Suitable webbing around wheel circumference
3 Fixture
4 Applied force

Figure 8 c) — Measurement of braking force from hand-operated brake (typical arrangement)

4.7.8 Braking performance

4.7.8.1 Hand-operated brake performance test — requirement

When tested in accordance with 4.7.8.2, 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.

For front brakes, with the appropriate lever forces, the minimum and maximum braking forces shall conform to Table 1.

For rear brakes, with the appropriate lever forces, the minimum braking forces shall conform to Table 1.

Table 1 — Brake lever input forces and braking forces at the tyre

Brake lever input force	Braking force at the tyre	
N	min. N	max. (front brake only) N
40	40	100
[AC> 60 <AC]	50	140
80	60	180

4.7.8.2 Hand-operated brake performance test — test method

Conduct the hand-operated brake performance test on a bicycle fully assembled, and with the brake correctly adjusted (the saddle and seat pillar may be removed).

Secure the bicycle and attach a braking force measuring device to the appropriate wheel, as shown in Figure 8 c).

Apply forces of 40 N, 50 N, 60 N, 70 N and 80 N progressively to the appropriate brake lever at a point specified in 4.7.2.3 and normal to the handlebar grip in the plane of travel of the lever (see Figure 7).

For each handlever force apply a steady pulling force to the wheel through the force measuring device, tangentially to the circumference of the tyre and in the forward-travel direction of rotation.

After one half-revolution of the wheel, record the average braking force as the wheel rotates through a further revolution at a steady linear tyre surface speed of between 0,5 m/s and 2,0 m/s.

For each force on the lever, take the average of three readings.

4.7.8.3 Back-pedal brake performance test — requirement

When tested in accordance with 4.7.8.4, 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 ratio of pedal force to braking force shall not exceed 2.

4.7.8.4 Back-pedal brake performance test — test method

Conduct the back-pedal brake performance test on a fully assembled bicycle with the brake correctly adjusted.

Secure the bicycle and attach a braking force measuring device to the rear wheel as shown in Figure 8 a).

Apply forces of 20 N, 40 N, 60 N, 80 N and 100 N to the pedal at right angles to the crank and in the braking direction.

Apply a steady pulling force to the wheel through the force measuring device tangentially to the circumference of the tyre and in the forward-travel direction of rotation.

After one half-revolution of the wheel, record the average braking force as the wheel rotates through a further revolution at a steady linear tyre surface speed of between 0,5 m/s and 2,0 m/s.

For each force on the pedal, take the average of three readings.

4.8 Steering

4.8.1 Handlebar — dimensions and end fittings

The handlebar shall have an overall width between 350 mm and 550 mm unless national regulations dictate otherwise. The vertical distance between the top of the handlebar grips, when assembled to the highest riding position according to the manufacturers instructions, and the seat surface of the saddle at its lowest position shall not exceed 400 mm.

4.8.2 Handlebar grips

4.8.2.1 Requirement

The ends of the handlebars shall be fitted with handlebar grips that can withstand a removal force of 70 N. The handlebar grips shall be of resilient material and shall have an enlarged and covered end not less than 40 mm in diameter. Handlebar grips shall not obstruct the operation of brake levers.

NOTE Regarding material see also 4.2.

4.8.2.2 Test method

Immerse the handlebar, with handlebar grips fitted, in water at room temperature for one hour and then place the handlebar in a freezing cabinet until the handlebar is at a temperature lower than –5 °C. Remove the handlebar from the freezing cabinet and allow the temperature of the handlebar to reach –5 °C, and then apply a force of 70 N in the loosening direction. Maintain the force until the temperature of the handlebar has reached +5 °C.

4.8.3 Handlebar-stem — insertion depth mark or positive stop

The handlebar-stem shall be provided with one of the two following alternative means of ensuring a safe insertion-depth into the fork-stem:

a) it shall contain a permanent, transverse mark, of length not less than the external diameter of the cross-section of the handlebar-stem that clearly indicates the minimum insertion-depth of the handlebar-stem into the fork-stem. The mark shall be located not less than 2,5 times the external diameter of the handle-bar-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;

b) it shall incorporate a permanent stop to prevent it from being drawn out of the fork-stem such as to leave the insertion less than the amount specified in a) above.

4.8.4 Steering stability

The steering shall be free to turn through at least 60° either side of the straight-ahead position and shall exhibit no tight spots, stiffness or slackness in the bearings when correctly adjusted.

A minimum of 25 % of the total mass of the bicycle and rider 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.

4.8.5 Steering assembly — static strength and security tests

4.8.5.1 Handlebar and stem assembly — lateral bending test

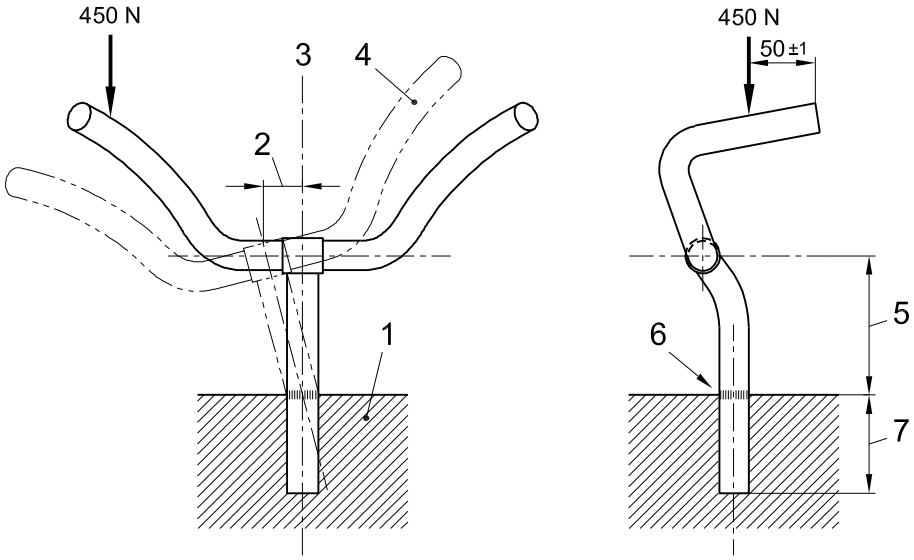
4.8.5.1.1 Requirement

When tested by the method described in 4.8.5.1.2, there shall be no cracking or fracture of the handlebar or stem 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.

4.8.5.1.2 Test method

Assemble the handlebar and stem in accordance with the manufacturer's instructions and unless the stem and handlebar are permanently connected e.g. by welding or brazing, align the grips portion of the handlebar in a plane perpendicular to the stem axis. Clamp the stem securely at the minimum insertion depth and apply a vertical force of 450 N at a position 50 mm ± 1 mm from the free end of the handlebar as shown in Figure 9. Maintain this force for 1 min.

Dimension in millimetres



Key

1 Clamping fixture
2 Permanent set
3 Stem centreline
4 Deflected shape
5 Free stem length
6 Limit mark
7 Minimum insertion depth

Figure 9 — Handlebar and stem assembly — lateral bending test

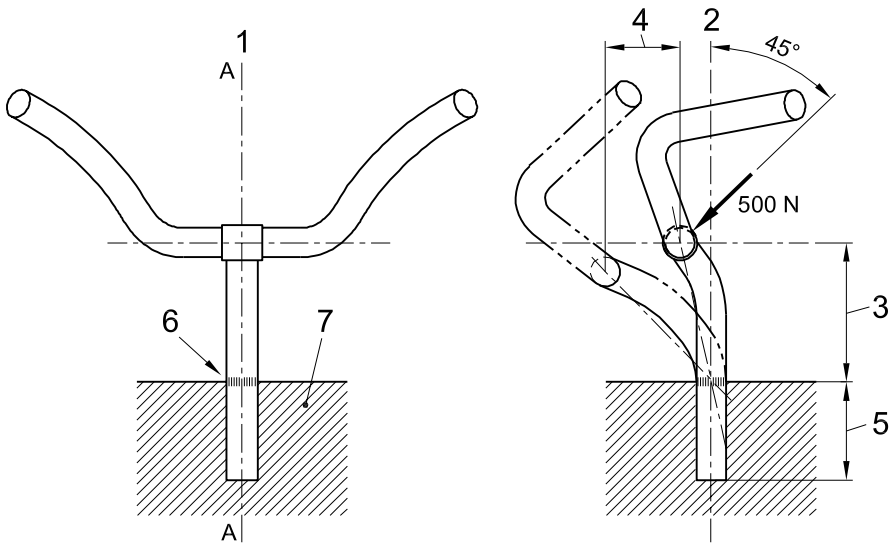
4.8.5.2 Handlebar and stem assembly — forward bending test

4.8.5.2.1 Requirement

When tested by the method described in 4.8.5.2.2, there shall be no cracking or fracture of the handlebar or stem and the permanent set measurement at the point of application of the test force shall not exceed 20 mm per 100 mm of free stem length.

4.8.5.2.2 Test method

With the handlebar stem securely clamped to the minimum insertion depth, apply a force of 500 N through the handlebar attachment point in the forward and downward direction at 45° to the axis of the stem shank, in plane A-A (see Figure 10). Maintain this force for 1 min.



Key

1 Force applied in plane A-A
2 Axis of stem shank
3 Applied force
4 Free stem length
5 Permanent set
6 Minimum insertion depth
7 Limit mark
8 Clamping fixture

Figure 10 — Handlebar and stem assembly – forward bending test

4.8.5.3 Handlebar to handlebar stem – torsional security test

4.8.5.3.1 Requirement

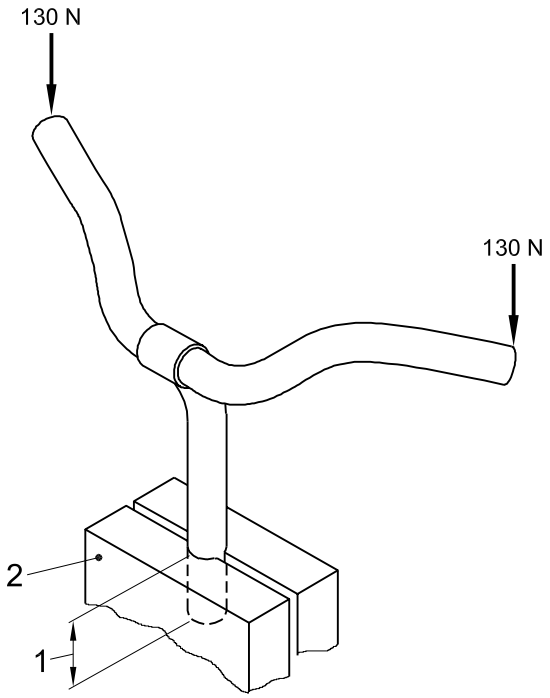
The handlebar shall not move in relation to the stem when tested in accordance with 4.8.5.3.2.

4.8.5.3.2 Test method

With the stem of the handlebar assembly securely clamped to the minimum insertion depth, apply a force of 130 N simultaneously to each side of the handlebar, in a direction and at a point giving maximum torque at the junction of the handlebar and stem. If the point of application is at the end of the handlebar, apply the force as near to the end as practicable, but no more than 15 mm from the end (see Figure 11). Maintain this force for 1 min.

Depending on the shape of the handlebar, the forces may be applied in a different direction from those illustrated in Figure 11.

If the handlebar/stem assembly uses a clamp, the torque applied to the fastener shall not exceed the manufacturer's recommended minimum torque.



Key

1 Applied force

2 Minimum insertion depth

3 Clamping block

Figure 11 — Handlebar to handlebar stem — torsional security test

4.8.5.4 Handlebar stem to fork stem — torsional security test

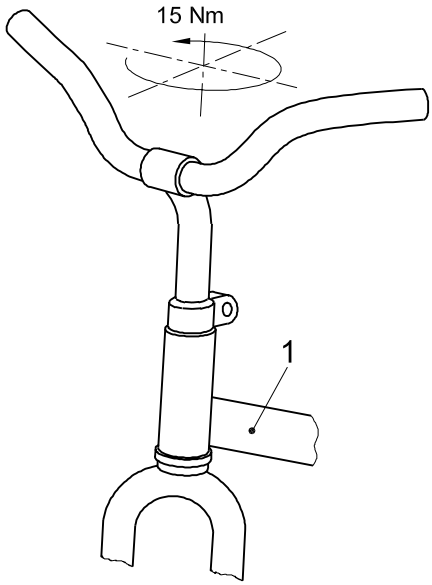
4.8.5.4.1 Requirement

The handlebar shall not move in relation to the fork stem when tested in accordance with 4.8.5.4.2.

4.8.5.4.2 Test method

With the handlebar stem correctly assembled in the frame and fork stem, and the clamping device tightened to the manufacturer's recommended minimum torque, apply a torque of 15 Nm to the handlebar/fork clamping device, as shown in Figure 12. Maintain this torque for 1 min.

〈AC〉



〈AC〉

Key

1 Applied torque

2 Frame and fork assembly

Figure 12 — Handlebar stem to fork stem – torsional security test

4.8.6 Handlebar and stem assembly – fatigue test

4.8.6.1 General

Handlebar-stems can influence test failure of handlebars and for this reason, a handlebar and stem is always to be tested as an assembly.

Conduct the test in two stages on the same assembly as follows.

4.8.6.2 Requirement for stage 1

When tested by the method described in 4.8.6.3, there shall be no visible cracks or fractures in any part of the handlebar and stem assembly.

4.8.6.3 Test method for stage 1

Unless the handlebar and stem are permanently connected, e.g. by welding or brazing, align the grip of portions of the handlebar in a plane perpendicular to the stem axis (see Figure 13), and secure the handlebar to the stem according to the manufacturer's recommendations.

Clamp the handlebar stem securely in a fixture to the minimum insertion depth.

Apply fully-reversed forces of 115 N at a position 50 mm from the free end each side of the handlebar and in a plane parallel to the stem axis for 100 000 cycles, with the forces at each end of the handlebar being out of phase with each other and parallel to the axis of the handlebar stem as shown in Figure 14 a). The maximum test frequency shall be 25 Hz.

NOTE Any resonant condition should be avoided.

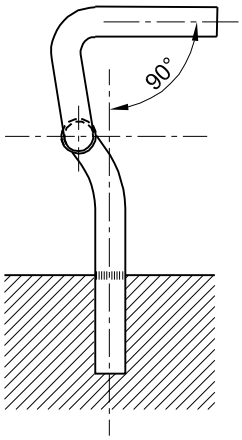
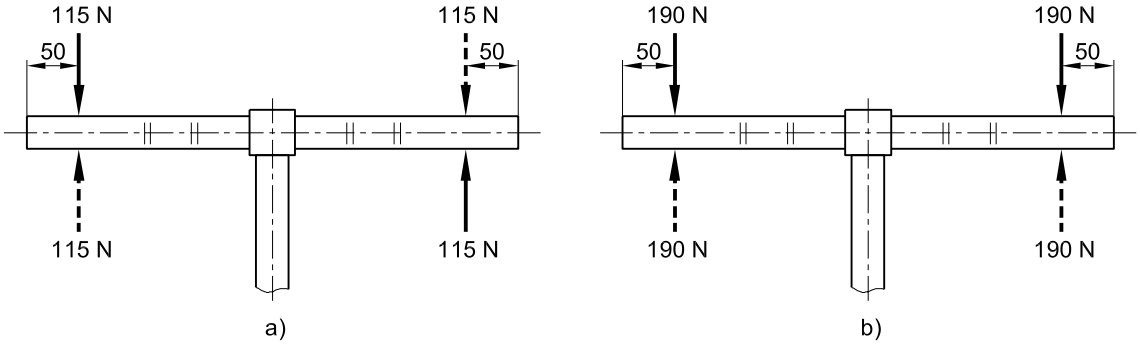


Figure 13 — Adjustable handlebars — orientation for test

Dimension in millimetres



Key

a) Stage 1 — Out-of-phase loading

b) Stage 2 — In-phase loading

Figure 14 — Handlebar and stem – fatigue tests

4.8.6.4 Requirement for stage 2

When tested by the method described in 4.8.6.5, there shall be no visible cracks or fractures in any part of the handlebar and stem assembly.

4.8.6.5 Test method for stage 2

Apply fully-reversed forces of 190 N at a position 50 mm from the free end each side of the handlebar and in a plane parallel to the stem axis for 100 000 cycles, with the forces at each end of the handlebar being in phase with each other and parallel to the axis of the handlebar stem as shown in Figure 14 b). The maximum test frequency shall be 25 Hz.

4.9 Frames

4.9.1 Frame and front fork assembly – impact test (falling mass)

4.9.1.1 Requirement

When tested by the method described in 4.9.1.2, there shall be no visible cracks or fractures in any part of the frame/fork assembly.

The permanent set measured between the axes of the wheel axles (measured as the wheelbase – see Figure 15) shall not exceed 20 mm.

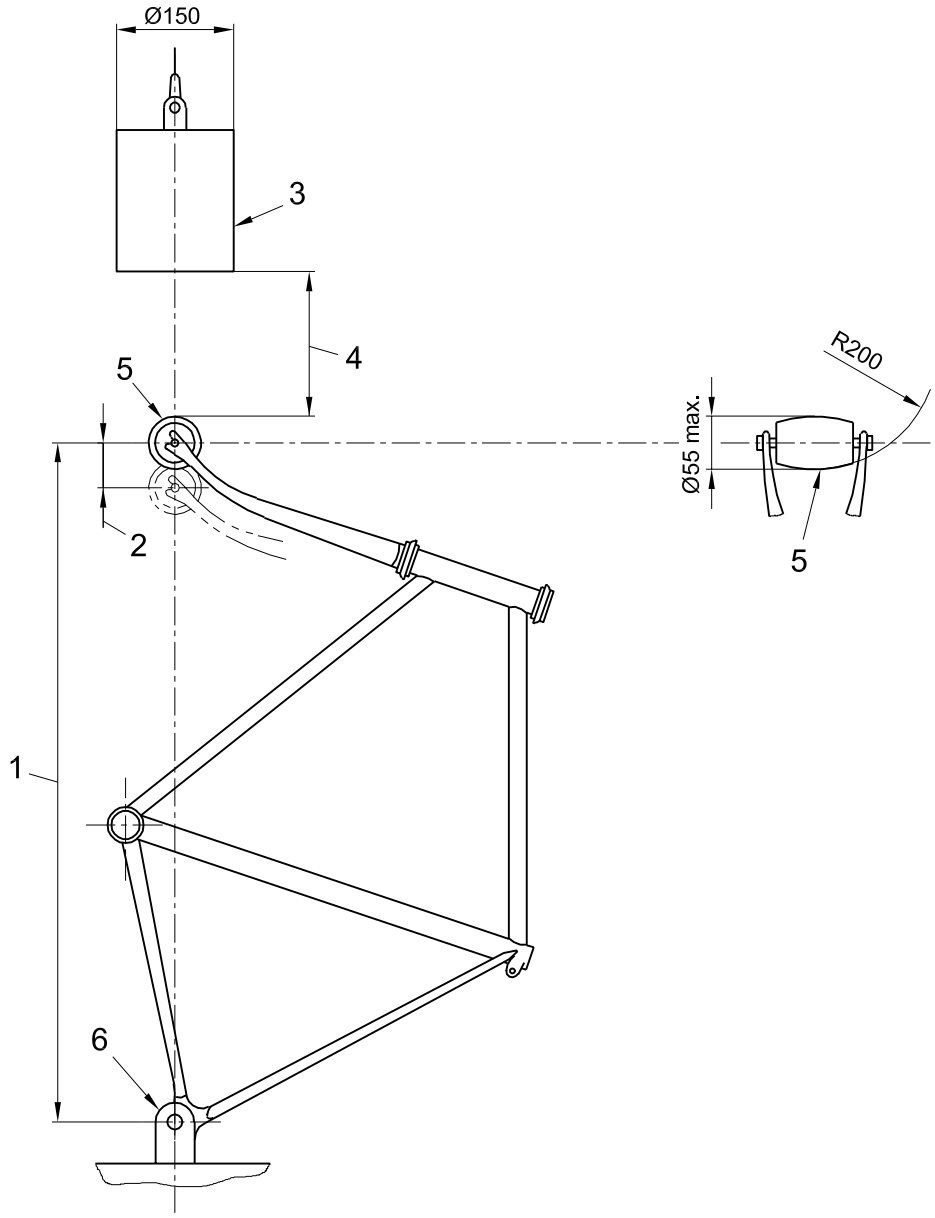
4.9.1.2 Test method

If the bicycle frame is convertible for male and female riders by removal of a bar, test the frame with the bar removed.

Measure the distance between the axle centrelines. Assemble a roller of mass less than or equal to 1 kg and with the dimensions conforming to those shown in Figure 15 in the front fork, and hold the frame/fork assembly vertically, clamped to a rigid fixture by the rear axle attachment points, as shown in Figure 15.

Drop a striker of mass 22,5 kg from a height of 120 mm onto the low mass roller at a point in line with the wheel centres and against the direction of the fork rake.

Dimension in millimetres



Key

1 Wheelbase
2 Permanent set
3 22,5 kg striker
4 Drop height 120 mm
5 Low-mass roller (1 kg max)
6 Rigid mounting for rear axle attachment point

Figure 15 — Frame and front fork assembly – impact test (falling mass)

4.9.2 Frame and front fork assembly – impact test (falling frame)

4.9.2.1 Requirement

When tested by the method described in 4.9.2.2, there shall be no visible cracks or fractures in any part of the frame/fork assembly.

The permanent set measured between the axes of the wheel axles (the wheelbase – see Figure 16) shall not exceed 20 mm.

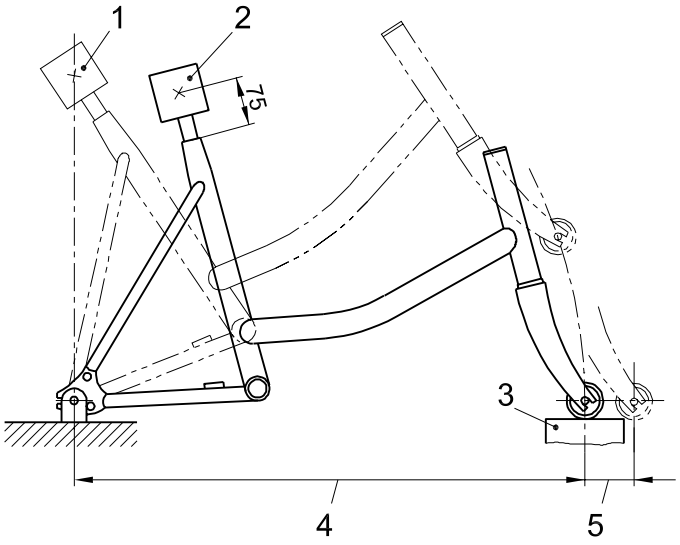
4.9.2.2 Test method

Conduct the falling frame/fork assembly test on the frame/fork/roller assembly used in 4.9.1.

Mount the assembly at the rear axle attachment points so that it is free to rotate about the rear axle in the vertical plane. Support the front fork with a flat steel anvil so that the frame is in the normal position of use. Fix a 30 kg mass to the seat pillar, with the centre of gravity on the axis of the saddle tube and 75 mm from the top of the saddle tube along the axis. Rotate the assembly about the rear axle so that the centre of gravity of the 30 kg mass is vertically above the rear axle, then allow the assembly to fall freely onto the anvil (see Figure 16).

Perform the test twice.

Dimension in millimetres



Key

1 Mass vertically above rear axle
2 30 kg mass
3 Steel anvil
4 Wheelbase
5 Permanent set

Figure 16 — Frame and front fork assembly – impact test (falling frame)

4.10 Front fork

4.10.1 General

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.

4.10.2 Front fork – bending fatigue test

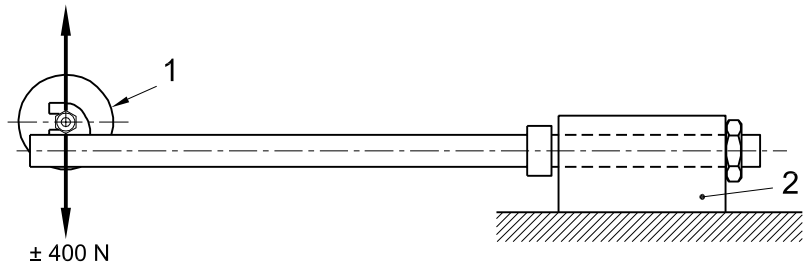
4.10.2.1 Requirement

When tested by the method described in 4.10.2.2, there shall be no fractures or visible cracks in any part of the fork.

4.10.2.2 Test method

Mount the fork in a fixture representative of the head-tube and gripped in the normal bearings as shown in Figure 17.

Apply cycles of fully reversed, dynamic forces of ± 400 N (accurate to within 0/+5 %) in the plane of the wheel and perpendicular to the stem-tube to a loading attachment and swivel on an axle located in the axle-slots of the blades for 100 000 test cycles with a test frequency not exceeding 25 Hz.



Key

1 Pivoted force-application device

2 Rigid mount incorporating head bearings

Figure 17 — Front fork – bending fatigue test

4.11 Wheels

4.11.1 Rotational accuracy

4.11.1.1 General

Rotational accuracy shall be as defined in ISO 1101 in terms of circular run-out tolerance (lateral). The run-out tolerances given in 4.11.1.2 and 4.11.1.3 represent the maximum variation of position of the rim (i.e., full indicator reading) of a fully assembled and adjusted wheel during one complete revolution about the axle without axial movement.

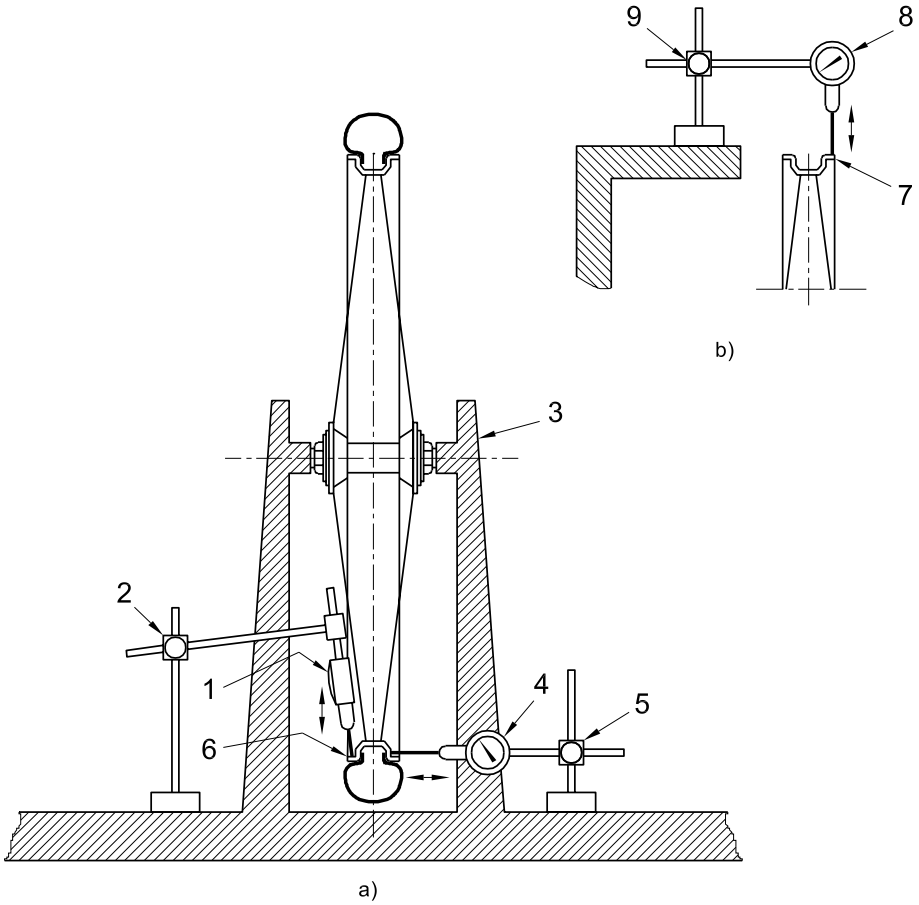
4.11.1.2 Wheel/tyre assembly – concentricity tolerance

For measurement of both axial run-out and radial run-out (concentricity) the wheel shall be fitted with a tyre inflated to the maximum pressure as marked on the tyre but, for rims where the concentricity cannot be measured with the tyre fitted, it is permissible to make measurements with the tyre removed.

The run-out shall not exceed 2 mm when measured perpendicular to the axle at a suitable point along the rim, see Figure 18.

4.11.1.3 Wheel/tyre assembly – lateral tolerance

The run-out shall not exceed 2 mm when measured parallel to the axle at a suitable point along the rim, see Figure 18.



Key

a) Rim with tyre
b) Rim without tyre
1 Dial-gauge (concentricity)
2 Instrument stand
3 Hub axle support
4 Dial-gauge (lateral run-out)
5 Instrument stand
6 Rim with tyre
7 Rim without tyre
8 Dial-gauge (concentricity)
(alternative position)
9 Instrument stand

Figure 18 — Wheels – rotational accuracy

4.11.2 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.

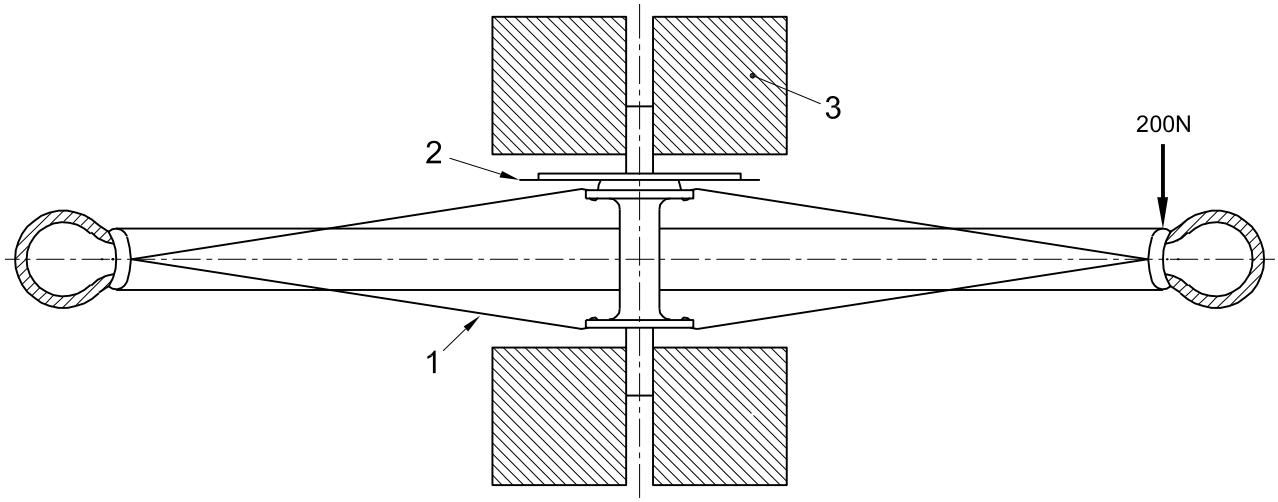
4.11.3 Wheel/tyre assembly – static strength test

4.11.3.1 Requirement

When a fully-assembled wheel fitted with a tyre inflated to the manufacture's recommended pressure is tested by the method described in 4.11.3.2, there shall be no failure of any of the components of the wheel, and the permanent set, measured at the point of application of the force on the rim, shall not exceed 1,5 mm.

4.11.3.2 Test method

Clamp and support the wheel suitably as shown in Figure 19 and apply a static force of 200 N at one point on the rim, perpendicular to the plane of the wheel. Apply the force once only for a duration of 1 min.



Key

1 Wheel assembly

2 Drive sprockets

3 Clamping fixture

Figure 19 — Wheels – static strength test

4.11.4 Wheel retention

4.11.4.1 General

Wheels shall be secured to the bicycle frame and fork such that when adjusted to the manufacturer's recommendations they comply with 4.11.4.2 and 4.11.4.3.

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

4.11.4.2 Front wheel retention — retention devices secured

4.11.4.2.1 Requirement

When tested by the method described in 4.11.4.2.2, there shall be no relative motion between the axle and the front fork.

4.11.4.2.2 Test method

Apply a force of 1 000 N distributed symmetrically to both ends of the axle for a period of 1 min in the direction of the removal of the wheel.

4.11.4.3 Rear wheel retention — retention devices secured

4.11.4.3.1 Requirement

When tested by the method described in 4.11.4.3.2, there shall be no relative motion between the axle and the frame.

4.11.4.3.2 Test method

Apply a force of 1 000 N distributed symmetrically to both sides of the axle for a period of 1 min in the direction of the removal of the wheel.

4.11.4.4 Front wheel retention – retention devices unsecured

4.11.4.4.1 Requirement

When tested by the method described in 4.11.4.4.2, the wheel shall not detach from the fork.

4.11.4.4.2 Test method

Unscrew the axle nuts by one complete turn from the finger-tight condition and apply a force of 100 N to the wheel for a period of 1 min in direction of removal of the wheel.

4.12 Rims, tyres and tubes

NOTE Non-pneumatic tyres are excluded from the requirements of 4.12.1 and 4.12.2.

4.12.1 Tyre inflation pressure

The maximum inflation pressure recommended by the manufacturer shall be moulded on the sidewall of the tyre so as to be readily visible when the latter is assembled on the wheel.

NOTE It is recommended that the minimum inflation pressure specified by the manufacturer also be moulded on the sidewall of the tyre.

4.12.2 Tyre and rim compatibility

Tyres shall comply with the requirements of ISO 5775-1 and rims shall comply with the requirements of ISO 5775-2.

NOTE In the absence of suitable information from International or European Standards, other publications may be used. (see Bibliography).

The tyre, tube and rim-tape shall be compatible with the rim design.

When inflated to 110 % of the maximum inflation pressure for a period of not less than 5 min, the tyre shall remain intact on the rim.

4.13 Pedals and pedal/crank drive system

4.13.1 Pedal tread

4.13.1.1 The tread surface of a pedal shall be secured against movement within the pedal assembly.

The pedal shall turn freely on its axle.

4.13.1.2 Pedals shall have

a) tread surfaces on the top and bottom surfaces of the pedal, or

b) a definite preferred position that automatically presents the tread surface to the rider's foot.

4.13.2 Pedal clearance

4.13.2.1 Ground clearance

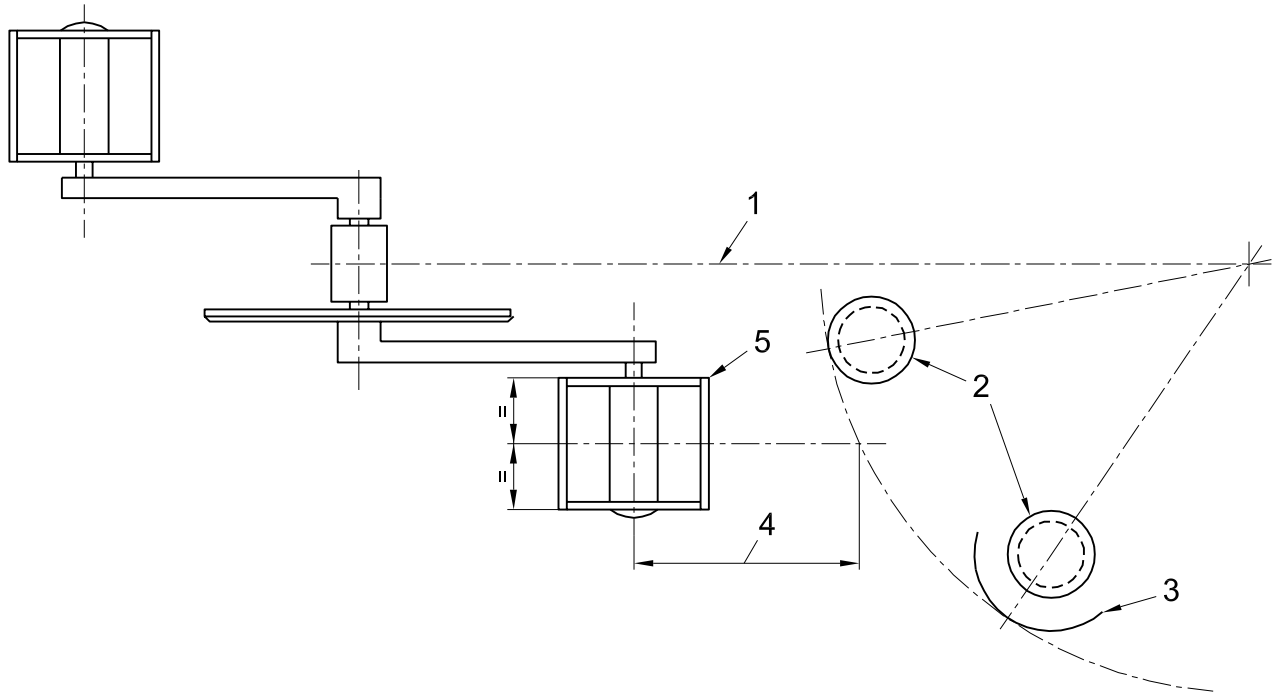
With the bicycle un-laden, with any stabilisers removed, the pedal at its lowest point and the tread surface of the pedal parallel to the ground (and uppermost where it has only one tread surface), the bicycle shall be capable of being leaned over at an angle of 23° from the vertical before any part of the pedal touches the ground.

Suspension devices (if applicable) shall be depressed by application of a 30 kg mass to the saddle whilst the bicycle is held vertical. With the suspension clamped in this position, the bicycle shall be capable of being leaned over at an angle of 23° from the vertical before any part of the pedal touches the ground.

4.13.2.2 Toe clearance

Bicycles shall have at least 89 mm clearance between the pedal and front tyre or mudguard (when turned to any position). The clearance shall be measured forward and parallel to the longitudinal axis of the bicycle from the centre of either pedal to the arc swept by the tyre or mudguard, whichever is the lesser (see Figure 20).

Dimension in millimetres



Key

1 Longitudinal axis
2 Front tyre
3 Mudguard
4 Clearance
5 Pedal

Figure 20 — Toe clearance

4.13.3 Pedal-spindle impact test

4.13.3.1 Requirement

When tested by the method described in 4.13.3.2, the spindle shall not fracture.

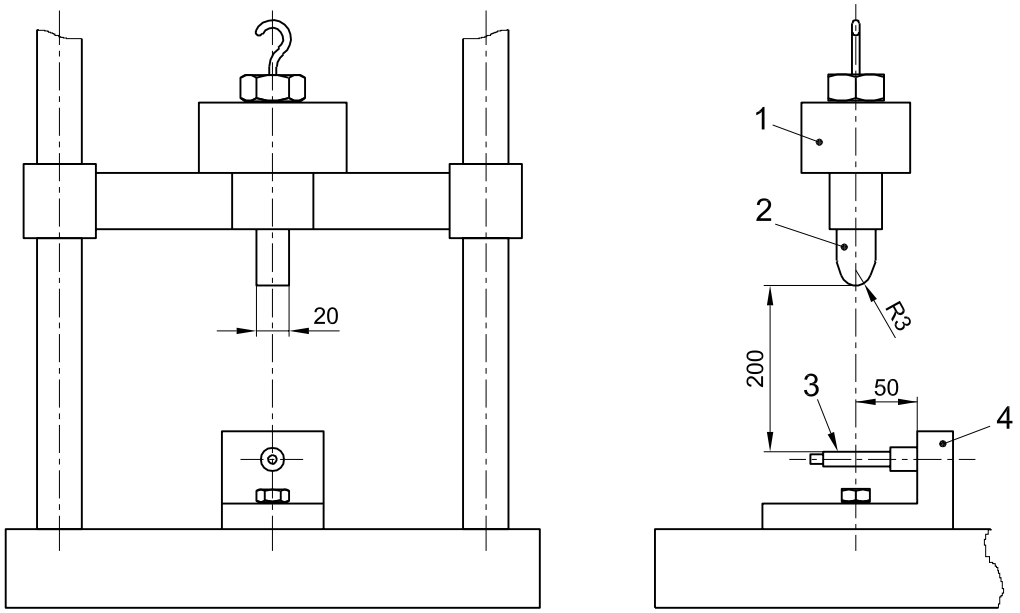
NOTE Visible cracking is permissible because of the hardened surface.

4.13.3.2 Test method

Screw the pedal-spindle securely into a suitable rigid fixture with its axis horizontal and release a striker of the design shown in Figure 21 and weighting 15 kg from a height of 200 mm to strike the spindle at a point 50 mm from the mounting-face of the rigid fixture or 5 mm from the end of the spindle if the spindle is shorter than 55 mm.

Dimension in millimetres

AC



AC

Key

1 15 kg mass (whole assembly)

2 Striker

3 Pedal-spindle

4 Rigid fixture

Figure 21 — Pedal-spindle – impact test

4.13.4 Pedal/pedal-spindle —dynamic durability test

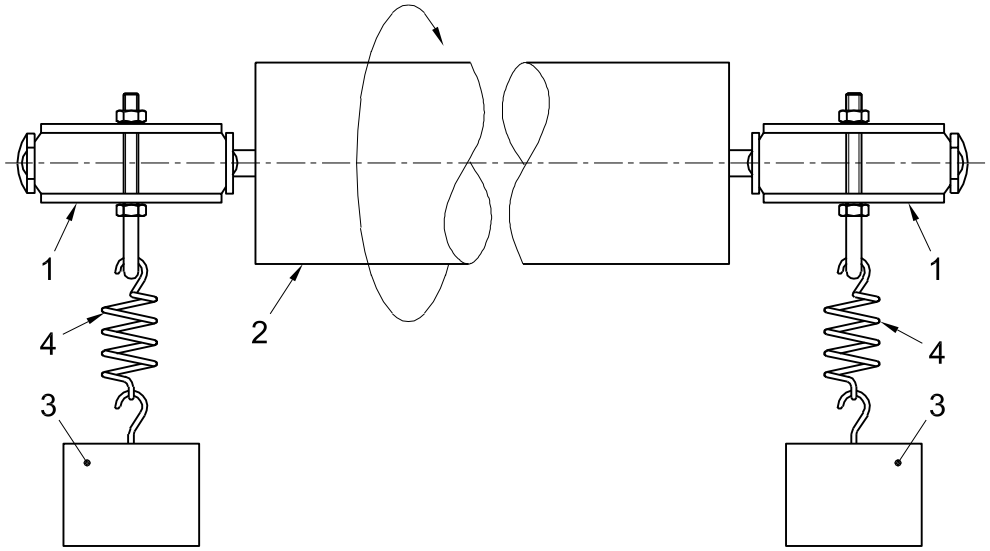
4.13.4.1 Requirement

When tested by the method described in 4.13.4.2, there shall be no fractures or visible cracking of any part of the pedal, the pedal-spindle or of the crank-threads.

4.13.4.2 Test method

Screw each pedal securely into a threaded hole in a rotable test-shaft as shown in Figure 22 and suspend a mass of 30 kg by means of a tension-spring to each pedal as shown in Figure 22, the object of the springs being to minimise oscillations of the load.

Drive the shaft at a speed not exceeding 100 min^{-1} for a total of 100 000 revolutions. If the pedals are provided with two tread surfaces, rotate them through 180° after 50 000 revolutions.



Key

1 Pedal

2 Test-shaft

3 30 kg mass

4 Tension spring

Figure 22 — Pedal/pedal-spindle – dynamic durability test

4.13.5 Drive system static strength test

4.13.5.1 Requirement

No component of the drive system shall fracture when tested in accordance with 4.13.5.2. Drive capability shall not be lost.

4.13.5.2 Test method

4.13.5.2.1 General

Conduct the drive system static load test on an assembly comprising the frame, pedals, transmission system, rear wheel assembly, and, if appropriate, the gear-change mechanism. Support the frame with the central plane vertical and with the rear wheel held at the rim to prevent the wheel rotating.

4.13.5.2.2 Single speed system

Carry out the following:

a) With the left-hand crank in the forward horizontal position, gradually apply a vertical downward force, increasing to 700 N, to the centre of the left-hand pedal, and maintain the full force for 1 min.

If the drive sprockets tighten so that the crank rotates under the load, return the crank to the horizontal position, after fully tightening, and repeat the test.

b) On completion of a), repeat the test with the right-hand crank in the forward horizontal position and the load applied to the centre of the right-hand pedal.

4.13.5.2.3 Multi-speed system

Carry out the following:

a) Conduct test 4.13.5.2.2 a) with the transmission in the highest gear.

b) Conduct test 4.13.5.2.2 b) with the transmission in the lowest gear.

4.13.6 Crank assembly — fatigue tests

4.13.6.1 Requirement

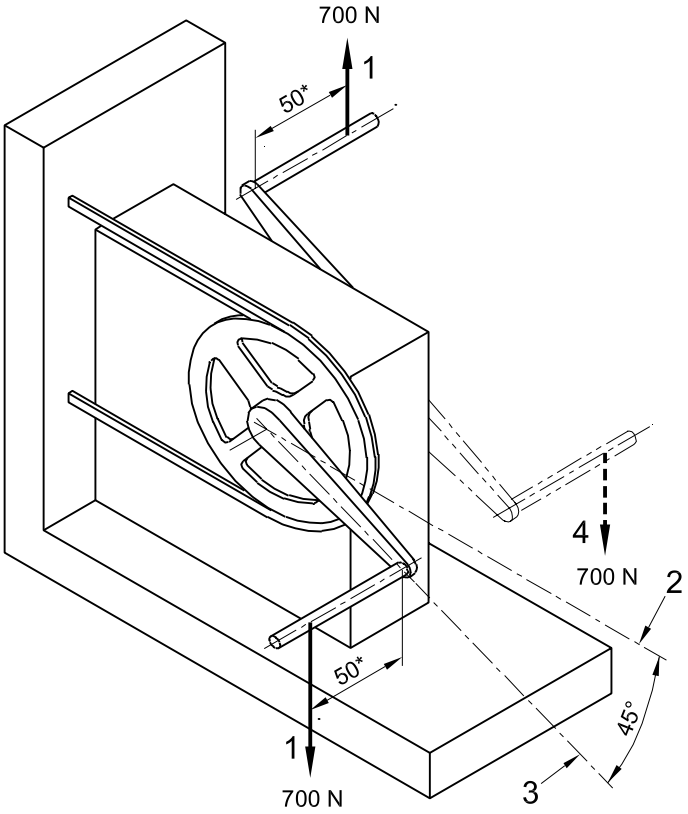
When tested by the method described in 4.13.6.2, there shall be no fractures or visible cracks in the pedal-spindles, the cranks, the bottom-bracket spindle or any of the attachment features, or loosening or detachment of the chain-wheel from the crank. Pedal-spindles may be replaced by suitable adaptors.

4.13.6.2 Test method

Mount the assembly of the two pedal-spindles, the two cranks, the chain wheel (or other drive component), and the bottom-bracket spindle located on its normal-production bearings in a fixture with bearing-housings representative of the bottom-bracket, as shown in Figure 23. It is permissible to perform the test with both cranks in the forward position, see hatched line in Figure 23. Incline the cranks at 45° to the horizontal. Prevent rotation of the assembly by locating a suitable length of drive-chain around the chain wheel and securing it firmly to a suitable support, or, for any other type of transmission (e.g. belt- or shaft-drive) by securing the first stage of the transmission.

Apply repeated, vertical, dynamic forces of 700 N alternately to the pedal-spindles of the left- and right-hand cranks at a distance of 50 mm from the outboard face of each crank (as shown in Figure 23) for 100 000 cycles (where one test cycle consists of the application of the two forces). If the cranks are assembled conventionally, the direction of the force on the right-hand crank shall be vertically downwards and that on the left-hand crank shall be vertically upwards. If the two cranks are in a forward position the direction of the force on both cranks shall be vertically downward. During application of these forces, ensure that the force on a "pedal-spindle" falls to 5 % or less of the peak force before commencing application of the test force to the other pedal-spindle.

Dimension in millimetres



Key

1 Repeated test force

2 Horizontal axis

3 Axis of crank

4 Alternative position for left crank

* From outboard face of crank

Figure 23 — Crank assembly – fatigue test with cranks at 45° (typical test arrangement)

4.14 Saddles and seat-pillars

4.14.1 Limiting dimensions

No part of the saddle, saddle supports, or accessories to the saddle shall be more than 125 mm above the top saddle surface at the point where the saddle surface is intersected by the seat-pillar axis.

4.14.2 Seat-pillar – insertion-depth mark or positive stop

The seat-pillar 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, transverse mark of length not less than the external diameter or the major dimension of the cross-section of the seat-pillar that clearly indicates the minimum insertion-depth of the pillar into the frame. For a circular cross-section, the mark shall be located not less than two diameters of the pillar from the bottom of the pillar (i.e. where the diameter is the external diameter). For a non-circular cross-section, the insertion-depth mark shall be located not less than 65 mm from the bottom of the pillar (i.e. where the seat-pillar 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.

4.14.3 Saddle and seat pillar – security test

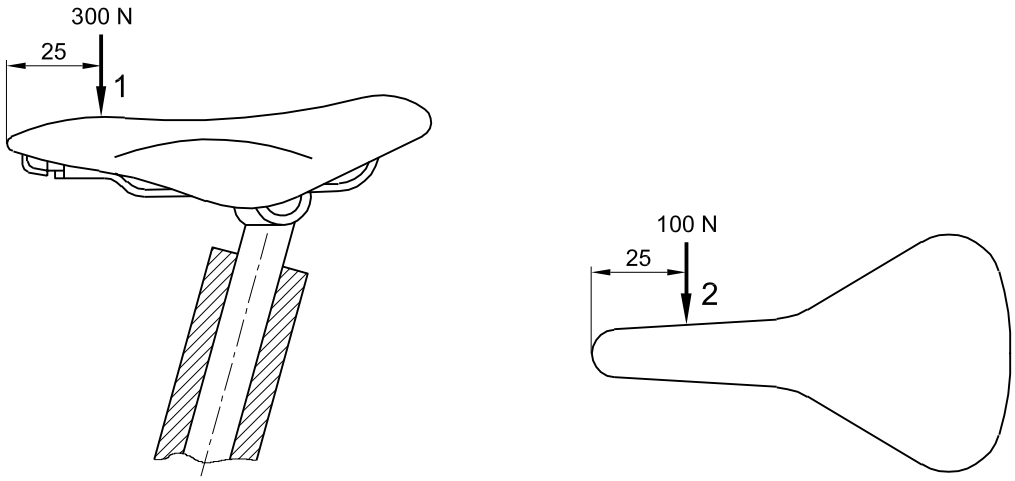
4.14.3.1 Requirement

When tested by the method described in 4.14.3.2, there shall be no movement of the saddle adjustment clamp in any direction with respect to the pillar, or of the pillar with respect to the frame.

4.14.3.2 Test method

With the saddle and seat-pillar correctly assembled to the bicycle frame, and the clamps tightened to the torque recommended by the bicycle manufacturer, apply a force of 300 N vertically downwards at a point 25 mm from either the front or rear of the saddle, whichever produces the greater torque on the saddle-clamp. Remove this force and apply a lateral force of 100 N horizontally at point 25 mm from either the front or rear of the saddle, whichever produces the greater torque on the clamp (see Figure 24).

Dimension in millimetres



a) Vertical force

b) Horizontal force

Key

1 Vertical force

2 Horizontal force

Figure 24 — Saddle/seat-pillar – security test

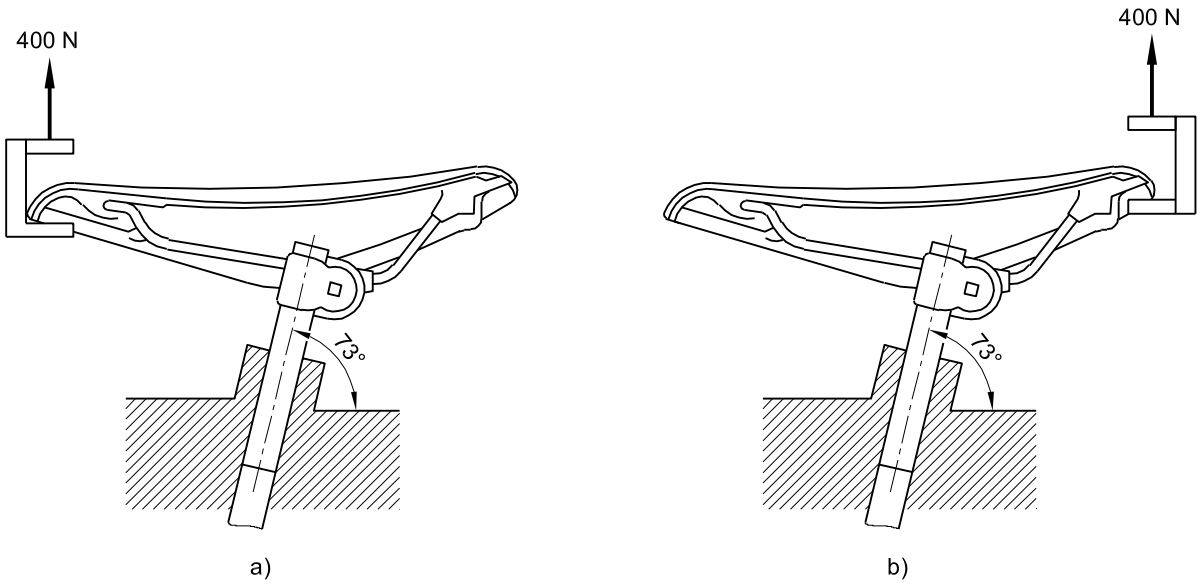
4.14.4 Saddle — static strength test

4.14.4.1 Requirement

When tested by the method described in 4.14.4.2, the wire chassis shall not disengage from the saddle cover and/or plastic moulding shall not disengage from the wire chassis and there shall be no cracking or permanent distortion of the saddle assembly.

4.14.4.2 Test method

With the saddle clamped to a suitable fixture representative of a seat-pillar and the clamps tightened to the torque recommended by the bicycle manufacturer, apply forces of 400 N once, in turn, under the rear and nose of the saddle cover, as shown in Figure 25, ensuring that the force is not applied to any part of the chassis of the saddle.



Key

a) Force under nose
b) Force under rear

Figure 25 — Saddle – static strength test

4.14.5 Seat-pillar — fatigue test

4.14.5.1 General

In the following test, if a suspension seat-pillar is involved, the test may be conducted with the suspension system either free to operate or locked. If it is locked, the pillar shall be at its maximum length.

4.14.5.2 Requirement

When tested by the method described in 4.14.5.3 there shall be no fractures or visible cracks in the seat-pillar.

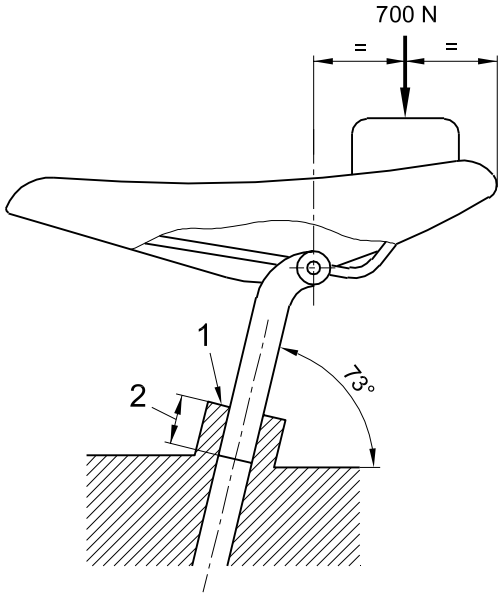
4.14.5.3 Test method

Clamp the seat-pillar securely in a fixture to the minimum insertion depth with the saddle attached to the seat-pillar to the manufacturer's recommendations.

Apply a repeated, vertical force of 700 N with a suitable adaptor to the saddle, as shown in Figure 26, for 100 000 cycles. The frequency shall not exceed 4 Hz.

In case of saddles in which the saddle and the pillar are one part, the angle in Figure 26 shall be chosen in such a way that the saddle surface is horizontal.

Dimension in millimetres



Key

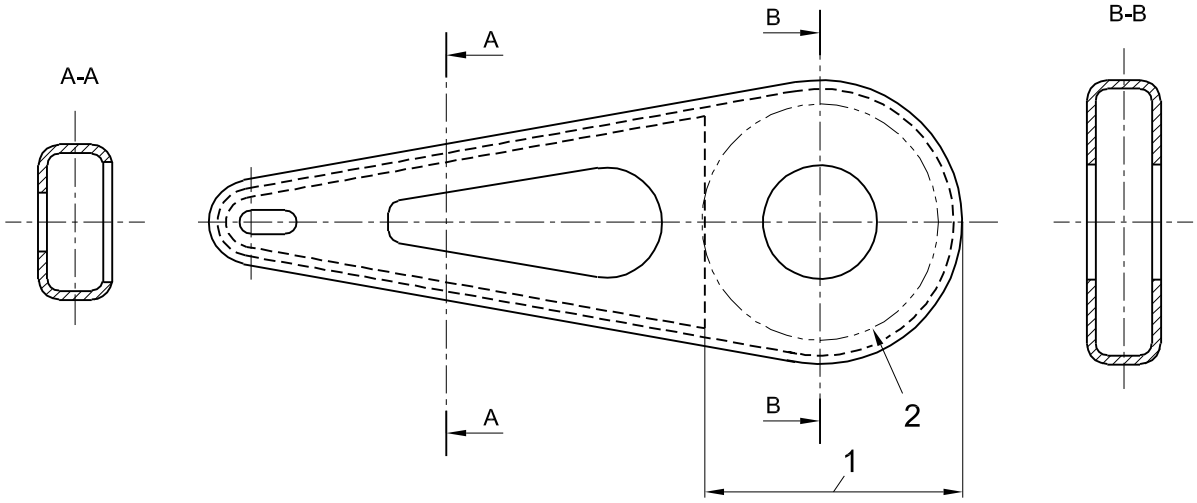
1 Rigid mount

2 Minimum insertion depth

Figure 26 — Seat-pillar – fatigue test

4.15 Chain-guard

Bicycles shall be equipped with a chain-guard that fully shields the outside face and edge of the chain, chain wheel and rear sprocket, and the inside face of the chain wheel and junctions of the chain and chain wheel (see Figure 27).



Key

1 Extent of cover on inside face

2 Chain wheel

Figure 27 — Chain-guard

4.16 Stabilizers

4.16.1 Mounting and dismounting

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

4.16.2 Dimensions

When attached to the bicycle in accordance with the manufacturer's instructions:

a) the horizontal distance between the vertical plane through each stabilizer wheel and the vertical plane through the centreline of the bicycle frame shall be at least 175 mm (see Figure 28);

b) the clearance between each stabilizer wheel and the ground shall not exceed 25 mm with the bicycle supported upright on a flat horizontal surface.

4.16.3 Vertical load test

4.16.3.1 Requirement

The deflection under load and permanent set shall not exceed 25 mm and 15 mm, respectively, when tested in accordance with 4.16.3.2.

4.16.3.2 Test method

With the bicycle frame inverted and rigidly secured in the upright position via the seat pillar, apply a vertically downward force of 300 N to one of the stabilizer wheels, as shown in Figure 28, for 3 min.

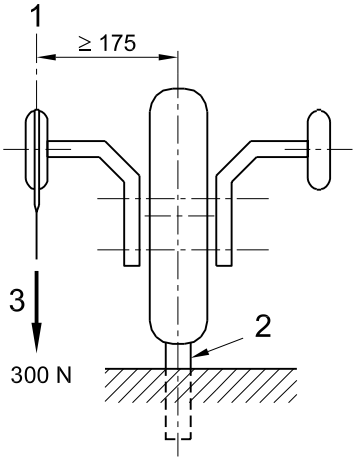
Measure the deflection under load at a point on the circumference of the stabilizer wheel.

Repeat the test on the other stabilizer wheel.

Repeat the alternate loading a further four times without checking the deflection (a total of five loadings on each stabiliser, each for a period of three minutes).

One minute after removal of the fifth loading on each stabilizer, measure the permanent set at the same measuring point.

Dimensions in millimetres



Key

1 Stabilizer wheel

2 Seat pillar secured in rigid fixture

3 Force acting through centreline of stabilizer wheel

Figure 28 — Vertical load test

4.16.4 Longitudinal load test

4.16.4.1 Requirement

The permanent set shall not exceed 15 mm when tested in accordance with 4.16.4.2.

No component of the stabilizer assembly shall fracture in the test.

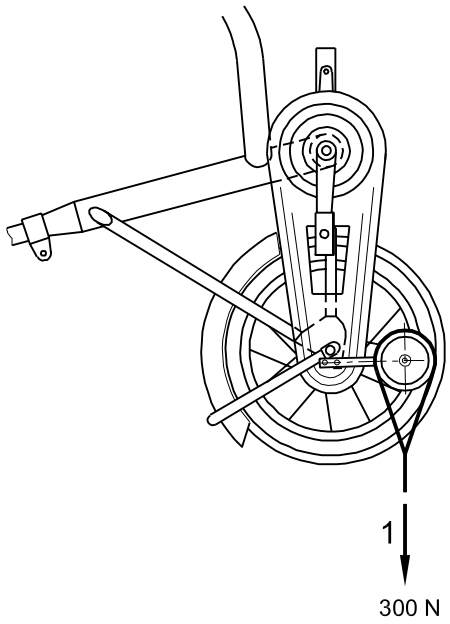
4.16.4.2 Test method

With the bicycle frame rigidly supported into the front axle vertically above the rear wheel axle, apply a vertically downward force of 300 N to one of the stabilizer wheels, as shown in Figure 29, for 3 min.

Repeat the test on the other stabilizer wheel.

Repeat the alternate loading a further four times (a total of five loadings on each stabiliser, each for a period of three minutes).

One minute after removal of the fifth loading on each stabiliser, measure the permanent set at a point on the circumference of the stabilizer wheel.



Key

1 Force acting through centreline of stabilizer wheel

Figure 29 — Longitudinal load test

4.17 Luggage carriers

If luggage carriers are provided they shall comply with [A1] EN 14872 [A1].

4.18 Lighting systems and reflectors

4.18.1 Lighting and reflectors

Lighting systems and reflectors will not normally be fitted to bicycles for young children but the manufacturer's instruction shall advise the user to take note of national regulations for the country in which the bicycle is to be used (see Clause 5 h)).

4.18.2 Wiring harness

When a wiring harness is fitted, it shall be positioned to avoid any damage by contact with moving parts or sharp edges. All connections shall withstand a tensile force in any direction of 10 N.

4.18.3 Warning device

Where a bell or other suitable device is fitted, it shall comply with ISO 7636.

5 Instructions

Each bicycle shall be provided with a set of instructions in the language of the country to which the bicycle will be supplied, containing information on:

a) the type of use for which the bicycle has been designed (i.e. the type of terrain for which it is suitable) with a warning about the hazards of incorrect use;

b) preparation for riding – how to measure and adjust the saddle height to suit the rider with an explanation of the insertion-depth warning marks on the seat-pillar and handlebar stem. Clear information on which lever operates the rear brake, the presence of any brake-power modulators with an explanation of their function and adjustment, and the correct method of using a back-pedal brake, if fitted;

c) the importance of parents or carers ensuring that children are properly instructed in the use of a child's bicycle, particularly in the safe use of the braking systems (especially a back-pedal brake);

d) indication of minimum saddle height and the way to measure it;

e) the recommended method for adjusting any adjustable suspension system fitted;

f) recommendations for safe riding – use of a bicycle helmet, regular checks on brakes, tyres, steering, rims, and caution concerning possible increased braking distances in wet weather;

g) the permissible total weight of the rider plus luggage and the maximum total weight (bicycle + rider + luggage);

h) an advisory note to drawn attention to the rider concerning possible national legal requirements when the bicycle is to be ridden on public roads (e.g. lighting and reflectors);

i) recommended tightening of fasteners related to the handlebar, handlebar-stem, saddle, seat-pillar, and wheels, with torque values for threaded fasteners;

j) fitting, adjustment and removal of stabilizers, and a warning regarding risks when using stabilizers;

k) the correct method of assembling any parts supplied unassembled;

l) lubrication – where and how often to lubricate, and the recommended lubricants;

m) the correct chain tension and how to adjust it or other drive mechanism;

n) adjustment of gears and their operation;

o) adjustment of brakes and recommendations for the replacement of the friction components;

p) recommendations on general maintenance;

q) the importance of using only genuine replacement parts for safety-critical components;

r) appropriate spares, i.e. tyres, tubes, and brake friction-components;

s) accessories – where these are offered as fitted, details should be included such as operation, maintenance required (if any) and any relevant spares (e.g. light bulbs).

NOTE Any other relevant information may be included at the discretion of the manufacturer.

6 Marking

6.1 Requirement

The frame shall be:

a) visibly and permanently marked with a successive frame number at a readily visible location

b) visibly and durably marked with the name of the manufacturer or the manufacturer's representative, and the number of this European Standard, i.e. EN 14765. The method of testing for durability is specified in 6.2.

NOTE 1 In some countries there is a legal requirement concerning marking of bicycles.

NOTE 2 For components, currently there are no specific requirements, but it is recommended that the following safety-critical components be clearly and permanently marked with traceable identification, such as a manufacturer's name and a part number:

1) front fork;
2) handlebar and handlebar stem;
3) saddle pillar;
4) brake blocks and/or brake-block holders and brake-pads;
5) brake outer-cable casing;
6) hydraulic-brake tubing;
7) brake-levers;
8) chain;
9) pedals and cranks;
10) bottom-bracket spindle;
11) wheel rims.

6.2 Durability test

6.2.1 Requirement

When tested by the method described in 6.2.2, marking shall remain easily legible. It shall not be easily possible to remove any label nor shall any label show any sign of curling.

6.2.2 Test method

Rub the marking by hand for 15 s with a piece of cloth soaked in water and again for 15 s with a piece of cloth soaked in petroleum spirit.

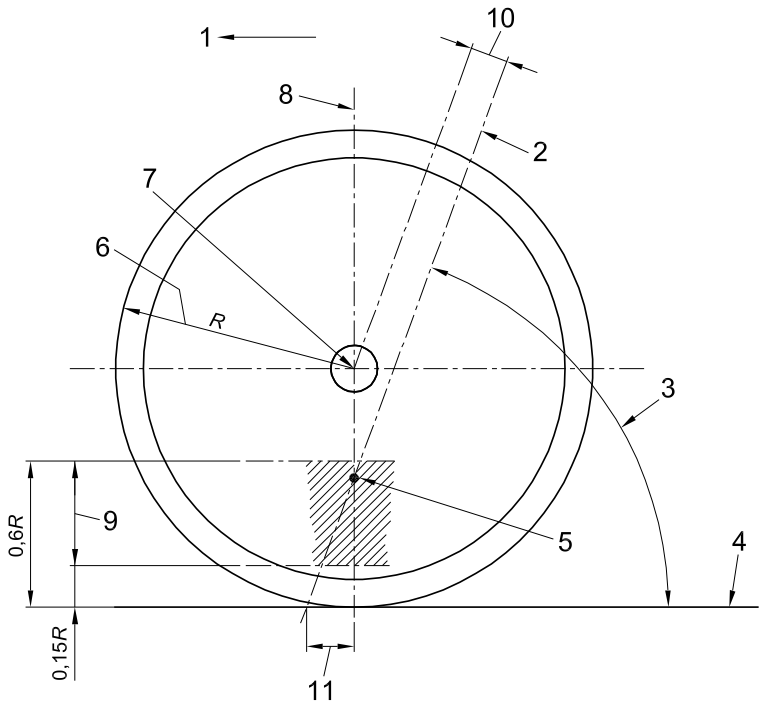
Annex A
(informative)

Steering geometry

The steering geometry employed, as shown in Figure A.1, will generally be dictated by the use for which the bicycle is intended but it is nevertheless recommended that:

a) the steering head angle be not more than 75° and not less than 65° in relation to the ground line, and

b) the steering axis intersects a line perpendicular to the ground line, drawn through the wheel centre, at a point not lower than 15% and not higher than 60 % of the wheel radius when measured from the ground line.



Key

1 Direction of travel
2 Steering axis
3 Steering head angle
4 Ground line
5 Intersection point
6 Wheel radius
7 Wheel centre
8 Perpendicular to ground line
9 Tolerance
10 Offset
11 Trail

Figure A.1 — Steering geometry

Bibliography

[1] EN 71, *Safety of toys*

[2] [A1] ISO/DIS 3452-1, *Non-destructive testing — Penetrant testing — Part 1: General principles* [A1]

[3] ISO 3452-2, *Non-destructive testing — Penetrant testing — Part 2: Testing of penetrant materials*

[4] ISO 3452-3, *Non-destructive testing — Penetrant testing — Part 3: Reference test blocks*

[5] ISO 3452-4, *Non-destructive testing — Penetrant testing — Part 4: Equipment*

[6] *ETRTO – Standards manual 2002 (Red Book) (and successive editions)*, ETRTO, The European Tyre and Rim Technical Organisation, Avenue Brugmann 32/2, B-1060 Brussels, Belgium

[7] *ETRTO – Recommendations 2002 (Red Book) (and successive editions)*, ETRTO, The European Tyre and Rim Technical Organisation, Avenue Brugmann 32/2, B-1060 Brussels, Belgium

blank

BS EN 14765:2005 +A1:2008

Incorporating corrigendum May 2006

British Standards Institute (BSI)

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover.
Tel: +44 (0)20 8996 9000 Fax: +44 (0)20 8996 7400

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services.
Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001
Email: orders@bsigroup.com

You may also buy directly using a debit/credit card from the BSI Shop on the Website http://www.bsigroup.com/shop.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre.
Tel: +44 (0)20 8996 7111 Fax: +44 (0)20 8996 7048
Email: info@bsigroup.com

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration.
Tel: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001
Email: membership@bsigroup.com

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsigroup.com/BSOL.

Further information about BSI is available on the BSI website at http://www.bsigroup.com.

Copyright

BSI Group Headquarters
389 Chiswick High Road,
London W4 4AL, UK
Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/standards