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Cycles — Luggage carriers for bicycles — Requirements and test methods

Cycles — Porte-bagages pour bicyclettes — Exigences et méthodes d'essai

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 149, *Cycles*, Subcommittee SC 1, *Cycles and major sub-assemblies*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 333, *Cycles*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 11243:2016), which has been technically revised.

The main changes are as follows:

— change of Scope;

— the following terms and definitions; “cycle specific luggage carrier”, “non cycle specific luggage carrier”, “exposed protrusion” were added;

— improvement of Clause 3 and Clause 4;

— improvement of 5.1 and 5.5.2;

— addition of 5.6;

— improvement of 5.9, 5.10 and 5.11;

— addition of 5.12;

— improvement of 5.13;

— improvement of Clause 6, Clause 7 and Clause 8;

— deletion of some annexes and addition of some annexes with changes in the text.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document has been developed in response to demand throughout the world, and the aim has been to ensure that luggage carrier manufactured in conformity with it will be as safe as is practically possible. The tests have been designed to ensure the strength and durability of the luggage carrier, demanding high quality throughout and consideration of safety aspects from the design stage onwards.

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

Cycles — Luggage carriers for bicycles — Requirements and test methods

1 Scope

This document specifies safety and performance requirements for the design and testing of both non cycle specific luggage carriers intended for mounting (with or without tools) and cycle specific luggage carriers mounted on complete cycles. It applies to luggage carriers intended to be positioned above and adjacent to the wheels of cycles. This document lays down guidelines for instructions on the use and care of such luggage carriers.

This document does not apply to removable luggage (for example, handlebar bags or baskets that are not permanently attached).

Toy carrier intended to be mounted on bicycles for young children in the scope of ISO 8098 are not covered by this document.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
luggage carrier
device, including containers such as baskets, that is mounted and permanently attached above and/or adjacent to the rear wheel(s) (in the case of a rear luggage carrier) or front wheel(s) (in the case of a front luggage carrier) of a cycle and that is designed for carrying luggage or children in child seats

3.2
cycle specific luggage carrier
luggage carrier that is removable, designed to be mounted on a specific cycle

3.3
non cycle specific luggage carrier
luggage carrier sold as a separate accessory intended to be mounted on a wide range of suitable cycles

3.4
luggage carrier platform
flat part of the *luggage carrier* (3.1) upon which loads may be placed or fixed, or the flat top rail from which panniers may be hung, or the bottom part of a container

Note 1 to entry: The bottom part of a container, for example a basket.

3.5
luggage carrier platform length
L
maximum overall length of the *luggage carrier platform* (3.4)

3.6
visible crack
crack which results from a test, wherein that crack is visible to the naked eye

[SOURCE: ISO 4210-1:2023, 3.2.11]

3.7
fracture
unintentional separation into two or more parts

[SOURCE: ISO 4210-1:2023, 3.2.4]

3.8
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

[SOURCE: ISO 4210-1:2023, 3.2.3]

3.9
toy carrier
luggage carrier with a part intended for containing a maximum mass of 1 kg and not intended to carry luggage

3.10
permanently attached luggage carrier
luggage carrier (3.1) which is permanently attached

Note 1 to entry: For example, luggage carrier welded to the frame.

3.11
normal rear luggage carrier
rear luggage carrier supported by fixings to the bicycle frame close to the rear wheel axle

3.12
frame-mounted beam luggage carrier
rear luggage carrier that is structurally a cantilever, fixed to the bicycle frame in front and/or above the rear wheel

Note 1 to entry: It may also be fixed to the seat post, in addition to the frame, but receives no support from the bicycle frame near to the axle of the rear wheel.

3.13
seat-post mounted beam luggage carrier
rear luggage carrier that is structurally a cantilever, fixed to the seat post of the bicycle without additional fixings to the frame

3.14
above wheel front luggage carrier
front luggage carrier with a platform upon which loads can be placed above the front wheel

3.15
low-load front luggage carrier
front luggage carrier that is exclusively designed for carrying a pair of panniers, where the “platform” is a pair of rails (from which the panniers hang), one each side of the wheel and not more than 200 mm above the lower points of attachment of the luggage carrier near to the axle of the front wheel

3.16
front mounted container
container such as a basket that is mounted and permanently attached above the front wheel of a bicycle and that is exclusively designed for carrying luggage

3.17
maximum load capacity
maximum load that can be carried

Note 1 to entry: The restrictions of maximum load capacity are defined in Table 1.

3.18
electrically power assisted cycle
EPAC
cycle, equipped with pedals and an auxiliary electric motor, which cannot be propelled exclusively by means of this auxiliary electric motor, except in the walk assistance mode

[SOURCE: ISO/TS 4210-10:2020, 3.2]

3.19
platform height
height measured from wheel axis to the luggage carrier platform

4 The restrictions of maximum load capacity for the types of non cycle specific luggage carrier

Manufacturers of non cycle specific luggage carrier shall take into consideration any restrictions laid down in Table 1.

For cycle specific luggage carrier, the manufacturer is responsible for determining the maximum load capacity.

For designs exceeding the capacity restrictions, a risk assessment should be performed by the manufacturer in particular addressing the effect of the higher load capacity and to identify suitable measures to address the identified risks.

In Table 1, the maximum limit (if any) for the load capacity is indicated for each type of non cycle specific luggage carrier that falls within the scope of this document. The applicable requirements and test methods differ according to the type and maximum load capacity.

Table 1 — The restrictions of maximum load capacity for the types of non cycle specific luggage carrier

Type of luggage carrier	Rear			Front		
	Normal rear luggage carrier	Beam carriers		Above wheel front luggage carrier	Low-load front luggage carrier	Front mounted container
		Seat post-mounted beam luggage carrier	Frame-mounted beam luggage carrier			
Restriction of maximum load capacity, kg	no limit	10	27	10	18	10
NOTE Maximum load capacity does not include the battery mass if so equipped.						

NOTE Examples of luggage carrier configurations are shown in Annex C.

5 Requirements and test methods

5.1 General

The fatigue tests shall be done on the same sample and fasteners. Static tests and the additional tests on child seat compatible luggage carriers can be conducted on a new test sample, but if only one test sample is available, it is permissible to conduct all of the tests on the same sample with the sequence of testing in the order: dynamic load tests, static tests.

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.

If the luggage carrier is made of plastics or metal and plastics, it shall be submitted to the tests in 5.13 after being tested according to 5.9, 5.10, 5.11 and 5.12.

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

The luggage carrier shall be tested using the connecting interface position(s) and type(s) according to the luggage carrier manufacturer's specifications.

When the manufacturer allows more than one mounting configuration the stiffest and weakest configuration shall be tested. The stiffness is determined by measuring the largest and smallest displacement of the each configuration according the method described in 5.11.

The luggage carrier shall be tested with all accessories provided (e.g. lock, pumps, etc.).

For luggage carrier intended to be fitted on an electrically power assisted cycle (EPAC) and designed to include a battery, the test shall be performed with the maximum battery load [see Clause 7 q)] in addition to the mass defined in Clause 4.

For maximum load capacity under 27 kg, the user shall be warned that the product is not suitable for the transportation of a child seat. See Clause 6.2 e).

Permanently attached luggage carriers are not within the scope of this document. However, manufacturers should take into consideration and apply all clauses of this document except 5.8, 5.13, 6.2 c) and 6.2 e) as a basis of safety requirements.

5.2 Tolerances

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

Forces	0/+5 %
Masses	±1 %
Dimensions	±1 mm
Angles	±1°
Time duration	±5 s
Temperatures	±2 °C
Frequencies and linear stroke	±5 %

Torque wrenches shall have a maximum permissible relative deviation of ±6 %

Note Unilateral tolerance such as 0/+5 % allows variation to occur in only one direction. The minimum applied force shall be the standard force plus the maximum permissible error of the equipment. Typically, the equipment is set at half the tolerance (+2,5 %).

5.3 Crack detection methods

Standardized methods may be used to emphasize the presence of cracks where visible cracks are specified as criteria of failure in tests specified in this document.

NOTE For example, suitable dye-penetrant methods are specified in ISO 3452-1 and ISO 3452-2.

5.4 Sharp edges

Exposed edges that could come into contact with the rider's or a transported person's hands, legs, etc., during normal riding or normal handling and normal maintenance shall be neither sharp nor designed such that injuries can arise when the bicycle is used correctly. Spring ends shall be rounded or fitted with protective caps.

5.5 Security of safety-related fasteners

5.5.1 Security of screws

Any screws used in the internal assembly of the luggage carrier shall be provided with suitable locking devices, for example, lock-washers, lock-nuts, stiff nuts or thread locking compound.

5.5.2 Minimum failure torque

The minimum failure torque of screws for the fastening of the luggage carrier to the cycle shall be at least 20 % greater than the manufacturer's maximum recommended tightening torque.

NOTE For example, mechanical and physical properties of bolts are specified in ISO 898-1.

5.6 Minimum requirements for rear luggage carriers to which a child seat could be attached

Except for luggage carriers using a manufacturer-specific child seat mounting system, a luggage carrier platform maximum width of 175 mm is recommended for rear luggage carriers to which a child seat could be attached. And the maximum load capacity of the rear luggage carrier shall be at least 27 kg.

NOTE Some child seats can have other additional attaching requirements.

5.7 Protrusions

This requirement is intended to address the hazards associated with the users of bicycles falling on projections or rigid components on a bicycle, possibly causing internal injury or skin puncture.

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.

5.8 Rear luggage carriers — Provision for lighting

The rear aspect of any rear luggage carrier not equipped with an integral rear lamp and reflector can be equipped with a bracket or brackets, either as an integral part or separate accessory (or accessories) to allow the fitting of a rear lamp and reflector.

When this requirement is satisfied by the provision of separate accessories, these accessories should be included when the luggage carrier is sold.

5.9 Dynamic load tests

5.9.1 Requirement

When tested by the methods described in 5.9.3, 5.9.4 and 5.9.5, there shall be no fractures or visible cracks in any part of the luggage carrier or fasteners and the specifically designed mounting points of the luggage carrier. The loading methods for 5.9.3 and 5.9.4 are shown in 5.9.2.

NOTE Alternative dynamic test requirements and test methods are given in Annex B.

5.9.2 General loading method

The mounting method for the dynamic load test of cycle specific luggage carriers and non cycle specific luggage carriers differ. The mounting requirement are given in Annex A.

Attach a specified weight with a mass equal to the maximum load capacity stated by the manufacturer.

The specified weight (maximum load capacity given by the manufacturer) shall be applied in the middle of the platform = $L/2$ and $W/2$ this is illustrated in Figure 1. Tolerance ±5 mm on the position of the weight. The clamping shall not deform the tube or the platform:

— For luggage carriers with a platform, a weight or weights shall be evenly distributed on more than 70 % area of the top surface of the luggage carrier platform;

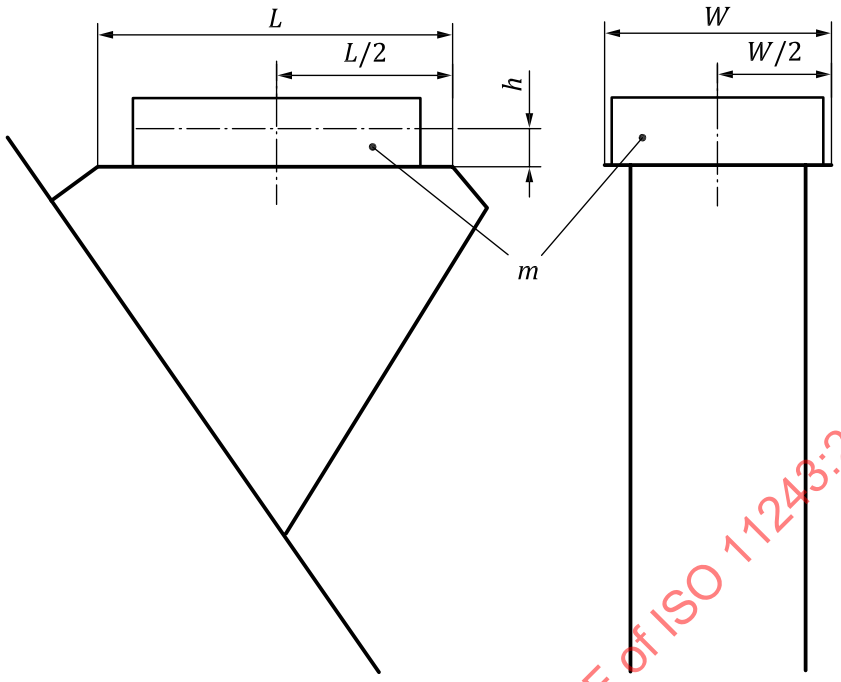
— The centre of gravity of this weight shall coincide with this position and also lie within h = 40 mm of the centreline of the top of the platform;

— Luggage carriers that are suitable for mounting side bags, that side bags can be filled with the balls that have a typical diameter of 40 mm and 24 g (e.g. squash balls) until reaching the load capacity, other dimension and mass can be used to obtain a good matching between mass and volume. The mass shall be evenly distributed;

— The total width of the weight shall not exceed the luggage carrier platform width by more than 100 mm. A weight or weights shall be attached in the best possible way to prevent movement. The attachments for the weight are not included in the test weight;

— Front-mounted containers or baskets can be filled with balls that have a typical diameter of 40 mm and 24 g mass (e.g. squash balls), until reaching the load capacity other dimension and mass can be used to obtain a good matching between mass and volume. The load is secured by a film to avoid moving during dynamic test.

— For low-load front luggage carriers and low-load rear luggage carriers with special attachments according to the manufacturer specification, separate weights shall be attached on each side with no connecting bar. Each weight shall equal half the rated capacity. This can be arranged with a balanced pair of weights. Each weight clamped around each top rail.



Key

L luggage carrier platform length
W luggage carrier platform width
m weight with a mass, *m*
h height of the centre of gravity of the mass

Figure 1 — Weight position

If the luggage carrier is equipped with brackets for the fastening of lamps and reflectors an additional weight with a mass of (200 ± 10) g shall be attached to the bracket(s) during the test. The centre of gravity of this weight shall be located 20 mm to the rear of the vertical mounting surface.

NOTE A block with dimensions as shown in Figure 2 and with a total mass of 200 g is suitable for the purpose.

Dimensions in millimetres

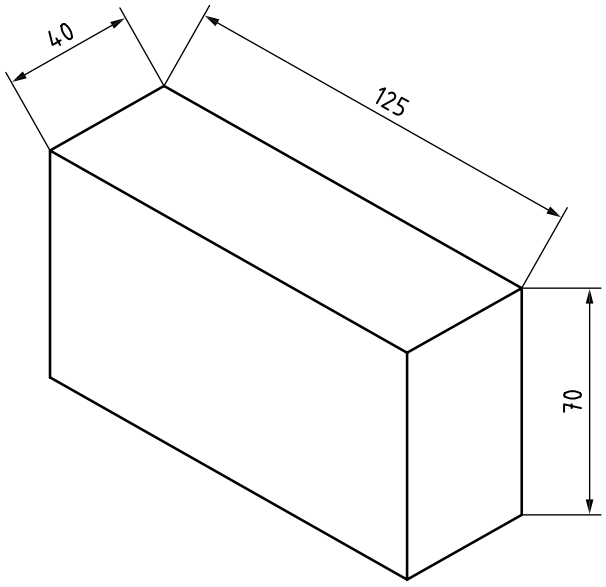


Figure 2 — Examples of test block dimensions for lamp-bracket test

5.9.3 Vertical test method

Vibrate the luggage carrier with a vertical sinusoidal motion, according to each set of conditions (see Figure A.2, Figure A.3 and Table 2).

If the natural vibration frequency of the luggage carrier corresponds to the frequency of the test, so that resonance occurs, the frequency shall be reduced by 10 % and the amplitude increased by 23 %.

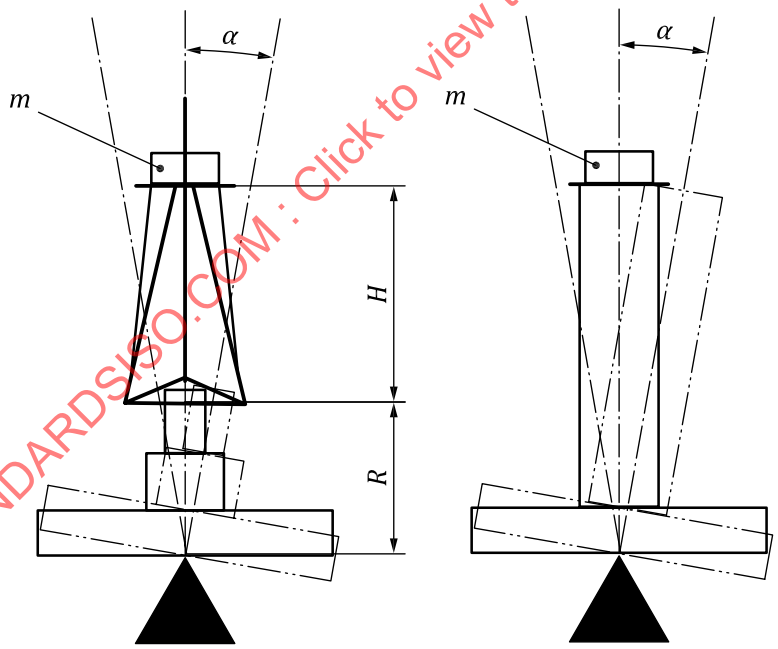
The machine should reach the required frequency progressively in order to avoid any overload due to inertial effect.

Table 2 — Vertical dynamic load testing conditions

Type of luggage carrier	Rear luggage carrier	Front luggage carrier
Stroke, S mm	10	15
Number of cycles	100 000	100 000
Frequency, Hz	7	7

5.9.4 Lateral test method

Vibrate the luggage carrier laterally at 1 Hz, by swinging it from side to side, to an angle of ±α° on both sides of the symmetry plane. The rotation shall be about a horizontal longitudinal axis at a distance $R + H$ measured below the luggage carrier platform. See Figure 3 and Table 3 for test conditions.



Key

H platform height
m weight with a mass, m
R wheel size
α arc

Figure 3 — Lateral dynamic load testing conditions

Table 3 — Lateral dynamic load testing conditions.

Type of luggage carrier	Rear luggage carrier	Front luggage carrier
Arc, α degrees	5	7,5
Number of cycles lateral test method	100 000	100 000

5.9.5 Additional test method for child seat compatible luggage carrier

5.9.5.1 General

When a luggage carrier is declared compatible with child seats, additional dynamic tests shall be performed using the test conditions in Table 5 or Table D.1 for each options (See Table 4). In particular, the vertical dynamic load test (rear) according 5.9.3 and the lateral dynamic load test (rear) according 5.9.4. It is allowed to use a new sample for these tests.

Table 4 — Options child seat compatibility

a) Option 1	Side clamp construction	
b) Option 2	Construction using manufacturer-specific child seat mounting system	

The manufacturer shall select which type of child seat the luggage carrier is compatible for (see also Instruction chapter). It is possible to choose multiple options. Each option may be tested on a different sample.

5.9.5.2 Test method for Option 1

The luggage carrier can be tested according to the method described in Annex D or in combination with an original seat including standardized bags on the luggage carrier.

These bags shall be constructed from a material that is strong enough to prevent slump to the contents, so that they still conform with the specified dimensions at the end of the tests, but are sufficiently flexible to conform to the parts of the seat, which support them. They shall be completely filled to the specified mass with any suitable inert, granular, homogenous material (not necessarily sand).

5.9.5.3 Test method for Option 2

When a child seat has an integrated mounting system which is fundamentally different from option 1, this construction shall be tested in combination with an original seat including standardized bags in the seat. The test setup shown in Figure 4.

These bags shall be constructed from a material that is strong enough to prevent slump to the contents, so that they still conform with the specified dimensions at the end of the tests, but are sufficiently flexible to conform to the parts of the seat, which support them. They shall be completely filled to the specified mass with any suitable inert, granular, homogenous material (not necessarily sand). The body bag (B) shall be a cylinder of diameter d_1, length l_1 and mass m_1, and the two foot bags (F) shall each be L-shaped, 90° bent cylinders of diameter d_2, length l_2, height h_2 and mass m_2 (see Figure 5). Values for these dimensions and masses are given in Table 6. Mark the position of the seat on the fixture.

Table 5 — Test conditions for dynamic load tests for child seat compatible luggage carrier

Type of test	Vertical dynamic load test (rear)	Lateral dynamic load (rear)
Arc, α degrees	N/A	5
Stroke, S mm	10	N/A
Number of cycles Option 2	100 000	100 000
Frequency Hz	7	1

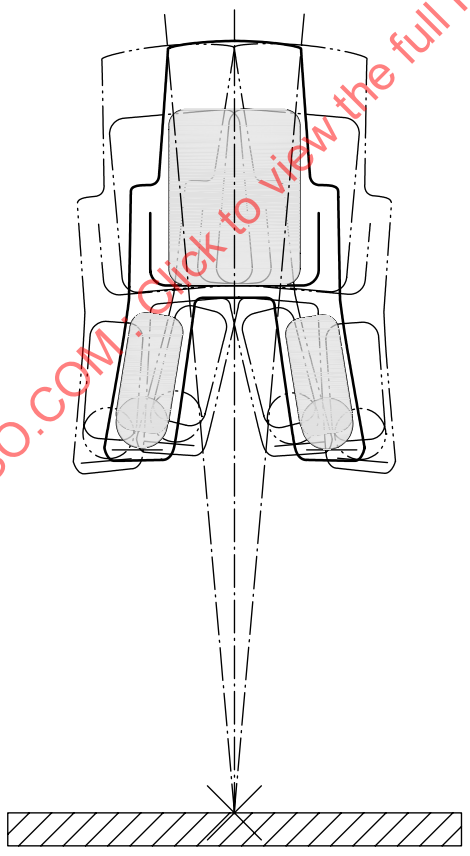
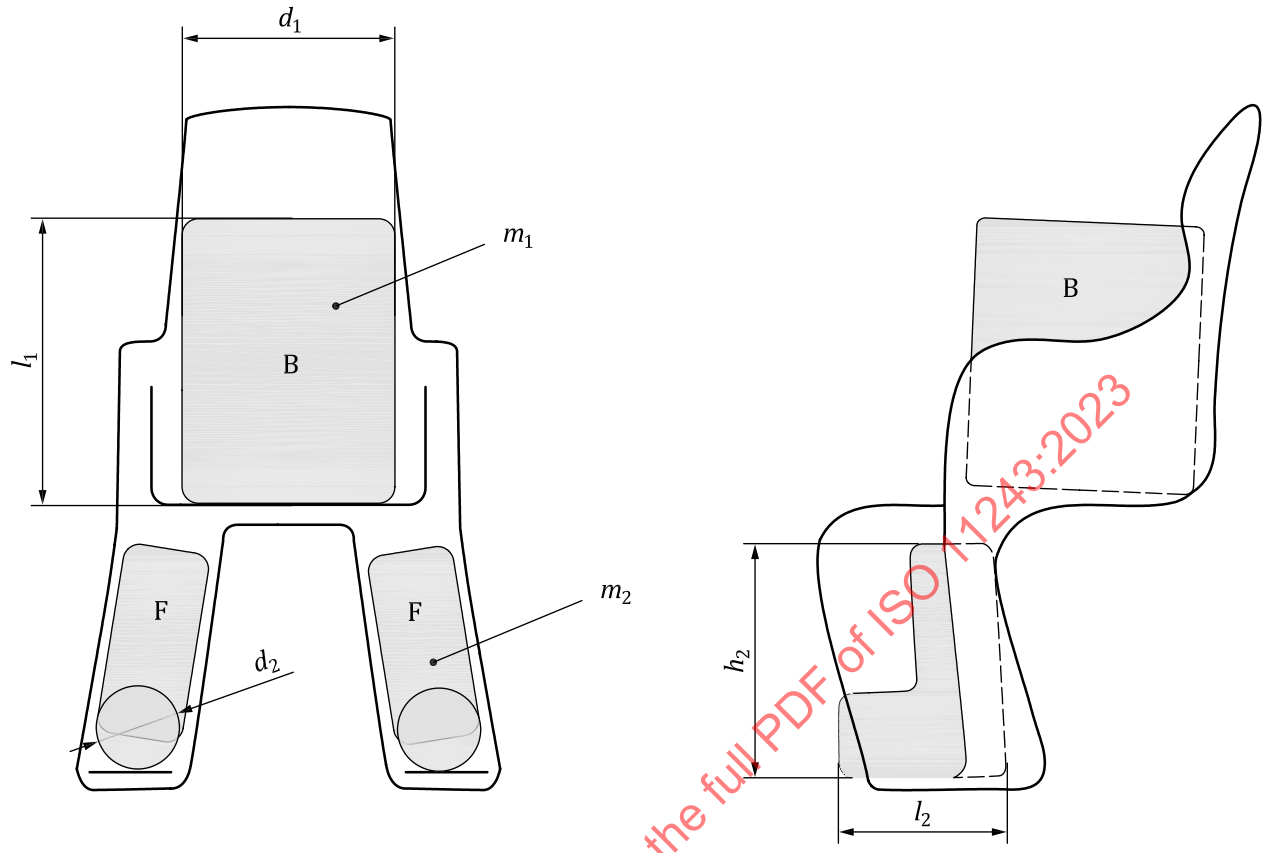


Figure 4 — Test setup vertical and lateral test method for luggage carrier with child seat option 2



Key

B body bag
F foot bag
d_1 diameter of body bag
d_2 diameter of foot bag
h_2 height of foot bag
l_1 length of body bag
l_2 length of foot bag
m_1 mass of body bag
m_2 mass of foot bag

Figure 5 — Dummy child in child seat

Table 6 — Dummy body and foot bags dimensions

Class of seat	Body bag (B)			Foot bag (F)			
	d_1 mm	l_1 mm	m_1 kg	d_2 mm	l_2 mm	h_2 mm	m_2 kg
A22	200 ± 40	260 ± 50	18 ± 0,1	80 ± 20	160 ± 30	200 ± 40	3 ± 0,1
NOTE See EN 14344[5] for information on class A22.							

Mount the child seat on the platform according to the manufacturer's instructions, not to interfere with the movement of each dynamic load test.

Load the seat and its footrests with test bags, arranged according to Figure 4, to represent the mass of a child.

Secure the bags with the straps provided with the seat. Additional straps, belts, and/or adhesive tape, padding material, all of negligible mass as may be used to prevent excess free movement of the test bags during the tests.

Vertical dynamic load test and lateral dynamic test shall be performed by replacing the test conditions in Table 2, Table 3 and specified mass with the test conditions in Table 5.

5.10 Static load test — Vertical load

5.10.1 Requirements

When tested by the method described in 5.10.2, the permanent deformation of the luggage carrier, measured at the point of application of the load after the removal of the load, shall not exceed 5 mm.

5.10.2 Test method

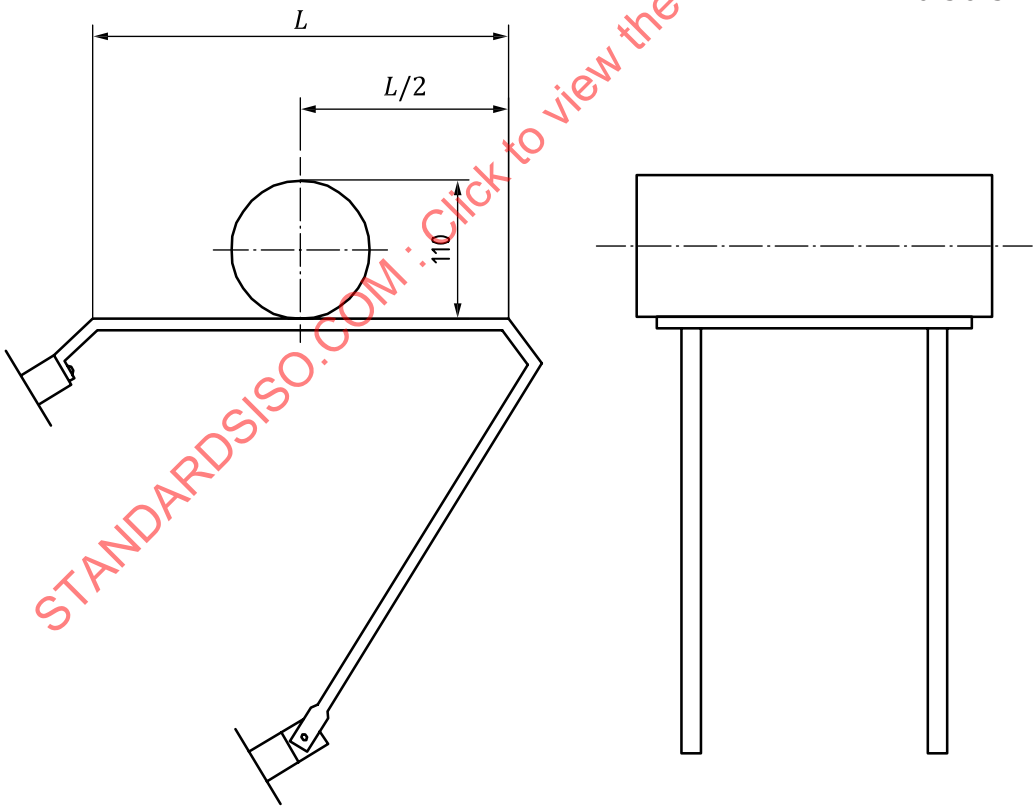
Mount the test sample in accordance with Annex A.

Apply a load by means of a rigid cylinder, diameter 110 mm, positioned transversely upon the luggage carrier platform at the mid-point of the luggage carrier platform with a tolerance of 5 mm (See Figure 6).

Apply a load equal to three times the rated capacity of the luggage carrier for 1 min.

Measure the permanent deformation at the point of application of the load.

Dimensions in millimetres



Key

L luggage carrier platform length

Figure 6 — Position of the cylinder for vertical load test

5.11 Static load test — Lateral load

5.11.1 Requirements

When tested using the method described in 5.11.2,

a) the maximum lateral displacement under load measured at the load application point shall not exceed the value given in Table 7, and

b) the lateral permanent deformation of the luggage carrier, measured at the point of application of the load after removal of the load, shall not exceed value given in Table 7.

Table 7 — Maximum lateral deformation

Type of luggage carrier	Rear luggage carrier	Front luggage carrier	
	All types	Above wheel	Low-load
Maximum displacement mm	15	10	
Maximum deformation after removal of the load mm	5	5	

NOTE For seat-post mounted beam luggage carrier, rotation of the product is considered as displacement respectively deformation.

5.11.2 Test method

Mount the test sample in accordance Annex A.

Apply a lateral force, $F = 10 \times m$, in newtons, by pushing or pulling, where m is the load capacity in kg given by the manufacturer of the luggage carrier for 1 min to the side of the luggage carrier platform as shown in Figure 7, or two forces each equal to half this force ($F/2$) to each side of the platform as specified in Table 8 for low-load luggage carriers and as shown in Figure 8. For basket, the force shall be applied in the plane of the bottom of the basket.

The application of the force shall be carried out as follows:

a) apply a lateral force in newtons, corresponding to 20 % of the maximum load capacity given by the manufacturer of the luggage carrier for 10 s in one direction;

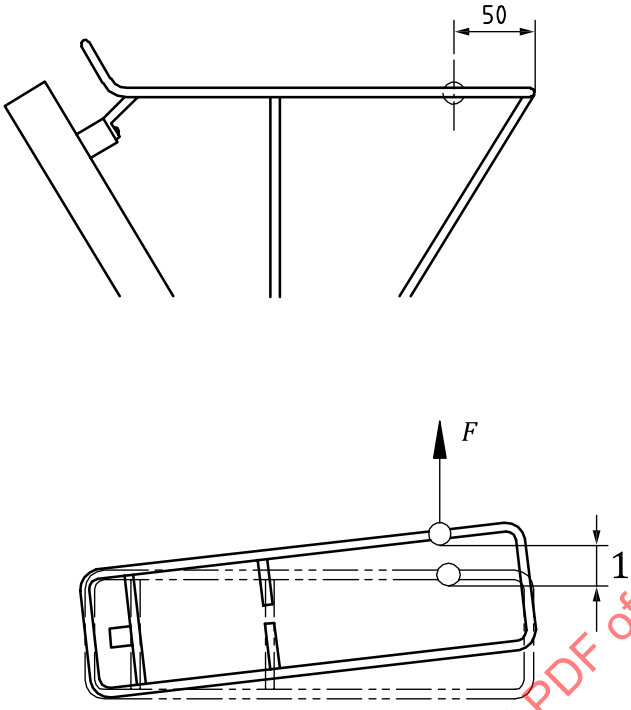
b) apply a lateral force in newtons, corresponding to 20 % of the maximum load capacity given by the manufacturer of the luggage carrier for 10 s in the opposite direction as in a);

c) apply once, in the same direction as in a), a lateral force in newtons, corresponding to 100 % of the rated capacity of the luggage carrier and measure the displacement during the application of the load and the permanent deformation after the release of the load.

Table 8 — Requirements for lateral static load test

Type of luggage carrier	Rear luggage carrier	Front luggage carrier	
	All types	Above wheel	Low-load
Force applied	All on one side of the luggage carrier		Half ($F/2$) on each side of luggage carrier platform
Point of application and deflection	50 mm from rear of luggage carrier platform	50 mm from front of luggage carrier platform	

Dimensions in millimetres

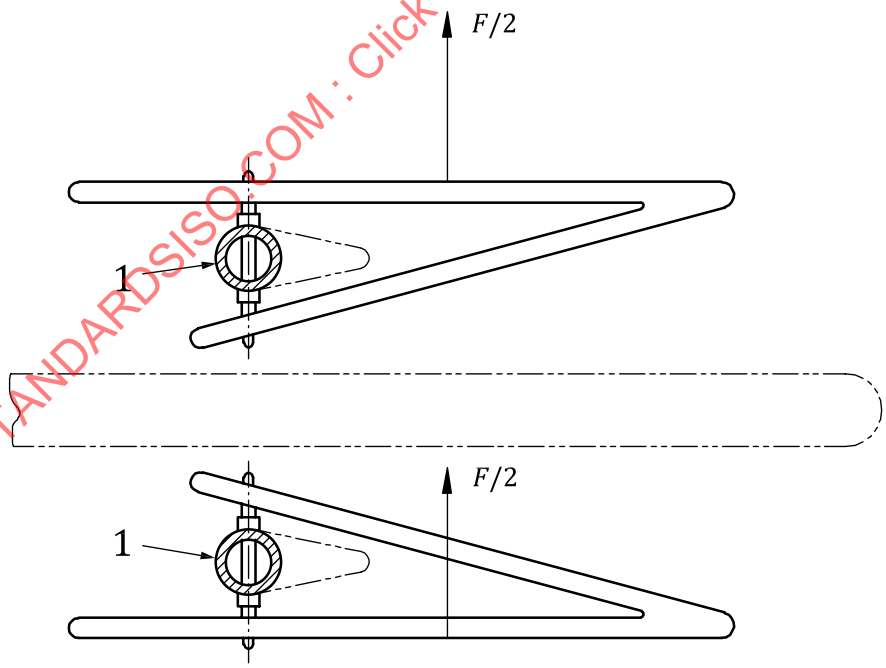


Key

F lateral force

1 deflection

Figure 7 — Lateral load test with load *F*



Key

F lateral force

1 connection element luggage carrier/bicycle

Figure 8 — Lateral load test of low-load front luggage carrier with load *F*/2

5.12 Static load test — Longitudinal direction

5.12.1 General

The purpose of this test is to check the connection between luggage carrier and bicycle.

5.12.2 Requirements

When tested by the method described in 5.12.3, no fracture, no movement between the different parts or detachment of the luggage carrier mounting system.

5.12.3 Test method

Mount the test sample in accordance with Annex A.

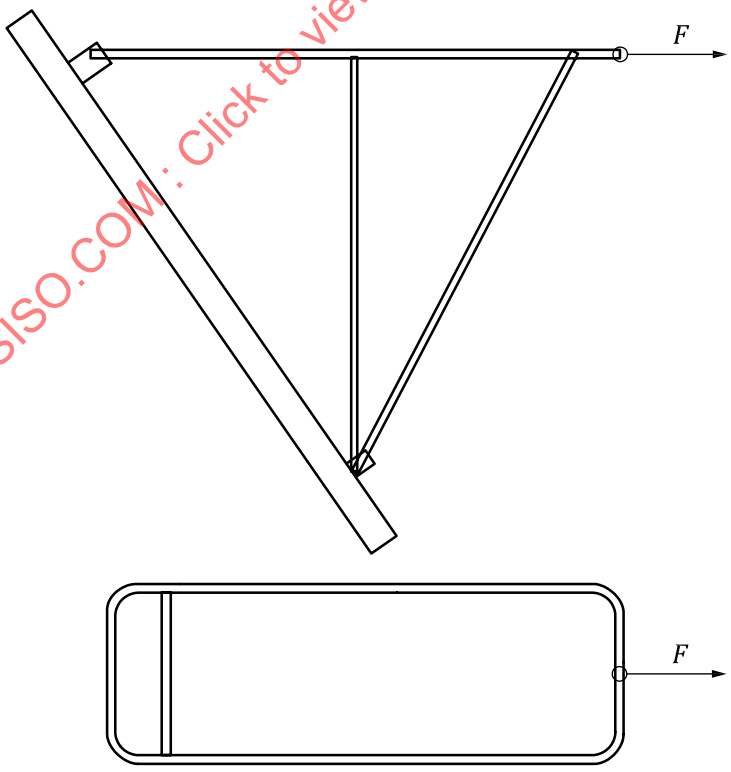
Apply a longitudinal force, *F*, equal to 2 times the maximum load capacity given by the manufacturer of the luggage carrier

a) at the level of the luggage carrier platform or luggage support points. The attachment of the load may be made symmetrically if required by the luggage carrier construction (see Figure 9 and Figure 10);

b) horizontally along the centerline of the bicycle towards the rear for rear luggage carriers or towards the front for front luggage carriers.

Apply for 1 min.

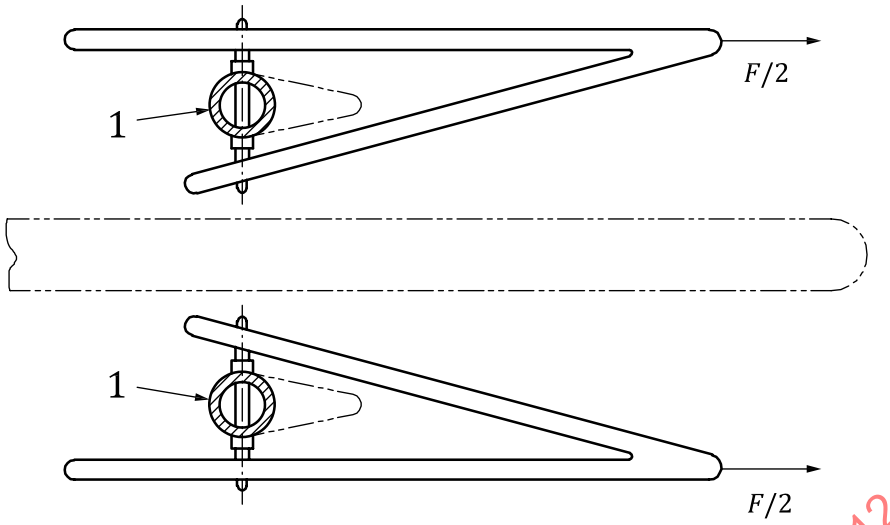
Check if there is no fracture, slippage or detachment of the luggage carrier mounting system.



Key

F longitudinal force

Figure 9 — Typical arrangement for static load in riding direction



Key

F longitudinal force

1 connection element luggage carrier/bicycle

Figure 10 — Static load in riding direction for low-load front luggage carrier with load *F*/2

5.13 Drop impact test (only for luggage carriers of plastics or metal and plastics)

5.13.1 General

The requirements in 5.13.2 apply only to luggage carriers of plastics or metal and plastics. The test shall be done after dynamic and static tests.

5.13.2 Requirement

When tested by the method described in 5.13.3.1 and 5.13.3.2, there shall be no fractures or visible cracks in any part of the luggage carrier, or any distortion which affects the function or safety of the luggage carrier.

5.13.3 Test method

5.13.3.1 High temperature — Stage 1

Store the luggage carrier for at least 3 h in a chamber at a temperature of (65 ± 5) °C. Remove and go to stage 2.

5.13.3.2 Low temperature — Stage 2

Store the luggage carrier for at least 3 h in a chamber at a temperature of (–20 ± 1) °C. Remove the luggage carrier from the chamber and within 15 s, drop the luggage carrier from a height of (1 ± 0,01) m onto a smooth, level, concrete floor. Prior to release, orientate the luggage carrier in a position that allows the most onerous impact onto floor. Immediately examine the luggage carrier to check if the requirements in 5.13.2 are fulfilled.

6 Marking

6.1 General

The luggage carrier shall be marked in accordance with 6.2.

Countries in which the product is marketed can have specific provisions for marking. These provisions should be used in conjunction to this document.

6.2 Requirements

The luggage carrier shall be visibly and durably marked with the following:

a) the maximum load capacity. In case of low-load front luggage carriers this shall be stated as 2 times half the load capacity (2 × ...);

b) the name of the manufacturer or the manufacturer's representative for all luggage carriers;

c) the number of this document, i.e. ISO 11243:2023;

d) batch number or reference for all luggage carriers. Trademark and/or model of the luggage carrier is informative;

e) symbol or warnings for 'child-seat forbidden' in case of luggage carriers with a horizontal platform and carriers which might be mis-used to attach child-seats.

6.3 Durability test

6.3.1 Requirements

The requirements in 6.3.2 do not apply to markings established by mechanical means, like embossed, etched, engraved or lasered markings.

When tested by the method described in 6.3.2, the marking shall remain easily legible. It shall not be easily possible to remove any label nor shall any label shows any sign of curling or shrivelling.

6.3.2 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.

7 Instructions

If a luggage carrier is sold as an accessory, it shall be provided with a set of instructions containing information on items a) to r) below. If the luggage carrier is sold already mounted on a cycle, information on items c) to r) below shall be included in the instructions for the cycle (unless the same information is supplied in a separate set of instructions).

a) Warning to the buyer to check that the geometric data and the strength of the bicycle, on which the luggage carrier is to be mounted, are compatible with the luggage carrier specifications;

b) How and where the luggage carrier is to be attached to the bicycle with recommended tightening torque of fasteners and the specifications for these fasteners and screws (e.g. size, geometry, strength, lock washers, lock-nuts or stiff nuts);

c) Maximum load capacity of the luggage carrier, i.e. the maximum load for which the luggage carrier is designed and whether or not it is suitable for the attachment of a child seat;

d) Instruction that the permissible load of the bicycle should not be exceeded;

e) Instruction that the fasteners are to be secured and checked frequently;

f) Warning that luggage can only be safely carried on the luggage carrier;

g) Warning to the buyer not to modify the luggage carrier;

h) Advice as to whether or not the luggage carrier is designed to pull a trailer;

i) Warning to the buyer that the bicycle may behave differently (particularly with regard to steering and braking) when the luggage carrier is loaded;

j) Warning to the buyer to ensure that any luggage or child seat feature fitted to the luggage carrier is securely fitted in accordance with the manufacturer's instructions and that there are no loose straps that can get caught in the wheel;

k) Advice to the buyer regarding the positioning of reflectors and lamps such that these are not obscured when luggage is attached to the luggage carrier;

l) Advice to distribute luggage mass of the side bags evenly between the two sides of the luggage carrier;

m) Specific sizing requirements for luggage carrier fitment for non-cycle specific luggage carrier frames;

n) Inform maximum platform height measured from wheel axis to the luggage carrier platform;

o) Information containing the name and address of the manufacturer, importer or representative, trademark and model;

p) Information on the type(s) of bicycles for which the luggage carriers are intended, unless the product is sold as part of the bicycle and already attached to it;

q) If applicable the maximum mass of the battery in kilograms;

r) Inform user which types of child seat construction are compatible with the luggage carrier.

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

8 Test report

The test report shall include at least the following information:

— the sample;

— the number of this document, e.g. ISO 11243:2023;

— the method used (if the standard includes several);

— any deviations from the procedure;

— any unusual features observed;

— the date of the test;

— the type and maximum load capacity of the sample;

— the type of fixture (bicycle or dummy) used for dynamic and static tests. If frames, front forks or mudguards are used instead of a fixed test jig, their specifications and how they are mounted on the test machine;

— complete description of mounting on the test rig (e.g. stay length);

— if applicable the maximum mass of the battery in kilograms;

— the test frequency for all dynamic tests.

Annex A
(normative)

Test setup requirements

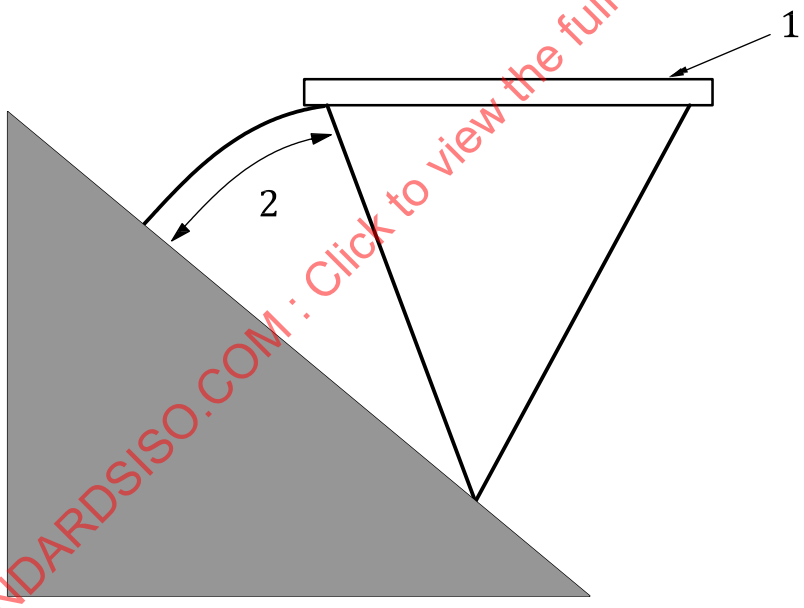
A.1 General

Luggage carriers shall be tested on a fixed test jig. Use of a real frame, front fork or mudguards (where applicable) instead of jig shall done upon the agreement of the manufacturer and mentioned in the test report.

The mounting requirements are for the dynamic, static test. Dimension *R* is not applicable for static testing.

Most onerous test set-up for non cycle specific luggage carriers is shown in Figure A.1.

Luggage carriers with specifically designed mounting points for attaching side bags need to have additional test conditions. The goal of this test is to make sure that the specifically designed mounting points can withstand the forces which are caused by the side bags.



Key

1 luggage carrier deck

2 max length

Figure A.1 — Most onerous test set-up for non cycle specific luggage carriers

A.2 Mounting requirement for cycle specific luggage carrier

Cycle specific luggage carriers shall be tested on a fixed test rig (see Figure A.2). The dedicated part(s) for the bicycle frame mounting shall be provided and integrated correctly as specified by manufacturer into the test rig. The fastening devices shall be secured according to the manufacturer given instructions.

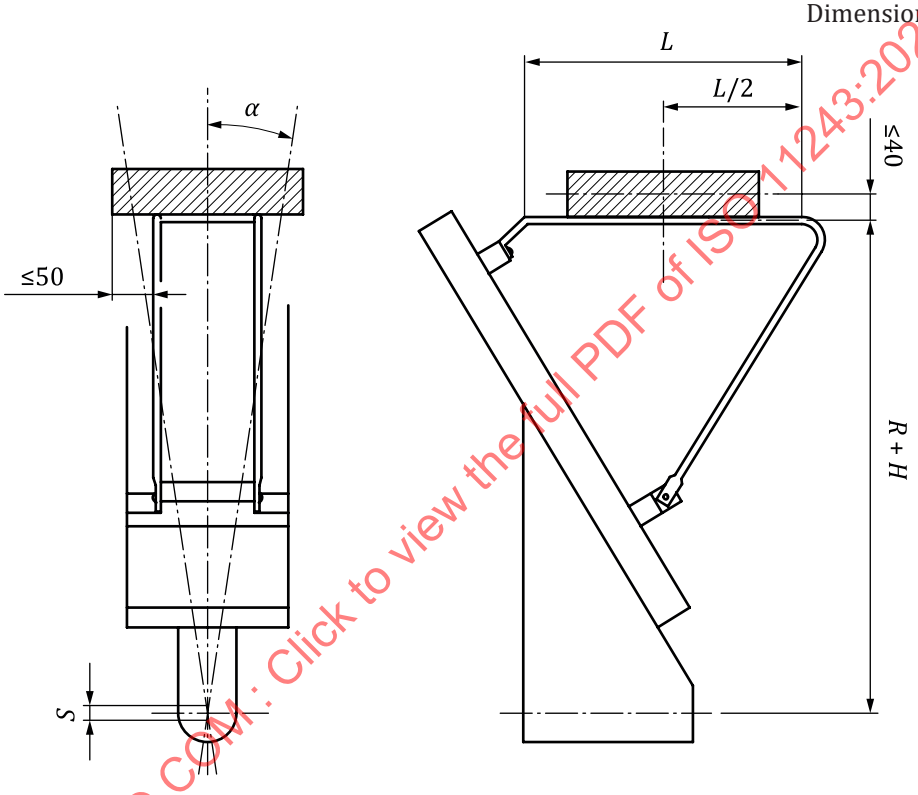
The assembly shall be mounted as intended by manufacturer riding geometry on the test machine.

For lateral dynamic test, the platform position is determined by the dimensions $R + H$. Size R is according to the maximum wheel size given by the manufacturer (see Table A.1). Size H is a result of the maximum height of the assembly. Tolerance ±5 mm on the $R + H$.

Table A.1 — Wheel size *R*

Wheel diameter	16”	18”	20”	22”	24”	26”	650b or 27,5’’	29” or 700c
R mm	202	228	253	279	305	330	349	368

Dimensions in millimetres



Key

H height
L luggage carrier platform length
R wheel size
S stroke
α arc

Figure A.2 — Test set-up for dynamic load tests for both rear and front mounted luggage carriers

A.3 Non cycle specific luggage carrier mounting requirements

Non cycle specific luggage carriers shall be tested on a fixed test jig (see Figure A.2). If other adjustments are possible, they shall be made so that the luggage carrier is attached to the rig in a way that represents the most onerous situation that can occur in practice. The luggage carrier is mounted with the original fastening devices which are fastened according the manufacturer given instructions. The luggage carrier is placed on the test machine, taking the following into account:

— The luggage carrier platform shall be aligned horizontally as much as possible.

— When the manufacturer allows more than one mounting configuration the stiffest and weakest configuration shall be tested. The stiffness is determined by measuring the largest and smallest displacement of the each configuration according the method described in 5.11 Static load test — Lateral load.

— For lateral dynamic test, the platform position is determined by the dimension *R* (see Table A.1) according to the maximum wheel size and the platform height *H* given by the manufacturer [see Clause 7 n)] (*R* + *H*).

A.4 Seat-post mounting luggage carriers

Seat-post mounting luggage carriers secure to a rigid fixture which resembles the seat-post (Figure A.3) of the bicycle to which the luggage carrier is designed to fit, using the original fastening devices and screws supplied or according the manufacturer given instructions. For each dynamic load test, two-step sequence shall be followed.

— Step 1: 50 % of the test with the largest dimension of the attachment point (e.g. diameter of the seat tube, given by the manufacturer);

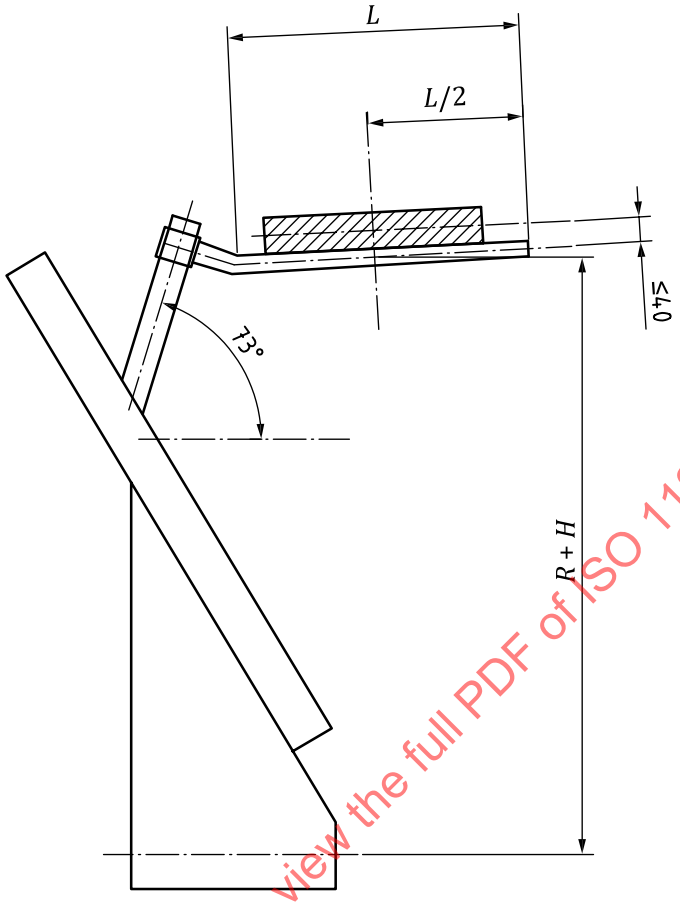
— Step 2: 50 % of the test with the smallest dimension of the attachment point (e.g. diameter of the seat tube, given by the manufacturer).

The luggage carrier is placed on the test machine, taking the following into account:

— The luggage carrier platform shall be aligned horizontally as much as possible;

— For lateral dynamic test, the platform position is determined by the dimension *R* (see Table A.1) according to the maximum wheel size and the platform height *H* given by the manufacturer [see Clause 7 n)] (*R* + *H*).

Dimensions in millimetres



Key

H platform height
L luggage carrier platform length
R wheel size

Figure A.3 — Dynamic test (seat-post mounting luggage carrier)

Annex B
(informative)

Alternative dynamic test requirements and test methods for luggage carrier

B.1 General

The tests described in this annex were deeply discussed within the ISO working group. The conclusion of the discussion was to include them into the standard in order to make all manufacturers of luggage carriers aware about this work. Manufacturers are invited to evaluate the relevance of this annex.

B.2 Vertical test method

Vibrate the luggage carrier with a sinusoidal motion, according to each set of conditions (see Figure B.1, Figure B.2 and Table B.1).

If the natural vibration frequency of the luggage carrier corresponds to the frequency of the test, so that resonance occurs, the frequency shall be reduced by 10 % and the amplitude increased by 23 %.

The machine should reach the required frequency progressively in order to avoid any overload due to inertial effect.

Table B.1 — Vertical dynamic load testing conditions

Type of luggage carrier	Rear luggage carrier	Front luggage carrier
Radius of rotation mm	580 ± 5	870 ± 5
Stroke, *S* mm	10	15
Number of cycles	100 000	100 000
Frequency, Hz	5	5

B.3 Lateral test method

Vibrate the luggage carrier laterally at 1 Hz, by swinging it from side to side, to an angle of ±α° on both sides of the symmetry plane. The rotation shall be about a horizontal longitudinal axis at a distance $R + H$ measured below the luggage carrier platform. See Figure 3 and Table B.2 for test conditions.

Table B.2 — Lateral dynamic load testing conditions

Type of luggage carrier	Rear luggage carrier	Front luggage carrier
Arc, α degrees	5	7,5
Number cycles lateral test method	2 000	100 000