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Wheels and rims for pneumatic tyres — Vocabulary, designation and marking

Roues et jantes pour pneumatiques — Vocabulaire, désignation et marquage

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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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This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 33, *Vehicle dynamics and chassis components*.

This fourth edition cancels and replaces the third edition (ISO 3911:2004), which has been technically revised.

The main changes compared to the previous edition are as follows:

— 3.8.1, optional bead seat profiles has been added;

— contre-pente (CP) hump in Figure 10 has been omitted;

— definition for five-piece rims have been amended to include 6-, 7-, 8- and 9-piece rims;

— 4,0 and 5,0 wheel designation and marking have been added, and annexes have been deleted;

— manually adjustable wheel graphic in Figure 8 has been made common with power adjustable graphic.

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.

Wheels and rims for pneumatic tyres — Vocabulary, designation and marking

1 Scope

This document presents a vocabulary of terms related to, and systems for the designation and marking of, wheels and rims intended for use with pneumatic tyres. The intention is to define fundamental wheel and rim terms rather than provide a comprehensive tabulation of all wheel design features. Also specified are the content, location and minimum size of the wheel and rim marking, with the purpose of establishing, on a worldwide basis, a uniform identification system for wheels and rims.

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 http://www.electropedia.org/

3.1
wheel
rotating load-carrying member between the tyre and the axle, usually consisting of two major parts, the rim and the wheel disc, which may be integral, permanently attached or detachable

Note 1 to entry: See Figures 1 to 8.

3.2 wheel components

3.2.1
rim
part of the *wheel* (3.1) on which the tyre is mounted and supported

3.2.2
disc
wheel disc
part of the *wheel* (3.1) which is the supporting member between the axle and the rim

3.2.3
single wheel
wheel (3.1) which supports one tyre on one end of an axle

3.2.4
inset wheel
wheel (3.1) so constructed that the rim centreplane is located inboard of the attachment face of the disc

Note 1 to entry: See Figure 1 a).

Note 2 to entry: Inset is the distance from the attachment face of the disc to the rim centreplane.

3.2.5
zeroset wheel
wheel (3.1) so constructed that the rim centreplane is coincident with the attachment face of the disc

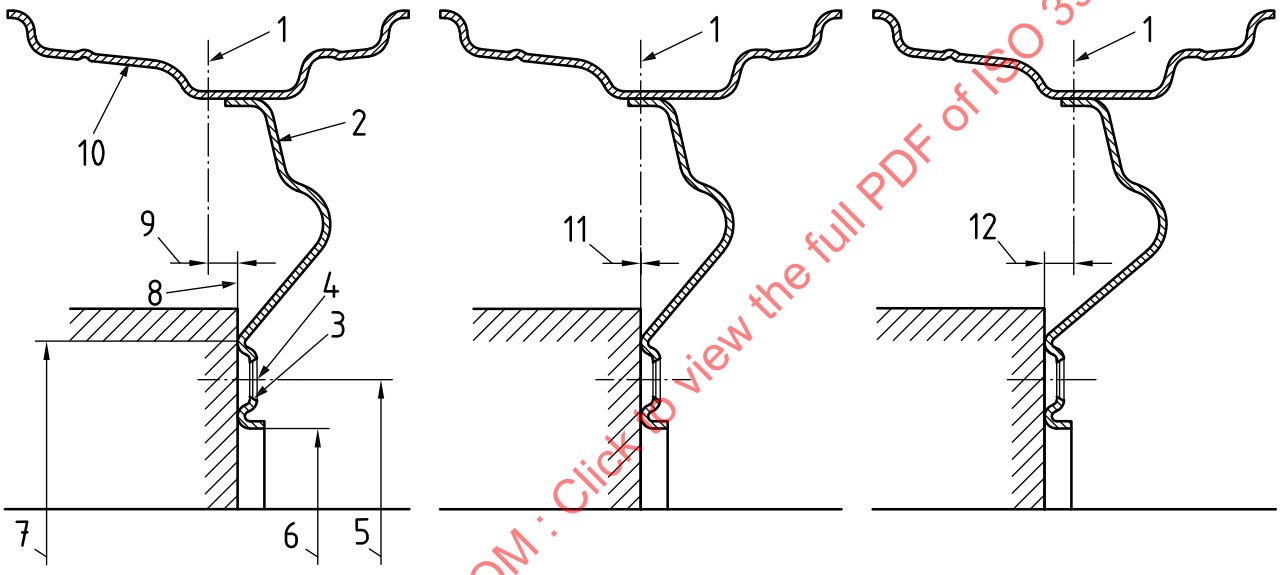
Note 1 to entry: See Figure 1 b).

3.2.6
outset wheel
wheel (3.1) so constructed that the centreplane of the rim is located outboard of the attachment face of the disc

Note 1 to entry: See Figure 1 c).

Note 2 to entry: Outset is the distance from the attachment face of the disc to the centreplane of the rim.

Note 3 to entry: Track, the distance between the centreplanes of the tyres on an axle, increases as the outset of the wheels is increased.



a) Inset wheel **b) Zeroset wheel** **c) Outset wheel**

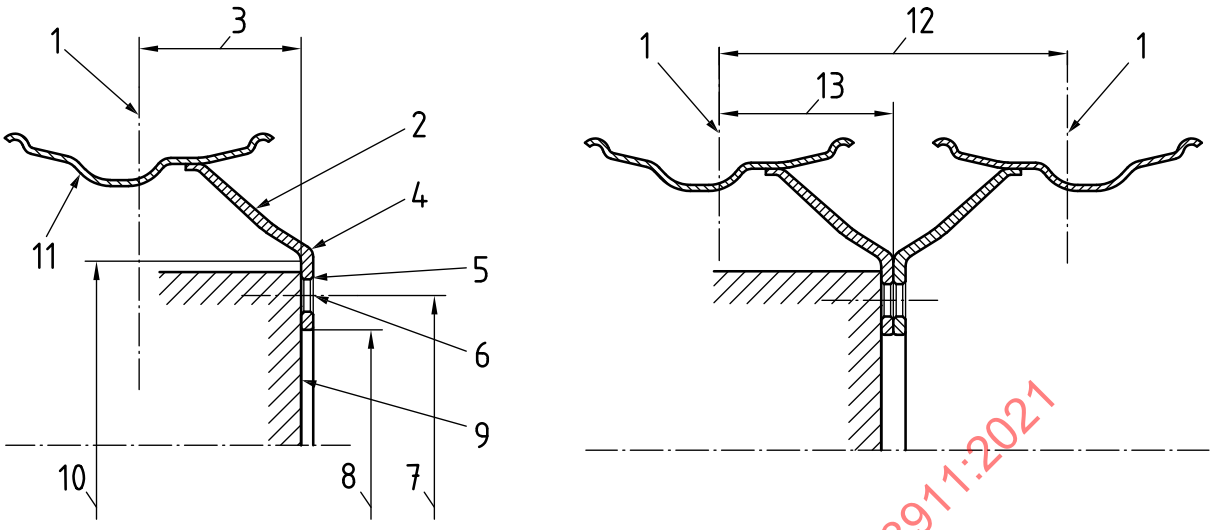
Key

1	rim centreplane	7	attachment face diameter of wheel
2	disc	8	attachment face
3	nut seat	9	inset
4	bolt hole	10	rim
5	pitch circle diameter of bolt holes	11	zeroset
6	centre hole diameter	12	outset

Figure 1 — Passenger car and light commercial vehicle disc wheels — Nomenclature

3.2.7
dual wheel
wheel (3.1) with sufficient inset and configuration so that two such wheels, when assembled with each other, support two tyres on one end of an axle

Note 1 to entry: See Figure 2.



a) Single application **b) Dual application**

Key

1	rim centreplane	8	centre hole diameter
2	disc	9	attachment face
3	inset	10	attachment face diameter of wheel
4	external face of disc	11	rim
5	nut seat	12	dual spacing
6	bolt hole	13	half dual spacing
7	pitch circle diameter of bolt holes		

Figure 2 — Commercial vehicle disc wheels — Nomenclature

3.2.8
dual spacing
distance between the centreplanes of the rims to provide the required clearance between the tyres

Note 1 to entry: See Figures 2, 5 and 6.

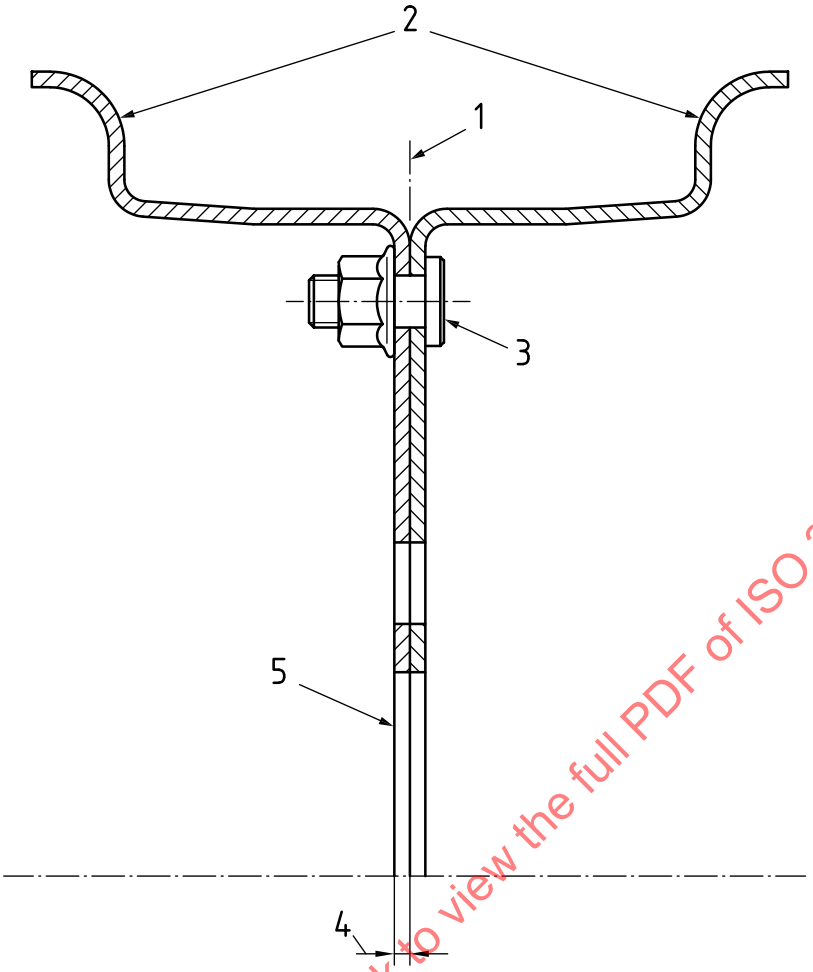
3.3 Wheel types

3.3.1
disc wheel
permanent combination of a rim and wheel disc

Note 1 to entry: See Figures 1 and 2.

3.3.2
divided wheel
wheel (3.1) so constructed that its two main parts, the rim portions of which might or might not be the same in width, when securely fastened together with clamping bolts or equivalent mechanical means, combine to form a rim having two fixed flanges

Note 1 to entry: See Figure 3.



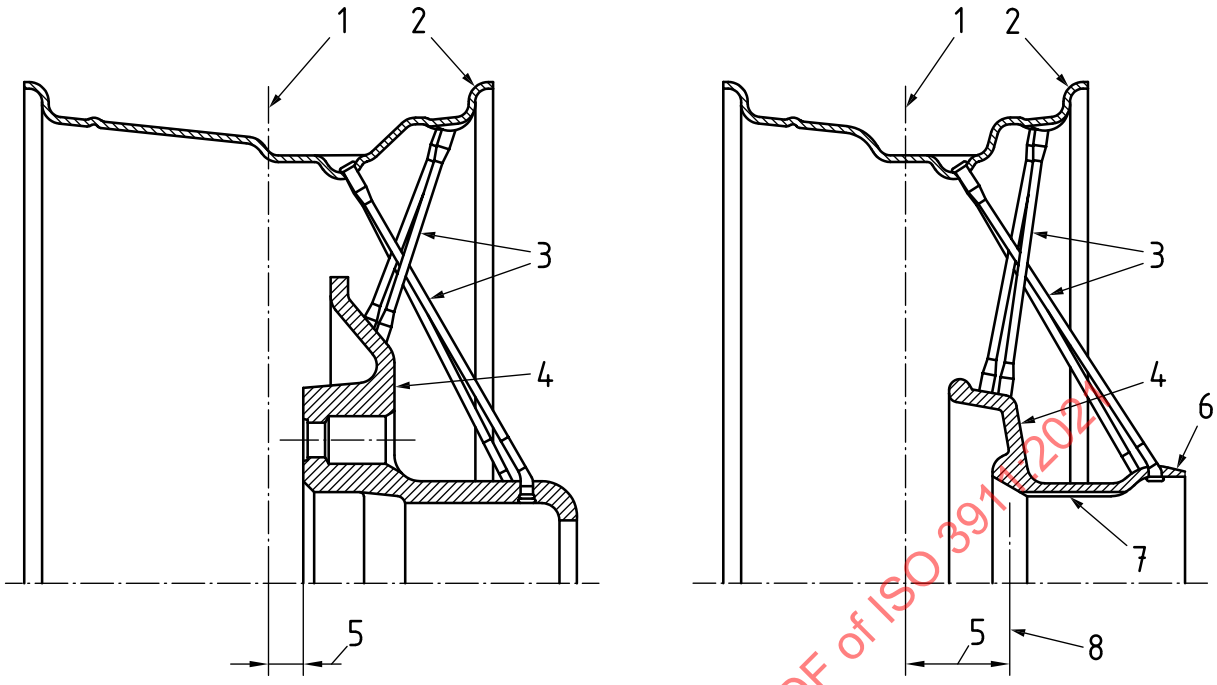
Key

1 rim centreplane
2 fixed flanges
3 clamping bolts or equivalent mechanical means
4 outset
5 attachment face

Figure 3 — Divided wheel — Nomenclature

3.3.3
wire wheel
wheel (3.1) so constructed that its rim is joined to the centre member (shell) by a series of wire spokes

Note 1 to entry: See Figure 4.



a) Conventional mounting type **b) Centre mounting type**

Key

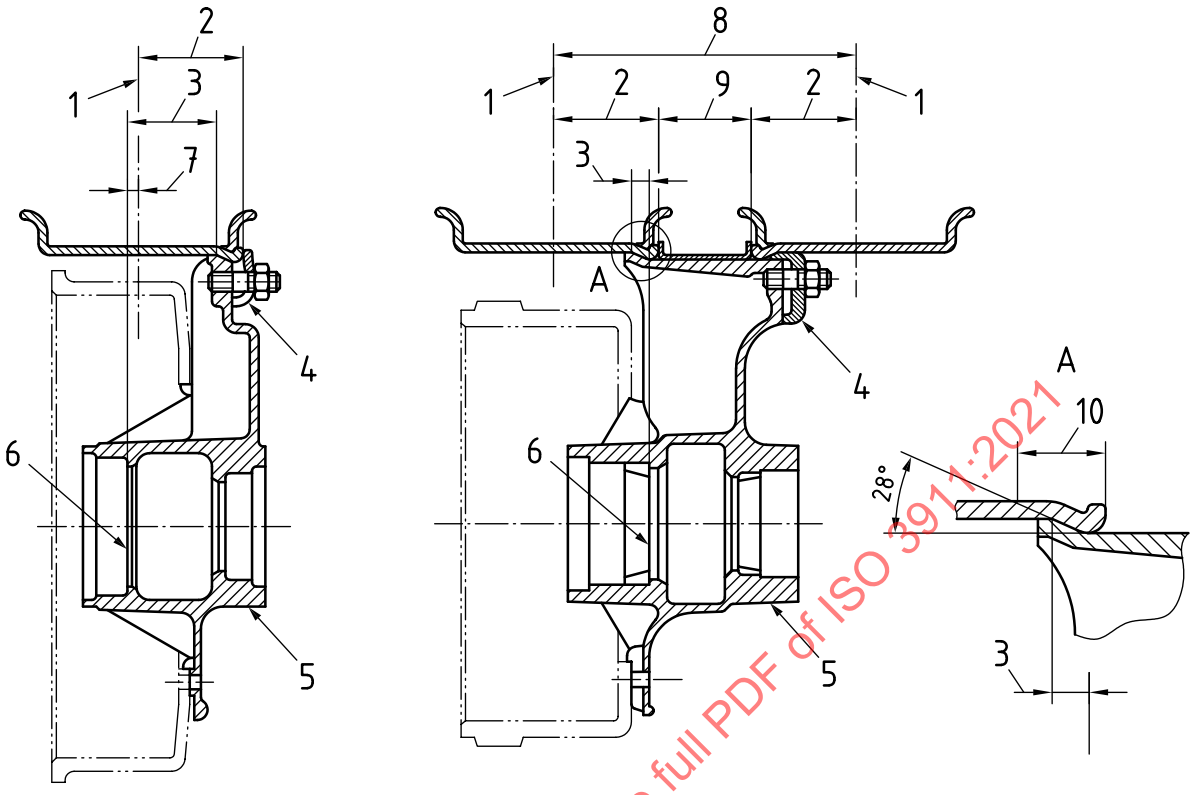
1	rim centreplane	5	inset
2	rim	6	cone seat for retaining nut
3	wire spokes	7	spline
4	centre member (shell)	8	hub seat reference plane

Figure 4 — Wire wheels — Nomenclature

3.4 Wheels with demountable rims

3.4.1
wheel with 28° mounting bevel
wheel (3.1) so constructed that one or two demountable rims are clamped to the cast wheel body, which also serves as the hub support for the brake drum or disc brake rotor

Note 1 to entry: Figure 5.



a) Single **b) Dual**

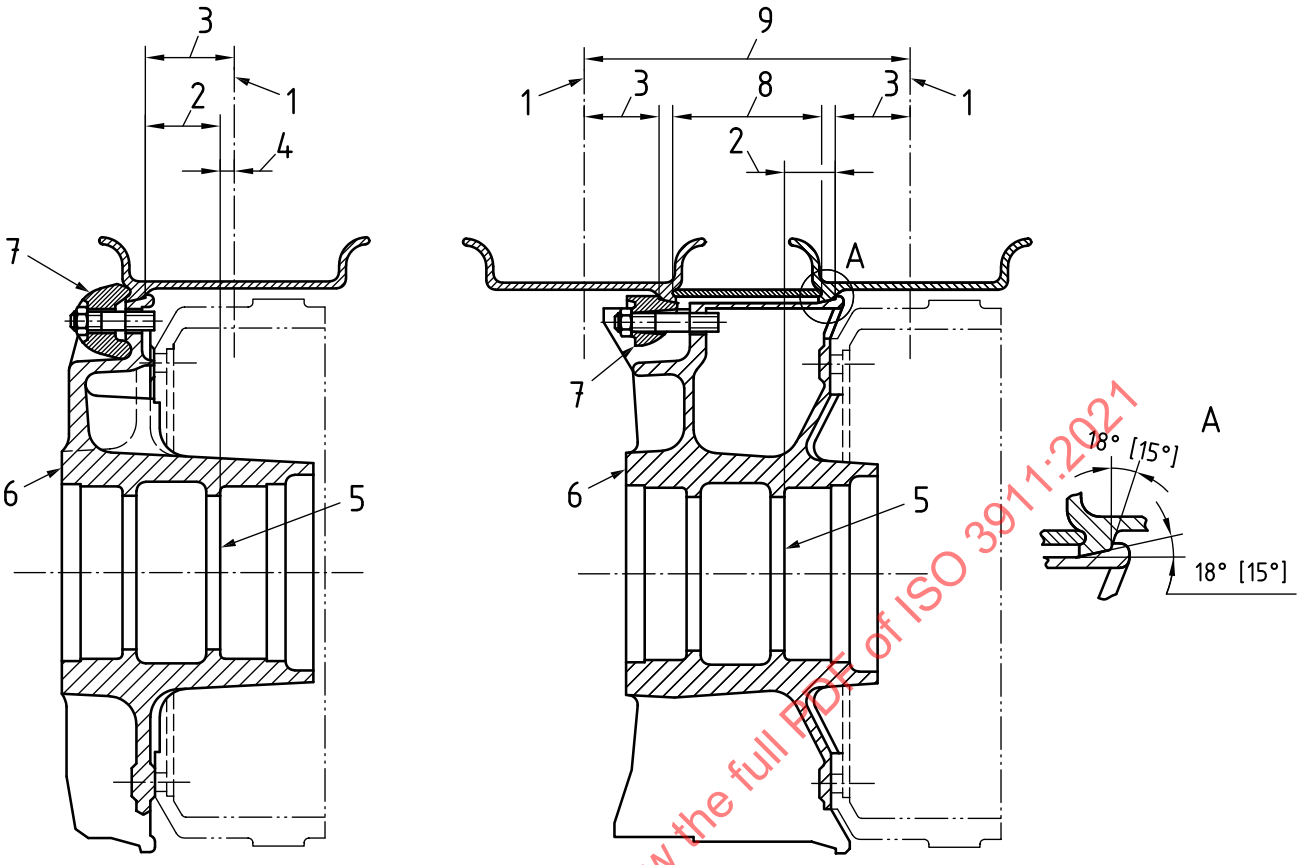
Key

1	rim centreplane	6	inner bearing cup shoulder (reference plane)
2	rim base offset	7	outset
3	wheel bevel offset	8	dual spacing
4	clamp	9	spacer band width
5	cast wheel body	10	rim bevel location

Figure 5 — Wheels with 28° mounting bevel — Nomenclature

3.4.2
wheel with 18° [15°] mounting bevel
wheel (3.1) so constructed that one or two demountable rims are clamped to an 18° [15°] mounting bevel on the cast wheel body

Note 1 to entry: See Figure 6.



a) Single **b) Dual**

Key

1	rim centreplane	6	cast wheel body
2	wheel bevel offset	7	clamp
3	rim base offset	8	spacer band width
4	inset	9	dual spacing
5	inner bearing cup shoulder (reference plane)		

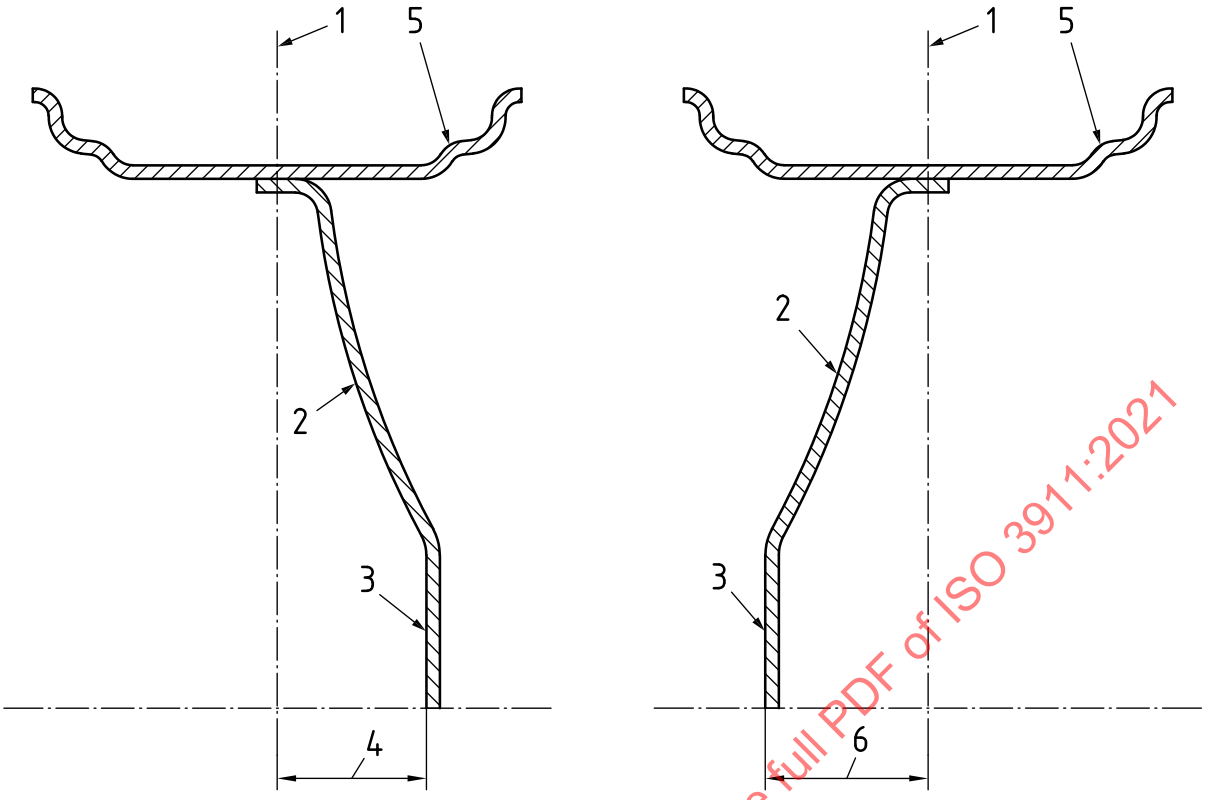
Figure 6 — Wheels with 18° [15°] mounting bevel — Nomenclature

3.5 Wheels with more than one mounting option

3.5.1
reversible wheel

wheel (3.1) so constructed that its disc can be mounted on either face to provide inset (narrow track) or outset (wide track)

Note 1 to entry: See Figure 7.



Key

1 rim centreplane
2 disc
3 attachment face
4 inset
5 rim
6 outset

Figure 7 — Reversible wheel

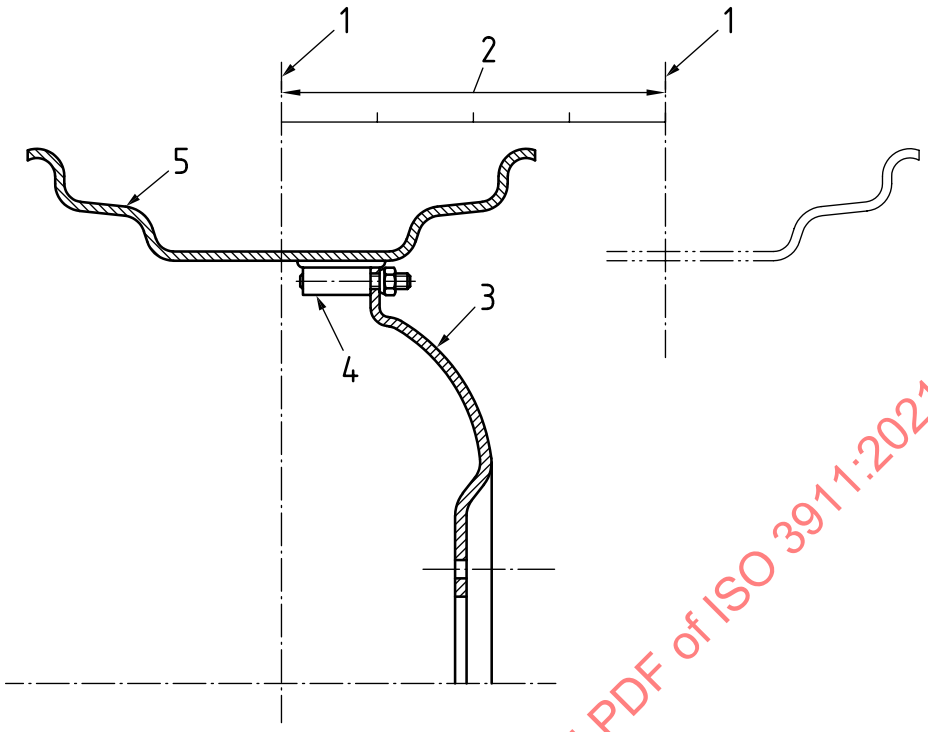
3.6 Wheels with adjustable rims

3.6.1
adjustable wheel
wheel (3.1) so constructed that the rim can be repositioned axially relative to the wheel disc

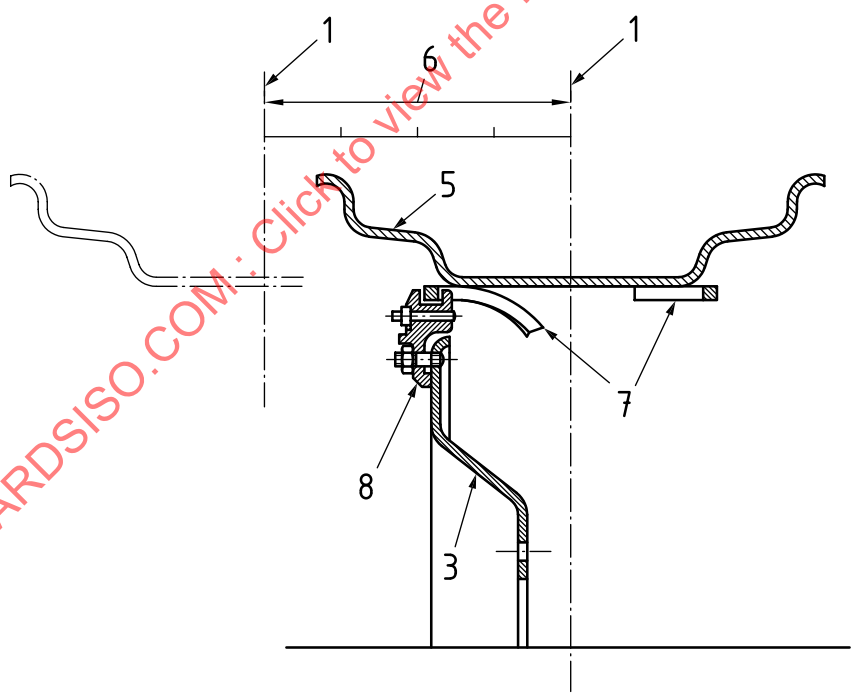
Note 1 to entry: Repositioning adjustments can be made manually or by power of the vehicle

Note 2 to entry: The power adjustable is a construction that can adjust the thread easily by loosening the clamp bolt without dismounting the rim from the disc, and by rotating the rim relatively to the wheel disc along the rail.

Note 3 to entry: See Figure 8 a) or b), respectively.



a) Manually adjustable



b) Power adjustable

Key

1	rim centreplane	5	rim
2	total adjustment with wheel reversed	6	total adjustment without wheel reversed
3	disc	7	rails
4	bracket	8	clamp

Figure 8 — Adjustable wheel

3.7 Rim nomenclature

3.7.1
flange
part of the rim which provides lateral support to the tyre

Note 1 to entry: See Figure 9, a, b, g, r_1, r_2, r_3.

3.7.2
bead seat
part of the rim which provides radial support to the tyre

Note 1 to entry: See Figure 9, D, p, r_3, β.

3.7.3
well
part of the rim so located with sufficient depth and width to enable the tyre beads to be mounted and demounted over the mounting side rim flange or bead seat taper

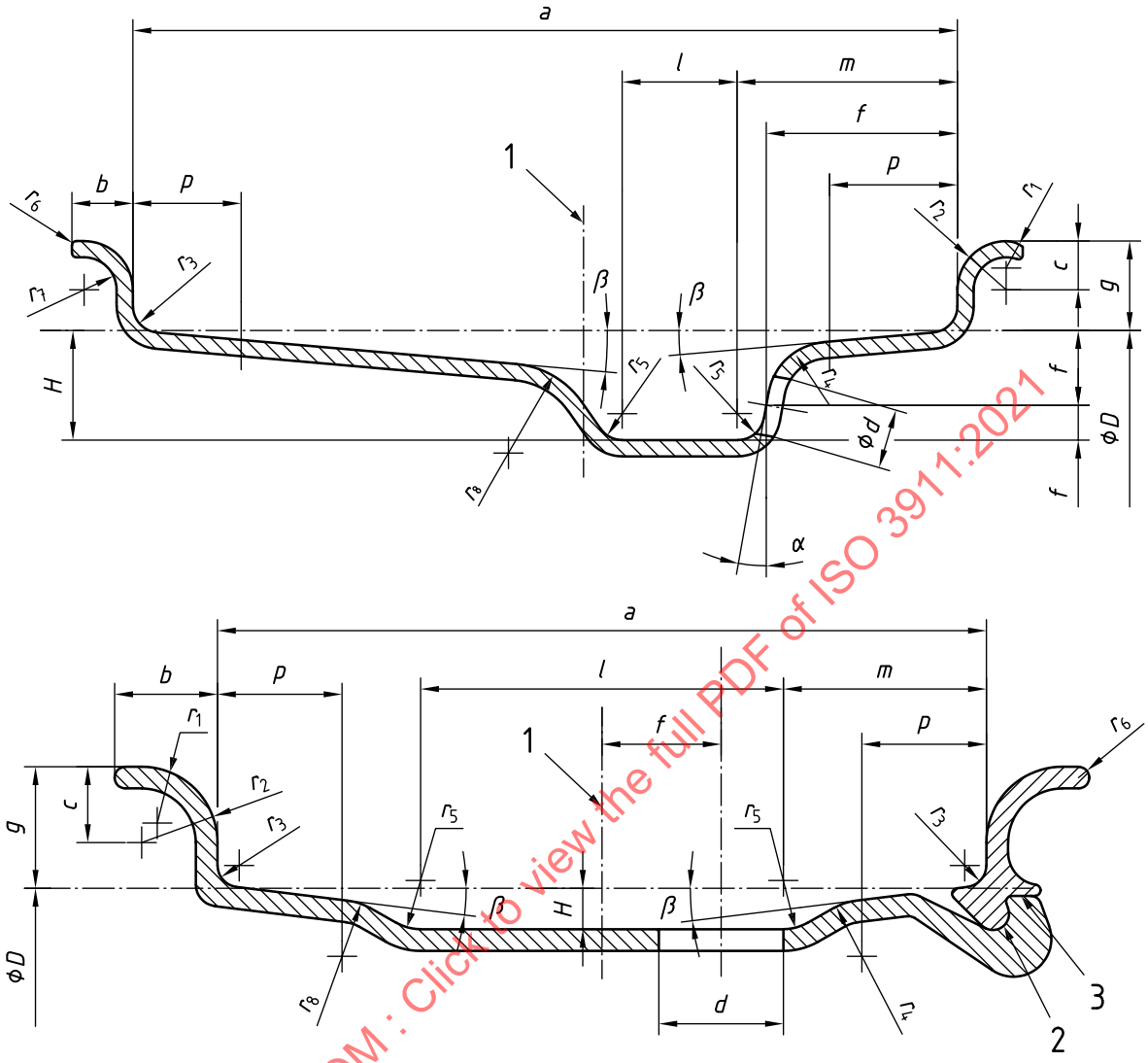
Note 1 to entry: See Figure 9, H, l, m, r_4, r_5, α.

3.7.4
valve aperture
valve hole
hole or slot in the rim which accommodates the valve for tyre inflation

Note 1 to entry: See Figure 9, d and f.

3.7.5
gutter
groove in the rim base in which rim parts such as a spring lock ring or a detachable spring flange fit and are retained by the gutter tip

Note 1 to entry: See Figure 9, keys 2 and 3.



Key

a	specified rim width	r_2	flange radius
b	flange width	r_3	bead seat radius
c	flange radius location	r_4	well top radius — tyre mounting side
D	specified rim diameter	r_5	well bottom radius
d	valve aperture	r_6	flange edge radius
f	valve aperture location (for information only)	r_7	flange radius at balance weight side
g	flange height	r_8	well top radius — non tyre mounting side
H	well depth	α	side wall angle of well
l	well width	β	bead seat angle
m	well position	1	rim centreplane
p	bead seat width	2	gutter
r_1	flange compound radius	3	gutter tip

Note 2 to entry For ledge depth, h, see Figures 10 and 11.

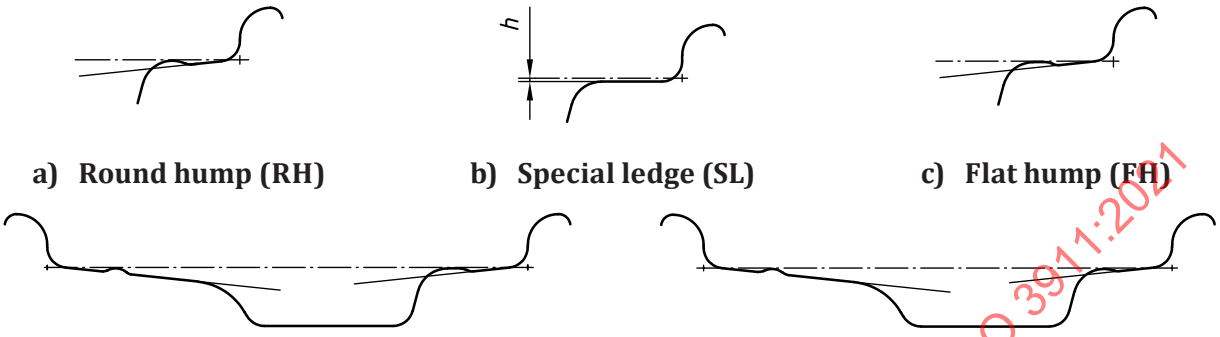
Note 3 to entry For multi-piece rims, the valve aperture location, f, may be measured from a fixed flange or inside edge of the gutter groove.

Figure 9 — Rim tyre side profiles — Nomenclature

3.8 Rim types

3.8.1
optional bead seat profiles
rim hump or special ledge geometries

Note 1 to entry: See Figure 10



a) Round hump (RH) **b) Special ledge (SL)** **c) Flat hump (FH)**

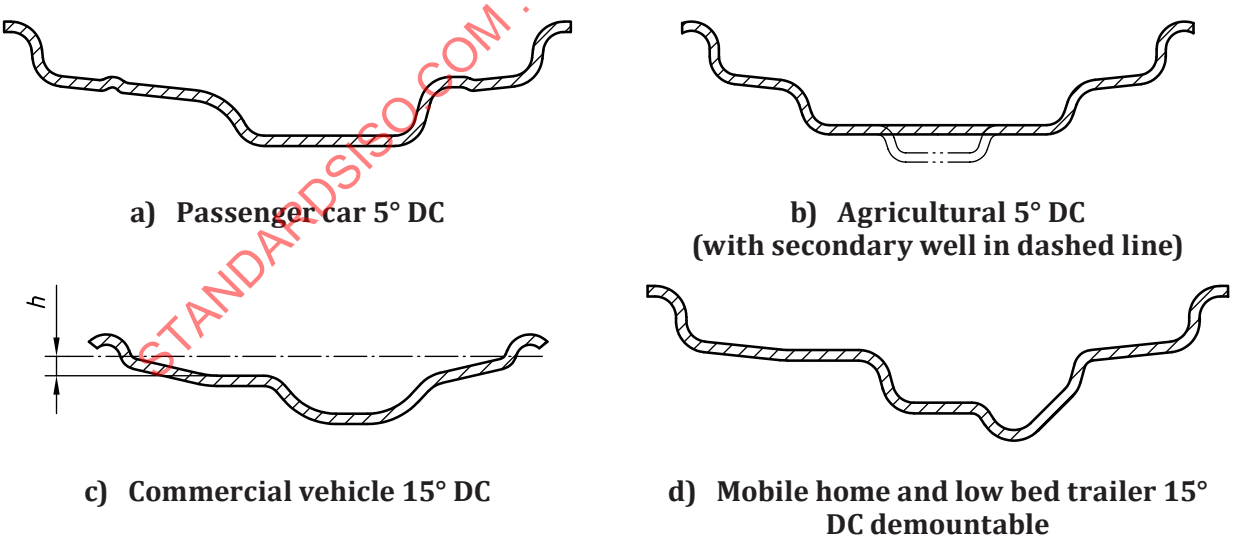
d) Combination hump (CH) **e) Double hump (H2)**

Key
h ledge depth

Figure 10 — Optional bead seat profiles

3.8.2
one-piece rim
drop-centre rim
rim which is of one-piece construction and incorporates a well

Note 1 to entry: See Figure 11.



a) Passenger car 5° DC

b) Agricultural 5° DC (with secondary well in dashed line)

c) Commercial vehicle 15° DC

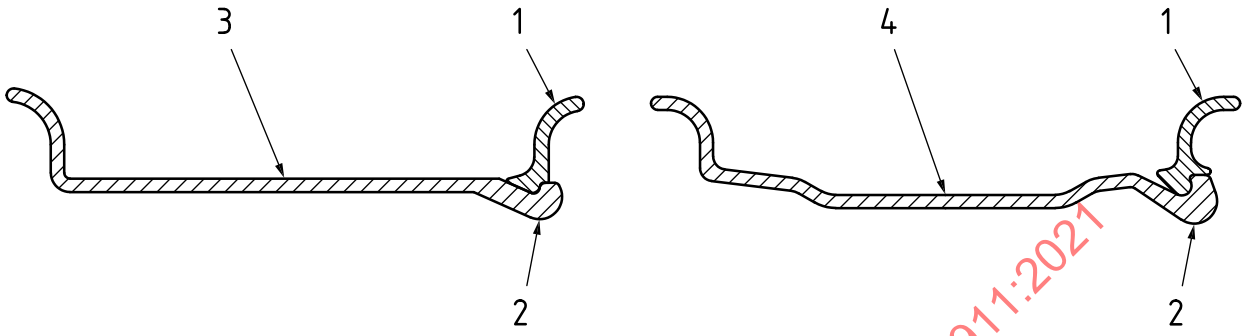
d) Mobile home and low bed trailer 15° DC demountable

Key
h ledge depth

Figure 11 — One-piece (drop-centre) rims — Nomenclature

3.8.3
two-piece rim
rim of construction with two pieces

Note 1 to entry: See Figure 12.



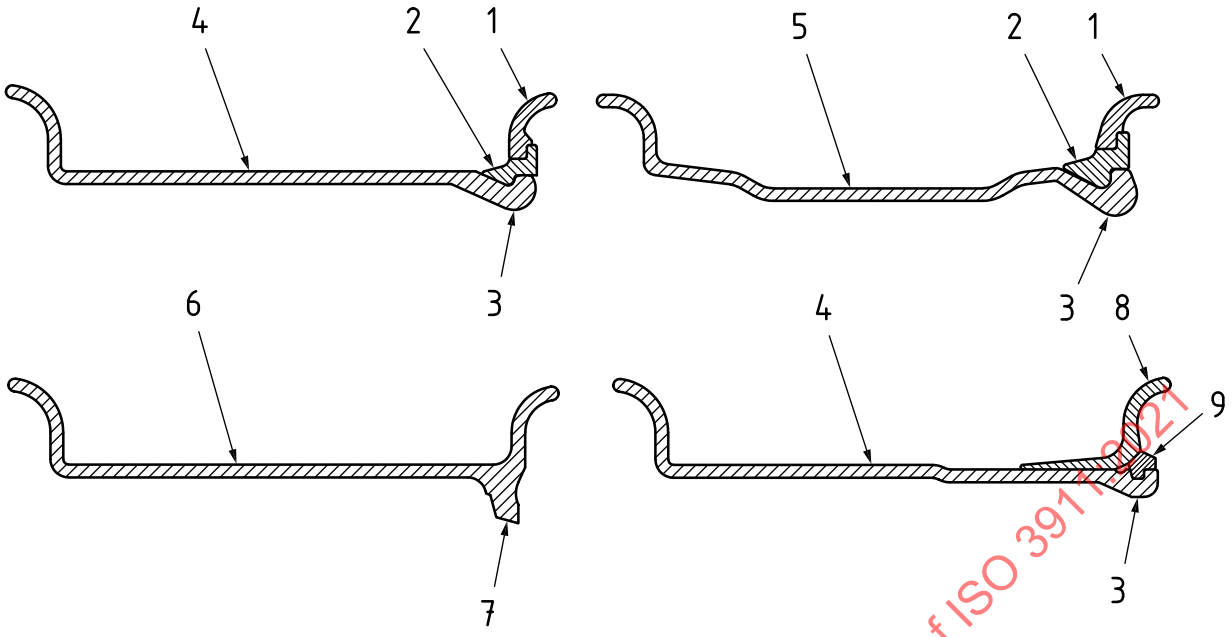
Key

1	detachable spring flange	3	rim base
2	gutter portion	4	rim base (semi-drop-centre)

Figure 12 — Two-piece rims — Nomenclature

3.8.4
three-piece rim
rim of construction with three pieces

Note 1 to entry: See Figure 13.



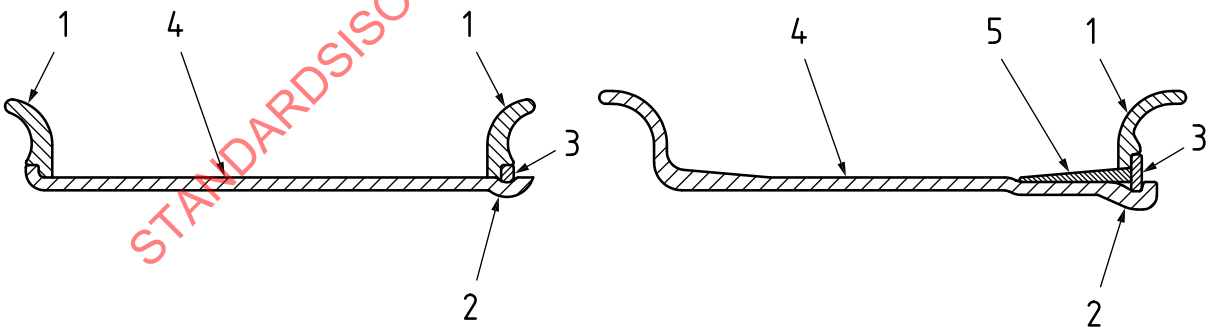
Key

1 detachable endless flange
2 spring lock ring
3 gutter portion
4 rim base
5 rim base (semi-drop-centre)
6 3 x 120° segment rim
7 18° [15°] bevel
8 detachable endless flange with tapered bead seat
9 spring lock ring

Figure 13 — Three-piece rims — Nomenclature

3.8.5
four-piece rim
rim of construction with four pieces

Note 1 to entry: See Figure 14.



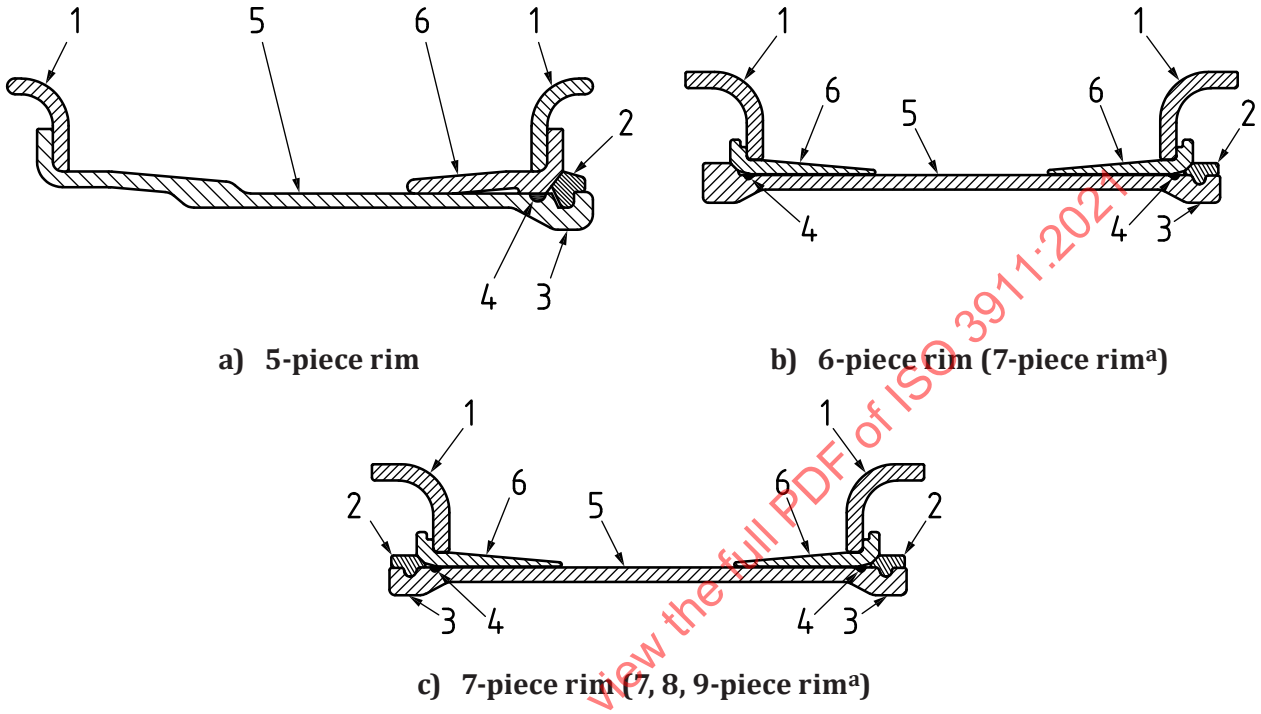
Key

1 detachable endless flange
2 gutter portion
3 spring lock ring
4 rim base
5 spring tapered bead seat ring

Figure 14 — Four-piece rims — Nomenclature

3.8.6
five- or more piece rims
rim of construction with five or more pieces such that the detachable flange may consist of separate types and pieces for a total of 5, 6, 7, or 8 pieces

Note 1 to entry: See Figure 15.



a) 5-piece rim

b) 6-piece rim (7-piece rim[a])

c) 7-piece rim (7, 8, 9-piece rim[a])

Key
1 detachable endless flange
2 spring lock ring
3 gutter portion
4 groove for O-ring seal for tubeless type applications
5 rim base
6 detachable endless tapered bead seat ring
[a] Lock ring may be two-part lock ring.

Figure 15 — Five- or more piece rims — Nomenclature

4 Wheel/rim size designation

4.1 Designation

The size designation of wheels and rims shall be shown by numbers and letters, in the following preferred order.

a) Nominal rim diameter:

— in a size code[1)] for existing rim types;

— in millimetres when used in combination with new-concept tyres which require new-concept rims.

1) The size code is based on inch dimensions.