SAE INTERNATIONAL

SURFACE VEHICLE RECOMMENDED PRACTICE

J1982™ MAR2023

Issued 1991-12
Reaffirmed 2016-05
Revised 2023-03

Superseding J1982 MAY2016

Nomenclature - Wheels for Passenger Cars, Light Trucks, and Multipurpose Vehicles

RATIONALE

This document was revised to reflect the new definitions from SAE J3204.

1. SCOPE

This SAE Recommended Practice establishes uniform engineering nomenclature for the most common wheel constructions, and their components used on passenger cars, light trucks, and multipurpose vehicles. These wheel constructions are welded disc wheels, cast wheels, forged wheels, composite wheels and hybrid wheels. This nomenclature and the accompanying drawings are intended to define fundamental wheel terms rather than to provide a comprehensive tabulation of all wheel design types.

2. REFERENCES

2.1 Related Publications

The following publications are provided for information purposes only and are not required part of this SAE Technical Report.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J393 Nomenclature - Wheels, Hubs, and Rims for Commercial Vehicles

SAE J694 Disc Wheel and Hub or Drum Interface Dimensions - Truck and Bus

SAE J851 Dimensions - Wheels for Demountable Rims, Demountable Rims, and Spacer Bands - Truck and Bus

SAE J1986 Balance Weight and Rim Flange Design Specifications, Test Procedures, and Performance Recommendations

SAE J1992 Wheel/Rims - Military Vehicles - Test Procedures and Performance Requirements

SAE J3204 Aftermarket Composite Wheels Made of Matrix Material and Fiber Reinforcement Intended for Normal Highway Use - Test Procedures and Performance Requirements

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
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For more information on this standard, visit
https://www.sae.org/standards/content/J1982_202303/

2.1.2 ISO Publications

Copies of these documents are available online at https://webstore.ansi.org/.

ISO 3911 Wheels/Rims - Nomenclature, Designation, and Marking

2.1.3 Other Publications

Tire Guide - Complete tire and wheel information for cars and trucks available at www.tireguides.com, Tel: (561-997-9229)

3. DEFINITIONS

3.1 Wheel

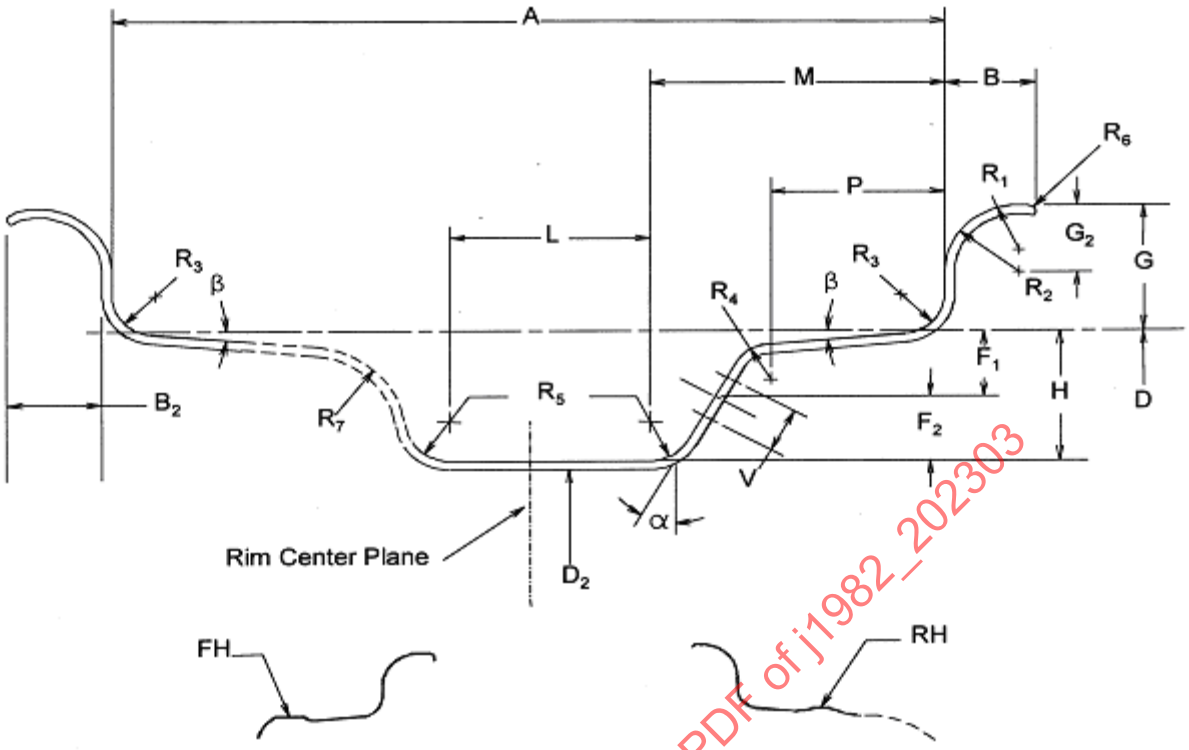
A rotating load-carrying member supporting the tire and affixed to the hub. Disc wheels usually consist of two major components: (a) the rim, as shown in Figure 1; (b) the disc, as shown in Figure 2. The rim and wheel disc may be integral, permanently attached, or detachable. Cast wheels or forged wheels typically have a one-piece construction, as shown in Figure 3.

3.1.1 Rim

That part of the wheel on which the tire is mounted and supported. (See Figure 1.)

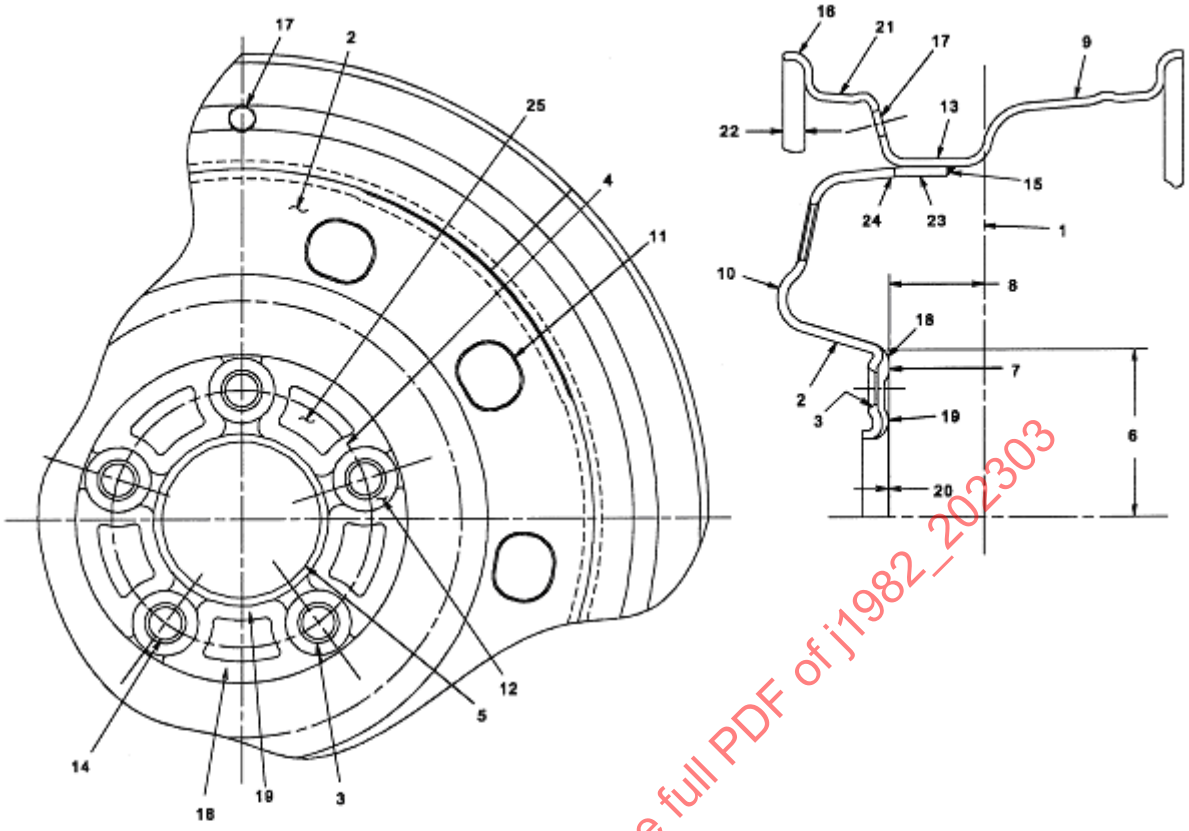
3.1.2 Wheel Disc

That part of the wheel which is the supporting member between the hub and the rim. (See Figure 2.)



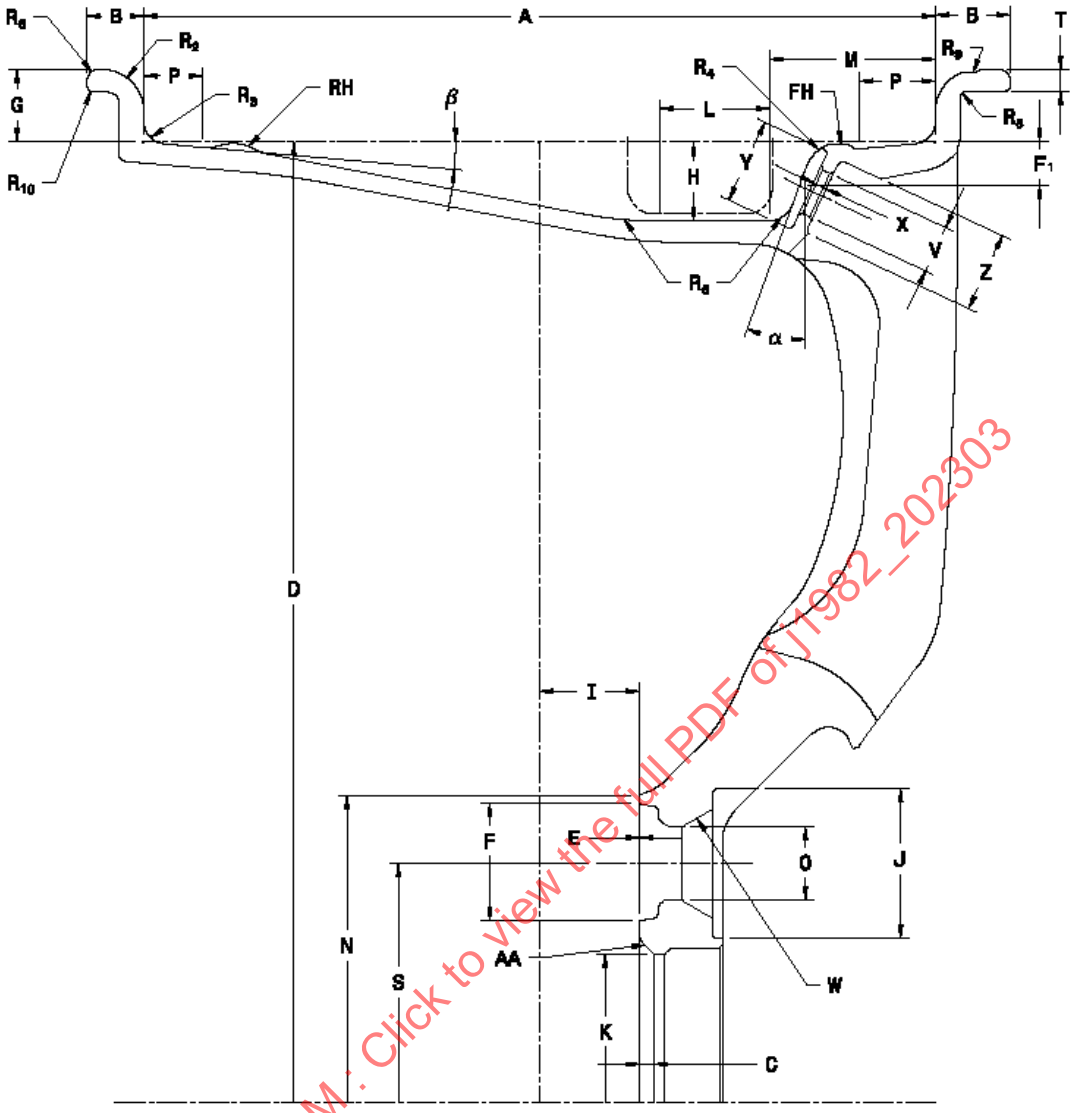
A	Specified rim width
B	Flange width
B_2	Flange offset
D	Specified rim diameter
D_2	Well Inside Diameter
F_1, F_2	Valve Hole Location
FH	Flat Hump
G	Flange height
G_2	Flange radius location
H	Well depth
L	Well width
M	Well position
P	Bead seat width
R_1	Flange compound radius
R_2	Flange radius
R_3	Bead seat radius
R_4	Well top radius
R_5	Well bottom radius
R_6	Flange edge radius
R_7	Well wall radius
RH	Round Hump
V	Valve hole
α	Well angle
β	Bead seat angle

Figure 1 - Rim



1. Rim Center Plane
2. Disc
3. Nut Seat
4. Pitch Circle Diameter of Bolt Holes
5. Center Hole Diameter
6. Attachment Face Diameter
7. Attachment Face
8. Offset (Figure 4 - Detail)
9. Rim
10. Hat
11. Window
12. Nut Boss
13. Well
14. Bolt Hole
15. Assembly Weld
16. Rim Flange
17. Valve Hole
18. Outer Mounting Pad
19. Inner Mounting Pad
20. Step
21. Bead Seat
22. Flange Offset
23. Disc Flange
24. Disc Scallop
25. Rib

Figure 2 - Disc wheel



A	Specified rim width	P	Bead seat width
α	Well angle	R_2	Flange radius
β	Bead seat angle	R_3	Beat seat radius
B	Flange width	R_4	Well top radius
C	Center hole height	R_5	Well bottom radius
D	Specified rim diameter	R_6	Flange edge radius
E	Step	R_8	Flange radius, balance weight side
F	Rotor/drum retainer clip pocket	R_9	Balance weight retention groove
F_1	Valve hole location	R_{10}	Flange corner radius, balance weight side
FH	Flat hump	RH	Round hump
G	Flange height	S	Pitch circle diameter of bolt holes
H	Well depth	T	Flange thickness
I	Inset	V	Valve hole diameter
J	Nut seat counterbore	W	Nut seat
K	Center hole diameter	X	Valve hole thickness
L	Well width	Y	Valve hole counterbore diameter tire side
M	Well position	Z	Valve hole counterbore diameter
N	Attachment face diameter	AA	Center hole chamfer
O	Bolt hole diameter		

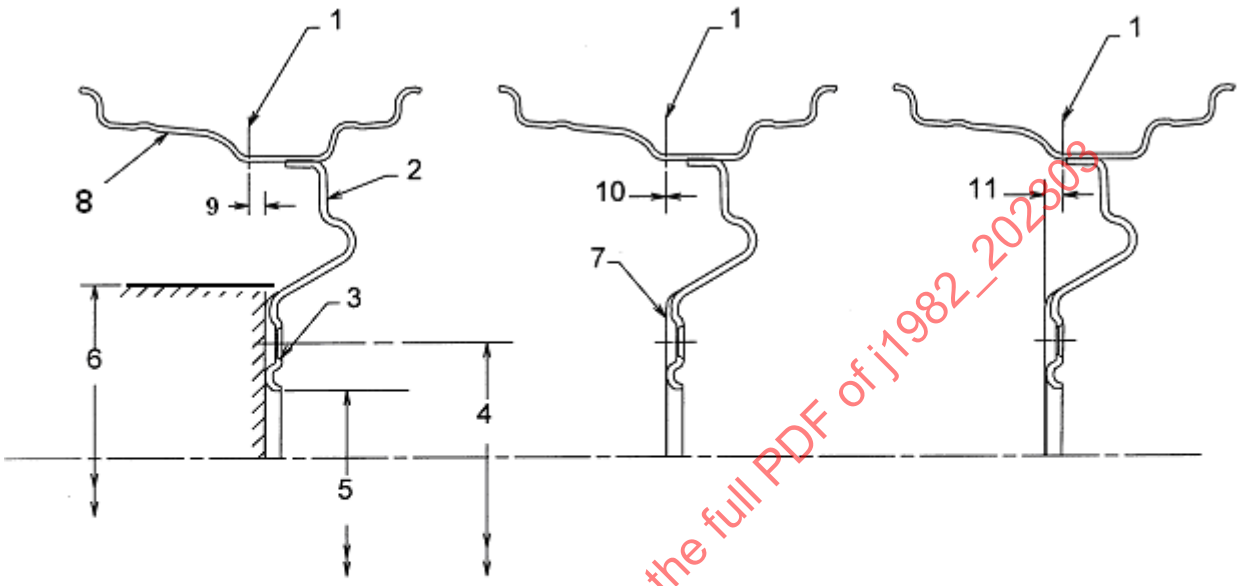
Figure 3 - Cast/forged wheel

3.1.3 Hub

The rotating member to which the wheel is attached.

3.1.4 Inset Wheel

A wheel so constructed that the center plane of the rim is located inboard of the wheel attachment face. Inset is the distance from the wheel attachment face to the center plane of the rim. (See Figure 4.)



1. Rim Center Plane
2. Disc
3. Nut Seat
4. Pitch Circle Diameter of Bolt Holes
5. Center Hole Diameter
6. Attachment Face Diameter
7. Attachment Face
8. Rim
9. Inset
10. Zeroset
11. Outset

Figure 4 - Rim to disc location

3.1.5 Zeroset Wheel

A wheel so constructed that the center plane of the rim is coincident with the wheel attachment face. (See Figure 4.)

3.1.6 Outset Wheel

A wheel so constructed that the center plane of the rim is located outboard of the wheel attachment face. Outset is the distance from the wheel attachment face to the center plane of the rim. (See Figure 4.)

3.2 Wheel Types

3.2.1 Disc Wheel

A permanent combination of a rim and wheel disc. (See Figure 2.)

3.2.2 Cast Wheel

A wheel formed by a casting, and subsequent machining, process. (See Figure 3.)

3.2.3 Forged Wheel

A wheel that has been forged from a billet and subsequently machined (as necessary) to create functional features for balance, tire mounting, balance weight retention, and hub attachment. (See Figure 3.)

3.2.4 Composite Wheel

A wheel made of matrix material and fiber reinforcement in both the rim and center area.

3.2.5 Hybrid Wheel

A wheel with a metallic center section attached to composite rim.

3.2.6 Composite Rim

A rim made of matrix material and fiber reinforcement.

3.3 Rim Types

3.3.1 One-Piece (Drop Center)

A rim which is of one-piece construction and incorporates a well. (See Figure 1.)

3.3.2 Two-Piece

A rim with two pieces that are not permanently attached.

3.3.3 Average Radial Runout

The average radial run-out of the inner and outer bead seats measured simultaneously. Measurements are taken adjacent to the R_3 radii.

3.3.4 Average Lateral Runout

The average lateral runout of the inner and outer flanges measured simultaneously. Measurements are taken adjacent to the R_3 radii.

3.4 Rim Nomenclature

(See Figures 1 and 3.)

3.4.1 Flange

That part of the rim which provides lateral support to the tire and a means for attaching balance weights and decorative trim components.

3.4.2 Bead Seat

That part of the rim which provides radial support to the tire and air pressure seal for tubeless tires.

3.4.3 Well

That part of the rim so located with sufficient depth and width to enable the tire beads to be mounted and dismounted over the mounting side rim flange.

3.4.4 Valve Hole

The hole or slot in the rim which accommodates the valve for tire inflation.

3.4.5 Balance Weight Retention Groove

A circumferential groove located on the rim flanges to improve balance weight retention.

3.5 Disc Nomenclature

(See Figure 2.)

3.5.1 Disc Flange

The part of the disc that supports the rim (disc wheels only).

3.5.2 Hat

The transition area in the disc between the disc flange and the attachment area (disc wheels only).

3.5.3 Attachment Face

The surface of the disc supported by the hub face or other components mounted to the hub face.

3.5.4 Inner Mounting Pad

The surface of the attachment face that is located inside the pitch circle diameter of bolt holes.

3.5.5 Outer Mounting Pad

The surface of the attachment face that is located outside the pitch circle diameter of bolt holes.

3.5.6 Nut Boss

The portion of the attachment face in which the lug nut, or wheel bolt contacts the wheel.

3.5.7 Step

The axial distance between the datum of the outer mounting pad and the inner mounting pad.

3.5.8 Bolt Hole

Clearance hole for the wheel stud or wheel bolt.

3.5.9 Nut Seat

The portion of the disc at the bolt hole that is the bearing surface for the wheel nut.

3.5.10 Pitch Circle Diameter of Bolt Holes

A circle locating the centers of the bolt holes that are used to attach the wheel to the hub.

3.5.11 Rib

The raised area between bolt holes.

3.5.12 Center Hole

The clearance hole for the pilot of the hub.