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Off-Highway Tire and Rim Classification—SAE J751d

SAE Recommended Practice
Completely Revised January 1977

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APPEAR IN THE NEXT EDITION
OF THE SAE HANDBOOK

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PREPRINT

OFF-HIGHWAY TIRE AND RIM CLASSIFICATION— SAE J751d

SAE Recommended Practice

Report of Construction and Industrial Machinery Technical Committee approved
January 1951 and completely revised January 1977.

1. **Scope**—This Recommended Practice describes the classification of off-highway tires and rims, defines related terminology in common use, and shows representative construction details of component parts.

2. **Purpose**—To establish a standard nomenclature for tire classifications and tire and rim components.

3. **General**—In recent years, technological advances in vehicle designs and applications have necessitated the inception of numerous special size and design tires. The proliferation of old and new terminology requires organized expression. Specific size, capacity, and other application information should be obtained through tire and rim manufacturers and their organizations.

4. **Tire Definition**—An off-highway tire is designated by an alpha-numeric sequence: a section width reference, a nominal rim diameter, a carcass strength rating, and a service code (for example, 24.00-49 42PR E4).

4.1 **Section Width Reference**—There are three commonly accepted designations: conventional, wide base, and 65 series. (Note that section width reference is not a tire dimension.)

4.1.1 **Conventional**—Where the section width reference includes zeros following the decimal point, (for example, 24.00), an aspect ratio (section height over section width) of approximately 0.96 is indicated and the tire called conventional.

4.1.2 **Wide Base**—Where the section width reference includes digits other than zero following the decimal point, an aspect ratio of approximately 0.83 is indicated and the tire called wide base (for example, 33.5 and 33.25).

4.1.3 **65 Series**—Where the section width reference consists of 4 digits the first 2 of which are 65 (for example, 65/40), an aspect ratio of 0.65

is indicated. The third and fourth digits denote the nominal tire section width.

4.2 **Nominal Rim Diameter**—The nominal rim diameter is that part of the tire designation which follows the section width reference and specifies the appropriate diameter rim.

4.3 **Carcass Strength Rating**—Carcass strength is identified by three methods: ply rating (PR), load range (LR), and a symbol mark type of rating. Equivalent ply rating and load range designations are given in Table 1. Ply rating and load range are indices of tire strength and do not necessarily represent the number of cord plies in a tire. For the meaning of the symbols on symbol marked tires, refer to the respective tire manufacturer.

4.4 **Service Code**—Service code is an alpha-numeric identification for off-highway tires in terms of type of tire for intended service and tire tread. The identification consists of a letter designating service category followed by a numeral indicating the tread. The recommended code identification is given in Table 2.

**TABLE 2—RECOMMENDED CODE IDENTIFICATION FOR
OFF-HIGHWAY TIRES (TUBE OR TUBELESS TYPES)**

Category	Tread Type	Code Number
C - Compactor Service	Smooth	C-1
	Grooved	C-2
E - Earthmover Service	Rib	E-1
	Traction	E-2
	Rock	E-3
	Rock Deep Tread	E-4
	Flotation	E-7
G - Grader Service	Rib	G-1
	Traction	G-2
	Rock	G-3
	Rock Deep Tread	G-4
L - Loader and Dozer Service	Traction	L-2
	Rock	L-3
	Rock Deep Tread	L-4
	Rock Extra Deep Tread	L-5
	Smooth	L-3S
	Smooth Deep Tread	L-4S
	Smooth Extra Deep Tread	L-5S
	Half Track Regular Tread	L-3/L-3S
	Half Track Deep Tread	L-4/L-4S
	Half Track Extra Deep Tread	L-5/L-5S

**TABLE 1—LOAD RANGE AND PLY RATING EQUIVALENTS
FOR OFF-HIGHWAY TIRES (TUBE OR TUBELESS)**

LR	PR
A	2
B	4
C	6
D	8
E	10
F	12
G	14
H	16
J	18
L	20
M	22
N	24
P	26
Q	28
R	30
S	32
T	34
U	36
V	38
W	40
X	42
Y	44
Z	46
AA	48
AB	50
AC	52
AD	54
AE	56
AF	58
AG	60

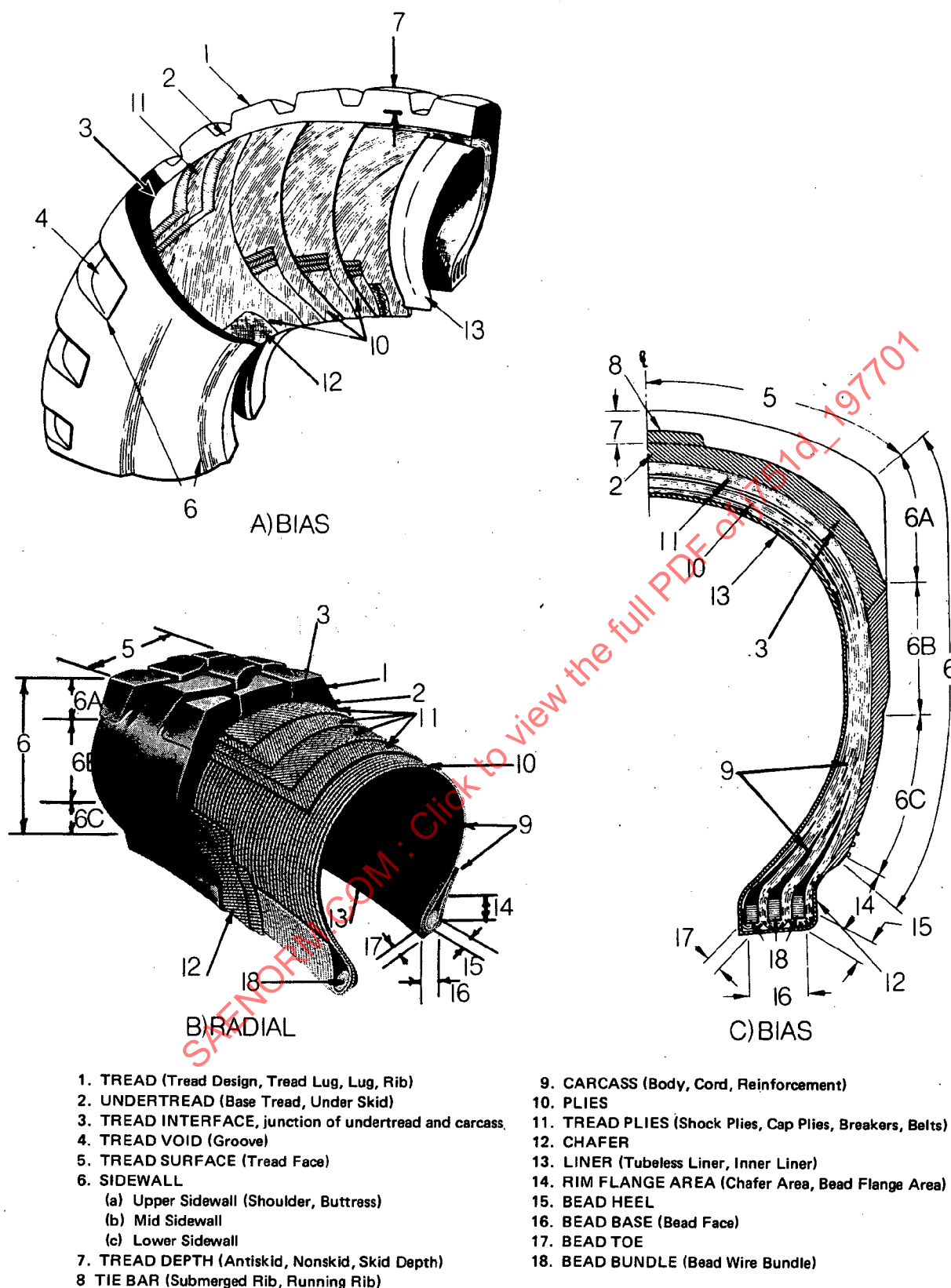


FIG. 1-NOMENCLATURE FOR OFF-HIGHWAY TIRES

4.4.1 A Compactor Tire—Category C, can be defined as—A high pressure tire utilizing a wide, smooth tread surface for smooth road work and a button design for compaction in loose soils; these tires are load capacity rated for operation basically at 5 mph.

4.4.2 An Earthmover Tire—Category E, can be defined as—A medium-to-high pressure, rugged, heavy load carrying, special purpose tire designed for haulage vehicles at medium to higher speeds. These tires are load capacity rated for short haul operation at 30 and 40 mph. They also are rated for tmph, (ton-mile-per-hour) capacity and application (J1015 and J1098 respectively).

4.4.3 A Grader Tire—Category G, can be defined as—A low pressure, large section size tire. It is generally provided with both a rib type tread for resistance to lateral forces caused by blade and by turning, and with a lug type tread having superior traction and self-cleaning abilities for operation in both soft soils and rugged terrains. These tires are load capacity rated for operation at 25 mph.

4.4.4 A Loader and Dozer Tire—Category L, can be defined as—A thick, heavy tread and sidewall tire for maximum protection against cutting. These tires are load capacity rated for operation at 5 mph.

4.5 Construction—There are two basic tire constructions: bias ply and radial.

4.5.1 A bias ply constructed tire is designated by a hyphen (-) between the designated section width reference and the nominal rim diameter followed by designators for carcass strength and service code respectively. For example:

24.00-49 42PR E4

Refer to Fig. 1 A for representative construction details.

4.5.2 A radial constructed tire is designated in the same manner as a bias ply tire (paragraph 4.5.1) except that an upper case R is inserted in place of the hyphen (-). For example:

24.00R49 42 PR E4

Refer to Fig. 1 B for representative construction details.

5. Vehicle Clearances—When designing for vehicle clearances, the maximum dimensions for grown tires in service should be used. (See Fig. 2.) Where specific tire dimensions are required, the alpha dimensions and definitions in Fig. 2 are the recommended nomenclature for communication with the tire manufacturer.

6. Rim Definition—The rim assembly is that member on which the tire is mounted and supported. A multi-piece off-highway rim contour is designated by an alpha-numeric sequence: a rim width reference number, a nominal rim diameter reference number, and a nominal flange height reference number or rim profile designation. The origin of the numeric designation is inch units.

6.1 Rim Width Reference Number—The rim width reference number is the width as measured in inches between flanges of the rim contour. (See Fig. 3.)

6.2 Nominal Rim Diameter Reference Number—The nominal rim diameter reference number is the diameter of the rim as measured in inches at the intersection point of the bead taper and the vertical tangent of the flange contour. (See Fig. 3.)

6.3 Nominal Flange Height Reference Number—The nominal flange height reference number is the height of the flange, as measured in inches from the intersection point of the bead taper and the vertical tangent of the flange contour to the horizontal tangent of the outermost portion of the flange contour. (See Fig. 3.)

6.4 Rim Profile Designation—The rim profile designation is one or more letters which signify the rim contour at the tire to rim interface. This designation is used instead of the nominal flange height reference number on certain rim contours, and follows the rim width.

7. Typical Off-Highway Multi-Piece Rim Construction and Component Identification—There are 3 types of off-highway rim construction.

7.1 The two-piece type. (Refer to Fig. 3A.)

7.2 The three-piece type. (Refer to Fig. 3B.)

7.3 The five-piece type. (Refer to Fig. 3C.)

8. Rim Assembly Component Marking—Each component of the rim assembly is identified by a legible alpha-numeric marking. The origin of

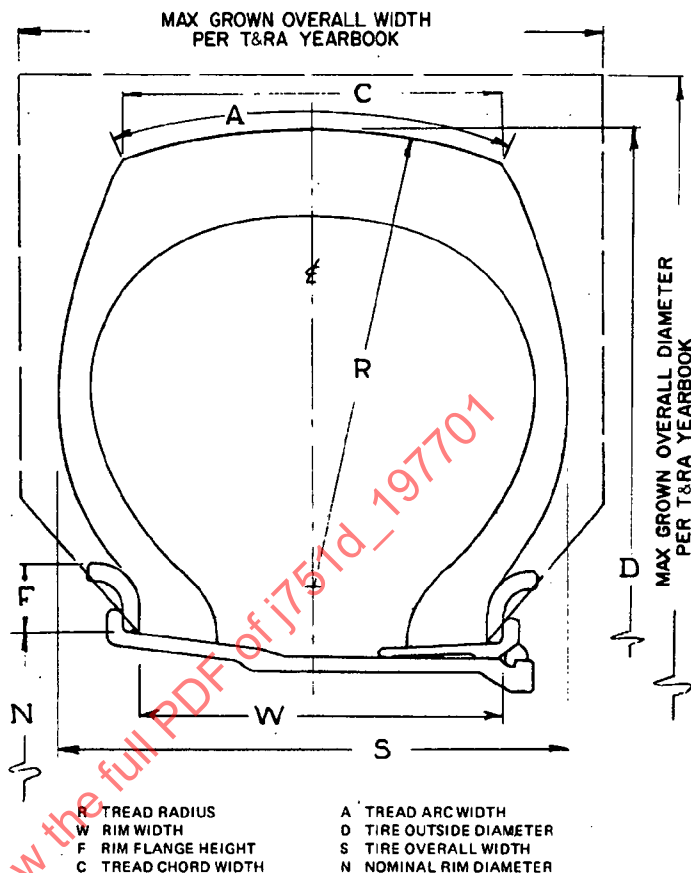


FIG. 2—INDUSTRY METHOD FOR DEPICTING MAXIMUM DIMENSIONS FOR GROWN TIRES IN SERVICE

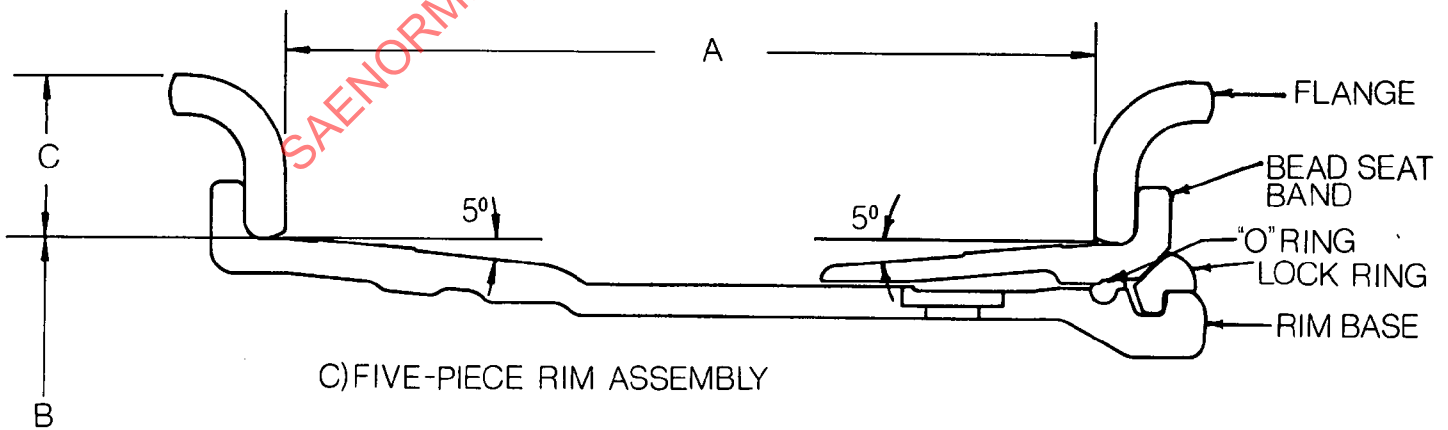
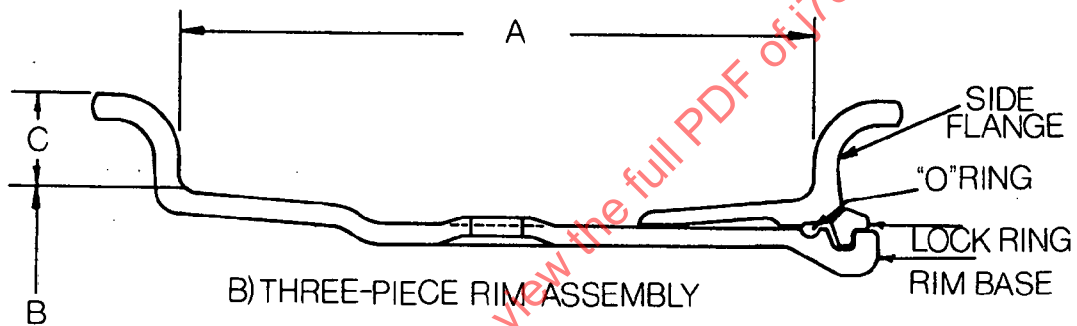
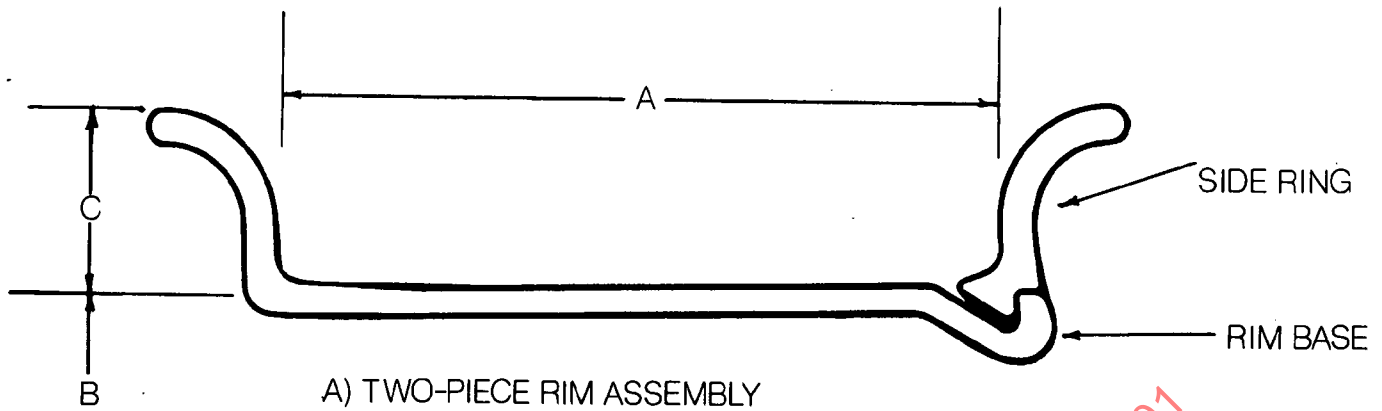
the numeric marking is inch units. The marking is to be visible after the tire is inflated. The five piece assembly is the only construction for which a standard method of component marking is established, as detailed below. Consult rim manufacturers' catalogs for the marking of other rim constructions. **CAUTION**—Rim components are not necessarily interchangeable; therefore, consult rim manufacturers for proper matching and assembly instructions.

8.1 Rim Base Marking—The rim base marking consists of a prefix letter B, denoting a rim base, followed by 2 digits denoting rim width, 2 digits denoting nominal rim diameter, and one or more numbers or letters denoting rim type or style designation. In cases where the rim design width contains decimal fractions, the decimal portion is deleted from the rim marking. The rim type or style designation indicates certain design details or features of the rim assembly, and does not relate to the tire to rim contour. The use and meaning of these suffix letters and numbers is at the discretion of the rim manufacturer.

Examples: B1751HDTD
B1533EM

8.2 Bead Seat Band Marking—The bead seat band marking consists of prefix letters BB, and two or three digits followed by one or more letters. The BB denotes bead seat band. The latter two digits denote nominal rim diameter. Where a third digit is present, it denotes the bead taper width to the smallest whole in. The suffix letters denote type or style designation.

Examples: BB35HTG
BB25STN
BB425EMO
BB539EH



- A RIM WIDTH
B NOMINAL RIM DIAMETER
C FLANGE HEIGHT

FIG. 3-RIM CONTOUR

