

Specification for

Retreaded car and commercial vehicle tyres

ICS 43.040.50; 83.160.10

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Automobile Standards Committee (AUE/-) to Technical Committee AUE/3, upon which the following bodies were represented:

- Association of County Councils
- Automobile Association
- British Rubber Manufacturers' Association
- Bus and Coach Council
- Consumer Policy Committee of BSI
- Department of Transport
- National Tyre Distributors' Association
- Retread Manufacturers' Association
- Road Haulage Association Ltd.
- Society of Motor Manufacturers and Traders Ltd.

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Foreword

This British Standard has been prepared under the direction of the Automobile Standards Committee. It was first published in 1968, revised as BS AU 144a in 1970, and revised again in 1977 to reflect developments, in particular to require the raising of the speed capability of commercial vehicle tyres to a minimum of 60 mile/h (96 km/h) to align with the permitted speeds of such vehicles on the motorways in the UK.

In the 1988 revision, prepared at the request of the British Rubber Manufacturers' Association and the Retread Manufacturers' Association, the minimum speeds of 70 mile/h (112 km/h) for passenger car tyres and 60 mile/h (96 km/h) for commercial vehicle tyres were deleted, being replaced by the requirement that retreaded tyres be marked with load indices (LI) or ply rating (PR) where applicable and speed symbols, and that the tyres comply with the associated loads and speeds.

Performance verification by rolling drum tests was included for the first time for retreaded tyres, similar to that applicable to new tyres. The performance and rolling drum test requirements specified for retreaded passenger car tyres are technically identical with those of ECE regulation 30¹⁾, while the shortened 6 h drum test for commercial vehicle tyres is technically equivalent to the 47 h test of ECE regulation 54¹⁾, which is also permitted as an acceptable alternative test.

Criteria are included for the inspection and repair of tyres during retreading, and for inspection after the retreading process. Tyre acceptance criteria following a rolling drum test are also included.

NOTE 1 This edition of the standard will only become effective at such time as it is invoked by regulations, expected to be made by the Secretary of State for Transport.

NOTE 2 BSI Sales Department will respond to purchase orders for BS AU 144 by supplying copies of the latest edition. The most recent changes to the standard are indicated by vertical lines in the margin.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 24, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

¹⁾ Available from HMSO.

1 Scope

This British Standard specifies requirements for the retreading of car and commercial vehicle pneumatic tyres for road vehicles primarily designed for use on the public highway and first used after 3 January 1933. It specifies inspection procedures for the tyre carcass before and during processing, repairing and processing details, rubber depth under the tread pattern, tread pattern information, and rotating drum verification tests. The requirements apply to both tubed and tubeless retreaded tyres.

The standard does not apply to:

- a) tyres designed for use on pre-1933 vehicles, as their design and construction may be unique and outside the range of tyres in current use;
- b) temporary use spare tyres; or
- c) tyres with speed categories VR or ZR.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard the following definitions apply.

NOTE Figure 1 to Figure 4 supplement the definitions given in this clause.

2.1 General definitions

2.1.1 retreading

Generic term for tyre reconditioning, including 2.1.1.1 to 2.1.1.3, to extend the useful life of the tyre by the addition of new material. It covers the replacement of the tread rubber and may include the renovation of the sidewall rubber and the renewal of part or whole of the protective breaker or belt of a radial ply commercial vehicle tyre.

2.1.1.1 recapping

process in which rubber is removed from the worn tread and over the shoulder and new rubber is then applied

2.1.1.2 remoulding

process in which rubber is removed as necessary and new rubber, extending from bead area to bead area, is applied

2.1.1.3 top-capping

process in which the worn tread rubber only is renewed

2.1.2

cure

conditions necessary to produce a given state of vulcanization

2.1.3

rubber

macromolecular material which has, or can be given, properties of:

- a) at room temperature, returning rapidly to the approximate shape from which it has been substantially distorted by a weak stress; and
- b) not being easily changed to any other permanent shape by the application of moderate heat and pressure.

2.1.4

repair

a permanent repair

2.2 Definitions related to structure

2.2.1

diagonal (cross) ply tyre

pneumatic tyre in which the ply cords extend to the beads and are laid at alternate angles substantially less than 90° to the centreline of the tread

2.2.2

radial ply tyre

pneumatic tyre in which the cords extend to the beads and are laid substantially at 90° to the centreline of the tread, the carcass being stabilized by an essentially inextensible circumferential belt

2.2.3

bias-belted

pneumatic tyre structure of diagonal (cross) ply type in which the carcass is restricted by a belt comprising two or more layers of substantially inextensible cord material laid at alternate angles smaller than those of the carcass

2.3 Definitions related to service

2.3.1

ply rating (PR)

index of tyre strength used to identify a given tyre with its recommended maximum permitted load when used for a specific service as given in BS AU 50-1

NOTE It does not necessarily represent the actual number of plies in a tyre.

2.3.2

service description

the combination of a tyre's load index or load indices and its speed symbol (see Table 1 and Table 2)

2.3.3

load-capacity index (also referred to as load index or LI)

a numerical code associated with the maximum load a tyre can carry at the speed indicated by its speed symbol (see Table 1 and Table 2)

2.3.4

speed category (also referred to as speed symbol)

a symbol indicating the speed at which a tyre can carry the load corresponding to its load index or indices (see Table 1 and Table 2)

2.3.5

free rolling tyre (FRT)

a commercial vehicle tyre restricted to the equipment of non-driven axles, excluding motor vehicle front steering axles

2.3.6

special-use tyre

a tyre for mixed use, both on and off the road and/or at restricted speed

2.4 Definitions related to main components**2.4.1**

bead

the part of a pneumatic tyre which is of such shape and structure as to fit the rim and hold the tyre on it

2.4.2

bead heel

that part of the bead which fills the angle formed by the junction of the rim flange and the bead seat

2.4.3

bead toe

innermost part of the bead opposite the heel

2.4.4

belt (radial ply tyre)

layer(s) of material(s) underneath the tread, laid substantially in the direction of the tread centreline, that restricts the carcass in a circumferential direction

2.4.5

breaker (diagonal ply tyre)

intermediate ply between carcass and tread (see also “protective breaker” in 2.4.13)

2.4.6

buffing

preparation of the original tyre surface prior to the application of unvulcanized material

2.4.7

carcass (casing)

rubber bonded cord structure of a tyre integral with the bead, which contains the inflation pressure

2.4.8

chafer

material in the bead area to protect the carcass against rim-chafing

2.4.9

cord

textile or non-textile strands (threads) used in various components of the tyre carcass, plies, belts, breakers, etc.

2.4.10

crown

area lying between the shoulders of a tyre

2.4.11

inner-lining

layer of rubber, from bead toe to bead toe, on the inside of the carcass. In tubeless tyres it has air-retaining properties

2.4.12

ply

layer of rubber-coated parallel cords

2.4.13

protective breaker (commercial vehicle radial ply tyre)

optional strip of ply material embodied within the pneumatic tyre between the tread and the belt to minimize damage to the belt

2.4.14

sidewall

part of a pneumatic tyre between the tread and the bead

2.4.15

sidewall rubber

rubber layer on the sidewall of the tyre and over the carcass, which may include ornamental or protective ribs and fitting lines

2.4.16

shoulder

transitional area between the sidewall and the tread

2.4.17

tread

part of a pneumatic tyre intended to come in contact with the road

2.4.18

tread rubber

one of the following:

- a) camel-back. Tread compound extruded through a pre-determined die shape to give tread lengths of definite cross-sectional area.

b) strip-wound. Tread compound extruded through a pre-determined die shape to form a ribbon feed which is wound on to a prepared carcass.

c) direct extrusion. Tread compound extruded through a pre-determined die shape directly on to a prepared carcass, which is positioned to form one half of the die profile.

d) pre-cured. Tread compound cured to form pattern and undertread prior to application to a prepared carcass.

2.4.19

tread wear indicators

projections in the tread grooves designed to give a visual indication of the degree of wear of the tread

2.4.20

tubeless tyre

pneumatic tyre designed for use without an inner tube

2.4.21

tyre fitting lines

moulded lines on the outside of the upper bead area to facilitate obtaining concentricity when fitting

2.5 Definitions related to rotating drum tests

2.5.1

rim

the rim on which a tyre is required to be fitted for testing

2.5.2

chunking

breaking away of pieces of rubber from the tread

2.5.3

cord separation

parting of the cords from their rubber coating

2.5.4

ply separation

parting of adjacent plies

2.5.5

tread separation

pulling away of the tread from the carcass

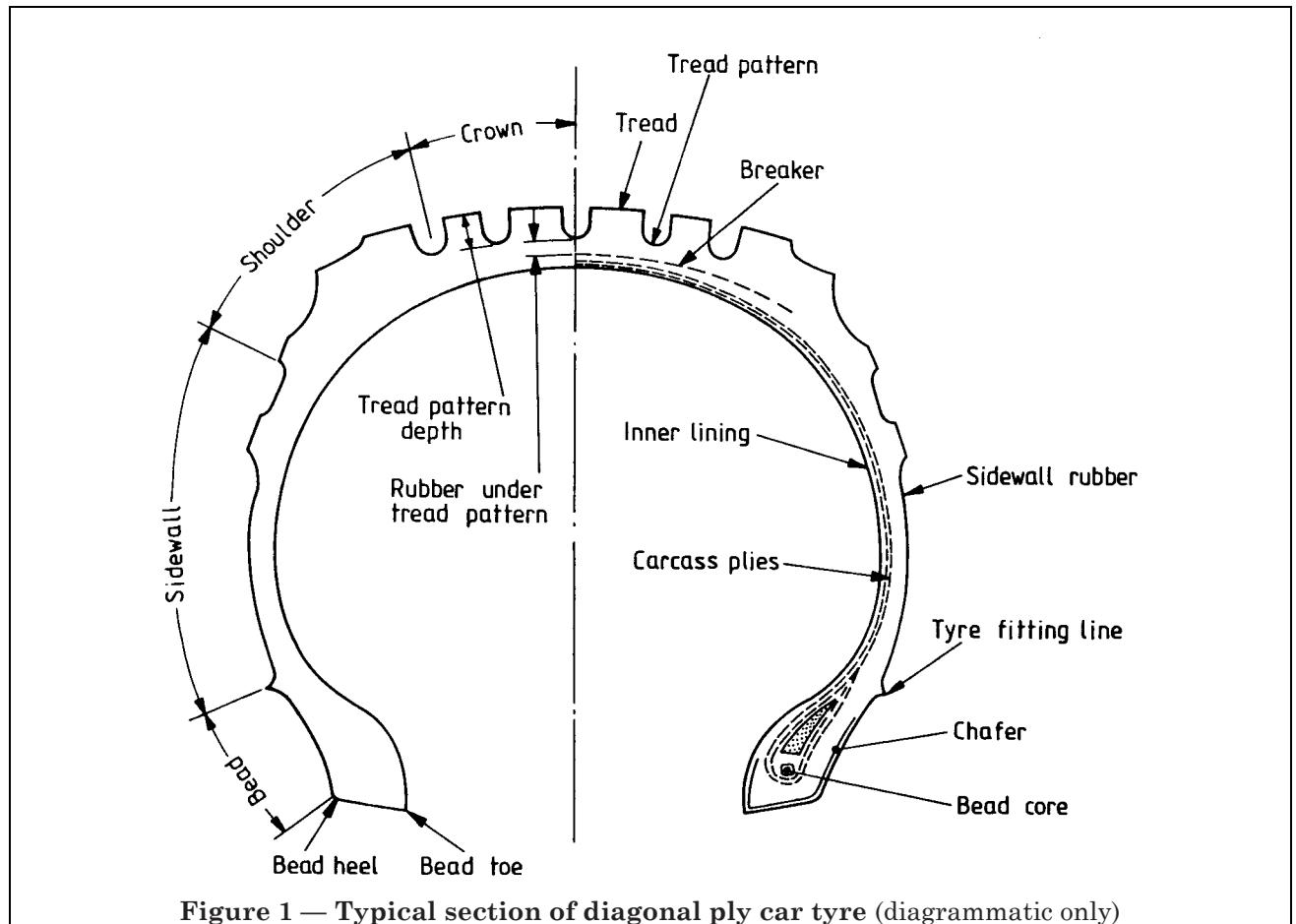


Figure 1 — Typical section of diagonal ply car tyre (diagrammatic only)

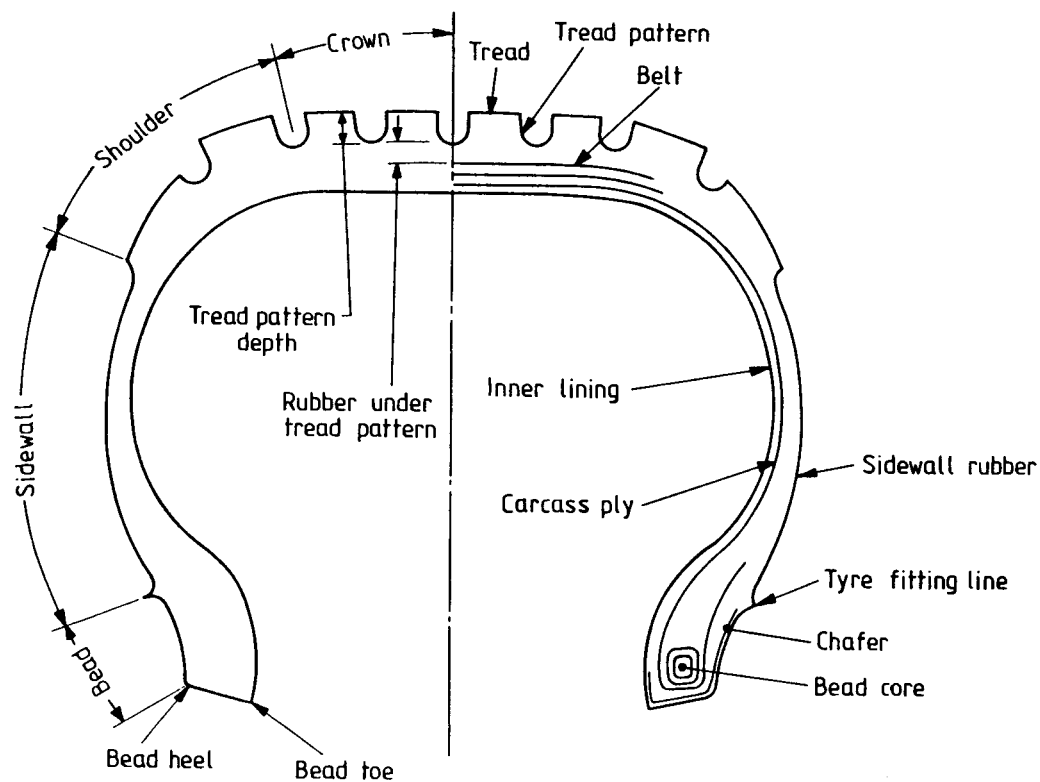


Figure 2 — Typical section of radial ply car tyre (diagrammatic only)