BRITISH STANDARD AEROSPACE SERIES

BS 4M 45-1: 1998
ISO 3324-1: 1997
Incorporating Amendment No. 1 to BS 4M 45-1:1998

Aircraft tyres and rims —

Part 1: Specifications

ICS 49.035; 83.160.20

National foreword

This British Standard reproduces verbatim ISO 3324-1:1997 and implements it as the UK national standard. It supersedes BS 3M 45-1:1994 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ACE/59, Aircraft tyres, wheels and associated equipment, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled "International Standards Correspondence Index", or by using the "Find" facility of the BSI Standards Electronic Catalogue.

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 and ii, the ISO title page, pages ii to iv, pages 1 to 23 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.

Amendments issued since publication

Amd. No.	Date	Comments
10360	March 1999	Indicated by a sideline in the margin

This British Standard, having been prepared under the direction of the Engineering Sector Board, was published under the authority of the Standards Board and comes into effect on
15 April 1998

ISBN 0 580 29797 7

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INTERNATIONAL STANDARD

ISO 3324-1

Fourth edition
1997-12-15

Aircraft tyres and rims —

Part 1: Specifications

Pneumatiques et jantes pour aéronefs —
Part 1: Spécifications

Reference number
ISO 3324-1:1997(E)

Contents

Descriptors: Aircraft, tyres, pneumatic tyres, rims, specifications, dimensions, designation, marking.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 3324-1 was prepared by Technical Committee ISO/TC 31, *Tyres, rims and valves,* Subcommittee SC 8, *Aircraft tyres and rims*.

This fourth edition cancels and replaces the third edition (ISO 3324-1:1993), of which it constitutes a technical revision.

ISO 3324 consists of the following parts, under the general title *Aircraft tyres and rims:*

— *Part 1: Specifications*;

— *Part 2: Test methods for tyres.*

Annex A of this part of ISO 3324 is for information only.

1 Scope

This part of ISO 3324 gives specifications for new and retread aircraft tyres and for aircraft rims.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 3324. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 3324 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 4223-1:1989, *Definitions of some terms used in the tyre industry — Part 1: Pneumatic tyres.*

3 Definitions

For the purposes of this part of ISO 3324, the definitions in ISO 4223-1 and the following definitions apply.

3.1
aspect ratio (AR)

ratio of section height to section width

3.2
balance mark

identifying red dot, located on the sidewall at the light spot of the tyre

3.3
chine

annular protuberance located around the shoulder area of the tyre, designed to deflect water

3.4
ply rating

term used to identify a given tyre with its maximum load when used in a specific type of service. It is an index of relative tyre strength

3.5
skid depth (mould)

depth of the deepest tread grooves in the mould

3.6
venting mark

identification dot, other than red, located at the vents of tyres

3.7
retread tyre

tyre which has been subjected to a retreading operation

4 New tyres

4.1 Tyre size designation

The tyre size designation for new design tyres in accordance with this part of ISO 3324 shall include a three-part size marking as follows:

Overall diameter × Overall section width – Nominal rim diameter

— tyre overall diameter times overall section width, expressed in millimetres (mm) or in inches (in);

— nominal rim diameter, expressed as a code (see Table 1).

For radial-ply tyres, the letter “R” shall be inserted between the overall section width and nominal rim diameter in the tyre size designation replacing the hyphen (“-”).

The size designation may also include one of the following letter prefixes:

B indicates tyres for 15° bead seat rims with 60 % to 70 % rim width to tyre section width ratio;

H indicates tyres for 5° bead seat rims with 60 % to 70 % rim width to tyre section width ratio.

4.2 Tyre markings

The marking of new tyres shall include the following:

a) tyre size designation;

b) ply rating (optional);

c) maximum speed rating expressed in knots (kn) or miles per hour (mile/h);

NOTE 1 Mile/h is also sometimes written mph.

d) skid depth (mould) expressed in millimetres or inches;

e) original serial number and date manufacture: the date of manufacture shall be expressed numerically and may use a system of marking based on the Gregorian calendar (for example 12 March 1989 becomes 9071, the 9 representing 1989 and 071 representing 12 March which is the 71st day of the year) or specify month and year of manufacture with a dash ("-") separating them (for example March 1989 becomes 03-89);

NOTE 2 The numerical date of manufacture may from the first four digits of the manufacturer's unique serial number.

f) the word "tubeless" if applicable;

g) manufacturer's (brand) name, and country of manufacture;

h) balance mark;

i) venting mark if applicable;

j) rated load (kg or lb);

k) part number.

4.3 Bias tyre dimensions and growth allowances

4.3.1 *Tyre dimensions*

New inflated the dimensional tolerances shall be calculated using the factors shown in Figure 3 or Figure 4. When used, the size designation as defined in **4.1** determines the maximum overall diameter and maximum section width of the new inflated tyre. Therefore tolerances shall be specified as a minus from the permitted maximum dimensions.

Tyre dimensions shall be measured after the new tyre has been mounted on the specified rim, inflated to its rated inflation pressure, and allowed to stand for a minimum of 12 h at normal room temperature and the inflation pressure readjusted to the original value. The maximum section width includes elevations due to labelling (marking, decorations, and all protective bands or ribs except chines).

4.3.2 *Determination of growth allowances*

4.3.2.1 *General*

Growth allowances provide for the increase in tyre dimensions over the maximum new inflated tyre dimensions to allow for growth or stretch of the tyre during service.

4.3.2.2 *Dimensions and symbols*

The following dimensions and symbols are used:

	Inflated new tyre	Inflated growth tyre
Maximum section width[a]	W	W_G
Maximum shoulder width[b]	W_S	W_{SG}
Maximum overall diameter	D_o	D_G
Maximum shoulder diameter	D_S	D_{SG}
Maximum section height	H	—
Maximum shoulder height	H_S	—
Aspect ratio	AR	
Ply rating	PR	
Specified rim diameter	D	
Nominal rim diameter code	D_r	
Section height growth factor	G_H	
Section width growth factor	G_W	
Minimum lateral distance required from wheel centreline to adjacent structure	W_X	
Minimum radial distance required from axle centreline to adjacent structure	R_X	
Minimum lateral clearance[c]	C_W	
Minimum radial clearance[c]	C_R	
Minimum shoulder clearance[c]	S_X	

[a] Maximum section width includes protective side ribs, lettering bars and decorations, but does not include chines (water deflectors) present on certain types of nose wheel (or auxiliary gear) tyres.

[b] Maximum shoulder width does not include chines (water deflectors) present on certain types of nose wheel (or auxiliary gear) tyres.

[c] These are minimum clearance allowances between the maximum grown tyre and the adjacent structure.

4.3.2.3 *Calculations*

4.3.2.3.1 Determine grown dimensions as follows, using the appropriate growth factor given in **4.3.2.3.2**:

$W_G = G_w W$

$W_{SG} = G_W W_S$

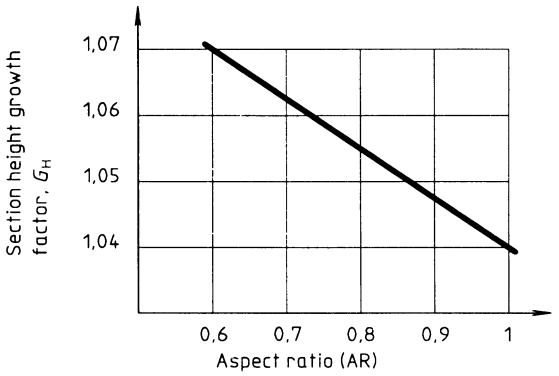
$D_G = D_r + 2G_H H$

$D_{SG} = D_r + 2G_H H_S$

$$H = \frac{D_o - D_r}{2}$$

$$H_s = \frac{D_s - D_r}{2}$$

4.3.2.3.2 Growth factors are expressed in Figure 1.



Section width growth factor, $G_W = 1,04$
Section height growth factor, $G_H = 1,115 - (0,075 \times AR)$

Figure 1 — Growth factors

4.3.2.3.3 Obtain the new tyre dimensions D_o, D_S, W and W_S, as shown in the tyre tables; such dimensions should be considered maxima.

4.3.2.3.4 Nominal rim diameters are shown in Table 1.

Table 1 — Nominal rim diameter code

Code	Nominal rim diameter, D_r	
	inch	mm
4	4	102
5	5	127
6	6	152
7	7	178
8	8	203
9	9	229
10	10	254
11	11	279
12	12	305
13	13	330
14	14	356
15	15	381
16	16	406
17	17	432
18	18	457
19	19	483
20	20	508
21	21	533
22	22	559
23	23	584
24	24	610

4.3.2.3.5 The maximum shoulder width, W_S, and the maximum shoulder height, H_S, are determined by the formulae:

$W_S = 0{,}9\ W$

$H_S = 0{,}9\ H$

4.4 Radial tyre dimensions and dimensional tolerances

The dimensions to be specified for radial tyres are the growth tyre dimensions. They include:

a) the maximum overall diameter, D_G;

b) the maximum section width, W_G;

c) the maximum shoulder diameter, D_{SG};

d) the maximum shoulder width, W_{SG}[1)];

e) the minimum static loaded radius, $SLR_{G,min}$;

f) the maximum static loaded radius, $SLR_{G,max}$.

D_G, W_G, D_{SG}, W_{SG} are the maximum permitted grown inflated tyre dimensions. SLR_G is the loaded radius when the grown tyre is inflated to its rated inflation pressure, and loaded to its rated load against a flat surface.

[1)] For some tyre sizes, the maximum shoulder width should be calculated using the formula:
$W_{SG} = 0{,}88\ W_G$
Consult the tyre manufacturer for application recommendation.

Grown dimensions shall be measured on tyres that have complete a sufficient number of take-off cycles. Tyres shall be allowed to cool to room temperature and to be measured at the rated inflation pressure.

The size designation defined in **4.1** determines the maximum dimensions of an equivalent new inflated bias tyre that would have the same grown dimensions as calculated in **4.3.2**.

4.5 Determination of clearance allowances

4.5.1 *Clearance around individual tyres*

Clearance allowances between the tyre and the adjacent parts of the aircraft shall be provided by the aircraft manufacturer. These allowances are to be based on the maximum overall tyre dimensions plus growth allowances due to service, plus the increase in diameter due to centrifugal force. Minimum distances to adjacent parts of the aircraft are determined as specified in **4.5.1.1** to **4.5.1.3**.

4.5.1.1 Determine the maximum grown tyre envelope as specified in **4.3.2**. for bias tyres and **4.4** for radial tyres. (This is the dotted line labelled “grown (used) inflated tyre” in Figure 2.)

4.5.1.2 Obtain the radial (C_R) and lateral (C_W) clearances from the formulae in a) or b) as appropriate.

For speeds which do not fall into the stated categories, clearance dimensions are to be interpolated.

a) For dimensions in millimetres:

C_R = 0,084 W_G + 10 for 230 kn (265 mile/h)
= 0,07 W_G + 10 for 213 kn (245 mile/h)
= 0,063 W_G + 10 for 204 kn (235 mile/h)
= 0,06 W_G + 10 for 195 kn (225 mile/h)
= 0,047 W_G + 10 for 182 kn (210 mile/h)
= 0,037 W_G + 10 for 165 kn (190 mile/h)
= 0,029 W_G + 10 for 139 kn (160 mile/h)
= 0,023 W_G + 10 for 104 kn (120 mile/h)

C_W = 0,019 W_G + 6

b) For dimensions in inches:

C_R = 0,084 W_G + 0,4 for 230 kn (265 mile/h)
= 0,07 W_G + 0,4 for 213 kn (245 mile/h)
= 0,063 W_G + 0,4 for 204 kn (235 mile/h)
= 0,06 W_G + 0,4 for 195 kn (225 mile/h)
= 0,047 W_G + 0,4 for 182 kn (210 mile/h)
= 0,037 W_G + 0,4 for 165 kn (190 mile/h)
= 0,029 W_G + 0,4 for 139 kn (160 mile/h)
= 0,023 W_G + 0,4 for 104 kn (120 mile/h)

C_W = 0,019 W_G + 0,23

4.5.1.3 Determine the distance to adjacent parts as follows:

a) The radial distance from the axle centreline to the adjacent part, $R_{X,min}$, is given by

$$R_{X,min} = \frac{D_G}{2} + C_R$$

b) The lateral distance from the wheel centreline to the adjacent part, $W_{X,min}$, is given by

$$W_{X,min} = \frac{W_G}{2} + C_W$$

c) The radius or clearance allowed between tyre shoulder area and adjacent part, $S_{X,min}$, is given by

$$S_{X,min} = \frac{C_W + C_R}{2}$$

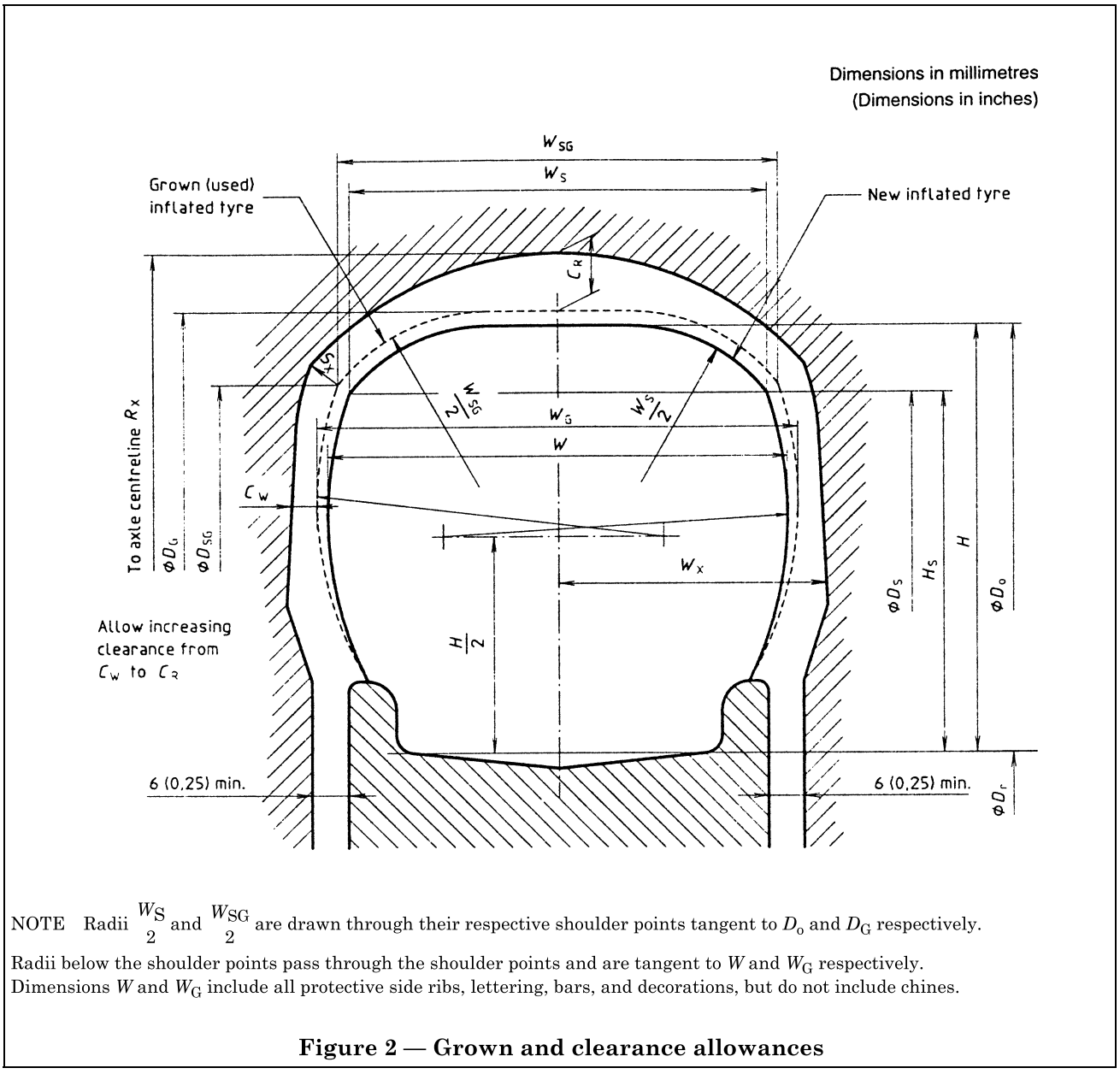
NOTE The radial clearance, $S_{X,min}$, includes allowances for increase in tyre diameter due to centrifugal force at speeds up to 230 kn (265 mile/h).

4.5.2 *Spacing between twin tyres*

The minimum distance between the tyre tread centrelines shall be $1{,}18 \times W_G$, where W_G is the maximum grown width of the tyre.

4.5.3 *Spacing between tyre in tandem*

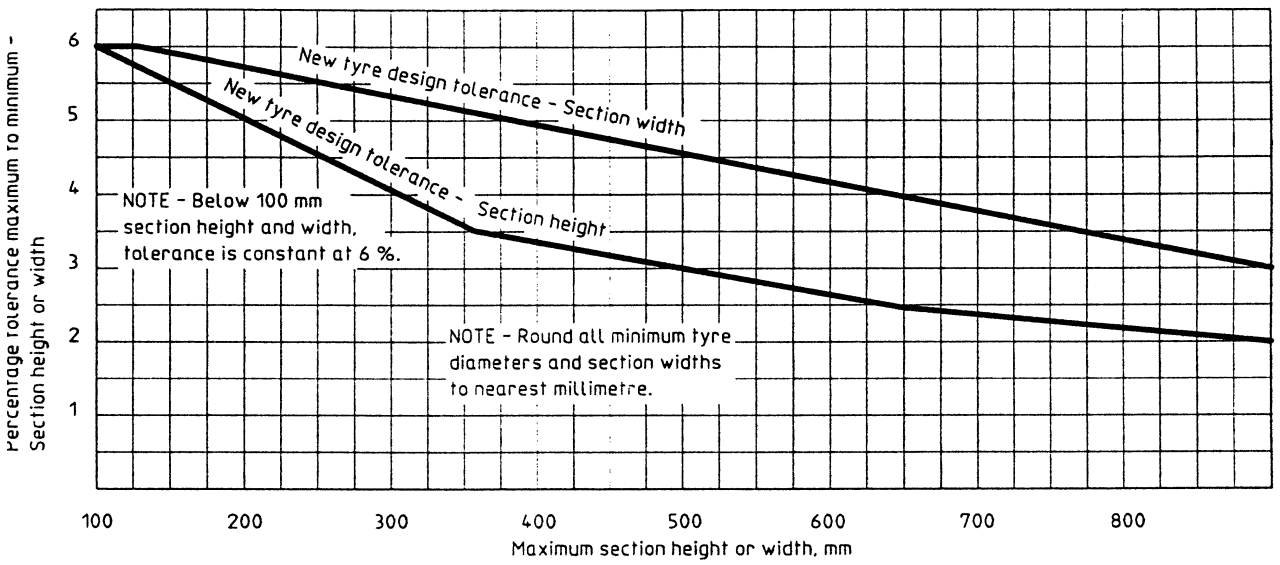
The minimum distance between axle centres shall be $D_G + 2C_R$, where D_G is the maximum grow tyre diameter and C_R is the tyre radial clearance allowance for the maximum aircraft ground speed.



NOTE Radii $\frac{W_S}{2}$ and $\frac{W_{SG}}{2}$ are drawn through their respective shoulder points tangent to D_o and D_G respectively.

Radii below the shoulder points pass through the shoulder points and are tangent to W and W_G respectively.
Dimensions W and W_G include all protective side ribs, lettering, bars, and decorations, but do not include chines.

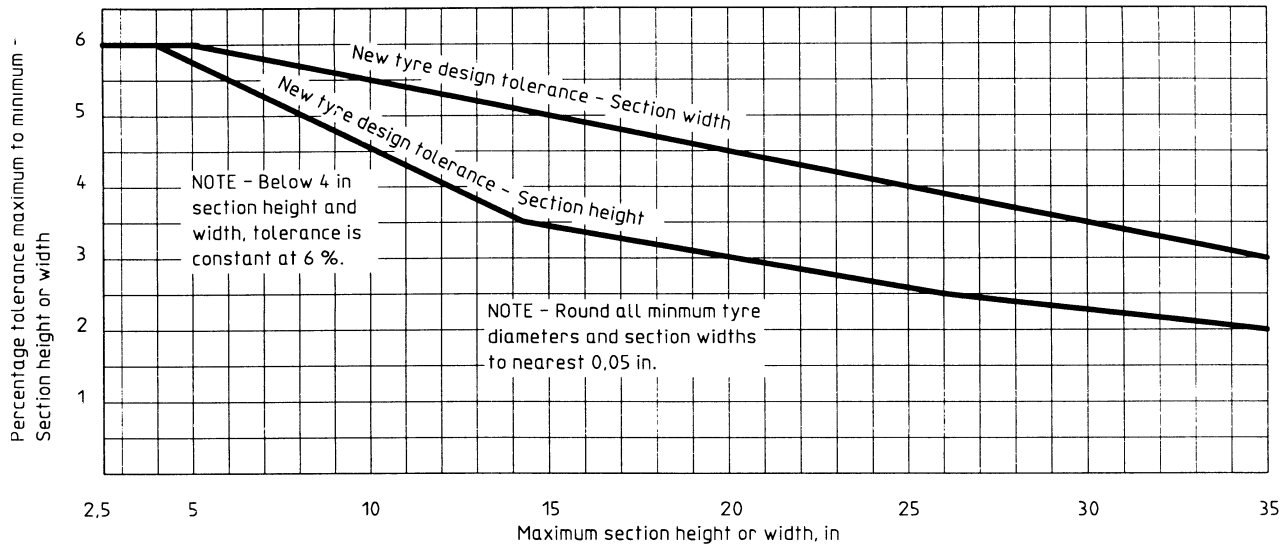
Figure 2 — Grown and clearance allowances



Percent of tolerance

Maximum section width, W mm	**Formula** %
$0 < W \leqslant 127$	6
$127 < W \leqslant 890$	$6{,}5 - 0{,}004\ W$
Maximum section height, H mm	
$0 < H \leqslant 100$	6
$100 < H \leqslant 355$	$7 - 0{,}01H$
$355 < H \leqslant 635$	$(1\ 335 - H)/280$
$635 < H \leqslant 890$	$3{,}75 - 0{,}002H$

Figure 3 — Dimensional tolerances for new aircraft tyre section height and width: millimetres



Percent of tolerance

Maximum section width, W in	**Formula** %
$0 \leqslant W \leqslant 5$	6
$5 < W \leqslant 35$	$6{,}5 - 0{,}1W$
Maximum section height, H in	
$0 < H \leqslant 4$	6
$4 < H \leqslant 14$	$7 - 0{,}25H$
$14 < H \leqslant 25$	$(52{,}5 - H)/11$
$25 < H \leqslant 35$	$3{,}75 - 0{,}05H$

Figure 4 — Dimensional tolerances for new aircraft tyre section height and width: inches

5 Retread tyres

5.1 Tyre size designation

Designation is the same as the new tyre size designation, as detailed in **4.1**.

5.2 Tyre markings

The tyre markings may be original carcass markings and/or retread markings.

The marking of retread tyres shall include the following:

a) original tyre size designation;

b) ply rating, if marked on original tyre;

c) maximum speed rating expressed in knots or mile/h (miles per hour);

d) original serial number;

e) original carcass date of manufacture unless part of original serial number;

f) the word “tubeless” if applicable;

g) original manufacturer’s (brand) name, and country of manufacture;

h) retreader’s name;

i) retreader’s factory location;

j) date of retread: this shall be expressed numerically and may use a system based on the Gregorian calendar (for example 12 March 1989 becomes 9071, the 9 representing 1989 and 071 representing 12 March which is the 71st day of the year) or specify month and year of retreading with a dash ("-") separating them (for example March 1989 becomes 03-89);

k) retread level: letter R located separately from the tyre size designation followed by the total number of times the tyre has been retreated (for example, R-3);

l) balance mark — applied to retread tyres;

m) skid depth (retread mould) expressed in millimetres or inches;

n) venting mark, if applicable;

o) rated load (kg) or (lib);

p) retreader's designated part number which will identify the standard of the retread.

5.3 Retread tyre dimensions

Retread tyre dimensional tolerances shall be in accordance with the new tyre grown dimensional tolerances as detailed in **4.3** and **4.4**.

6 Rims

6.1 Fundamental rim standards

6.1.1 *Symbols*

The following symbols for dimensions are used:

A	width between flanges
B_{min}	minimum flange width
G_{min}	minimum ledge width
F_H	flange height
F_D	flange diameter
I_{min}	minimum well depth
F_R	flange radius
J_R	heel radius (redesigned or recently designed rims may follow rim heel compound radius clearance envelope in Figure 6)
r_R	flange edge radius
D	specified rim diameter at distance x from flange (see Figure 9)
D_i	sharp diameter (diameter at intersection of flange vertical and bead seat taper) common to both conventional and compound bead seats
Y_R	primary (blend) radius of compound heel contour (see Figure 6) tangent to bead taper at distance T from vertical flange
P_R	secondary radius of compound heel contour (see Figure 6) tangent to both flange vertical and Y_R
T	horizontal distance from flange vertical to tangent of bead seat taper and Y_R
V_{min}	valve hole location for tube-type tyre (see Figure 10).

6.1.2 *Rim dimensions*

Figure 5 shows the contour of the bead seat area, where the heel radius, J_R, has the values given in Table 2 and Table 3. Figure 6, in conjunction with Table 2 and Table 3, gives the design envelope for compound heel radii of the existing series.

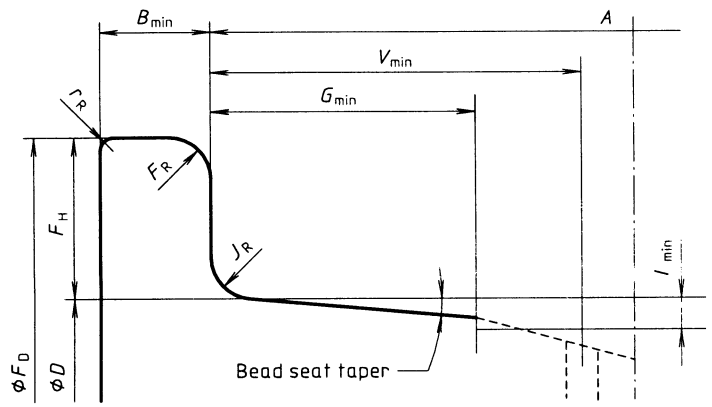
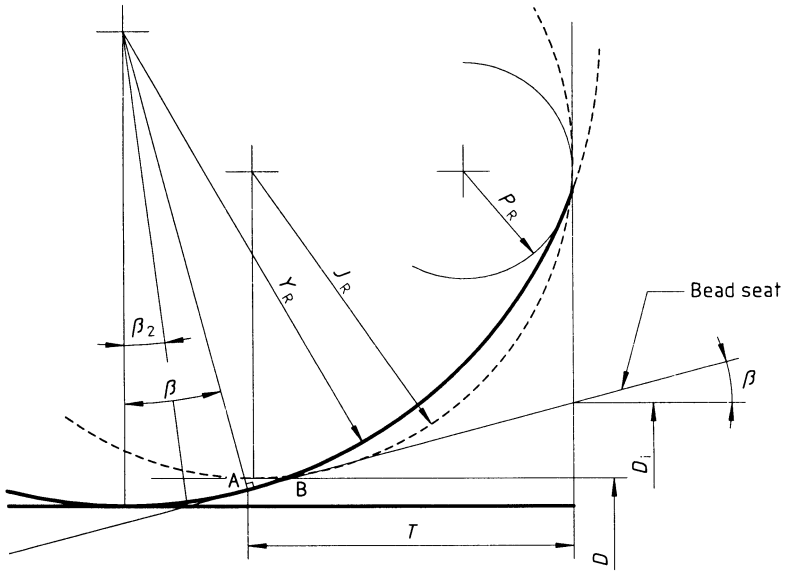


Figure 5 — Contour of bead seat area



Point A Tangent of Y_R to Bead Seat
Point B Intersection of D diameter with bead seat ledge
NOTE Y_R, P_R, T and D_i are design dimensions. For maximum values use maximum J_R and D dimensions.

Figure 6 — Design envelope for compound heel radii

Table 2 — Compound heel radii dimensions in millimetres

Dimensions in millimetres

J_R	T	P_R[a]	Y_R[b]	D_i
1,98	3,05	1,57	3,96	D + 0,33
2,39	3,66	1,57	4,78	D + 0,40
2,77	4,24	1,57	5,54	D + 0,46
3,18	4,88	1,57	6,35	D + 0,53
3,96	6,07	1,57	7,92	D + 0,66
4,37	6,71	1,57	8,74	D + 0,73
4,75	7,29	1,57	9,50	D + 0,79
4,78	7,32	1,60	9,55	D + 0,80
5,16	7,90	1,73	10,31	D + 0,86
5,56	8,53	1,85	11,13	D + 0,93
5,59	8,56	1,85	11,18	D + 0,94
6,35	9,75	2,11	12,70	D + 1,06
7,14	10,95	2,39	14,27	D + 1,19
7,85	12,04	2,62	15,70	D + 1,31
7,92	12,17	2,64	15,85	D + 1,33
8,59	13,16	2,87	17,17	D + 1,44
8,74	13,41	2,92	17,48	D + 1,46
8,89	13,64	2,97	17,78	D + 1,49
9,30	14,25	3,10	18,59	D + 1,56
9,53	14,61	3,18	19,05	D + 1,59
10,01	15,34	3,33	20,02	D + 1,67
10,16	15,60	3,38	20,32	D + 1,70
10,72	16,43	3,58	21,44	D + 1,79
11,13	17,07	3,71	22,25	D + 1,86
11,43	17,53	3,81	22,86	D + 1,91
12,70	19,48	4,24	25,40	D + 2,12
13,97	21,44	4,65	27,94	D + 2,34
16,51	25,32	5,51	33,02	D + 2,76

[a] $P_R = \frac{J_R}{3}$, P_R min. = 1,57 mm

[b] $Y_R = 2J_R$

Table 3 — Compound heel radii dimensions in inches

Dimensions in millimetres

J_R	T	P_R[a]	Y_R[b]	D_i
0,078	0,120	0,062	0,156	D + 0,013
0,094	0,144	0,062	0,188	D + 0,016
0,109	0,167	0,062	0,218	D + 0,018
0,125	0,192	0,062	0,250	D + 0,021
0,156	0,239	0,062	0,312	D + 0,026
0,172	0,264	0,062	0,344	D + 0,029
0,187	0,287	0,062	0,374	D + 0,031
0,188	0,288	0,063	0,376	D + 0,031
0,203	0,311	0,068	0,406	D + 0,034
0,219	0,336	0,073	0,438	D + 0,037
0,220	0,337	0,073	0,440	D + 0,037
0,250	0,384	0,083	0,500	D + 0,042
0,281	0,431	0,094	0,562	D + 0,047
0,309	0,474	0,103	0,618	D + 0,052
0,312	0,479	0,104	0,624	D + 0,052
0,338	0,518	0,113	0,676	D + 0,057
0,344	0,528	0,115	0,688	D + 0,058
0,350	0,537	0,117	0,700	D + 0,059
0,366	0,561	0,122	0,732	D + 0,061
0,375	0,575	0,125	0,750	D + 0,063
0,394	0,604	0,131	0,788	D + 0,066
0,400	0,614	0,133	0,800	D + 0,067
0,422	0,647	0,141	0,844	D + 0,071
0,438	0,672	0,146	0,876	D + 0,073
0,450	0,690	0,150	0,900	D + 0,075
0,500	0,767	0,167	1,000	D + 0,084
0,550	0,844	0,183	1,100	D + 0,092
0,650	0,997	0,217	1,300	D + 0,109

[a] $P_R = \frac{J_R}{3}$, P_R min. = 0,062 in

[b] $Y_R = 2J_R$

6.1.2.1 *Rim dimensions in millimetres*

For rim dimensions in millimetres, multiply the final values determined from Table 4 by 25,4 and round to one less decimal place than the original rounded inch values.

6.1.2.2 *Rim dimensions in inches*

Rim dimensions of the inch series shall be as given in Table 4.

Table 4 — Rim dimensions in inches

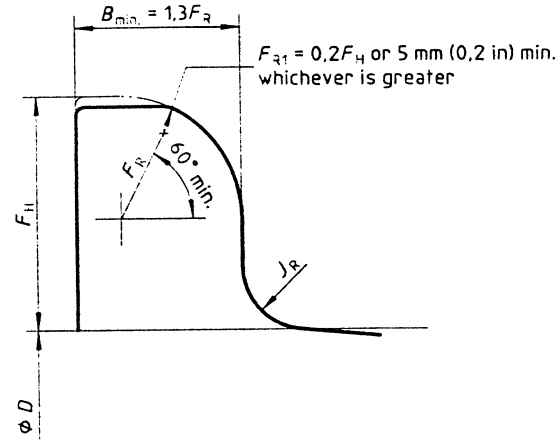
Wheel details	Ratio of rim width to maximum tyre — section width		
	60 % to 70 %		70 % and over
Size designation prefix	"B" prefix	"H" prefix	No prefix
Bead ledge taper	15°	5°	5°
Nominal rim diameter (D_r) **code**[b]	For 1 inch increments of the code, diameter to end in 5 (examples: 10,5; 12,5).	For 1 inch increments of the code, diameter to end in whole number (examples: 20; 21).	For 1 inch increments of the code, diameter to end in whole number (examples: 15; 16).
Flange height, F_H	0, 75 × calculated flange height (see Figure 11). Round to nearest 0,125 in.	0,85 × calculated flange height (see Figure 11). Round to nearest 0,05 in for flange height < 1 in, and to nearest 0,1 in for flange height ⩾ 1 in.	See Figure 11. Round up to nearest 0,125 in increment.
Flange radius, F_R	0,67 × flange height rounded down to nearest 0,125 in.	0,6 × flange height rounded down to nearest 0,05 in.	0,5 × flange height. Round down to nearest 0,050 in.
Heel radius J_R	0,33 × flange height rounded to nearest 0,05 in.	0,3 × flange height rounded up to nearest 0,05 in.	0,25 × flange height for flanges ⩽ 1,25 in height and 0,225 of flange height for flanges > 1,25 in height. In all cases, round flange height to nearest 0,05 in.
Minimum flange width, B_{min}	1,3 × flange radius rounded to the nearest 0,001 in.	1,3 × flange radius rounded to the nearest 0,001 in.	1,3 × flange radius rounded to the nearest 0,001 in.
Rim width between flanges — Increments, ***(A)***	max. tyre width × 0,65. Round to nearest 0,25 in.		Maximum tyre width × 0,775. Round to nearest 0,25 in.
Flange edge radius, r_R	0,062 in min.		
Minimum well depth, I_{min}	0,268($G_{min} - J_R$) + 0,002 5 D. Round to nearest 0,001 in.	0,087 5($G_{min} - J_R$) + 0,002 5 D. Round to nearest 0,001 in.	

[a] For new designs the preferred ratio of rim width to maximum tyre — section width for "B" and "H" type tyres is 65 % (adjusted to the nearest appropriate rim increment as shown above).

[b] See Table 7 and Table 8 for specified rim diameters and tolerances.

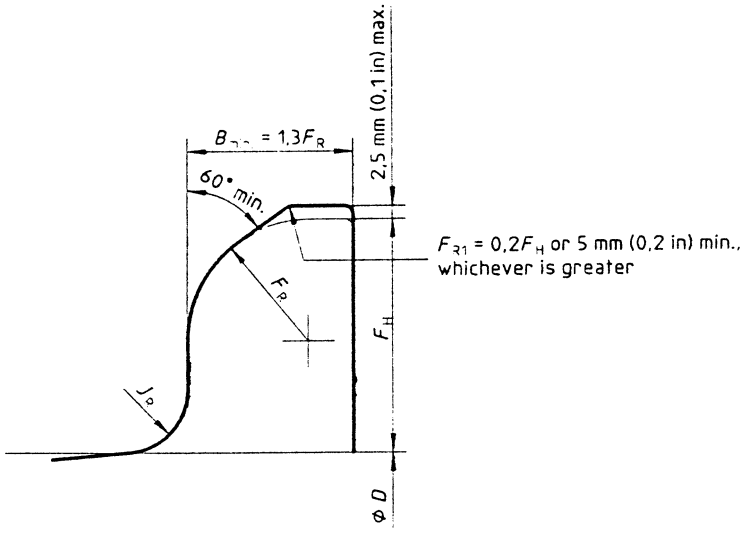
6.1.3 *Alternate asymmetric rim flange contours*

Aircraft applications may require the use of alternate rim flange contours as shown in Figure 7 and Figure 8.



NOTE The term "inboard" refers to the flange closest to the axle attachment point.

Figure 7 — Inboard flange height decrease from specified dimension



NOTE The term "outboard" refers to the flange furthest from the axle attachment point.

Figure 8 — Outboard flange height increase from specified dimension

6.1.4 *Rim flange height*

For inch dimensions see Figure 11.

6.1.5 *Width between rim flanges*

See Table 4.

6.2 Inspection tolerances of rims

Inspection tolerances for the rims given in **6.1.2.1** and **6.1.2.2** shall be as given in **6.2.1** and **6.2.2** respectively.

6.2.1 *Inspection tolerances for dimensions in millimetres*

Inspection tolerances for rim dimensions of the millimetre series shall be as given in Table 5.

Table 5 — Rim inspection tolerances in millimetres

Dimensions in millimetres

Dimension (see **6.1.1**)	Tolerance	
	plus	minus
A	1,6	1,6
B_{min}	(Minimum dimension)	
D[a]	See Table 7	
D_i	0,05[b]	0,05[b]
G_{min}	(Minimum dimension)	
J_R	0,25	0,25
F_R	0,4	0,4
F_D	0,5	0,5
Bead seat taper	30′	30′

[a] D is used as a minimum value for calculations unless otherwise stated.
[b] Add to the rim diameter tolerances given in Table 7.

6.2.2 *Inspection tolerances for dimensions in inch*

Inspection tolerances for rim dimensions of the inch series shall be as given in Table 6

Table 6 — Rim inspection tolerances in inches

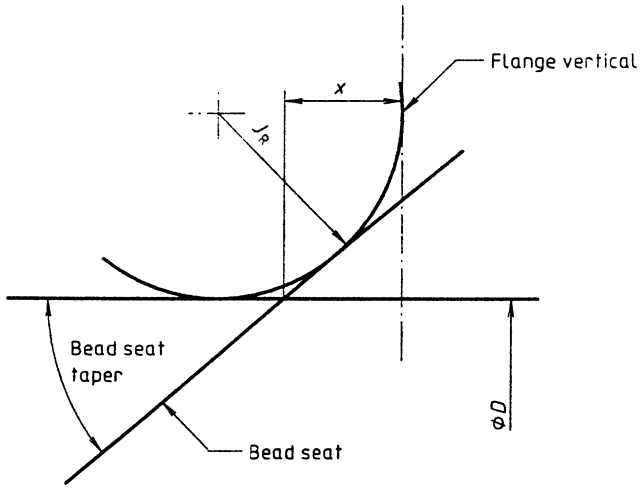
Dimensions en inches

Dimension (see **6.1.1**)	Tolerance	
	plus	minus
A	0,063	0,063
B_{min}	(Minimum dimension)	
D[a]	See Table 8	
D_i	0,002[b]	0,002[b]
G_{min}	(Minimum dimension)	
J_R	0,01	0,01
F_R	0,016	0,016
F_D	0,02	0,02
Bead seat taper	30′	30′

[a] D is used as a minimum value for calculations unless otherwise stated.
[b] Add to the rim diameter tolerances given in Table 8.

6.2.3 *Method of dimensioning and inspection tolerances for rim diameters, dimension D, for rims with single heel radius*

Dimensioning and inspection tolerances for rim diameters dimension, D, for rims with a single heel radius shall be in accordance with Figure 9, and either Table 7, for specified rim diameters in millimetres, or Table 8, for specified rim diameters in inches.



For 5° rim, x = 0,956J_R
For 15° rim, x = 0,868J_R

Figure 9 — Dimensioning of *D* specified rim diameter

Table 7 — Specified rim diameters in millimetres

Dimensions in millimetres

Nominal rim diameter (D_r) code	Specified rim diameter		
	D	Tolerances on *D*	
		plus	minus
4	101,60	0,33	0,00
5	127,00	0,41	
6	152,40	051	
7	177,80	0,51	0,00
8	203,20	0,51	
9	228,60	0,51	
10	254,00	0,53	
11	279,40	0,53	0,00
12	304,80	0,53	
13	330,20	0,53	
14	355,60	0,53	
15	381,00	0,56	0,00
16	406,40	0,56	
17	431,80	0,56	
18	457,20	0,56	
19	482,60	0,56	0,00
20	508,00	0,61	
21	533,40	0,64	
22	558,80	0,66	
23	584,20	0,69	0,00
24	609,60	0,69	
25 and over	635,00 and over	0,71	

6.3 Valve, fuse plug and over pressure hole locations for connections to valve or plug hole location, V_{min}

6.3.1 *For tubeless tyres*

a) If valve, fuse plug, or over pressure plug hole infringes into the minimum ledge width, G_{min}, the hole shall be recessed.

b) Recessed area shall be 7,5 mm (0,3 in) minimum width by 2,5 mm (0,1 in) minimum depth at G_{min}.

c) Recessed area shall extend 12,5 mm (0,5 in) minimum past G_{min} or exit into well area.

d) Recessed area may only extend into G_{min} dimension, 15 % of G_{min} or 12,5 mm (0,5 in) whichever is less.

Table 8 — Specified rim diameters in inches

Dimensions in inches

Nominal rim diameter (D_r) code	Specified rim diameter		
	D	Tolerances on D	
		plus	minus
4	4,000	0,013	0,000
5	5,000	0,016	
6	6,000	0,020	
7	7,000	0,020	0,000
8	8,000	0,020	
9	9,000	0,020	
10	10,000	0,021	
11	11,000	0,021	0,000
12	12,000	0,021	
13	13,000	0,021	
14	14,000	0,021	
15	15,000	0,022	0,000
16	16,000	0,022	
17	17,000	0,022	
18	18,000	0,022	
19	19,000	0,022	0,000
20	20,000	0,024	
21	21,000	0,025	
22	22,000	0,026	
23	23,000	0,027	0,000
24	24,000	0,027	
25 and over	25,000 and over	0,028	

6.3.2 *For tube-type tyres*

$V_{min} = 1{,}2G_{min} + 0{,}1G_{min}$ where $0{,}1G_{min}$ shall not be less than 5 mm (0,2 in) (see Figure 10).

6.4 Rim flange height

For metric dimensions see Table 4; for inch dimensions see Figure 11.

6.5 Width between rim flanges

See Table 4.

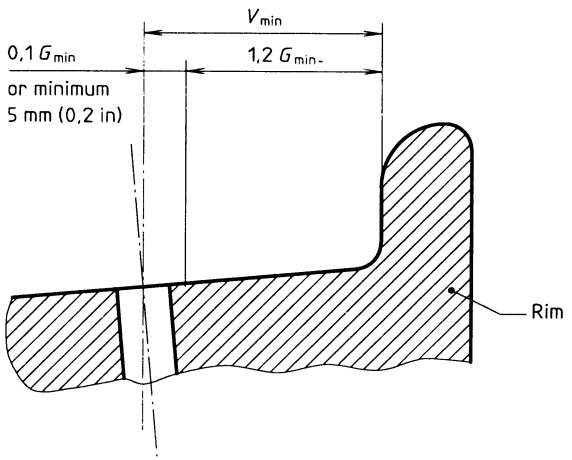
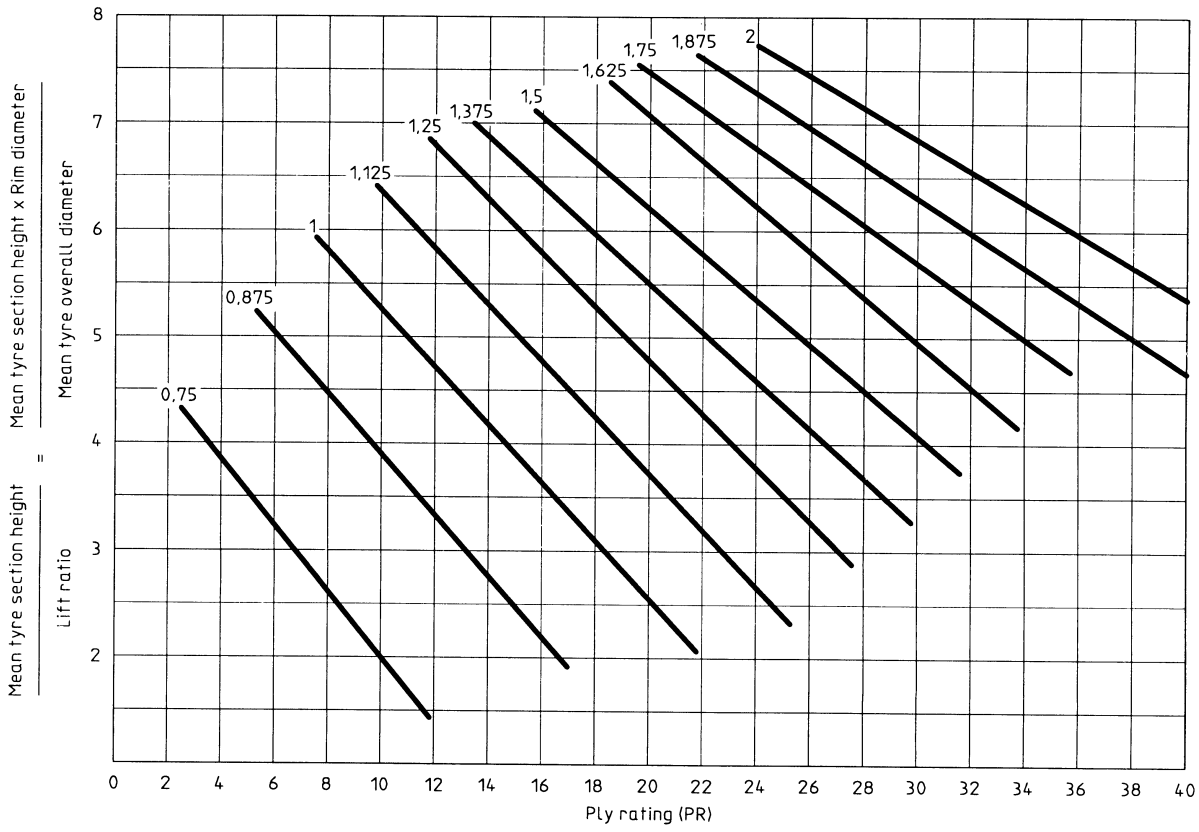


Figure 10 — Valve hole location for tube-type tyre



NOTE 1 Base flange height on the required PR plus 4 — to allow for increased aircraft weight.
NOTE 2 When calculated value falls above a given curve, apply value applicable to the next higher curve.

Figure 11 — Rim flange height in inches

Annex A (informative)
Aircraft tyre size designations

A list of tyre size designations are given for information in Table A.1. These sizes are standardized by the following national standards bodies:

TRA — The Tire and Rim Association, Inc.

ETRTO — The European Tyre and Rim Technical Organization.

NOTE 1 If the size is listed under more than one standard, there may be minor variations in the data.
NOTE 2 This list is not restrictive. New sizes will be added as they are standardized.

Table A.1

Tyre size	TRA	ETRTO	Possible further standards bodies
5.00 - 4	×		
5.00 - 5	×	×	
6.00 - 6	×	×	
6.50 - 8	×	×	
6.50 - 10	×	×	
7.00 - 6	×	×	
7.00 - 8	×		
7.25 - 6		×	
7.50 - 10		×	
7.50 - 14	×	×	
8.00 - 4	×		
8.00 - 6	×		
8.00 - 7		×	
8.50 - 6	×	×	
8.50 - 10	×	×	
8.90 - 12.50	×		
9.00 - 6	×	×	
9.00 - 10		×	
9.25 - 12		×	
9.50 - 16	×	×	
10.50 - 16		×	
11.00 - 12	×	×	
12.50 - 16	×	×	
15.00 - 12	×		
15.00 - 16	×	×	
15.50 - 20	×	×	
17.00 - 16	×		
17.00 - 20	×		
20.00 - 20		×	
16 × 4.4 (– 8)	×	×	
18 × 4.4 (– 10)	×	×	
20 × 4.4 (– 12)		×	
18 × 5.5 (– 8)	×	×	
22 × 5.5 (– 12)		×	
24 × 5.5 (– 14)		×	
18 × 5.7 (– 8)		×	
24 × 6.6 (– 12)		×	
26 × 6.6 (– 14)	×	×	

Table A.1

Tyre size	TRA	ETRTO	Possible further standards bodies
25 × 6.75 (– 14)		×	
24 × 7.7 (– 10)	×	×	
29 × 7.7 (– 15)	×	×	
30 × 7.7 (– 16)		×	
24.5 × 8.5 (– 10)		×	
30 × 8.8 (– 15)		×	
32 × 8.8 (– 16)	×	×	
34 × 11 (– 14)	×	×	
36 × 11 (– 16)	×	×	
40 × 12 (– 18)	×	×	
39 × 13 (– 16)	×	×	
40 × 14 (– 16)	×	×	
42 × 15 (– 16)	×	×	
44 × 16 (– 18)	×	×	
46 × 16 (– 20)	×	×	
49 × 17 (– 20)	×	×	
18 × 4.25 - 10	×	×	
20 × 5.25 - 11		×	
14.5 × 5.5 - 6	×	×	
17.5 × 5.75 - 8	×	×	
18 × 5.75 - 8	×		
22 × 5.75 - 12	×	×	
15 × 6.0 - 6	×		
17.5 × 6.25 - 6	×	×	
22 × 6.5 - 10	×		
18 × 6.5 - 8		×	
19.5 × 6.75 - 8	×	×	
H19.5 × 6.75 - 10	×		
22 × 6.75 - 10	×	×	
25.75 × 6.75 - 14	×		
26 × 6.75 - 14	×		
23 × 7.0 - 12	×	×	
21 × 7.25 - 10	×		
24 × 7.25 - 10		×	
24 × 7.25 - 12	×		
22 × 7.75 - 10	×		
25 × 7.75 - 10	×		
26 × 7.75 - 13		×	
27 × 7.75 - 15	×		
22 × 8.0 - 8	×		
22 × 8.0 - 10	×		
24 × 8.00 - 13		×	
25.5 × 8.0 - 14		×	

Table A.1

Tyre size	TRA	ETRTO	Possible further standards bodies
26 × 8.0 - 14		×	
H26.5 × 8.0 - 14	×		
29 × 8.00 - 15		×	
22 × 8.5 - 11		×	
C24.5 × 8.5 - 12	×		
H27 × 8.5 - 14	×		
25.5 × 8.75 - 10		×	
26 × 8.75 - 11		×	
28 × 9.0 - 12		×	
29 × 9.0 - 15	×		
30 × 9.0 - 15		×	
35 × 9.00 - 17		×	
34 × 9.25 - 16	×		
H34 × 9.25 - 18	×		
B24 × 9.5 - 10.5	×		
31 × 9.75 - 14		×	
H31 × 9.75 - 13	×		
35 × 10 - 17		×	
36 × 10 - 18		×	
31 × 10.75 -14		×	
32 × 10.75 - 14		×	
33.5 × 10.75 - 15		×	
34 × 10.75 - 16		×	
29 × 11.0 - 10	×		
30 × 11.5 - 14.5		×	
31 × 11.50 - 16		×	
32 × 11.5 - 15	×	×	
34 × 11.75 - 14		×	
37 × 11.75 - 16		×	
34.5 × 12 - 14		×	
H31 × 13.0 - 12	×	×	
36 × 13.00 - 12		×	
37 × 13.0 - 16	×	×	
37 × 14.0 - 14	×	×	
H37 × 14.0 - 15	×	×	
C40 × 14.0 - 21	×		
H40 × 14.0 - 19		×	
H40 × 14.5 - 19	×	×	
41 × 15.0 - 18	×	×	
40 × 15.5 - 16	×	×	
40.5 × 15.5 - 16	×	×	
47 × 15.75 - 22.1		×	
H42 × 16.0 - 19	×	×	

Table A.1

Tyre size	TRA	ETRTO	Possible further standards bodies
44.5 × 16.5 - 18	×	×	
H44.5 × 16.5 - 20	×	×	
H45 × 17.0 - 20	×	×	
C40 × 18.0 - 17	×		
H46 × 18.0 - 20	×	×	
50 × 18 (– 20)		×	
49 × 19.0 - 20	×	×	
H49 × 19.0 - 22	×		
50 × 20.0 - 20	×	×	
56 × 20.0 - 20	×	×	
52 × 20.5 - 20	×		
52 × 20.5 - 23	×	×	
50 × 21.0 - 20	×	×	
54 × 21.0 - 23	×		
H54 × 21.0 - 24	×		
175 × 254 × 545		×	
360 × 135 - 6		×	
380 × 150 - 4		×	
380 × 150 - 5		×	
420 × 150 (– 6 1/2)		×	
450 × 190 - 5		×	
550 × 250 - 6		×	
605 × 155 - 13		×	
615 × 225 - 10		×	
640 × 170 - 14		×	
670 × 210 - 12		×	
750 × 230 - 15		×	
960 × 354 - 18		×	
	×		
30 × 8.8 R15			
42 × 17.0 R18	×	×	
1050 × 395 R16	×	×	
1400 × 530 R23		×	

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