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MAP 1753-83
1 November 1985

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METRIC AEROSPACE RECOMMENDED PRACTICES

MAP 1753

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Revised

HOLE SIZES, RECOMMENDED FOR METRIC FASTENERS ON PROPULSION EQUIPMENT

1. PURPOSE:

1.1 Scope: To establish recommended hole sizes for use with protruding head metric threaded fasteners primarily used on propulsion equipment and provide the recommended positional tolerance for use with these holes.

1.2 Application: The data for hole sizes and the positional tolerances provided in this document are suitable for protruding head fasteners based on the dimensional data in MA1518 for sizes 3 thru 20 mm nominal diameter, and with a strength class less than 1250 MPa.

2. APPLICABLE DOCUMENTS: The following publications form a part of this document to the extent specified herein:

MA1518 - Bolt, Screw and Nuts - External Wrenching Metric Threads - Design Parameters for

ANSI B4.2 - Preferred Metric Limits and Fits

3. FASTENER CLEARANCE HOLE:

3.1 Normal Clearance: The recommended clearance holes for use with externally threaded fasteners with a coarse tolerance shank, as defined in MA1518, are shown in Table I.

3.2 Close Clearance: The recommended hole sizes in Table II are for use in conjunction with externally threaded fasteners with a shank tolerance less than f7, see ANSI B4.2, where alignment of assembled parts, wall thickness or other criteria necessitate the use of the close tolerance shank fastener.

3.3 Hole Chamfer or Counterbore: The entering side of the holes should be provided with a chamfer or counterbore to provide sufficient clearance to avoid crushing the underhead fillet radius on the fastener, see Figure 1. Data for the recommended chamfer or counterbore including minimum edge distance (B_{min}) are shown in Table I and II, as applicable. The optional method of providing clearance by use of a counterbore is not recommended for notch sensitive materials or in areas subject to cyclic loading.

MAP 1753

4. POSITIONAL TOLERANCES: The positional tolerances for holes are provided in Table I and II, as applicable. These tolerances are applicable where two or more parts with the same clearance hole diameter are assembled with fasteners, and it is desired to use the same positional tolerance for the parts to be assembled. Where one of the mating parts has an aligning feature, the positional tolerances in the Tables should be divided by two. Typical applications of fixed fasteners are:

Bolts or screws that mate with threaded holes
Studs
Countersunk fasteners

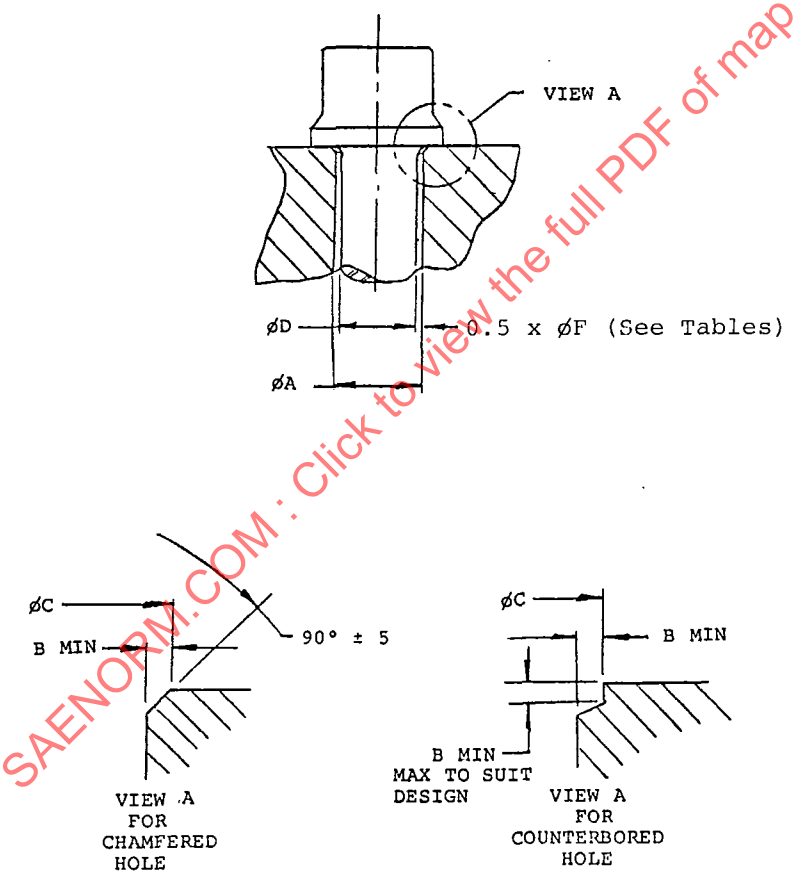

FIGURE 1

MAP 1753

TABLE I

COARSE TOLERANCE SHANK FASTENERS-RECOMMENDED
NORMAL CLEARANCE HOLES AND POSITIONAL TOLERANCES

Dimensions in millimetres

ØD Nominal Thread Size	R_{max}	ØA Tol: H13 See Note 6	ØC Tol: H14 See Note 6	B_{min}	Max. True Positional Tolerance for ØA at MMC ØF
3	0.4	3.30- 3.48	4.00- 4.30	0.3	0.3
4	0.4	4.40- 4.58	5.10- 5.40	0.3	0.4
5	0.5	5.50- 5.68	6.40- 6.76	0.4	0.5
6	0.7	6.60- 6.82	7.90- 8.26	0.5	0.6
7	0.7	7.70- 7.92	9.00- 9.36	0.5	0.7
8	0.7	8.80- 9.02	10.10-10.53	0.5	0.8
10	0.8	10.80-11.07	12.20-12.63	0.6	0.8
12	0.9	12.80-13.07	14.40-14.83	0.7	0.8
14	1.1	14.80-15.07	16.80-17.23	0.9	0.8
16	1.1	16.80-17.07	18.80-19.32	0.9	0.8
18	1.3	18.80-19.13	21.10-21.62	1.1	0.8
20	1.3	20.80-21.13	23.10-23.62	1.1	0.8

1. R_{max} = Max. underhead fillet radius per MA1518.
2. $ØA_{min} = ØD_{nom}$ + Clearance;
   where clearance= 0.1 x $ØD_{nom}$, but not exceeding 0.8.
3. $ØC_{min} = ØA_{min} + 2 \times 0.9 \times R_{max}$; rounded to nearest 0.1.
4. $B_{min} = 0.9 \times R_{max} - 0.1$; rounded to nearest 0.1.
5. $ØF = ØA_{min} - ØD_{nom}$
6. Tolerances selected from ANSI B4.2.