BRITISH STANDARD

BS 916:1953

Incorporating Amendment Nos. 1, 2, 3 and 4

Specification for

Black bolts screws and nuts —

Hexagon & Square, With B.S.W. Threads, and Partly Machined Bolts, Screws & Nuts, Hexagon & Square With B.S.W. or B.S.F. Threads

UDC. 621.882.072

Co-operating organizations

The Mechanical Engineering Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:—

Admiralty*
Air Ministry
Associated Offices' Technical Committee
Association of Consulting Engineers (Incorporated)
British Chemical Plant Manufacturers' Association
British Compressed Air Society
British Electrical and Allied Manufacturers' Association*
British Electricity Authority and Area Board
British Engineers' Association*
British Internal Combustion Engine Manufacturers' Association
British Iron and Steel Federation*
British Railways, The Railway Executive*
Crown Agents for the Colonies*
D.S.I.R. — Mechanical Engineering Research Laboratory
Engineering Equipment Users' Association
Gas Council
High Commission of India*
Institute of Marine Engineers
Institute of Petroleum
Institution of Civil Engineers
Institution of Gas Engineers
Institution of Heating and Ventilating Engineers
Institution of Mechanical Engineers
Institution of Mechanical Engineers (Automobile Division)
Institution of Production Engineers
Locomotive Manufacturers' Association*
Machine Tool Trades' Association
Ministry of Fuel and Power
Ministry of Labour and National Service (Factory Department)
Ministry of Supply*
Ministry of Transport
Ministry of Fuel and Power
Ministry of Works*
Radio Industry Council
War Office

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the Committee entrusted with the preparation of this standard:—

Agricultural Engineers' Association
Black Bolt and Nut Association of Great Britain
British Constructional Steelwork Association
Institution of Engineers and Shipbuilders in Scotland
Institution of Naval Architects
National Coal Board
National Physical Laboratory
North East Coast Institution of Engineers and Shipbuilders
Railway Carriage and Waggon Building Association
Washer Manufacturers' Association
United Society of Boilermakers and Iron and Steel Shipbuilders

This British Standard, having been approved by the Mechanical Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council on 29 September 1953

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Amendments issued since publication

Amd. No.	Date of issue	Comments
1894	May 1954	
4164	May 1961	
4331	October 1961	
5906	August 1966	Indicated by a sideline in the margin

Contents

Amendment No. 4, published 11 August, 1966
to BS 916:1953
Black bolts, screws and nuts

At a fully representative conference held on 23rd November, 1965 consideration was given to the action to be taken in relation to the move to metric as far as British Standards for screw threads were concerned and it was decided that:

British industry should be strongly recommended to adopt the internationally agreed ISO metric threads[1)] or ISO inch threads[2)] but that the ISO inch threads should be regarded as second choice. The implementation of this recommendation means that B.A., B.S.F. and B.S.W. threads should become obsolescent and should not be used in new designs.

ACCORDINGLY IT HAS BEEN AGREED THAT BS 916 BE RENDERED OBSOLESCENT: IT WILL BE MADE OBSOLETE IN DUE COURSE.

NOTE A standard for ISO metric black hexagon bolts, screws and nuts is in course of preparation.

1) BS 3643, "ISO metric screw threads".

2) BS 1580, "Unified screw threads".

Foreword

This standard makes reference to the following British Standards:

BS 84, *Parallel screw threads of Whitworth form.*

BS 1769, *Unified black hexagon bolts, screws and nuts — heavy series.*

NOTE The requirements for washers in this standard have been superseded by the publication of BS 3410, *"Metal washers for general engineering purposes"*, to which reference should now be made.

BS 916 was first issued in 1940, as a war emergency standard at the request of the Ministry of Supply, to supersede BS 28, "*Black bolts and nuts*". The specification was reviewed in 1946 and confirmed for re-issue as the regular British Standard for black hexagon and square bolts and nuts.

The main purpose of the present revision is to take fuller account of regular practice in the manufacture and use of black bolts and nuts. In addition to making provision for products having the comparatively wide tolerances which are usual in the case of black bolts and nuts, provision is also made for bolts faced under the head, with or without turning on the shank, and for nuts faced on one or both sides; for partly machined bolts a choice between medium and free fit threads is given. It will also be noted that the standard recognizes the production and usage of black screws and the title has been amended accordingly.

In adhering to the decision not to re-issue BS 28, it was realized that there are certain applications in heavy engineering work for which the use of the old large (Whitworth) size nuts might be desirable. BS 1769, "*Unified black hexagon bolts, screws and nuts — heavy series*", may, however, meet this need, but where it does not, nuts of the basic dimensions of BS 28 will be supplied by the manufacturers when required for such applications as those referred to above.

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.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and iv, pages 1 to 14 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.

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1 Scope

This standard relates to ferrous bolts, screws and nuts.

Dimensions and certain requirements are given in respect of bolts, screws and nuts which are either black all over or have partially machined finishes.

The bolts, screws and nuts may be produced by hot or cold forging at the option of the manufacturer.

2 Material

The steel used for the manufacture of the bolts, screws and nuts shall be such that the finished products possess a minimum tensile strength of 26 tons/sq. in. and a minimum elongation of 20 per cent of the gauge length or a minimum tensile strength of 28 tons/sq. in. and a minimum elongation of 17 per cent. The choice of either material will normally be at the option of the manufacturer except where the purchaser specifically states which of the two he requires.

NOTE Gauge length = $4\sqrt{\text{area}}$. (See BS 18.[3])

3 Finish

The bolts, screws and nuts shall be neatly and cleanly made.

4 Dimensions

The dimensions and tolerances of the bolts, screws and nuts shall be in accordance with Table 1 to Table 5 inclusive.

5 Length of bolts and screws

a) The nominal length of the bolts and screws shall be the distance from the underside of the head to the further end of the shank, the length of the machined point, if any, being regarded as part of the nominal length.

b) The permissible tolerance on the nominal length shall be as follows:—

Nominal length	Diameter	Tolerance on length
All lengths	Below 1 in. 1 in. and over	+ $^1/_8$ in. – 0 + $^3/_{16}$ in. – 0

6 Ends of bolts and screws

The ends of bolts and screws may, at the option of the manufacturer, be finished with either a flat chamfer with a 90° included angle to a depth slightly exceeding the depth of thread, or with a radius approximately equal to $1^1/_4$ times the nominal diameter of shank. When bolts and screws are made with rolled threads the lead formed at the end of the bolt or screw by the thread rolling operation may be regarded as providing the necessary chamfer to the end, no other machining operation being necessary, and the end shall be reasonably square with the centre line of the shank.

7 Screw threads

a) *Bolts and screws.* For bolts and screws as forged the screw threads shall be B.S.W. free class in accordance with BS 84, "*Parallel screw threads of Whitworth form*".

For bolts and screws machined under the head, with or without turning on the shank, the screw threads may be B.S.W. or B.S.F. and may be free class or medium class, in accordance with BS 84, as specified by the purchaser.

The screw threads may be cut or rolled at the option of the manufacturer.

b) *Nuts.* For nuts as forged the screw threads shall be B.S.W. normal class and for nuts machined on one or both faces they shall be B.S.W. or B.S.F. normal class, in accordance with BS 84, as specified by the purchaser.

[3] BS 18, *"Tensile testing of metals"*.

8 Length of thread

a) *Bolts.* The length of the thread shall be such that when a machined nut is screwed as far as possible on to the bolt by hand, the distance between the underside of the bolt head and the nearest face of the nut shall not be more than the nominal length of the bolt minus the values given at i) or ii) below, as applicable.

i) *Bolts as forged.*

Length of bolt	All diameters up to and including $^1/_2$ in. and all drilled bolts	All diameters over $^1/_2$ in.
Up to and including 4 in.	2 diameters	$1^1/_2$ diameters
Over 4 in. and up to and including 8 in.	2 diameters	2 diameters
Over 8 in.	$2^1/_2$ diameters	$2^1/_2$ diameters

ii) *Bolts faced under the head with or without turning on the shank.*

Length of bolt	All diameters
All lengths	2 diameters

Bolts that are too short for minimum thread length shall be threaded as screws.

b) *Screws.* Screws shall be threaded to permit a standard screw ring gauge to be screwed by hand to within a distance from the underside of the head as follows:—

Threads per inch	Distance from underside of head
16 and under	2 × pitch
Over 16, up to and including 20	$2^1/_2$ × pitch
Over 20	3 × pitch

9 Chamfering and facing

a) *Bolts and screws.* Hexagon bolt heads and screw heads shall be chamfered at an angle of approximately 30°, and square heads at an angle of approximately 25°, on their upper faces. The diameter of the ring formed by the chamfer on the upper face of the bolt or set screw head shall not be smaller than 90 per cent of the minimum across flats dimension (Figure 1). The lower or bearing face shall be machined only if specified by the purchaser.

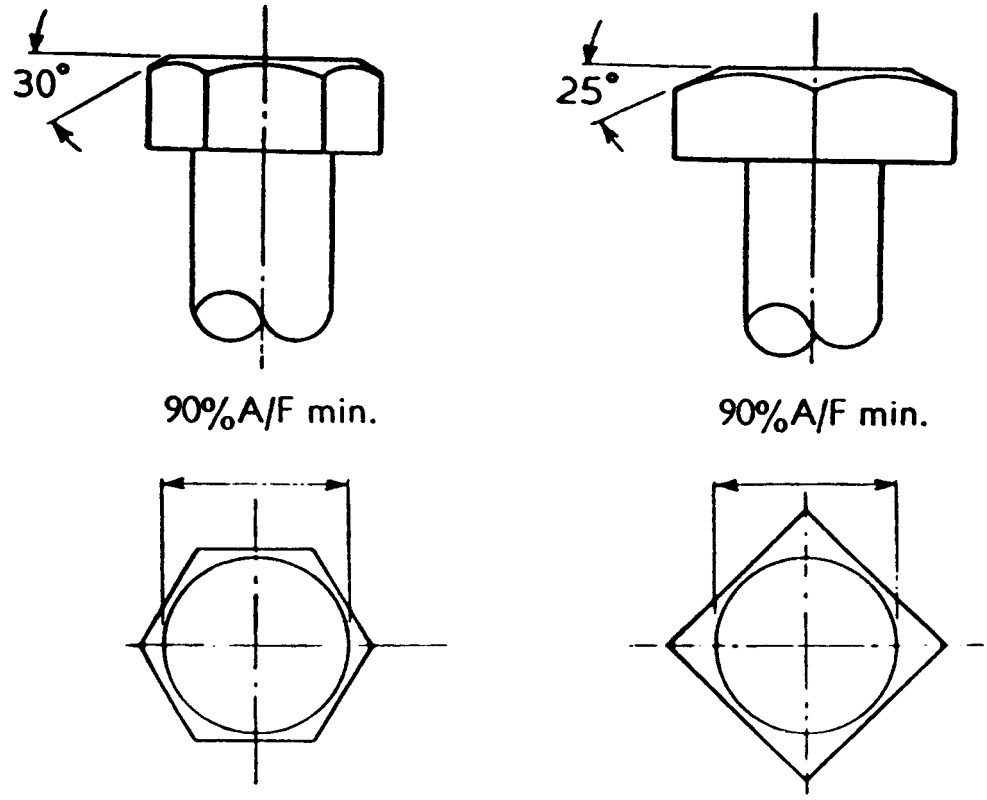

Figure 1

b) *Nuts: hexagon and square.* These shall be chamfered at an angle of approximately 30°, and square nuts at an angle of approximately 25°, on one or both faces at the option of the manufacturer. They shall be machined on one or both faces only when so specified.

c) *Unmachined lock nuts.* These shall be chamfered to an angle of approximately 30° on one or both faces, at the option of the manufacturer. They shall be machined and chamfered on both faces only when so specified.

NOTE The option referred to in Sub-clauses b) and c) above shall apply unless the purchaser in his enquiry and order specifically states that he requires the nuts to be "full bearing" or "double-chamfered".
Attention is drawn to the fact that these alternative methods of finishing the lower face of nuts are associated both with the nominal size and the particular method of manufacture. A request by the purchaser for a specific type of finish limits the manufacturing processes available, and it is therefore recommended that the purchaser avoids making a request for a specific type of finish unless circumstances fully justify it.

10 Nuts: squareness of thread to face

a) The bearing surface of unmachined (black) nuts shall be square to the axis of the thread of the nut within the tolerances given in Column 18 of Table 3.

b) The bearing surface of machined nuts shall be square to the axis of the thread of the nut within the tolerances given in Column 19 of Table 3.

11 Diameter of shank of bolts

a) The maximum diameter of the unthreaded portion of the shank of bolts shall be in accordance with the dimensions given in Column 2 of Table 1 and Table 2.

The shank diameter shall be checked by means of a plain ring gauge having a maximum thickness equal to the nominal diameter of the bolt, a minimum fillet radius in the bore equal to the maximum radius under the bolt head and an internal diameter equal to the maximum shank diameter as specified in Column 2 of Table 1 and Table 2. The internal diameter shall be subject to a tolerance of + 0.001 in., + 0.002 in. for all sizes.

b) The unthreaded shank on bolts shall be machined only if stated by the purchaser in his order. When the shank is machined the limits of size shall be in accordance with the dimensions given in Columns 3 and 4 of Table 2.

12 Drilled bolts and split-pin holes

a) Bolts with split-pin holes will be supplied only when specially ordered; the purchaser shall specify dimension J (see Figure 14). Table 4 shows the recommended sizes of drilled holes, but if other sizes are required they shall be specified by the purchaser.

b) The tolerances on the specified dimension J shall be as follow:—

Nominal size of bolt	Tolerance on dimension "J"
Up to and including $^5/_8$ in. Over $^5/_8$ in. and up to and including 1 in.	+ $^1/_{32}$ in. – 0 + $^3/_{64}$ in. – 0
Above 1 in. and up to and including $1^1/_2$ in.	+ $^1/_{16}$ in. – 0

c) The split-pin holes shall be drilled through the centre of the bolt and at right angles to the axis.

Washers

This clause was deleted by Amendment No. 3, October, 1961.

Hexagon and square head bolts and screws

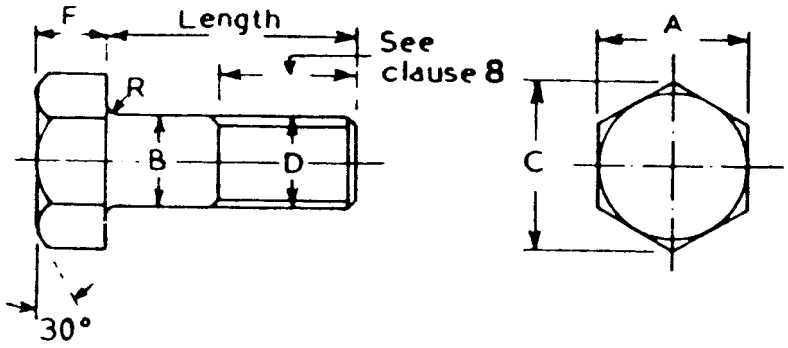

Figure 2 — Hexagon head bolt

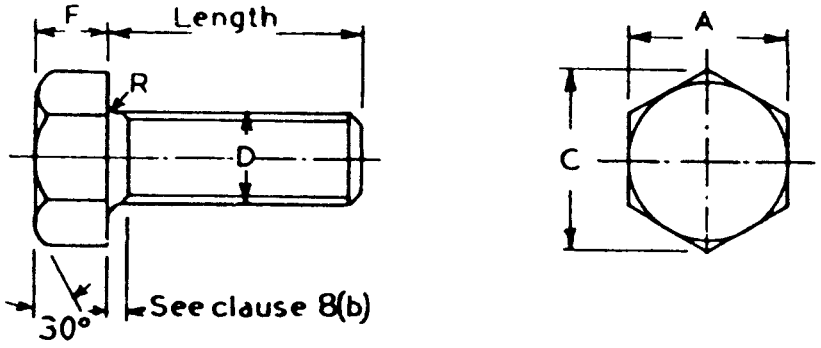

Figure 3 — Hexagon head screw

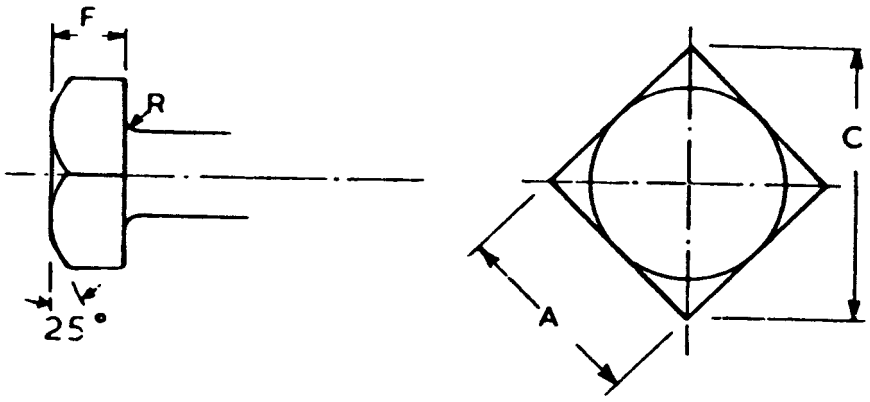

Figure 4 — Square head bolt

Alternative types of end permissible on bolts and screws

Hexagon and square head bolts and screws

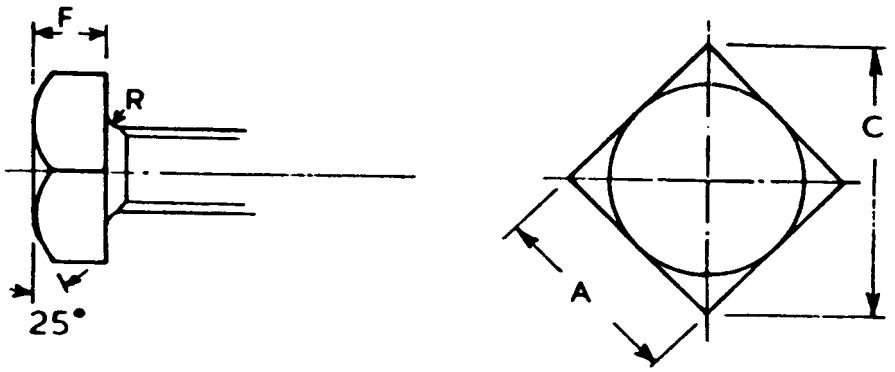

Figure 5 — Square head screw

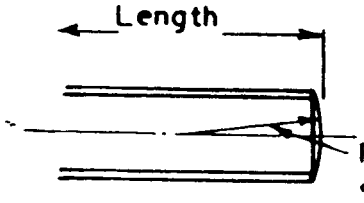

Figure 6 — Rounded end

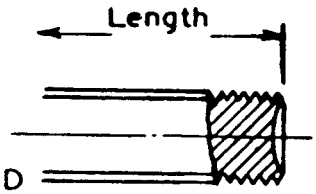

Figure 7 — Rolled thread end

Alternative types of end permissible on bolts and screws

Table 1 — Hexagon and square head bolts and screws

1	2	3	4	5	6	7	8	9	10	11
Nominal size D	Dia. of unthreaded shank B	No. of threads per inch	Width across flats A hex. and square		Approx. max. width across corners C		Radius under head R	Thickness of head F hex. and square		Nominal size D
	max.	B.S.W.	max.	min.	hex.	square	max.	max.	basic	
in.	in.		in.	in.	in.	in.	in.	in.	in.	in.
1/4	0.280	20	0.445	0.435	0.51	0.63	1/32	0.186	0.166	1/4
5/16	0.342	18	0.525	0.515	0.61	0.74	1/32	0.228	0.208	5/16
3/8	0.405	16	0.600	0.585	0.69	0.85	1/32	0.270	0.250	3/8
7/16	0.468	14	0.710	0.695	0.82	1.00	1/32	0.312	0.292	7/16
1/2	0.530	12	0.820	0.800	0.95	1.16	1/32	0.363	0.333	1/2
9/16	0.592	12	0.920	0.900	1.06	1.30	3/64	0.405	0.375	9/16
5/8	0.665	11	1.010	0.985	1.17	1.43	3/64	0.447	0.417	5/8
3/4	0.790	10	1.200	1.175	1.39	1.70	3/64	0.530	0.500	3/4
7/8	0.915	9	1.300	1.270	1.50	1.84	1/16	0.623	0.583	7/8
1	1.040	8	1.480	1.450	1.71	2.09	1/16	0.706	0.666	1
1 1/8	1.175	7	1.670	1.640	1.93	2.36	1/8	0.79	0.75	1 1/8
1 1/4	1.300	7	1.860	1.815	2.15	2.63	1/8	0.89	0.83	1 1/4
1 3/8[a]	1.425	6	2.050	2.005	2.37	2.90	1/8	0.98	0.92	1 3/8[a]
1 1/2	1.550	6	2.220	2.175	2.56	3.14	1/8	1.06	1.00	1 1/2
1 5/8[a]	1.685	5	2.410	2.365	2.78	3.41	1/8	1.18	1.08	1 5/8[a]
1 3/4	1.810	5	2.580	2.520	2.98	3.65	1/8	1.27	1.17	1 3/4
2	2.060	4.5	2.760	2.700	3.19	3.90	1/8	1.43	1.33	2
2 1/4	—	4	3.150	3.090	3.64	4.45	3/16	1.60	1.50	2 1/4
2 1/2	—	4	3.550	3.490	4.10	5.02	3/16	1.77	1.67	2 1/2
2 3/4	—	3.5	3.890	3.830	4.49	5.50	3/16	1.93	1.83	2 3/4
3	—	3.5	4.180	4.080	4.83	5.91	3/16	2.15	2.00	3
3 1/4[a]	—	3.25	4.530	4.430	5.23	6.41	1/4	2.32	2.17	3 1/4[a]
3 1/2	—	3.25	4.850	4.750	5.60	6.86	1/4	2.48	2.33	3 1/2
3 3/4[a]	—	3	5.180	5.080	5.98	7.33	1/4	2.65	2.50	3 3/4[a]
4	—	3	5.550	5.450	6.41	7.85	1/4	2.82	2.67	4
4 1/2	—	2.875	6.380	6.255	7.37	9.02	1/4	3.20	3.00	4 1/2
5	—	2.750	7.300	7.175	8.43	10.32	1/4	3.53	3.33	5
5 1/2	—	2.625	8.350	8.225	9.64	11.81	1/4	3.87	3.67	5 1/2
6	—	2.5	9.450	9.325	10.91	13.36	1/4	4.20	4.00	6

[a] To be dispensed with wherever possible.

Hexagon and square head bolts and screws

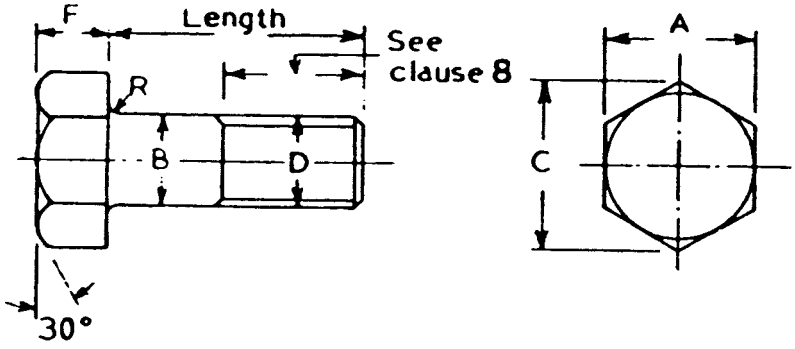

Figure 2 — Hexagon head bolt

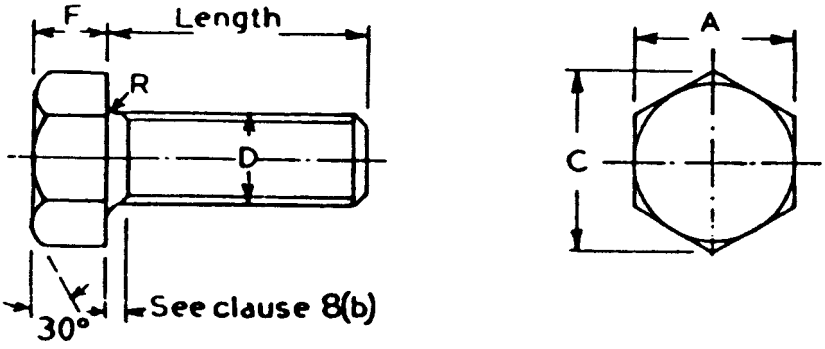

Figure 3 — Hexagon head screw

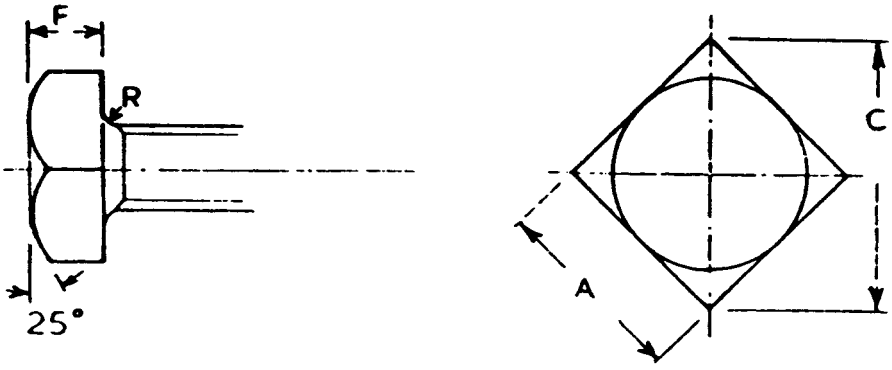

Figure 4 — Square head bolt

Alternative types of end permissible on bolts and screws

Hexagon and square head bolts and screws

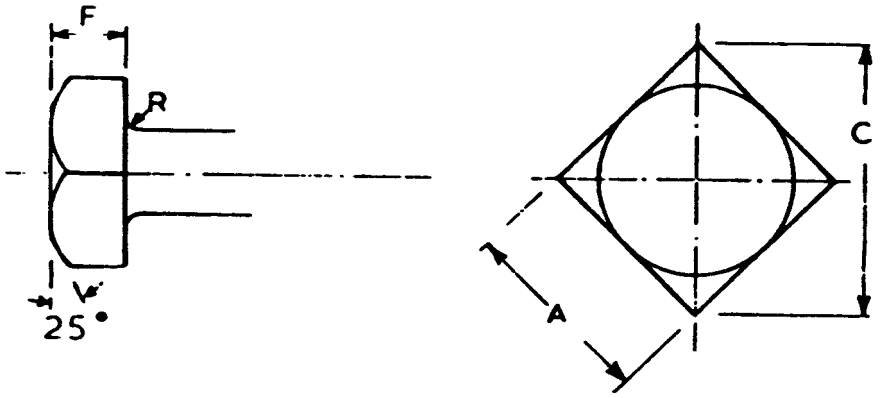

Figure 5 — Square head screw

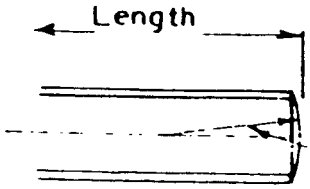

Figure 6 — Rounded end

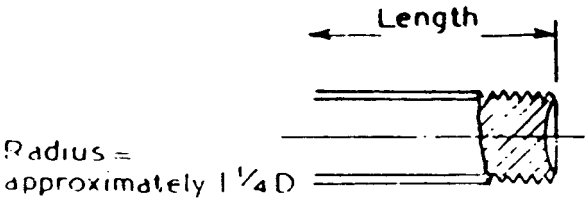

Figure 7 — Rolled thread end

Alternative types of end permissible on bolts and screws

Table 2 — Hexagon and square head bolts faced under head, and faced under head and turned on shank

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Nom. size D	Diameter of shank			Number of threads per inch		Width across flats A		Approx. max. width across corners C		Radius under head R	Thickness of head F hexagon and square		Nom. size D
	Faced under head	Faced under head and turned on shank											
	max.	max.	min.	B.S.W.	B.S.F.	max.	min.	hex.	sq.	max.	max.	min.	
in.	in.	in.	in.			in.	in.	in.	in.	in.	in.	in.	in.
1/4	0.280	0.250 0	0.246 5	20	26	0.445	0.435	0.51	0.63	1/32	0.176	0.156	1/4
5/16	0.342	0.312 5	0.309 0	18	22	0.525	0.515	0.61	0.74	1/32	0.218	0.198	5/16
3/8	0.405	0.375 0	0.371 5	16	20	0.600	0.585	0.69	0.85	1/32	0.260	0.240	3/8
7/16	0.468	0.437 5	0.433 5	14	18	0.710	0.695	0.82	1.00	1/32	0.302	0.282	7/16
1/2	0.530	0.500 0	0.496 0	12	16	0.820	0.800	0.95	1.16	1/32	0.343	0.323	1/2
9/16	0.592	0.562 5	0.558 5	12	16	0.920	0.900	1.06	1.30	1/32	0.375	0.345	9/16
5/8	0.665	0.625	0.619	11	14	1.010	0.985	1.17	1.43	1/32	0.417	0.387	5/8
3/4	0.790	0.750	0.744	10	12	1.200	1.175	1.39	1.70	1/32	0.500	0.470	3/4
7/8	0.915	0.875	0.867	9	11	1.300	1.270	1.50	1.84	1/32	0.583	0.553	7/8
1	1.040	1.000	0.992	8	10	1.480	1.450	1.71	2.09	1/32	0.666	0.636	1
1 1/8	1.175	1.125	1.117	7	9	1.670	1.640	1.93	2.36	3/64	0.75	0.71	1 1/8
1 1/4	1.300	1.250	1.242	7	9	1.860	1.815	2.15	2.63	3/64	0.83	0.79	1 1/4
1 3/8[a]	1.425	1.375	1.365	6	8	2.050	2.005	2.37	2.90	3/64	0.92	0.88	1 3/8[a]
1 1/2	1.550	1.500	1.490	6	8	2.220	2.175	2.56	3.14	3/64	1.00	0.96	1 1/2
1 5/8[a]	1.685	1.625	1.615	5	8	2.410	2.365	2.78	3.41	3/64	1.08	1.02	1 5/8[a]
1 3/4	1.810	1.750	1.740	5	7	2.580	2.520	2.98	3.65	3/64	1.17	1.11	1 3/4
2	2.060	2.000	1.990	4.5	7	2.760	2.700	3.19	3.90	3/64	1.33	1.27	2
2 1/4	—	2.250	2.240	4	6	3.150	3.090	3.64	4.45	1/16	1.50	1.42	2 1/4
2 1/2	—	2.500	2.490	4	6	3.550	3.490	4.10	5.02	1/16	1.67	1.59	2 1/2
2 3/4	—	2.750	2.740	3.5	6	3.890	3.830	4.49	5.50	1/16	1.83	1.75	2 3/4
3	—	3.000	2.990	3.5	5	4.180	4.080	4.83	5.91	1/16	2.00	1.90	3
3 1/4[a]	—	3.250	3.235	3.25	5	4.530	4.430	5.23	6.41	3/32	2.17	2.07	3 1/4[a]
3 1/2	—	3.500	3.485	3.25	4.5	4.850	4.750	5.60	6.86	3/32	2.33	2.23	3 1/2
3 3/4[a]	—	3.750	3.735	3	4.5	5.180	5.080	5.98	7.33	3/32	2.50	2.40	3 3/4[a]
4	—	4.000	3.980	3	4.5	5.550	5.450	6.41	7.85	3/32	2.67	2.57	4
4 1/2	—	4.500	4.480	2.875	4	6.380	6.255	7.37	9.02	1/8	3.00	2.85	4 1/2
5	—	5.000	4.980	2.75	4	7.300	7.175	8.43	10.32	1/8	3.33	3.18	5
5 1/2	—	5.500	5.480	2.625	4	8.350	8.225	9.64	11.81	1/8	3.67	3.52	5 1/2
6	—	6.000	5.980	2.5	4	9.450	9.325	10.91	13.36	1/8	4.00	3.85	6

[a] To be dispensed with wherever possible.

Table 3 — Hexagon and square nuts and hexagon lock nuts

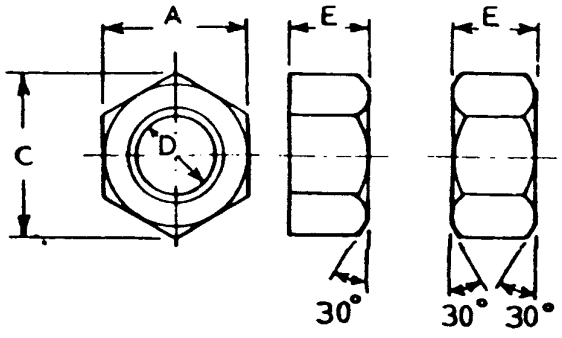

Figure 8 — Hexagon nut

Figure 9 — Double chamfered

Alternative types of hexagon nuts

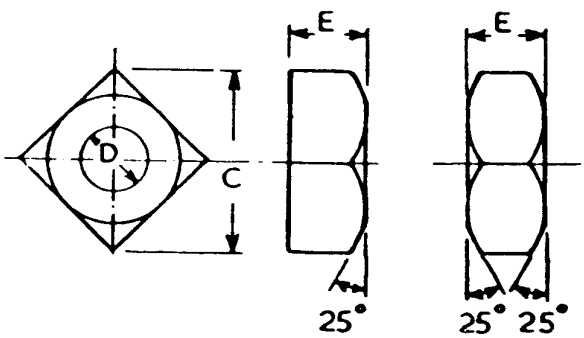

Figure 10 — Square nut

Figure 11 — Double chamfered

Alternative types of square nuts

1	2	3	4	5	6	7	8	9	10
Nominal size D	Number of threads per inch		Width across flats A		Approx. max. width across corners C		Thickness of nut E		
							Black		Faced one side
	B.S.W.	B.S.F.	max.	min.	hexagon	square	max.	min.	max.
in.			in.	in.	in.	in.	in.	in.	in.
1/4	20	26	0.445	0.435	0.51	0.63	0.220	0.200	0.200
5/16	18	22	0.525	0.515	0.61	0.74	0.270	0.250	0.250
3/8	16	20	0.600	0.585	0.69	0.85	0.332	0.312	0.312
7/16	14	18	0.710	0.695	0.82	1.00	0.395	0.375	0.375
1/2	12	16	0.820	0.800	0.95	1.16	0.467	0.437	0.437
9/16	12	16	0.920	0.900	1.06	1.30	0.530	0.500	0.500
5/8	11	14	1.010	0.985	1.17	1.43	0.602	0.562	0.562
3/4	10	12	1.200	1.175	1.39	1.70	0.728	0.687	0.687
7/8	9	11	1.300	1.270	1.50	1.84	0.810	0.750	0.750
1	8	10	1.480	1.450	1.71	2.09	0.935	0.875	0.875
1 1/8	7	9	1.670	1.640	1.93	2.36	1.060	1.000	1.000
1 1/4	7	9	1.860	1.815	2.15	2.63	1.205	1.125	1.125
1 3/8 [a]	6	8	2.050	2.005	2.37	2.90	1.330	1.250	1.250
1 1/2	6	8	2.220	2.175	2.56	3.14	1.455	1.375	1.375
1 5/8 [a]	5	8	2.410	2.365	2.78	3.41	1.580	1.500	1.500
1 3/4	5	7	2.580	2.520	2.98	3.65	1.725	1.625	1.625
2	4.5	7	2.760	2.700	3.19	3.90	1.850	1.750	1.750
2 1/4	4	6	3.150	3.090	3.64	4.45	1.975	1.875	1.875
2 1/2	4	6	3.550	3.490	4.10	5.02	2.225	2.125	2.125
2 3/4	3.5	6	3.890	3.830	4.49	5.50	2.475	2.375	2.375
3	3.5	5	4.180	4.080	4.83	5.91	2.775	2.625	2.625
3 1/4 [a]	3.25	5	4.530	4.430	5.23	6.41	3.025	2.875	2.875
3 1/2	3.25	4.5	4.850	4.750	5.60	6.86	3.275	3.125	3.125
3 3/4 [a]	3	4.5	5.180	5.080	5.98	7.33	3.525	3.375	3.375
4	3	4.5	5.550	5.450	6.41	7.85	3.775	3.625	3.625
4 1/2	2.875	4	6.380	6.255	7.37	9.02	4.200	4.000	4.000
5	2.750	4	7.300	7.175	8.43	10.32	4.700	4.500	4.500
5 1/2	2.625	4	8.350	8.225	9.64	11.81	5.200	5.000	5.000
6	2.500	4	9.450	9.325	10.91	13.36	5.700	5.500	5.500

[a] To be dispensed with wherever possible.

The dimensions of black lock nuts in the above table are designed to permit the product to be manufactured by either hot forging, cold forming or cold pressing, at the option of the manufacturer.

Table 3 — Hexagon and square nuts and hexagon lock nuts

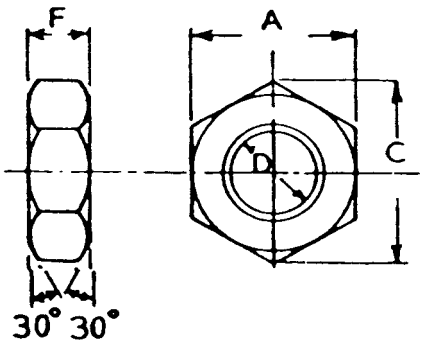

Figure 12 — Hexagon lock nut

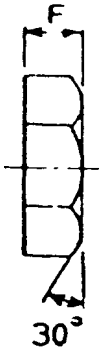

Figure 13 — Hexagon lock nut

Alternative types of hexagon lock nuts

11	12	13	14	15	16	17	18	19	20
Thickness of nut E			Thickness of lock nuts F				Tolerance for squareness of thread to face of nut (see Clause 10)		Nominal size D
Faced one side	Faced both sides		Black		Faced both sides		Black	Machined	
min.	max.	min.	max.	min.	max.	min.	max.	max.	
in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
0.180	0.200	0.190	0.185	0.180	—	—	0.014	0.007	1/4
0.230	0.250	0.240	0.210	0.200	—	—	0.018	0.009	5/16
0.292	0.312	0.302	0.260	0.250	—	—	0.020	0.010	3/8
0.355	0.375	0.365	0.275	0.265	—	—	0.022	0.011	7/16
0.417	0.437	0.427	0.300	0.290	—	—	0.026	0.013	1/2
0.480	0.500	0.490	0.333	0.323	—	—	0.026	0.013	9/16
0.542	0.562	0.552	0.410	0.375	0.375	0.365	0.028	0.014	5/8
0.668	0.687	0.677	0.490	0.458	0.458	0.448	0.034	0.017	3/4
0.720	0.750	0.740	0.550	0.500	0.500	0.490	0.040	0.020	7/8
0.835	0.875	0.865	0.630	0.583	0.583	0.573	0.040	0.020	1
0.960	1.000	0.990	0.720	0.666	0.666	0.656	0.048	0.024	1 1/8
1.080	1.125	1.105	0.810	0.750	0.750	0.730	0.048	0.024	1 1/4
1.190	1.250	1.230	0.890	0.833	0.833	0.813	0.052	0.026	1 3/8[a]
1.315	1.375	1.355	0.980	0.916	0.916	0.896	0.052	0.026	1 1/2
1.440	1.500	1.480	1.060	1.000	1.000	0.980	0.052	0.026	1 5/8[a]
1.565	1.625	1.605	1.160	1.083	1.083	1.063	0.060	0.030	1 3/4
1.690	1.750	1.730	1.250	1.166	1.166	1.146	0.060	0.030	2
1.815	1.875	1.855	1.430	1.250	1.250	1.229	0.060	0.030	2 1/4
2.065	2.125	2.105	1.600	1.416	1.416	1.396	0.070	0.035	2 1/2
2.315	2.375	2.355	1.770	1.580	1.580	1.560	0.070	0.035	2 3/4
2.525	2.625	2.605	1.980	1.750	1.750	1.730	0.080	0.040	3
2.775	2.875	2.845	2.150	1.915	1.915	1.882	0.080	0.040	3 1/4[a]
3.025	3.125	3.095	2.320	2.083	2.083	2.051	0.090	0.045	3 1/2
3.275	3.375	3.345	2.480	2.250	2.250	2.212	0.090	0.045	3 3/4[a]
3.525	3.625	3.595	2.650	2.417	2.417	2.387	0.100	0.050	4
3.850	4.000	3.970	3.030	2.666	2.666	2.636	0.110	0.055	4 1/2
4.350	4.500	4.470	3.370	3.000	3.000	2.970	0.120	0.060	5
4.850	5.000	4.970	3.700	3.333	3.333	3.303	0.130	0.065	5 1/2
5.350	5.500	5.470	4.030	3.666	3.666	3.636	0.140	0.070	6

[a] To be dispensed with wherever possible.

The dimensions of black lock nuts in the above table are designed to permit the product to be manufactured by either hot forging, cold forming or cold pressing, at the option of the manufacturer.

Table 4 — Drilled holes — Position and recommended sizes, and split cotter pin sizes

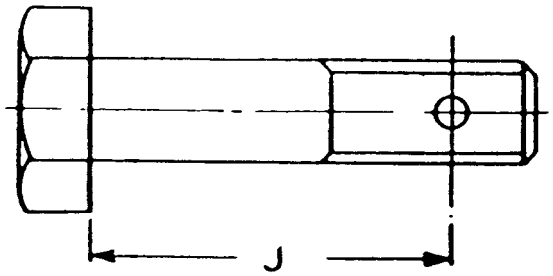

Figure 14 — Position of split-pin hole

NOTE Dimension J to be specified by purchaser (see Clause **12**).

1	2		3
Nominal size of bolt	**Recommended drill size**		**Recommended size of split cotter pin**
	Metric size	**Inch equivalent**	
in.	mm.	in.	in.
$^1/_4$	1.800	0.070 9	$^1/_{16}$
$^5/_{16}$	1.800	0.070 9	$^1/_{16}$
$^3/_8$	2.650	0.104 3	$^3/_{32}$
$^7/_{16}$	2.650	0.104 3	$^3/_{32}$
$^1/_2$	3.450	0.135 8	$^1/_8$
$^9/_{16}$	3.450	0.135 8	$^1/_8$
$^5/_8$	5.100	0.200 8	$^3/_{16}$
$^3/_4$	5.100	0.200 8	$^3/_{16}$
$^7/_8$	6.600	0.259 8	$^1/_4$
1	6.600	0.259 8	$^1/_4$
$1^1/_8$	8.200	0.322 8	$^5/_{16}$
$1^1/_4$	8.200	0.322 8	$^5/_{16}$
$1^3/_8$[a]	8.200	0.322 8	$^5/_{16}$
$1^1/_2$	8.200	0.322 8	$^5/_{16}$

[a] To be dispensed with wherever possible.

Table 5 — Plain washers

Deleted by Amendment No. 3, October, 1961.

Appendix

Table 6 — Stock size of steel hexagon head black bolts

Nominal size D	Nominal length in inches																											
	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2	9	10	11	12
in.																													
1/4	X	X	X	X	X	X	X	X	X	X	X	X																	
5/16		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X													
3/8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
7/16				X	X	X	X	X	X	X	X	X	X	X	X	X													
1/2				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
5/8				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3/4					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7/8						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1							X	X	X	X	X	X	X	X	X	X	X	X	X	X	—	X	—	X	—	X	X	X	X

NOTE Stock sizes for screws are as above, but are restricted to 4 in. maximum length.

blank

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