BRITISH STANDARD

BS 2583:1955

Specification for

Podger spanners

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Telephone Manufacturers Technical Development Committee
Spanner manufacturers

This British Standard, having been approved by the Mechanical Engineering Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council on 3 March 1955

The following BSI references relate to the work on this standard:—
Committee reference MEE/9/4
Draft for comment CR(MEE) 5054

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Amendments issued since publication

Amd. No.	Date	Comments

Contents

Foreword

This standard makes reference to the following British Standards:

BS 860, *Table of approximate comparison of hardness scales.*

BS 916, *Black bolts and nuts. Hexagon and square, BSW and BSF.*

BS 970, *Wrought steels.*

BS 1083, *Precision hexagon bolts, screws, nuts and plain washers.*

BS 1769, *Unified black hexagon bolts, screws and nuts and plain washers. Heavy series.*

This British Standard, which has been prepared under the authority of the Mechanical Engineering Industry Standards Committee, forms one of a group relating to various types of spanners which are either already published or in course of preparation.

Although these spanners are generally known by the name adopted for this specification, i.e. podger spanners, they are also sometimes referred to by the alternative names of "rat-tail spanners", "erector's spanners" or "constructor's spanners".

It was originally intended to include the specifications for railway track spanners, square nut (Post Office type) spanners and podger spanners in one standard, but consideration of their entirely different and distinct functions led to a decision to keep them separate. Not the least of the considerations in the case of podger spanners centred on safety, particularly having regard to the severe stresses (and abuse) to which they are sometimes subject.

It was seen to be impossible to provide for a tool which would be safe under all conditions and on all occasions but, throughout the work of preparation, the question of safety has been kept well to the forefront, the intention being to produce a document which would ensure that the tools did not fall below a certain standard of quality and therefore safety.

Two different designs of spanner are included, one applying when the tool is manufactured from steel to En 3A and the other when it is made from En 8. The proportions and heat treatment of each have been laid down in relation to the use of the spanner, whether turning a nut or bolt or whether being applied through the podger end to force heavy steel beams into line or as a cantilever on which the operator intends to stand. There is no doubt that this latter use, while very widespread, is injudicious and ill-advised. It constitutes a type of abuse for which such a specification cannot provide, although it was considered when the loads for the torque test were being investigated and when actual tests were being made.

It is quite common in steel construction work for these spanners to be left lying in the foundations or on open ground after erection is completed. It will be readily understood that the strength and safety of the tool is likely to be seriously affected by the resultant corrosion and that extra precautions should be taken if the spanner is to be used again, particularly on the top of high structures.

In conclusion it should be remarked that while several other forms of podger spanner are popular and in fairly wide use, those given in this specification have been selected because they represent types which can be adopted with some confidence having proved their value during lengthy and extensive service in construction work and in shipyards.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 8, 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.

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1 Scope

This British Standard relates to the materials, proportions, dimensions and tests of spanners having an open jaw at one end and with the shank tapering to form a podger bar at the other end, as designed for use on construction work and in shipyards.

2 Material

All spanners complying with the provisions of this British Standard shall be manufactured from steel either to specification En 3A or to specification En 8 from BS 970[1)].

3 Heat treatment and hardness

a) *Spanners from En* 3*A*. All spanners manufactured from steel to specification En 3A shall be normalized before being hardened.

After normalizing the spanners shall be case-hardened inside the faces of the jaws and on the podger end to a depth of from 0.010 in. to 0.020 in.

NOTE As the case-hardening in a) above is intended only to provide resistance against wear, the question of hardness figures does not arise.

b) *Spanners from En* 8. Spanners manufactured from steel to specification En 8 shall be oil quenched and tempered within the range of 13 to 25 on the Rockwell C scale to give a tensile strength between 45 and 55 tons.

If desired the equivalent hardness figures on other recognised hardness scales may be used in place of those given above.[2)]

4 Proportions

The dimensions of podger spanners shall be generally proportional to the width across the jaws W (see Figure 1 & Figure 2). The proportions of the spanners shall vary according to the material from which they are made, as given below:—

a) *When made from En* 3*A* (see Figure 1).

Head width = 2.25 W minimum.

Head depth = 2.25 W minimum.

Head thickness of spanners for BS and W hexagons = diameter of appropriate Whitworth bolt (see D. Figure 1).

Head thickness of spanners for Unified heavy hexagons = maximum thickness of "as forged" nuts (see D. Figure 1).

Diameter of round portion of shank = diameter of appropriate bolt.

Jaw depth = 1.25 W minimum.

Width of shank adjacent to head = 0.8 W at point of tangency.

Overall length = 13W + 4 in. minimum.
15W + 4 in. maximum.

Length from nose to start of parallel shank = 5 W.

Length of tapered end of podger = 2 W.

Finger clearance on cranked spanners = not less than 0.75 W.

Taper. The included angle of the podger end taper shall be approximately 6°.

All other proportions not mentioned above shall be as shown on Figure 1.

b) *When made from En* 8 (see Figure 2 and Figure 3).

Head width = 2.25 W maximum.

Head depth = 1.6 W.

Head thickness of spanners for BS and W hexagons = 0.5 W.

Head thickness of spanners for Unified heavy bolts = maximum thickness of "as forged" nuts.

Jaw depth = 0.95 W minimum.

Width of shank adjacent to head = 0.95 W.

Maximum thickness of straight portion of shank = 0.25 W (the section of this part of the spanner is fishbacked as shown in Figure 2 and Figure 3).

Length of straight shank = 6 W.

Maximum thickness of rounded shank = 0.55 W.

Length of podger end = 2.5 W.

Overall length = 13 W + 4 in. minimum.
15 W + 4 in. maximum.

Finger clearance on cranked spanners = not less than 0.75 W.

Taper. The included angle of the podger end taper shall be approximately 6°.

All other proportions not mentioned above shall be as shown on Figure 2 and Figure 3.

5 Head inclination and cranking

a) *Spanners from En* 3*A*.

i) *Inclination*. Heads of spanners made from En 3A shall be straight in line with the shank and shall not be inclined (see Figure 1).

[1)] BS 970, "*Wrought steels*".
[2)] BS 860, "*Table of approximate comparison of hardness scales*".

ii) *Cranking*. Spanners made from En 3A shall be available either in the flat form (having head and shank in one plane), or the cranked form (having the shank cranked in relation to the head), see Figure 1.

b) *Spanners from En* 8.

i) *Cranking*. Spanners made from En 8 shall be available either as flat or as cranked tools (see Figure 2 and Figure 3).

ii) *Inclination*. When the spanner is flat [see i) above] the head shall be inclined at 15° to the shank.

When the spanner is cranked the head shall be straight in line with the shank (see Figure 2).

NOTE Cranked spanners from En 8 with the heads inclined at 15° will be available by arrangement between purchaser and manufacturer.

6 Finish

All sharp corners shall be removed and the spanners shall be free from burrs, cracks and other defects. The outer ends of the jaws and the periphery of the head shall be radiused as indicated on Figure 1, Figure 2 and Figure 3. The faces of the spanners shall remain parallel after being finished.

All spanners shall have a black oiled finish.

7 Range

Two ranges of nominal sizes shall be available. The first range shall include the hexagons applicable to the following bolt diameters (in inches) in BS 916[3] and BS 1083[4]:—

$^3/_8$, $^7/_{16}$, $^1/_2$, $^9/_{16}$, $^5/_8$, $^{11}/_{16}$, $^3/_4$, $^7/_8$, 1, $1^1/_8$, $1^1/_4$, $1^3/_8$.

NOTE This range also applies to the relative Whitworth large hexagons.

The second range includes the hexagons applicable to the following bolt diameters (in inches) in BS 1769[5]:—

$^1/_2$, $^5/_8$, $^3/_4$, $^7/_8$, 1, $1^1/_8$, $1^1/_4$, $1^3/_8$.

8 Marking

Podger spanners shall be marked adjacent to the head with either one of the following alternatives according to the type of bolt on which it is to be used.

a) *Spanners for hexagon sizes in BS* 916 *or BS* 1083 *and for Whitworth large hexagons*. These shall be marked with two fractions, the first representing the nominal bolt diameter corresponding to the hexagon dimensions in BS 916 or BS 1083, this fraction being followed by the letters BS.

The second fraction represents the nominal bolt diameter corresponding to the appropriate large Whitworth hexagon, this fraction being followed by the letter W.

e.g. $^3/_8$ BS

$^5/_{16}$ W

b) *Spanners for hexagon sizes in BS* 1769. These shall be marked with a fraction representing the nominal fractional dimension across flats of the hexagon on which the spanner fits, this fraction being followed by the letters AF.

e.g. $^7/_8$ AF

9 Dimensions

The dimensions of the podger spanners shall be those given in Table 1 and Table 2.

10 Torque tests

Each spanner shall be capable of passing the torque test detailed below using the turning moments given in Table 1 or Table 2 appropriate to the type of spanner.

The spanner to be tested shall be placed on a rigidly held test block which complies with the following conditions:—

a) It shall have been prepared from hardened and tempered steel.

b) Its depth shall be not less than the maximum thickness of the spanner to be tested.

c) The test faces of the block shall be parallel.

d) The dimension between the test faces shall equal the maximum AF dimension of the hexagon appropriate to the jaw opening of the spanner to be tested.

e) The length of the test faces shall equal the maximum dimension of the faces of the corresponding hexagon.

The spanner jaws shall be right home on the test block as shown in Figure 4 and the specified load shall then be applied as near as practicable to the extreme end of the podger bar and in successively opposite directions.

Upon completion of the test the jaw opening shall not exceed the maximum for the nominal size given in Table 1 or Table 2 and the podger end shall not have been damaged by bending, cracking or any other fault.

[3] BS 916, "*Black bolts and nuts. Hexagon and square, BSW and BSF*".
[4] BS 1083, "*Precision hexagon bolts, screws, nuts and plain washers*".
[5] BS 1769, "*Unified black hexagon bolts, screws and nuts. Heavy series*".

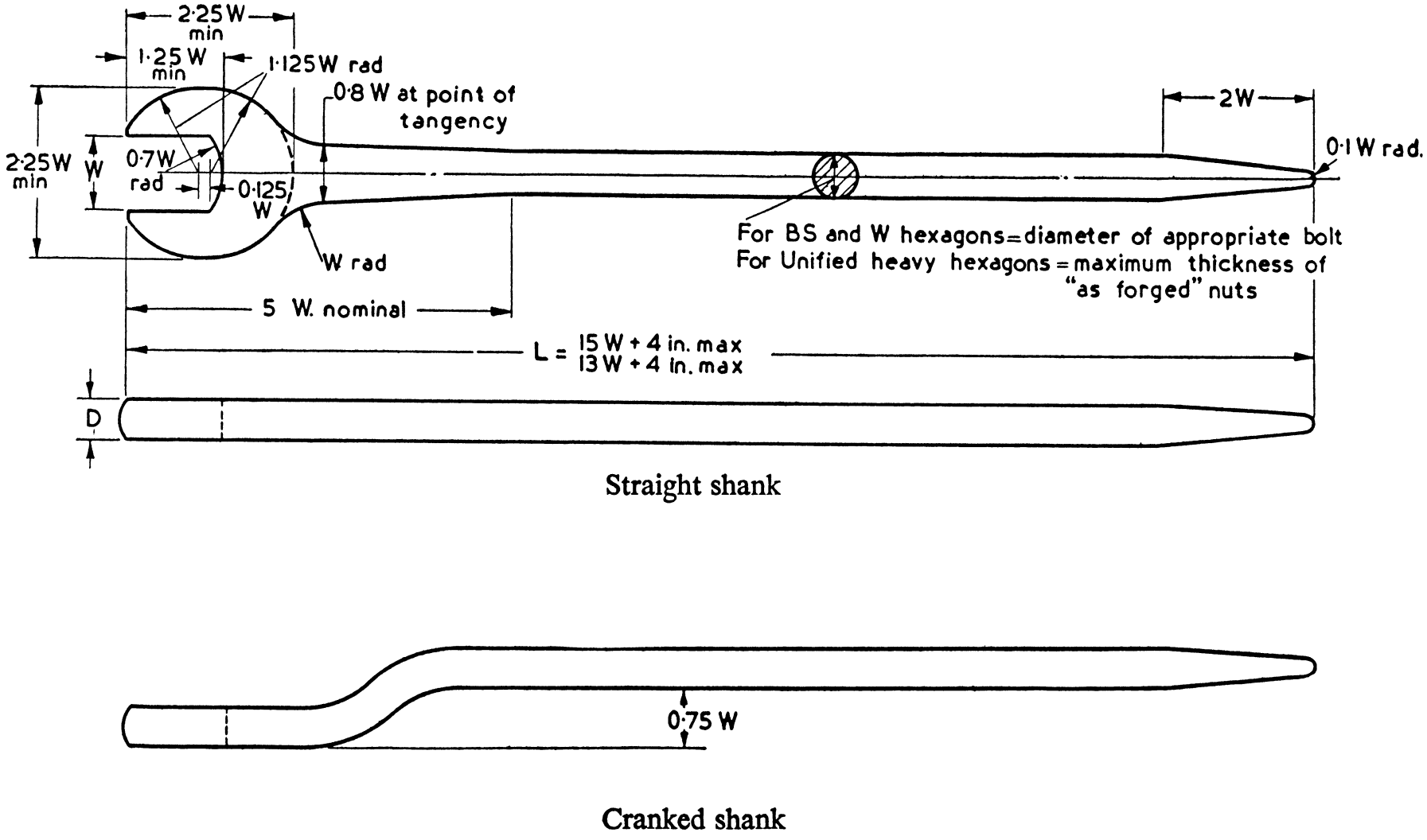


Figure 1 — Proportions of podger spanners when manufactured from En 3A

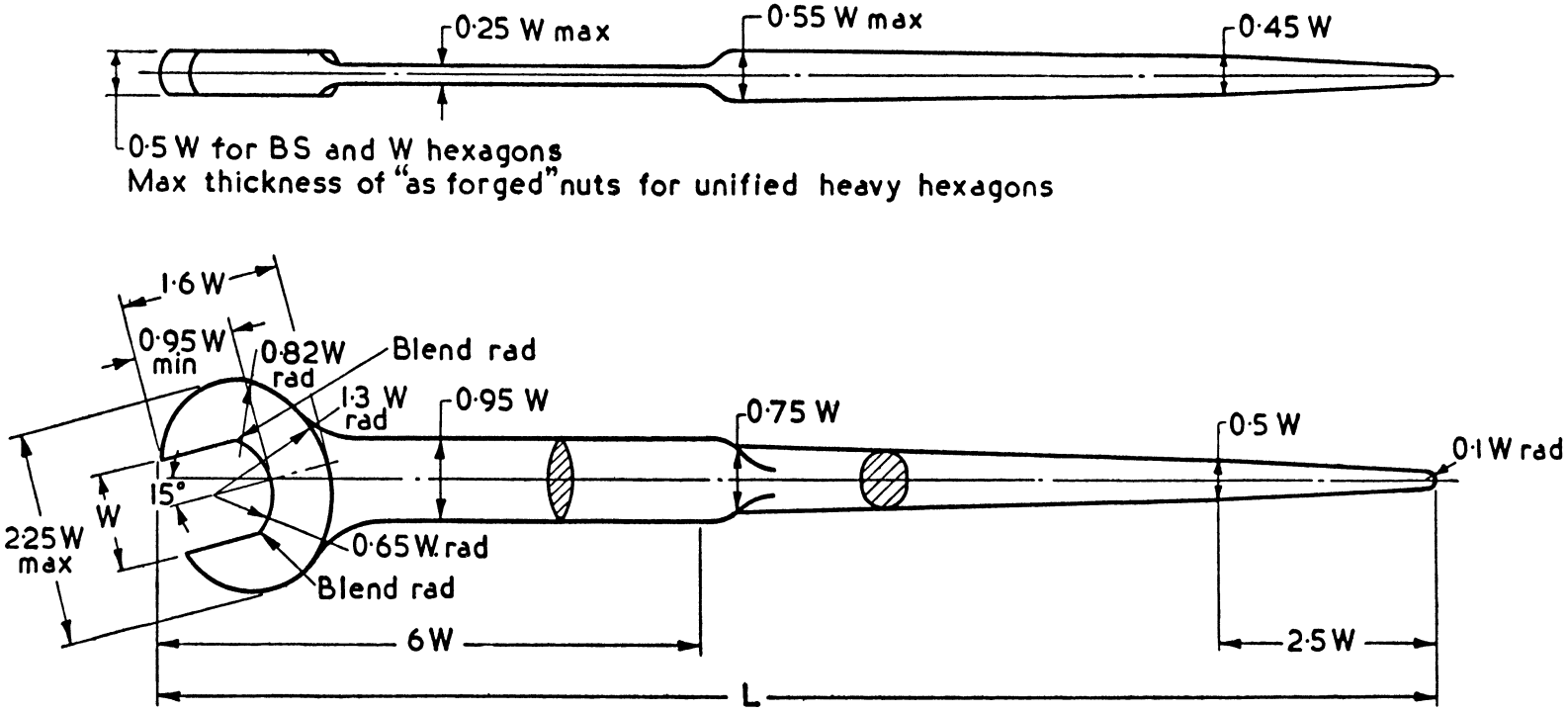


Figure 2 — Proportions of podger spanners with straight shank when manufactured from En 8

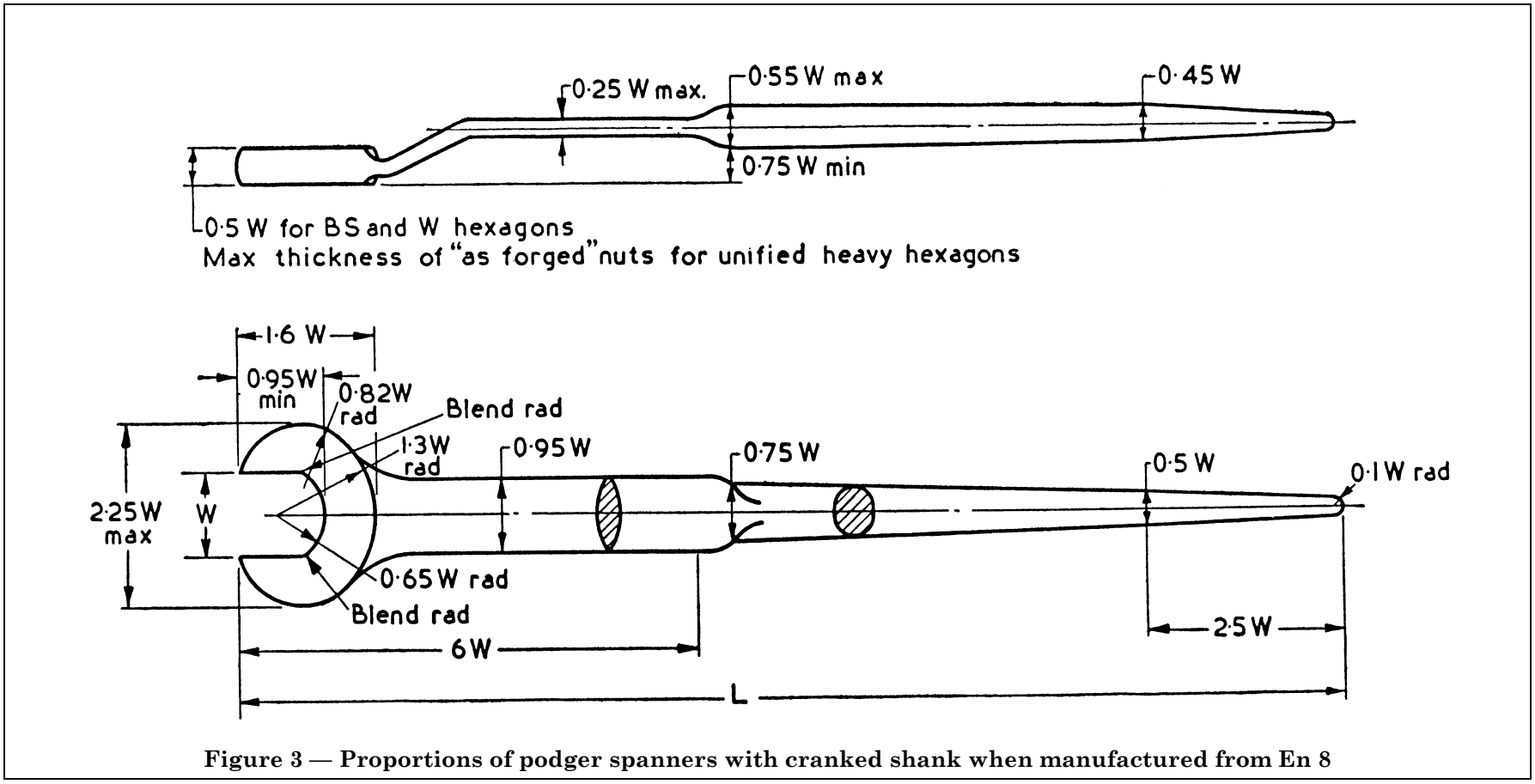


Figure 3 — Proportions of podger spanners with cranked shank when manufactured from En 8

Table 1 — Dimensions of podger spanners for BS 916 and BS 1083 hexagons and Whitworth large hexagons

All dimensions are in inches

1	2	3	4	5	6	7	8	9	10	11
Nominal size of spanner (bolt diameter)		Dimension across jaws W		Head dimensions				Turning moment for proof test lb in.	Overall length L	
				When made from En 3A		When made from En 8				
BS	W	Minimum	Maximum	Width	Thickness	Width	Thickness	Minimum	Maximum	Minimum
(BS 916 and BS 1083)	(Whitworth large)			Minimum	Maximum	Maximum	Maximum			
$^{3}/_{8}$	$^{5}/_{16}$	0.604	0.608	1.368	0.312	1.368	0.304	560	13.1	11.9
$^{7}/_{16}$	$^{3}/_{8}$	0.715	0.720	1.620	0.375	1.620	0.360	780	14.8	13.4
$^{1}/_{2}$	$^{7}/_{16}$	0.825	0.830	1.868	0.438	1.868	0.415	1 000	16.5	14.8
$^{9}/_{16}$	$^{1}/_{2}$	0.926	0.932	2.097	0.500	2.097	0.466	1 300	18.0	16.2
$^{5}/_{8}$	$^{9}/_{16}$	1.016	1.022	2.300	0.562	2.300	0.511	1 700	19.3	17.3
$^{11}/_{16}$	$^{5}/_{8}$	1.107	1.114	2.506	0.625	2.506	0.557	2 100	20.75	18.5
$^{3}/_{4}$	$^{11}/_{16}$	1.207	1.214	2.732	0.688	2.732	0.607	2 500	22.2	19.8
$^{7}/_{8}$	$^{3}/_{4}$	1.308	1.316	2.961	0.750	2.961	0.658	3 100	23.75	21.0
1	$^{7}/_{8}$	1.489	1.498	3.370	0.875	3.370	0.749	4 700	26.5	23.5
$1^{1}/_{8}$	1	1.680	1.690	3.802	1.000	3.802	0.845	7 000	29.5	24.0
$1^{1}/_{4}$	$1^{1}/_{8}$	1.871	1.882	4.234	1.125	4.234	0.941	10 000	32.3	28.5
$1^{3}/_{8}$	$1^{1}/_{4}$	2.062	2.074	4.666	1.250	4.666	1.037	15 000	35.25	31.0

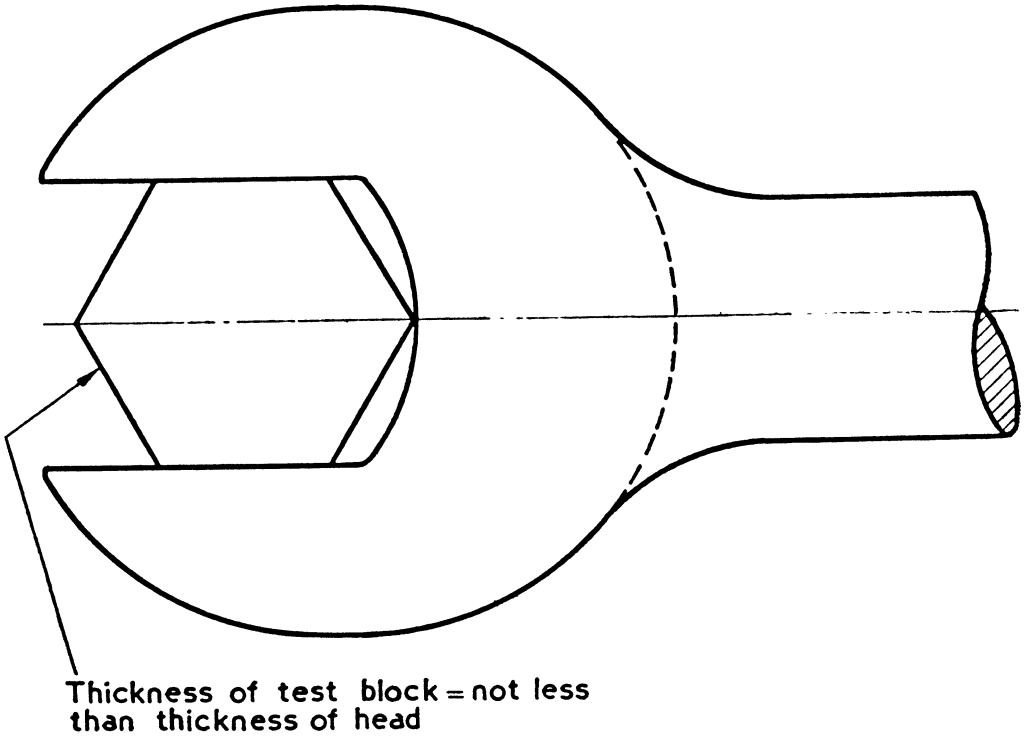
NOTE *Head thicknesses.* In Column 6 are same as Whitworth bolt diameter (for En 3A)
In Column 8 are 0.5W as on page 13 of BS 192. The W being that in Column 4 of this table (for En 8).
Head widths. Columns 5 and 7 are calculated from 2.25 W (W as in Column 4).

Table 2 — Dimensions of podger spanners for part of the range of BS 1769 unified black hexagons, heavy series

All dimensions are in inches

1	2	3	4	5	6	7	8	9
Nominal size of spanner (fractional dimension across flats)	Dimension across jaws W		Head dimensions		Turning moment for proof test lb in.	Overall length L		Nominal diameter of bolt in BS 1769 for which spanner is suitable
			Width	Thickness				
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	
$^{7}/_{8}$	0.880	0.885	1.991	0.520	1 300	17.3	15.5	$^{1}/_{2}$
$1^{1}/_{16}$	1.069	1.076	2.421	0.647	1 700	20.1	18.0	$^{5}/_{8}$
$1^{1}/_{4}$	1.258	1.266	2.848	0.774	2 500	23.0	20.5	$^{3}/_{4}$
$1^{7}/_{16}$	1.446	1.455	3.274	0.901	3 100	25.8	22.9	$^{7}/_{8}$
$1^{5}/_{8}$	1.635	1.645	3.701	1.028	4 700	28.7	25.4	1
$1^{13}/_{16}$	1.823	1.834	4.126	1.155	7 000	31.5	27.8	$1^{1}/_{8}$
2	2.012	2.024	4.554	1.282	10 000	34.4	30.3	$1^{1}/_{4}$
$2^{3}/_{16}$	2.201	2.214	4.981	1.409	15 000	37.2	32.8	$1^{3}/_{8}$

NOTE *Head widths.* In Column 4 are 2.25 W (the W of Column 3).
Head thicknesses. In Column 5 are equal to maximum thickness of "As forged" nuts in BS 1769, Table 2, Column 7.



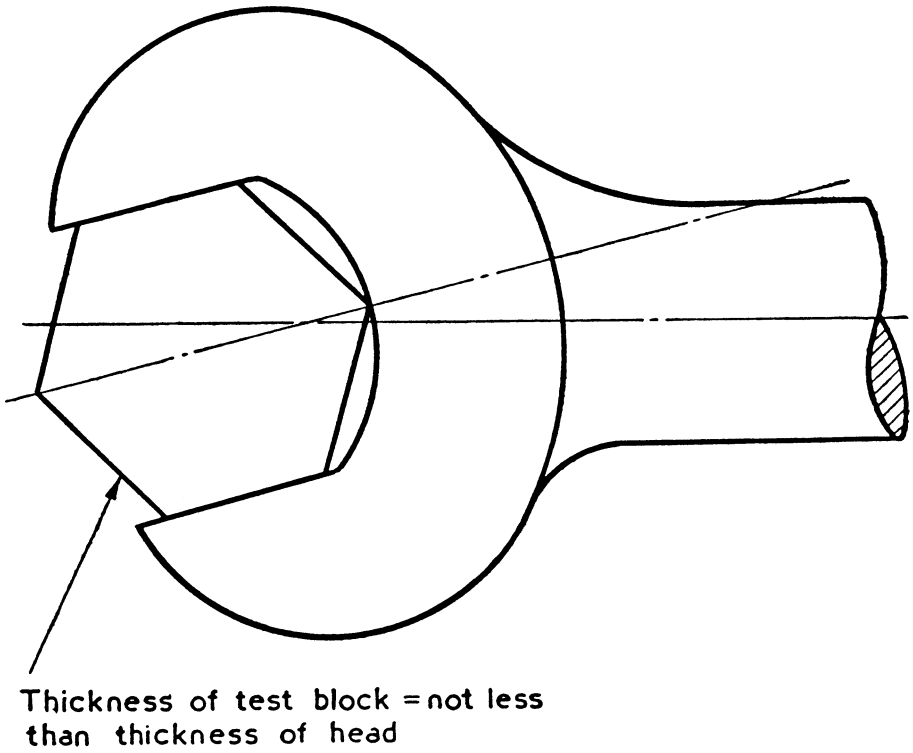


Figure 4 — Torque test. Location of test block

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