

Specifications for

Turnbarrels, tension rods and swaged cable-end connections for aircraft*

*Turnbarrels, tension rods and swaged cable-end connections in Unified sizes are covered by BS SP 101-104.

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Foreword

These British Standards are published by BSI Standards Limited, under licence from The British Standards Institution.

BS SP 33-39:1951+A5:2015 supersedes BS SP 33-39:1951+A4:2012, which is withdrawn.

The start and finish of text introduced or altered by Amendment No.4:2012 and Amendment No.5:2015 is indicated in the text by tags **A4** and **A4** and **A5** and **A5**. Minor editorial changes are not tagged. Previous amendments are not indicated.

CAUTION. BS SP 33-39 turnbarrels, tension rods and swaged cable connections have cadmium as a plating material that has been restricted and/or banned for use in many countries owing to environmental and health concerns; they should not be used in new product designs. Local officials should be consulted about any concerns on using cadmium plated parts.

These British Standards provide a tensioning device for aircraft control cables and a variable range of cable-end fittings as a safeguard against the crossing of controls. The turnbarrel and tension rod are designed to connect screwed end and tapped end fittings respectively: these in turn are swaged to cables.

For each load rating of cable, two alternative thread sizes are provided for the end fittings, each thread size having an alternative left-hand or right-hand thread. It is therefore possible to provide eight turnbuckle assemblies for any one load rating of cable in such a way that no control run can be crossed when all are assembled. Details of such an arrangement of the fittings, together with figures showing the dimensions of the assemblies, are given in the appendix to these British Standards.

This combined series of British Standards comprises the following seven standards:

BS SP 33, <i>Turnbarrels.</i>	BS SP 37, <i>Eye ends.</i>
BS SP 34, <i>Screwed ends.</i>	BS SP 38, <i>Fork ends.</i>
BS SP 35, <i>Tension rods.</i>	BS SP 39, <i>Eye ends for chain.</i>
BS SP 36, <i>Tapped ends.</i>	

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Summary of pages

These British Standards, having been approved by the Aircraft Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, were published under the authority of the General Council on 19 November 1951

This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 20 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
2399	February 1956	
4086	February 1961	
2753	November 1978	
A4	31 August 2012	See Foreword
A5	31 October 2015	See Foreword

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BS SP 33:1951+A5:2015

Turnbarrels

1 Material

The turnbarrels shall be manufactured from material complying with the requirements of the latest issue of one of the following British Standards:—

BS S 1, *35–45 ton carbon steel*.

^{A4} BS T 64, *Specification for carbon-manganese steel tube (550 N/mm²)*. ^{A4}

BS T 45, *45-ton steel tubes (suitable for welding)*.

^{A4} BS S 154, *Specification for 2 1/2 % nickel chromium molybdenum steel billets, bars, forgings and parts – (880–1080 MPa: limiting ruling section 150 mm)*.

Def-Stan 80-217, *Corrosion Preventive Compound: Soft Film, Cold Application NATO Code: C-614 Joint Services Designation: PX-1*. ^{A4}

2 ^{A4} Protective ^{A4} finish

The turnbarrels shall be cadmium plated in accordance with the latest issue of ^{A5} SAE AMS03-19 ^{A5} ^{A4} or BS EN 2133 ^{A4} ^{A5}, Class C ^{A5} and dipped in temporary rust preventive complying with the latest issue of ^{A4} Def Stan 80-217 ^{A4}.

3 Dimensions

The turnbarrels shall conform to the dimensions and tolerances specified in Table 1 where these relate to Figure 1. The data relating to Figure 2 are given for information only.

4 Screw threads

- a) *BSF*. All BSF threads shall be in accordance with the “free fit” limits and tolerances specified in BS 84, “*Screw threads of Whitworth form*.” The threads shall be required to pass gauges approved by the Inspecting Authority.
- b) *BA*. All BA threads shall have the thread form and pitches specified in the latest issue of BS 93, “*British Association (BA) screw threads with tolerances for sizes 0 BA to 16 BA*” The threads shall be required to pass gauges approved by the Inspecting Authority.

5 Identification and marking

- a) Turnbarrels with BSF threads shall have the appropriate code letter [see Clause 5 c)] marked on the unthreaded portion of the barrel, in the position indicated in Figure 1, without distortion of the barrel, with the letters “LH,” marked immediately below the code letter to indicate the end of the turnbarrel carrying the left-hand thread.
- b) Turnbarrels with BA threads shall be ^{A5} packed in bags or parcels ^{A5} which shall have the number of this British Standard and the appropriate code letter [see Clause 5 c)] clearly stated on the labels.
- c) The British Standard number shall not be applied to the turnbarrels, but shall be used for the purpose of specifying turnbarrels on drawings and for ordering the fittings. For example, the complete part reference number for a 1/4 in. BSF turnbarrel for ordering, etc., is ^{A5} SP33E ^{A5}, but the corresponding marking on the turnbarrel will be E.

BS SP 33:1951+A5:2015

Turnbarrels

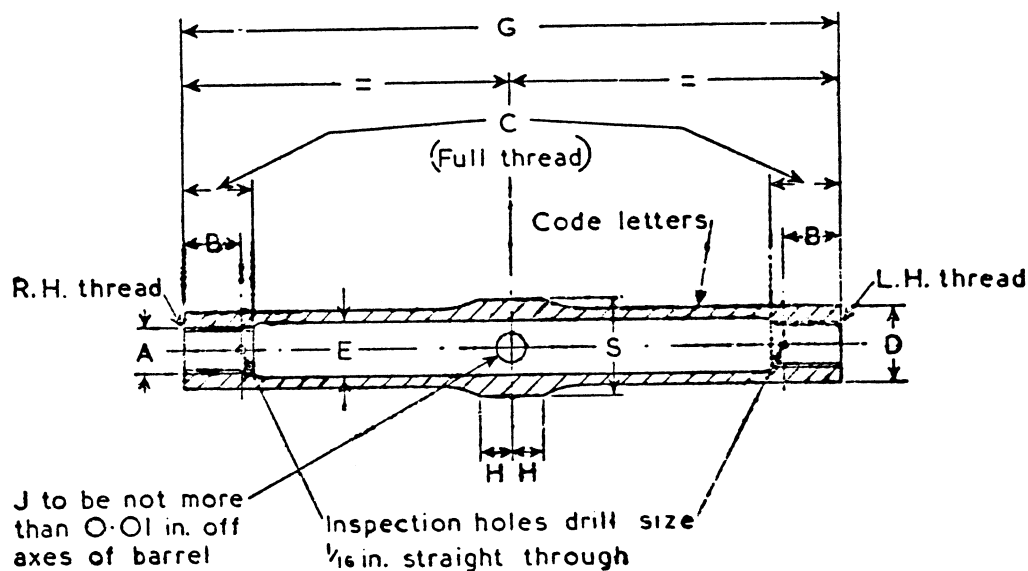
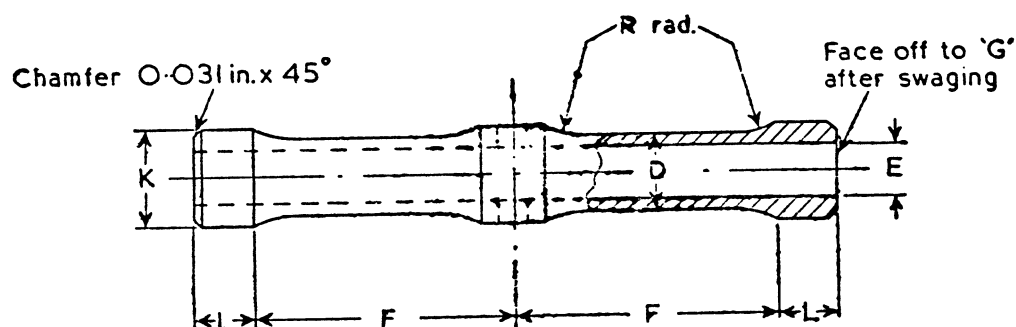


Figure 1



This view shows dimensions before swaging for thread and is for reference only (see Clause 3).

Figure 2

Table 1 — Dimensions of turnbarrels

Code letter	A	B +0.010 0	C min.	D 0 -0.005	E Drill	F 0 -0.05	G +0.020 0	H +0.010 0	J Drill ^a	K	L min.	R rad.	S 0 -0.005
B	4 BA	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
C	2 BA	0.20	0.25	0.250	$\frac{11}{64}$	0.75	1.91	0.100	$\frac{7}{64}$	0.300	0.20	0.50	0.312
E	$\frac{1}{4}$ in. BSF	0.25	0.30	0.312	$\frac{7}{32}$	1.38	3.26	0.125	No. 26	0.375	0.25	0.50	0.375
G	$\frac{5}{16}$ in. BSF	0.30	0.35	0.406	$\frac{9}{32}$	1.38	3.36	0.150	No. 26	0.500	0.30	0.75	0.500
		0.35	0.40	0.500	$\frac{11}{32}$	1.40	3.50	0.175	No. 26	0.600	0.35	0.75	0.625

^a No. 26 drill = 0.147 in.

BS SP 34:1951+A5:2015

Screwed ends

1 Material

The screwed ends shall be manufactured from material complying with the requirements of the latest issue of one of the following British Standards:—

BS S 94, *55-ton low alloy steel*.

^{A4} *Text deleted.* ^{A4}

BS S 114, *55-ton manganese-molybdenum steel*.

BS S 117, *55-ton, 1 per cent chromium steel*.

^{A4} BS S 154, *Specification for 2 1/2 % nickel chromium molybdenum steel billets, bars, forgings and parts – (880–1080 MPa: limiting ruling section 150 mm)*.

Def-Stan 80-217, *Corrosion Preventive Compound: Soft Film, Cold Application NATO Code: C-614 Joint Services Designation: PX-1.* ^{A4}

2 ^{A4} Protective ^{A4} finish

The screwed ends shall be cadmium plated in accordance with the latest issue of ^{A5} SAE AMS03-19 ^{A5} ^{A4} or BS EN 2133 ^{A4} ^{A5}, Class C ^{A5}.

3 Dimensions

The screwed ends shall conform to the dimensions and tolerances specified in Table 1.

4 ^{A5} Screw threads ^{A5}

a) *BSF*. All BSF threads shall be in accordance with the “medium fit” limits and tolerances specified in the latest issue of BS 84 “*Screw threads of Whitworth form*.” The threads shall be required to pass gauges approved by the Inspecting Authority.

b) *BA*. All BA threads shall have the “close class” thread form and pitches specified in the latest issue of BS 93, “*British Association (BA) screw threads with tolerances for sizes 0 BA to 16 BA*.” The threads shall be required to pass gauges approved by the Inspecting Authority.

5 Identification and marking

a) Screwed ends with BSF threads shall have the appropriate code letters [see Clause 5 c)] marked on the unthreaded and unswaged portion of the fitting, in the position indicated in Figure 1.

b) Screwed ends with BA threads shall be ^{A5} packed in bags or parcels ^{A5} which shall have the number of this British Standard and the appropriate code letters [see Clause 5 c)] clearly stated on the labels.

c) The British Standard number shall not be marked on the screwed ends, but shall be used for the purpose of specifying screwed ends on drawings and for ordering the fittings. For example, the complete part reference numbers for a ⁵/₁₆ in. BSF left-hand thread screwed end for swaging on a 20 cwt. cable is ^{A5} SP34G20L ^{A5} for ordering, etc., but the corresponding marking on the screwed end will be G20L.

BS SP 34:1951+A5:2015
Screwed ends

