
British Standard Specification for
**Rigging screws and turnbuckles for general
engineering, lifting purposes and pipe hanger
applications**

Ridoirs métalliques et manchons de serrage pour mécanique générale, applications de levage
et supports de tuyaux. Spécifications

Spannschrauben- und muttern für den Maschinenbau, Hebezeuge und Rohrleitungs- aufhängungen

Foreword

This revised British Standard has been prepared under the direction of the Mechanical Handling Standards Committee. BS 4429 was first issued in 1969 as a revision of BS 716 'Rigging screws and stretching screws for general engineering purposes' and BS 4013 'Rigging screws for shipping purposes and for guyed masts'. This revision of BS 4429 supersedes BS 4429 : 1969 which is withdrawn. It takes account of commercially accepted items and introduces a new range of hexagon-ended turnbuckles specifically for general engineering, lifting purposes and for pipe hanger applications. The safe working load (SWL) ratings for rigging screws and turnbuckles have been updated by 25 %. SWL values for pipe hanger turnbuckles take cognizance of work currently being undertaken in ISO/TC 5/SC 1.

Rigging screws are specified with combinations of screwed elongated eyes and screwed forks. Turnbuckles are specified with combinations of screwed elongated eyes, screwed forks or screwed hooks (hitherto the term 'stretching screw' was used). Reference should be made to BS 3974 : Part 1 for fittings for pipe hanger turnbuckles.

Rigging screws are normally supplied in the ungalvanized condition (i.e. self-coloured) but the purchaser has the option of ordering rigging screws in the hot dip galvanized condition, provided this is stated on his enquiry and order. The reverse applies to turnbuckles, which are normally supplied in the hot dip galvanized condition, with the purchaser having the option to order self-coloured turnbuckles (see appendix A).

It is sometimes desirable to fit the threaded shanks of rigging screws and turnbuckles with lock-nuts to prevent possible slacking back, particularly where vibration occurs. It is pointed out that, if lock-nuts are fitted, dimension H (closed) will be increased by twice the thickness of one nut.

Details of the information that should be supplied with any enquiry and order are given in appendix A.

This standard is based on a design study carried out at the National Physical Laboratory and funded by the Health and Safety Executive.

Two reports covering this design study are available from the National Physical Laboratory, Teddington, Middlesex TW11 0LW entitled:

'NPL Report DMA (A) 108 The technical background to the revision of BS 4429 : 1969 Rigging screws and turnbuckles', by T.A.E. Gorley; and

'NPL Report DMA (A) 125 The effects of tolerances on the technical background of rigging screws, turnbuckles and associated components in the revision of BS 4429 : 1969', by T.A.E. Gorley.

This design study was supplemented by actual testing of components at the laboratories of the Health and Safety Executive. A report by the Health and Safety Executive, reference IR/L/ME/86/23, entitled 'Tests to failure of rigging screw and turnbuckle components — revision of BS 4429' gives the results of proving tests carried out on components made to this British Standard.

The Secretary of State for Industry accepts no responsibility for loss or damage arising from the use of the recommendations made in the report except to the extent that such loss or damage arises from the negligence of the Secretary or his servants or agents.

In this standard, attachments having screwed ends are geometrically similar throughout their respective ranges, taking account of commercial considerations. The screwed elongated eyes of these rigging screws have been proportioned to accept higher tensile steel shackles.

The terms 'British Standard rigging screw' or 'British Standard turnbuckle' should be taken as applying only to those rigging screws, turnbuckles and attachments which comply with this British Standard.

A new appendix B entitled 'Notes on design' has been added giving recommendations on the geometric formulae to be applied when sizes not covered by this standard are required.

A new appendix C has also been added in this revision covering the selection, application and use of rigging screws and turnbuckles.

Whilst this standard is for general engineering, lifting and pipe hanger purposes it is recognized that the items covered may also be specified for other uses such as rigging of masts, etc. Whilst the information given in this standard applies, particular precautions should be taken in respect of exterior environmental conditions, oscillation/vibration caused by high winds, etc.

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



Amendment No. 1
published and effective from 30 June 1989
to BS 4429 : 1987

**Specification for rigging screws and turnbuckles
for general engineering, lifting purposes and
pipe hanger applications**

Corrections

AMD 5875
June 1989

Figure 3. Hexagon-ended open body for turnbuckles
Delete the existing figure and substitute the following.

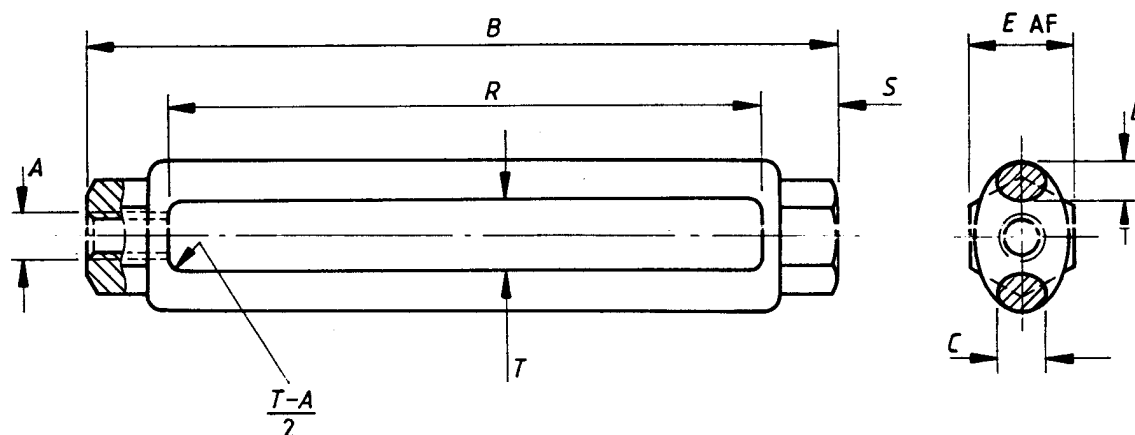


Figure 3. Hexagon-ended open body for turnbuckles

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June 1989

Figure 5. Screwed elongated eye
Delete the existing figure and substitute the following.

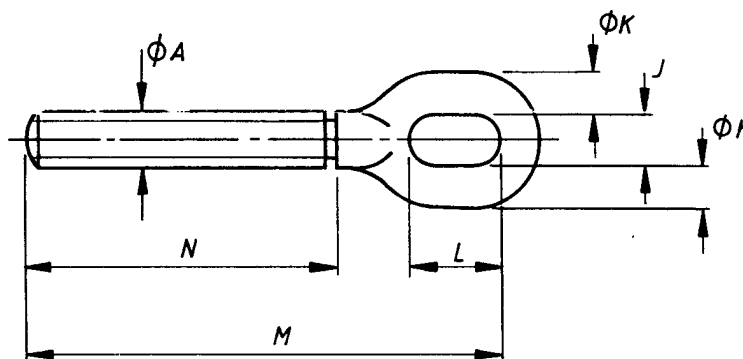


Figure 5. Screwed elongated eye

Figure 7. Screwed trapezoidal hook for turnbuckles
Delete the existing figure and substitute the following.

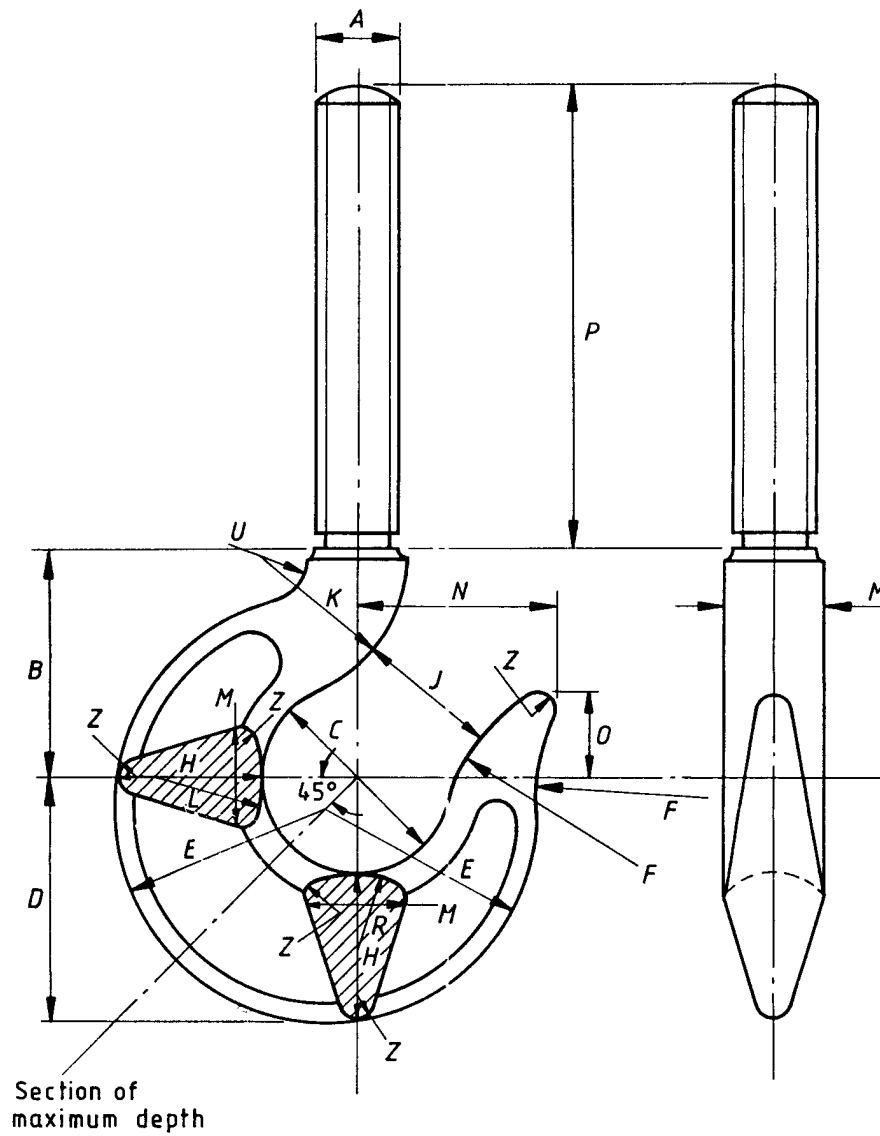


Figure 7. Screwed trapezoidal hook for turnbuckles

Contents

	Page		Page
Foreword		Inside front cover	
Committees responsible		Back cover	
Specification		Section four. Specific requirements for attachments	
Section one. General requirements		4.1 General	12
1.1 Scope	2	4.2 Screwed elongated eyes	12
1.2 Definitions	2	4.3 Screwed forks	13
1.3 Lifting applications	2	4.4 Screwed trapezoidal hooks	14
1.4 Size	2	4.5 Lock-nuts	14
1.5 Tolerance on dimensions	2	Appendices	
1.6 Heat treatment	2	A Information to be supplied by the purchaser with the enquiry and order	17
1.7 Hot dip galvanizing	2	B Notes on design	17
1.8 Screw threads	2	C Selection, application and use of rigging screws and turnbuckles for lifting applications	17
1.9 Freedom from defects	2	Tables	
1.10 Proof loading	2	1 Recommended maximum sizes of marking stamps	3
1.11 Marking	3	2 Tubular bodies for rigging screws	5
1.12 Test certificate	3	3 Open and closed dimensions (<i>H</i>) and safe working loads for rigging screws	7
Section two. Specific requirements for rigging screws		4 Hexagon-ended open bodies for turnbuckles	9
2.1 General	4	5 Open and closed dimensions (<i>H</i>) and safe working loads for turnbuckles	11
2.2 Tubular body	4	6 Screwed elongated eyes	12
2.3 Workmanship	4	7 Screwed forks (supplied complete with bolt and nut)	14
2.4 Attachments	4	8 Screwed trapezoidal hooks for turnbuckles	16
2.5 Types of rigging screw	5	9 Types of defect found in in-service inspections and actions to be taken in the event of a defect	18
2.6 Open and closed dimensions	5	Figures	
2.7 Safe working loads	5	1 Tubular body for rigging screws	4
Section three. Specific requirements for turnbuckles		2 Types of rigging screw	6
3.1 General	8	3 Hexagon-ended open body for turnbuckles	8
3.2 Designation	8	4 Types of turnbuckle	10
3.3 Open body	8	5 Screwed elongated eye	12
3.4 Workmanship	8	6 Screwed fork	13
3.5 Attachments	8	7 Screwed trapezoidal hook for turnbuckles	15
3.6 Types of turnbuckle	9		
3.7 Open and closed dimensions	9		
3.8 Safe working loads	9		

Specification

Section one. General requirements

1.1 Scope

This British Standard specifies materials, components, dimensions, finishes and tests for rigging screws and turnbuckles of the following types and nominal sizes for both lifting and non-lifting applications.

Rigging screws : 8 mm to 100 mm, size of screw thread

Turnbuckles, : 8 mm to 72 mm, size of screw thread

series no. 1,

series no. 2 and

pipe hanger

applications

Lock-nuts are also covered (see section four).

Attachments for turnbuckles for use in pipe hanger applications are excluded from this British Standard (see BS 3974 : Part 1).

NOTE. The titles of the publications referred to in this standard are listed on the inside back cover.

1.2 Definitions

For the purposes of this British Standard, the following definitions apply.

1.2.1 rigging screw. A tubular body internally threaded at each end, with one right-hand and one left-hand thread, having attachments of required form, i.e. screwed eyes or screwed forks.

1.2.2 turnbuckle. An open body consisting of reins, with bosses at each end and internally threaded at each end, with one right-hand and one left-hand thread, having attachments of required form, e.g. screwed eyes, screwed forks, screwed hooks, or for use, without attachments, for pipe hanger applications.

1.3 Lifting applications

Only rigging screws and turnbuckles that are marked with the appropriate safe working load (see 1.11) after proof loading (see 1.10) shall be used for lifting applications.

1.4 Size

The size of the rigging screw or turnbuckle shall be the diameter *A*, in millimetres, of the screwed shank in accordance with tables 2 to 8 inclusive.

1.5 Tolerance on dimensions

When components are manufactured by the drop forging process, the tolerances on dimensions, etc. shall be quality F as specified in BS 4114.

When hand forged, the variation from any of the dimensions given in the tables of this standard shall not exceed $\begin{matrix} +7.5 \\ -0 \end{matrix} \%$.

When swaging is involved in the forming of a rigging screw body, the dimensions shall comply with 2.3. Tolerances on screw threads are given in 1.8.

1.6 Heat treatment

After completion of all forging operations and before machining, all components shall be hardened and tempered with the exception of screwed elongated eyes and screwed forks of size M64 and over (see 4.2.1 and 4.3.1).

1.7 Hot dip galvanizing

1.7.1 Rigging screws

All components of all rigging screws shall normally be supplied in the self-coloured condition.

NOTE. If rigging screws are required in the hot dip galvanized condition, this should be stated on the enquiry and order (see appendix A) and should be in accordance with BS 729.

1.7.2 Turnbuckles

All components of all turnbuckles, with the exception of the screw threads, shall normally be supplied in the hot dip galvanized condition in accordance with BS 729.

NOTE. If turnbuckles are required in the self-coloured condition this should be stated on the enquiry and order (see appendix A).

1.8 Screw threads

The screw threads of the bodies of rigging screws and turnbuckles and their attachments shall comply with BS 3643 : Part 2, coarse pitch series, class 7H/8g (free fit).

For sizes M72 and over, a constant pitch series of 6 mm shall be used.

1.9 Freedom from defects

Each component of the completed rigging screw/turnbuckle shall be carefully examined before assembly and shall be free from any visible flaw or defect.

1.10 Proof loading

The testing machine used for proof loading shall have been verified in accordance with BS 1610 : Part 2 and maintained within grade 2.0 as specified in BS 1610 : Part 1.

Each complete rigging screw or turnbuckle to be used for lifting purposes shall, after manufacture, heat treatment and assembly, be subjected to a proof load equal to twice the safe working load (see tables 3 and 5) which it shall withstand without showing signs of permanent deformation. Each item to be tested shall be in the fully extended (open) position, in the manner in which the working load is applied in service.

After removal of the proof load, each rigging screw or turnbuckle shall be dismantled and thoroughly examined by a competent person and shall be accepted only if found to be free from visible flaws or defects.

NOTE. In the cases of rigging screws or turnbuckles that are not to be used for lifting purposes the proof loading is optional and is to be carried out only if specified by the purchaser on his enquiry and order (see appendix A).