

Specification for
Ships' derrick fittings

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Foreword

This British Standard has been prepared under the direction of the Shipbuilding and Marine Standards Committee and is based on a proposal of the British Ship Research Association.

The proliferation of designs of ships' derrick fittings in the UK to date has been the direct result of individual design and manufacturing practices operated by UK shipbuilders within the general guide-lines specified by the Regulatory Bodies. Among overseas shipbuilding countries, national standards were available and consequently the variation in basic design was not so great as in the UK, although in some instances dimensional variations still occur. In order to resolve this situation, the International Organization for Standardization (ISO) has scheduled a programme of work by Technical Committee ISO/TC 8/SC 2, Ships' cargo handling appliances.

Draft proposals for the standardization of some derrick fittings are at an advanced stage within ISO and these are based on a continental design. Since there are basic design differences between the continental methods and the UK methods, it has been necessary in the interest of International Standardization to introduce certain features of the continental designs into this standard, except for those instances where for economic and manufacturing reasons it was considered more beneficial to adhere to UK practices.

This standard should be used in association with the companion standard BS MA 83¹⁾.

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 ii, pages 1 to 16 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.

¹⁾ In course of preparation.

NOTE Users of this British Standard Marine Series should note that while observing the requirements of this standard, they should at the same time ensure compliance with such statutory requirements, rules and regulations as may be applicable to the individual ship concerned.

1 Scope

This British Standard specifies dimensions and recommends materials for ships' derrick fittings suitable for axial or permissible loads ranging from 1.6 t to 40 t inclusive.

Excluded from this standard are:

- a) the specification for tubular derrick booms, for which reference should be made to BS MA 83²⁾;
- b) the specification for securing bolts for the attachment of the cargo blocks to the heel blockholder or topping swivel, where special types of bolts with spring adjusters are sometimes used.

2 References

This standard makes reference to the following standards publications.

BS 499, *Welding terms and symbols — Part 2: Specification for symbols for welding.*

BS 970, *Wrought steels in the form of blooms, billets — Part 1: Carbon and carbon manganese steels including free cuttings steels.*

BS 1486, *Lubricating nipples — Part 1: Lubricating nipples and adaptors for use on machinery and vehicles.*

BS 1574, *Split cotter pins — metric and inch series.*

BS 4320, *Metal washers for general engineering purposes.*

BS 4360, *Specification for weldable structural steels.*

BS 5135, *Metal-arc welding of carbon and carbon manganese steels.*

BS MA 10, *Oval eyeplates.*

BS MA 48, *Code of practice for design and operation of ships' derrick rigs.*

BS MA 83, *Specification for tubular derrick booms*²⁾.

3 Terminology and descriptions

For the purposes of this standard the following terminology applies.

NOTE 1 Reference should be made to Figure 1, which gives an illustrated location of the fittings described below for a typical derrick rig arrangement.

NOTE 2 Figure 2 and Figure 3 respectively give detailed arrangements of the gooseneck bearing assembly and the topping swivel assembly shown in outline in Figure 1.

3.1

head fittings (see Figure 4)

a double-ended eyeplate located near the free end of the boom and penetrating through the boom on the vertical centreline. The derrick head cargo block is attached to the lower part of the head fitting and the derrick head span block is attached to the upper part. For guy pendant connections, a head fitting is fitted through the boom on the horizontal centreline

NOTE The types of head fittings used on derricks are often referred to as sword fittings.

3.2

heel fitting (see Figure 5)

a forked fitting welded into the lower end of the boom for connecting to the gooseneck pin. The fork permits the boom to be raised or lowered in a vertical direction (topped)

3.3

heel cross-pin (see Figure 6)

the pin for securing the derrick boom via the heel fitting to the gooseneck pin

3.4

gooseneck pin (see Figure 7)

a pin having a spade end and eye located at the top which connects with the forked heel fitting on the derrick boom. The centreline of the eye in the spade end is either in-line with the vertical centreline of the pin, i.e. straight type, or offset from the pin centreline away from the supporting structure towards the derrick boom, i.e. cranked type
the gooseneck pin is free to revolve in its bearing bracket and thus permits the boom to be slewed

3.5

gooseneck bearing bracket (see Figure 8)

a fabricated bracket welded to the ship's mast, samson post, or superstructure, and having an upper and lower bearing into which the gooseneck pin fits

²⁾ In course of preparation.

3.6

heel blockholder (see Figure 9)

a thick steel ring incorporating either a single or double lug with drilled eye(s). The blockholder fits into the interspace between the upper and lower bearings on the bearing bracket and is free to rotate on the gooseneck pin. The cargo runner derrick heel lead block is secured to the lug(s) by means of a through pin or bolt

3.7

retaining ring with pin for goosenecks

(see Figure 10)

a steel ring fitting under the blockholder in the interspace between the upper and lower bearings on the bearing bracket. By means of a through pin, it is secured to the gooseneck pin and prevents this from being lifted out of the bearings. It also serves as a distance piece, in that, together with the heel blockholder, it makes up the vertical distance between the upper and lower bearings

3.8

topping swivel and locating pin (see Figure 11)

a similar type of fitting to the heel blockholder (3.6) but located high up on the mast or samson post for the purpose of raising or lowering (i.e. topping) the derrick boom. The swivel has a spade end with a drilled eye for securing the mast head span block. The swivel is located in the bearing bracket by means of a vertical locating pin

3.9

topping swivel bearing bracket (see Figure 12)

a fabricated support bracket attached to the mast or samson post

4 Axial and permissible loads

4.1 The axial and permissible loads shall be determined, from the safe working load (SWL) of the rig (but see note), in accordance with BS MA 48. The load capacity of the particular fitting selected, whether on the basis of axial thrust load or permissible load, shall not be less than the maximum load that will be exerted on the fitting, as determined by calculation.

NOTE The calculated load (axial or permissible) exerted on the individual fitting should not be regarded as the safe working load (SWL) of the complete rig, which will have to be determined according to the type of rig, purchase effects, effective boom length, suspension height, etc. Reference should be made to BS MA 48 for guidance on the design of complete rigs and the evaluation of the resulting loads in the various component fittings.

4.2 The derrick fittings detailed in Figure 4, Figure 8, Figure 9, Figure 11 and Figure 12 are not designated by nominal size, but by the permissible load that shall not be exceeded on the eye of the fitting.

5 Nominal sizes

The nominal size designations of the derrick fittings given in the tables of Figure 5, Figure 6 and Figure 7 are for reference purposes and shall be selected according to the axial thrust load in the derrick boom.

6 Materials

Recommended materials are listed in Table 1. Materials shall be suitable in all respects for the intended duty and shall be equally acceptable to the purchaser and Statutory Authority concerned.

Table 1 — Recommended materials

Part	Component	BS Specification
Derrick boom attachments	Head fittings	BS 4360 grade 43A ^a
	Heel fittings	
Gooseneck bearing assembly	Steel plate	BS 4360 grade 43A ^a
	Bearings	BS 970 070M20 <i>or</i> BS 4360 grade 43A ^a
	Gooseneck pins	
	Heel blockholders	
	Retaining rings	
	Heel cross-pins	
	Retaining pins	BS 970 070M20
	Washers	BS 4320
	Split cotter pins	BS 1574
Topping swivel assembly	Steel plate	BS 4360 grade 43A ^a
	Swivel	BS 970 070M20 <i>or</i> BS 4360 grade 43A ^a
	Locating pin	BS 970 070M20
	Washers	BS 4320
	Split cotter pins	BS 1574

^a Shipbuilding quality steel plate may be used provided that it is of equivalent mechanical and weldable properties.

7 Construction and quality of manufacture

7.1 General. The fittings shall be constructed by fabricating, forging, profiling, and machining, as necessary, and shall comply with the form and dimensions specified for the appropriate fitting in Figure 2 to Figure 12. The fittings shall be free from any flaws that could precipitate failure when under loaded conditions.

To avoid stress concentrations, corners shall be well rounded.

7.2 Welding. Where fittings are fabricated, the welding shall be carried out in accordance with BS 5135. The stress in any weld shall not exceed 85 N/mm².

NOTE The welding symbols shown in the figures of this standard are in accordance with BS 499-2, and the associated dimensions are expressed in terms of weld throat thickness and *not* leg length.

Weld sizes for the attachment of the gooseneck and topping brackets to the ship's structure have been omitted from Figure 8 and Figure 12 as the weld size may vary, depending upon whether the brackets are mounted on to a curved or flat surface, and the actual area of metal-to-metal contact. In these cases, it shall be the responsibility of the shipbuilder to determine the weld size for the particular installation.

7.3 Flame cutting. Where fittings are profiled to shape by flame cutting, care shall be taken to ensure that an acceptable surface finish is obtained, or that surfaces are ground or machined as necessary. Wherever possible, the fibre direction of the plate shall be in the direction of the greatest stress.

7.4 Moving parts. All moving parts shall be adequately greased on assembly.

NOTE Reference should be made to Figure 2 and Figure 3 for illustrations and notes for the gooseneck bearing assembly and topping swivel assembly respectively.

8 Testing, inspection and certification

Lifting equipment shall comply with certain statutory requirements specified by the Docks Regulations, 1934, and reference shall be made to these Regulations, an extract from which is given in BS MA 48.