

Specification

High pedestal or portal jib cranes

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Aluminium Development Association	Engineering and Allied Employers' National Federation
Association of Crane Makers	Excavator Manufacturers' Association
British Constructional Steelwork Association	Federation of Civil Engineering Contractors
Cable Makers' Association	Institute of Welding
Chamber of Shipping of the United Kingdom	Institution of Engineering Inspection
D.S.I.R.—Building Research Station	Institution of Structural Engineers
Dock and Harbour Authorities Association	National Federation of Building Trades Employers
Docks and Inland Waterways, British Transport Commission	

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Contents

	Page
Co-operating organizations	Inside front cover
Foreword	iii
1 Scope	1
2 Information to be supplied with enquiry or order	1
3 Information to be supplied by manufacturer	1
4 Materials	1
5 Service conditions	1
6 Radius — Load indication	1
7 Classification and duty	3
8 Permissible stresses	3
9 Slewing	3
10 Wind <i>Text Deleted</i>	3
11 Stability	3
12 Crane structure <i>Text Deleted</i>	3
13 Structural sections	3
14 Minimum sections	3
15 Jibs	3
16 Struts, including jibs	3
17 Plate girders	4
18 Braced or lattice girders	4
19 Working stresses in structure (excluding struts) <i>Text Deleted</i>	4
20 Joints	5
21 Rivet spacing <i>Text Deleted</i>	5
22 Rivets and bolts <i>Text Deleted</i>	5
23 Fusion welding <i>Text Deleted</i>	5
24 Bolts, other than those used in crane structure, and set screws	5
25 Supports for the slewing part of the crane	5
26 Wire ropes	6
27 Rope drums	6
28 Rope pulleys	7
29 Lifting hooks	7
30 Shackles	7
31 Overhauling weight	7
32 Gearing	7
33 Gear boxes	8
34 Shafts and axles	8
35 Keys and keyways	8
36 Bearings	8
37 Travelling wheels	8
38 Carriage buffers	8
39 Crane anchoring	9
40 Guarding	9
41 Lubrication	9
42 Ladders and platforms	9
43 Driver's cabin and machinery house	9
44 Grabbing	9
45 Brakes	10
46 Electric braking	11

	Page
47 Brake magnets	11
48 Electric motors	12
49 Controllers and resistors	12
50 Controls	12
51 Electrical protective gear	12
52 Main, emergency and isolating switches	13
53 Limit switches	13
54 Cables and wiring	13
55 Collector rings	14
56 Main supply	14
57 Wiring diagram	14
58 Lighting	14
59 Heaters	14
60 Earthing	14
61 Insulation	14
62 Testing	14
63 Painting	15
64 Identification	15
Appendix A Information desirable to be supplied with enquiry of order	16
Appendix B Information to be supplied by manufacturer	17
Appendix C List of British Standards for materials and equipment to be used in the manufacture of cranes	19
Appendix D Load capacity of gears	20
Appendix E Factories Acts legislation affecting cranes in Great Britain	21
Appendix F Customary types of grabs	21
Appendix G Design of struts <i>Text Deleted</i>	21
Figure 1 — Types of high pedestal or portal jib cranes	1
Figure 2 — Types of high pedestal or portal jib cranes	2
Figure 3 — Types of high pedestal or portal jib cranes	2
Figure 4 — Clearance diagram	22
Figure 5 — Track rail	22
Table 1 — Diameter of rope drums and pulleys	6
Table 2 — Brake magnet ratings	11
Table 3 — Brake magnet operating currents	11

Foreword

This standard makes reference to a number of British Standards which are listed in Appendix C.

This British Standard forms one of a number of standards relating to jib cranes, others being for low carriage jib cranes and mobile cranes.

It indicates the minimum requirements for electrically driven jib cranes, either fixed or movable, other than those covered by BS 327-1 and BS 327-3, BS 357 or BS 1757. It therefore covers the types frequently referred to as “wharf” or “dockside” cranes.

As with other British Standards for cranes, the object of the specification is to ensure reliability and safety, without placing restrictions on the general design of cranes or the methods employed in their construction.

Appendix E contains a list of Factories Acts legislation affecting cranes in Great Britain.

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 to iv, pages 1 to 22, 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.

1 Scope

This specification applies to electrically driven jib cranes of the following types, mounted on a high pedestal or portal carriage:—

Type A. Level luffing.

Type B. Derricking.

Type C. Fixed radius.

It does not apply to the cranes dealt with in BS 327-1¹⁾ or BS 327-3²⁾ or BS 357³⁾ or BS 1757⁴⁾.

Figure 1 to Figure 3 illustrate some of the types of crane to which the standard applies.

2 Information to be supplied with enquiry or order

All information regarding the conditions under which the crane is to be used, together with the particulars required to complete Appendix A, should be supplied with the enquiry or order.

3 Information to be supplied by manufacturer

The manufacturer shall supply to the purchaser the information regarding the construction of the crane required to complete Appendix B.

4 Materials

As far as is practicable, the materials used in the construction of the crane shall comply with the British Standards given in Appendix C.

No timber shall be used in any stress bearing part of the crane structure.

5 Service conditions

The crane shall be deemed to be under service conditions when it is operating without load or with a load up to and including the safe working load, and shall include, in the case of outdoor cranes, the load imposed by the wind pressure as specified in BS 2573-1.

6 Radius — load indication

The crane shall bear a legible and permanent inscription naming the safe working load (S.W.L.) or loads, the radii appropriate thereto, and the BS class of crane 2, 3 or 4 (see Clause 7).

For cranes of variable radius, separate clear indication of the permissible loads at the various radii shall be given by means of an indicator, which shall be in full view of the operator.

When change-speed gear is used for the hoisting motion a corresponding safe working load for each speed shall be indicated.

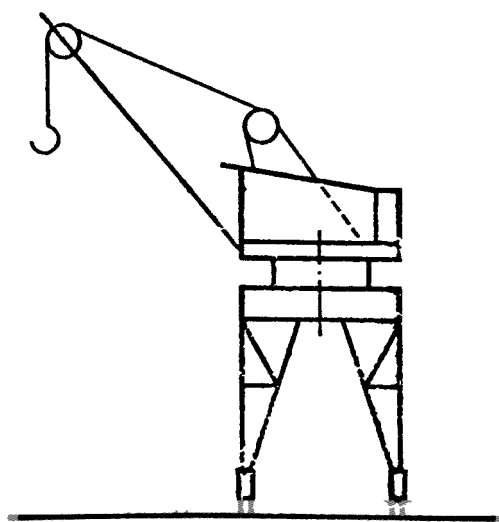


Figure 1 — Types of high pedestal or portal jib cranes

¹⁾ BS 327-1, "Power-driven derrick cranes".

²⁾ BS 327-3, "Power-driven rail mounted derrick and tower derrick cranes" (in course of preparation).

³⁾ BS 357, "Travelling jib cranes (contractor's type)".

⁴⁾ BS 1757, "Power-driven mobile cranes".

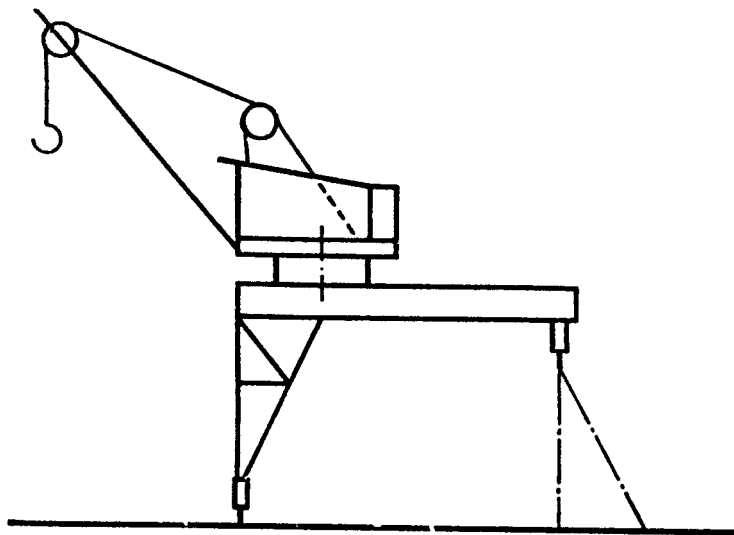


Figure 2 — Types of high pedestal or portal jib cranes

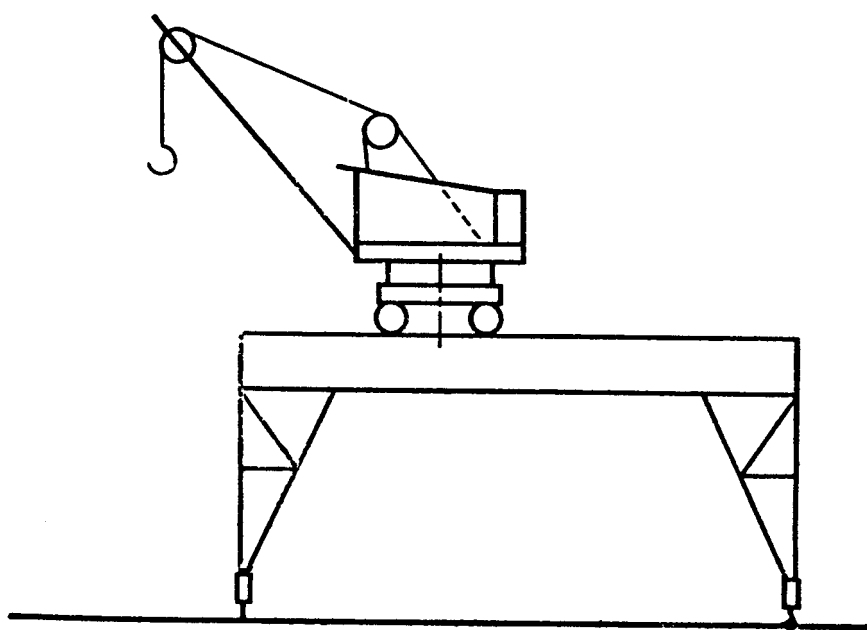


Figure 3 — Types of high pedestal or portal jib cranes

7 Classification and duty

This British Standard covers the design and construction of Classes 2, 3 and 4 cranes and the duty related to each of these classes is given below. For the purpose of computing permissible stresses, BS 2573 divides cranes into these same classes.

Class	Maximum number of hours in use per year (for design purposes)	Description of duty
2	2 000	Medium duty for general use
3	3 000	Heavy duty — intermittent grabbing and magnet work
4	Greater than 3 000	Extra heavy duty — continuous grabbing and magnet work

NOTE The previous Classes 1, 2 and 3 have been superseded by the Classifications 2, 3 and 4 respectively which have been adopted to align with BS 2573.

8 Permissible stresses

The structure of the crane shall comply with BS 2573-1:1960.

The factor of safety for all other parts of the crane shall be not less than 5, with the exception of gearing and wire ropes, for which see Clauses 26 and 32.

9 Slewing

The acceleration and retardation of the slewing motion at the jib head when the crane is working at the radius at which the maximum stress is induced shall be assumed to be not less than the following:—

$$\text{Class 2. } \frac{V}{240}$$

$$\text{Class 3. } \frac{V}{200}$$

$$\text{Class 4. } \frac{V}{160}$$

where V is the rated slewing speed in feet per minute at the jib head and at the radius under consideration.

The value for the acceleration and retardation shall not, in any case, be taken as less than 2 ft/sec/sec.

The slewing speed at the jib head should not normally exceed 750 ft/min.

10 Wind

Text Deleted

⁵⁾ This is also known as the “equivalent length”.

11 Stability

Class 2 and Class 3 cranes shall not tip with less than 1.75 times, and Class 4 cranes with less than twice the safe working load at its maximum radius with not less than 5 lb/sq.ft. wind pressure.

The crane shall not tip either under storm conditions (see BS 2573) or with the jib removed.

These conditions shall be fulfilled without depending on the use of anchoring devices.

Where possible the vertical projection of the centre of gravity of the revolving superstructure shall be kept inside the horizontal rollerpath for all service conditions.

12 Crane structure

Text Deleted

13 Structural sections

Wherever practicable the rolled steel sections used in the work shall be in accordance with the appropriate British Standards.

14 Minimum sections

Plates, flat bars or angles used in the load-bearing members of the structure shall be not less than $\frac{5}{16}$ in. thick.

15 Jibs

The jib feet and the members by which they are connected to the revolving bedplate shall be of steel. Spigoted bearings of steel with bushes or of cast iron may be inserted into the jib feet to diminish the intensity of bearing pressure.

Diaphragm braces shall be provided for stiffening the jib when the jib is of lattice construction.

With jibs derricked by ropes buffer stops shall be provided, wherever practicable, just inward of the minimum radius.

16 Struts, including jibs

The slenderness ratio, $\frac{l}{k}$, for any strut shall be

obtained by dividing the effective length,⁵⁾ l , of the strut in inches by the appropriate radius of gyration, k , in inches. For pin-jointed struts of tapered or parabolic form the value of k shall be the least radius of gyration within the middle third of the length.