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Mobile cranes — Presentation of rated capacity charts

Grues mobiles — Présentation des tableaux de charges



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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11661 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 6, *Mobile cranes*.

Annex A of this International Standard is for information only.

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Mobile cranes — Presentation of rated capacity charts

1 Scope

ISO 11661 specifies a standard presentation or format for mobile crane rated capacities on rated capacity charts.

This International Standard is applicable to mobile cranes fitted with jibs as defined in ISO 4306-2 and when used in the lifting mode.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 4306-2:1994, *Lifting appliances — Vocabulary — Part 2: Mobiles cranes*.

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 4306-2 and the following apply.

3.1

crane rating manual

collection of all pertinent rated capacity charts, working area diagrams, range diagrams, tables, warning notes, illustrations and other information required by the manufacturer

3.2

rated capacity chart

tabulation detailing a crane's lifting capacities, set-up and operational notes for a specific jib combination and crane supports

3.3

range diagram

side elevation view of the crane depicting the heights and radii for all useable jib and jib/fly-jib combinations

NOTE It may also depict areas of instability.

3.4

working area diagram

plan (top) view of the crane depicting working areas and operating limitations in these areas

4 Rated capacity — Chart presentation

4.1 Data required

4.1.1 The following is a list of the minimum information to be included of each rated capacity chart:

- a) crane manufacturer's model to which the ratings apply;
- b) counterweight(s) required for use of the ratings (non-removable counterweight information need not be included);
- c) jib or fly-jib type for which ratings apply;
- d) set-up configuration for which ratings apply, i.e. on crawlers, outriggers or tyres;
- e) maximum reaction of outrigger at rated capacity;
- f) any special restrictions unique to the use of the ratings;
- g) may be used to show set-up and/or jib or fly-jib configuration in c) and d).

4.1.2 A sufficient number of rated capacity charts shall be provided to clearly define the rated capacity of the crane.

4.1.3 A method of presenting the required capacity information is presented in table 1.

Table 1 — Rated capacity presentation

Load radius m	Loaded jib angle degrees	Jib length			
		360°	Over side	Over rear	Over front

4.1.4 Set-up and operational notes, definitions and illustrations should be provided to explain any terminology or specifications associated with the rated capacity charts presented. These are to be included at one location in the manual, unless warning notes peculiar to a specific configuration are to be included on the same page or in the same section as the chart (see 4.6).

4.1.5 The manufacturer may deviate from the rated capacity chart format. One example is where rated capacity columns for 360°, over side, over rear, or rear, or over front may be combined or omitted as applicable.

4.1.6 Rating numbers need have no more than three significant figures.

NOTE The rating units provided may be SI or SI and imperial units, as requested by the customer. Ratings may be in kilograms or tonnes depending upon what is most appropriate for the size of the crane.

4.1.7 Ratings limited by structural strength or load bearing limitations shall be separated from stability ratings by a bold line (or an equivalent means).

4.1.8 Minimum jib angle and maximum jib length for a no-load condition for a given attachment configuration and machine set-up shall be noted on the rated capacity charts. If required, the mass of the manufacturer's installed hook blocks shall also be noted.

4.2 Attachment equipment mass table

The crane ratings manual shall include a table consisting of the equivalent deductions for all equipment that can be installed on the base attachment. This table can be either at one place within the manual or included with each

applicable rated capacity chart. When such equipment is installed, load ratings shall be decreased by subtracting the tabulated values.

This type equipment is any equipment provided by the manufacturer with an individual crane that can be installed onto the crane except via the load hoist line (e.g. fly jibs). Equipment that is attached via the load hoist line, such as hooks blocks, shall be considered as part of the load subtracted from the printed capacities on the chart. Illustrations, where deemed necessary, should accompany the weight chart.

4.3 Range diagrams

The crane rating manual shall include a range diagram (see figure A.1). The range diagram can be either at one place within the manual or included with each rated capacity chart on the opposite facing page. For simple cranes, where all unloaded jib instability areas may be clearly shown, a single range diagram may be separately mounted and not included in the format.

4.4 Forward and backward instability

For defining areas of forward instability, an unload condition at a given jib length is a condition where only the heaviest load block (e.g. hook block, overhaul ball) specified by the manufacturer for the specific machine is attached to the crane via the load hoist line.

If backward instability exists for attainable maximum jib angles, this condition shall be noted on the range diagram.

4.5 Working area diagram

The crane rating manual shall include a working area diagram for which rating capacities apply. The working area diagram can be either at one place within the manual or included with each applicable rated capacity chart. See figure A.2. for an example.

4.6 Illustration

The crane rating manual shall include an illustration showing at least two views of the crane and its basic dimensions.

4.7 Notes

Notes, where used, shall be subdivided into informational data, warnings, and definitions. Warnings shall be further subdivided into general, set-up and operational.

4.8 Data deviations

Where necessary, the following deviations are permitted.

4.8.1 Radius increments are a manufacturer's option.

4.8.2 Jib length increments are a manufacturer's option.

4.8.3 The warning notes shown in annex A are typical of those that may be required on many construction cranes. The exact content and wording may vary according to specific usage and manufacturer's requirements. Clear, precise, simple language shall be used.

4.9 Manufacturer's identification

This shall appear at one place in the manual.

5 Data publication — General requirements

5.1 General

Rated capacity charts as defined in clause 4 may be published under one cover in the crane rating manual, separately, or in any combination. The grouping of documents will be dictated by the type of crane involved. Means shall be provided to quickly reference rated capacity charts and other pages within the crane rating manual.

5.2 Language

If the language of the publication is other than the language of the country or origin, the final draft shall be written or edited by a technically competent person who is able to use the language of the publication competently.

5.3 Paper/Chart

The rated capacity charts and other pages of the crane rating manual shall be legible and permanently marked, and shall have reasonable durability when exposed to rain, dampness, water, oil, grease, or sunlight, and temperatures between – 40 °C and 60 °C.

5.4 Cover

When required, the cover shall have a reasonable durability when exposed to rain, dampness or grease. The cover shall be of an appropriate size to protect the internal pages.

5.5 Binding

The binding or binders shall be appropriate and durable for the intended usage.

5.6 Page layout

Typography shall be such that information is clearly legible under normal lighting conditions with normal or corrected vision. Illustrations shall be located on the same pages or as close as possible to their references. The pages shall be numbered consecutively beginning with the left-hand page, or a group numbering system may be used to permit intermediate additions or revisions as appropriate. Headings and sub-headings shall be used for easy reference.

5.7 Reproductions

The method of reproduction shall be such that the text and illustrations resist fading and smearing.

5.8 Readability and print (type) size

The type shall be definite and legible. Alphanumeric characters used on the rated capacity charts and other pages of the crane rating manual shall be no less than 8 point font size.

6 Data location

6.1 Placement

When the crane rating chart/manual is permanently affixed in the crane operator's cabin, it shall be located in the front hemisphere of the operator's visibility. The operator shall have easy access to the crane rating manual for reference. See figure 1.

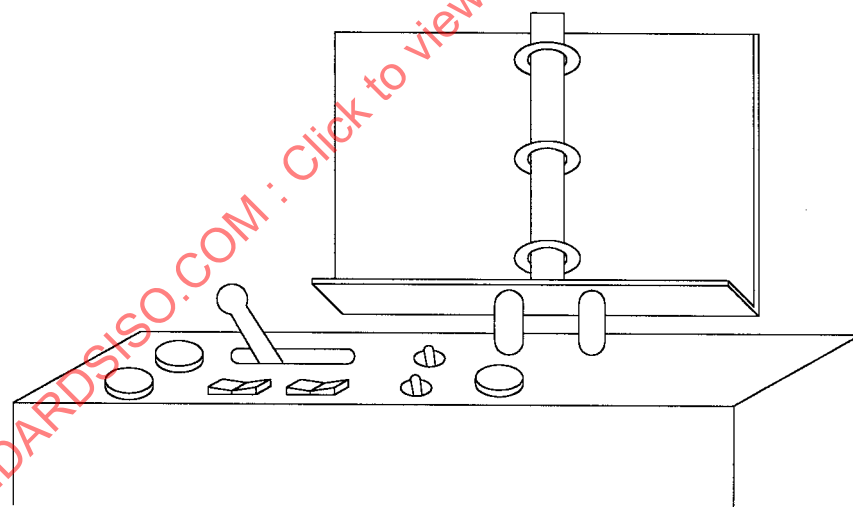
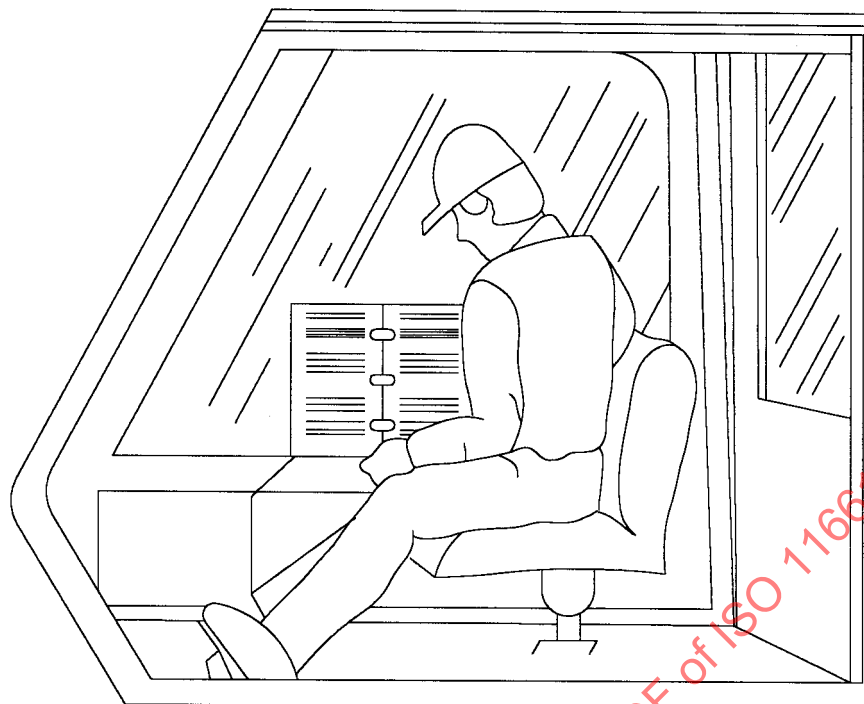


Figure 1 — Typical location of crane rating manual at operator's position

6.2 Fastening

The crane rating chart/manual shall be fastened to the cabin in such a manner that it cannot be removed without tools.

7 Examples of data presentation

7.1 Annex A shows examples of the format used to present the data. For a simple crane or jib arrangement, one or two charts may suffice.

7.2 Tables A.1 and A.2 present examples of the rating chart. They include a title and a list of warning notes, informational data, and load ratings. The format shown is for a complex jib arrangement and adheres to all the requirements of this International Standard. Figure A.1 shows an example of a working range diagram, while figure A.2 presents a working area diagram.

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Annex A (informative)

Examples of rated capacity chart format

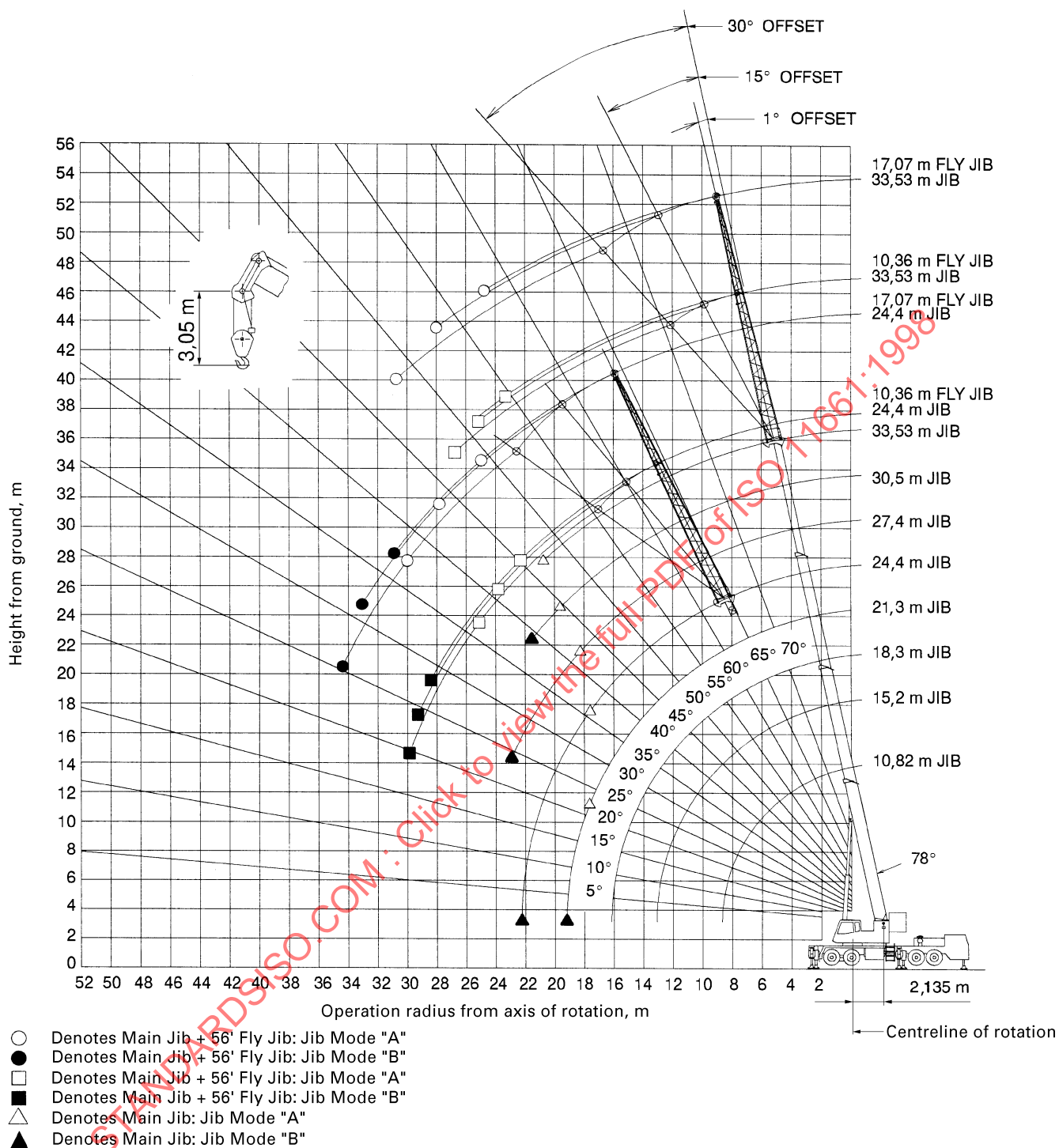
Table A.1 — Rated capacity chart for telescopic jib

Rated lifting capacities in kilograms with counterweight (CTWT)

Jib configuration illustration (optional)		Maximum allowable lifting capacities Rated lifting capacities in kilograms on fully extended outriggers (See set-up Note 2)							Set-up or outrigger position illustration (optional)	
1 360 kg CTWT										
11,58 m to 16,8 m main jib										
Load radius m	11,58 m			13,7 m			16,8 m			Load radius m
	Loaded jib angle degrees	360°	Over front	Loaded jib angle degrees	360°	Over front	Loaded jib angle degrees	360°	Over front	
3,0	67,0	60 000	60 000	71,0	19 050	19 050	74,5	19 050	19 050	3,0
3,5	65,0	55 200	55 200	69,0	19 050	19 050	73,0	19 050	19 050	3,5
4,0	62,0	50 550	50 550	65,5	19 050	19 050	71,0	19 050	19 050	4,0
4,5	59,0	46 300	46 300	64,5	19 050	19 050	69,5	19 050	19 050	4,5
5,0	55,5	42 300	42 300	62,0	19 050	19 050	67,5	19 050	19 050	5,0
6,0	49,0	34 400	34 400	57,0	19 050	19 050	64,0	19 050	19 050	6,0
7,0	41,5	29 100	29 100	51,5	19 050	19 050	60,0	19 050	19 050	7,0
8,0	32,0	24 250	24 350	45,5	19 050	19 050	56,0	19 050	19 050	8,0
9,0	19,5	19 550	20 000	39,0	19 050	19 050	51,0	19 050	19 050	9,0
10,0				30,5	16 400	16 600	46,5	16 550	16 700	10,0
12,0							35,5	11 850	12 100	12,0
14,0							19,5	8 800	9 000	14,0
Min. jib angle/cap.	0°	11 900	11 900	0°	9 100	9 100	0°	6 500	6 500	Min. jib angle/cap.
NOTES ON SET-UP										
1 Level the machine on a firm supporting surface. Depending on the nature of the supporting surface, it may be necessary to have structural supports under the outrigger floats or tyres to spread the load to a larger bearing surface.										
2 For outrigger operation, outriggers shall be properly extended with tyres raised free of crane mass before operating the boom or lifting loads.										
3 If machine is equipped with a front jack cylinder, the front jack cylinder shall be set in accordance with written procedure.										
4 When equipped with extendible counterweight, the counterweight shall be fully extended before operation.										
5 Inflate tyres to the recommended pressure before lifting on rubber.										
6 With certain jib and hoist tackle combinations, maximum capacities may not be obtainable with standard cable lengths.										
7 Do not travel with crane fly jib erected.										
NOTES ON OPERATION										
1 Do not exceed rated loads at rated radius.										
2 Rated loads include the mass of hookblock, slings and auxiliary lifting devices. Subtract their masses from the listed rating to obtain the net load to be lifted. When more than the minimum required hoist reeving is used, consider the additional rope mass as part of the load to be handled.										
3 Load ratings are based on freely suspended loads. Do not attempt to move a load horizontally on the ground in any direction.										
4 Rated loads are for lift crane service only.										
5 Do not operate at a radius or jib length where capacities are not listed. At these positions, the machine may overturn without any load on the hook.										
6 When either jib length or radius or both are between values listed, use the smallest load shown at either the next larger radius or next longer or shorter jib length.										
7 For safe operation, the user shall make due allowances for his particular job conditions, such as: soft or uneven ground, out of level conditions, high winds, side loads, pendulum action, jerking or sudden stopping of loads, hazardous conditions, experience of personnel, two machine lifts, traveling with loads, electric wires, etc. Side pull on jib or fly jib is extremely dangerous.										
8 Capacities appearing above the bold line are based on structural strength, and tipping should not be relied upon as a capacity limitation.										

Table A.2 — Rated capacity chart for fixed fly jib

Jib configuration illustration (optional)		Maximum allowable lifting capacities Rated lifting capacities in kilograms on fully extended outriggers ¹⁾					Set-up outrigger position illustration (optional)	
5 440 kg CTWT								
33,53 m main jib + 17,07 m offset fly jib								
Load radius	1° Offset		15° Offset		30° Offset		Load radius	
m	Loaded jib angle degrees	360°	Loaded jib angle degrees	360°	Loaded jib angle degrees	360°	m	
14,0	74,5	2 900					14,0	
16,0	72,5	2 900	77,5	2 600			16,0	
18,0	70,0	2 600	75,0	2 350			18,0	
20,0	68,0	2 300	72,5	2 100	77,0	1 900	20,0	
22,0	65,5	2 050	70,0	1 850	74,5	1 750	22,0	
24,0	62,5	1 850	67,5	1 700	72,0	1 550	24,0	
26,0	60,0	1 650	64,5	1 550	69,0	1 400	26,0	
28,0	57,5	1 500	62,0	1 400	66,5	1 300	28,0	
30,0	54,5	1 350	59,0	1 250	63,5	1 200	30,0	
32,0	51,5	1 200	56,5	1 150	60,5	1 100	32,0	
34,0	48,5	1 050	53,0	1 000	57,0	950	34,0	
36,0	45,5	900	50,0	850	53,5	800	36,0	
38,0	42,0	800	46,0	750	49,5	650	38,0	
40,0	38,0	650	42,5	600	45,5	500	40,0	
42,0	34,0	550	38,0	500			42,0	
WARNING — Do not lower 17,07 m offset fly jib in working position below 20° unless main jib length is 30,1 m or less, since loss of stability will occur, causing a tipping condition.								
1) See notes to table A.1.								



NOTE Jib and fly jib geometry shown are for unloaded condition and crane standing level on firm supporting surface. Jib deflection, subsequent radius and jib angle changes shall be accounted for when applying load to hook.

WARNING — Do not lower the jib below the minimum jib angle for no load as shown in the above chart for the jib lengths shown. Loss of stability will occur, causing a tipping condition.

Figure A.1 — Example of range diagram on fully extended outriggers