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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 19924-2021

Mobile cranes - Determination of stability

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document replaces GB/T 19924-2005 "Determination of the stability of mobile cranes", compared with GB/T 19924-2005, except

In addition to structural adjustments and editorial changes, the main technical changes are as follows.

---Added terms and definitions (see Chapter 3);

---The stability calculation of crawler crane is changed from "not greater than 0.4m/s" to "not greater than 0.1m/s" and "greater than 0.1m/s and not greater than

More than 0.4m/s" two requirements (see Table 1, Table 2, 2005 Edition of Table 1, Table 2);

---The value of the wind load in the stability calculation has increased the sub-item safety factor S (see Table 2);

---Added the requirement of the minimum crane tipping angle (see Table 3);

---The back roll stability is modified to two requirements with and without the main boom (see 4.3, 3.3 in the 2005 edition);

---Added the criteria for determining the tipping angle of mobile cranes (see 4.5.4, Appendix

B);

---The tipping line of the crawler crane's end is modified to be determined separately according to whether the driving wheel or the guide wheel is off the ground (see Figure A.5,.2005)

Version of Figure A.5).

The translation method used in this document is equivalent to ISO 4305.2014 "Determination of Mobile Crane Stability" and ISO 4305.2014/

Amd.1.2016 "Determining Amendment to the Stability of Mobile Cranes 1".

The Chinese documents that have consistent correspondence with the normatively cited international documents in this document are as follows.

---GB/T 6974.1-2008 Crane Terminology Part 1.General Terminology (ISO 4306-1.2007, IDT)

---GB/T 6974.2-2017 Crane Terminology Part 2.Mobile Cranes (ISO 4306-2.2012, IDT)

Compared with ISO 4305.2014, this document has editorial changes as follows.

--- Added "hereinafter referred to as crane" (see Chapter 1);

--- Deleted the source description of the term "fixed-length arm" "with modification, the English phrase'whichlength' was changed to'thelengthof

which"" description (see 3.1).

1 Scope

This document specifies various conditions that should be considered to verify the stability of mobile cranes through calculations.

Flat supporting surface (the inclination is not more than 1%).

This document applies to mobile cranes defined in ISO 4306-2 (except for truck-mounted cranes, hereinafter referred to as cranes), that is. installed on the truck

A crane with or without outriggers on wheels (tires) or crawlers.

2 Normative references

The contents of the following documents constitute the indispensable clauses of this document through normative references in the text. Among them, dated quotations

Only the version corresponding to that date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

This document.

GB/T 5905-2011 Crane test specifications and procedures (ISO 4310.2009, IDT)

ISO 4302 Cranes-Windloadassessment (Cranes-Windloadassessment)

ISO 4306-1 Crane Terminology Part 1.General Terminology (Cranes-Vocabulary-Part 1.General)

ISO 4306-2 Crane Terminology Part 2.Mobile Cranes (Cranes-Vocabulary-Part 2.Mobile cranes)

3 Terms and definitions

The following terms and definitions defined by ISO 4306-2 (except for main boom, jib and post boom) and the following apply to this document.

3.1

Fixed-lengthboom

The length of the boom with a fixed working length can be changed by adding or reducing the intermediate boom section, but it cannot be during the working cycle.

change.

[Source. ISO 4306-2.2012,4.1]

3.2

Latticeboom

Fixed length arm of truss structure.

[Source. ISO 4306-2.2012,4.1.1]

3.3

Telescopingboom

It is composed of a basic boom and one or more boom sections arranged therein, and a boom frame whose length is changed by the expansion and contraction of the boom section.

[Source. ISO 4306-2.2012,4.2]

3.4

Column boom (tower boom) mast-mountedboom

A boom mounted at or near the end of a vertical or nearly vertical main boom.

Note. The angle between the main boom and the column boom can be changed during operation.

[Source. ISO 4306-2.2012,4.3]

3.5

Flyjib

Mounted on or near the end of the main boom or column boom to increase the length and assist the lifting boom.

Note. There is a certain angle between the jib and the main arm.

[Source. ISO 4306-2.2012,4.4]

3.6

Tippingangle

The angle formed by the vertical plane of the tipping line (fulcrum) and the plane of the tipping line (fulcrum) and the center of gravity of the crane.

Note 1. See Figure B.1~Figure B.6.

Note 2. When calculating the overall center of gravity of the crane load, consider the lifting load acting on the center of the pulley at the main boom or the jib end.

4.1 General

The calculation should verify that the crane is stable under the following conditions.

- a) The criteria specified in Table 1;
- b) The criteria specified in Table 2;
- c) The criteria specified in Table 3;
- d) Backflip stability (see 4.3);
- e) Stability under non-working wind loads (see 4.4).

4.2.1 See Table 1, Table 2 and Table 3 for stability criteria.

4.2.2 Based on the criteria specified in Table 1, Table 2 and Table 3, consideration should be given to the amount of crane stability determined when the minimum wind speed is 8.3m/s.

Set the weight. In special cases, the manufacturer should clearly indicate the maximum wind speed used in the stability calculation.

Table 1 Stability calculation under applied load

4.3.1 General