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Mobile cranes — Determination of stability

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National foreword

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Foreword

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The committee responsible for this document is ISO/TC 96, *Cranes*, Subcommittee SC 6, *Mobile cranes*.

This third edition cancels and replaces the second edition (ISO 4305:1991), which has been technically revised.

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INTERNATIONAL STANDARD ISO 4305:2014+A1:2016(E)

Mobile cranes — Determination of stability

1 Scope

This International Standard specifies the conditions to be taken into consideration when verifying the stability of a mobile crane by calculation, assuming that the crane is operating on a firm and level surface (up to 1 % gradient).

It applies to mobile cranes as defined in ISO 4306-2, i.e. appliances mounted on wheels (tires) or crawlers, with or without outriggers with the exception of loader cranes.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable to its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4302, *Cranes — Wind load assessment*

ISO 4306-1, *Cranes — Vocabulary — Part 1: General*

ISO 4306-2, *Cranes — Vocabulary — Part 2: Mobile cranes*

ISO 4310:2009, *Cranes — Test code and procedures*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4306-2 (except for boom, fly jib and mast mounted boom) apply.

3.1
fixed-length boom
boom of fixed operating length, the length of which can be varied by the addition or removal of inserts, but cannot be varied during the operating cycle

[SOURCE: ISO 4306-2:2012, 4.1, modified — The phrase “which length” has been changed to read “the length of which”.]

3.2
lattice boom
fixed-length boom of trussed construction

[SOURCE: ISO 4306-2:2012, 4.1.1]

3.3
telescoping boom
boom consisting of a base section from which one or more boom sections are telescoped for additional length

[SOURCE: ISO 4306-2:2012, 4.2]

3.4
mast-mounted boom
assembly comprising a boom mounted at or near the top of a vertical or almost vertical mast member

Note 1 to entry: The angle of the boom to mast may be changed during operation.

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[SOURCE: ISO 4306-2:2012, 4.3]

3.5
fly jib
extension attached at or near the boom point or mast-mounted boom to provide additional boom length and an auxiliary hoisting means

Note 1 to entry: A fly jib is configured with a fixed angle to the boom.

[SOURCE: ISO 4306-2:2012, 4.4]

3.6
tipping angle
angle formed between the vertical plane through the tipping line (fulcrum) and the plane through the tipping line and the centre of gravity of the crane

Note 1 to entry: See Figures B.1 to B.6.

Note 2 to entry: Take into consideration the lifted load at the centre of the boom point or jib point sheaves to calculate the machine centre of gravity plus the load centre of gravity.

4 Calculations of stability

4.1 General

The calculations shall 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) backward stability (see 4.3);

e) stability with out-of-service wind (see 4.4).

4.2 Criteria for stability

4.2.1 See Tables 1, 2 and 3.

4.2.2 Based on the criteria specified in Table 1, Table 2, and Table 3, it is intended that the stability-limited crane ratings shall be usable in a minimum wind speed of 8,3 m/s. Under special conditions where this requirement imposes a restriction on rated capacity, the manufacturer shall clearly specify the maximum wind speed included in the stability calculation.

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