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Mobile cranes — Experimental determination of crane performance —

Part 2: Structural competence under static loading

Grues mobiles — Détermination expérimentale des performances des grues —

Partie 2: Compétence structurale sous le chargement statique

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

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

ISO 11662 consists of the following parts, under the general title *Mobile cranes — Experimental determination of crane performance*:

— *Part 1: Tipping loads and radii*

— *Part 2: Structural competence under static loading*

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Introduction

When design calculations are made for mobile cranes, they are based on an ideal model in which all members and components are perfectly straight and fabrication has been exact. For tension members and members subjected to bending, the difference between the real crane and the ideal model is usually not significant. But, for compression members subject to column buckling, an allowance for deviation in straightness and fabrication is necessary.

When mobile cranes are tested non-destructively by means of strain gauges, the stresses determined intrinsically include these effects of deviations in straightness and accuracy of fabrication.

This test method is intended to describe the approximate maximum loading conditions to which any component of the entire load-supporting structure of a crane is subjected (See Annex D). In some cases, a more severe loading condition(s) can be indicated by analysis. In these cases, the more severe condition(s) can be added to or substituted for the specified test loading condition(s). This test method also classifies stress areas as Types I (Uniform Stress Areas), II (Stress Concentration Areas), III (Column Buckling Areas), and IV (Local Plate Buckling Areas; see Clause 10), and defines limits for each class. Results can be used to correlate boom system calculation results for Class III stress areas as given by boom system calculations. Test results for Class I stress areas throughout the structure can be used to check any available calculations. This test method evaluates Class II stress areas for which calculations are seldom available. Class IV stress areas, where disproportionately high stress readings can occur, can be reviewed for better insight by calculation methods.

A production boom system that has been rated by the methods of this part of ISO 11662 can be used on another machine without re-testing by the methods specified herein, provided the same analytical procedure shows its stress levels will be less than or equal to the stress levels in the original application, and provided that the supporting structure is as rigid as the original mounting. Rigidity of the supporting structure is determined by the change in the slope of the jib foot axis as test loads are applied.

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Mobile cranes — Experimental determination of crane performance —

Part 2: Structural competence under static loading

1 Scope

This part of ISO 11662 applies to mobile construction-type lifting cranes utilizing

a) rope supported, lattice boom attachment or lattice boom, and fly jib attachment (see Annex E, Figure E.3),

b) rope supported, mast attachment and mast mounted boom, and fly jib attachment (see Annex E, Figures E.1 and E.2), or

c) telescoping boom attachment or telescopic boom and fly jib attachment (see Figure E.4).

Mobile crane manufacturers can use this part of ISO 11662 to verify their design for the mobile crane types illustrated in Figures E.1 through E.4.

This test method is to provide a systematic, non-destructive procedure for determining the stresses induced in crane structures under specified conditions of static loading through the use of resistance-type electric strain gauges, and to specify appropriate acceptance criteria for specified loading conditions.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for 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 9373:1989, *Cranes and related equipment — Accuracy requirements for measuring parameters during testing*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
strain
relative elongation or compression of material at any given point with respect to a specific plane passing through that point, expressed as change in length per unit length (m/m)

3.2
stress
S
internal force per unit area resulting from strain, expressed in pascals (Pa) or newtons/square meter

Note 1 to entry: For this document, megapascals (Mpa) will be used for brevity.

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