

Safety of earth-moving machinery —

Part 9: Methods for the calculation and verification of the lift capacity of hydraulic excavators

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee B/513, Construction equipment and plant, and site safety, to Subcommittee B/513/1, Earth-moving machinery upon which the following bodies were represented:

- Associated Offices Technical Committee
- British Coal Corporation
- Construction Plant (Hire Association)
- Federation of Civil Engineering Contractors
- Federation of Manufacturers of Construction Equipment and Cranes
- Health and Safety Executive
- Institution of Civil Engineers
- Institution of Highways and Transportation
- Silsoe Research Institute

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National foreword

This Part of BS 6912 has been prepared under the direction of Technical Committee B/513 construction equipment and plant, and site safety. It is identical with ISO 10567:1992 *Earth-moving machinery — Hydraulic excavators — Lift capacity*, published by the International Organization for Standardization (ISO).

ISO 10567 was prepared by Subcommittee 2, Safety requirements and human factors, of ISO Technical Committee 127, Earth-moving machinery, with the active participation and approval of the UK.

Annex A forms an integral part of this British Standard. Annex B is for information only.

Cross-references

International Standard Corresponding British Standard

Normative

ISO 6015:1989	BS 6911 <i>Testing earth-moving machinery</i> Part 3:1990 <i>Measurement of tool forces of hydraulic excavators</i> (Identical)
ISO 7135	BS 6914 <i>Terminology (including definitions of dimensions and symbols) for earth-moving machinery</i> A Part standard is in preparation. See clause 2 of the text of the International Standard.

Informative

ISO 6016:1982	BS 6300:1982 <i>Methods of measuring the masses of whole machines, their equipment and components of earth-moving machinery</i> (Identical)
ISO 6165:1987	BS 6914 <i>Terminology (including definitions of dimensions and symbols) for earth-moving machinery</i> Part 1:1988 <i>Glossary of terms for basic types of earth-moving machinery</i> (Identical)
ISO 6746-1:1987	Part 2:1988 <i>Glossary of terms for base machine</i> (Identical)
ISO 6746-2:1987	Part 3:1988 <i>Glossary of terms for equipment</i> (Identical)

Textual error. When adopting the text of the International Standard, the textual error given below was discovered. It has been indicated by asterisk in the text and has been reported to ISO in a proposal to amend the text of the International Standard.

An important dimensional error concerning lift point height occurs in Figure 1b) of the ISO standard and a corrected version is shown in national Annex A.

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 and ii, pages 1 to 10, 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 International Standard provides a uniform method to calculate hydraulic excavator lift capacity and a test procedure for verifying the calculations. It covers both hydraulic lift capacity limits and machine tipping limits and establishes the rated lift capacity for hydraulic excavators as defined in ISO 7135.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were 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 editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards. ISO 6015:1989, *Earth-moving machinery — Hydraulic excavators — Methods of measuring tool forces*.

ISO 7135:—, *Earth-moving machinery — Hydraulic excavators — Terminology and commercial specifications*¹⁾.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 load

external force, including the weight of the attached equipment, applied at the lift point

3.2 lift point

location on the bucket or the bucket mounting bracket, specified by the manufacturer, to which a load may be attached, or the centre-line of the bucket pivot mounting pin on the arm. For bucket or bucket mounting bracket load attachment, the bucket cylinder is fully extended. See Figure 1

3.3 lift point height

vertical distance from the ground reference plane to the lift point. See Figure 1

3.4 lift point radius

horizontal distance from the axis of rotation to the vertical hoist line or tackle. See Figure 1

3.5 balance point

moment acting to overturn the machine with a specific load and point lift radius which is equal to the moment of the machine available to resist overturning

3.6 tipping load

static load at the balance point

3.7 rated tipping load

75 % of the static tipping load

3.8 Hydraulic pressures

3.8.1 working circuit pressure

that nominal pressure applied to the specific circuit by the pump(s)

3.8.2 holding circuit pressure

maximum static pressure in a specific circuit, limited by a relief valve at a flow no greater than 10 % of rated circuit flow

3.9 hydraulic lift capacity

Load that can be lifted from the lift point by the boom cylinders with the bucket in rated lift bucket position and the excavator physically restrained from tipping.

3.9.1 boom hydraulic lift capacity

load that can be lifted by applying working circuit pressure to the boom cylinder(s) without exceeding holding circuit pressure in any other circuit

3.9.2 arm hydraulic lift capacity

load that can be lifted by applying working circuit pressure to the arm cylinder(s) without exceeding the working circuit pressure in the boom cylinders or the holding circuit pressure in any other circuit

3.10 rated hydraulic lift capacity

87 % of the smaller of boom or arm hydraulic, lift capacity at specific lift point positions

3.11 rated lift capacity

smaller of either rated tipping load (3.7) or rated hydraulic lift capacity (3.10)

¹⁾ To be published.