INTERNATIONAL STANDARD

ISO 12117-2

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Earth-moving machinery — Laboratory tests and performance requirements for protective structures of excavators —

Part 2: Roll-over protective structures (ROPS) for excavators of over 6 t

Engins de terrassement — Essais de laboratoire et exigences de performance des structures de protection des pelles —

Partie 2: Structures de protection au retournement (ROPS) pour pelles de terrassement de plus de 6 t

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 12117-2 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 2, *Safety, ergonomics and general requirements*.

ISO 12117 consists of the following parts, under the general title *Earth-moving machinery — Laboratory tests and performance requirements for protective structures of excavators*:

— *Part 1: Tip over protective structures (TOPS) for compact excavators*

— *Part 2: Roll-over protective structures (ROPS) for excavators of over 6 t*

Introduction

It was long thought that hydraulic excavators did not overturn as easily as other earth-moving machines because their large attachments support the machine bodies once they start inclining. However, in some regions of the world, accident data have shown a need for roll-over protection of hydraulic excavators. Standardization was thus needed.

This part of ISO 12117 provides a test method for roll-over protective structures (ROPS) for hydraulic excavators of over 6 t used in earth-moving. Unlike the machines covered by ISO 3471, hydraulic excavators feature large attachments which affect the required performance capability of the ROPS. Therefore, the test method and criteria required for hydraulic excavators are different from those needed for the other earth-moving machines.

It is also applicable to hydraulic excavators used in forestry applications. The criteria of ROPS for hydraulic excavators, used in forestry, with cab riser, have been included for information.

Earth-moving machinery — Laboratory tests and performance requirements for protective structures of excavators —

Part 2: Roll-over protective structures (ROPS) for excavators of over 6 t

1 Scope

This part of ISO 12117 establishes a consistent and reproducible means of evaluating the load-carrying characteristics of roll-over protective structures (ROPS) for excavators under static loading, and prescribes performance requirements of a representative specimen under such loading.

It applies to ROPS of hydraulic excavators as defined in ISO 6165 with a mass of over 6 t and less than 50 t. ROPS will ensure minimum crush protection space for a seat-belted operator when the machine rolls 360° about longitudinal axis of its revolving frames without losing contact with a hard clay slope of less than 30°. ROPS is to be applied where the risk of roll-over exists.

It also applies to ROPS for excavator-based or derivated excavators used in object or material handling, demolition or with attachments such as magnets, clamshell, grab or multi-claw grab.

It does not apply to excavators with elevating cab risers.

NOTE This part of ISO 12117 is intended to be applied to excavators having a gross operating mass up to 50 000 kg due to the limitation of the experimental and statistical data set used to derive acceptance criteria. This does not preclude the possibility of applying the procedure described in this part of ISO 12117 to excavators having larger or smaller masses, with the exclusion of excavators specially designed for mining application, where the requirements may lead to impractical design.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3164, *Earth-moving machinery — Laboratory evaluations of protective structures — Specifications for deflection-limiting volume*

ISO 5353, *Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point*

ISO 6165, *Earth-moving machinery — Basic types — Identification and terms and definitions*

ISO 9248, *Earth-moving machinery — Units for dimensions, performance and capacities, and their measurement accuracies*