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

GB/T 19930-2005

**Earth-moving machinery -- Tip-Over Protection Structure
(TOPS) for compact excavators -- Laboratory tests and
performance requirements
(English Translation)**

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Foreword

This Standard is developed for the first time.

This Standard modifies and adopts ISO 12117.1997 "Earth-moving machinery

- Tip-over protection structure (TOPS) for compact excavators - Laboratory tests and performance requirements" (English edition), including its Technical Corrigendum 1 published on December 1, 2000.

This Standard is redrafted in accordance with ISO 12117.1997.

The technical differences between this Standard and ISO 12117.1997 are as follows.

a) For normative references.

- ISO 12117.1997 refers to two ISO standards to be published. This Standard refers to the national standards which adopt the current edition of the international standards. GB/T 8498-1999 "Earth-moving machinery - Basic types - Vocabulary" (eqv ISO 6165.1997) and GB/T 19932-2005 "Earth-moving machinery - Hydraulic excavators - Laboratory tests and performance requirements for operator protective guards" (ISO 10262.1998, MOD). This Standard accordingly deletes Footnote 1) and Footnote 2) related to edition statement in ISO 12117.1997;

- ISO 12117.1997 refers to ISO 898-1.1988. This Standard refers to GB/T 3098.1-2000 "Mechanical Properties of Fasteners - Bolts, Screws and Studs" which adopts ISO 898-1.1999.

b) DELETE the note in 7.2 of ISO 12117.1997 "Note. In those countries using the inch system, it is important that the bolts and nuts used be of an equivalent grade."

For ease of use, this Standard has also made some editorial changes.

- The word "this International Standard" is changed to "this Standard";
- USE the decimal point "." instead of "," as the decimal point;
- DELETE the Foreword of the International Standard.

Annex A of this Standard is a normative annex. Annex B is an informative annex.

This Standard was proposed by China Machinery Industry Federation.

Earth-moving machinery - Tip-Over Protection

Structure (TOPS) for compact excavators - Laboratory tests and performance requirements

1 Scope

This Standard establishes a consistent and reproducible means of evaluating the load-carrying characteristics of tip-over protective structures (TOPS) under

static loading, and prescribes performance requirements of a representative specimen under such loading.

This Standard applies to TOPS of compact excavators (as defined in GB/T 8498) with swing type boom, having an operating mass of 1000 kg~6000 kg.

2 Normative references

The following documents contain the provisions which, through reference in this Standard, become the provisions of this Standard. For the dated references, their subsequent amendments (excluding corrections) or revisions do not apply to this Standard. However, the parties who enter into agreement based on this Standard are encouraged to investigate whether the latest editions of these documents are applicable. For undated reference documents, the latest editions apply to this Standard.

GB/T 229 Metallic Materials - Charpy Pendulum Impact Test Method (GB/T 229-1994, eqv ISO 148.1983)

GB/T 3098.1 Mechanical Properties of Fasteners - Bolts, Screws and Studs (GB/T 3098.1-2000, idt ISO 898-1.1999)

GB/T 3098.2 Mechanical properties of fasteners - Nuts - Coarse thread (GB/T 3098.2-2000, idt ISO 898-2.1992)

GB/T 6572.1-1997 Hydraulic excavators - Terminology (eqv ISO 7135.1993)

GB/T 8498 Earth-moving machinery - Basic types - Vocabulary (GB/T 8498-1999, eqv ISO 6165.1997)

GB/T 17772-1999 Earth-moving machinery - Laboratory evaluations of protective structures - Specifications for deflection-limiting volume (idt ISO 3164.1995)

GB/T 17921-1999 Earth-moving machinery - Seat belts and seat belt anchorages (idt ISO 6683.1981)

GB/T 19932 Earth-moving machinery - Hydraulic excavators - Laboratory tests and performance requirements for operator protective guards (GB/T

19932-2005, ISO 10262.1998, MOD)

JB/T 7690 Engineering machinery - Unit and measurement accuracy for dimension and performance (JB/T 7690-1995, eqv ISO 9248.1992)

3 Terms and definitions

The following terms and definitions apply to this Standard.

3.1 Tip-over protective structure (TOPS)

System of structural members whose primary purpose is to reduce the possibility of an operator, held by a seat belt system (3.5), being crushed should a machine tip-over.

Note: Structural members include any subframe, bracket, mounting, socket, bolt, pin, suspension, flexible shock absorber used to secure the system to the swing frame; but exclude mounting provisions that are integral with the swing frame.

3.1.1 Cabin type TOPS

TOPS for machines with a cabin.

3.1.2 Canopy type TOPS

TOPS for machines having an open canopy.

Note: Both of these types of TOPS are considered to be integrated with the main members of the TOPS for the evaluation test, whether they are separated from the load carrying members or not.

3.2 Falling object guard (FOG)

System of top guard and front guard for the protection of the hydraulic excavator operator station. (See GB/T 19932.)

3.3 Swing frame

Main chassis or main load bearing structural member(s) of the revolving upper frame of the mini-excavator upon which the TOPS is directly mounted.

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