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# GB/T 17771-2010 / ISO 3449:2005

Replacing GB/T 17771-1999

## Earth-moving machinery - Falling-object protective structures - Laboratory tests and performance requirements

土方机械 落物保护结构 试验室试验和性能要求

(ISO 3449:2005, IDT)

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**Standardization Administration of the People's Republic of China.**

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# Foreword

This Standard identically adopts ISO 3449:2005 "Earth-moving machinery - Falling-object protective structures - Laboratory tests and performance requirements" (English version).

This Standard is an identical translation version of ISO 3449:2005.

For ease of use, the following editorial modifications have been made to this Standard:

- Change the term "this International Standard" to "this Standard";
- Use the decimal point "." instead of "," as the decimal point;
- Delete the Foreword of the international standard;
- For the international standards referenced in ISO 3449:2005, replace the corresponding international standards with those that have been adopted as Chinese standards.

This Standard replaces GB/T 17771-1999 " Earth-moving machinery -- Falling-object protective structures -- Laboratory tests and performance requirements".

Compared with GB/T 17771-1999, the main changes in this Standard are as follows:

- Add several terms and definitions in Chapter 3 of this Standard;
- Modify or add all legends in this Standard;
- Redefine the diameter of the test body for acceptance criteria I and II;
- Add Table 1 "Minimum impact strength of V-notch pendulum";
- Delete Annex B of GB/T 17771-1999. Merge some parts of the Annex B of GB/T 17771-1999 into the Annex A of this Standard.

Annex A of this Standard is normative.

This Standard was proposed by China Machinery Industry Federation.

This Standard shall be under the jurisdiction of National Technical Committee on Earth Moving Machinery of Standardization Administration of China (SAC/TC 334).

Main drafting organizations of this Standard: Tianjin Engineering Machinery Research Institute, Tianjin Yishan Engineering Machinery Co., Ltd., Xiamen Xiagong Machinery Co., Ltd., Hunan Shanhe Intelligent Machinery Co., Ltd., Guangxi Liugong Machinery Co., Ltd., Xiamen Product Quality Supervision and Inspection Institute [National Factory Motor Vehicle Quality Supervision and Inspection Center].

# Earth-moving machinery - Falling-object protective structures - Laboratory tests and performance requirements

## 1 Scope

This Standard specifies laboratory tests for measuring the structural characteristics of, and gives performance requirements in a representative test for, falling-object protective structures (FOPS) intended for use on ride-on earth-moving machines as defined in GB/T 8498.

It is applicable to both FOPS supplied as an integral part of the machine and those supplied separately for attachment to the machine. It is not intended to apply to FOPS intended for use on landfill compactors, excavators, rollers, trenchers, pipelayers, for the additional seat for operation of an attachment (e.g., attachment backhoe), or on machines with a power rating of less than 15 kW.

**NOTE:** This Standard can be used to provide guidance to the manufacturers of roll-over or falling-object protective structures should it be decided to provide such protection for these or other machines for a particular application.

## 2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 229, *Metallic materials - Charpy pendulum impact test method* (GB/T 229-2007, ISO 148-1:2006, Metallic materials - Charpy pendulum impact test - Part 1: Test method, MOD)

GB/T 3098.1-2000, *Mechanical properties of fasteners - Bolts, screws and studs* (idt ISO 898-1:1999)

GB/T 3098.2-2000, *Coarse thread fasteners mechanical properties of nuts* (idt ISO 898-2:1992)

GB/T 8498, *Earth-moving machinery - Basic types - Identification and terms and definitions* (GB/T 8498-2008, ISO 6165:2006, IDT)

**5.1.2** Test facility apparatus that provides a means to

a) raise the test object to the required height,

b) release it so that it drops without restraint, and

c) determine whether the FOPS enters the deflection-limiting volume (DLV) during the test.

The means of determining c) may be either 5.1.3 or 5.1.4.

**5.1.3** DLV structure, placed upright and made of a material that will indicate any penetration by the FOPS - grease or other suitable material being permitted to be put on the lower surface of the FOPS cover to indicate such penetration.

The DLV structure and its location shall be in accordance with GB/T 17772. The DLV structure shall be fixed firmly to the same part of the machine as the operator's seat and shall remain there during the entire formal test period.

**5.1.4** Suitable dynamic instrumentation system, with a dynamic measurement accuracy of ± 5%, for measuring the expected deflection of the FOPS with respect to the DLV.

**5.2 Test conditions**

**5.2.1 Test bed**

The FOPS to be evaluated shall be attached to the machine structure, as it would be in actual machine use. Although a complete machine is not required, the portion on which the FOPS is mounted shall be identical to the actual structure, and the vertical stiffness of the test bed shall be not less than that of an actual machine according to 5.2.2.

**5.2.2 Machine-mounted FOPS**

For FOPS mounted on a machine:

a) the machine may be provided with equipment or attachments as specified by the manufacturer;

b) all ground-engaging tools shall be in the normal transport position;

c) all suspension systems, including pneumatic tyres, shall be set at operating levels, and variable suspensions shall be in the "maximum stiffness" range;

d) all cab elements, such as windows, normally removable panels or non-structural fittings, shall be removed so that they do not contribute to the strength of the FOPS.

**5.3 Test procedure**

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