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PEOPLE'S REPUBLIC OF CHINA**

GB/T 17921-2010

**Earth-moving machinery -- Seat belts and seat belt anchorages
-- Performance requirements and tests
(English Translation)**

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Foreword

The modification of this Standard adopts ISO 6683.2005 Earth-moving Machinery - Seat Belts and Seat Belt Anchorages - Performance Requirements and Tests (English version).

This Standard is re-drafted in accordance with ISO 6683.2005.

In accordance with the practical application and the national condition of China, this Standard makes some modifications in the adoption of ISO 6683.2005. The technical differences between this Standard and ISO 6683.2005 are as follows.

---The quoted standard is modified from UNECE R16.2000 to GB 14166-2003;

---The quoted standard SAE J386. 1997 Operator Restraint System for Off-Road Work Machines is deleted;

---Chapter 4 is deleted; the content in the previous Chapter 4 is modified into 4.4; Chapter No. is postponed.

In order to make it convenient for application, this Standard makes the following editorial modifications.

---"This international standard" is modified into "this Standard";

---The foreword of the international standard is deleted.

This Standard serves as a replacement of GB/T 17921-1999 Earth-moving Machinery - Seat Belts and Seat Belt Anchorages.

In comparison with GB/T 17921-1999, this Standard has the following main changes.

---The name of the standard is modified into "Earth-moving Machinery - Seat Belts and Seat Belt Anchorages - Performance Requirements and Tests";

---Normative reference "GB/T 19930 Earth-moving Machinery - Tip-over Protection Structure (TOPS) for Compact Excavators - Laboratory Tests and Performance Requirements (GB/T 19930-2005, ISO 12117. 1997, MOD)" is added;

---The term "seat belt device" is modified into "seat belt assembly";

---The title of Chapter 4 is modified into "Technical Requirements of Restraint System";

---"4.4 Seat Belt Assembly" is added to Chapter 4;

---In 4.3, "when (670 ± 45) N tensile force acts on the seat belt, the acting force Earth-moving Machinery - Seat Belts and Seat Belt Anchorages - Performance Requirements and Tests

1 Scope

This Standard specifies the minimum performance requirements of restraint system (seat belts and seat belt anchorages) for earth-moving machinery. Once a machine rolls over (please refer to the stipulation in GB/T 17922), it needs to firmly fasten the driver or passenger within the Roll Over Protection System (ROPS), or once a machine tips over (please refer to the stipulation in GB/T 19930), it needs to firmly fasten the driver or passenger within the Tip Over Protection System (TOPS).

2 Normative References

Through the quotation in this Standard, clauses in the following documents become clauses of this Standard. In terms of references with a specified data, all the subsequent modification lists (excluding corrigendum content) or revised editions are not applicable to this Standard. However, all parties that reach an agreement in accordance with this Standard are encouraged to explore the possibility of adopting the newest versions of these documents. In terms of references without a specified

date, the newest versions are applicable to this Standard.

GB/T 8420 Earth-moving Machinery - Human Physical Dimensions of Operators and Minimum Operator Space Envelope (GB/T 8420-2000, eqv ISO 3411. 1995)

GB/T 8591 Earth-moving Machinery - Seat Index Point (GB/T 8591-2000, eqv ISO **5353 1995**)

GB 14166-2003 Safety Belts and Restraint Systems for Adult Occupants of Motor Vehicles (ECE R16.1993, MOD)

GB/T 17922 Earth-moving Machinery - Roll-over Protective Structures - Laboratory Tests and Performance Requirements (GB/T 17922-1999, idt ISO

3471 1994)

GB/T 19930 Earth-moving Machinery - Tip-Over Protection Structure (TOPS) for Compact Excavators - Laboratory Tests and Performance Requirements (GB/T 19930-2005, ISO 12117. 1997, MOD)

W---cushion width;

Z---seat belt fastened area.

a Calibration point of driver's seat (please refer to GB/T 8591).

Figure 1 -- Range of Seat Belt Fastening

If seats can rotate or there is a suspension device, seat belt shall be fastened on the anchorage near the rear corner of the driver's seat cushion (in the shadow line area illustrated in Figure 1), so that the seat belt assembly can move together with the cushion. Belts, strings or similar objects that are easily bendable and tenacious can be utilized to transmit the force of the seat belt assembly from the anchorage to the machine.

The calibration point of driver's seat shall be determined in accordance with the stipulation in GB/T 8591.

6 Performance Requirements and Test Methods of

Restraint System

When loading from the upper front, namely, within the range of $60^\circ \pm 15^\circ$ above the horizontal direction, when the acting force basically goes through SIP point (please refer to GB/T 8591), the installed restraint system shall comply with the following requirements.

a) The fastened restraint system shall be able to endure not less than 15,000 N continuously increased tensile force F (Figure 1), force-bearing time shall be not less than 10 s at the minimum and not more than 30 s at the maximum.

When imposing force F , the shape block demonstrated in Figure 2 can be adopted.

b) Under the circumstance of bearing force F , the length increase of the seat belt shall not be more than 20%.

c) Under the effect of the force F , any component in the seat belt assembly and its fastened part are allowed to manifest permanent deformation. However, the restraint system, seat components and seat adjustment and locking mechanism shall not be loosened.

d) After the buckle endures the force F , the force that unlocks the buckle shall comply with the requirement in 4.3.

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