
**Earth-moving machinery —
Operator's controls**

Engins de terrassement — Commandes de l'opérateur

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

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

This third edition cancels and replaces the second edition (ISO 10968:2004), which has been technically revised. The main changes compared to the previous edition are as follows:

- the document has been reorganized for easier interpretation;
- minimum and normal actuating forces have been removed;
- state-of-the-art solutions have been taken into account.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document specifies design criteria for operator's controls on earth-moving machinery. As machines have gone through significant developments since the first edition of this document in 1995, this document covers both legacy machines and state-of-the-art solutions. This is important to take into account when reading the annexes.

As attachments and controls are becoming more advanced, it was considered important to reorganize the document for easier interpretation whereby base machine, equipment and attachments were separated in different annexes. As graders and dozers often have unique operator's controls, it was also decided to separate these two machine types into separate annexes.

Other important changes made in the third edition include the removal of minimum and normal actuating forces for operator's controls. It was considered that as there is a large variation in actuating forces for different types of controls, providing standardized actuating forces was not feasible. Instead, it is the manufacturer's responsibility that minimum actuating forces are enough to prevent inadvertent activation of the operator's controls caused by machine operation (e.g. machine acceleration/deceleration, vibration).

While preparing this document, it was noted that levers are developing rapidly and there are large differences even within a given machine family, for example excavators. The document therefore tries to also account for the most advanced excavators, whereby more controls are added to levers in order to allow for more functionality. It is recognized that new technologies and new technical measures will be developed as the state-of-the-art changes in order to improve the operation of earth-moving machinery.

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