



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

**GB/T 21938-2021**

---

**Earth-moving machinery - Hydraulic excavator and backhoe  
loader lowering control device - Requirements and tests**

**Issued on: December 31, 2021**

**Implemented on: July 1, 2022**

---

**Issued by: State Administration for Market Regulation, China National  
Standardization Administration**

## Table of Contents

foreword

Introduction

1 Scope

2 Normative references

3 Terms and Definitions

### foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules of Standardization Documents" drafted:

This document replaces GB/T 21938-2008 "Earth-moving machinery hydraulic excavator and backhoe loader boom lowering control device requirements

Compared with GB/T 21938-2008, in addition to structural adjustment and editorial changes, the main technical changes are as follows:

- a) Changed the scope of the standard (see Chapter 1, Chapter 1 of the:2008 edition);
- b) Added normative references (see Chapter 2, Chapter 2 of the:2008 edition);
- c) Some terms and definitions have been changed, added and deleted (see Chapter 3, Chapter 3 of the:2008 edition);
- d) Changed the requirements for the descent control device (see Chapter 4, Chapter 4 of the:2008 edition);
- e) Changed the test method (see Chapter 5, Chapter 5 of the:2008 edition);
- f) Added references (see References):

This document is identical to ISO 8643:2017 "Requirements for lowering controls for earth-moving machinery hydraulic excavators and backhoe loaders and test":

Please note that some content of this document may be patented: The issuing agency of this document assumes no responsibility for identifying patents:

### Introduction

When an excavator or backhoe loader is used to lift objects, the failure or rupture of the hydraulic line can cause safety problems for people under the raised load:

threat:

This hazard can be reduced by the use of a descent control device, which ensures that in the event of a hydraulic line failure or rupture, the load is lowered:

The drop speed is controlled:

The test method is developed based on the hydraulic system design characteristics and operating conditions of hydraulic excavators and backhoes of backhoes:

Earthmoving Machinery Hydraulic Excavators and Backhoe Loaders

Descent control device requirements and tests

## 1 Scope

This document specifies the performance requirements and test methods for lowering control devices installed in the moving parts of hydraulic excavators and backhoe loaders:

On the hydraulic cylinder of the boom, the intermediate boom and the stick, it is used to control the lowering speed of the boom when the hydraulic pipeline fails or breaks:

This document applies to hydraulic excavators and backhoe loaders for lowering control devices during object lifting operations (installation manufacturer

specified standard linkage): On machines that provide alternative linkages, only the standard lengths specified by the manufacturer are tested:

## 2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, dated citations

documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to

this document:

ISO 6165 Earth-moving machinery basic types identification, terms and definitions (Earth-moving machinery-Basic types-I-

identification and terms and definitions)

Note 1: GB/T 8498-2017 Identification, Terms and Definitions of Basic Types of Earth-moving Machinery (ISO 6165:2012, IDT)

ISO 9248 Earth-moving machinery dimensions, properties and parameters of units and

measurement accuracy (Earth-moving machinery-Units

for dimensions, performance and capacities, and their measurement accuracies)

Note 2: GB/T 21153-2007 Units and measurement accuracy of dimensions, properties and parameters of earth-moving machinery (ISO 9248:1992, MOD)

### 3 Terms and Definitions

The terms and definitions defined in ISO 6165 and the following apply to this document:

3:1

Linkage control system linkage control system

Hydraulic control components (including pilot servo valves) for lifting and lowering the lifting point when objects are hoisted:

3:2

Lifting linkage lifting linkage

The combination of components used to lift and lower the lifting point during the lifting of objects, such as the combination of a boom and a stick:

3:3

lowering control device

A hydraulic control valve group used to control the lowering of the linkage mechanism when the hydraulic pipeline fails or ruptures:

3:4

failure-simulating device

Hydraulic valve block used to simulate failure or rupture of hydraulic lines in linkage control systems:

3:5

Signal oil circuit signal line

Hydraulic circuit used to detect pressure: