ICS 53.100
CCS P 97

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 44259-2024

Earth-moving machinery - Battery electric hydraulic excavator for plateau tunnels

土方机械 高原隧道用纯电动液压挖掘机

Issued on: July 24, 2024 **Implemented on: July 24, 2024**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

Table of Contents

Foreword

This document is the official English translation of GB/T 44259-2024, issued by the State Administration for Market Regulation and the National Standardization Administration on 24 July 2024 and in force from the same date. SAC/TC 334 is in charge of the English translation; in case of doubt about its contents, the Chinese original is authoritative.

The standard was drafted according to the rules of GB/T 1.1-2020. It was proposed by the China Machinery Industry Federation and prepared by SAC/TC 334, the National Technical Committee on Earth-moving Machinery.

Attention is drawn to the possibility that some elements of this standard may be the subject of patent rights; the issuing body is not responsible for identifying them.

1 Scope

China's national standard for battery electric hydraulic excavators built to work inside tunnels on the high plateau. Tunnelling at altitude is the worst place to run a diesel machine: the exhaust has nowhere to go, thin air makes combustion engines lose power and burn dirtier, and ventilating the heading enough to keep a diesel excavator legal is a large share of the cost of the works. A battery machine removes the exhaust from the tunnel altogether, but it inherits its own problems - air that cools electronics and motors poorly, reduced dielectric strength, cold, dust and water - and those are exactly what this document addresses. It sets the parameters, the requirements, the test methods and the inspection rules for excavators whose energy comes entirely from an on-board rechargeable storage system driving an electric motor, for service between 2 000 m and 5 000 m of altitude. It

covers safety of the electrical installation, the operator's station, performance, waterproofing and wading, heat balance and battery swapping, and it ends with marking, packaging, transport and storage. It is written for the manufacturers and testing bodies of these machines and for the tunnelling contractors that buy them.

This document specifies the parameters, requirements, inspection rules, marking, packaging, transport and storage of battery electric hydraulic excavators for plateau tunnels, and describes the corresponding test methods.

It applies to the manufacturing and testing of hydraulic excavators used in tunnelling conditions in plateau environments, where the operating energy is supplied exclusively by an on-board rechargeable energy storage system and the machine is driven by an electric motor with a maximum operating voltage of Class B voltage.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references only the edition cited applies; for undated references the latest edition applies, including any amendments.

The list runs to some sixty documents and is dominated by the GB/T earth-moving machinery series - safety of hydraulic excavators, operator enclosure environment, field of view, protective structures, braking, noise and vibration - together with the electric-drive and traction-battery standards GB 18384-2020, GB/T 18488, GB/T 37133, GB/T 38943.1-2020, GB/T 38943.3, GB/T 44254, GB/T 44255-2024 and GB/T 44257.1 and .2, the plateau apparatus standard GB/T 20645-2021, and JB/T 5947 for packing. The full list is reproduced in the normative references of this record.

3 Terms and definitions

The terms and definitions of GB/T 6572, GB/T 25602, GB/T 36693 and GB/T 44254 apply, together with the two defined here.

3.1 battery electric hydraulic excavator for plateau tunnels: a hydraulic excavator suitable for working in plateau tunnels, with the operating energy fully supplied by an on-board rechargeable energy storage system and driven by electric motors.

3.2 state-of-charge (SOC): the percentage of actual capacity in a current battery cell, module, pack or system that can be released under the discharge conditions specified by the manufacturer. The definition is taken from GB/T 44254-2024, 3.4.2.1.

4 Parameters

The main parameters of the battery electric hydraulic excavators covered by this document - referred to throughout as electric excavators - are given in the informative Annex A, Table

A.1.

5 Requirements

5.1 General requirements. The electric excavator has to be capable of operating normally in tunnel environmental conditions defined as: a non-explosive environment; an altitude between 2 000 m and 5 000 m; an ambient temperature between -30 degrees C and +45 degrees C; and a relative humidity not greater than 95 per cent. The clause continues with the warnings and indications to be displayed in the operator's cab, and with the requirements for safety, the electrical system, the hydraulic system, performance and the operator's station, which are not reproduced here.