

ICS 53.100
CCS P97



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

GB/T 45054-2024

**Earth-moving machinery - Battery electric non-road mining
dumpers - Test methods**

土方机械 纯电动非公路矿用自卸车 试验方法

Issued on: December 31, 2024

Implemented on: July 1, 2025

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

Table of Contents

1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 Test conditions	2
5 Preparation before the test	2
6 Determination of main parameters	2
7 Power performance test	3
8 Electric brake performance test	5
9 Braking performance test	6
10 Braking wheel track deviation test	7
11 Steering wheel control force and steering stability test	8
12 Turning ability test	8
13 Determination of minimum turning diameter	8
14 Hydraulic dumping mechanism test	9
15 Low temperature starting performance test	9
16 Constant speed driving energy consumption rate test	10
17 Charging performance test	11
18 Lighting, signal and marking lamps and reflector tests	12
20 Falling Object Protective Structure (FOPS) and Rollover Protective Structure (ROPS) Test	12
21 Electromagnetic compatibility test	12
22 Noise measurement	12
23 Vehicle and charging socket insulation resistance test	12
24 Potential equalization test	12
25 Insulation resistance monitoring verification test	12
26 Power battery system simulation cleaning test	12
27 Vehicle Simulation Cleaning Test	13
28 Vehicle and external conductive connection locking function test	13
29 Battery replacement lock mechanism status detection function test	13
30 Protection function test	13
31 Driver seat vibration test	14
32 Driver's room air conditioning performance test	15

33 Driver's cab windshield defrosting performance test	16
27 Table B.6 Reliability test results statistics table	27

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 for standardization documents" Drafting. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the China Machinery Industry Federation. This document is under the jurisdiction of the National Technical Committee for Standardization of Earthmoving Machinery (SAC/TC334). This document was drafted by: Xiangdian Heavy Equipment Co., Ltd., Inner Mongolia North Heavy Duty Truck Co., Ltd., Zhuzhou Converter Technology Co., Ltd. Engineering Research Center Co., Ltd., Fujian Hongda Times New Energy Technology Co., Ltd., Xuzhou Xugong Mining Machinery Co., Ltd., Shaanxi Tongli Heavy Industry Co., Ltd., Tianjin Engineering Machinery Research Institute Co., Ltd., MCC Jingcheng (Xiangtan) Mining Equipment Co., Ltd., Sany Heavy Equipment Co., Ltd. Co., Ltd., Shanghai Qiyuanxin Power Technology Co., Ltd., Guangzhou Electric Locomotive Co., Ltd., Lovol Heavy Industry Group Co., Ltd., Qingdao Huituo Intelligent Machinery Co., Ltd., Hunan Xiangdian Green Energy Intelligent Control Co., Ltd., Inner Mongolia Power Investment Energy Co., Ltd., Xiangtan Industrial and Mining Electric Drive Vehicle Quality Quality Inspection Center, Shanghai Jiao Tong University, Jiangsu XCMG National Heavy Duty Laboratory Technology Co., Ltd., and Boredon Technology Co., Ltd. The main drafters of this document are: Hu Wenfeng, Yao Shujun, Fu Ruyuan, Mu Junjie, Duan Danru, Meng Yuanyuan, Wu Hongli, Xiao Fukai, Cong Jun, Zhou Wenjie, Deng Zejing, Wang Zhenghang, Chen Long, Sun Weiyang, Chen Chuang, Huang Lei, Wang Yafei, Wu Mingyu, Tang Jianlin, Jiang Lei, Zhang Xiaoqiang, Han Zhicheng. Earthmoving machinery pure electric off-road mining dump truck Test methods

1 Scope

GB/T 45054-2024 gives the Chinese test methods for battery electric non-road mining dump trucks. China is electrifying open-pit haulage faster than anywhere else, and the machines involved are extreme: payloads of tens or hundreds of tonnes, battery packs measured in megawatt hours, and duty cycles in which the descent loaded regenerates a substantial part of the energy consumed climbing empty. None of that is captured by the test methods written for diesel machines, which is why this standard exists. It sets the test conditions and the preparation before test, the determination of the main parameters, and then the tests themselves: the power performance test, the electric braking performance

test, the service braking performance test, the energy consumption and range under defined haul cycles, the charging performance, the thermal behaviour of the battery and drive under sustained load, and the gradeability and stability checks. It takes effect on 1 July 2025, and for a manufacturer or a mine comparing electric haul trucks in China it is the basis of every published figure.

This document describes the performance test methods and reliability test methods for pure electric off-highway mining dump trucks. This document applies to pure electric off-road mining dump trucks (pure electric off-road mechanical transmission mining dump trucks and pure electric off-road electric transmission mining dump trucks) Inspection of mobile mining dump trucks.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 2900.1 Basic terms of electrical engineering

GB/T 4208-2017 Enclosure protection degree (IP code)

GB/T 8419 Laboratory evaluation of vibration of earth-moving machinery driver's seats

GB/T 8592 Earth-moving machinery - Determination of steering dimensions of wheeled machines

GB/T 14781 Earth-moving machinery - Wheeled machinery - Steering requirements

GB/T 16937 Earth-moving machinery driver's field of vision test method and performance criteria

GB/T 17771 Laboratory test and performance requirements for falling object protection structures of earth-moving machinery

GB/T 17922 Laboratory test and performance requirements for rollover protective structures of earth-moving machinery

GB 18384-2020 Safety requirements for electric vehicles

GB/T 18386.2-2022 Test methods for energy consumption and driving range of electric vehicles Part

3 Terms and definitions

The terms and definitions defined in GB/T 2900.1 and GB/T 45051 apply to this document.

5 Test method for windshield defrosting system

GB/T 20418 Lighting, signal and marking lights and reflectors for earth-moving machinery

GB/T 21152-2018 Earth-moving machinery - Wheeled or high-speed rubber tracked machine braking system performance requirements and test methods

GB/T 21153 Units and measurement accuracy of dimensions, performance and parameters of earth-moving machinery

GB/T 22359.1 Electromagnetic compatibility (EMC) of earth-moving machinery and construction machinery with built-in power supply Part

1. Typical General requirements for EMC under electromagnetic environment conditions

GB/T 35193-2017 Earth-moving machinery Non-road mechanical drive mining dump truck test methods

GB/T 35197-2017 Earth-moving machinery - Test methods for non-road electric drive mining dump trucks

GB 44263-2024 Safety requirements for conductive charging systems for electric vehicles

GB/T 45051 Technical requirements for pure electric off-road mining dump trucks for earth-moving machinery GB J

22 Factory and mine road design specifications