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

GB/T 8190.2-2026

Replacing GB/T 8190.2-2011

**Reciprocating internal combustion engines - Exhaust emission
measurement - Part 2: Measurement of gaseous and particulate
exhaust emissions under field conditions**

往复式内燃机 排放测量 第2部分：气体和颗粒排放物的现场测量
(English Translation)

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Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative References	
3 Terms, Definitions, Symbols, and Abbreviations	
3.1 Terms and Definitions	
3.2 Symbol	
3.3 Abbreviations	
4 Discrete operating condition steady-state test field measurements (measurements at a single operating point or based on weighted cycles) 5.	
4.1 General Rules	
4.2 Test Conditions	
4.3 Installation of Sampling Probe and Equipment	
4.4 Measuring Device and Measured Data	
4.5 Operating Conditions	
4.6 Trial run	
5 Measurement of engine emissions performance during typical in-service operation using a portable emissions testing system (PEMS) under field conditions.11	
5.1 Test Conditions	
5.2 Data Sampling Method	
5.3 ECU Data Stream	
5.4 Test Procedure	
5.5 Data Preprocessing	
5.6 Determination of Work Events	
5.7 Test Data Availability	
5.8 Calculate	
5.9 Test Report	
5.10 Instantaneous measurement data files and instantaneous calculation data files	
5.11 Overview of Measurement and Evaluation Sequence	
Appendix A (Normative) Portable Emissions Testing System (PEMS)	
A.1 Basic Requirements	
A.2 Measuring Equipment Requirements	
A.3 Requirements for delivery pipes and sampling probes	

Appendix B (Normative) Test Procedures for Measuring Gas Emissions Using PEMS

B.1 Test Parameters

B.2 Minimum test duration

B.3 Preparation of Non-Road Mobile Machinery

B.4 PEMS Installation

B.5 Pre-test Procedure

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 2 of GB/T 8190 "Emission Measurement of Reciprocating Internal Combustion Engines". GB/T 8190 has already published the following parts.

- Part 1: Test Bench Measurement System for Gas and Particulate Emissions;
- Part 2: Field Measurements of Gas and Particulate Emissions;
- Part 3: Test Procedure for Measuring Exhaust Smoke Opacity of Compression-Ignition Engines Using a Filter Paper Smoke Meter;
- Part 4: Steady-state and transient test cycles for engines of different applications;
- Part 5: Experimental Fuels;
- Part 6: Measurement Results and Test Report;
- Part 7: Determining the Engine Family;
- Part 8: Determination of Engine System Groups;
- Part 9: Test cycles and procedures for bench measurement of exhaust smoke opacity under transient operating conditions of compression-ignition engines;
- Part 10: Test cycles and procedures for field measurement of exhaust smoke opacity of compression ignition engines under transient operating conditions.

This document replaces GB/T 8190.2-2011 "Emission Measurement of Reciprocating Internal Combustion Engines - Part 2: On-site Measurement of Gases and Particulate Emissions".

Compared with GB/T 8190.2-2011, the main technical changes in "Measurement" are as follows, except for structural adjustments and editorial modifications.

a) General terms and definitions (see 3.1-3.10 in the 2011 edition) have been removed, and

terms and definitions related to field measurements have been added.

(See 3.1.1, 3.1.3~3.1.8);

b) Symbols and abbreviations have been changed (see 3.2, 3.3, Chapter 4 of the 2011 edition);

c) The requirements for field measurements applicable to discrete steady-state tests have been changed, including changes to the test conditions (see 4.2, 2011 edition).

Chapter 5 adds requirements for sampling probes and equipment installation [see 4.3f], and modifies the requirements for measuring devices and the data to be measured (see Chapter 5).

4.4 and Appendix K, Chapters 7-9 of the 2011 edition), changed the test run requirements (see 4.6, 2011 edition).

Chapters 11 and 12);

d) Added a method for measuring engine gas emission performance during typical in-service operation using PEMS under field conditions.

(See Chapter 5);

e) Added PEMS requirements (see Appendix A);

f) A test procedure for measuring gas emissions using PEMS has been added (see Appendix B);

g) Added methods for measuring the reference work and CO₂ of engines applicable only to NRSC bench test cycles (see Appendix C);

h) Added data preprocessing for calculating gaseous pollutant emissions (see Appendix D);

i) An algorithm for determining work events during use testing has been added (see Appendix E);

j) A method for determining instantaneous substitution power based on CO₂ mass flow rate has been added (see Appendix F);

k) Added calculation of gaseous pollutant emissions (see Appendix G);

l) An additional method for checking the consistency of the ECU torque signal has been added (see Appendix H);

m) Added ECU data stream information requirements (see Appendix I).

This document is equivalent to ISO 8178-2:2021 "Emissions measurement of reciprocating internal combustion engines - Part 2: Gases and particulate matter".

Field Measurement.

The following minimal editorial changes have been made to this document.

---Added "Note. 'Reciprocating internal combustion engine' is hereinafter referred to as 'engine'." (See Chapter 1);

---Added table numbers and references (see 3.2);

--- Formula numbers and references have been added (see 5.1.4).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no 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 on Standardization of Internal Combustion Engines (SAC/TC177).

Introduction

GB/T 8190 aims to rationally formulate test procedures for non-road engines and simplify relevant regulations on gas and particulate matter emission control.

The drafting of engine technical specifications and engine certification should be carried out in an economical and efficient manner.

To achieve the above objectives, GB/T 8190 adopts three basic principles.

---First principle. Classify applications according to the similar operating characteristics of the engines in order to minimize the number of test cycles, while ensuring these...

The test cycle energy represents the actual operating conditions of the engine.

---Second principle. Emission measurement results are expressed according to the effective power specified in GB/T 8190.1, which ensures that when the engine...

The experiment need not be repeated when the application changes.

---Third principle. Introduce the concept of engine families. Within this family, engines with similar emission characteristics and similar structures can...

It is represented by the engine with the highest emissions in this family.

ISO 8178 is under the jurisdiction of ISO/TC70/SC8. From 1994 to 2006, ISO/TC70/SC8 published 11 parts.

---Part 1: Test Bench Measurements of Gases and Particulate Emissions. The aim is to establish the gas and particulate emission standards for reciprocating internal combustion engines under steady-state conditions.

Test bench measurement and evaluation methods for particulate emissions.