

HJ

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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**Emissions control technical requirements of non-road diesel
mobile machinery
(English Translation)**

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1 Scope

This standard specifies the technical requirements for pollutant emission control of the stage IV non-road diesel mobile machinery (hereinafter referred to as the machinery), the diesel engine it is equipped with, as well as the second diesel engine installed in the vehicle for carrying people (cargo) on the road.

This standard applies to the type inspection, production consistency inspection, emission compliance inspection, in-use compliance inspection and durability requirements, for the following (including but not limited to) machinery and diesel engines installed at non-constant speed, such as.

- Construction machinery (including excavation machinery, shoveling machinery, hoisting machinery, forklift trucks, compaction machinery, road construction and maintenance machinery, concrete machinery, excavation machinery, piling machinery, aerial work machinery, rock drilling machinery, etc.);
- Agricultural machinery (including tractors, combine harvesters, etc.);
- Forestry machinery;
- Airport ground handling equipment;
- Material handling machinery;
- Snow plow equipment;
- Industrial drilling equipment.

This standard applies to the type inspection, production consistency inspection, emission compliance inspection, in-use compliance inspection, durability requirements, for the following (including but not limited to) machinery and diesel engines installed at constant speed, such as.

- Air compressor;
- Generator sets;
- Fishing machinery (aerators, pond excavators, etc.);
- Water pump.

Three-wheeled vehicles and their installed diesel engines, AND ships with rated net power less than 37 kW and their installed diesel engines, shall implement this standard.

2 Normative references

This standard refers to the following documents or clauses thereof. For undated references, the latest edition applies to this standard.

GB 7258 Technical specifications for safety of power-driven vehicles operating on roads

GB 17691-2005 Limits and measurement methods for exhaust pollutants from compression ignition and gas fueled positive ignition engines of vehicles (III, IV, V)

GB 17691-2018 Limits and measurement methods for emissions from diesel fueled heavy-duty vehicles (CHINA VI)

GB 20891-2014 Limits and measurement methods for exhaust pollutants from diesel engines of non-road mobile machinery (CHINA III, IV)

GB 29518-2013 Diesel engines NO_x reduction agent - Aqueous urea solution (AUS 32)

GB 36886-2018 Limits and measurement methods for exhaust smoke from non-road mobile machinery equipped with diesel engine

GB/T 1147.1 Small and medium power internal combustion engines - Part 1.

General requirements

GB/T 25606 Earth-moving machinery - Product identification numbering system

HJ 437-2008 Technical specification for on-board diagnostic (OBD) system of compression ignition and gas fueled positive ignition engines of vehicles

ISO 13400 Road vehicles - Diagnostic communication over Internet Protocol (DoIP)

3 Terms and definitions

The terms and definitions as defined in GB 20891-2014, as well as the following terms and definitions, apply to this standard.

3.1 Emission control strategy

A design element or set of design elements, which are integrated with the overall design of a diesel engine system or machinery, for controlling pollutant emissions, including a base emission control strategy (BECS) and a set of auxiliary emission control strategy (AECS).

3.2 Base emission control strategy (BECS)

The emission control strategy, that works in the entire diesel engine speed and load range, when the auxiliary emission control strategy is not activated, such as. diesel engine timing map (engine timing map), EGR flow characteristic map (EGR map),

SCR system reagent supply characteristic map (SCR catalyst reagent dosing map), etc.

3.3 Auxiliary emission control strategy (AECS)

The emission control strategy, which functions under specific environmental conditions and/or operating conditions (such as vehicle speed, diesel engine speed, gear position, intake air temperature or intake pressure, etc.), for one or more specific purposes, to implement temporary replacement or modification of emission control strategies.

3.4 Defeat strategy

An emission strategy, that does not meet the performance requirements of the base emission strategy or the auxiliary emission strategy, which is specified in this standard.

4.2 Change of product type

For any modification of diesel engine models or machinery, that has been type-tested, it shall not have adverse effects on pollutant emissions, AND still meet the requirements of this standard. If the changed items are public information, machinery manufacturers/importers shall disclose the information on the change of the product. If the changed items may affect the emission performance, the corresponding type inspection shall be carried out, AND the information of the product changes and type inspection results shall be disclosed.

4.3 Information disclosure

4.3.1

For the machinery within the scope of application of this standard, the machinery manufacturing/importing enterprises shall make information disclosure, in accordance with the requirements of Appendix A of GB 20891-2014, as well as Appendix A of this standard. Relevant content, which involves the secrets of diesel engine manufacturers, may be disclosed by diesel engine enterprises, after technical processing.

4.4 Environmental production consistency and in-use compliance

4.4.1

Machinery and diesel engine manufacturers shall ensure the environmental protection production consistency of mass-produced machinery and diesel engines;

provide relevant production consistency assurance materials, in accordance with the requirements of Appendix F. Manufacturers shall, in accordance with the provisions of this standard, ensure that the emissions of newly-produced machinery and diesel engines meet the standards;

5.1.1 Requirements for base emission control strategies

The base emission control strategy shall be effective, within the normal working range of the diesel engine AND meet the relevant requirements of this standard.

5.1.2 Requirements for auxiliary emission control strategies

5.1.3 The machinery manufacturer shall prepare a file package, on the detailed descriptions of the technical points that affect the emission of the machinery, the diesel engine emission control strategy, the method for the diesel engine system to directly or indirectly control the variables related to emission, the driver alarm system and the drivability limiting system as required in Appendix C and Appendix D, which meets the requirements of A.3.2.

5.2 Type inspection items

When the type inspection of machinery and diesel engine models (family) is carried out, according to this standard, the required type inspection items are as shown in Table 1 (if applicable).

5.3 Standard cycle emission requirements

5.3.1

Machines, which are equipped with diesel engines, at a rated net power of 37 kW

~ 560 kW, shall be equipped with wall-flow diesel particulate filters (DPF) OR more efficient particulate control devices. When tested in accordance with the test procedures of Appendix B of GB 20891-2014 and Appendix B of this standard,

5.3.2

During the test, in accordance with the test procedures in Appendix B of GB

20891-2014 and Appendix B of this standard, it shall measure the CO₂ emission and fuel consumption of the diesel engine, at the same time; record the measurement results.