

HJ

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

HJ 689-2014

**Limits and measurement methods for exhaust pollutants from
diesel engines of urban vehicles (WHTC)**
(English Translation)

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1 Application Scope

This standard specifies the limits and measurement methods for exhaust pollutants from diesel engines of urban vehicles (WHTC).

This standard is applicable to the type approval, production conformity inspection and in-service conformity inspection of urban vehicles with the total mass greater than 3,500 kg and their diesel engines.

2 Normative References

This standard makes reference to the following documents and the provisions in them, for undated references, the latest editions are applicable to this standard.

GB 17691-2005 Limits and Measurement Methods for Exhaust Pollutants from Compression

Ignition and Gas Fuelled Positive Ignition Engines of Vehicles (III IV V)

HJ 437-2008 Technical Specification for On-board Diagnostic (OBD) System of

Compression Ignition and Gas Fuelled Positive Ignition Engines of Vehicles

HJ 438-2008 Durability of Emission Control Systems of Compression Ignition and Gas Fuelled Positive Ignition Engines of Vehicles

HJ 439-2008 In-service Conformity of Compression Ignition and Gas Fuelled Positive

Ignition Engines of Vehicles

The modification plan of [2008 No.24] Announcement of the Ministry of Environmental Protection "Limits and Measurement Methods for Exhaust Pollutants from Compression Ignition and Gas Fuelled Positive Ignition Engines of Vehicles (III IV V)" (GB 17691-2005), hereinafter referred to as "Modification Plan".

3 Terminologies and Definitions

For the purpose of this standard, the following terminologies and definitions and those established in GB 17691-2005 apply.

3.1

WHTC test (World Harmonized Transient Cycle test)

It refers to the transient cycle including 1,800 working conditions transforming second by second in the Appendix A of this standard.

3.2

Urban vehicles

It refers to the buses, mail cars and sanitation trucks operating in the city.

4.1 Type approval application

For the new type vehicles or engines within the application scope of this standard, the vehicle or engine (or family) manufacturing enterprise or its authorized agency shall propose the type approval application to the type approval competent departments according to the requirements of

GB 17691-2005 and this standard, and shall complete the specified inspection items.

4.2 Type approval

If the vehicles or engines (family) within the application scope of this standard meet the requirements of GB 17691-2005 and its "Modification Plan" as well as those specified in this standard, the type approval shall be conducted and the type approval certificate in accordance with

Appendix B shall be issued.

5.1 Exhaust requirements of gaseous pollutants and particulate matters

For the engine or vehicle which is conducted with type approval according to this standard, the

WHTC cold starting and hot starting emission tests shall be conducted according to the test procedures specified in Appendix A to determine the exhaust of gaseous pollutants and particulate matters.

5.1.1

The results of exhaust pollutants measured by cold starting and hot starting tests shall be weighted according to the following formula.x

Where, coldm - the mass of various exhaust pollutants in cold starting cycle, g/cycle;

6 Marking of Engine

For the engine approved according to this standard, its mark shall meet the requirements of Chapter 6 in GB 17691-2005, and the text "meeting the requirements of HJ 689-2014" also shall be indicated on the nameplate.

7 Production Conformity

7.1

The manufacturing enterprise shall take measures to ensure the production conformity.

7.2

Production conformity inspection and judgment shall be conducted according to the requirements of GB 17691-2005. Not only the corresponding technical requirements of GB 17691-2005, but also the WHTC exhaust pollutants shall be inspected, the calibration shall be conducted according to deterioration coefficient or correction value to meet the limit requirements specified in this standard.

8 Engine Family

The engines in same family shall not only meet the requirements of Chapter 9 in GB 17691-2005, but also shall meet the requirements of this standard in the aspect having same emission control strategies, measures and technical parameters [e.g., optimal control strategy and urea injection strategy (Mapping adjustment), improving the catalyst activity, exhaust heat management, etc.], and related materials shall be provided to the type approval organization to prove that it can reach the same control effect.

9.1 Type approval

The type approval of engines or vehicles within the application scope of this standard shall be implemented from the issuance date of this standard.

9.2 Registration, sales and service

For the engines or vehicles within the application scope of this standard, from the date specified in Table 2, the new vehicles failing to meet the requirements of this standard shall not be sold or registered, and the new engines failing to meet the requirements of this standard shall not be sold or put into service.

Table 2 -- Implementation Date for Registration, Sales and Service

Stage Stage IV Stage V

Implementation date January 1st, 2015 Being consistent with Stage V in GB 17691-2005

Appendix A (Normative)

WHTC Test Specification

A.1 Overview

A.1.1 This appendix specifies the test specification for measuring the engine exhaust pollutants by WHTC test cycle.

A.1.2 The test shall be carried out on the engine dynamometer rack.

A.1.3 Exhaust pollutants measuring system

This standard specifies two measuring principles with equivalent function.

- Gas components shall be measured by direct sampling method; particulate matters shall be measured by fractional flow dilution system;
- Gas components and particulate matters shall be measured by full-flow dilution constant volume sampling system (CVS system).

Both of the two principles may be used in WHTC test cycle, and the two principles may be randomly combined (such as gas direct sampling measurement and particulate matter full flow measurement).

The engine shall be operated according to the requirements of WHTC test cycle.

WHTC test cycle.

WHTC test cycle includes a group of standard percentage values (percentage in rated speed or rated torque, refer to Attachment AA) of rotational speed and torque which vary second by second;

refer to Figure A.1 for WHTC test cycle. In order to conduct the test on engine test bench, convert the percentage value into actual value according to the mapping curve of each engine so as to form reference cycle. The test cycle shall be conducted according to the