

HJ

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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**Technical specification for emission remote supervision system
of heavy-duty vehicles - Part 1: On-board terminal**
(English Translation)

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1 Scope

This standard specifies the technical requirements for on-board terminals of emission remote monitoring systems of heavy-duty vehicle, including functions, performance requirements, test methods.

This standard applies to equipment, which is installed on heavy-duty vehicles, for collecting, storing, transmitting vehicle's OBD information and engine emission data.

2 Normative references

This standard refers to the following documents or clauses thereof. For the dated documents, only the versions with the dates indicated are applicable to this document;

for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

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

GB/T 2423.18 Environmental testing - Part 2: Test methods - Test Kb: Salt mist, cyclic (sodium chloride solution)

GB/T 4208 Degrees of protection provided by enclosure (IP code)

GB/T 28046.1 Road vehicles - Environmental conditions and testing for electrical and

electronic equipment - Part 1: General

GB/T 32960.2 Technical specifications of remote service and management system for electric vehicles - Part 2: On-board terminal

GB/T 32960.3 Technical specifications of remote service and management system for electric vehicles - Part 3: Communication protocol and data format

GB/T 37027 Information security technology - Specifications of definition and description for network attack

ISO 9001 Quality management system

ISO 14001 Environmental management system

GM/T 0008 Cryptography test criteria for security IC

GM/T 0009 SM2 Cryptography algorithm application specification

3 Terms and definitions

The terms and definitions, which are defined in GB 17691, as well as the following terms and definitions, apply to this standard.

3.1

Heavy-duty vehicles (HDV)

Heavy-duty vehicles in this standard refer to vehicles, that undergo type inspection and information disclosure, in accordance with the technical requirements specified in GB 17691, including compression-ignition engine vehicles, gas-fuel ignition engine vehicles, dual-fuel vehicles, hybrid electric vehicles.

3.2

On-board terminal

Equipment, which is installed on heavy-duty vehicles, to collect, store, transmit vehicle's on-board diagnostic system (OBD) information and engine emission data,

AND shall not be artificially removed. It is a pollution control device.

3.3

Digital signature

Data attached to a data unit, or a cryptographic conversion of a data unit. Such data or conversion allows the receipt of the data unit to confirm the origin and integrity of the data unit AND to protect the data from forgery or denial by a person (such as the recipient).

3.4

Key

A sequence of symbols, which are used to control cryptographic transformation operations (such as encryption, decryption, cryptographic verification function computation, signature generation, or signature verification). It is an asymmetric key pair, which consists of a public and private key. The private key is used for signature or decryption, which shall not be disclosed. The public key is used for signature verification or encryption.

3.5

Time to first fix (TTFF)

The time to obtain the correct fix, after the navigation receiver is powered on.

3.6

Re-get time

After a brief interruption of the satellite signal, the time when the navigation receiver reacquires the satellite signal AND determines its current position.

3.7

Real-time kinematic (RTK)

The carrier phase difference technology, which is a difference method for processing the carrier phase observations of two measuring stations in real time. It sends the carrier phase, which is collected by the base station, to the user receiver, to calculate the difference and resolve the coordinates.

4 General requirements

4.1

The on-board terminals for emission remote monitoring of heavy-duty vehicles shall meet the requirements of GB 17691; meet the functional requirements, which are specified in Chapter 5 of this standard; meet the performance requirements, which are specified in Chapter 6.

4.2

In principle, the original OBD interface shall not be occupied, by the installation of the on-board terminal for emission remote monitoring. If it is required to be occupied, an OBD interface, that meets the relevant standards, shall be reserved separately.

4.3

Vehicle manufacturers shall install alarm light-related indicators, in prominent positions, such as on-board terminals, dashboards or display panels. Owners of heavy- duty vehicles can use the alarm lights and other indicators of on-board terminals, to know the networking

situation of on-board terminals, in real time.

4.4

The on-board terminal shall have anti-dismantling technical measures, to ensure that the on-board terminal cannot be dismantled, without the authorization of the vehicle manufacturer.

4.5

The on-board terminal shall ensure the data quality of the collected data. The service life shall not be less than 7 years.

4.6

The vehicle manufacturer shall carry out the function and performance test of the on-board terminal; the test method shall meet the provisions of Chapter 7.

5.6 Data retransmission

When the data communication link is abnormal, the on-board terminal shall store the emission remote monitoring data locally. After the data communication link returns to normal, the stored data is retransmitted. The data to be retransmitted shall be the data, which is stored during the abnormal period of the communication link, within 5 x 24 hours before the time of restoration of communication. The data format is the same as that of real-time transmission data. The data retransmission shall be carried out, according to the specified communication protocol.

5.7 Alarm of removal

When the on-board terminal fails or is dismantled, the vehicle shall activate the driver alarm system. If the technology allows, the removal alarm information can be transmitted to the Ministry of Ecology and Environment, according to the prescribed communication protocol. The alarm information includes the removal status, removal time, positioning latitude and longitude information.

6.1 Adaptability

According to the provisions of Appendix Q.7 of GB 17691, the electrical adaptability, environmental adaptability, electromagnetic compatibility of the on-board terminal shall meet the requirements of 4.3.1 ~ 4.3.3 in GB/T 32960.2. Among them, for electromagnetic compatibility, the requirements of the on-board terminal for the electrical transient conduction immunity test pulse 1, along the power line, are category

C.