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GB 19755-2016

Replacing GB/T 19755-2005

Technical requirements and measurement methods for emissions from light-duty hybrid electric vehicles

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Foreword

This Standard is formulated for the purpose of implementing the Environmental Protection Law of the People's Republic of China and the Atmospheric Pollution Prevention and Control Law of the People's Republic of China, preventing and controlling the pollution of emissions from motor vehicles to the environment and improving the quality of ambient air.

This Standard specifies the measurement methods and technical requirements for emission pollutants, double idle speed emission pollutants, crankcase pollutants, evaporative pollutants, durability of pollutant control device and on-board diagnostics (OBD) system of light-duty hybrid electric vehicles with spark-ignition engines at room temperature and low temperature; it also specifies the measurement methods and technical requirements for emission pollutants, free acceleration emission smoke, pollutant control device and on-board diagnostics (OBD) system of light-duty hybrid electric vehicles with compression-ignition engines at room temperature.

This Standard is a supplement to "Limits and measurement methods for emissions from light-duty vehicles" (GB 18352), it is applicable to the type test, production consistency and in-use compliance inspection of light-duty hybrid electric vehicles in the fourth stage and beyond.

This Standard refers to the technical content of hybrid electric vehicle emissions in "05 series of amendments" (Addendum 82: Regulation No.83 Revision 3 - Amendment 3 Supplement 8 to the 05 series of amendments - Date of entry into force: 22 July 2009) issued on 4 November 2009 of R83 Regulation "Uniform provisions concerning the approval of vehicles with regard to the emission of pollutants according to engine fuel requirements" of UN Economic Commission for Europe (ECE).

This Standard is a revision of "Measurement methods for emissions from light-duty hybrid electric vehicles" (GB/T 19755-2005). The main amendments are as follows:

- CHANGE the specification for type I test;
- ADD the specification for type VI test;
- ADD the specification for double idle speed test;
- ADD the specification for OBD test;
- ADD the specification for free acceleration smoke test;
- ADD the inspection and determination methods for in-use compliance;
- ADD new test methods for off-vehicle charging hybrid electric vehicles;

Technical requirements and measurement methods for emissions from light-duty hybrid electric vehicles

1 Scope of application

This Standard specifies the measurement methods and technical requirements for emission pollutants, double idle speed emission pollutants, crankcase pollutants, evaporative pollutants, durability of pollutant control device and on-board diagnostics (OBD) system of light-duty hybrid electric vehicles with spark-ignition engines at room temperature and low temperature.

This Standard specifies the measurement methods and technical requirements for emission pollutants, free acceleration emission smoke, pollutant control device and on-board diagnostics (OBD) system of light-duty hybrid electric vehicles with compression-ignition engines at room temperature.

This Standard specifies the inspection and determination methods for the type test, production consistency and in-use compliance of light-duty hybrid electric vehicles.

This Standard applies to light-duty hybrid electric vehicles with a maximum design speed greater than or equal to 50 km/h and installed with spark-ignition engines or compression-ignition engines. For vehicles with only parking idle speed stop function as described in QC/T 837, their emission measurement is carried out according to the requirements of conventional vehicles and does not fall within the scope of this Standard.

2 Normative references

The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. For undated references, the valid version applies to this Standard.

GB 3847-2005 Limits and measurement methods for exhaust smoke from C.I.E. (Compression Ignition Engine) and vehicle equipped with C.I.E.

GB 18352 Limits and measurement methods for emissions from light-duty vehicles⁽¹⁾

⁽¹⁾ GB 18352 refers to GB 18352.3-2005 "Limits and measurement methods for emissions from light-duty vehicles (China stage III, IV)", GB 18352.5-2013 "Limits and measurement methods for emissions from light-duty vehicles (China stage V)" and its latest valid version.

GB/T 19596-2004 Terminology of electric vehicles

GB/T 19753 Test methods for energy consumption of light-duty hybrid electric vehicles

QC/T 837 Types of hybrid electric vehicles

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions and those established in GB 18352 and GB/T 19596-2004 apply.

3.1

hybrid electric vehicle

Vehicles at least capable of obtaining power from the following two types of on-board stored energy:

- consumable fuels;
- rechargeable/energy storage device.

3.2

light-duty hybrid electric vehicle

Hybrid electric vehicles within the scope of GB 18352.

3.3

type test

Refers to the stereotypes test, after the design of a hybrid electric vehicle model is completed, to the trial new product to verify whether the product can meet the technical requirements of this Standard.

3.4

energy storage device

Devices, mounted on hybrid electric vehicles, capable of storing electrical energy, including all power batteries, supercapacitors and flywheel batteries or other combinations.

3.5

- (1) The item does not apply to the fourth stage.
- (2) The item does not apply to the fourth stage.
- (3) For light-duty hybrid electric vehicles of the fifth stage, carbon tank and catalytic converter tests shall also be carried out according to GB 18352.5-2013.

Type I test: refers to the air pollutant emission test at normal temperature after cold start

Type II test: refers to the measurement of CO and THC of double idle speed and λ value (excess air coefficient) of high idle speed for vehicles with spark-ignition engines; refers to free acceleration smoke for vehicles with compression -ignition engines

Type III test: refers to the crankcase pollutant emission test

Type IV test: refers to the evaporative pollutant emission test

Type V test: refers to the durability test for pollution control devices

Type VI test: refers to the CO and HC emission test at low temperature after cold start

6 Test description

6.1 Type I test (air pollutant emission test at normal temperature after cold start)

6.1.1 Off-board vehicle charging (OVC) hybrid electric vehicles without function of manual selection of driving mode

The test shall be carried out under the following conditions:

- Condition A: the energy storage device is in the maximum state of charge;
- Condition B: the energy storage device is in the minimum state of charge.

Refer to Annex C for the schematic diagram of the state of charge of the energy storage device in type I test.

6.1.1.1 Condition A test

6.1.1.1.1 Energy storage device discharges through vehicle running

The vehicle is running on a test runway or chassis dynamometer as required below until meet one of the following discharge termination conditions:

- Vehicle speed is stabilized at (50 ± 2) km/h until the engine of the hybrid electric vehicle starts;
- If the engine is not started, and the vehicle can not reach a stable speed of (50 ± 2) km/h, then the vehicle speed shall be reduced so that the vehicle can run at a certain time/distance at this vehicle speed when the engine is not started (determined by the testing organization and the manufacturer) until the engine starts;

$t(h) = 3 \times \text{Nominal energy storage of the energy storage device (Wh)}/\text{power supply power (W)}$

6.1.1.1.5 Test procedure

The vehicle is normally started and the first cycle begins when the vehicle enters the start-up state. The manufacturer shall carry out the test as specified in 6.1.1.1.5.1 (Option 1) or as specified in 6.1.1.1.5.2 (Option 2).

6.1.1.1.5.1 Option 1 (single cycle): Sampling shall be carried out according to the specifications of GB 18352. Sampling shall be started before or during the start of the vehicle. Sampling shall be stopped at the end of the last idle speed condition of the two-type suburb cycle.

6.1.1.1.5.2 Option 2 (multiple cycles): Sampling shall be started before or during the start of the vehicle. A number of (N times) test cycles shall be repeated continuously. Stop sampling at the end of the last idle speed period of the first suburb (2-type) cycle when the energy storage device reaches the minimum state of charge (see 3.7).

Between two cycles, a hot exposure process of no more than 10 minutes is allowed, and the power system during the hot exposure shall be in the off state.

At the end of each test cycle, it shall measure the electricity balance Q; the measurement method is in accordance with the relevant specifications of GB/T 19753; it shall also determine whether the energy storage device is in the minimum state of charge.

The number of test cycles can also be increased at the manufacturer's request when the energy storage device reaches the minimum state of charge after the N times of test cycles. If the electricity balance measured by each additional cycle indicates that the amount of battery discharge (Q is positive value) is lower than the previous cycle discharge, the results of the additional test cycle shall be considered in the calculations of 6.1.1.1.6 and 6.1.1.3.2.

6.1.1.1.5.3 Use of transmission. The vehicle operates according to the specifications of GB 18352. If the manufacturer has special requirements for gear shift, type I test's operation cycle is not applicable for the requirements of the vehicle's gear shift point, it may operate according to the requirements for the use of transmission in GB 18352, combined with the manufacturer's product instructions and operating instructions of gearbox.

6.1.1.1.5.4 Emission pollutants are analyzed according to GB 18352.

6.1.1.1.6 Calculation of emission of pollutants of condition A test (M_{Ai})

For vehicles tested according to 6.1.1.1.5.1, M_{Ai} is calculated on the basis of the result

than a complete test cycle, the type I test may be carried out in electric mode at the manufacturer's request. In this case, the vehicle pretreatment in accordance with 6.1.2.1.3 may be omitted.

6.1.2.1.2 Energy storage device discharges through vehicle running

6.1.2.1.2.1 If the vehicle has a function of electric mode selection, the driving mode switch is placed in electric mode position, and the vehicle runs on a test runway or on a chassis dynamometer at a steady speed of $70\% \pm 5\%$ of the maximum speed for 30 minutes at electric mode, and discharges to the energy storage device. The discharge process is stopped if one of the following conditions is met:

- the vehicle can not run at 65 % of the maximum speed for 30 minutes;
- the standard on-vehicle equipment instructs the driver to stop;
- after running 100 km.

6.1.2.1.2.2 If the vehicle does not have a function of electric mode selection, the vehicle shall discharge in accordance with 6.1.1.1.1.

6.1.2.1.3 Vehicle pretreatment, processing, charging of energy storage device, test procedure and emission calculation

According to the relevant specifications of 6.1.1.1, carry out pretreatment, processing, charging and discharging test of energy storage device to the vehicle, and calculate the emission of pollutant (M_{Ai}) of condition A test, M_{Ai} shall meet the emission requirements of the corresponding stage specified in GB18352.

6.1.2.2 Condition B test

6.1.2.2.1 Vehicle pretreatment

The vehicle is pretreated according to the specifications of 6.1.1.2.1.

6.1.2.2.2 Energy storage device

The energy storage device of the vehicle shall discharge according to the specifications of 6.1.2.1.2.

6.1.2.2.3 Carry out vehicle exposure and discharge tests according to the relevant specifications of 6.1.1.2.3 and 6.1.1.2.4.

6.1.2.2.4 Determination of test validity

The vehicle shall be determined for validity according to the specifications of 6.1.1.2.5. If the test is invalid, the vehicle shall be retested from 6.1.2.2.2.

mode, if the vehicle has engine operating mode, the vehicle shall be tested at “engine operating mode” and “hybrid mode” respectively. In the engine operating mode, carry out the emission test according to the requirements for conventional vehicles and specifications of GB 18352. For “hybrid mode” test, if the vehicle has several available hybrid modes, it shall choose the mode of maximum fuel consumption and test according to the specifications of 6.1.4.2 to 6.1.4.5. The testing organization shall also confirm that the test results in all modes meet the standard limit requirements.

6.1.4.2 According to the manufacturer’s recommendations, the electrical energy state of the vehicle’s energy storage device is set to ensure that the vehicle meet the specifications of 6.1.3.3 during the emission test.

6.1.4.3 When the vehicle is pretreated, at least two complete type I test operation cycles specified in GB 18352 are run continuously (including one-type and two-type).

6.1.4.4 Test according to the specifications of 6.1.1.1.5.3.

6.1.4.5 The determination of test validity is the same as 6.1.3.3. If the determination condition is satisfied, the emission test result is valid; if the determination condition is not satisfied, the vehicle will be retested from 6.1.4.2 until the condition is satisfied.

6.2 Type II test (double idle speed test or free acceleration smoke test)

6.2.1 Double idle speed test (measure CO and HC of double idle speed and λ value of high idle speed (excess air coefficient))

The double idle speed test shall be carried out according to the specifications of Annex D of GB 18352, using the engine mode. The manufacturer shall provide a working mode in which the test can be carried out.

6.2.2 Free acceleration smoke test

The vehicle in the VI stage shall be carried out with the free acceleration smoke test according to the specifications of Annex D of GB 3847-2005; the vehicle after the V stage shall be carried out with the free acceleration smoke test according to the relevant specifications of GB 18352.

If there are special requirements for hybrid electric vehicles when carrying out this test, then these requirements shall be described in detail in product instructions. In addition to the device provided by the vehicle itself, this special measurement requires no other device.

6.3 Type III test (crankcase pollutant emission test)

It shall carry out type III test according to the specifications of Annex E of GB 18352 and shall meet the following requirements.

6.5 Type V test (durability test of pollution control device)

It shall test according to the specifications of type V test in GB 18352 and shall meet the following requirements.

6.5.1 Off-board vehicle charging hybrid electric vehicles (OVC)

6.5.1.1 During the range accumulation test, the energy storage device is allowed to be charged twice a day.

6.5.1.2 For off-board vehicle charging hybrid electric vehicles with manual selection of driving mode, the range accumulation test shall be carried out in the mode (normal mode) that is automatically set after the ignition switch is turned on.

6.5.1.3 For the purpose of continuous range accumulation, after the approval of the testing organization, it is allowed to switch to another hybrid mode during the range accumulation test. The measurement of emission pollutants shall be carried out under the same conditions as those specified in condition B of type I test in 6.1.1.1 and 6.1.2.2.

6.5.2 Not off-board vehicle charging hybrid electric vehicles (NOVC)

6.5.2.1 For not off-board vehicle charging hybrid electric vehicles with manual selection of driving mode, the range accumulation test shall be carried out in the mode (normal mode) that is automatically set after the ignition switch is turned on.

6.5.2.2 The measurement of emission pollutants shall be carried out under the same conditions as those specified in type I test.

6.6 Type VI test (CO and HC emission test at low temperature after cold start)

It shall test according to the specifications of type VI test in Annex H of GB 18352 and shall meet the following requirements.

6.6.1 For off-board vehicle charging hybrid electric vehicles (OVC), the measurement of emission pollutants shall be carried out under the same conditions as those specified in condition B of type I test in 6.1.1.1 and 6.1.2.2, except for 6.1.1.2.5.

6.6.2 For not off-board vehicle charging hybrid electric vehicles (NOVC), the measurement of emission pollutants shall be carried out under the same conditions as those specified in type I test, except for 6.1.3.3.

6.7 On-board diagnostics (OBD) system test

It shall test according to the relevant specifications of OBD in Annex I of GB 18352 and shall meet the following requirements.

Annex A

(normative)

Type test related information

Any schematic diagram in the information shall be adequately described in the appropriate proportions. If there is a photo, it shall show its details. Such as systems, components or stand-alone technology assembly with microprocessor control, shall be provided with their performance data.

A.1 General

A.1.1 Label (trade name of the manufacturer):

A.1.2 Model and general business description:

A.1.3 Vehicle model logo:

A.1.4 Type of vehicle:

A.1.5 Name and address of the manufacturer:

A.1.6 Address of assembling plant:

A.2 Overall structural characteristics of vehicles

A.2.1 Photo and/or schematic diagram of the representative vehicle:

A.2.2 Power shaft (number, position, interconnection):

A.3 Mass and dimensions (in kg and mm) (if applicable, see schematic diagram)

A.3.1 Mass of the vehicle with the vehicle body under running conditions, or mass of the vehicle with the cab chassis if the manufacturer does not fit the vehicle body (with standard equipment including coolant, oil, fuel, tools, spare tire and driver) (maximum and minimum):

A.3.2 Technically allowable maximum loading mass (maximum and minimum):

A.4 Power system (for vehicles that can use both gasoline and diesel and another fuel, the item shall be redone; for hybrid vehicles, supplements are required to fill in A.4.5)

A.4.1 Manufacturer:

A.4.1.1 Engine type (e.g. marked on engine, or other means of identification):

A.4.2.6.2.5 Description of the fan and its transmission mechanism:

A.4.2.6.3 Air cooling

A.4.2.6.3.1 Blower: Yes/No²⁾

A.4.2.6.3.2 Characteristics:

A.4.2.6.3.2.1 Label:

A.4.2.6.3.2.2 Model:

A.4.2.6.3.3 Transmission ratio:

A.4.2.7 Air intake system

A.4.2.7.1 Turbocharger: Yes/No²⁾

A.4.2.7.1.1 Label:

A.4.2.7.1.2 Model:

A.4.2.7.1.3 System description (i.e. maximum inflatable pressure: kPa, deflation mode (if any)):

A.4.2.7.2 Intercooler: Yes/No²⁾

A.4.2.7.2.1 Type: Air - Air/Air - Water²⁾

A.4.2.7.3 Air intake vacuum at rated engine speed and 100 % load (only for compression-ignition engines)

Minimum allowable value kPa

Maximum allowable value kPa

A.4.2.7.4 Description and schematic diagram of the intake pipe and its accessories (inflatable chamber, heating device, additional intake air, etc.):

A.4.2.7.4.1 Description of intake manifold (including schematic diagram and/or photo): .

A.4.2.7.4.2 Air filter, schematic diagram:, or

A.4.2.7.4.2.1 Label:

A.4.2.7.4.2.2 Model:

A.4.2.7.4.3 Intake muffler, schematic diagram:, or

A.4.2.11.2.1.10 Thermal protection: Yes/No²⁾

A.4.2.11.2.1.11 Measures for regeneration system/exhaust after-treatment system, description:

4.2.11.2.1.11.1 Under the condition that equivalent to that of type I test, the number of type I operation cycle or equivalent engine bench test cycle between two regeneration stages (the distance “D” in Annex P):

A.4.2.11.2.1.11.2 Description of the method for determining the number of cycles between two regeneration stages:

A.4.2.11.2.1.11.3 Loading level parameters required before determining the regeneration (i.e., temperature, pressure, etc.):

A.4.2.11.2.1.11.4 Description of the method for loading system in the test procedure described in Annex P

A.4.2.11.2.1.11.5 Normal operating temperature range (K):

A.4.2.11.2.1.11.6 Consumable reactants (if applicable):

A.4.2.11.2.1.11.7 Type and concentration of reactants required for catalytic action (if applicable):

A.4.2.11.2.1.11.8 Normal operating temperature range of reactants (if applicable):

A.4.2.11.2.1.11.9 International standards (if applicable):

A.4.2.11.2.1.11.10 Frequency of re-addition of reactants: continuous/maintained²⁾ (if applicable):

A.4.2.11.2.1.12 Label of catalytic converter:

A.4.2.11.2.1.13 Component number identification:

A.4.2.11.2.2 Oxygen sensor: Yes/No²⁾

A.4.2.11.2.2.1 Model:

A.4.2.11.2.2.2 Location:

A.4.2.11.2.2.3 Scope of control:

A.3.2.13.2.2.4 Label of oxygen sensor:

A.3.2.13.2.2.5 Component number identification:

A.4.2.11.2.6.4.3 Loading level parameters required before determining the regeneration (i.e., temperature, pressure, etc.):

A.4.2.11.2.6.4.4 Description of the method for loading system in the test procedure described in Annex P

A.4.2.11.2.6.5 Label of particle trap:

A.4.2.11.2.6.6 Component number identification:

A.4.2.11.2.7 OBD system

A.4.2.11.2.7.1 Written description and/or schematic diagram of MI:

A.4.2.11.2.7.2 List and purpose of all components monitored by OBD system:

A.4.2.11.2.7.3 Written description of the following items:

A.4.2.11.2.7.3.1 Spark-ignition engine²⁾

A.4.2.11.2.7.3.1.1 Monitoring of catalytic converter²⁾:

A.4.2.11.2.7.3.1.2 Fire monitoring²⁾:

A.4.2.11.2.7.3.1.3 Monitoring of oxygen sensor²⁾:

A.4.2.11.2.7.3.1.4 Other components monitored by OBD system²⁾:

A.4.2.11.2.7.3.2 Compression-ignition engine²⁾

A.4.2.11.2.7.3.2.1 Monitoring of catalytic converter²⁾:

A.4.2.11.2.7.3.2.2 Monitoring of particle trap²⁾:

A.4.2.11.2.7.3.2.3 Monitoring of electronic fuel supply system²⁾:

A.4.2.11.2.7.3.2.4 Other components monitored by OBD system²⁾:

A.4.2.11.2.7.4 MI activation decision (fixed number of running cycles or statistical method):

A.4.2.11.2.7.5 List of all output codes and formats used by OBD system (each of which is specified):

A.4.2.11.2.7.6 The automobile manufacturer shall provide the following additional information to ensure compatibility of its OBD system with accessories, service parts, diagnostic tools and inspection devices, unless such information relates to intellectual property or to the technical secrets of the manufacturer or OEM supplier.

A.4.2.12.2.1 Describe the measures to protect catalytic converter from switching gasoline and LPG back and forth:

A.4.2.12.2.2 System arrangement (electrical wiring, vacuum connection compensation hose, etc.):

A.4.2.12.2.3 Schematic diagram of symbol:

A.4.2.13 NG supply system: Yes/No²⁾

A.4.2.13.1 Engine control unit for NG supply

A.4.2.13.1.1 Label:

A.4.2.13.1.2 Model:

A.4.2.11.1.3 Adjustment of emissions-related possibilities:

A.4.2.13.2 Supplementary information:

A.4.2.13.2.1 Describe the measures to protect catalytic converter from switching gasoline and NG back and forth:

A.4.2.13.2.2 System arrangement (electrical wiring, vacuum connection compensation hose, etc.):

A.4.2.13.2.3 Schematic diagram of symbol:

A.4.3 Permissible temperature of the manufacturer

A.4.3.1 Cooling system

A.4.3.1.1 Liquid cooling system

Maximum temperature at outlet: K

A.4.3.1.2 Air cooling system

A.4.3.1.2.1 Reference point:

A.4.3.1.2.2 Maximum temperature at reference point: K

A.4.3.2 Maximum exhaust temperature at intercooler inlet: K

A.4.3.3 Maximum exhaust temperature of the reference point in the exhaust pipe near the outer boundary of the exhaust manifold K

A.4.3.4 Temperature of fuel

A.4.5.6.3 Rated power: kW

A.4.5.7 Electronic vacuum pump

A.4.5.7.1 Manufacturer:

A.4.5.7.2 Model:

A.4.5.7.3 Rated power: kW

A.4.5.8 Electronic power steering device

A.4.5.8.1 Manufacturer:

A.4.5.8.2 Model:

A.4.5.8.3 Rated power: kW

A.4.5.9 Dedicated braking energy recovery system (Yes/No²⁾, active recovery system/Yes, passive recovery system)

A.4.5.9.1 Manufacturer:

A.4.5.9.2 Model:

A.4.5.10 DC/DC converter

A.4.5.10.1 Manufacturer:

A.4.5.10.2 Model:

A.4.5.10.3 Rated power: kW

A.4.5.10.4 Integration with motor controller: Yes/No²⁾

A.4.5.10.5 One-way or two-way:

A.4.5.10.6 Output voltage range:

A.5 Transmission system

A.5.1 Moment of inertia of engine flywheel:

A.5.1.1 Additional moment of inertia without gears:

A.5.2 Clutch (type):

A.5.2.1 Maximum torque transmitted:

Annex B

(normative)

Type test results

B.1 Basic information

B.1.1 Label (Manufacturer's trademark):

B.1.2 Type:

B.1.2.1 Trade name (if applicable):

B.1.3 Identification method and position of vehicle type, if marked on the vehicle¹⁾:

B.1.3.1 Location of the symbol:

B.1.4 Type of vehicle:

B.1.5 Name and address of Manufacturer:

B.1.6 Name and address of assembly plant:

B.1.7 Representative of Manufacturer:

B.2 Test report index

B.2.1 Testing agency responsible for conducting the type test:

B.2.2 Date of test report:

B.2.3 Number of test report:

B.3 Automobile parameters and test conditions

B.3.1 Mass of vehicle preparation:

B.3.2 Maximum total mass of vehicle:

B.3.3 Mass of vehicle benchmark:

B.3.4 Number of seats (including driver's seat):

B.3.5 Vehicle body type:

B.3.5.1 For type M vehicles: saloon car, warehouse-style reserve vehicle, passenger and cargo vehicle, hatchback, convertible, utility vehicle²⁾

condition A multiplied by Ki and DF (M _A) ^{(i) (iv)}	3	1								
	Mean									
K _i ^{(i) (iv)}							(ii)		(ii)	(ii)
DF ^{(i) (iv)}										(ii)
Measured value of condition B (i) (iv)	1	1								
	2	1								
	3	1								
	Mean									
Measured value of condition B multiplied by Ki and DF (M _B) ^{(i) (iv)}	—	—								
Weighted mean ^{(i) (iv)}										
Limit										(ii)
(i) If applicable (li) Not applicable (iii) The mean of THC and NO _x are added together after multiplied by Ki (M.Ki), respectively (iv) Round to two decimal places (v) Round to four decimal places (vi) Round to more than a decimal place than the limit										

For not off-board charging hybrid electric vehicles (if having engine operating mode, it shall fill measurement results according as required in the following table)

Type I test result	Test	CO (g/km)	THC (g/km)	NMHC (g/km)	NO _x (g/km)	THC+ NO _x (g/km)	PM (g/km)	PN (#/km)	CO ₂ (g/km)
Measured value of mixed mode ^{(i) (iv)}	1								
	2								
	3								
Mean of mixed mode ^{(i) (iv)}									
Mean of mixed mode multiplied by									

B.4.8.3.1.2 Monitoring of catalytic converter:

B.4.8.3.1.3 Monitoring of oxygen sensor:

B.4.8.3.1.4 Other parts monitored by OBD system:

B.4.8.3.2 Compression-ignition vehicles

B.4.8.3.2.1 Monitoring of catalytic converter:

B.4.8.3.2.2 Monitoring of particle trap:

B.4.8.3.2.3 Monitoring of electronically controlled fuel system actuator:

B.4.8.3.2.4 Other parts monitored by OBD system:

B.4.8.4 MI activation determination (fixed number or statistical method of operation cycle):

B.4.8.5 List of all OBD system output codes and the format used (each of which shall be described):

B.5 Pollution control device

B.5.1 Catalytic converter

B.5.1.1 Original catalytic converter tested according to all relevant requirements of this Standard: Yes/No²⁾

B.5.1.1.2 Label and model of original catalytic converter (listed in A.4.2.11.2.1):

B.5.1.1.3 Carrier volume: L

B.5.1.1.4 Total content of precious metal: g

B.5.1.1.5 Proportion of precious metal: (Pt : Pd : Rh)

B.5.2 Original particle trap tested according to all relevant requirements of this Standard: Yes/No²⁾

B.5.2.1 Label and model of original particle trap for replacement (listed in A.4.2.11.2.6):

B.5.3 Original carbon tank tested according to all relevant requirements of this Standard: Yes/No²⁾

B.5.3.1 Label and model of original carbon tank:

B.5.3.2 Effective volume of carbon tank: L

Annex D

(informative)

Net power and maximum 30 minutes power test for electric drive system

D.1 Relevant definitions

D.1.1 Net power

Net power is the power measured at the end of the motor output shaft when carrying out the bench test under the specified environmental conditions, or the equivalent power at the corresponding motor speed considering the consumption of the accessory device listed in Table D.1 of this specification.

D.1.2 Maximum 30 minutes power

Maximum 30 minutes power is the average of the maximum net power that can be continuously output by the power drive system over a 30 minute period under the power supply conditions defined in D.2.6.

D.2 Test preparation

D.2.1 Measurement accuracy

D.2.1.1 Torque: ± 1 % of measured torque.

The torque measuring system of the dynamometer shall be calibrated to eliminate the influence of the frictional resistance. When the torque is less than 50 % of the full range of the dynamometer, the accuracy can be ± 2 % of the measured torque.

D.2.1.2 Motor speed: ± 0.5 % of measured speed

D.2.1.3 Motor inlet air temperature: ± 2 K

D.2.2 The electric drive system shall be pretreated according to the manufacturer's specifications.

D.2.3 If the measurement of power can only be carried out on a drive system with a gearbox or reducer, the corresponding efficiency shall be taken into account.

D.2.4 Other setting conditions shall meet the product instructions of the manufacturer of the motor product and shall not be subject to further changes for a particular purpose.

D.2.5 Accessories

D.2.5.1 Accessories to be installed

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