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Fuel consumption evaluation methods and targets for passenger cars

乘用车燃料消耗量评价方法及指标

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Fuel consumption evaluation methods and targets for passenger cars

1 Scope

This document specifies requirements for corporate average fuel consumption indicators and production consistency for passenger cars, and describes the corresponding evaluation methods.

This document applies to M_1 vehicles, including gasoline, diesel, bi-fuel and dual-fuel vehicles, hybrid electric vehicles, battery electric vehicles, fuel cell vehicles, natural gas fueled vehicles, liquefied petroleum gas fueled vehicles, methanol fueled vehicles, etc.

2 Normative references

The provisions of the following documents constitute the essential clauses of this document through normative references in this text. Among them, for referenced documents with dates, only the versions corresponding to the dates are applicable to this document; for referenced documents without dates, the latest versions (including all amendments) are applicable to this document.

GB/T 18386.1-2021 Test methods for energy consumption and range of electric vehicles - Part 1: Light-duty vehicles

GB/T 19233-2020 Measurement methods of fuel consumption for light-duty vehicles

GB/T 19596 Terminology of electric vehicles

GB/T 19753-2021 Test methods for energy consumption of light-duty hybrid electric vehicles

GB/T 29125 Test methods for fuel consumption of CNG vehicles

GB/T 37340-2019 Conversion methods for energy consumption of electric vehicles

GB/T 38146.1 China automotive test cycle - Part 1: Light-duty vehicles

GB/T 43252-2023 Test methods of energy consumption and range for fuel cell

electric vehicles

QC/T 1130-2021 Measurement methods of fuel consumption for methanol vehicles

3 Terms and definitions

The terms and definitions defined in GB/T 19596 and GB/T 38146.1 and the following apply to this document.

3.1 fuel consumption of vehicle type

The comprehensive fuel consumption of a certain vehicle type determined according to the prescribed method.

3.2 average fuel consumption

The average fuel consumption of a group of vehicles, which is calculated by weighing the number of vehicles corresponding to the vehicle type.

3.3 corporate average fuel consumption; CAFC

The average fuel consumption that is obtained from the calculation of the fuel consumption of passenger car types produced or imported by an enterprise in a certain year, by weightings of the corresponding production or import volume in that year.

3.4 corporate average fuel consumption of traditional passenger cars

$CAFC_{tp}$

The average fuel consumption that is obtained from the calculation of the fuel consumption of traditional energy passenger car types produced or imported by an enterprise in a certain year, by weightings of the corresponding production or import volume in that year.

NOTE: Traditional energy passenger cars refer to vehicles that can be fueled by gasoline, diesel, gas fuel or alcohol ether fuel, etc., and do not include off-vehicle-chargeable hybrid electric vehicles (OVC-HEV).

3.5 corporate average fuel consumption target

T_{CAFC}

The average fuel consumption that is obtained from the calculation of the fuel consumption target value of passenger car types produced or imported by an enterprise in a certain year, by weightings of the corresponding production or import volume in that year.

3.6 corporate average fuel consumption target of traditional passenger cars

$T_{\mathrm{CAFC_{tp}}}$

The average fuel consumption that is obtained from the calculation of the fuel consumption target value of traditional energy passenger car types produced or imported by an enterprise in a certain year, by weightings of the corresponding production or import volume in that year.

3.7 off-cycle technology; OCT

A technology that has significant energy-saving effects in actual use but cannot be (completely) measured using existing test methods.

4 Determination of fuel consumption of vehicle type, target values, and CO_2 emission reference values

4.1 Determination of fuel consumption of vehicle type

4.1.1 For gasoline, diesel, bi-fuel and dual-fuel passenger cars, the type approval value of fuel consumption of vehicle type shall be determined using the Worldwide Harmonized Light Vehicle Test Cycle (WLTC) in accordance with GB/T 19233-2020.

4.1.2 For non-off-vehicle-chargeable hybrid electric passenger cars, the WLTC shall be used in accordance with GB/T 19753-2021 to determine the type-approved value of the fuel consumption of vehicle type; for off-vehicle-chargeable hybrid electric passenger cars, the WLTC shall be used in accordance with GB/T 19753-2021 to determine the type-approved values of the OVC-HEV fuel consumption and the OVC-HEV power consumption, and the OVC-HEV converted fuel consumption shall be calculated in accordance with G.3 of GB/T 19753-2021 (conversion by simple conversion method).

4.1.3 For battery electric passenger cars, the energy consumption type approval value

shall be determined in accordance with GB/T 18386.1-2021 and converted into the corresponding gasoline fuel consumption using the simple conversion method in GB/T 37340-2019.

4.1.4 For non-off-vehicle-chargeable fuel cell passenger cars, hydrogen consumption shall be determined in accordance with GB/T 43252-2023. For off-vehicle-chargeable fuel cell passenger cars, hydrogen consumption and electric energy consumption shall be determined in accordance with GB/T 43252-2023. Electric energy consumption shall be calculated by multiplying the result calculated in Section C.2.9 of GB/T 43252-2023 by the result calculated in Section C.2.5 of GB/T 43252-2023. The electric energy consumption shall then be converted to the corresponding gasoline fuel consumption using the simple conversion method in GB/T 37340-2019. For years up to 2030, hydrogen consumption shall be calculated as zero.

4.1.5 For CNG, LNG, and LPG passenger cars, a simulated comprehensive cycle fuel consumption test shall be conducted on a chassis dynamometer in accordance with GB/T 29125 to determine the gas fuel consumption, which shall then be converted into gasoline fuel consumption in accordance with GB/T 29125.

4.1.6 For methanol-fueled passenger cars, the methanol fuel consumption and equivalent gasoline or diesel fuel consumption shall be determined in accordance with QC/T 1130-2021.

4.1.7 For vehicles using one or more OCT/OCD systems, the energy consumption of the vehicle type shall be deducted by a certain amount based on the energy saving effect of the OCT/OCD system[1)].

4.2 Target values of the fuel consumption of vehicle types

4.2.1 For passenger cars with fewer than three rows of seats[2)], the target values of the fuel consumption of vehicle types shall be calculated according to formula (1), and the calculated result shall be rounded to two decimal places.

[1)] The specific options, testing and evaluation methods, energy consumption reduction quotas, and implementation dates for OCT/OCD will be determined separately.
[2)] A "seat" exists as long as there are usable seat anchor points.

4.2.2 For passenger cars with three or more rows of seats[1)], the target values of the fuel consumption of vehicle types shall be the result calculated in 4.2.1 plus 0.14 L/100 km, and the calculated result shall be rounded to two decimal places.

4.3 CO_2 emission reference values

The CO_2 emission reference value corresponding to the target value is calculated according to formula (2), and the calculation result is rounded to two decimal places.

5 Calculation methods and index requirements for corporate fuel consumption and CO_2 emission

5.1 Corporate average fuel consumption (CAFC)

The corporate average fuel consumption is calculated by taking the sum of the product of the fuel consumption of each vehicle type determined according to 4.1 and the corresponding annual production or import volume in the enterprise, divided by the total annual production or import volume of the enterprise's passenger cars, and using formula (3).

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