



2023/2866

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COMMISSION IMPLEMENTING REGULATION (EU) 2023/2866

of 15 December 2023

implementing Regulation (EU) 2019/631 of the European Parliament and of the Council by determining the procedures for performing the verification of the CO₂ emission and fuel consumption values of passenger cars and light commercial vehicles in-service (in-service verification)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) 2019/631 of the European Parliament and of the Council of 17 April 2019 setting CO₂ emission performance standards for new passenger cars and for new light commercial vehicles, and repealing Regulations (EC) No 443/2009 and (EU) No 510/2011 ⁽¹⁾, and in particular Article 7(9), third subparagraph and Article 13(4), first subparagraph, thereof,

Whereas:

- (1) Article 13 of Regulation (EU) 2019/631 requires the Commission to verify the CO₂ emission and fuel consumption values of vehicles in-service.
- (2) In order to ensure that the in-service verification is representative, a minimum number of vehicle families to be tested should be selected by the granting type-approval authorities. It is appropriate that synergies are found between in-service verification of CO₂ emissions and the in-service conformity checks of pollutant emissions.
- (3) In order to target those in-service verification families that have the highest risk of including vehicles with a deviation in the CO₂ emission and fuel consumption values from the specific emissions of CO₂ and fuel consumption values recorded in the certificate of conformity, the granting type-approval authority should select for verification those in-service verification families for which it received evidence which it considers to be sufficiently indicating that such deviation may exist, complemented by in-service verification families selected on the basis of a risk assessment to be performed by the Commission.
- (4) In order to ensure sufficient coverage of each type of test, it is appropriate to set a minimum percentage of families to be covered by each type of test, based on the total number of in-service verification families for which the granting type-approval authority has issued emissions type-approvals, including emissions type-approval extensions involving changes to the declared CO₂ emissions values.
- (5) As the CO₂ emission and fuel consumption values recorded in the certificate of conformity are determined based on type-approval testing, it is appropriate to require that the vehicles selected for the in-service verification test are in a similar condition as those tested during type-approval, in particular by setting requirements for their maximum mileage and age.
- (6) In order to limit the testing burden, the granting type-approval authority should be able to either apply the same correction factors for calculating the vehicle's CO₂ emissions as for type-approval or, if it sees a need to verify one or more of those factors, to determine them as part of the in-service verification by performing the same tests as for type-approval.
- (7) For off-vehicle charging hybrid electric vehicles ('OVC-HEV'), the in-service verification chassis dynamometer test result should be based only on the charge sustaining mode and information on the relevant parameters in charge depleting mode should be collected to allow assessing whether a future adjustment would be necessary.

⁽¹⁾ OJ L 111, 25.4.2019, p. 13.

- (8) In order to enable the future in-service verification of the accuracy of the on-board fuel and/or energy consumption monitoring ('OBFCM') devices installed in the vehicles, it is appropriate to collect the values recorded by the OBFCM device during the in-service verification chassis dynamometer test.
- (9) In order not to underestimate the size of the deviation in the CO₂ emission values of any vehicle within an in-service verification family, the size of the deviation should be based on the average ratio of the CO₂ emission value determined from the in-service tests to the CO₂ emission value as recorded in the certificate of conformity, and on the CO₂ emission value of the vehicle high of that in-service verification family.
- (10) In order to evaluate the road load test result against the CO₂ emission value reported in the certificate of conformity of the vehicle, the CO₂ emission value corresponding with the road load test result should be calculated using the interpolation method applied for type-approval or, where that method was not applied, using a generic fuel-type specific average ratio of the CO₂ emission values to the cycle energy demand.
- (11) In order to detect an artificial strategy, which operates only during the type-approval tests and not during normal operation in-service, it is crucial that the specific testing conditions are not known beforehand and, therefore, the conditions for the dedicated artificial strategy tests should be determined on a case-by-case basis by the granting type-approval authority.
- (12) Given that the exact nature of artificial strategies cannot be known beforehand, the analysis and evaluation of the artificial strategy test results should be done by the granting type-approval authority based on a comparison of results found under different test conditions.
- (13) In order to document the test results and provide for their further analysis, the granting type-approval authority should make the test report available to the Commission and the manufacturer concerned. In order to support the risk assessment performed by the Commission, it is appropriate to require that the test data is also submitted to the Commission, using a dedicated platform.
- (14) In case there is a deviation in the CO₂ emission values found, the manufacturer concerned should be given the opportunity to react to the findings of the granting type-approval authority, including by providing evidence that would challenge those findings. In order to avoid an undue extension of the in-service verification process, it is reasonable to limit the response time for the manufacturer.
- (15) Where a lack of correspondence of CO₂ emission values or the presence of any strategies artificially improving a vehicle's performance is found as a result of the in-service verifications performed, the specific emissions of CO₂ of all vehicles of the in-service verification family or, where applicable, of the road load family, should be corrected, given that the test vehicle sample is deemed to be representative of the whole in-service verification family or, where applicable, whole road-load family. In such case, the responsible type-approval authority should also take the necessary measures set out in Chapter XI of Regulation (EU) 2018/858 ⁽²⁾, as well as ensure the correction of the certificates of conformity.
- (16) As the test procedures for in-service verification are based on the worldwide harmonised light vehicles test procedure ('WLTP') set out in UN Regulation No 154 ⁽³⁾, a correction of the average specific emissions of CO₂ of a manufacturer can be applied starting from 2021, as that is since when those average specific emissions of CO₂ are based on the WLTP. A manufacturer should be given the opportunity to notify errors in the corrections applied, as part of the existing error notification procedure during the CO₂ emission monitoring process.

⁽²⁾ Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC (OJ L 151, 14.6.2018, p. 1).

⁽³⁾ UN Regulation No 154 – Uniform provisions concerning the approval of light duty passenger and commercial vehicles with regards to criteria emissions, emissions of carbon dioxide and fuel consumption and/or the measurement of electric energy consumption and electric range (WLTP) (OJ L 290, 10.11.2022, p. 1).

(17) The measures provided for in this Regulation are in accordance with the opinion of the Climate Change Committee,

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter and scope

1. This Regulation determines the procedures for verifying that the CO₂ emission and fuel consumption values recorded in the certificates of conformity correspond to the CO₂ emissions from and the fuel consumption of vehicles in-service and the procedures for verifying the presence of any strategies on board or relating to the vehicles that artificially improve the vehicle's performance in the tests performed for the purpose of type-approval ('in-service verification').
2. This Regulation also establishes detailed rules on the procedures for reporting deviations found in the CO₂ emissions of vehicles in-service as compared to the specific emissions of CO₂ recorded in the certificates of conformity as a result of in-service verification and for taking those deviations into account in the calculation of the manufacturer's average specific emissions of CO₂.
3. This Regulation does not apply to the following:
 - (a) vehicles which are exempted from measurement of CO₂ emissions;
 - (b) manufacturers which, together with all of their connected undertakings, have been responsible for fewer than 1 000 new passenger cars or for fewer than 1 000 new light commercial vehicles registered in the Union in the calendar year two years before the calendar year in which in-service verification families are selected in accordance with Article 3.

Article 2

Definitions

For the purpose of this Regulation, the definitions in Article 2 of Regulation (EU) 2017/1151 ⁽⁴⁾, Article 3 of Regulation (EU) 2019/631, paragraph 3 of UN Regulation No 154 and Article 2 of Commission Delegated Regulation (EU) 2023/2867 ⁽⁵⁾ shall apply.

In addition, the following definitions shall apply:

- (1) 'deviation in the CO₂ emission values' means where the CO₂ emissions of vehicles in-service are higher than the specific emissions of CO₂ recorded in the certificates of conformity, taking into account the statistical evaluation of the tests in accordance with Annex I;
- (2) 'chassis dynamometer test' means a chassis dynamometer test in accordance with Annex B6 and Annex B8 to UN Regulation No 154, which is performed on a vehicle in-service;
- (3) 'road load test' means a road load test in accordance with Annex B4 to UN Regulation No 154, which is performed on a vehicle in-service;
- (4) 'artificial strategies test' means a dedicated test performed on a vehicle in-service, to verify whether artificial strategies are present;

⁽⁴⁾ Commission Regulation (EU) 2017/1151 of 1 June 2017 supplementing Regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information, amending Directive 2007/46/EC of the European Parliament and of the Council, Commission Regulation (EC) No 692/2008 and Commission Regulation (EU) No 1230/2012 and repealing Commission Regulation (EC) No 692/2008 (OJ L 175, 7.7.2017, p. 1).

⁽⁵⁾ Commission Delegated Regulation (EU) 2023/2867 of 5 October 2023 supplementing Regulation (EU) 2019/631 of the European Parliament and of the Council by setting out the guiding principles and criteria for defining the procedures for the verification of the CO₂ emissions and fuel consumption values of passenger cars and light commercial vehicles in-service (in-service verification) (OJ L, 2023/2867, 18.12.2023, ELI: http://data.europa.eu/eli/reg_del/2023/2867/oj).

- (5) 'vehicle high of the in-service verification family' means the vehicle high of any of the interpolation families included in the in-service verification family that has the highest declared CO₂ emission value.

Article 3

Selection of in-service verification families

1. The number of in-service verification families selected each year by a granting type-approval authority shall be at least 2 % of the total number of in-service verification families for which that authority has issued emissions type-approvals in the three calendar years preceding the in-service verification.
2. When selecting in-service verification families in accordance with Article 3 of Delegated Regulation (EU) 2023/2867, the granting type-approval authority shall:
 - (a) include all in-service verification families for which in the preceding 12 months it has received evidence from the Commission, a type-approval authority, a market surveillance authority or a third party complying with the requirements of Commission Implementing Regulation (EU) 2022/163 ⁽⁶⁾, indicating the presence of a deviation in the CO₂ emission values;
 - (b) select further in-service verification families on the basis of the assessment by the Commission of the risk that those families may include vehicles with a deviation in the CO₂ emission values, as reported in accordance with paragraph 3.
3. When performing the assessment referred to in paragraph 2, point (b), the Commission shall take into account at least the following elements, when available:
 - (a) the total number of new vehicles from the in-service verification family that have been placed on the Union market;
 - (b) in-service verification families with similar technical characteristics but with lower CO₂ emission or fuel consumption values, identified using the data collected pursuant to Article 14 of Commission Implementing Regulation (EU) 2021/392 ⁽⁷⁾;
 - (c) the results of previous in-service verifications, and in particular the findings related to the presence of artificial strategies;
 - (d) relevant information from in-service conformity tests pursuant to Regulation (EU) 2017/1151;
 - (e) real-world data as defined in Article 2(c) of Implementing Regulation (EU) 2021/392.
4. Each year, by 31 December, the Commission shall publish a report describing the methodology used for the assessment referred to in paragraph 2, point (b), and the main findings of its assessment undertaken in that year. The report shall also contain a list of in-service verification families with the highest risk of including vehicles with a deviation in the CO₂ emission values.

⁽⁶⁾ Commission Implementing Regulation (EU) 2022/163 of 7 February 2022 laying down the rules on the application of Regulation (EU) 2018/858 of the European Parliament and of the Council as regards functional requirements for market surveillance of vehicles, systems, components and separate technical units (OJ L 27, 8.2.2022, p. 1).

⁽⁷⁾ Commission Implementing Regulation (EU) 2021/392 of 4 March 2021 on the monitoring and reporting of data relating to CO₂ emissions from passenger cars and light commercial vehicles pursuant to Regulation (EU) 2019/631 of the European Parliament and of the Council and repealing Commission Implementing Regulations (EU) No 1014/2010, (EU) No 293/2012, (EU) 2017/1152 and (EU) 2017/1153 (OJ L 77, 5.3.2021, p. 8).

*Article 4***Type and number of in-service verification tests**

1. For each in-service verification family selected in a given calendar year in accordance with Article 3, the granting type-approval authority shall undertake in that year at least one of the following tests on the vehicles selected, ensuring the following distribution:
 - (a) chassis dynamometer tests for at least 75 % of the in-service verification families selected;
 - (b) road load tests for at least 50 % of the in-service verification families selected, excluding in-service verification families for which the default road load calculation method has been applied for type-approval;
 - (c) artificial strategies tests for at least 25 % of the in-service verification families selected.
2. For each in-service verification family selected, the following number of vehicles shall be tested:
 - (a) for chassis dynamometer and road load tests: between 3 and 10 vehicles in accordance with the method described in Annex I;
 - (b) for artificial strategies tests: at least 1 vehicle.
3. The granting type-approval authority may decide to include in-service verification test results performed by the Commission, another type-approval authority, a market surveillance authority or a third party complying with the requirements of Implementing Regulation (EU) 2022/163, in the statistical method described in Annex I if all of the following conditions are met:
 - (a) the granting type-approval authority is informed of upcoming testing in order to allow the granting type-approval authority to observe the testing;
 - (b) all results of the in-service verification testing are reported to the granting type-approval authority within 5 days from each test.

*Article 5***Selection of individual test vehicles**

1. The granting type-approval authority shall select test vehicles that, at the time of selection, meet all of the following criteria:
 - (a) they have a mileage between 3 000 km and 40 000 km;
 - (b) they are not older than two years counted from the date of their first registration.
2. Notwithstanding paragraph 1, where a granting type-approval authority is not able to select a sufficient number of vehicles meeting those criteria, the granting type-approval authority may select test vehicles that, at the time of selection, meet all of the following criteria:
 - (a) they have a mileage between 3 000 km and 100 000 km;
 - (b) they are not older than five years counted from the date of their first registration.
3. The granting type-approval authority shall verify and ensure that the test vehicles are in a state representative of a vehicle properly maintained and used, and have characteristics covered by those recorded in the certificate of conformity, by means of the vehicle checklist set out in Annex II.

Article 6

Test conditions for chassis dynamometer tests

1. For each test vehicle selected to undergo a chassis dynamometer test, the chassis dynamometer load settings referred to in paragraph 8 of Annex B4 to UN Regulation 154 shall be set according to the road load coefficients f_0 , f_1 , f_2 and the test mass specified in the certificate of conformity of the test vehicle.
2. The test fuel used for the chassis dynamometer tests shall be the reference fuel as specified in Annex B3 to UN Regulation No 154.

In the case of bi-fuelled vehicles running on petrol and liquefied petroleum gas or on petrol and compressed natural gas, and in the case of flex-fuel vehicles using petrol and ethanol (E85) fuel, the chassis dynamometer test shall be performed on the fuel for which Member States have to report the CO₂ emissions value as set out in point 2a of Part A of Annex II to Regulation (EU) 2019/631 or in point 2a of Part A of Annex III to Regulation (EU) 2019/631.

Article 7

Chassis dynamometer test result of an individual test vehicle

1. The granting type-approval authority shall calculate the RCB, target speed and distance corrections referred to in Annex B7 or, where applicable, B6 or B8, to UN Regulation No 154, using the results of the chassis dynamometer test performed.

For the calculation of the K_i , K_{CO_2} and ATCT family correction factors referred to in Annex B6, B7 and B8 to UN Regulation No 154, the granting type-approval authority shall do any of the following:

- (a) apply the K_i , K_{CO_2} and ATCT family correction factors which were used for type-approval;
- (b) calculate the K_i , K_{CO_2} and ATCT family correction factors based on tests performed on the vehicle selected for the in-service verification test following the procedures described in Annex B6, B7 and B8 to UN Regulation No 154.

2. For each individual test vehicle, other than an OVC-HEV, undergoing a chassis dynamometer test, the granting type-approval authority shall determine the chassis dynamometer test result (CO_2 ratio) as the ratio of the CO₂ emission value calculated from the chassis dynamometer test, taking into account the correction factors referred to in paragraph 1 (CO_2 , in-service verification) to the combined CO₂ emission value recorded in entry 49 of the certificate of conformity of that vehicle (CO_2 , CoC).

3. For each OVC-HEV undergoing a chassis dynamometer test, the granting type-approval authority shall determine the chassis dynamometer test result (CO_2 ratio) as the ratio of the CO₂ emission value calculated from the chassis dynamometer test in charge sustaining mode according to Annex B8 to UN Regulation No 154, taking into account the correction factors referred to in paragraph 1 (CO_2 , in-service verification) to the combined charge sustaining CO₂ emission value recorded in entry 49 of the certificate of conformity of that vehicle (CO_2 , CoC).

In addition, the granting type-approval authority shall determine the equivalent all electric range and CO₂ emission value calculated from the chassis dynamometer test in charge depleting mode according to Annex B8 to UN Regulation No 154, taking into account the correction factors referred to in paragraph 1.

The test report shall include the ratio of the weighted combined CO₂ emission value calculated from the chassis dynamometer tests, taking into account the correction factors referred to in paragraph 1, to the weighted combined CO₂ emission value recorded in entry 49 of the certificate of conformity of that vehicle, as well as information on the deterioration of the traction battery over time and the equivalent all electric range.

4. For each individual test vehicle, the granting type-approval authority shall, before and after the chassis dynamometer test, read out from the on-board diagnostics serial port of the vehicle the values of the real-world data as defined in Article 2(c) of Implementing Regulation (EU) 2021/392, using a generic scan-tool. The granting type-approval authority shall include these values in the test report, together with the value for 'fuel_consumed_{WLTP}' in accordance with Annex C5 to UN Regulation No 154.

Article 8

Statistical evaluation of chassis dynamometer test results and calculation of the size of the deviation

1. The granting type-approval authority shall evaluate the chassis dynamometer test results of the individual test vehicles obtained in accordance with Article 7 to establish whether or not there is a deviation in the CO₂ emission values of the in-service verification family undergoing chassis dynamometer tests, by using the method set out in Annex I.
2. In case the in-service verification family fails the statistical evaluation as set out in Annex I, the granting type-approval authority shall determine the size of the deviation in the CO₂ emission values as follows:

$$\text{Deviation} = (\text{average}(\text{CO}_{2\text{ratio}}) - 1) * \text{CO}_{2\text{VH}} [\text{g/km}],$$

where:

- CO_{2VH} is the declared CO₂ emission value of the vehicle high of the in-service verification family [g/km] or, for OVC-HEV, the CO₂ emission value in charge sustaining mode of the vehicle high of the in-service verification family [g/km];
- average (CO_{2ratio}) is as defined in Annex I.

Article 9

Test conditions for road load tests

1. For a road load test, the granting type-approval authority may use any of the measurement methods referred to in Annex B4 to UN Regulation No 154.
2. A vehicle selected for a road load test shall be emptied of all additional equipment and any features that were not present at the time of first registration shall be removed. The vehicle's fuel tanks shall be filled to at least 90 per cent of their capacity. The vehicle shall be fitted with the standard equipment in accordance with the manufacturer's specifications, with an additional mass of 100 kg and with the mass representative of the vehicle load, as defined in paragraph 3.2.26 of UN Regulation No 154. The granting type-approval authority shall determine the mass of the vehicle thus prepared or as if thus prepared, which will be considered as the test mass determined during the road load test.
3. The granting type-approval authority shall ensure that the tyres of a vehicle selected for a road load test meet all of the following conditions:
 - (a) they belong to the same energy efficiency class as recorded in the certificate of conformity;
 - (b) they fulfil the criteria laid out in paragraph 4.2.2.2 of Annex B4 to UN Regulation No 154.

As an alternative to condition (a), the granting type-approval authority may apply a correction to the road load coefficient f_0 as set out in Annex III. The $f_{0, \text{measured, corrected}}$ shall then be considered as the f_0 determined during the road load test.

4. The granting type-approval authority shall ensure that during the road load test the vehicle height control and active grill shutters of each test vehicle, as well as other movable aerodynamic body parts that dynamically modify its aerodynamic drag, operate according to the requirements set out in paragraph 4.2.1.5 of Annex B4 to UN Regulation No 154.

Article 10

Road load test result of an individual test vehicle

1. For each individual test vehicle, other than an OVC-HEV, undergoing a road load test, the granting type-approval authority shall calculate the CO₂ emission value (CO_{2, in-service verification}) from the road load coefficients f_0 , f_1 , f_2 and the test mass determined during the road load test by applying the methods set out in Annex B7 or, where applicable, Annex B8, to UN Regulation No 154, using the measured CO₂ emission values for vehicle low and vehicle high.
2. In case of an OVC-HEV undergoing a road load test, the granting type-approval authority shall calculate CO_{2, in-service verification} from the road load coefficients f_0 , f_1 , f_2 and the test mass determined during the road load test by applying the methods set out in Annex B8 to UN Regulation No 154, using the interpolation line corresponding to the charge-sustaining mode.
3. In case the interpolation method was not used, CO_{2, in-service verification} shall be calculated from the road load coefficients f_0 , f_1 , f_2 and the test mass determined during the road load test as set out in Annex IV.
4. For each individual test vehicle undergoing a road load test, the granting type-approval authority shall determine the road load test result (CO_{2 ratio}) as the ratio of CO_{2, in-service verification} determined in accordance with paragraphs 1 to 3 of this Article, to the combined CO₂ emission value, or, in case of an OVC-HEV, the combined charge sustaining CO₂ emission value, recorded in entry 49 of the certificate of conformity of that vehicle (CO_{2, COC}).

Article 11

Statistical evaluation of road load test results and calculation of the size of the deviation

1. The granting type-approval authority shall evaluate the road load test results obtained in accordance with Article 10 to establish whether or not there is a deviation in the CO₂ emission values of the road load family undergoing road load tests, by using the method set out in Annex I.
2. In case the road load family fails the statistical evaluation as set out in Annex I, the granting type-approval authority shall determine the size of the deviation in the CO₂ emission values, as follows:

$$\text{Deviation} = \left(\text{average}(\text{CO}_{2\text{ratio}}) - 1 \right) * \text{CO}_{2\text{VH}} \text{ [g/km]},$$

where:

- CO_{2 VH} is the declared CO₂ emission value of the vehicle high of the in-service verification family [g/km] or, for OVC-HEV, the CO₂ emission value in charge sustaining mode of the vehicle high of the in-service verification family [g/km];
- average (CO_{2 ratio}) is as defined in Annex I.

Article 12

Test conditions for artificial strategies tests

The granting type-approval authority shall verify the presence of artificial strategies in the test vehicle selected in accordance with Article 4 by means of the following tests:

- (a) a chassis dynamometer test;
- (b) a chassis dynamometer test as set out in Annex B6 to UN Regulation No 154 with the test phases performed in a different order, or any other test for which the testing conditions do not lead to a significant change in the physical response of the vehicle and/or any of its sub-systems without artificial strategies;

- (c) an on-road Real Driving Emission test as set out in Annex IIIA to Regulation (EU) 2017/1151 or any other on-road test that might indicate whether an artificial strategy is present;
- (d) a chassis-dynamometer test with the aim to replicate the on-road test performed according to point (c).

Article 13

Evaluation of artificial strategies test results and calculation of the size of the deviation

1. The granting type-approval authority shall evaluate the results of the tests performed in accordance with Article 12 to assess the risk of artificial strategies being present in the test vehicle, by comparing the following:
 - (a) the CO₂ emission values from the test referred to in Article 12(b) with those values from the test referred to in Article 12(a);
 - (b) the CO₂ emission values, divided by the cycle energy demand, from the test referred to in Article 12(c) with those values from the test referred to in Article 12(a);
 - (c) the CO₂ emission values, divided by the cycle energy demand, from the test referred to in Article 12(d) with those values from the test referred to in Article 12(c).
2. The granting type-approval authority shall describe the criteria used for this evaluation in the test report, with artificial strategies to be understood as any software, control logic, hardware or component on board or relating to the vehicle, which reduces the vehicle's CO₂ emission or fuel consumption values in the tests performed for the purpose of emissions type-approval, but which does not operate consistently when the vehicle is in-service, taking into account the difference in conditions, unless this is required by legislation or can be justified by the necessity to protect the vehicle against immediate damage or to ensure safe operation of the vehicle.
3. If, based on the evaluation according to paragraph 1, the granting type-approval authority assesses the risk that artificial strategies are present in the test vehicle to be high, it shall specify and perform a specific test programme in addition to the tests performed according to Article 12, to identify the presence or absence of an artificial strategy.
4. If the granting type-approval authority identifies that artificial strategies are present, it shall determine the size of the deviation in the CO₂ emission values by comparing the CO₂ emission value with and without artificial strategies. If the size of that deviation cannot be determined based on the tests performed according to Article 12 and, if applicable, paragraph 3, the size of the deviation in the CO₂ emission values shall be 10 % of the CO₂ emission value of the vehicle high of the in-service verification family or, for OVC-HEV, 10 % of the CO₂ emission value in charge sustaining mode of the vehicle high of the in-service verification family, in both cases with a minimum of 14 g/km.

Article 14

Test report

1. The granting type-approval authority shall include in the test reports referred to in Article 5(1) of Delegated Regulation (EU) 2023/2867, at least the following information for each in-service verification family tested and for each type of test:
 - (a) the type of test performed;
 - (b) the vehicle checklist;
 - (c) the test conditions;
 - (d) the test results of each of the individual test vehicles;
 - (e) the statistical evaluation of the test results;
 - (f) if applicable, the calculation of the size of the deviation;
 - (g) in case of an artificial strategies test: the criteria used for evaluating the test results.

2. Within 20 working days of finishing the tests, the test report shall be made available to the manufacturer of the vehicles concerned and the test report together with the following data for each of the individual test vehicles shall be uploaded in an encrypted format to a dedicated Commission server:

- (a) for each chassis dynamometer test and artificial strategies test performed, the data specified in point (1) of Annex V;
- (b) for each road load test performed, the data specified in point (2) of Annex V.

The data and parameters specified in points (a) and (b) shall not be published.

Where all data have been correctly uploaded for all tested vehicles of the in-service verification family, a receipt shall be sent from the Commission server to the uploading entity.

Article 15

Conclusions of the granting type-approval authority

1. If the results of the in-service verification show that there is no deviation in the CO₂ emission values, the granting type-approval authority shall come to a conclusion to that effect and attach it to the test report.

2. If the results of the in-service verification show that there is a deviation in the CO₂ emission values, the manufacturer may contest the results within 20 working days after receiving the test report, by providing evidence demonstrating the correspondence between the CO₂ emission values recorded in the certificates of conformity and the values resulting from the in-service verification.

In the absence of a reaction, the manufacturer shall be considered to have accepted the results of the in-service verification.

3. Taking into account the information provided by the manufacturer pursuant to paragraph 2, the granting type-approval authority shall come to a conclusion on whether or not the in-service verification has identified a lack of correspondence between the CO₂ emission values of the in-service verification and the values recorded in the certificates of conformity, or on the presence of artificial strategies.

The granting type-approval authority shall transmit its conclusion to the manufacturer concerned and to the Commission at the latest 40 working days after informing the manufacturer according to paragraph 2.

4. The granting type-approval authority's conclusions referred to in paragraph 3 shall, as a minimum, include the following:

- (a) where the granting type-approval authority finds that there is no lack of correspondence between the CO₂ emission values concerned, or cannot establish the presence of artificial strategies:
 - (i) the in-service verification family, vehicle interpolation families and, where its findings are based on road load test results, the road load family concerned;
 - (ii) the grounds for its findings that the deviations found as a result of the in-service verification do not lead to a lack of correspondence;
- (b) where the granting type-approval authority establishes a lack of correspondence between the CO₂ emission values concerned or the presence of artificial strategies:
 - (i) the in-service verification family, vehicle interpolation families and, where its findings are based on road load test results, the road load family concerned;
 - (ii) the size of the deviation in the CO₂ emission values;
 - (iii) where applicable, the artificial strategies identified.

5. Before 1 March of each calendar year, the granting type-approval authority shall publish an overview of the in-service verifications performed in the previous calendar year and its conclusions issued in that year, as referred to in paragraphs 1 and 3, using the format set out in Annex VI. For in-service verification tests for which no conclusion is established before the publication of the overview, the conclusion shall be included in the next annual overview.

Article 16

Correction of the average specific emissions of CO₂ of a manufacturer

1. Where the granting type-approval authority has issued a conclusion as referred to in Article 15(4), point (b), the Commission shall, based on the information included in that conclusion, for the calendar year in which the conclusion was issued and for the following calendar years, apply the size of the deviation of the CO₂ emission values for its provisional calculation of the average specific emissions of CO₂ according to Article 7(4) of Regulation (EU) 2019/631, and notify the manufacturer according to Article 7(5) of Regulation (EU) 2019/631.

2. The Commission shall also apply the size of the deviation of the CO₂ emission values as specified in the conclusion referred to in Article 15(4), point (b), for correcting the average specific emissions of CO₂ of the manufacturer for the ten calendar years prior to the year in which the conclusion was issued, but not earlier than the calendar year 2021. The Commission shall amend the implementing acts adopted in accordance with Article 9(1) of Regulation (EU) 2019/631 accordingly.

Article 17

Review

The Commission shall by end of 2026 assess the need to increase the minimum number of in-service verification families to be selected each year according to Article 3(1) considering, in particular, the following:

- (a) the total number of in-service verification families for which the granting type-approval authority has issued emissions type-approvals in the preceding years;
- (b) the number of vehicles tested for each in-service verification family in accordance with Article 4;
- (c) the availability of testing facilities and forecast of the evolution of such availability.

Article 18

Entry into force

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 15 December 2023.

For the Commission
The President
Ursula VON DER LEYEN

ANNEX I

Statistical evaluation of chassis dynamometer and road load test results**(1) Starting point**

The starting point for the statistical evaluation are the values for CO₂ ratio calculated for 3 individual test vehicles (N = 3) according to paragraphs 2 and 3 of Article 7 for chassis dynamometer test results and according to paragraph 4 of Article 10 for road load test results.

The criteria set out under point (2) determine if additional vehicles need to be tested.

(2) Statistical parameters

For the total number of vehicles tested (N), the average (X_{tests}) and the standard deviation (s) of the test results shall be determined:

$$X_{tests} = \frac{(x_1 + x_2 + \dots + x_N)}{N}$$

and

$$s = \sqrt{\frac{(x_1 - X_{tests})^2 + (x_2 - X_{tests})^2 + \dots + (x_N - X_{tests})^2}{N - 1}}$$

where

x_i is the value CO₂ ratio calculated for the individual test vehicle i according to paragraphs 2 and 3 of Article 7 for chassis dynamometer test results and according to paragraph 4 of Article 10 for road load test results.

(3) Evaluation

For the 3 vehicles initially tested and after each additional vehicle tested, the value X_{tests} shall be assessed as set out below in order to reach one of the following conclusions for the in-service verification family or road load family concerned:

(1) Pass the family if: $X_{tests} \leq A - t_p \cdot s$

(2) Fail the family if: $X_{tests} > A + t_F \cdot s$

(3) Test an additional vehicle if: $A - t_p \cdot s < X_{tests} \leq A + t_F \cdot s$

where:

t_p and t_F are as set out in the below table

s is the standard deviation determined in accordance with point (2)

A is 1,02 for chassis dynamometer test results;

A is 1,03 for road load test results;

A is 1,08 for road load test results for families tested in the years 2024 or 2025.

Table

Values for the pass/fail decision t-parameters

Number of vehicles tested	t_p	t_F
3	2,2655	Highest value of 1,1062 and (0,02/s) ⁽¹⁾
4	1,5093	0,5970
5	1,1230	0,3737
6	0,8196	0,2430

⁽¹⁾ Where s is the standard deviation determined in accordance with point (2).

7	0,5944	0,1548
8	0,3866	0,0902
9	0,1873	0,0402
10	0,0000	0,0000

(4) Calculation of the size of the deviation

For the calculation of the size of the deviation, the average (CO₂ ratio) is defined as X_{tests} for the total number of vehicles tested, after the family has failed according to point (3):

average (CO₂ ratio) = X_{tests}

ANNEX II

Checklist for vehicles selected for in-service verification tests

'Exclusion criteria' means that if the condition described is met (reply to the question is 'yes'), the vehicle cannot be selected for in-service verification tests.

'Confidential' means that this information shall be kept as appropriate by the granting type-approval authority, but not be included in the test report submitted to the Commission.

(1) Vehicle Characteristics

1.1. The following information shall be recorded and included in the test report:

1.1.1.	VIN:	CONFIDENTIAL
1.1.2.	Mileage:	
1.1.3.	Date of first registration:	
1.1.4.	TAN (whole vehicle type-approval number):	
1.1.5.	Emissions type-approval number:	
1.1.6.	VFN (vehicle interpolation family identifier):	
1.1.7.	Road load family identifier:	
1.1.8.	Tyre manufacturer's name, type and Tyre Identification Number (when available)	

1.2. The following exclusion criteria shall be checked:

		Yes / No
1.2.1.	Mileage: <i>Is the mileage lower than 3 000 km or higher than 100 000 km?</i>	
1.2.2.	Date of first registration: <i>Is that date more than 5 years prior to the date of vehicle selection?</i>	

(2) Vehicle Owner/User Interview

(The owner shall have no knowledge of the implications of the replies)

2.1. The following information shall be recorded:

2.1.1.	Name of the owner	CONFIDENTIAL
2.1.2.	Contact (address / telephone)	CONFIDENTIAL

2.2. The following exclusion criteria shall be checked:

	<i>Unauthorized use of the vehicle</i>	Yes / No
2.2.1.	Has the vehicle carried heavy loads over the specifications of the manufacturer?	

2.2.2.	Was the vehicle used for racing or motor sports?	
2.2.3.	Was the vehicle driven in a non-EU Member State for more than 10 % of driving time?	
2.2.4.	Has the vehicle ever been used with a wrong fuel type (e.g. gasoline instead of diesel) or with non-commercially available EU-quality fuel (black market, or blended fuel)?	
2.2.5.	Has a fuel additive, not approved by the manufacturer, been used?	
	<i>Unauthorized repairs</i>	
2.2.6.	Has the vehicle been maintained not in accordance with the manufacturer's instructions?	
2.2.7.	Have there been unauthorised major engine or vehicle repairs?	
2.2.8.	Was the vehicle involved in a serious accident?	
	<i>Unauthorized changes</i>	
2.2.9.	Has there been a power increase/tuning?	
2.2.10.	Was any part of the emissions after-treatment system permanently removed?	
2.2.11.	Were there any unauthorised devices installed (urea killer, emulator, etc.)?	

(3) Vehicle Examination

3.1. The following information shall be included in the test report:

3.1.1.	Powertrain Control Module calibration part number and checksum	
3.1.2.	OBD diagnosis	Read Diagnostic Trouble Codes & print error log ⁽¹⁾
3.1.3.	OBD Service Mode 09 Query	Read Service Mode 09 and record the information.
3.1.4.	OBD mode 07	Read Service Mode 07 and record the information.
3.1.5.	Pictures of the tested vehicle including of the underbody	

Remark: All checks requiring OBD connections are to be performed before and after the emission test

⁽¹⁾ All systems shall be part of OBD Diagnosis and 'Error logs/Information detected and diagnosed' shall be part of the test report. This guarantees that errors with indirect effect on emissions can be properly detected.

3.2. The following exclusion criteria shall be checked:

		Yes / No
3.2.1.	Are there any warning lights on the instrument panel activated indicating a vehicle or exhaust after-treatment system malfunctioning that cannot be resolved by normal maintenance? (Malfunction Indication Light, Engine Service Light, etc?)	
3.2.2.	Are there any aftermarket aerodynamics modification that cannot be removed before testing (Note: roof boxes, load racking, spoilers, etc. can be removed)? Are no standard aerodynamics components missing (front deflectors, diffusers, splitters, etc.)?	(Exclusion criterion for road load tests only)

3.3. If the following conditions are not met, the vehicle may still be selected on the condition that appropriate action is taken before performing in-service verification tests:

	Check to do	Issue identified and action to be taken
3.3.1.	Fuel tank level	<i>If fuel reserve light ON, refuel before test.</i>
3.3.2.	AdBlue	<i>If SCR light is on after engine-on, the AdBlue should be filled in, or the repair executed before the vehicle is used for testing.</i>
3.3.3.	Air filter and oil filter <i>Check for contamination and damage</i>	<i>If damaged or heavily contaminated or less than 800 km before the next recommended change; change the filters.</i>
3.3.4.	Check fluid levels and grade <i>Check the max. and min. levels (engine oil, cooling liquid)</i>	<i>If below minimum, top up. If different grade, replace.</i>
3.3.5.	Ignition cable (gasoline) <i>Check spark plugs, cables, etc.</i>	<i>In case of damage, replace them.</i>
3.3.6.	Service <i>Check if less than 800 km away from next scheduled service</i>	<i>If yes, then perform the service.</i>
3.3.7.	For road load tests ONLY: <i>Check if wheel alignment and if adjustable vehicle height/ground clearance are out of range.</i>	<i>If yes, adjust wheel alignment and vehicle height/ground clearance to be in range.</i>
3.3.8.	For vehicles with mileage above 40 000 km or older than 2 years ONLY	<i>Replace low voltage battery with a new equivalent battery.</i>

ANNEX III

Correction of the road load coefficient f_0

Step 1: Recalculation of $f_{0,CoC}$:

(i) **In case the interpolation method was used for the road load determination of the individual vehicle:**

$$f_{0, CoC, new\ tyre} = f_{0,H} - (f_{0,H} - f_{0,L}) \times \frac{TM_H \times RR_H - TM_{CoC} \times RR_{new\ tyre}}{TM_H \times RR_H - TM_L \times RR_L}$$

where:

$f_{0,H}$ is the road load coefficient f_0 of the vehicle high of the road load family [N];

$f_{0,L}$ is the road load coefficient f_0 of the vehicle low of the road load family [N];

TM_H is the test mass of the vehicle high of the road load family [kg];

TM_L is the test mass of the vehicle low of the road load family [kg];

TM_{CoC} is the test mass of the vehicle as recorded in the certificate of conformity [kg];

$RR_{new\ tyre}$ is the rolling resistance of the tyres of the selected in-service vehicle, as defined in Table A4/2 of Annex XXI to Regulation (EU) 2017/1151 [kg/tonne];

RR_H is the actual rolling resistance of the tyres of the vehicle high of the road load family [kg/tonne];

RR_L is the actual rolling resistance of the tyres of the vehicle low of the road load family [kg/tonne].

(ii) **In case the interpolation method was not used for the road load determination of the individual vehicle:**

$$f_{0,CoC, new\ tyre} = \text{Max} \left(\frac{\left(0,05 \times f_{0,r} + 0,95 \times \left(f_{0,r} \cdot \frac{TM_{CoC}}{TM_r} + \left(\frac{RR_{new\ tyre} - RR_r}{1000} \right) \times 9,81 \times TM_{CoC} \right) \right)}{\left(0,2 \times f_{0,r} + 0,8 \times \left(f_{0,r} \cdot \frac{TM_{CoC}}{TM_r} + \left(\frac{RR_{new\ tyre} - RR_r}{1000} \right) \times 9,81 \times TM_{CoC} \right) \right)} \right)$$

where:

$f_{0,r}$ is the road load coefficient f_0 of the representative vehicle of the road load matrix family, or the vehicle high of the road load family [N];

TM_r is the test mass of the representative vehicle of the road load matrix family, or the vehicle high of the road load family [kg];

TM_{CoC} is the test mass of the vehicle as recorded in the certificate of conformity [kg];

$RR_{new\ tyre}$ is the rolling resistance of the tyres of the selected in-service vehicle as defined in Table A4/2 of Annex XXI to Regulation (EU) 2017/1151 [kg/tonne];

RR_r is the actual rolling resistance of the tyres of the representative vehicle of the road load matrix family, or vehicle high of the road load family [kg/tonne].

Step 2: Correction of $f_{0, \text{measured}}$:

$$f_{0, \text{measured, corrected}} = f_{0, \text{measured}} + (f_{0, \text{CoC}} - f_{0, \text{CoC, new tyre}})$$

Where:

$f_{0, \text{measured}}$ is the measured road load coefficient f_0 [N];

$f_{0, \text{CoC}}$ is the road load coefficient f_0 as recorded in the certificate of conformity [N];

$f_{0, \text{CoC, new tyre}}$ is the road load coefficient f_0 as calculated in step 1 [N].

ANNEX IV

Calculation of CO₂, in-service verification in case the interpolation method was not used

$$CO_{2in-service\ verification} = CO_{2CoC} + a \cdot [CED_{in-service\ verification} - CED_{CoC}]$$

where:

CED_{CoC} : is the Cycle Energy Demand calculated from the road load coefficients f_0 , f_1 , f_2 and the test mass recorded in the certificate of conformity according to paragraph 5 of Annex B7 to UN Regulation No 154 [kJ]

$CED_{in-service\ verification}$: is the Cycle Energy Demand calculated from the road load coefficients f_0 , f_1 , f_2 and the test mass determined during the road load test [kJ]

a : is the value set out in the below table [g/km/kJ].

Fuel type	a
diesel	0,009
petrol	0,010
liquefied petroleum gas	0,008
natural gas	0,007

ANNEX V

In-service verification test data to be reported**(1) In-service verification test data to be reported for a chassis dynamometer test or an artificial strategies test**

The data to be reported is the data specified in Table 2 of the Annex to Implementing Regulation (EU) 2021/392, where for the purpose of this Regulation, all references to vehicle H and L are to be understood as references to the individual test vehicle and all references to type-approval documentation are to be understood as references to the specific entries in the certificate of conformity of that vehicle.

In addition, the following data is to be reported:

No	Parameters	Unit	Source	Remarks
1	Other interpolation families that are part of the same in-service verification family	—	Point 2.1.1.2.1. of Appendix 8a to Annex I to Regulation (EU) 2017/1151 (first three lines of the table)	On the basis of the same Type 1 test, meaning the same reported values for 'measured value', 'speed and distance corrected value', and 'RCB correction coefficient'
2	Vehicle number	—	—	Vehicle sequence (1, 2, 3, ...10) in the statistical evaluation
3	Total number of vehicles tested	—	—	Total number of vehicles included in the statistical evaluation described in Annex I
4	Road load family or road load matrix family number	—	Entry 0.2.3.4 or 0.2.3.5. of certificate of conformity	Road load or road load matrix family of tested vehicle
5	Emissions type-approval number	—	Part of type-approval documentation	Emissions type-approval number specific for the interpolation family of vehicle tested
6	Whole vehicle type-approval number	—	Entry 0.11 of certificate of conformity	Identifier of the whole vehicle type-approval as defined in Annex IV to Regulation (EU) 2020/683
7	Equivalent All Electric range (EAER) combined – CoC	km	Entry 5.2. of certificate of conformity	Only in case of OVC-HEVs
8	Total fuel consumed (lifetime)	l	Table 1 of the Annex to Implementing Regulation (EU) 2021/392	OBFCM data collected from the vehicle
9	Total distance travelled (lifetime)	km	idem	idem
10	Total fuel consumed in charge depleting operation (lifetime)	l	idem	idem, only in case of OVC-HEVs

11	Total fuel consumed in driver-selectable charge increasing operation (lifetime)	l	idem	idem
12	Total distance travelled in charge depleting operation with engine off (lifetime)	km	idem	idem
13	Total distance travelled in charge depleting operation with engine on (lifetime)	km	idem	idem
14	Total distance travelled in driver-selectable charge increasing operation (lifetime)	km	idem	idem
15	Total grid energy into the battery (lifetime)	kWh	idem	idem
16	Chassis dynamometer test result (CO ₂ ratio)	—	Article 7(2); for OVC-HEV: Article 7(3)	—

(2) **In-service verification test data to be reported for a road load test**

No	Parameters	Unit	Source	Remarks
1	Road load family or road load matrix family number	—	Entry 0.2.3.4 or 0.2.3.5. of certificate of conformity	
2	Vehicle Interpolation family number		Entry 0.2.3.1. of certificate of conformity	
3	Other interpolation families that are part of the same road load/road load matrix family	—	—	List all vehicle interpolation family numbers
4	Vehicle number	—	—	Vehicle sequence (1, 2, 3, ...10) in the statistical evaluation
5	Total number of vehicles tested	—		Total number of vehicles included in the statistical evaluation described in Annex I
6	Emissions type-approval number	—	Type-approval documentation	Emissions type-approval number specific for interpolation family of vehicle tested
7	Whole vehicle type-approval number	—	Entry 0.11 of certificate of conformity	—
8	Testing facility (name/location)	—	—	—

9	Vehicle category and class	—	—	M ₁ or N ₁ Class 1, 2 or 3
10	Vehicle mileage	km	—	Vehicle odometer reading before road load test
11	Test method	—	Annex B4 to UN Regulation No 154	On-road coast-down/ on-road torque meter/ wind tunnel flat belt/ wind tunnel chassis dynamometer
12	Declared road load coefficient f_0	N	Entry 47.1.3. of certificate of conformity	
13	Declared road load coefficient f_1	N/(k-m/h)	Entry 47.1.3. of certificate of conformity	
14	Declared road load coefficient f_2	N/(k-m/h) ²	Entry 47.1.3. of certificate of conformity	
15	Declared test mass	kg	Entry 47.1.1. of certificate of conformity	
16	Declared cycle energy demand (CED)	kJ	Point 3.2.3.2.3. of Annex B7 to UN Regulation No 154	Cycle energy demand over a complete applicable WLTC Class cycle used to interpolate CO ₂ emission of tested vehicle
17	Declared CO ₂ emission	g/km	Entry 49.4. of certificate of conformity	CO ₂ emission value of tested vehicle; in case of OVC-HEVs: the combined charge sustaining CO ₂ emission value
18	Tyre size designation (front/rear)	—	—	Tyre code (e.g. P195/55R1685H) of tyres of the test vehicle
19	Declared tyre rolling resistance class (front/rear)	—	Entry 35 of certificate of conformity	
20	Tyre rolling resistance class (front/rear)	—	—	Rolling resistance class of the tyre used for road load test or, in case of below class A tyres, the actual rolling resistance.
22	Average temperature	°C	—	Average temperature measured during road load test; only in case of on-road tests
23	Average wind speed	m/s	—	Average wind speed measured during road load test; only in case of on-road tests

24	Average air pressure	kPa	—	Average air pressure measured during road load test; only in case of on-road tests
25	Average mass of the vehicle	kg	Entry 4.2.1.6. of Annex B4 to UN Regulation No 154	Average mass of tested vehicle measured before and after the road load determination procedure
26	Final measured road load coefficient f_0	N	Annex B4 to UN Regulation No 154	Final road load coefficient f_0 of tested vehicle after all corrections
27	Final measured road load coefficient f_1	N/(k-m/h)	Annex B4 to UN Regulation No 154	Final road load coefficient f_1 of tested vehicle after all corrections
28	Final measured road load coefficient f_2	N/(k-m/h) ²	Annex B4 to UN Regulation No 154	Final road load coefficient f_2 of tested vehicle after all corrections
29	Test mass	kg	Article 9(2)	
30	Final measured cycle energy demand (CED)	kJ	3.2.3.2.3. of Annex B7 to UN Regulation No 154	Cycle energy demand over a complete applicable WLTC cycle calculated from measured road load coefficients and test mass (entries 26 to 29)
31	Calculated CO ₂ emission value (CO ₂ , in-service verification)	g/km	Article 10(1)	
32	Road load test result (CO ₂ ratio)	—	Article 10(4)	

ANNEX VI

Reporting format for the in-service verification annual overview

A. General information

(1)	Granting type-approval authority	
(2)	Date of annual overview	
(3)	Year concerned	
(4)	Total number of in-service verification families for which the authority has issued emissions type-approvals in the three calendar years preceding the in-service verification	
(5)	Minimum number of in-service verification families to be tested (= 3 % of point (4))	
(6)	Total number of in-service verification families tested in the year concerned	

B. List of the in-service verification families selected for testing

- Identification number of the in-service verification family selected (ISV ID);
- Vehicle manufacturer concerned (OEM);
 - all manufacturers to which the type-approval authority has granted an emission type approval in the 3 preceding years should be included;
- Vehicle interpolation family identifiers for each of the in-service verification families selected (IP ID);
- Reason(s) for selecting the in-service verification families (Reason):
 - ‘evidence’ if the selection is based on Article 3(2)(a);
 - ‘risk assessment’ if based on Article 3(2)(b);
 - ‘other’ if any other reason, please specify in a footnote.

ISV ID	OEM	Vehicle interpolation family identifiers (IP ID)	Reason
1			
2			
3			
...			

C. Summary of in-service verification test results

- Type of test: chassis dynamometer (CDM), road load (RL) or artificial strategies (AS) tests;
- Minimum number of in-service verification families per type of test to be tested (Min.), calculated according to Article 4(1) as a percentage of the total number of in-service verification families tested (point A(6) of this Annex);
- Total number of in-service verification families tested per type of test (Total);
- Total number of conclusions per type of test:
 - no lack of correspondence (Pass);

- lack of correspondence (Fail);
- no conclusion established yet (Pending).

Type of test	Min.	Total	Pass	Fail	Pending
CDM test (75 %)					
RL test (50 %)					
AS test (25 %)					

D. Detailed in-service verification test results for the year concerned

- Identification number of the in-service verification family selected (ISV ID);
- Manufacturer concerned (OEM);
- Type of test performed (Type of test): chassis dynamometer (CDM), road load (RL) or artificial strategies (AS) test;
- Start date of the test (Start date) according to Article 5(2) of Delegated Regulation (EU) 2023/2867;
- Name of organisation(s) performing the test (granting type-approval authority or Technical Service) (GTAA/TS);
- Number of vehicles tested (#vehicles);
- Test result of each individual test vehicle ($CO_{2, ratio}$);
- Conclusion of the test (Conclusion/Deviation), that is 'Pass', 'Fail' or 'Pending', incl. size of the deviation in case of 'Fail';
- Test report reference number (Test ref.);
- Conclusion reference number (Conclusion ref.).

ISV ID	OEM	Type of test	Start date	GTAA/TS	# vehicles	$CO_{2, ratio}$	Conclusion/Deviation	Test ref.	Conclusion ref.
1									
2									
3									
...									

E. Detailed in-service verification test results, for which conclusions were reported as 'Pending' in the previous annual overview

Year concerned	ISV ID	OEM	Type of test	Start date	GTAA/TS	# vehicles	$CO_{2, ratio}$	Conclusion/Deviation	Test ref.	Conclusion ref.
...	...									