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00	2024-04-05	Initial version
01	2024-05-23	Update of section 4 (table A1, B1)
02	2025-02-27	Update of section Determination of the total number of in-service verification families Update of section 4 (table A1, B1, C1, D1, E1)
3	2025-05-19	Update of table 2.2

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Glossary:

ATCT	Ambient Temperature Correction Test for WLTP
AS	Artificial Strategies tests
CDM	Chassis Dynamometer Measurement tests
CED	Cycle Energy Demand
CI	Compression ignition engine
CO	Carbon monoxide
CO_2	Carbon dioxide
CoC	Certificate of Conformity
DF	Deterioration factors
DICE	Database for In-Service verification of CO_2 Emissions
EEA	European Environment Agency
EU	European Union
f0, f1, f2	road load coefficients
GTAA	Granting Type-Approval Authority
HC	Hydrocarbons
ICE	Internal Combustion Engine
ISC	In-Service Conformity
ISV	In-Service Verification
IP	Interpolation (Family)
JRC	Joint Research Centre
Ki	Regeneration factors
LDV	Light-Duty Vehicles
LPG	Liquefied Petroleum Gas
NEDC	New European Driving Cycle
NG	Natural Gas
NMHC	Non-methane hydrocarbons
NOVC-HEV	Not-Off-Vehicle Charging Hybrid Electric Vehicle
OBFCM	On-Board Fuel and energy Consumption Monitoring
OEM	Original equipment manufacturer
OVC	HEV Off-Vehicle Charging Hybrid Electric Vehicle
PI	Positive ignition
PM	Particle mass
PN	Particle number
QC	Quality Control
RA	Risk assessment
RCB	REESS charge balance
RDE	Real Driving Emissions
RL	Road Load (Family)
SI	Positive ignition engine
TAN	Whole vehicle type-approval number
THC	Total hydrocarbons
UNECE	United Nations Economic Commission for Europe
VH	Vehicle High
VL	Vehicle Low
VIN	Vehicle identification number

WLTP	Worldwide harmonized Light vehicles Test Procedure
ATCT	Ambient Temperature Correction Test for WLTP
AS	Artificial Strategies tests
CDM	Chassis Dynamometer Measurement tests

1. Overview and scope of in-service verification testing to verify CO_2 emissions and fuel consumption of passenger cars and light commercial vehicles

With the in-service verification according to the commission delegated Regulation (EU) 2023/2867 and implementing Regulation (EU) 2023/2866, the granting type approval authority shall conduct tests (CDM, RL and AS tests) to verify that the CO_2 emission and fuel consumption values recorded in the certificates of conformity correspond to the CO_2 emissions from and the fuel consumption of vehicles in-service testing. Furthermore, in-service verification testing shall detect the presence of any strategies on board that artificially improve the vehicle's performance in the tests performed for the purpose of type-approval.

This Regulation does not apply to the following:

a) vehicles which are exempted from measurement of CO_2 emissions

b) manufacturers which, together with all of their connected undertakings, have been responsible for fewer than 1000 new passenger cars or for fewer than 1000 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 according to Article 3 of Regulation (EU) 2023/2866.

2. Number of in-service verification families for testing and selection

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 CO_2 emissions values.

Determination of the total number of in-service verification families:

In a first step all emission type approvals according to (EC) No 715/2007 granted by the GTAA Luxembourg for the period from the 01.01.2021 to the 31.12.2023 have been identified. In a second step all extensions for the same type-approval number, not having an impact on the CO_2 emission value have been subtracted. Type approvals with extensions, where the base approval was before the 01.01.2021 and occurring the first time in the observation period have been not considered [1].

For vehicle type approvals where the IP family has been divided into 2 or 3 IP families due to the CO2 margin of 30 g/km (all other IP family criteria are fulfilled), the IP families have been grouped in one ISV family. During this period no emission type approval for light commercial vehicles according to (EC) No 595/2009 has been performed. Hence the total number of in-service verification families is 349. According to Article 3 of Regulation (EU) 2023/2866 the minimum number of in-service verification families for testing is 2% of the total number of in-service verification families. With a total number of 349 ISV families the minimum number of ISV families for testing is 7[2].

Total number of emission type approvals (including extension, revisions)	Total number of in-service verification families respectively type approval with CO_2 impact	Minimum of in-service verification families for testing (2%)
1310	349	7

Table 2.1 [3]:

[1] See communication DG CLIMA EU from the 16th April 2024: RE: Questions ISV preparation review 8th April

[2] The percentage value is 2% (clarified with the European Commission), value in Annex 6 of Regulation (EU) 2023/2866 of 3 % is wrong (see email DG Clima RE Questions ISV preparation review 8th April.msg).

Selection of in-service verification families for testing

For the selection of the in-service families for testing the following conditions shall be respected:

1) All ISV families with sufficient evidence received
   [see Reg. (EU) 2023/2866 Article 3 (2) and Rec (3)]
2) Further ISV families based on the risk assessment report, up to:
   a. at least 2% of total number of ISV families for which GTAA issued emissions type approvals in the period from 01.01.2021 to 31.12.2023 [see Reg. (EU) 2023/2866 Article 3 (1)]
   b. at least one per manufacturer [see Reg. (EU) 2023/2867 Article 3]
3) Choose type of test for each ISV family [IR Art 4(1)]
   a. respecting the minimum percentages for each type of test:

Condition 1):

No evidence (Article 3(2) (a)of (EU) 2023/2866) has been received, since it is the first time of in-service verification.

Condition 2):

From the risk assessment 16 ISV families with first priority have been identified for the GTAA Luxembourg, where for 10 ISV families the test type has been determined. For ISV families with second priority 7 families have been identified for the GTAA Luxembourg, whereas for the group with 3rd priority 158 ISV families have been determined. Based on the total number of emission approvals with CO_2 impact (349) a minimum of 7 ISV families shall be selected.

In table 2.2 are all manufacturers listed for which an emission type approval has been done. For position 1 to 8 are manufacturers depicted where ISV families have been identified by the risk assessment. For 2 further manufacturers an ISV family shall be selected. To meet conditions 2 b) at least 10 ISV families shall be identified. All mentioned manufactures are individual manufacturers according to article 2 of regulation (EU) 2024/865, where individual and pools of manufacturers are formed following article 6 of regulation (EU) 2019/631.

Pos	Manufacturer	No. IP-Families (1st priority)	No. IP-Families (2nd priority)	No. IP-Families (3rd priority)
1	Audi AG	5	6	74
2	Volkswagen AG	9	0	8
3	Mazda Motor Corporation	2	1	46
4	Bentley Motors Limited	0	0	3
5	Mazda Motor Logistics Europe N.V. (MLE)	0	0	4
6	Subaru Corporation	0	0	1
7	Ford Werke GmbH	0	0	19
8	Audi Sport GmbH	0	0	3
9	General Motors Holdings LLC	0	0	0
10	Audi Hungaria Zrt	0	0	0

Table 2.2: Manufacturers to be considered for in service verification testing

Condition 3):

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) or 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.

3. In-service verification testing

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.

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.

Not finished yet, since tests are pending.

4. Main conclusions of in-service verification tests

1. If the results of the in-service verification show that there is no deviation in the CO_2 emission values, the granting type-approval authority shall conclude 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 CO_2 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 CO_2 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 CO_2 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.

Not finished yet, since tests are pending.

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5. Reporting of annual in-service verification testing, ANNEX VI (EU) 2023/2866

A. General information

(1) Granting type-approval authority	Luxembourg (e13) SOCIÉTÉ NATIONALE DE CERTIFICATION ET D'HOMOLOGATION S.A. Registre de Commerce: B 27180 L-8070 Bertrange
(2) Date of annual overview	25.05.2024
(3) Year concerned	2024
(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	349
(5) Minimum number of in-service verification families to be tested (= 2 % of point (4))	7
(6) Total number of in-service verification families tested in the year concerned	11

Table A1: General Information

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) no evidence received
  - 'risk assessment' (RA) if based on Article 3(2) (b)
  - 'other' if any other reason, please specify in a footnote

Pos	ISV ID	OEM	Vehicle interpolation family identifiers (IP ID)	Reason	Test type
1	2023-e13-IP-MQB27ZZ_A1_0529-WAU-1	Audi AG	IP-MQB27ZZ_A1_0529-WAU-1	RA (1, 66)	CDM, RL
2	2022-e13-IP-MQB37WZ_A0_1011-WVW-1	Volkswagen AG	IP-MQB37WZ_A0_1011-WVW-1	RA (1, 79)	CDM, RL
3	2022-e13-IP-MQB48ZZ_A1-B1_0843-WVW-1	Volkswagen AG	IP-MQB48ZZ_B1_0843-WVW-1	RA (1, 94)	AS
4	2020-e13-IP-13_2019_526-JMZ-1	Mazda Motor Corporation	IP-13_2019_526-JMZ-1	RA (1,164)	CDM, RL
5	2021-e13-IP-3S_2021_W12_00-SCB-1	Bentley Motors Limited	IP-3S_2021_W12_00-SCB-1	RA (3)	AS
6	2023-e13-IP-0015-JF1-1	Subaru Corporation	IP-0015-JF1-1	RA (3)	CDM, RL
7	2019-e13-IP-13_2019_0518-JM4-1	Mazda Motor Logistics Europe N.V. (MLE)	IP-13_2019_0518-JM4-1	RA (3)	AS
8	2021-e13-IP-B479_2022_00002-WF0-1	Ford Werke GmbH	IP-B479_2022_00002-WF0-1	Other [1)]	CDM, RL
9	2022-e13-IP-MLB58_Z_A0-B0_0741-WUA-1	Audi Sport GmbH	IP-MLB58_Z_B0_0741-WUA-1	Other [2)]	CDM, RL
10	2021-e13-IP-62_LT2_AP_RWD-1G1-0	General Motors Holdings LLC	IP-62_LT2_AP_RWD-1G1-0	Other [3)]	CDM, RL
11	2021-e13-IP-MQB___Z_A0_0709-TRU-1	Audi Hungaria Zrt.	IP-MQB___Z_A0_0709-TRU-1	Other [4)]	CDM; RL

Table B1: List of in-service verification families selected for testing

[1)] The only emission type approval performed for this manufacturer during period (01.10.2021 – 31.12.2023)

[2)] The emission type approval performed with highest sales for this manufacturer during period (01.10.2021 – 31.12.2023)

[3)] Vehicle type not tested by ISC (below sales number limit for ISC)

[4)] Vehicle type shows less CO_2 emission compared to other IP-families of same type with same characteristics (RL parameter, mass VL/VH, …)

C. Summary of in-service verification test results

- Type of test: chassis is 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%)	8	8			8
RL test (50%)	6	8			8
AS test (25%°	3	3			3

Table C1: Summary of in-service verification test results

D. Detailed in-service verification test results for the years 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.)

Pos	ISV ID	OEM	Type of test	Start date	GTAA / TS	# vehicles	test vehicle (CO_2, ratio);	Conclusion/ Deviation	Test ref.	Conclusion ref.
1	2023-e13-IP-MQB27ZZ_A1_0529-WAU-1	Audi AG	CDM		DEKRA					
2	2023-e13-IP-MQB27ZZ_A1_0529-WAU-1	Audi AG	RL		DEKRA					
3	2022-e13-IP-MLB58_Z_A0-B0_0741-WUA-1	Audi Sport GmbH	CDM		DEKRA					
4	2022-e13-IP-MLB58_Z_A0-B0_0741-WUA-1	Audi Sport GmbH	RL		DEKRA					
5	2021-e13-IP-MQB___Z_A0_0709-TRU-1	Audi Hungaria Zrt	CDM		DEKRA					
6	2021-e13-IP-MQB___Z_A0_0709-TRU-1	Audi Hungaria Zrt	RL		DEKRA					
7	2022-e13-IP-MQB48ZZ_A1-B1_0843-WVW-1	Volkswagen AG	AS		DEKRA					
8	2021-e13-IP-3S_2021_W12_00-SCB-1	Bentley Motors Ltd	AS		TÜV NORD					
9	2021-e13-IP-B479_2022_00002-WF0-1	Ford Werke GmbH	CDM		TÜV NORD					
10	2021-e13-IP-B479_2022_00002-WF0-1	Ford Werke GmbH	RL		TÜV NORD					
11	2021-e13-IP-62_LT2_AP_RWD-1G1-0	General Motors Holdings LLC	CDM		TÜV NORD					
12	2021-e13-IP-62_LT2_AP_RWD-1G1-0	General Motors Holdings LLC	RL		TÜV NORD					
13	2023-e13-IP-0015-JF1-1	Subaru Corporation	CDM		TÜV NORD					
14	2023-e13-IP-0015-JF1-1	Subaru Corporation	RL		TÜV NORD					
15	2020-e13-IP-13_2019_526-JMZ-1	Mazda Motor Corporation	CDM		UTAC					
16	2020-e13-IP-13_2019_526-JMZ-1	Mazda Motor Corporation	RL		UTAC					
17	2019-e13-IP-13_2019_0518-JM4-1	Mazda Motor Logistics Europe N.V. (MLE)	AS		UTAC					
18	2022-e13-IP-MQB37WZ_A0_1011-WVW-1	Volkswagen AG	CDM		UTAC					
19	2022-e13-IP-MQB37WZ_A0_1011-WVW-1	Volkswagen AG	RL		UTAC					

Table D1: Detailed in-service verification test results for the year concerned

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

Pos	ISV ID	OEM	Type of test	Start date	GTAA / TS	# vehicles	test vehicle (CO_2, ratio);	Conclusion/ Deviation	Test ref.	Conclusion ref.
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Table E1: Detailed in-service verification test results for the year concerned for which conclusions were reported as 'Pending' (previous review)