EUROPEAN
COMMISSION

Brussels, XXX
[…](2025) XXX draft

ANNEXES 4 to 12

**ANNEXES**

**to the**

**Commission Implementing Regulation**

**laying down rules, procedures and testing methodologies for the application of Regulation (EU) 2024/1257 as regards exhaust and evaporative emission type-approval of vehicles of categories $M_1$ and $N_1$**

# ANNEX IV

# MANIPULATION DEVICES AND MANIPULATION STRATEGIES

1. INTRODUCTION

1.1. This Annex sets out the tests, methods and procedures for establishing the absence of manipulation devices and manipulation strategies as construed under Article 4(5) of Regulation (EU) 2024/1257 and in accordance with manufacturers' obligations under Article 4 of the same Regulation.

1.2. This Annex also specifies the documentation that ensures the proper monitoring and enforcement of rules related to manipulation devices and manipulation strategies. It aims to strengthen emissions control mechanisms, enhance transparency, and ensure that vehicles comply with regulatory requirements for the lifetime of the vehicles, particularly Euro 7 exhaust emission and evaporative emission limits under the conditions set out in Annex III of Regulation (EU) 2024/1257 as well as the prohibition of manipulation devices and manipulation strategies.

1.3. Specifications for methodologies, tests and procedures that relate to data integrity, such as manipulation of data related to sensors, fuel or electric energy consumption, electric range or battery durability, are provided for in Regulation (EU) <*publication office to insert the reference to the Second Implementing Act*>.

1.4. This Annex also sets out roles and responsibilities for the actors involved to ensure compliance with the above-mentioned regulatory requirements and prohibition of manipulation devices and manipulation strategies.

1.5. For the purposes of this Annex, manipulation devices and manipulation strategies should be construed as set out by Article 3(41) and 3(42) of Regulation (EU) 2024/1257. The notion of manipulation strategy shall be distinguished from respectively the notions of 'Euro 7 Base Emission Strategies (BES)' and 'Euro 7 Auxiliary Emission Strategies (AES)' which are defined in respectively Article 3(35) and 3(36) of this Regulation, and which relate to documentation requirements under this Annex.

2. GENERAL REQUIREMENTS – TESTS AND METHODOLOGIES

2.1. Referring to the provisions of Articles 3(41) and 3(42) of Regulation (EU) 2024/1257, (i) manipulation devices and manipulation strategies related to physical emissions (exhaust, evaporative or other) and (ii) manipulation devices and manipulation strategies related to data integrity should be distinguished.

2.2. When assessing situations that could involve the use of manipulation devices or manipulation strategies for exhaust and evaporative emissions, a broad assessment and interpretation of those situations should be made. Any devices or strategies that reduce the effectiveness of exhaust and non-exhaust emission limits and testing condition requirements under this Regulation, that cause a non-compliant vehicle to appear compliant or that falsify test results, should be considered when determining whether manipulation devices or manipulation strategies exist. Market surveillance authorities should apply dedicated screening tests and enforcement measures to prevent the circumvention of Euro 7 requirements.

2.3. The assessment of such situations as part of type-approval should distinguish and identify specific situations where the reduction of effectiveness of exhaust and evaporative emission control[1] is justified by technical reasons and is not due to manipulation. This is particularly relevant in driving conditions that are adjacent to one or more boundary conditions of a regulated emissions test. For such situations, manufacturers shall comply with criteria for the declaration of technically justified emission control strategies that are only active for a specific set of ambient or operating conditions, thereby documenting and explaining the reduction of the effectiveness of emission control that may be observed (for instance, the dosing of reagent may stop at very low temperatures due to physical limitations of hardware). These technically justified emission control strategies shall satisfy strict

[1] Regulation (EU) 2024/1257, Recital (26).

criteria to demonstrate that they are acceptable AES and that therefore they do not constitute a manipulation device or manipulation strategy as defined in Regulation (EU) 2024/1257, without prejudice to the requirements set out in Article 4(2) of the same Regulation. The methodology for the assessment and approval of AES is specified in Appendix 1 to this Annex.

2.4. Manufacturers shall ensure that no vehicle is equipped with manipulation devices or strategies related to data integrity as defined in paragraphs 41 and 42 in Article 3 of Regulation (EU) 2024/1257.

2.5. Manufacturers shall not introduce software or calibration updates that manipulate data related to sensors, fuel or electric energy consumption, electric range or battery durability, either before or after the placing in the market.

2.6. Manufacturers shall disclose any software and calibration updates affecting the integrity of data related to sensors, fuel or electric energy consumption, electric range or battery durability to the granting type-approval authority.

3. TECHNICAL REQUIREMENTS - DOCUMENTATION

3.1. Manufactures shall document Euro 7 Auxiliary Emission Strategies (AES) at type-approval. The procedure of assessing AES ensures the consistent approval of elements of design or actions, in line with Article 14(7) of Regulation (EU) 2024/1257. For the type-approval authorities to be able to assess the proper use of AES, considering the prohibition of manipulation devices and manipulation strategies contained in Article 4(5) of Regulation (EU) 2024/1257, the manufacturer shall provide an extended documentation package, as described in Appendix 1 to this Annex.

3.2. The extended documentation shall remain strictly confidential. It may be kept by the approval authority, or, at the discretion of the approval authority, may be retained by the manufacturer. In the case the manufacturer retains the documentation package, that package shall be identified and dated by the approval authority once reviewed and approved. It shall be made available for inspection by the approval authority at the time of approval or at any time during the validity of the approval.

3.3. Manufacturers shall also provide to the approval authorities a formal documentation package, as described in Appendix 2 to this Annex, containing information on AES/BES that would allow an independent tester to identify if the emissions measured can be attributed to an AES or BES strategy or are potentially due to a manipulation device or manipulation strategy.

3.4. The formal documentation package shall be made available to all type-approval authorities, technical services, market surveillance authorities, recognised third parties and the Commission upon request.

3.5. An AES for which the extended documentation package and the formal documentation package have been approved as part of the emission type-approval shall not constitute a manipulation device or manipulation strategy.

3.6. Manufacturers shall introduce an indicator (AES flag or timer) to indicate when a vehicle runs in AES mode instead of BES mode. The indicator shall be available via the serial port of the standard diagnostic connector upon request of a generic scan-tool. The AES that is running shall be identifiable via the formal documentation package.

4. ROLES AND RESPONSIBILITIES

4.1. This paragraph sets out roles and responsibilities for the actors involved to ensure compliance with regulatory requirements:

– For vehicle manufacturers: it introduces criteria for the declaration of technically justified emission control strategies that are active for a specific purpose and in response to a specific set of ambient or operating conditions. These emission control strategies shall satisfy strict technical criteria to demonstrate that they do not constitute a manipulation device or manipulation strategy as defined in Regulation (EU) 2024/1257.

– For type-approval authorities: it introduces criteria for the approval of technically justified emission control strategies. The approval of such emission control strategies relies on the concept of 'Auxiliary Emission Strategies' (AES), which is adapted from the Euro 6 legal framework. This Annex supports the documentation of AES and clarifies their role in aiding emissions measurement and monitoring through on-board monitoring systems (OBM).

– For market surveillance authorities: it sets a framework for the detection of manipulation devices and manipulation strategies using dedicated screening tests and enforcement measures to prevent the circumvention of Euro 7 requirements.

– For recognised third parties and the European Commission: it sets out roles in the performance of screening tests.

4.2. Roles and responsibilities of vehicle manufacturers

4.2.1. Manufacturers shall ensure the absence of manipulation devices and manipulation strategies related to emissions under the scope of this Regulation: manufacturers shall ensure that no vehicle is equipped with manipulation devices or strategies as defined in paragraphs 41 and 42 in Article 3 of Regulation (EU) 2024/1257.

4.2.2. Manufacturers shall document software updates that modify the effectiveness of emissions control strategies after type-approval.

4.2.3. Manufacturers shall disclose any software updates or calibrations affecting exhaust emissions control systems to the granting type-approval authority.

4.2.4. Manufacturers shall document Euro 7 Auxiliary Emission Strategies (AES) as part of type-approval as specified in paragraph 3 'Technical requirements – documentation'.

4.2.5. In cooperation with the type-approval authorities, the manufacturer shall select up to a maximum of 5 AES that will be monitored by OBM according to Annex I of [Implementing Regulation (EU) 2024/yyy ('Second Implementing Act')].

4.3. Roles and responsibilities of type-approval authorities

4.3.1. At the request of the manufacturer, the approval authority shall conduct a preliminary assessment of the AES for new vehicle types with regard to emissions. In that case, the relevant documentation shall be provided to the type-approval authority between 2 and 12 months before the start of the type-approval process.

4.3.2. The type-approval authority shall make a preliminary assessment based on the extended documentation package, as described in point (b) of Appendix 2 to this Annex, provided by the manufacturer. The approval authority shall make the assessment in accordance with the methodology described in Appendix 1 to this Annex.

4.3.3. The preliminary assessment of the AES for new vehicle types with regard to emissions shall remain valid for the purposes of type-approval for a period of 18 months.

4.3.4. In cooperation with the manufacturer, the type-approval authority shall select [5] AES that will be monitored by OBM according to Annex I of [Implementing Regulation (EU) 2024/yyy ('Second Implementing Act')]. The selection of AES shall prioritise those AES with the greatest expected impact by combination of their effect upon emissions when they are active and the greatest and their expected rate of activation while the vehicles are in use.

4.3.5. The extended documentation package shall be identified and dated by the approval authority and kept by that authority for at least 10 years after the approval is granted.

4.3.6. The type-approval authority shall evaluate the documentation of software updates that modify the effectiveness of emissions control strategies after type-approval and extend the approval as appropriate as long as the requirements continue to be met.

4.3.7. The type-approval authority may test the functionality of the AES flag or timer to indicate when a vehicle runs in AES mode instead of BES mode.

4.3.8. Type-approval authorities shall ensure a harmonised assessment of Euro 7 Auxiliary Emission Strategies (AES). A list of AES which were deemed non-acceptable by type-approval authorities shall be compiled yearly by the Forum for Exchange of Information on Enforcement and made available to the public by the Commission at the latest by end of March of the following year, in case there were AES which were deemed non-acceptable.

4.4. Roles and responsibilities of market surveillance authorities

4.4.1. Market surveillance authorities may conduct screening tests to detect manipulation devices and manipulation strategies related to emissions.

4.4.2. Market surveillance authorities should decide case-by-case which methods are best suited, based on an appropriate risk assessment which considers possible non-compliance, the likelihood of its occurrence, and other possible indicators, like the severity of the occurrence.

4.4.2. The search for manipulation devices or strategies could include two distinct cases:

Case A) 'Boundary detection": manipulation devices or strategies that use the regulated test boundaries or surrogates thereof as triggers (such as ambient temperature, altitude, trip duration, fuel consumed and driving dynamics ranges) or;

Case B) 'Test detection': manipulation devices or strategies triggered by the presence of test equipment (e.g., backpressure increase at the tailpipe, signals on rear ultrasonic sensors, connection of a data recorder on the OBD port) or the vehicle localization (i.e., anything informing the vehicle that it is being tested on road for tailpipe emissions). These 'Test detection' manipulation devices or manipulation strategies apply primarily to on-road tests with PEMS, since vehicles tested in the laboratory usually need to use a special 'chassis dynamometer mode' to allow emissions testing without triggering safety devices, etc.

4.4.3. For all screening test campaigns, it shall be necessary, as a minimum, to include testing the vehicle with the regulatory methodologies. This is an important step to make sure that the vehicle is free of malfunctioning, poor maintenance or other similar issues, which would unduly increase the level of emissions.

4.4.4. To detect the presence of manipulation devices or strategies according to Case A, it is necessary that the vehicles are tested under variations of the regulated testing conditions referred to as 'modalities'. The set of modalities is not fixed but instead kept open due to the need to detect specific technology behaviours in response to a complex set of parameters and the need to keep an unpredictable character.

4.4.5. The result of screening tests to detect manipulation devices and manipulation strategies related to emissions shall be evaluated based on appropriate 'emission ratios', defined as the vehicle emissions during the test divided by the applicable emissions limit.

4.4.6. Market surveillance authorities shall enforce the prohibition of manipulation devices and manipulation strategies related to emissions. If a manipulation device or strategy related to emissions is identified, market surveillance authorities shall impose corrective measures in accordance with Chapter XI of Regulation (EU) 2018/858.

4.4.7. Market surveillance authorities shall ensure a uniform application of criteria for the assessment of screening tests by having regard to the latest version of the relevant non-binding guidance published by the European Commission and to the information available within the Forum for Exchange of Information on Enforcement.

4.5. Roles and responsibilities of the Commission and recognised third parties

4.5.1. The Commission and recognised third parties may conduct screening tests to detect manipulation devices and manipulation strategies related to emissions according to paragraph 0.

## Appendix 1

### Methodology for the assessment and approval of AES

This appendix provides a structured approach for assessing Euro 7 Auxiliary Emission Strategies (AES).

1. Documentation of AES

Manufacturers shall justify the use of an AES based on one or more of the following criteria:

(a) The AES is necessary for the safe operation of the vehicle.

(b) The AES is necessary to avoid sudden and irreparable damage to a powertrain component.

(c) The AES is only active during engine start.

For each AES, manufacturers shall submit:

– A description of the technical motivation for the AES. This will be substantiated by supporting evidence, such as durability tests or risk analyses, demonstrating why the AES is technically necessary;

– A description of the precise conditions that lead to the activation and de-activation of the AES. This shall include, as appropriate, engine parameters, ambient parameters and deterioration factors;

– An estimation of the emissions and $CO_2$ impact of the AES when it is active;

– An estimation of the expected rate of activation of the AES while the vehicles are in use.

This information shall be included in the extended documentation package according to Appendix 2.

2. Assessment of AES

Authorities shall approve an AES if it is technically justified by one or more criteria under paragraph 1., provided that the following criteria are also met:

– The technical motivation for the AES is satisfactory and supported by appropriate evidence;

– The conditions that lead to the activation and de-activation of the AES are set according to technical characteristics of the emission control systems concerned and not to the boundary conditions or other conditions covered by a regulatory test.

3. Approval of AES

The type-approval authority shall approve the AES submitted by the manufacturer based on the contents of the extended documentation package.

The extended documentation package shall be limited to 100 pages.

The extended documentation package may be complemented with annexes and other attached documents, containing additional and complementary elements, if necessary. The manufacturer shall send a new consolidated version of the extended documentation package (with tracked changes) to the type-approval authority every time changes are introduced to the AES. The new version of the AES shall be evaluated and approved by the type-approval authority.

The extended documentation package shall include a declaration of the software versions and calibrations used to control these AES/BES, including the appropriate checksums or reference values of these software versions and calibrations, as well as instructions to the authority on how to read the checksums or reference values; the declaration shall be updated and sent to the type-approval authority that holds this extended documentation package each time there is a new software version or calibration that has an impact on the AES/BES. Manufacturers may request to use an alternative to a checksum if it provides an equivalent level of traceability for software version and calibration management.

The extended documentation package shall also include a declaration of the manufacturer on the absence of manipulation devices or manipulation strategies. The approval of the extended documentation package shall not constitute proof of the absence of manipulation devices or manipulation strategies.

## Appendix 2

## DOCUMENTATION PACKAGES

***Formal Documentation Package***

The manufacturer may use one formal documentation package for multiple emission type-approvals. The formal documentation package shall include the following information:

| **Point** | **Explanation** |
|---|---|
| **1. Emission Type-approval Number(s)** | List of emission type-approval number(s) covered by this BES-AES declaration:<br>including type-approval reference, software reference, calibration number, checksums of each version and of each relevant Control Unit such as engine and aftertreatment ones |
| Method of reading of software and calibration version | E.g. scan-tool explanation |
| **2. Base Emission Strategies** | |
| BES x | Description of strategy x |
| BES y | Description of strategy y |
| **3. Auxiliary Emission Strategies** | |
| Presentation of the AESs | Hierarchical relations among AES: which AES takes precedence if more than one is present |
| AES x | — AES description and justification<br>— Measured and/or modelled parameters for AES activation<br>— Other parameters used to activate the AES<br>— Increase of pollutant and $CO_2$ emissions during the use of AES compared to BES |
| AES y | As above |

***Extended Documentation Package***

The extended documentation package shall be structured as follows:

***Extended Documentation Package for AES Application No YYY/OEM in accordance with Regulation (EU) 2024/1257***

| **Parts** | **Paragraph** | **Point** | **Explanation** |
|---|---|---|---|
| Introduction documents | | Introduction letter to TAA | Reference of the document with the version, the date of issuing the document, signature by the relevant person in the manufacturer organisation |
| | | Versioning table | Content of each version modifications: and with part is modified |
| | | Description of the (emission) types concerned | |
| | | Attached documents table | List of all attached documents |
| | | Cross references | (Indicate where to find each requirement of the regulation) |
| | | Declaration on absence of manipulation devices and manipulation strategies | + signature |
| Core document | 0 | Acronyms/abbreviations | |
| | 1 | GENERAL DESCRIPTION | |
| | 1.1 | Engine general presentation | Description of main characteristics: displacement, aftertreatment,… |
| | 1.2 | General system architecture | System bloc diagram: list of sensors and actuators, explanation of engine general functions |
| | 1.3 | Reading of software and calibration version | E.g. scan-tool explanation |
| | 2 | Base Emission Strategies | |
| | 2.x | BES x | Description of strategy x |
| | 2.y | BES y | Description of strategy y |

| | | | |
|---|---|---|---|
| | 3 | Auxiliary Emission Strategies | |
| | 3.0 | Presentation of the AESs | Hierarchical relations among AES: description and justification (e.g. safety, reliability, etc.) |
| | 3.x | AES x | 3.x.1 AES justification<br>3.x.2 measured and/or modelled parameters for AES characterization<br>3.x.3 Action mode of AES - Parameters used<br>3.x.4 Effect of AES on pollutants and $CO_2$ |
| | 3.y | AES y | 3.y.1<br>3.y.2<br>etc. |
| | 100-page limit ends here | | |
| | Annex | | List of types covered by this BES-AES: including type-approval reference, software reference, calibration number, checksums of each version and of each control unit (engine and/or after-treatment if any) |
| Attached documents | | Technical note for AES justification n° xxx | Risk assessment or justification by testing or example of sudden damage, if any |
| | | Technical note for AES justification n° yyy | |
| | | Test report for specific AES impact quantification | test report of all specific tests done for AES justification, test conditions details, description of the vehicle, date of the tests, emission and/or $CO_2$ impact with or without AES activation |

# ANNEX V

## VERIFYING EMISSIONS OF CRANKCASE GASES

## (TYPE 3 TEST)

1. INTRODUCTION

1.1. The manufacturer shall ensure that the engine's ventilation system does not permit the emission of any crankcase gases into the atmosphere. For the purpose of type-approval the manufacturer shall provide the granting approval authority with a signed declaration of compliance as regards the crankcase emissions requirements of vehicles with positive ignition engines.

1.2. A template for the manufacturer's declaration of compliance with the Type 3 requirements is laid down in Appendix 1 of this Annex.

1.3. In the case a granting approval authority requests a demonstration test at type-approval or in case of conformity of production testing, in-service conformity or market surveillance checks this Annex describes the procedure for the type 3 test verifying emissions of crankcase gases as described in section 5.3.3. of UN Regulation No 83[2].

2. GENERAL REQUIREMENTS

2.1. The general requirements for conducting the type 3 test shall be those set out in sections 1 and 2 of Annex 6 to UN Regulation No 83, with the exceptions set out in point 2.2 below.

2.2 The road load coefficients to be used shall be those for vehicle low (VL). If VL does not exist, then the VH road load shall be used. In that case VH is defined in accordance with point 4.2.1.1.1. of Annex B4 to UN Regulation No 154[3]. In case the interpolation method is used VL and VH are specified in point 4.2.1.1.2. of Annex B4 to UN Regulation No 154.

3. TECHNICAL REQUIREMENTS

The technical requirements shall be those set out in sections 3 to 6 of Annex 6 to UN Regulation No 83.

[2] UN Regulation No 83 - Uniform provisions concerning the approval of vehicles with regard to the emission of pollutants according to engine fuel requirements (OJ L, 2024/1312, 27.6.2024, ELI: http://data.europa.eu/eli/reg/2024/1312/oj).

[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), 02 series of amendments (OJ L, 2022/2124, 10.11.2022, ELI: http://data.europa.eu/eli/reg/2022/2124/oj).

## Appendix 1

## MANUFACTURER'S DECLARATION OF COMPLIANCE WITH THE TYPE 3 REQUIREMENTS

(Manufacturer): …..

(Address of the manufacturer): …..

Declares that the Vehicle Type(s) and/or listed Family(ies) with regard to emissions below are in compliance with the Type 3 requirements

Vehicle Type(s): …..
Family(ies): …..
Other vehicle descriptor(s) ([4]): …..

In accordance with Annex V to Regulation (EU) 2024/1257:

[ ] a closed crankcase system is installed.

[ ] the crankcase emissions are routed directly or indirectly to the tailpipe of the vehicle.

[ ] the crankcase emissions are routed to any other system that prevents the emissions of crankcase gases to the atmosphere.

Done at [….. Place ([5])]

On [….. Date]

[*Name and Signature of Manufacturer's Representative ([10])*]

[4] Delete what is not applicable.
[5] Established in the Union.

# ANNEX VI

## DETERMINATION OF EVAPORATIVE EMISSIONS

## (TYPE 4 TEST)

1. INTRODUCTION

This Annex provides the method to determine the levels of evaporative emission from light-duty vehicles in a repeatable and reproducible manner designed to be representative of real-world vehicle operation.

2. GENERAL REQUIREMENTS

The general requirements for conducting the type 4 test shall be those set out in paragraph 6.6. of UN Regulation No 154[6]. The limit value shall be that specified in Table 3 of Annex I to Regulation (EU) 2024/1257.

3. TECHNICAL REQUIREMENTS

The technical requirements for conducting the type 4 test shall be those set out in Annex C3 to UN Regulation No 154.

[6] 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), 02 series of amendments (OJ L, 2022/2124, 10.11.2022, ELI: http://data.europa.eu/eli/reg/2022/2124/oj).

# ANNEX VII

# VERIFYING THE DURABILITY OF THE EMISSION CONTROL SYSTEMS

# (TYPE 5 TEST)

1. DECLARATION

1.1. A template for the manufacturer's declaration of compliance with the emission durability requirements of the emission control systems is laid down in Appendix 1 of this Annex.

1.2. In the case that a test is requested within the main lifetime or the additional lifetime period for the purpose of in-service conformity or market surveillance checks, this test shall follow the requirements for demonstration of compliance with exhaust emission limits for type-approval. In addition, that test shall follow the usual procedures for in-service conformity and market surveillance testing, such as a vehicle inspection before the test.

1.3. Deterioration factors shall not be applied when the vehicle mileage is above 15 000 km.

1.4. For tests performed in the additional lifetime period, the applicable durability multiplier set out in Table 2 of Annex IV to Regulation (EU) 2024/1257 shall be applied for test evaluation.

## Appendix 1

## MANUFACTURER'S DECLARATION OF COMPLIANCE WITH THE TYPE 5 REQUIREMENTS FOR TYPE-APPROVAL PURPOSES

(Manufacturer): …..

(Address of the manufacturer): …..

Declares that the vehicle Type(s) and/or listed Family(ies) with regard to emissions below are in compliance with the Type 5 requirements regarding durability of exhaust emission control over the main lifetime and the additional lifetime as defined in Annex IV to Regulation (EU) 2024/1257.

Vehicle Type(s): …..
Family(ies): …..
Other vehicle descriptor(s) ([7]): …..

For Type 1 (WLTP) tests conducted for the purpose of type-approval or for conformity of production testing the following (default) deterioration factors shall be used to determine the final pollutant emission results:

Compression-ignition engine

| Multiplicative deterioration factors[8] | | | | | | | |
|---|---|---|---|---|---|---|---|
| | $NO_X$ | CO | THC | NMHC | $HC+NO_X$ | PM | PN |
| Multiplicative | | | - | - | | | |

Positive ignition engine

| Multiplicative deterioration factors | | | | | | | |
|---|---|---|---|---|---|---|---|
| | $NO_X$ | CO | THC | NMHC | $HC+NO_X$ | PM | PN |
| Multiplicative | 1,6 | 1,5 | 1,3 | 1,3 | - | 1,0 | 1,0 |

Done at [….. Place ([9])]

On [….. Date]

….. [*Name and signature of Manufacturer's Representative ([10])*]

[7] Delete what is not applicable.

[8] Manufacturers shall declare the deterioration factors rounded off to one decimal.

[9] Established in the Union.

[10] 'Manufacturer's representative' means any natural or legal person established in the Union who is duly appointed by the manufacturer to represent the manufacturer before the approval authority or the market surveillance authority and to act on the manufacturer's behalf in matters covered by the Regulation, as defined in article 3(41) of Regulation (EU) 2018/858.

# ANNEX VIII

# VERIFYING THE AVERAGE EMISSIONS AT LOW AMBIENT TEMPERATURES (TYPE 6 TEST)

1. INTRODUCTION

1.1. This Annex describes the equipment required and the procedure for the Type 6 test in order to verify the emissions at cold temperatures.

2. GENERAL REQUIREMENTS

2.1. The general requirements for the Type 6 test are those set out in section 5.3.5. of UN Regulation No 83[11].

3. TECHNICAL REQUIREMENTS

3.1. The technical requirements and specifications are those set out in section 2 to 6 of Annex 8 to UN Regulation No 83 with the exception specified in section 3.2 below.

3.2. The road load coefficients to be used shall be those for vehicle low (VL). If VL does not exist then the vehicle high (VH) road load shall be used. In that case VH shall be specified in accordance with paragraph 4.2.1.1.1. of Annex B4 to UN Regulation No 154[12]. In case the interpolation method is used VL and VH shall be specified in accordance with paragraph 4.2.1.1.2. of Annex B4 to UN Regulation No 154. The dynamometer shall be adjusted to simulate the operation of a vehicle on the road at – 7 °C. Such adjustment may be based on a determination of the road load force profile at – 7 °C. Alternatively, the driving resistance determined may be adjusted for a 10% decrease of the coast-down time. The technical service may approve the use of other methods for determining the driving resistance.

[11] UN Regulation No 83 - Uniform provisions concerning the approval of vehicles with regard to the emission of pollutants according to engine fuel requirements (OJ L, 2024/1312, 27.6.2024, ELI: http://data.europa.eu/eli/reg/2024/1312/oj).

[12] 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), 02 series of amendments (OJ L, 2022/2124, 10.11.2022, ELI: http://data.europa.eu/eli/reg/2022/2124/oj).

# ANNEX IX

## SPECIFICATIONS OF REFERENCE FUELS

1. REFERENCE FUELS

1.1. The specifications for the reference fuels to be used shall be those set out in Annex B3 to UN Regulation No 154 ([13]).

2. REFERENCE FUELS FOR TESTING EMISSIONS AT LOW AMBIENT TEMPERATURES – TYPE 6 TEST

2.1. The specifications for the reference fuels to be used in the Type 6 test shall be those set out in Annex 10 and Annex 10a to UN Regulation 83 ([14]).

[13] 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), 02 series of amendments (OJ L, 2022/2124, 10.11.2022, ELI: http://data.europa.eu/eli/reg/2022/2124/oj).

[14] UN Regulation No 83 - Uniform provisions concerning the approval of vehicles with regard to the emission of pollutants according to engine fuel requirements (OJ L, 2024/1312, 27.6.2024, ELI: http://data.europa.eu/eli/reg/2024/1312/oj).

# ANNEX X

# GEAR SHIFT INDICATOR (GSI)

1. INTRODUCTION

1.1. This Annex clarifies some of the requirements related to pollutant emissions in the real world, including when following the gear shift indicator (GSI).

2. GENERAL REQUIREMENTS

2.1. Regulation (EU) 2019/2144 ([15]) regulates gear shift indicators (GSI), whose main purpose is to minimise fuel consumption of a vehicle when a driver follows its indications.

2.2. The technical specifications for gear shift indicators set out in PART 2 of Annex IX to Regulation (EU) 2021/535 ([16]) shall apply.

3. CLARIFICATION OF THE REQUIREMENTS

3.1. The technical specifications for gear shift indicators set out in PART 2 of Annex IX to Regulation (EU) 2021/535 shall apply to $M_1$ vehicles equipped with a manual gearbox which can only be operated in manual mode.

3.2. Section 5.2 PART 2 of Annex IX to Regulation (EU) 2021/535 of the functional requirements for Gear Shift Indicators (GSI) shall be understood to serve as a clarification with non-exhaustive examples.

Regarding the provision that the GSI strategy shall facilitate the timely functioning of the pollution control devices, minimising their heat up time, 'timely functioning of the pollution control devices' shall be understood as ensuring compliance to the pollutant emission requirements laid down in this Regulation.

[15] Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users, amending Regulation (EU) 2018/858 of the European Parliament and of the Council (OJ L 325, 16.12.2019, p. 1, ELI: http://data.europa.eu/eli/reg/2019/2144/oj).

[16] Commission Implementing Regulation (EU) 2021/535 of 31 March 2021 laying down rules for the application of Regulation (EU) 2019/2144 of the European Parliament and of the Council as regards uniform procedures and technical specifications for the type-approval of vehicles, and of systems, components and separate technical units intended for such vehicles, as regards their general construction characteristics and safety (OJ L 117, 6.4.2021, p. 1, ELI: http://data.europa.eu/eli/reg_impl/2021/535/oj).

# ANNEX XI

## ON BOARD DIAGNOSTICS (OBD) FOR MOTOR VEHICLES

1. INTRODUCTION

1.1. This Annex sets out the functional aspects of on-board diagnostic (OBD) systems for the control of emissions from motor vehicles

2. GENERAL REQUIREMENTS

2.1. The requirements for OBD systems set out in paragraph 6.8. of UN Regulation No 154 ([17]) shall apply for the purposes of this Annex.

2.2. A template for the manufacturer's declaration of compliance with the OBD requirements for the purposes of type-approval is laid down in Appendix 1 of this Annex.

3. ADMINISTRATIVE PROVISIONS FOR DEFICIENCIES OF OBD SYSTEMS

3.1. The administrative provisions for deficiencies of OBD systems as set out in Article 8(3) shall be those specified in Section 4 of Annex C5 to UN Regulation No 154 with the following exceptions.

3.2. Reference to 'OBD thresholds' in paragraph 4.2.2. of Annex C5 to UN Regulation No 154 shall be understood as being reference to the OBD thresholds in Table 4A of paragraph 6.8.2. of UN Regulation No 154.

3.3. The second sub-paragraph of paragraph 4.6. of Annex C5 to UN Regulation No 154 shall be understood as being as follows:

'The type-approval authority shall notify its decision in granting a deficiency request in accordance with Article 8(3).'

4. TECHNICAL REQUIREMENTS

4.1. The definitions, requirements and tests for OBD systems set out in paragraphs 3.10, 4, 5.10, 6.8 and Annex C5 to UN Regulation No 154 shall apply for the purposes of this Annex.

4.2 References to the target useful life should be understood as references to the additional lifetime, as set out in Table 1 of Annex IV to Regulation (EU) 2024/1257.

[17] 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), 02 series of amendments (OJ L, 2022/2124, 10.11.2022, ELI: http://data.europa.eu/eli/reg/2022/2124/oj).

## Appendix 1

## MANUFACTURER'S DECLARATION OF COMPLIANCE WITH THE OBD REQUIREMENTS FOR THE PURPOSES OF TYPE-APPROVAL

(Manufacturer): …..

(Address of the manufacturer): …..

Declares that:

(1) For the Vehicle Type(s), Family(ies) or other vehicle descriptor(s) with regard to emissions ([18]) listed in Annex I to this declaration are in compliance with the provisions of Regulation (EU) 2024/1257 and its implementing legislation relating to the OBD system;

(2) The OBD information documentation in Annex II to this declaration describing the detailed technical criteria attached to this declaration is correct and complete for all vehicles to which this declaration applies;

(3) Annex III to this declaration lists any exemptions and/or deficiencies applicable to these vehicles related to the OBD provisions laid down in this Regulation.

Done at [….. Place ([19]) ]

On [….. Date]

[*Name and signature of Manufacturer's Representative ([20])*]

Attachments

Annex I: List of Vehicle Type(s), Family(ies) or other vehicle descriptor(s) with regard to emissions to which this declaration applies

Annex II: OBD Documentation package

Annex III: list of any exemptions and/or deficiencies applicable to these vehicles related to the OBD provisions laid down in this Regulation.

[18] Delete what is not applicable.

[19] Established in the Union.

[20] 'Manufacturer's representative' means any natural or legal person established in the Union who is duly appointed by the manufacturer to represent the manufacturer before the approval authority or the market surveillance authority and to act on the manufacturer's behalf in matters covered by the Regulation, as defined in article 3(41) of Regulation (EU) 2018/858.

# ANNEX XII

# TYPE-APPROVAL OF VEHICLES FITTED WITH ECO-INNOVATIONS AND DETERMINATION OF $CO_2$ EMISSIONS AND FUEL CONSUMPTION FROM VEHICLES SUBMITTED TO MULTI-STAGE TYPE-APPROVAL OR INDIVIDUAL VEHICLE APPROVAL

1. TYPE-APPROVAL OF VEHICLES FITTED WITH ECO-INNOVATIONS

1.1. In accordance with Article 7 of Regulation (EU) 2023/2767, a manufacturer wishing to benefit from a reduction of its average specific $CO_2$ emissions by means of the $CO_2$ savings from an eco-innovation , shall apply to an approval authority for an EU emission type-approval certificate of the vehicle fitted with the eco-innovation.

1.2. The type-approval authority shall determine the $CO_2$ savings of the eco-innovation in accordance with Article 30 of Regulation (EU) 2018/858, using a methodology set out in the Commission Implementing Decision on the approval of that innovative technology as an eco-innovation, in accordance with Article 6 of Regulation (EU) 2023/2767.

2. DETERMINATION OF $CO_2$ EMISSIONS AND FUEL CONSUMPTION FROM VEHICLES SUBMITTED TO MULTI-STAGE TYPE- APPROVAL OR INDIVIDUAL VEHICLE APPROVAL

2.1. In the case of a multi-stage type-approval, the procedures of Annex XXI shall apply for the purpose of determining the $CO_2$ emissions and fuel consumption of the completed vehicle.

2.2. By way of derogation from paragraph 2.1, at the request of the final-stage manufacturer, where the base vehicle is incomplete, and if the base vehicle manufacturer has made available a calculation tool to establish the final fuel consumption and $CO_2$ values as specified in Annex B7 to UN Regulation No 154 on the basis of the parameters of completed vehicles, the $CO_2$ emissions and fuel consumption of the completed vehicle shall be calculated by the final-stage manufacturer on the basis of the parameters of the completed vehicle as specified in paragraph 3.2.4. of Annex B7 to UN Regulation No 154.

For that purpose, the base vehicle manufacturer shall establish a road load matrix family, as defined in paragraph 6.3.4. of UN Regulation No 154, based on the parameters of a representative multi-stage vehicle in accordance with paragraph 4.2.1.4. of Annex B4 to UN Regulation No 154.

The base vehicle manufacturer shall calculate the road load coefficients of vehicle HM and LM of the road load matrix family as set out in paragraph 5 of Annex B4 to UN Regulation No 154 and shall determine the $CO_2$ emission and fuel consumption of those vehicles in a Type 1 test. The calculation of the road load and running resistance for an individual multi-stage vehicle shall be performed by the completed vehicle manufacturer in accordance with paragraph 5.1. of Annex B4 to UN Regulation No 154. These values shall be fed into the calculation tool to determine the $CO_2$ emissions and fuel consumption of the completed vehicle.

2.3. By way of derogation from paragraph 2.1, where the base vehicle is a complete vehicle, the final-stage manufacturer shall determine the $CO_2$ emissions of the completed vehicle on the basis of information from the base vehicle manufacturer. The $CO_2$ emissions shall be determined in accordance with the $CO_2$ interpolation method using the appropriate data from the completed vehicle or calculated on the basis of the parameters of the completed vehicle as specified in paragraph 3.2.4. of Annex B7 to UN Regulation No 154 and using the calculation tool referred to in point 2.2 if it is supplied by the base vehicle manufacturer. If the $CO_2$ interpolation is not possible or the tool is not available, subject to the agreement of the approval authority, the $CO_2$ emissions of the completed vehicle shall be the $CO_2$ emissions of Vehicle High from the base vehicle.

2.4. The final-stage manufacturer shall include in the certificate of conformity the information of the completed vehicle and the information of the base vehicle in accordance with Regulation (EU) 2020/683.

In the case of multi-stage vehicles submitted to individual vehicle approval, the individual approval certificate shall include the following information:

(a) the CO2 emissions measured in accordance with the methodology set out in point 2.1 or, where applicable, 2.2 or 2.3;

(b) the mass in running order of the completed vehicle;

(c) the type, variant and version of the base vehicle;

(d) the type-approval number of the base vehicle;

(e) the name and address of the base vehicle manufacturer;

(f) the mass in running order of the base vehicle.