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ANNEX 2

ANNEX

to the

Commission Regulation

amending Commission Regulation (EU) 2017/1151 for the purpose of adopting to technical progress the emission type approval procedures for light passenger and commercial vehicles

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Annex II

Annex II is replaced by:

‘ANNEX II

IN-SERVICE CONFORMITY METHODOLOGY

1. Introduction

This Annex sets out the in-service conformity (ISC) methodology for checking compliance against the emission limits for tailpipe (including low temperature) and evaporative emissions throughout the normal life of the vehicle.

2. Process description

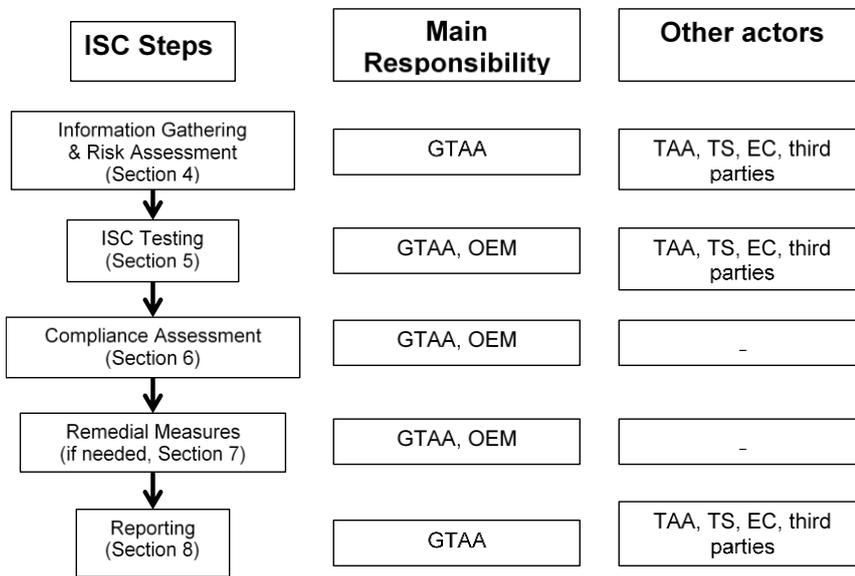


Figure B.1

Illustration of the in-service conformity process (where GTAA refers to the granting type-approval authority, OEM refers to the manufacturer, and Other Actors are defined as: TAA refers to type approval authorities other than the one granting the relevant type approval, TS refer to technical services, EC to the Commission, and third parties that meet the requirements laid down in Implementing Regulation (EC) 2022/163)

3. ISC family definition

An ISC family shall be composed of the following vehicles:

- (a) For tailpipe emissions (Type 1, Type 1a and Type 6 tests), the vehicles covered by the PEMS test family, as described in Appendix 7 of Annex IIIA,

(b) For evaporative emissions (Type 4 test), the vehicles included in the evaporative emission family, as described in paragraph 6.6.3. of UN Regulation No. 154.

4. Information gathering and initial risk assessment

The granting type approval authority and other actors shall gather all relevant information on possible emission non-compliances relevant for deciding which ISC families to check in a particular year. They shall take into account in particular information indicating vehicle types with high emissions in real driving conditions. That information shall be obtained by appropriate methods, which may include remote sensing, simplified on-board emissions monitoring systems (SEMS) and testing with PEMS. The number and importance of exceedances observed during such testing may be used to prioritise ISC testing.

As part of the information provided for the ISC checks, each manufacturer shall report to the granting type approval authority on emission-related warranty claims, and any emission-related warranty repair works performed or recorded during servicing, in accordance with a format agreed between the granting type approval authority and the manufacturer at type approval. The information shall detail the frequency and nature of faults for emissions-related components and systems by ISC family. The ISC reports shall be filed at least once a year for each ISC family for the duration of the period during which in-service conformity checks are to be performed in accordance with Article 9(3). The ISC reports shall be made available upon request.

On the basis of the information referred to in the first and second paragraphs, the granting type approval authority shall make an initial assessment of the risk of an ISC family to not comply with the in-service conformity rules and on that basis shall take a decision on which families to test and which types of tests to perform under the ISC provisions. Additionally, the granting type approval authority may randomly choose ISC families to test.

Other actors shall take into account the information collected according to the first paragraph in order to prioritise testing. Additionally, they may randomly choose ISC families to test.

5. ISC testing

The manufacturer shall perform ISC testing for tailpipe emissions comprising at least the Type 1 test for all ISC families. The manufacturer may also perform Type 1a, Type 4 and Type 6 tests for all or part of the ISC families. The manufacturer shall report to the granting type-approval authority all results of the ISC testing using the Electronic Platform for in-service conformity described in point 5.9, or other appropriate means where this is not possible.

The granting type approval authority shall check an appropriate number of ISC families each year, as set out in point 5.4. The granting type approval authority shall include all results of the ISC testing in the Electronic Platform for in-service conformity described in point 5.9.

Other actors may perform checks on any number of ISC families each year. They shall report to the granting type approval authority all results of the ISC testing using the Electronic Platform for in-service conformity described in point 5.9, or other appropriate means where this is not possible.

5.1. Quality assurance of testing

The granting type approval authority shall annually audit the ISC checks performed by the manufacturer. The granting type approval authority may also audit the ISC checks performed by third parties. The audit shall be based on the information provided by the manufacturers, or third parties which shall include at least the detailed ISC report in accordance with

Appendix 3. The granting type approval authority may require the manufacturers, or third parties to provide additional information.

5.2. *Disclosure of tests results*

The granting type approval authority shall communicate the results of the compliance assessment and remedial measures for a particular ISC family to other actors which provided test results for that family as soon as they become available.

The results of the tests, including the detailed data for all vehicles tested, may only be disclosed to the public after the publication by the granting type approval authority of the annual report or the results of an individual ISC procedure or after the closure of the statistical procedure (see point 5.10.) without a result. If the results of the ISC tests undertaken by other actors are published, reference shall be made to the annual report by the granting type approval authority which included them.

5.3. *Types of tests*

ISC testing shall only be performed on vehicles selected in accordance with Appendix 1.

ISC testing with the Type 1 test shall be performed in accordance with Annex XXI.

ISC testing with the Type 1a test shall be performed in accordance with Annex IIIA, Type 4 tests shall be performed in accordance with Appendix 2 to this Annex and Type 6 tests shall be performed in accordance with Annex VIII.

5.4. *Frequency and scope of ISC testing*

The time period between commencing two in-service conformity checks by the manufacturer for a given ISC family shall not exceed 24 months.

The frequency of ISC testing performed by the granting type approval authority shall be based on a risk assessment methodology consistent with the international standard ISO 31000:2018 — Risk Management — Principles and guidelines which shall include the results of the initial assessment made according to point 4.

Each granting type approval authorities shall perform both the Type 1 and Type 1a tests on a minimum of 5 % of the ISC families per manufacturer per year or at least two ISC families per manufacturer per year, where available. The requirement for testing a minimum of 5 % or at least two ISC families per manufacturer per year shall not apply to small volume manufacturers. The granting type approval authority shall ensure the widest possible coverage of ISC families and vehicle age in a particular in-service conformity family in order to ensure compliance according to Article 9, paragraph 3. The granting type approval authority shall complete the statistical procedure for each ISC family it has started within 12 months.

Type 4 or Type 6 ISC tests shall have no minimum frequency requirements.

5.5. *Funding for ISC testing by the granting type approval authorities*

The granting type approval authority shall ensure that sufficient resources are available to cover the costs for in-service conformity testing. Without prejudice to national law, those costs shall be recovered by fees that can be levied on the manufacturer by the granting type approval authority. Such fees shall cover ISC testing of up to 5 % of the in-service conformity families per manufacturer per year or at least two ISC families per manufacturer per year.

5.6. *Testing plan*

When performing testing for ISC, the granting type approval authority shall draft a testing plan. In the case of Type 1a testing, that plan shall include testing to check ISC compliance under a wide range of conditions in accordance with Annex IIIA.

5.7. *Selection of vehicles for ISC testing*

The information gathered shall be sufficiently comprehensive to ensure that in-service performance can be assessed for vehicles that are properly maintained and used. The tables in Appendix 1 shall be used to decide whether the vehicle can be selected for the purposes of ISC testing. During the check against the tables in Appendix 1, some vehicles may be declared as faulty and not tested during ISC, when there is evidence that parts of the emission control system were damaged.

The same vehicle may be used to perform and establish reports from more than one type of tests (Type 1, Type 1a, Type 4, Type 6) but only the first valid test of each type shall be taken into account for the statistical procedure.

5.7.1. *General requirements*

The vehicle shall belong to an ISC family as described in point 3 and shall comply with the checks set out in the table in Appendix 1. It shall be registered in the Union and have been driven in the Union for at least 90 % of its driving time. The emissions testing may be done in a different geographical region from that where the vehicles have been selected. In case of ISC testing conducted by the manufacturer, with the agreement of the granting type approval authority, vehicles registered in a non-EU country may be tested, if they belong to the same ISC family and are accompanied by a certificate of conformity.

The vehicles selected shall be accompanied by a maintenance record which shows that the vehicle has been properly maintained and has been serviced in accordance with the manufacturer's recommendations with only original parts used for the replacement of emissions related parts.

Vehicles exhibiting indications of abuse, improper use that could affect its emissions performance, tampering or conditions that may lead to unsafe operation shall be excluded from ISC.

The vehicles shall not have undergone aerodynamic modifications that cannot be removed prior to testing.

A vehicle shall be excluded from ISC testing if the information stored in the on-board computer shows that the vehicle was operated after a fault code was displayed and a repair was not carried out in accordance with manufacturer specifications.

A vehicle shall be excluded from ISC testing if the fuel from the vehicle tank does not meet the applicable standards laid down in Directive 98/70/EC of the European Parliament and of the Council¹ or if there is evidence or record of fuelling with the wrong type of fuel.

5.7.2. *Vehicle Examination and Maintenance*

Diagnosis of faults and any normal maintenance necessary in accordance with Appendix 1 shall be performed on vehicles accepted for testing, prior to or after proceeding with ISC testing.

¹ Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC (OJ L 350, p. 58).

The following checks shall be carried out: OBD checks (performed before or after the test), visual checks for lit malfunction indicator lamps, checks on air filter, all drive belts, all fluid levels, radiator and fuel filler cap, all vacuum and fuel system hoses and electrical wiring related to the after-treatment system for integrity; checks on ignition, fuel metering and pollution control device components for maladjustments and/or tampering.

If the vehicle is within 800 km of a scheduled maintenance service, that service shall be performed.

The window washer fluid shall be removed before the Type 4 test and replaced with hot water.

A fuel sample shall be collected and kept in accordance with the requirements of Annex IIIA for further analysis in case of fail.

All faults shall be recorded. When the fault is on the pollution control devices then the vehicle shall be reported as faulty and not be used further for testing, but the fault shall be taken into account for the purposes of the compliance assessment performed in accordance with point 6.1.

5.8. *Sample size*

When manufacturers apply the statistical procedure set out in point 5.10 for the Type 1 test, the number of sample lots shall be set on the basis of the annual sales volume of an in-service family in the Union, as described in the following table:

<i>Table B.1</i>	
<i>Number of sample lots for ISC testing with Type 1 tests</i>	
<i>EU Registrations per calendar year of vehicles in the sampling period</i>	<i>Number of sample lots (for Type 1 tests)</i>
up to 100000	1
100001 to 200000	2
above 200000	3

Each sample lot shall include enough vehicle types, in order to ensure that at least 20 % of the total registrations of this PEMS family in Europe for the previous year are covered. In case the same PEMS family is shared between more brands, then all brands shall be tested. When a family requires more than one sample lot to be tested, the vehicles in the second and third sample lots shall select vehicles used in different ambient and/or typical use conditions from those selected for the first sample.

5.9. *Use of the Electronic Platform for in-service conformity and access to data required for testing*

The Commission shall set up an electronic platform in order to facilitate the exchange of data between on the one side, the manufacturers, other actors and on the other side the granting type approval authority and the taking of the decision on the sample fail or pass.

The manufacturer shall complete the package on Testing Transparency referred to in Article 5 (12) in the format specified in Tables 1 and 2 of Appendix 5 and in the Table in this point and

transmit it to the type-approval authority which grants the emission type-approval. Table 2 of Appendix 5 shall be used in order to allow the selection of vehicles from the same family for testing and along with the Table 1 provide sufficient information for vehicles to be tested.

Once the electronic platform referred to in the first paragraph becomes available, the type-approval authority which grants the emission type-approval shall upload the information in Tables 1 and 2 of Appendix 5 to this platform within 5 working days of receiving it.

All information in Tables 1 and 2 of Appendix 5 shall be accessible to the public in an electronic form free of charge.

The following information shall also be part of the package on Testing Transparency and shall be provided by the manufacturer free-of-charge within 5 working days of the request by other actors.

ID	Input	Description
1.	Special Procedure for conversion of vehicles (4WD to 2WD) for dyno testing if available	As defined in paragraph 2.4.2.4. of Annex B6 to UN Regulation 154
2.	Dyno mode instructions, if available	How to enable the dyno mode as done also during TA tests
3.	Coastdown mode used during the TA tests	If the vehicle has coastdown mode instructions how to enable this mode
4.	Battery discharge procedure (OVC-HEV, PEV)	OEM procedure to deplete battery for preparing OVC-HEV for charge sustaining tests, and PEV to charge the battery
5.	Procedure to deactivate all auxiliaries	If used during TA
6.	Procedure to measure current and voltage of all REESS with the use of external equipment	As defined in Appendix 3 of Annex B8 to UN Regulation 154 To measure current and voltage independently of on-board data, OEM provides procedure, description of current and voltage access points and list of devices used for current and voltage measurement during type approval.

5.10. Statistical Procedure

5.10.1. General

The verification of in-service conformity shall rely on a statistical method following the general principles of sequential sampling for inspection by attributes. The minimum sample size for a pass result is three vehicles, and the maximum cumulative sample size is ten vehicles for the Type 1 and RDE tests.

For the Type 4 and Type 6 tests a simplified method may be used, where the sample shall consist of three vehicles and shall be considered a fail if all three vehicles fail to pass the test, and a pass if all three vehicles pass the test. In cases where two out of three passed or failed, the type approval authority may decide to conduct further tests or proceed with assessing the compliance in accordance with point 6.1.

Test results shall not be multiplied by deterioration factors.

For vehicles that have a Declared Maximum RDE Values reported in point 48.2 of the Certificate of Conformity, as described in Annex VIII of Regulation 2020/683/EC which is lower than the emission limits set out in Annex I to Regulation (EC) No 715/2007, the conformity shall be checked against these Declared Maximum RDE Values. If the sample is found not to conform with the Declared Maximum RDE Values, the granting type approval authority shall require the manufacturer to take corrective actions.

Prior to the performance of the first ISC test, the manufacturer, or other actors shall notify the intent of performing in-service conformity testing of a given vehicle family to the granting type approval authority. Upon this notification, the granting type approval authority shall open a new statistical folder to process the results for each relevant combination of the following parameters for that particular party/or that pool of parties: vehicle family, emissions test type and pollutant. Separate statistical procedures shall be opened for each relevant combination of those parameters.

The granting type approval authority shall incorporate in each statistical folder only the results provided by the relevant party. The granting type approval authority shall keep a record of the number of tests performed, the number of failed and passed tests and other necessary data to support the statistical procedure.

Whereas more than one statistical procedure can be open at the same time for a given combination of test type and vehicle family, a party shall only be allowed to provide test results to one open statistical procedure for a given combination of test type and vehicle family. Each test shall be reported only once and all tests (valid, not valid, fail or pass, etc.) shall be reported.

Each ISC statistical procedure shall remain open until an outcome is reached when the statistical procedure arrives to a pass or fail decision for the sample in accordance point 5.10.5. However, if an outcome is not reached within 12 months of the opening of a statistical folder, the granting type approval authority shall close the statistical folder unless it decides to complete testing for that statistical folder within the following 6 months.

The functions described above shall be executed directly in the Electronic Platform once the relevant functions are available.

5.10.2. Pooling of ISC results

Test results from other actors may be pooled for the purposes of a common statistical procedure. The pooling of test results shall require the written consent from all the interested parties providing test results to a pool of results, and a notification to the type approval authorities, and to the electronic platform when available, prior to the start of testing. One of the parties shall be designated as leader of the pool and be responsible for data reporting and communication with the granting type approval authority.

5.10.3. Pass/Fail/Invalid outcome for a single test

An ISC emissions test shall be considered as 'passed' for one or more pollutants when the emissions result is equal or below the emission limit set out in Annex I of Regulation (EC) No 715/2007 for that type of test.

An emissions test shall be considered as 'failed' for one or more pollutants when the emissions result is greater than the corresponding emission limit for that type of test. Each failed test result shall increase the 'f' count (see point 5.10.5) by 1 for that statistical instance.

An ISC emissions test shall be considered invalid if it does not respect the requirements of the tests referred to in point 5.3. Invalid test results shall be excluded from the statistical procedure and the test shall be repeated with the same vehicle in order to have a valid test.

The results of all ISC tests shall be submitted to the granting type approval authority within ten working days from the execution of each test on a single vehicle. The test results shall be accompanied by a comprehensive test report at the end of the tests. The results shall be incorporated in the sample in chronological order of execution.

The granting type approval authority shall incorporate all valid emission test results to the relevant open statistical procedure until a 'sample fail' or a 'sample pass' outcome is reached in accordance with point 5.10.5.

5.10.4. Treatment of Outliers

The presence of outlying results in the sample statistical procedure may lead to a 'fail' outcome in accordance with the procedures described below:

Outliers shall be categorised as mild, intermediate or extreme.

An emissions test result shall be considered as a mild outlier if it is more than the applicable emission limit but less than 1,3 times the applicable emission limit. The presence of a mild outlier only counts in the number of failed results in point 5.10.5. below.

An emissions test result shall be considered as an intermediate outlier if it is equal or greater than 1,3 times the applicable emission limit. The presence of two such outliers in a sample shall lead to a fail of the sample.

An emissions result shall be considered as an extreme outlier if it is equal or greater than 2,5 times the applicable emission limit. The presence of one such outlier in a sample shall lead to a fail of the sample. In such case, the plate number of the vehicle shall be communicated to the manufacturer and to the granting type approval authority. This possibility shall be communicated to the vehicle owners before testing.

5.10.5. Pass/Fail decision for a sample

For the purposes of deciding on a pass/fail result for the sample, 'p' is the count of passed results, and 'f' is the count of failed results. Each passed test result shall increase the 'p' count by 1 and each failed test result shall increase the 'f' count by 1 for the relevant open statistical procedure.

Upon the incorporation of valid emission test results to an open instance of the statistical procedure, the type approval authority shall perform the following actions:

- (a) update the cumulative sample size 'n' for that instance to reflect the total number of valid emissions tests incorporated to the statistical procedure;
- (b) following an evaluation of the results, update the count of passed results 'p' and the count of failed results 'f';
- (c) compute the number of extreme and intermediate outliers in the sample in accordance with point 5.10.4. ;
- (d) check whether a decision is reached with the procedure described below.

The decision depends on the cumulative sample size ‘n’, the passed and failed result counts ‘p’ and ‘f’, as well as the number of intermediate and/or extreme outliers in the sample. For the decision on a pass/fail of an ISC sample the granting type approval authority shall use the decision chart in Figure B.2 for vehicles based on types approved as of 1 January 2020 and the decision chart in Figure B.2.a for vehicles based on types approved until 31 December 2019. The charts indicate the decision to be taken for a given cumulative sample size ‘n’ and failed count result ‘f’.

Two decisions are possible for a statistical procedure for a given combination of vehicle family, emissions test type and pollutant:

‘Sample pass’ outcome shall be reached when the applicable decision chart from Figure B.2 or Figure B.2.a gives a ‘PASS’ outcome for the current cumulative sample size ‘n’ and the count of failed results ‘f’.

‘Sample fail’ decision shall be reached, for a given cumulative sample size ‘n’, when at least one of the following conditions is fulfilled:

- (a) the applicable decision chart from Figure B.2 or Figure B.2.a gives a ‘FAIL’ decision for the current cumulative sample size ‘n’ and the count of failed results ‘f’;
- (b) there are two “FAIL” decisions with intermediate outliers;
- (c) there is one “FAIL” decision with an extreme outlier.

If no decision is reached, the statistical procedure shall remain open and further results shall be incorporated into it until a decision is reached or the procedure is closed in accordance with point 5.10.1.

Figure B.2

Decision chart for the statistical procedure for vehicles based on types approved as of 1 January 2020 (where ‘UND’ means undecided)

Failed result count f	10								FAIL
	9							FAIL	FAIL
	8						FAIL	FAIL	FAIL
	7					FAIL	FAIL	FAIL	FAIL
	6				FAIL	FAIL	FAIL	FAIL	FAIL
	5			FAIL	FAIL	FAIL	UND	UND	PASS
	4		FAIL	FAIL	UND	UND	UND	UND	PASS
	3	FAIL	FAIL	UND	UND	UND	UND	PASS	PASS
	2	UND	UND	UND	UND	PASS	PASS	PASS	PASS
	1	UND	PASS						
	0	PASS							
	3	4	5	6	7	8	9	10	

	<i>Cumulative sample size n</i>
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Figure B.2.a

Decision chart for the statistical procedure for vehicles type approved until 31 December 2019 (where 'UND' means undecided)

<i>Failed result count f</i>	10								FAIL
	9							FAIL	FAIL
	8						FAIL	FAIL	FAIL
	7					FAIL	FAIL	FAIL	FAIL
	6				FAIL	FAIL	FAIL	FAIL	FAIL
	5			FAIL	UND	UND	UND	UND	PASS
	4		UND	UND	UND	UND	UND	PASS	PASS
	3	UND	UND	UND	UND	UND	PASS	PASS	PASS
	2	UND	UND	UND	PASS	PASS	PASS	PASS	PASS
	1	UND	PASS						
	0	PASS							
	3	4	5	6	7	8	9	10	
	<i>Cumulative sample size n</i>								

5.10.6. ISC for completed vehicles and multistage special purpose vehicles

The manufacturer of the base vehicle shall determine the allowed values for the parameters listed in Table B.3. The allowed Parameter Values for each family shall be recorded in the information document of the emissions type approval (see Appendix 3 to Annex I) and in the Transparency list 1 of Appendix 5. The final-stage manufacturer shall only be allowed to use the base vehicle emission values if the completed vehicle remains within the allowed Parameter Values. The parameter values for each final vehicle shall be recorded in its Certificate of Conformity.

<i>Table B.3</i>	
<i>Allowed Parameter Values for multistage and multistage special purpose vehicles to use the base vehicle emission type approval</i>	
Parameter Values:	Allowed values from - to:

Final Vehicle actual mass (in kg)	
Final Vehicle technically permissible maximum laden mass (in kg)	
Frontal area for final vehicle (in cm ²)	
Rolling resistance (kg/t)	
Projected frontal area of air entrance of the front grille (in cm ²)	

If a completed or multistage special purpose vehicle is tested and the result of the test is below the applicable emission limit, the vehicle shall be considered as a pass for the ISC family for the purposes of point 5.10.3.

If the result of the test on a completed or multistage special purpose vehicle exceeds the applicable emission limits but is not higher than 1,3 times the applicable emission limits, the tester shall examine whether that vehicle complies with the values in table B.3. Any non-compliance with these values shall be reported to the granting type approval authority. If the vehicle does not comply with those values, the granting type approval authority shall investigate the reasons for the non-compliance and take the appropriate measures regarding the manufacturer of the completed or multistage special purpose vehicle to restore conformity, including the withdrawal of the type-approval. If the vehicle complies with the values in table B.3, it shall be considered as a flagged vehicle for the in-service conformity family for the purposes of point 6.1.

If the result of the test exceeds 1,3 times the applicable emission limits, shall be considered as a fail for the in-service conformity family for the purposes of point 6.1., but not as an outlier for the relevant ISC family. If the completed or multistage special purpose vehicle does not comply with the values in table B.3, this shall be reported to the granting type approval authority, who shall investigate the reasons for the non-compliance and take the appropriate measures regarding the manufacturer of the completed or multistage special purpose vehicle to restore conformity, including the withdrawal of the type-approval.

6. Compliance Assessment

6.1. Within 10 days of the end of the ISC testing for the sample as referred to in point 5.10.5, the granting type approval authority shall start detailed investigations with the manufacturer in order to decide whether the ISC family (or part of it) complies with the ISC rules and whether it requires remedial measures. For multistage or special purpose vehicles the granting type approval authority shall also perform detailed investigations when there are at least three faulty vehicles with the same fault or five flagged vehicles in the same ISC family, as set out in point 5.10.6.

6.2. The granting type approval authority shall ensure that sufficient resources are available to cover the costs for compliance assessment. Without prejudice to national law, those costs shall be recovered by fees that can be levied on the manufacturer by the granting type approval authority. Such fees shall cover all testing or auditing needed in order for an assessment on compliance to be reached.

6.3. On the request of the manufacturer, the granting type approval authority may extend the investigations to vehicles in service of the same manufacturer belonging to other ISC families which are likely to be affected by the same defects.

6.4. The detailed investigation shall take no more than 60 working days after the start of the investigation by the granting type approval authority. The granting type approval authority may conduct additional ISC tests designed to determine why vehicles have failed during the original ISC tests. The additional tests shall be conducted under similar conditions as the original ISC failed tests.

Upon the request of the granting type approval authority, the manufacturer shall provide additional information, showing in particular the possible cause of the failures, which parts of the family might be affected, whether other families might be affected, or why the problem which caused the failure at the original ISC tests is not related to in-service conformity, if applicable. The manufacturer shall be given the opportunity to prove that the in-service conformity provisions have been complied with.

6.5. Within the deadline set out in point 6.4, the granting type approval authority shall take the decision on the compliance or the non-compliance. In case of non-compliance the authority shall define the remedial measures for the ISC family. It shall notify them to the manufacturer.

7. Remedial Measures

7.1. The manufacturer shall establish a plan of remedial measures and submit it to the granting type approval authority within 45 working days of the notification referred to in point 6.4. That period may be extended by up to an additional 30 working days where the manufacturer demonstrates to the granting type approval authority that further time is required to investigate the non-compliance.

7.2. The remedial measures required by the granting type approval authority shall include reasonably designed and necessary tests on components and vehicles in order to demonstrate the effectiveness and durability of the remedial measures.

7.3. The manufacturer shall assign a unique identifying name or number to the plan of remedial measures. The plan of remedial measures shall include at least the following:

- (a) a description of each vehicle emission type included in the plan of remedial measures;
- (b) a description of the specific modifications, alterations, repairs, corrections, adjustments or other changes to be made to bring the vehicles into conformity including a brief summary of the data and technical studies which support the decision of the manufacturer as to the particular remedial measures to be taken;
- (c) a description of the method by which the manufacturer will inform the vehicle owners of the planned remedial measures;
- (d) a description of the proper maintenance or use, if any, which the manufacturer stipulates as a condition of eligibility for repair under the plan of remedial measures, and an explanation of the need for such condition;
- (e) a description of the procedure to be followed by vehicle owners to obtain correction of the non-conformity; that description shall include a date after which the remedial measures shall be taken, the estimated time for the workshop to perform the repairs and where they can be done;
- (f) an example of the information transmitted to the vehicle owner;

(g) a brief description of the system which the manufacturer uses to assure an adequate supply of component or systems for fulfilling the remedial action, including information on when an adequate supply of the components, software or systems needed to initiate the application of remedial measures will be available;

(h) an example of all instructions to be sent to the repair shops which will perform the repair;

(i) a description of the impact of the proposed remedial measures on the emissions, fuel consumption, driveability, and safety of each vehicle emission type, covered by the plan of remedial measures, including supporting data and technical studies;

(j) where the plan of remedial measures includes a recall, a description of the method for recording the repair shall be submitted to the granting type approval authority. If a label is used, an example of it shall also be submitted.

For the purposes of point (d), the manufacturer may not impose maintenance or use conditions which are not demonstrably related to the non-conformity and the remedial measures.

7.4. The repair shall be done expeditiously, within a reasonable time after the vehicle is received by the manufacturer for repair. Within 15 working days of receiving the proposed plan of remedial measures, the granting type approval authority shall approve it or require a new plan in accordance with point 7.5.

7.5. When the granting type approval authority does not approve the plan of remedial measures, the manufacturer shall develop a new plan and submit it to the granting type approval authority within 20 working days of notification of the decision of the granting type approval authority.

7.6. If the granting type approval authority does not approve the second plan submitted by the manufacturer, it shall take all appropriate measures, in accordance with Article 53 of Regulation (EU) 2018/858, to restore conformity, including withdrawal of type approval where necessary.

7.7. The granting type approval authority shall notify its decision to all Member States and the Commission within 5 working days.

7.8. The remedial measures shall apply to all vehicles in the ISC family (or other relevant families identified by the manufacturer in accordance with point 6.2) that are likely to be affected by the same defect. The granting type approval authority shall decide if it is necessary to amend the type approval.

7.9. The manufacturer is responsible for the execution of the approved plan of remedial measures in all Member States and for keeping a record of every vehicle removed from the market or recalled and repaired and the workshop which performed the repair.

7.10. The manufacturer shall keep a copy of the communication with the customers of affected vehicles related to the plan of remedial measures. The manufacturer shall also maintain a record of the recall campaign, including the total number of vehicles affected per Member State and the total number of vehicles already recalled per Member State, along with an explanation of any delays in the application of the remedial measures. The manufacturer shall provide that record of the recall campaign to the granting type approval authority, the type approval authorities of each Member State and the Commission every two months.

7.11. Member States shall take measures to ensure that the approved plan of remedial measures is applied within two years to at least 90 % of affected vehicles registered in their territory.

7.12. The repair and modification or addition of new equipment shall be recorded in a certificate provided to the vehicle owner, which shall include the number of the remedial campaign.

8. Annual report by the granting type approval authority

The granting type approval authority shall make available on a publicly accessible website, free of charge and without the need for the user to reveal their identity or sign up, a report with the results of all the finalised ISC investigations of the previous year, at the latest by the 31 March of each year. In case some ISC investigations of the previous year are still open by that date, they shall be reported as soon as the investigation is finalised. The report shall contain at least the items listed in Appendix 4.

Appendix 1

CRITERIA FOR VEHICLE SELECTION AND FAILED VEHICLES DECISION

The vehicle survey shall be used in order to select properly maintained and used vehicles for testing in ISC. Vehicles that have one or more of the exclusion criteria below shall be excluded from testing or otherwise repaired and then selected.

<i>Selection of Vehicles for In-Service Conformity Emissions Testing</i>				
				<i>Confidential</i>
<i>Date:</i>				<i>x</i>
<i>Name of investigator:</i>				<i>x</i>
<i>Location of test:</i>				<i>x</i>
<i>Country of registration (in EU only):</i>			<i>x</i>	
<i>Vehicle Characteristics</i>		<i>x =</i>	<i>X =</i>	
		<i>Exclusion</i>	<i>Checked</i>	
		<i>Criteria</i>	<i>and</i>	
			<i>reported</i>	
<i>Registration plate number:</i>			<i>x</i>	<i>x</i>
<i>Mileage and age of vehicle:</i> <i>The vehicle must comply with the rules in regards to mileage and age in Article 9, otherwise it cannot be selected. The age of the vehicle counts from the date of first registration</i>		<i>x</i>		
<i>Date of first registration:</i>			<i>x</i>	
<i>VIN:</i>			<i>x</i>	<i>x</i>
<i>Emission class and character:</i>			<i>x</i>	
<i>Country of registration:</i> <i>The vehicle must be registered in the EU</i>		<i>x</i>	<i>x</i>	
<i>Model:</i>			<i>x</i>	
<i>Engine code:</i>			<i>x</i>	
<i>Engine volume (l):</i>			<i>x</i>	

<i>Engine power (kW):</i>		<i>x</i>	
<i>Gearbox type (auto/manual):</i>		<i>x</i>	
<i>Drive axle (FWD/AWD/RWD):</i>		<i>x</i>	
<i>Tyre size (front and rear if different):</i>		<i>x</i>	
<i>Is the vehicle involved in a recall or service campaign?</i> <i>If yes: Which one? Has the campaign repairs already been done?</i> <i>The repairs must have been done before the start of the ISC testing</i>	<i>x</i>	<i>x</i>	
Vehicle Owner Interview <i>(the owner will only be asked the main questions and shall have no knowledge of the implications of the replies)</i>			
<i>Name of the owner (only available to the accredited inspection body or laboratory/technical service)</i>			<i>x</i>
<i>Contact (address / telephone) (only available to the accredited inspection body or laboratory/technical service)</i>			<i>x</i>
<i>How many owners did the vehicle have?</i>		<i>x</i>	
<i>Did the odometer not work?</i> <i>If yes, the vehicle cannot be selected.</i>	<i>x</i>		
<i>Was the vehicle used for one of the following?</i>			
As car used in show-rooms?		<i>x</i>	
As a taxi?		<i>x</i>	
As delivery vehicle?		<i>x</i>	
For racing / motor sports?	<i>x</i>		
As a rental car?		<i>x</i>	
<i>Has the vehicle carried heavy loads over the specifications of the manufacturer?</i>	<i>x</i>		

<i>If yes, the vehicle cannot be selected.</i>			
<i>Have there been major engine or vehicle repairs?</i>		<i>x</i>	
<i>Have there been unauthorised major engine or vehicle repairs? If yes, the vehicle cannot be selected.</i>	<i>x</i>		
<i>Has there been an unauthorised power increase/tuning? If yes, the vehicle cannot be selected.</i>	<i>x</i>		
<i>Was any part of the emissions after-treatment and/or the fuel system replaced? Were original parts used? If original parts were not used, the vehicle cannot be selected.</i>	<i>x</i>	<i>x</i>	
<i>Was any part of the emissions after-treatment system permanently removed? If yes, the vehicle cannot be selected</i>	<i>x</i>		
<i>Were there any unauthorised devices installed (Urea killer, emulator, etc)? If yes, the vehicle cannot be selected</i>	<i>x</i>		
<i>Was the vehicle involved in a serious accident? Provide a list of damage and repairs done afterwards</i>		<i>x</i>	
<i>Has the car been used with a wrong fuel type (i.e. gasoline instead of diesel) in the past? Has the car been used with non-commercially available EU-quality fuel (black market, or blended fuel?) If yes, the vehicle cannot be selected.</i>	<i>x</i>		
<i>Did you use air-fresher, cockpit-spray, brake cleaner or other high hydrocarbon emission source around the vehicle during the last month? If yes, the vehicle cannot be selected for evaporative testing.</i>	<i>x</i>		
<i>Was there a gasoline spill in the inside or outside of the vehicle during the last 3 months? If yes, the vehicle cannot be selected for evaporative testing.</i>	<i>x</i>		
<i>Did anyone smoke in the car during the last 12 months? If yes, the vehicle cannot be selected for evaporative</i>	<i>x</i>		

<i>testing</i>			
<i>Did you apply corrosion protection, stickers, under seal protection, on any other potential sources of volatile compounds to the car? If yes, the vehicle cannot be selected for evaporative testing</i>	<i>x</i>		
<i>Was the car repainted? If yes, the vehicle cannot be selected for evaporative testing</i>	<i>x</i>		
<i>Where do you use your vehicle more often?</i>			
<i>% motorway</i>		<i>x</i>	
<i>% rural</i>		<i>x</i>	
<i>% urban</i>		<i>x</i>	
<i>Did you drive the vehicle in a non EU Member State for more than 10 % of driving time? If yes, the vehicle cannot be selected</i>	<i>x</i>	—	
<i>In which country was the vehicle refuelled during the last two times? If the vehicle was refuelled the last two times outside a state applying the EU Fuel Standards, the vehicle cannot be selected.</i>	<i>x</i>		
<i>Has a fuel additive, not approved by the manufacturer been used? If yes then the vehicle cannot be selected.</i>	<i>x</i>		
<i>Has the vehicle been maintained and used in accordance with the manufacturer's instructions? If not, the vehicle cannot be selected.</i>	<i>x</i>		
<i>Full service and repair history including any re-works If the full documentation cannot be provided, the vehicle cannot be selected.</i>	<i>x</i>		
	<i>Vehicle Examination and Maintenance</i>	<i>X = Exclusion Criteria/ F = Faulty Vehicle</i>	<i>X = checked and reported</i>

1	<p><i>Fuel tank level (full / empty)</i></p> <p>Is the fuel reserve light ON? <i>If yes, refuel before test.</i></p>			x
2	<p><i>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?)</i></p> <p><i>If yes, the vehicle cannot be selected</i></p>	x		
3	<p><i>Is the SCR light on after engine-on?</i></p> <p><i>If yes, the AdBlue should be filled in, or the repair executed before the vehicle is used for testing.</i></p>	x		
4	<p><i>Visual examination exhaust system</i></p> <p>Check leaks between exhaust manifold and end of tailpipe. Check and document (with photos)</p> <p><i>If there is damage or leaks, the vehicle is declared faulty.</i></p>	F		
5	<p><i>Exhaust gas relevant components</i></p> <p>Check and document (with photos) all emissions relevant components for damage.</p> <p><i>If there is damage, the</i></p>	F		

	<i>vehicle is declared faulty.</i>			
6	<i>Evaporative system</i> Pressurize fuel-system (from canister side), testing for leaks in a constant ambient temperature environment, FID sniff test around and in the vehicle. <i>If the FID sniff test is not passed, the vehicle is declared faulty.</i>	<i>F</i>		
7	<i>Fuel sample</i> Collect fuel sample from the fuel tank.			<i>x</i>
8	<i>Air filter and oil filter</i> Check for contamination and damage and change if damaged or heavily contaminated or less than 800 km before the next recommended change.			<i>x</i>
9	<i>Window washer fluid (only for evaporative testing)</i> Remove window washer fluid and fill tank with hot water.			<i>x</i>
10	<i>Wheels (front & rear)</i> Check whether the wheels are freely moveable or blocked by the brake. <i>If not, the vehicle cannot be selected.</i>	<i>x</i>		
11	<i>Tyres (only for evaporative testing)</i> Remove spare tyre,			<i>x</i>

	change to stabilised tyres if the tyres were changes less than 15000 km ago. Use summer and all season tyres only.			
12	<i>Drive belts & cooler cover</i> <i>In case of damage, the vehicle is declared faulty. Document with photos</i>	<i>F</i>		
13	<i>Check fluid levels</i> Check the max. and min. levels (engine oil, cooling liquid) / top up if below minimum			<i>x</i>
14	<i>Filler flap (only for evaporative testing)</i> Check overfill line within filler flap is completely free of residues or flush the hose with hot water.			<i>x</i>
15	<i>Vacuum hoses and electrical wiring</i> Check all for integrity. <i>In case of damage, the vehicle is declared faulty. Document with photos</i>	<i>F</i>		
16	<i>Injection valves / cabling</i> Check all cables and fuel lines. <i>In case of damage, the vehicle is declared faulty. Document with photos</i>	<i>F</i>		
17	<i>Ignition cable (gasoline)</i> Check spark plugs, cables, etc. In case of damage, replace them.			<i>x</i>

18	<p><i>EGR & Catalyst, Particle Filter</i></p> <p>Check all cables, wires and sensors.</p> <p><i>In case of tampering, the vehicle cannot be selected.</i></p> <p><i>In case of damage the vehicle is declared Faulty, Document with photos</i></p>	x/F		
19	<p><i>Safety condition</i></p> <p>Check tyres, vehicle's body, electrical and braking system status are in safe conditions for the test and respect road traffic rules.</p> <p><i>If not, the vehicle cannot be selected.</i></p>	x		
20	<p><i>Semi-trailer</i></p> <p>Are there electric cables for semi-trailer connection, where required?</p>			x
21	<p><i>Aerodynamic modifications</i></p> <p>Verify no aftermarket aerodynamics modification that cannot be removed before testing was made (roof boxes, load racking, spoilers, etc.) and no standard aerodynamics components are missing (front deflectors, diffusers, splitters, etc.).</p> <p><i>If yes, the vehicle cannot be selected. Document with photos.</i></p>	x		
22	<p><i>Check if less than 800 km away from next</i></p>			x

	<i>scheduled service, if yes, then perform the service.</i>			
23	<i>All checks requiring OBD connections to be performed before and/or after the end of testing</i>			
24	<i>Powertrain Control Module calibration part number and checksum</i>			<i>x</i>
25	<i>OBD diagnosis (before or after the emissions test)</i> Read Diagnostic Trouble Codes & Print error log			<i>x</i>
26	<i>OBD Service Mode 09 Query (before or after the emissions test)</i> Read Service Mode 09. Record the information.			<i>x</i>
27	<i>OBD mode 7 (before or after the emissions test)</i> Read Service Mode 07. Record the information			
	<i>Remarks for: Repair / replacement of components / part numbers</i>			

Appendix 2

RULES FOR PERFORMING TYPE 4 TESTS DURING IN-SERVICE CONFORMITY

Type 4 tests for in-service conformity shall be performed in accordance with Annex VI (or Annex VI of Regulation (EC) No 692/2008 where applicable), with the following exceptions:

- (a) vehicles tested with the Type 4 test shall be at least 12 months of age.
- (b) the canister shall be considered aged and therefore the Canister Bench Ageing procedure shall not be followed.
- (c) the canister shall be loaded outside the vehicle, following the procedure described for this purpose in Annex VI and shall be removed and mounted to the vehicle following the repair instructions of the manufacturer. An FID sniff test (with results less than 100 ppm at 20 °C) shall be made as close as possible to the canister before and after the loading to confirm that the canister is mounted properly.
- (d) the tank shall be considered aged and therefore no Permeability Factor shall be added in the calculation of the result of the Type 4 test.

Appendix 3

ISC REPORT

The following information shall be included in the detailed ISC report:

1. Test Date
1. Unique Number of ISC Report
2. Date of approval by authorised representative
3. Date of transmission to GTAA or upload to Electronic Platform
4. the name and address of the manufacturer;
5. the name, address, telephone and fax numbers and e-mail address of the responsible testing laboratory;
6. the model name(s) of the vehicles included in the test plan;
7. where appropriate, the list of vehicle types covered within the manufacturer's information, i.e. for tailpipe emissions, the in-service family;
8. the numbers of the type approvals applicable to these vehicle types within the family, including, where applicable, the numbers of all extensions and field fixes/recalls (re-works);
9. details of extensions, field fixes/recalls to those type approvals for the vehicles covered within the manufacturer's information (if requested by the approval authority);
10. the period of time over which the information was collected;
11. the ISC checking procedure, including where applicable:
 - (i) vehicle sourcing method;
 - (ii) vehicle selection and rejection criteria (including the answers to the table in Appendix 1, including photos);
 - (iii) test types and procedures used for the programme;
 - (iv) geographical area(s) within which the manufacturer has collected information;
 - (v) sample lot number and sampling plan used;
12. the results of the ISC procedure, including:
 - (i) identification of the vehicles included in the programme (whether tested or not). The identification shall include the Table in Appendix 1 without the confidential items.
 - (ii) test data for tailpipe emissions:
 - test fuel specifications (e.g. test reference fuel or market fuel),
 - test conditions (temperature, humidity, dynamometer inertia weight),
 - dynamometer settings (e.g. road load, power setting),
 - test results and calculation of pass/fail;
 - (iii) test data for evaporative emissions:

- test fuel specifications (e.g. test reference fuel or market fuel),
- test conditions (temperature, humidity, dynamometer inertia weight),
- dynamometer settings (e.g. road load, power setting),
- test results and calculation of pass/fail.

Appendix 4

ANNUAL ISC REPORT BY THE GRANTING TYPE APPROVAL AUTHORITY

TITLE

- A. Quick overview and main conclusions
- B. ISC activities performed by the manufacturer in the previous year:
 - (1) Information gathering by manufacturer
 - (2) ISC testing (including planning and selection of families tested, and final results of tests)
- C. ISC activities performed by the other actors in the previous year:
 - (3) Information gathering and risk assessment
 - (4) ISC testing (including planning and selection of families tested, and final results of tests)
- D. ISC activities performed by the granting type approval authority in the previous year:
 - (5) Information gathering and risk assessment
 - (6) ISC testing (including planning and selection of families tested, and final results of tests)
 - (7) Detailed investigations
 - (8) Remedial measures
- E. Assessment of the yearly expected emissions decrease due to any ISC remedial measures
- F. Lessons Learned (including for performance of instruments used)
- G. Report of other invalid tests

Appendix 5

TRANSPARENCY LISTS

Table 1: Transparency List 1

ID	Input	Type of data	Unit	Description
1	Emission TA number	Text	--	As reported in Annex I/Appendix 6 (Reg. (EU) 2017/1151)
1a	Emission Type Approval Date	Date	--	Date of emission type-
2	Interpolation Family ID (IP ID)	Text	--	As reported in Annex I, Appendix 4, Section II, Point 0. (Reg. (EU) 2017/1151) and in UNECE Regulation 154, Annex A2, Addendum to type approval communication item 0.1: Interpolation Family Identifier as defined in paragraph 6.2.2 the same regulation
5	ATCT family ID	Text	--	As reported in Annex I, Appendix 3, §0.2.3.2. (Reg. (EU) 2017/1151)
7	RL family ID of vehicle H or RM family ID	Text	--	As reported in Annex I, Appendix 3, §0.2.3.4.1. (for Road Load Matrix Family §0.2.3.5.) (Reg. (EU) 2017/1151)
7a	RL family ID of vehicle L (if relevant)	Text	--	As reported in Annex I, Appendix 3, §0.2.3.4.2. (Reg. (EU) 2017/1151)
7b	RL family ID of vehicle M (if relevant)	Text	--	As reported in In UNECE Regulation 154, Annex A1 - Appendix 1, §1.4.2. Road load parameters
13	Drive wheels of vehicle in family	Enumeration (Front, Rear, 4 Wheel Drive)	--	Annex I, Appendix 4, §1.7 (Reg. (EU) 2017/1151)
14	Chassis configuration Dyno during	Enumeration (Single)	--	As in UNECE Regulation 154, Annex B6;

	TA test	Axle, Dual Axle)		§2.4.2.4.
18	Driver selectable mode(s) used during the TA tests (pure ICE) or for charge sustaining test (NOVC-HEV, OVC-HEV, NOVC-FCHV)	Possible formats: pdf, jpg. ¹³ The name of the file shall be a UUID ¹⁴ , unique inside the package.	--	State and describe mode(s) used in type approval. In cases of predominant mode this will be only one entry. Alternatively the best and worst case modes need to be described. Description of modes that need to be used for TA tests As in UNECE Regulation 154, Annex B6; §2.6.6.
19	Driver selectable mode(s) used during the TA tests for charge depleting test (OVC-HEV)	Possible formats: pdf, jpg. ¹³ The name of the file shall be a UUID ¹⁴ , unique inside the package.	--	State and describe mode(s) used in type approval. In cases of predominant mode this will be only one entry. Alternatively the best and worst case modes need to be described. Description of modes that need to be used for TA tests As in UNECE Regulation 154, Annex B8 §3.2.3
20	Idling engine speed for vehicles with manual transmission fuel 1, fuel 2 (if relevant)	Number	rpm	Annex I, Appendix 3, §3.2.1.6. (Reg. (EU) 2017/1151)
21	No. of gears for vehicles with manual transmission	Number	--	Annex I, Appendix 4, §1.13.2. (Reg. (EU) 2017/1151)
23	Tyre dimensions of the test vehicle front/rear/middle, for vehicles with manual transmission	Text	--	Annex I, Appendix 8a §1.1.8 (Reg. (EU) 2017/1151) Use 1 for tyre dimensions of front wheels, 2 for tyre dimensions of rear wheels, 3 for tyre dimensions of middle wheels (if applicable)
24 + 25	Full load power curve with additional safety margin (ASM) for vehicles with manual transmission, fuel 1, fuel 2 (if relevant)	Table values	rpm vs. kW vs. %	The full load power curve over the engine speed range from nidle to nrated or nmax, or ndv(ngvmax) × vmax, whichever is higher together with ASM (if used for gearshift calculation) from Annex I, Appendix 8a, §1.2.4. (Reg. (EU) 2017/1151)

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				Example of table values can be found in Example of table values can be found in UNECE Regulation 154, Annex B2, Table A2/1
26	Additional information for gearshift calculation for vehicles with manual transmission, fuel 1, fuel 2 (if relevant)	See table in example	See table in example	Annex I, Appendix 8a, §1.2.4. (Reg. (EU) 2017/1151)
29	ATCT FCF fuel 1, fuel 2 (if relevant)	Number	--	One value per each fuel in case of Bi-fuel and Flex-fuel vehicle. Always match Fuel 1 with its ATCT FCF and Fuel 2 with its ATCT FCF. As defined in UNECE Regulation 154, Annex B6a, §3.8.1
30a	Additive Ki factor(s) for vehicles equipped with periodically regenerating systems	Table values	g/km for CO ₂ , mg/km for all the rest	Table defining the values for CO, NO _x , PM, THC (mg/km), and for CO ₂ (g/km). Empty if multiplicative Ki factors are provided or for vehicles that don't have any periodically regenerating systems. Annex I, Appendix 8a, §2.1.1.1.1. for pollutants and §2.1.1.2.1. for CO ₂ . (Reg. (EU) 2017/1151)
30b	Multiplicative Ki factors(s) for vehicles equipped with periodically regenerating systems	Table values	no units	Table defining the values for CO, NO _x , PM, THC, and for CO ₂ . Empty if additive Ki factors are provided or for vehicles that don't have any periodically regenerating systems.. Annex I, Appendix 8a, §2.1.1.1.1. for pollutants and §2.1.1.2.1. for CO ₂ (Reg. (EU) 2017/1151)
31a	Additive Deterioration Factors (DF) fuel 1, fuel 2 (if relevant)	Table values	(mg/km except for PN which is #/km	Table defining deterioration factors per each pollutant. (1) CO, PM, PN, NO _x , NMHC and THC for monofuel gasoline vehicles and all bi-fuel and flexifuel vehicles. (2) CO, NO _x , NMHC and THC for monofuel LPG and NG vehicles. (3) NO _x for monofuel H ₂ vehicles.

				<p>(4) NO_x, THC+NO_x, CO, PM and PN for all diesel vehicles.</p> <p>(5) Empty if multiplicative DF factors are provided. Annex I, Appendix 8a, §2.1.1.1.1. (Reg. (EU) 2017/1151).</p>
31b	Multiplicative Deterioration Factors (DF) fuel 1, fuel 2 (if relevant)	Table values	no units	<p>Table defining deterioration factors per each pollutant.</p> <p>13. CO, PM, PN, NO_x, NMHC and THC for monofuel gasoline vehicles and all bi-fuel and flexifuel vehicles.</p> <ul style="list-style-type: none"> • CO, NO_x, NMHC and THC for monofuel LPG and NG vehicles. • NO_x for monofuel H₂ vehicles. • NO_x, THC+NO_x, CO, PM and PN for all diesel vehicles. <p>Empty if additive DF factors are provided. Annex I, Appendix 8a, §2.1.1.1.1. (Reg. (EU) 2017/1151).</p>
32	Battery voltage for all REESS	Number	V	As defined in UNECE Regulation 154 Annex B6 - Appendix 2 §4.1 (DIN EN 60050-482)
33	K correction coefficient only for NOVC and OVC-HEVs	Table	(g/km)/(Wh/km)	For NOVC and OVC-HEVs correction of CS CO ₂ emissions as defined in UNECE Regulation 154 Annex B8, appendix 2, §2
42	Regeneration recognition	Document pdf or jpg ¹³ The name of the file shall be a UUID ¹⁴ , unique inside the package.		Description by vehicle manufacturer on how to recognize that a regeneration occurred during a test
43	Regeneration completion	Document pdf or	-	Description of the procedure to complete the regeneration

		jpg ¹³ The name of the file shall be a UUID ¹⁴ , unique inside the package.		
44a	Index Number of the transition cycle for VL	number	-	For OVC-HEV vehicles only. Number of CD tests performed until break-off criteria is met. Annex I, Appendix 8a, §2.1.1.4.1.4 . (Reg. (EU) 2017/1151)
For multistage or multistage special purpose vehicles				
45	Allowed final Vehicle mass in running order	Number	Kg	As reported in §0.2.2.1 in Annex I of Reg (EU) 2020/683 From-to
45a	Allowed final Vehicle actual mass	Number	kg	As reported in §0.2.2.1 in Annex I of Reg (EU) 2020/683 From-to
45b	Allowed Vehicle technically permissible maximum laden mass (in kg)	Number	kg	As reported in §0.2.2.1 in Annex I of Reg (EU) 2020/683 From-to
46	Allowed frontal area for final vehicle	Number	cm ²	As reported in §0.2.2.1 in Annex I of Reg (EU) 2020/683 From-to
47	Allowed Rolling resistance	Number	kg/t	As reported in §0.2.2.1 in Annex I of Reg (EU) 2020/683 From-to
48	Allowed projected frontal area of air entrance of the front grille	Number	cm ²	As reported in §0.2.2.1 in Annex I of Reg (EU) 2020/683 From-to
FOR ALL VEHICLES				

49	Propulsion Type	Enumeration Pure ICE, OVC- HEV, NOVC- HEV	--	Propulsion type as defined in (Reg. (EU) 2017/1151) ANNEX IIIA Appendix 7 §3.2.1
50	Ignition Type	Enumeration Positive ignition, Compressi on ignition	--	Ignition Type as reported in §3.2.1.1. Appendix 3 of Annex I (Reg. (EU) 2017/1151)
51	Fuel Operating Mode	Enumeration(Mono- fuel, Bi- fuel, Flex- fuel)	--	Vehicle Fuel Type as reported in §3.2.2.4. Appendix 3 of Annex I (Reg. (EU) 2017/1151)
52	Fuel Type fuel 1, fuel 2 (if relevant)	Enumeration (Petrol, Diesel, LPG, NG/Biome thane, Ethanol (E85), Hydrogen) .	--	Fuel Type as reported in §3.2.2.1. Appendix 3 of Annex I (Reg. (EU) 2017/1151). In the case of Bi-fuel and Flex-fuel vehicle list both fuels.
53	Transmission type	Enumeration (Manual, Automatic, CVT)	--	Transmission Type as reported in §4.5.1. Appendix 3 of Annex I (Reg. (EU) 2017/1151)
54	Engine Capacity	Number	cm3	Engine Capacity as reported in §3.2.1.3. Appendix 3 of Annex I (Reg. (EU) 2017/1151).
55	Method of engine fuelling fuel 1, fuel 2 (if relevant)	Enumeration Direct/Indi rect/Direct and Indirect		Method of engine fuelling as declared by OEM. §1.10.2 of Appendix 4 of Annex I (Reg. (EU)2017/1151)

Table 2

Transparency list 2

Field	Type of data	Description
TVV	Text	Unique identifier of the Type, Variant, Version of the vehicle §7.3 and 7.4 of Part B of Annex I (Reg (EU)2018/858)
PEMS Family ID	Text	Annex IIIa, App.7, § 5.2. (Reg. (EU) 2017/1151)
Make	Text	Trade name of manufacturer §0.1 Annex I (Reg (EU) 2020/683)
Commercial name	Text	Commercial names of the TVV §0.2.1 Annex I (Reg (EU)2020/683)
Other name	Text	Free text
Category and class	Enumeration (M1, N1 class I, N1 class II, N1 class III, N2, N3, M2, M3)	Category and class of vehicle 715/2007 Annex I (Class) 2018/858 Annex I (Categories)
Bodywork	Enumeration (AA Saloon; AB Hatchback, AC Station Wagon, AD Coupe, AE Convertible, AF Multi-purpose vehicle AG Truck station wagon BA Lorry, BB Van, BC Tractor unit for semi-trailer BD Road tractor BE Pick-up truck BX Chassis-cab or chassis-cowl)	Type of bodywork 0.3.0.2 Annex I (Reg (EU)2020/683)
Emission TA Number	Text	Annex IV of Regulation (EU)2020/683
WVTA Number	Text	Identifier of the Whole Vehicle Type-Approval as defined in

		Annex IV of Regulation (EU)2020/683
Evap family ID	Text	As reported in Annex I, Appendix 3, §0.2.3.7. (Reg. (EU) 2017/1151)
Rated Engine Power fuel 1, fuel 2 (if relevant)	Number	Annex I, Appendix 3, §3.2.1.8. (Reg. (EU) 2017/1151)
Twin tires	Yes/No	Declared by OEM
Fuel Tank Capacities (discreet values)	Number	Fuel tank(s) capacity(ies) §3.2.3.1.1 of Annex I (Reg (EU) 2020/683)
Sealed tank	Yes/No	3.2.12.2.5.5.3 of Annex I (Reg (EU) 2020/683)
WMI used in this WVTA+TVV	Text	Declared by the OEM (ISO 3779)

?