

**Response to document ECE/TRANS/WP.29/2009/57**  
**(Transposition of Euro 5/6 requirements into ECE R83.06)**

OICA would like to thank the European Commission and its consultants (KTI - Hungary and VTT - Finland) for their considerable work in compiling this document and those related to it (ECE/TRANS/WP.29/2009/75 and ECE/TRANS/WP.29/2009/76).

This is essential work for the application of the most recent stages of European emissions legislation in Contracting Parties outside of the European Union.

However, having analysed the document, OICA has the following major concerns:

- Although the matter was discussed at the last GRPE session (57<sup>th</sup> January 2009), OICA is not aware of any clear decision having been made by GRPE regarding the Stages (characters A – Y in the table in Appendix 6 to Annex I of Regulation (EC) 692/2008) to be included:
  - In the proposal, paragraph 4.4.3. refers to a means to differentiate between stages via the type approval number (characters A – M in the table in Annex 3) although this is absent from the example approval numbers (see Appendix 1 item 22) and there is no table in Annex 3. This differentiation is necessary for application in the EU
  - The proposal contains Annexes 4 and 4a but appears not to permit early application of Annex 4a (see Appendix 1 item 26).

OICA believes that the stages that cannot yet be approved in the EU should not be included in this proposal. The stages which are to be included need to be determined and therefore a clear decision is needed from GRPE/WP.29.

OICA proposes here:

- To include the table from Appendix 6 to Annex I of Regulation (EC) 692/2008, and
- To clearly permit the introduction dates to be set by Contracting Parties. This may be achieved by using Transitional Provisions with wording similar to that in R83.05 but should avoid blanket mandatory dates.

- The proposed paper includes test requirements for the vehicle classification “Flex-Fuel Diesel”:
 

“ ‘flex fuel biodiesel vehicle ’ means a flex fuel vehicle that can run on mineral diesel or a mixture of mineral diesel and biodiesel”.

As Regulation (EC) 692/2008 contains no test requirements for these vehicles (figure I.2.4 in Annex 1), OICA feels that the setting of test requirements is beyond the remit of transposition and that the references to Flex-Fuel Diesel vehicles should be omitted as incomplete legislation. These comments also apply to hydrogen mono- and bi-fuel vehicles.
- The requirements to make declarations regarding the operation of aftertreatment systems on diesel vehicles have been incorrectly transposed as requirements for spark ignition vehicles only:
  - Euro 5/6 requires no Type VI test for diesel engines but requires explanation of cold start strategy,
  - The R83.06 proposal requires Type VI test for petrol engines and requires explanation of cold start strategy
- The proposed requirement that Contracting Parties should also conduct In-Service testing in other Contracting Parties is seen by OICA as unworkable. OICA has proposed some alternative wording for this issue:
 

*“The manufacturer’s sampling shall be drawn from at least two geographic regions when substantially different vehicle operating conditions exist within the Contracting Party.”*
- There are aspects of the SCR monitoring Annex of Regulation (EC) 692/2008 (Annex XVI) which are in the process of being clarified (e.g. PID storage and reporting of reagent dosing deviations). This Annex should not be transposed until the open issues in the EU are resolved.
- There are aspects of the OBD IUPR requirements of Regulation (EC) 692/2008 which are in the process of being clarified (e.g. circuit continuity monitors, In-Service Ratio monitoring etc.). These requirements should not be transposed until the open issues are resolved in the EU.
- The requirement to select tyres based on their rolling resistance, which applies in the EU from 2014, has been proposed to apply with immediate effect. Not only does this deviate from the Euro 5/6 requirements but is unworkable due to

the absence of the required ISO standard for measurement of tyre rolling resistance.

A detailed assessment of OICA's concerns is attached as Appendices 1, 2 and 3.

Considering that the scope of emissions and CO2 legislation in the European Union is still unresolved:

- The new CO2 Regulation applies to all M1 vehicles without weight limitation but Regulation (EC) 715/2007 which defines the measurement of CO2 applies only to those vehicles with a reference mass below 2610 kg and may only apply to those vehicles with a reference mass below 2840 kg.
- Euro VI will further amend the scope of Regulation (EC) 715/2007 but the timing of this overlap is not yet defined.
- The Commission's own Communication <sup>(1)</sup> indicates that the new reference mass limit that defines the scope of the Regulation (2610 kg) may be incorrect.

OICA proposes to leave the scopes of Regulations 49, 83 and 101 unchanged.

---

<sup>(1)</sup> see Official Journal of the European Union, C182, 19.7.2008, p.17 (see point 11).

Appendix 1 – Detailed comments:

Item	Page	Reference	Comment
1	3	“Revision 2, ……”	ECE R83 is currently at Revision 3 amendment 2 supplement 7
2	10	1.1. …… extended from vehicles covered by paragraph 1……”	paragraph 1 does not describe the vehicles covered
3	10	1.2. “……Equivalent approvals The following do not need to be approved according to this Regulation: engines mounted in vehicles of up to 2840 kg reference mass to which an approval to Regulation 83 has been granted as an extension.”	this text does not belong in ECE 83, rather in ECE 49
4	11	2.1.1. the equivalent inertia determined in relation to the reference mass as prescribed in Annex 4, paragraph 5.1. and	If all stages of Euro 5 & 6 are to be covered, this reference should be to Annexes 4 and 4a (any paragraph reference for 4a is almost certainly wrong). If only stage Euro 5b/EOBD5+ is to be covered, the reference should be only to Annex 4a and the paragraph reference amended as necessary.
5	13	2.18. (h) Mixture of biodiesel and diesel (B5) (Flex fuel)	the definition of flex-fuel diesel vehicles should be considered an incomplete part of Euro 5/6 and therefore excluded
6	15	2.25.2. “Flex fuel biodiesel vehicle” means a flex fuel vehicle that can run on mineral diesel or a mixture of mineral diesel and biodiesel.	see item 5
7	17	(d) a declaration by the manufacturer that the OBD system complies with the provisions of paragraph 7 of Appendix 1 to Annex 11. relating to in-use performance under all reasonably foreseeable driving conditions;	Industry has always maintained that this is not a declaration that can be reliably be made at the time of Type Approval.


Item	Page	Reference	Comment
8	20	4.4.3. the approval mark shall contain an additional character after the letter "R", the purpose of which is to distinguish the emission limit values for which the approval has been granted. For those approvals issued to indicate compliance with the limits for the Type I test detailed in Table 1. in paragraph 5.3.1.4. of this Regulation, the letter "R" will be followed by the roman number "III". .....	OICA knows of no decision to restrict the content of ECE R83-06 to Euro 5 approvals. Those elements of the legislation that are incomplete should be excluded but elements that are complete and approvable in the EU should at least be considered for inclusion. This matter has been discussed and requires further discussion. In many sections references to "the limits in Table 1" could already be extended to "the limits in Table 1 or Table 2" independent of the discussion detailed above.
9	20	4.4.3. .... Furthermore, a capital letter (from A to M) should follow the type approval number. This letter should be chosen according to the Table 1 in Annex 3 to this Regulation.	This differentiation between the stages of approval is essential in the EU (even if only restricted stages are included in this document). This letter is however not shown in the examples of approval numbers in Annex 3 and Table 1 is not included in the proposal.
10	26	Table A – entries for flex-fuel biodiesel vehicles	see item 5 and; this is an addition compared to the content of Reg 692/2008. Handling of bi-fuel hydrogen vehicles should be consistent.
11	32	5.3.5.1. This test shall be carried out on all vehicles equipped with a positive-ignition engine. However, when applying for type-approval, manufacturers shall present to the approval authority with information showing that the NO <sub>x</sub> aftertreatment device .....	This implies, contrary to Reg 692/2008, that the requirement to submit NO <sub>x</sub> aftertreatment temperature data and EGR strategy description applies to SI engines. The text of the first sentence should read "This test shall not be carried out on diesel vehicles"
12	35	5.3.7.5. The table in item 17 to Annex 2 shall be completed.	This reference is incorrect

Item	Page	Reference	Comment
13	55	<p>9.3.1. The information gathered by the manufacturer shall be sufficiently comprehensive to ensure that in-service performance can be assessed for normal conditions of use as defined in paragraph 9.2. The manufacturer's sampling shall be drawn from at least two Contracting Parties with substantially different vehicle operating conditions. Factors such as differences in fuels, ambient conditions, average road speeds, and urban/highway driving split shall be taken into consideration in the selection of the Contracting Parties.</p>	<p>This requirement was developed to fit to the federal composition of the European Union. It would be unreasonable to expect a Contracting Party that has no such structure, to sample vehicles from another Contracting Party. Further, there may be Contracting Parties (e.g. small islands) that do not have "substantially different vehicle operating conditions" within their region.</p> <p>Proposal:</p> <p>9.3.1. The information gathered by the manufacturer shall be sufficiently comprehensive to ensure that in-service performance can be assessed for normal conditions of use as defined in paragraph <u>9.1</u>. The manufacturer's sampling shall be drawn from at least two <u>geographic regions when substantially different vehicle operating conditions exist within the Contracting Party</u>. Factors such as differences in fuels, ambient conditions, average road speeds, and urban/highway driving split shall be taken into consideration in the selection of these <u>regions</u>.</p>

Item	Page	Reference	Comment
14	55	<p>9.3.2. In selecting the Contracting Parties for sampling vehicles, the manufacturer may select vehicles from a Contracting Party that is considered to be particularly representative. In this case, the manufacturer shall demonstrate to the approval authority which granted the type approval that the selection is representative (e.g. by the market having the largest annual sales of a vehicle family within the Community). When an in-service family requires more than one sample lot to be tested as defined in paragraph 9.3.5., the vehicles in the second and third sample lots shall reflect different vehicle operating conditions from those selected for the first sample.</p>	<p>See justification to item 13:</p> <p>Proposal:</p> <p>9.3.2. In selecting the <u>geographic regions</u> for sampling vehicles, the manufacturer may select vehicles from a <u>region</u> that is considered to be particularly representative. In this case, the manufacturer shall demonstrate to the approval authority that the selection is representative (e.g. by the <u>region</u> having the largest annual sales of a vehicle family within the <u>Contracting Party</u>). When an in-service family requires more than one sample lot to be tested as defined in paragraph 9.3.5., the vehicles in the second and third sample lots shall reflect different vehicle operating conditions from those selected for the first sample <u>if such differences exist within the Contracting Party</u>.</p>
15	59	<p>12.1.1. After the date of entry into force, Contracting Parties applying this Regulation shall grant approvals only if the vehicle type to be approved meets the requirements of this Regulation as amended by the 06 series of amendments.</p>	<p>This appears to contradict the required ability of Contracting Parties to continue to issue R83-05 approvals for export.</p>

Item	Page	Reference	Comment
16	59	<p>12.1.2.1. With effect from 1 September 2009, and from 1 September 2010 in the case of category N<sub>1</sub> class II and III and category N<sub>2</sub> vehicles, Contracting Parties applying this Regulation shall grant approvals only if the vehicle type to be approved meet the requirements of the 06 series of amendments to this Regulation.</p> <p>12.1.2.2. With effect from 1 September 2011 Contracting Parties applying this Regulation shall grant approvals only if the vehicle type to be approved meet for the requirements of the 06 series of amendments to this Regulation with the tightened PM limit values according to the new measurement procedure.</p>	<p>Are these dates necessary in R83, where the Contracting Parties select their own introduction dates? Perhaps wording similar to that in the transitional provisions of ECE R 83.05 could be used:</p>
17	82	<p>and the driver inducement system as referred to in paragraph 8.3, when the situations referred to in paragraph 4.2, 5.4. or 5.5 occur.</p>	<p>this requirement has been stated as infeasible by industry on many occasions and is in the process of being amended in the EU. It should therefore not be included in this amendment.</p>
18	82	<p>7.1. Where reference is made to this paragraph, a non-erasable Parameter Identifier (PID) shall be stored identifying the reason for the inducement system activation. The vehicle shall retain a record of the PID and the distance travelled by the vehicle during the inducement system activation for at least 800 days or 30000 km of vehicle operation. The PID shall be made available via the serial port of a standard diagnostic connector upon request of a generic scan tool.</p>	<p>this requirement is influenced by work in SAE and is in the process of being amended in the EU. It should therefore not be included in this amendment.</p>
19	83	<p>the number of remaining restarts and/or the remaining distance; and (a) the conditions under which the vehicle can be restarted.</p>	<p>these requirements were chosen for European vehicles operated by European drivers under European conditions and can not necessarily be assumed as applicable worldwide.</p>



Item	Page	Reference	Comment
20	103	(a) for all tyre options indicate, size designation, load-capacity index, speed ..... category symbol, rolling resistance ..... (b) for tyres of category Z intended to be f ..... for wheels	formatting failure rendering the text unreadable.
21	118	<u>Annex 2 - Appendix 2</u> Manufacturer's certificate of compliance with the OBD in-use performance requirements .....	see item 7
22	120		<p>The text describes III = Euro 5 (confusing?) but the example shows V for Euro 5.</p> <p>No character is included to identify the stage of the Type Approval (A – V)</p> <p>This comment applies to all of the Approval Numbers shown.</p>
23	122	1. INTRODUCTION AND APPLICABILITY	typing error
24	137	(e) For ethanol (E85= (C <sub>1</sub> H <sub>2.74</sub> O <sub>0.385</sub> ))	) missing after E85

Item	Page	Reference	Comment					
25	160	<p>4.1.2. Tyres</p> <p>The choice of tyres shall be based on the rolling resistance. The tyres with the highest rolling resistance shall be chosen, measured according to ISO 28580.</p> <p>If there are more than three tyre rolling resistances, the tyre with the second highest rolling resistance shall be chosen.</p> <p>The rolling resistance characteristics of the tyres fitted to production vehicles shall reflect those of the tyres used for type-approval.</p>	<p>in Reg 692/2008, this requirement enter into force from 2014. It should not be included in this amendment as the ISO standard does not yet exist.</p>					
26	206	<p>This annex is applicable from 1 September 2011 for the approval of new types of vehicles. From 1 January 2013 contracting party must refuse on their territory the sale, registration or putting into service of new vehicles approved according to this Regulation but not complying with this annex.</p>	<p>This paragraph could be interpreted as forbidding early application of the Annex 4a test procedures.</p>					
27	229	<table border="1"> <tr> <td>23</td> <td>Deceleration</td> <td></td> <td>-0.86</td> <td>32-10</td> </tr> </table>	23	Deceleration		-0.86	32-10	<p>the "32" in the statement "32-10" appears to contradict the diagram (see Appendix 5) and differs from Annex 4.</p> <p>Although this appears to be an error that currently exists in ECE R 83.05, the opportunity is presented here to make the correction.</p>
23	Deceleration		-0.86	32-10				

Item	Page	Reference	Comment
28	285	<p>4.1.2. Tyres</p> <p>The choice of tyres shall be based on the rolling resistance. The tyres with the highest rolling resistance shall be chosen, measured according to ISO 28580.</p> <p>If there are more than three tyre rolling resistances, the tyre with the second highest rolling resistance shall be chosen.</p> <p>The rolling resistance characteristics of the tyres fitted to production vehicles shall reflect those of the tyres used for type-approval</p>	see item 25
29	343	<p>Type: Ethanol (E75)</p> <p>Reference fuel specification to be developed in advance of the dates for setting Type VI test mandatory to ethanol-fuelled vehicles</p>	This incomplete piece of legislation should not be copied into ECE R83. OICA expects the Commission to start immediately with definition of this reference fuel specification.
30	345	<p>1.1. Technical data of the LPG reference fuels used for testing vehicles to the emission limits given IN the table 1 in paragraph 5.3.1.4. - Type I test</p>	this fuel applies for all standards, not just for those in table 1

Appendix 2 repeated instances of the issue raised in item 4 above (References to Annex 4)

Page	Reference
11	2.2. " <u>Reference mass</u> " means the "unladen mass" of the vehicle increased by a uniform figure of 100 kg for test according to Annexes 4 and 8,
11	2.5. " <u>Particulate pollutants</u> " means components of the exhaust gas which are removed from the diluted exhaust gas at a maximum temperature of 325 K (52 °C) by means of the filters described in Annex 4;
16	"....if that percentage of misfire had been present from the start of a type 1 test as described in Annex 4 to this Regulation or could lead to an exhaust catalyst, or catalysts, overheating prior to causing irreversible damage;"
27	5.3.1.3. The test is carried out using the procedure described in Annex 4. The methods used to collect and analyse the gases and to remove and weigh the particulates shall be as prescribed.
32	5.3.5.1.2. The test consists of the four elementary urban driving cycles of Part One of the Type I test. The Part One test is described in Annex 4, Appendix 1 and illustrated in figures 1/1, 1/2 and 1/3 of the Appendix.
69	4.1. When a check on vehicles is deemed necessary, emission tests in accordance with Annex 4 to this Regulation are performed on pre-conditioned vehicles selected in accordance with the requirements of paragraphs 2. and 3. of this Appendix. Pre-conditioning cycles additional to those specified in Section 5.3. of Annex 4 to this Regulation will only be allowed if they are representative of normal driving.
298	The chassis dynamometer shall meet the requirements of Annex 4.
307	5.2.1. Within one hour from the completing of canister loading in accordance with paragraphs 5.1.5. or 5.1.6. the vehicle is placed on the chassis dynamometer and driven through one Part One and two Part Two driving cycles of Type I test as specified in Annex 4. Exhaust emissions are not sampled during this operation.
307	5.4.1. After conclusion of the soak period the vehicle is driven through a complete Type I test drive as described in Annex 4 (cold start urban and extra urban test). Then the engine is shut off. Exhaust emissions may be sampled during this operation but the results shall not be used for the purpose of exhaust emission type approval.
317	3.2. Calibration of the HC analyser The analyser should be calibrated using propane in air and purified synthetic air. See paragraph 4.5.2. of Annex 4 (Calibration and span gases).

Page	Reference
320	<p>2.1.1. This chapter deals with the equipment needed for low ambient temperature exhaust emission tests of positive-ignition engined vehicles. Equipment required and specifications are equivalent to the requirements for the Type I test as specified in Annex 4, with appendices, if specific requirements for the Type VI test are not prescribed. Paragraphs 2.2. to 2.6. describe deviations applicable to Type VI low ambient temperature testing.</p> <p>2.2.1. The requirements of paragraph 4.1. of Annex 4 apply. The dynamometer shall be adjusted to simulate the operation of a vehicle on the road at 266 K (-7 °C). Such adjustment may be based on a determination of the road load force profile at 266 K (-7 °C). Alternatively the driving resistance determined according to Appendix 3 of Annex 4 may be adjusted for a 10 per cent decrease of the coast-down time. The technical service may approve the use of other methods of determining the driving resistance.</p> <p>2.2.2. For calibration of the dynamometer the provisions of Appendix 2 to Annex 4 apply.</p> <p>2.3. Sampling system</p> <p>2.3.1. The provisions of paragraph 4.2. of Annex 4 and Appendix 5 to Annex 4 apply. Paragraph 2.3.2. of Appendix 5 is modified to read:</p>
321	<p>2.4.1. The provisions of paragraph 4.3. of Annex 4 apply, but only for carbon monoxide, carbon dioxide, and total hydrocarbon testing.</p> <p>2.4.2. For calibrations of the analytical equipment the provisions of Appendix 6 to Annex 4 apply.</p> <p>2.5.1. The provisions of paragraph 4.5. of Annex 4 apply, where they are relevant.</p> <p>2.6.1. For equipment used for the measurement of volume, temperature, pressure and humidity the provisions in paragraphs 4.4. and 4.6. of Annex 4 apply.</p>
321	<p>3.2. Test procedure</p> <p>The Part One urban driving cycle according to Figure 1/1 in Annex 4, Appendix 1, consists of four elementary urban cycles which together make a complete Part One cycle.</p> <p>3.2.1. Start of engine, start of the sampling and the operation of the first cycle shall be in accordance with Table 1.2 and Figure 1/1 in Annex 4.</p>
322	<p>3.3.1. For the test vehicle the provisions of paragraph 3.1. of Annex 4 apply. For setting the equivalent inertia mass on the dynamometer the provisions of paragraph 5.1. of Annex 4 apply.</p>

Page	Reference
324	<p>4.2.3. The preconditioning consists of the driving cycle according to Annex 4, Appendix 1, Figure 1/1, Parts One and Two. At the request of the manufacturer, vehicles with a positive-ignition engine may be preconditioned with one Part One and two Part Two driving cycles.</p> <p>4.2.5. The drive-wheel tyre pressure shall be set in accordance with the provisions of paragraph 5.3.2 of Annex 4.</p> <p>4.2.7. If requested by the manufacturer and approved by the technical service, additional preconditioning may in exceptional cases be allowed. The technical service may also choose to conduct additional preconditioning. The additional preconditioning consists of one or more driving schedules of the Part One cycle as described in Annex 4, Appendix 1. The extent of such additional preconditioning shall be recorded in the test report.</p>
326	5.1.1. The emission sampling is performed over a test procedure consisting of the Part One cycle (Annex 4, Appendix 1, Figure 1/1). Engine start-up, immediate sampling, operation over the Part One cycle and engine shut-down make a complete low ambient
326	5.2.1.4. The vehicle speed as measured from the dynamometer roll(s) shall be used (paragraph 4.1.4.4. of Annex 4).
327	<p>5.3.1. The provisions of paragraphs 6.2. to 6.6., excluding 6.2.2., of Annex 4 apply in respect of starting the engine, carrying out the test and taking the emission samples. The sampling begins before or at the initiation of the engine start-up procedure and ends on conclusion of the final idling period of the last elementary cycle of the Part One (urban driving cycle), after 780 seconds.</p> <p>5.3.2. For the analysis of the sampled emissions the provisions of paragraph 7.2. of Annex 4 apply. In performing the exhaust sample analysis the technical service shall exercise care to prevent condensation of water vapour in the exhaust gas sampling bags.</p> <p>5.3.3. For the calculations of the mass emissions the provisions of paragraph 8. of Annex 4 apply.</p>
335	6.3.1.2. The brake shall be adjusted in order to absorb the power exerted on the driving wheels at a steady speed of 80 km/h. Methods to be applied to determine this power and to adjust the brake are the same as those described in Appendix 3 to Annex 4.
336	6.3.1.4. Certain other test bench adjustments and features are deemed to be identical, where necessary, to those described in Annex 4 of this Regulation (inertia, for example, which may be mechanical or electronic).
348	2.9. " <u>Type I test</u> " means the driving cycle (Parts One and Two) used for emission approvals, as detailed in Annex 4, Appendix 1.
360	<p>3.1. Vehicle</p> <p>The test vehicle shall meet the requirements of paragraph 3.1. of Annex 4.</p>

Page	Reference
360	<p>4.1. The test temperature and pressure shall meet the requirements of the Type I test as described in Annex 4.</p> <p>5.1. Chassis dynamometer The chassis dynamometer shall meet the requirements of Annex 4.</p> <p>6.1. The operating cycle on the chassis dynamometer shall meet the requirements of Annex 4.</p>
374	<p>3.1.1.1. If the transition from one fuel to another is in practice aided through the use of a switch, this switch shall not be used during type approval. In such a case on the manufacturer's request and with the agreement of the technical service the pre-conditioning cycle referred to in paragraph 5.3.1. of Annex 4 may be extended.</p>
378	<p>..... phase. All emissions measurements and calculations shall be carried out according to Annex 4, paragraphs 5., 6., 7. and 8. Determination of average emissions for a single regenerative system shall be according to paragraph 3.3. of this annex and for multiple.....</p>
378	<p>3.2.1. Preparation of the vehicle, if required, for the emissions test during a regeneration phase, may be completed using the preparation cycles in paragraph 5.3. of Annex 4 or equivalent engine test bench cycles, depending on the loading procedure chosen in paragraph 3.1.2. above.</p> <p>3.2.2. The test and vehicle conditions for the Type I test described in Annex 4 apply before the first valid emission test is carried out.</p>
379	<p>3.2.6. The emission values during regeneration (<math>M_{ri}</math>) shall be calculated according to Annex 4, paragraph 8. The number of operating cycles (d) measured for complete regeneration shall be recorded.</p>
385	<p>1.2. As a general principle, for the tests of Type I, II, III, IV, V, VI and OBD, hybrid electric vehicles shall be tested according to Annex 4, 5, 6, 7, 9, 8 and 11 respectively, unless modified by this annex.</p>
386	<p>3.1.2.2.1. For compression-ignition engines, the Part Two cycle described in Appendix 1 of Annex 4 shall be used. Three consecutive cycles shall be driven according to paragraph 3.1.2.5.3. below.</p>

Page	Reference
388	<p>3.1.2.5.3. The vehicle shall be driven according to Annex 4, or in case of special gear shifting strategy, according to the manufacturer's instructions, as incorporated in the drivers' handbook of production vehicles and indicated by a technical gear shift instrument (for drivers' information). For these vehicles the gear shifting points prescribed in Annex 4, Appendix 1 are not applied. For the pattern of the operating curve the description according to paragraph 2.3.3. in Annex 4 shall apply.</p> <p>3.1.2.5.4. The exhaust gases shall be analyzed according to Annex 4.</p>
389	<p>3.1.3.1.1. For compression-ignition engines the Part Two cycle described in Appendix 1 of Annex 4 shall be used. Three consecutive cycles shall be driven according to paragraph 3.1.3.4.3. below.</p>
389	<p>3.1.3.4.3. The vehicle shall be driven according to Annex 4, or in case of special gear shifting strategy, according to the manufacturer's instructions, as incorporated in the drivers' handbook of production vehicles and indicated by a technical gear shift instrument (for drivers' information). For these vehicles the gear shifting points prescribed in Annex 4, Appendix 1 are not applied. For the pattern of the operating curve the description according to paragraph 2.3.3. in Annex 4 shall apply.</p> <p>3.1.3.4.4. The exhaust gases shall be analyzed according to Annex 4.</p>
392	<p>3.2.2.3.1. For compression-ignition engines the Part Two cycle described in Appendix 1 to the Annex 4 shall be used. Three consecutive cycles shall be driven according to paragraph 3.2.2.6.3. below.</p>
394	<p>3.2.2.6.3. The vehicle shall be driven according to Annex 4, or in case of special gear shifting strategy, according to the manufacturer's instructions, as incorporated in the drivers' handbook of production vehicles and indicated by a technical gear shift instrument (for drivers' information). For these vehicles the gear shifting points prescribed in Annex 4, Appendix 1 are not applied. For the pattern of the operating curve the description according to paragraph 2.3.3. in Annex 4 shall apply.</p> <p>3.2.2.6.4. The exhaust gases shall be analysed according to Annex 4.</p>
394	<p>3.2.3.1.1. For compression-ignition engines the Part Two cycle described in Appendix 1 to the Annex 4 shall be used. Three consecutive cycles shall be driven according to paragraph 3.2.3.4.3. below.</p>



Page	Reference
395	<p>3.2.3.4.3. The vehicle shall be driven according to Annex 4, or in case of special gear shifting strategy, according to the manufacturer's instructions, as incorporated in the drivers' handbook of production vehicles and indicated by a technical gear shift instrument (for drivers' information). For these vehicles the gear shifting points prescribed in Annex 4, Appendix 1 are not applied. For the pattern of the operating curve the description according to paragraph 2.3.3. in Annex 4 shall apply.</p> <p>3.2.3.4.4. The exhaust gases shall be analysed according to Annex 4.</p>
396	<p>3.4.1. These vehicles are preconditioned and tested in hybrid mode according to Annex 4. If several hybrid modes are available, the test shall be carried out in the mode that is automatically set after turn on of the ignition key (normal mode). On the basis of .....</p>
397	<p>3.4.3. The vehicle shall be driven according to Annex 4, or in case of special gear shifting strategy according to the manufacturer's instructions, as incorporated in the drivers' handbook of production vehicles and indicated by a technical gear shift instrument (for drivers' information). For these vehicles the gear shifting points prescribed in Annex 4, Appendix 1 are not applied. For the pattern of the operating curve the description according to paragraph 2.3.3. in Annex 4 shall apply.</p>

Appendix 3: repeated instances of the issue raised in item 8 above (References to table 1 limits)

Page	Reference
27	5.3.1.4. Subject to the requirements of paragraph 5.3.1.5. the test shall be repeated three times. The results are multiplied by the appropriate deterioration factors obtained from paragraph 5.3.6. and, in the case of periodically regenerating systems as defined in paragraph 2.20., also must be multiplied by the factors $K_i$ obtained from Annex 13. The resulting masses of gaseous emissions and, in the case of vehicles equipped with compression-ignition engines, the particulates obtained in each test shall be less than the limits shown in the Table 1. below:
46	8.2.2.1. Three vehicles shall be selected at random in the series and tested as described in paragraph 5.3.1 of this Regulation. The deterioration factors shall be used in the same way. The limit values are set out in paragraph 5.3.1.4, Table 1.
62	3. For each of the pollutants given in Table 1 of paragraph 5.3.1.4. of this Regulation, the following procedure is used (see Figure 2 of this Regulation).
64	3. The measurements of the pollutants given in Table 1 of paragraph 5.3.1.4. of this
74	4.2. For each of the pollutants given in the Table 1. of paragraph 5.3.1.4. of this Regulation, the following procedure is used (see Figure 4/2 below).
329	1.6. Deterioration factors are determined using either the procedures set out in points 1.2 and 1.3 or using the assigned values in the table referred in point 1.4. The deterioration factors are used to establish compliance with the requirements of the appropriate emissions limits set out in Table 1 in paragraph 5.3.1.4 of this Regulation during the useful life of the vehicle.
345	1.1. Technical data of the LPG reference fuels used for testing vehicles to the emission limits given IN the table 1 in paragraph 5.3.1.4. - Type I test

Appendix 4: repeated instances of the issue raised in item 16 above (Introduction dates)

Page	Reference
59	<p>12.1.3.1. With effect from 1 January 2011, and from 1 January 2012 in the case of category M<sub>1</sub> to fulfil specific social needs, category N<sub>1</sub> class II. and III. and category N<sub>2</sub> vehicles, Contracting Parties applying this Regulation shall grant approvals only if the vehicle type to be approved meet the requirements of the 06 series of amendments to this Regulation.</p> <p>12.1.3.2. With effect from 1 January 2013 in the case of category M, N<sub>1</sub> and N<sub>2</sub> Contracting Parties applying this Regulation shall grant approvals only if the vehicle type to be approved meet for the requirements of the 06 series of amendments to this Regulation with the tightened PM limit values according to the new measurement procedure.</p>
60	<p>12.1.4.1. With regard to performance criteria of OBD system to indicate malfunctions, according to Paragraph 3.3.2. of Annex 11, PM threshold limit of 80 mg/km shall apply to vehicles of categories M and N, with a reference mass greater than 1760 kg, until 1 September 2011 for the type approval of new types of vehicles.</p>
60	<p>12.1.4.2. With regard to performance of OBD system in engines of positive ignition type, according to Paragraph 3.3.3.1. of Annex 11, the system shall, at a minimum, monitor the reduction in the efficiency of the catalytic converter with respect to emissions of THC and NO<sub>x</sub>. However, Contracting Parties applying this Regulation may not refuse first national or regional registration (first entry into service) of a vehicle, which does not meet this requirement regarding NO<sub>x</sub>, before 1 January 2014.</p>
122	<p>This annex ceases to be applicable from 1 September 2011 for the approval of new types of vehicles and from 1 January 2013 for all new vehicles sold, registered or put into service on the territory of a contracting party.</p>
352	<p>3.3.3.1. the reduction in the efficiency of the catalytic converter with respect to emissions of THC and NO<sub>x</sub>. Manufacturers may monitor the front catalyst alone or in combination with the next catalyst(s) downstream. Each monitored catalyst or catalyst combination shall be considered malfunctioning when the emissions exceed the NMHC or NO<sub>x</sub> threshold limits provided for by paragraph 3.3.2. of this Annex. By way of derogation the requirement of monitoring the reduction in the efficiency of the catalytic converter with respect to NO<sub>x</sub> emissions shall only apply as from the dates set out in Paragraph 12.1.4.</p>
352	<p>(2) PM threshold limit of 80 mg/km shall apply to vehicles of categories M and N with a reference mass greater than 1760 kg until 1 September 2011 for the type approval of new types of vehicles.</p>

Appendix 5: Diagram referred to in item 28

