

Submitted par the expert from the
European Commission

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agenda item 5)

Regulation No. 96
Proposal for
03 Series of Amendments
GRPE, January 2011

Objectives of Amendment

- Introduction of stage IIIB and IV (Dir. 97/68/EC as amended) of exhaust emission control
- Introduction of NRMM gtr #11 test procedure
- Transposition of gtr #11
- Text alignment to European Non-Road Directive
- ✓ Approach presented to and accepted by GRPE in June 2010

Proposal for draft 03 series of amendments to Regulation No. 96

- This document establishes the consolidated version of the proposed R96 text
- This document is based on
- R96 E/ECE/324, E/ECE/TRANS/505 , Rev.1/Add.95/Rev.1
- incorporating all valid text up to and including:
 - Supplement 1 to the original version of the Regulation - Date of entry into force: 5 March 1997
 - Supplement 2 to the original version of the Regulation - Date of entry into force: 5 February 2000
 - 01 series of amendments - Date of entry into force: 16 September 2001
 - Supplement 1 to the 01 series of amendments - Date of entry into force: 31 January 2003
 - Supplement 2 to the 01 series of amendments - Date of entry into force: 12 August 2004
 - 02 series of amendments: Date of entry into force: 3 February 2008

Reference documents

- Directive 97/68/EC as amended up to 2010/26/EU
- GTR #11

Format of document 'inf 02'

- The document contains explanations in { }, deleted text in **yellow** and added text in **green**. This helps the readability of the document. (only in this draft)
- Subsequently available official version follows the GRPE format, giving a consecutive list of changes in **bold**
- [The re-issue of 'inf 02' regarded mainly the positioning of test results into the Approval document, Annex 2]

Method for revising R96

- Identification of IIIB and IV requirements (97/68/EC as amended incl. 2010/26/EU) included in Regulation text
 - Limits and implementation dates (transition clauses)
 - Verification of control strategies and NO_x control
- Updating of current test procedure to stages IIIB and IV ; placed in Annex 4A
- Introduction of new test procedure; gtr #11 placed in Annex 4B
- Moving common (4A+4B) requirements to subsequent new Annexes

Method for revising R96

Restructuring of Annexes 1A, 1B and 2

Grouping

- Manufacturer Information in Annex 1A
 - Adding information document (as in R120 and Dir. 97/68/EC)
 - Engine and family description declaration forms into appendices
- Collecting engine family definition criteria and choice of parent engine into Annex 1B
- Updating Approval document Annex 2
 - including the test report as appendix 1

Structure R96

1. Scope
2. Definitions and abbreviations
3. Application for approval
4. Approval
5. Specifications and tests
6. Installation on the vehicle
7. Conformity of production
8. Penalties for non-conformity of production
9. Modification and extension of approval of the approved type
10. Production definitely discontinued
11. Transitional provisions
12. Names and addresses of Technical Services responsible for conducting approval tests, and of Administrative Departments

Structure R96 cont.

<u>Annex 1A</u>	Information document {added as in R49, R120 and Dir. Annex VII}
Appendix 1	Essential characteristics of the engine
Appendix 2	Essential characteristics of the engine family {as structure of Directive}
Appendix 3	Essential characteristics of engine types within the family {ex Annex 1B App. B; now as structure of Directive}
<u>Annex 1B</u>	1. Parameter defining the engine family 2. Choice of the parent engine
<u>Annex 2</u>	Communication concerning the approval ...
Appendix 1	Test results {as Directive Annex VII App.1}
<u>Annex 3</u>	Arrangements of approval marks

Structure R96 cont.

Annex 4A - Test procedure {aligned with 97/68/EC}

Appendix 1 - Measurement and sampling procedures

Appendix 2 - Calibration procedures

Appendix 3 - Data evaluation and calculations

Appendix 4 - Analytical and sampling system

Appendix 5 – NRTC engine dynamometer schedule, {moved to Annex 5}

Appendix 6 - Durability Requirements reserved, {moved to Annex 8}

Structure R96 cont.

Annex 4B - Test procedure ... {gtr11} (without par. 1 and 2)

Appendix A.1 - Test cycles {moved to Annex 5}

Appendix A.2 – Statistics

Appendix A.3 - 1980 International gravity formula

Appendix A.4 - Carbon flow check

Appendix A.5 - Installation requirements for equipment and auxiliaries reserved { auxiliaries moved to Annex 7}

Appendix A.6 – Technical characteristics of reference fuel {fuel spec moved to Annex 6}

Appendix A.7 – Molar based emission calculation

Appendix A.7.1 – Diluted exhaust flow (CVS) calibration

Appendix A.7.2 - Drift correction

Appendix A.8 – Mass based emission calculation

Appendix A.8.1 – Diluted exhaust flow (CVS) calibration

Appendix A.8.2 – Drift correction

Structure R96 cont.

Annex 5 - Test Cycles

Annex 6 - Technical characteristics of reference fuel prescribed for approval tests and to verify conformity of production;

Annex 7 Installation requirements for equipment and auxiliaries

Annex 8 - Durability Requirements

Main Changes

- Definitions from old R96, from paragraph 5.3 and from Annex 4B are placed together in paragraph 2.1 and removed from Annexes.
- Symbols are removed from paragraph 2.2.1 and are explained in Annex 4A Paragraph 1.4 and Annex 4B Paragraph 3.2 respectively.
- Symbols and abbreviations for chemical components are collected in paragraph 2.2.2 and removed from the Annexes.
- Paragraphs 5.1.2, 5.1.3 and 5.1.4 have been changed, based on the following rationale:
 - Durability testing should be done in accordance with Annex 8, not good engineering practice;
 - Reference to paragraph 7.3 not available in R 96 (was deleted in 2001);
 - Requirement of emissions warranty is in contradiction to EU and ECE consumer rules.
- Paragraph 5.2: new paragraph specifying the applicability of Annexes 4A and 4B,

Main Changes

- Paragraph 5.2: text relating to Annex 4A only, has been moved to Annex 4A paragraph 1.1.
- Paragraph 5.2.1.: updated limit table for power bands relating to stages IIIB and IV
- New paragraph 5.3 added "Type approval requirements for power bands L to R" from Directive Annex I section 8 for Stages IIIB and IV: verification of control strategies and NOx control
- Paragraph 6.1.3. added on reagent control operator information
- Paragraph 11 new transitional provisions added
- In order to avoid non-consistent use of "Particulate pollutants (PT)" and/or "Particulate matter (PM) ", PT has been replaced by PM.

Main Changes

Old R96	Revised R96	Directive 97/68/EC as amended
	Annex 1A Information doc	Annex II
Annex 1A:	Annex1A Ap.1: Essential characteristics of engine	Annex II Ap. 1
(1. half) Essential characteristics of engine and	Replaced by Annex 2 Ap1	
(2. half) Information concerning conduct of test		
Annex 1B Ap. A	Annex 1A Ap.2: Engine family	Annex II Ap. 2
Annex 1B Ap. B	Annex 1A Ap.3: engine types in family	Annex II Ap. 3
Annex 1B	Annex 1B: Parameters defining engine family and choice of parent engine	Annex I sections 6 and 7
Annex 2	Annex 2	Annex VII
	Appendix 1 Test results	Annex VII Ap. 1

Main Changes

- Optional use of RMC cycles

a) Annex 4A paragraphs 3.7.1 allows the optional use of RMC cycles

b) Annex 4A, Appendix 1 'MEASUREMENT AND SAMPLING PROCEDURES (NRSC TEST)' allows now, that with agreement of the approval authority, the methods described in Annex 4B paragraph 9 may be used as an alternative to those in paragraph 1 of appendix 1.

c) Annex 4A, Appendix 2, paragraph 1 'CALIBRATION OF THE ANALYTICAL INSTRUMENTS' allows now, that with agreement of the approval authority, the methods described in Annex 4B paragraphs 8.1 and 8.2 may be used as an alternative to those in paragraph 1 of this appendix 2.

d) Annex 4A, Appendix 2, paragraph 2 'CALIBRATION OF THE PARTICULATE MEASURING SYSTEM' allows now, that with agreement of the approval authority, the methods described in Annex 4B paragraphs 8.1 and 8.2 may be used as an alternative to those in paragraph 2 of appendix 2.

e) Annex 4A, Appendix 2, paragraph 3 'CALIBRATION OF THE CVS SYSTEM' allows now, that with agreement of the approval authority, the methods described in Annex 4B paragraphs 8.1 and 8.2 may be used as an alternative to those in paragraph 3 of this appendix 2.

f) The following paragraph has been added to Annex 4A Appendix 3 paragraphs 1.1 and 1.2: If the ramped modal cycles of Annex 5, paragraph 1.2(a) or paragraph 1.2(b), respectively, are used, the data evaluation and calculation procedures of Annex 4B, paragraph 7.8.2.2., and the applicable sections of paragraphs A.8.2., A.8.3. and A.8.4. shall apply. The final test results shall be calculated according to equations A.8-60 and A.8-61 or A.7-49 and A.7-50, respectively.

Main Changes

- Example list removed from paragraphs 1.2 and 1.3, as in Directive
- R120 added to definition 2.1.41
- In paragraph 5.1.1 reference to paragraph 5.3 added.
- The definitions from 5.3.2 have been moved to paragraph 2.1 and paragraph 5.3.2 has been deleted and subsequent paragraphs have been renumbered
- Reference in Annex 4A paragraph 3.1 changed: from “ISO 14396: 2002” to “ECE R120”
- Annex 4A Appendix 1 paragraphs 1.4.5 and 2.3.5.1; the following sentence has been deleted, as it refers to power band C which is not in R96: If the composition of the exhaust gas is influenced by any exhaust after-treatment system, the exhaust sample must be taken upstream of this device in the tests of power bands C and below and downstream of this device in the tests of power bands D to G.

Main Changes

- Annex 4A paragraph 3.5 and Annex 4A, Appendix 1 paragraph 1.5; the note on the dilution temperature is improved for clarity:
 - Note: For power bands up to and including K using discrete mode cycles For steady-state procedure, the filter temperature may be kept at or below the maximum temperature of 325 K (52 °C) instead of respecting the temperature range of 42 °C to 52 °C.
- Annex 4B, Table in A.7.1.3 reports now the European fuel properties

Schedule

- Presentation of R96 Draft to GRPE in January 2011
- If experts agree, preparation of formal R96 document for June 2011 GRPE Meeting
- If accepted in June, preparation of formal document to WP.29 AC.1 for November 2011 or March 2012 Meeting

Question to GRPE

- The official document proposing the 03 series of amendments will be the formal list of changes. It will be about 400 pages strong
- We propose to adopt in parallel the consolidated version (based on inf. 02) in the GRPE and WP.29 process

Thank You