21 October 2010

Global registry

Created on 18 November 2004, pursuant to Article 6 of the Agreement concerning the establishing of global technical regulations for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles (ECE/TRANS/132 and Corr.1) done at Geneva on 25 June 1998

Addendum 4: Global technical regulation No. 4

Test procedure for compression ignition (C.I.) engines and positive-ignition (P.I.) engines fuelled with natural gas (NG) or liquefied petroleum gas (LPG) with regard to the emission of pollutants

Amendment 2 - Appendix 1

Proposal and report pursuant to Article 6, paragraph 6.3.7. of the Agreement

- Proposal to amend global technical regulation No. 4 (TRANS/WP.29/AC.3/20).
- Report on the development of Amendment 2 to global technical regulation (gtr) No. 4: Test procedure for compression ignition (C.I.) engines and positive-ignition (P.I.) engines fuelled with natural gas (NG) or liquefied petroleum gas (LPG) with regard to the emission of pollutants (ECE/TRANS/WP.29/2010/49).

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Proposal to amend global technical regulation No. 4

I. Objective of the proposal

1. The objective of this proposal is to introduce an amendment to the global technical regulation for heavy-duty vehicle emissions (gtr No. 4). This amendment is introduced with the aim of removing the options contained in document ECE/TRANS/180/Add.4 established in the Global Registry on 15 November 2006. The options refer to:

(a) Hot soak period

(b) Weighting factors for hot and cold phases

(c) Particulate sampling filter size and material

(d) Engine power definition

2. Regulations governing exhaust-emissions from all vehicles have been in use for many years but the methods of measurement vary. To ensure the maximum benefit to the environment as well as the efficient use of energy, it is desirable that as many countries as possible use the same high standards of emission control. In that context, this gtr is an important step forward.

3. Manufacturers of heavy-duty vehicles are already operating in a world market and it is economically inefficient for manufacturers to have to prepare different models in order to meet different emission regulations and methods of measuring CO_2/fuel consumption, which are, in principle, aimed at achieving the same objective. This gtr will enable vehicle manufacturers to develop new models in the most effective way.

II. Description of the global technical regulation

4. The regulation is based on research into the world-wide pattern of real heavy commercial vehicle use. From the collected data, two representative test cycles, one transient test cycle (WHTC) and one steady state test cycle (WHSC), have been created covering typical driving conditions in the European Union, the United States of America and Japan. Based on real life data a model was developed for translating the vehicle cycle into an engine cycle. The general laboratory conditions for the emission test and the engine family concept have been brought up to date by expert committees in the International Organization for Standardization (ISO) and reflect the latest technologies.

5. The WHTC and WHSC test procedures reflect world-wide on-road heavy-duty engine operation as closely as possible and provide a marked improvement in the test procedure for measuring the emission performance of existing and future heavy-duty engines.

6. The next phase of work on this global technical regulation aims at eliminating the above-mentioned options in order to achieve a fully harmonised test procedure. AC.3 is therefore requested to agree that gtr No. 4 be amended and that the informal group established for the development of the gtr under the Working Party on Pollution and Energy (GRPE) continues its work on the amendment of the gtr.

7. While it is difficult to foresee a deadline, it is expected that phase 2 will be completed in two years.

Report on the development of Amendment 2 to global technical regulation (gtr) No. 4: Test procedure for compression ignition (C.I.) engines and positive-ignition (P.I.) engines fuelled with natural gas (NG) or liquefied petroleum gas (LPG) with regard to the emission of pollutants

I. Current situation in gtr No.4

8. As noted in paragraphs 11 through 14 of the proposal for Amendment 1 to gtr No. 4 (ECE/TRANS/WP.29/2009/122), two of the five options on which the World Forum for Harmonization of Vehicle Regulations (WP.29) expected resolution by the WHDC informal group remain open. The hot soak period option remains as a 5 or a 20 minute soak while the cold start weighting factor option remains as either 14 per cent or 10 per cent.

II. Background on resolution of these options

9. During the past two years, the WHDC informal group within the Working Party on Pollution and Energy (GRPE) has looked into a 10 minute hot soak period possibly replacing the 5 or 20 minute option. Discussions within the informal group progressed to a debate between 10 minute and 20 minute soak periods with the United States leaning toward the 20 minute period given presence of a 20 minute soak period in the United States test procedures and, therefore, protection against possible backsliding of regulatory stringency. A number of parties put forward a recommendation of a 10 minute soak period to replace the current option of 5 or 20 minutes. The 5 minute soak option was considered undesirable by many parties as too short and likely to cause an unacceptable frequency of voided tests.

10. In an effort to resolve the issue and ensure that important decisions at GRPE are based on data-driven analysis wherever possible, the United States proposed a test program to shed light on the issue of stringency by comparing emission results using a 10 minute versus a 20 minute soak period. Three entities stepped forward to generate test data according to this test program: the Engine Manufacturers Association (EMA); Daimler AG; and, Detroit Diesel Corporation (DDC). These data, in part, were presented by the WHDC Chair and Secretary to GRPE at its June 2009 session, with more data made available to working group members on 31 July 2009. Since that time, the United States has been analysing the data and generating an internal position on how to proceed. Due to the timing of the test program data availability, and the importance of the issue to the United States, the resolution of the option was not possible within the time required for submitting new text to the WP.29 Secretariat for consideration at this 149th session of WP.29. Hence, the gtr as it is currently written contains an option of a 5 or 20 minute soak period (i.e., a 10 minute soak does not appear in the current gtr).

III. The position of the United States of America

11. The United States is prepared to eliminate the soak period and cold start weighting factor options consistent with its understanding of the discussions within the WHDC working group. Specifically, the United States will support a 10 minute soak period in conjunction with a 14 per cent cold start weighting factor.

IV. Other comments and considerations

12. The United States wishes to thank the WHDC working group and GRPE for its hard work on this gtr and, specifically, EMA, Daimler, and DDC for stepping forward to generate test data. The United States firmly believes that decisions at GRPE should be data-driven and made based on the best available scientific information.

13. In addition, it was noted that a formal rulemaking process would have to be conducted in the United States prior to adopting the WHDC gtr. During that rulemaking process, additional data will probably be needed to shed light on the relative stringency of the WHDC gtr relative to existing United States test procedures. The outcome of that process cannot be known today. The industry will be supportive of that need and will cooperate again when the time arises.

Comments specific to ECE/TRANS/WP.29/2009/121 (the WHDC gtr)

14. Suggested changes to paragraph 7.6.3

14.6.3. Hot soak period

Immediately upon completion of the cold start test, the engine shall be conditioned for the hot start test using a 10 ± 1 minutes hot soak period. ~~by using one of the following options:~~

~~(a) 5 ± 1 minutes hot soak period~~

~~(b) 20 ± 1 minutes hot soak period~~

~~The option shall be selected by the Contracting Parties.~~

15. Suggested changes to paragraph 8.6.3

15.6.3. Calculation of the specific emissions

[Text surrounding equation 69 left as is.]

For the WHTC, the final test result shall be a weighted average from cold start test and hot start test according to the following formula: ~~by using either of the following options:~~

[Renumber current equation “70a” to “70” and eliminate equation “70b”]

~~The option shall be selected by the Contracting Parties.~~