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**Economic Commission for Europe**

Inland Transport Committee

**World Forum for Harmonization of Vehicle Regulations****Working Party on General Safety Provisions****105<sup>th</sup> session**

Geneva, 8–11 October 2013

Item 9 of the provisional agenda

**Regulation No. 110 (CNG vehicles)****Proposal for amendments to Regulation No. 110 (CNG vehicles)****Submitted by the expert from the European Association of Automotive Suppliers \***

The text reproduced below was produced by the expert from the European Association of Automotive Suppliers (CLEPA) to introduce type approval provisions for "valve control at stop-start". It supersedes ECE/TRANS/WP.29/GRSG/2013/12 and introduces into UN Regulation No. 110 similar provisions as those for UN Regulation No. 67 (see ECE/TRANS/WP.29/GRSG/2013/24). The modification to the current text of UN Regulation No. 110, up to the 01 series of amendments, is marked in bold for new or strikethrough for deleted characters.

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\* In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208, para. 106 and ECE/TRANS/2010/8, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

## I. Proposal

*Part I, insert a new paragraph 4.1.1., to read:*

- "4.1.1. In addition to provisions of paragraph 4.1., one of the following additional marks shall be used for automatic cylinder valve which comply with paragraph 2.2.4. of Annex 4A:
- (a) "H1"
  - (b) "H2"
  - (c) "H3" "

*Part II, insert a new paragraph 14.1.4., to read:*

- "14.1.4. **"Commanded stop phase"** defines the period of time during which the combustion engine is switched off automatically for fuel saving and is allowed to start again automatically."

*Part II, paragraph 17.5.1., amend to read:*

"17.5.1. Automatic cylinder valve"

*Part II, insert new paragraphs 17.5.1.3. and 17.5.1.4. to read:*

- "17.5.1.3. Notwithstanding the provisions of paragraph 17.5.1.2., the automatic cylinder valve may stay in an open position during commanded stop phases.
- 17.5.1.4. If the automatic cylinder valve is closed during commanded stop phases, the valve shall comply with paragraph 2.2.4. of Annex 4A."

*Annex 4A, insert new paragraph 2.2.4., to read:*

- "2.2.4. If the automatic valve is closed during commanded stop phases, the valve shall be submitted to the following numbers of operations during test according paragraph 2.2.3. above:
- (a) 200,000 cycles (mark "H1") if the engine shuts off automatically when the vehicle comes to a halt;
  - (b) 500,000 cycles (mark "H2") if, in addition to (a), the engine also shuts off automatically when the vehicle drives with the electric motor only;
  - (c) 1,000,000 cycles (mark "H3") if, in addition to (a), the engine also shuts off automatically when the accelerator pedal is released.

Notwithstanding the above-mentioned provisions, the valve complying with (b) shall be deemed to satisfy (a), and the valve complying with (c) shall be deemed to satisfy (a) and (b)."

*Annex 4A, paragraph 2.2.4. (former), renumber as paragraph 2.2.5.*

*Annex 4H, paragraph 2.1., amend to read:*

- "2.1. The electronic control ... valve in case of a switch off of the engine or a broken fuel supply pipe or ..."

*Annex 4H, insert a new paragraph 2.1.1., to read:*

- "2.1.1. Notwithstanding the provisions of paragraph 2.1., the automatic valve may stay in an open position during commanded stop phases."

*Annex 4H, paragraph 2.2.*, amend to read:

"2.2. The switching-off delay of ..."

## **II. Justification**

1. The stop-start or hybrid-electric functionality of the engine will be used in Compressed Natural Gas (CNG) vehicle systems to reduce CO<sub>2</sub> emissions. Therefore, the number of opening/closing cycles of the CNG automatic valves shall be increased by a factor of fifty. The current Regulation requires the valve to be closed when the engine is switched off. It is proposed to let the tank valves stay open in a commanded stop-start phase as it is the case for the idling phase of vehicles not equipped with start-stop systems. The same durability requirement as regards opening/closing cycles of the valves as for non-stop-start systems is preserved. The automatic cylinder valve may stay in an open position to ensure a correct and save operation of the valve over the lifetime of the vehicle.

2. If the automatic valves are closed during commanded stop phases, the cylinder valves shall be type approved according the expected cycle number.

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