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**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on General Safety Provisions****115th session**

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Item 9(b) of the provisional agenda

**Amendments to gas-fuelled vehicle regulations:****UN Regulation No. 110 (CNG and LNG vehicles)****Proposal for a Supplement to the 02 and 03 series of amendments to UN Regulation No. 110 (CNG and LNG vehicles)****Submitted by the expert from the International Organization of Motor Vehicle Manufacturers\***

The text reproduced below was prepared by the expert from the International Organization of Motor Vehicle Manufacturers (OICA) to adapt the provisions of the UN Regulation to the current state of technology on gas flow adjustment in the carburettor or injector. It is based on informal document GRSG-114-27, presented at the 114th session of the Working Party on General Safety Provisions (GRSG) (see report ECE/TRANS/WP.29/GRSG/93, para. 35). The modifications to the current text of UN Regulation No. 110 are marked in bold characters.

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\* In accordance with the programme of work of the Inland Transport Committee for 2014–2018 (ECE/TRANS/240, para. 105 and ECE/TRANS/2014/26, cluster 02.4), the World Forum will develop, harmonize and update UN regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

## I. Proposal

*Part II of the Regulation*

*Paragraph 18.3.1.7., shall be deleted.*

*Paragraphs 18.3.1.8. to 18.3.1.15., renumber as paragraphs 18.3.1.7. to 18.3.1.14.*

*Insert new paragraph 18.3.2.9., to read:*

**"18.3.2.9. Gas flow adjuster;"**

## II. Justification

1. Carburettors and injectors, termed gas supply device in UN Regulation No. 110, are the two preferred methods of pre-blending fuel and air mixture in spark ignited engines. Modern engines use injectors.
2. A carburettor is a device which mixes air and fuel to a pre-determined ratio which is suitable for combustion. They are most common for liquid gasoline engines. A constriction in the air flow forces the air to increase in speed, which lowers the air pressure according to Bernoulli's principle. At this constriction, one or several small orifices in contact with the fuel system, allow fuel to be sucked into the air stream, due to the lowered pressure in the constriction compared to the fuel. To ensure, among other things, that fuel is not injected when the engine is not on, a float regulates the amount of available liquid fuel to the carburettor. Commonly, this float is integrated into the carburettor and not mentioned as a stand-alone part. For vapour fuels, such as CNG, a float is not possible to utilise. Thus, there is a need for a separate component to regulate the fuel available to the carburettor, which in UN Regulation No. 110 is termed "gas flow adjuster".
3. It is important to note that a carburettor, without a gas flow adjuster or a float would be normally open. The gas flow adjuster and float adjust the amount of fuel introduced.
4. An injector on the other hand is controlled by an Electrical Control Unit (ECU) and is normally closed. The injector is closed by a spring which is overpowered by the ECU, which applies a magnetic force in order to open the injector. The ECU measures air flow and commands the injector to open for a specified duration and fuel is injected for an optimal fuel and air mixture.
5. Conclusion: When injectors are utilized as a mode of air/fuel mixture, a separate gas flow adjuster is thus not required; therefore it should be removed from paragraph 18.3.1. When utilizing a carburettor for gaseous fuels, a gas flow adjuster is inherently needed for motor function; therefore it must be added to paragraph 18.3.2.