

Proposal for amendments to Regulation No. 110 (CNG and LNG vehicles)

The text reproduced below was prepared by the experts from OICA. It proposes amendments to UN Regulation No. 110 to adapt the text of the Regulation to the current state of technology with regard to gas flow adjuster in case of carburettor vs. injector. The modifications to the current text of the regulation are marked in bold for new characters and strikethrough for deleted characters.

I. Proposal

Part II, paragraph 18, amend to read:

- “18.3. The CNG system
18.3.1. A CNG system shall contain at least the following components:
...
~~18.3.1.7. Gas flow adjuster;~~
...
18.3.2. The CNG system may also include the following components:
...
18.3.2.9. Gas flow adjuster;”

II. Justification

1. Carburettors and injectors, termed *Gas supply device* in UN R110, 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. There is thus a need for a separate component to regulate the fuel available to the Carburettor, which in UN R110 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 utilised 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 utilising 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.