

UN Regulation No. 110 (CNG/LNG vehicles)

Proposals for amendments to Supplement 1 to the 01 series of amendments to UN Regulation No. 110 (Specific equipment for CNG/LNG) as adopted by WP.29 in its 161st Session of November 2013 (ECE/TRANS/WP.29/2013/101 as amended by para. 59 of the report ECE/TRANS/WP.29/1106).

The modifications to the current text of UN Regulation No. 110 are marked in bold for new or strikethrough for deleted characters.

I Proposals:

1. *Paragraph 18.4.3 to 18.4.3.1* amend to read:
"18.4.3. When the vehicle is ~~ready for use~~ **in normal driving condition** the fuel container and/or tank shall not be less than 200 mm above the road surface **and the fuel container and/or tank shall not touch the ground if any tire or tires are deflated.**"

18.4.3.1 The provisions of paragraph 18.4.3. shall not apply if the container and/or tank is adequately protected, at the front and the sides and no part of the container is located lower than this protective structure."
2. *Insert a new paragraph 18.4.3.2* as follows:
"18.4.3.2: Where the vehicle has "kneeling capability" or variable suspension height, the fuel tank shall not touch the ground in the kneeling or lowest suspension position. To avoid puncture or other damage the tank shall be adequately protected from touching the ground in the kneeling or lowest suspension position."
3. *Paragraphs 18.12 and 18.13*, amend to read:
"18.12. The LNG system shall be designed to prevent any LNG ~~trapping~~ **accumulation.**
18.13. The LNG system in ~~category M~~ vehicles shall be equipped with a natural gas detector and/or gas tight housing. **This requirement does not apply to vehicles where** ~~The LNG system in category N vehicles may be equipped with a natural gas detector~~ if the fuel storage tank and associated piping is mounted on the exterior of the vehicle **i.e. without the possibility of gas accumulation (as in paragraph 18.12.) in an enclosed area or volume in the vehicle.** ~~If the fuel storage tank is located inside the cargo area of a category N vehicle then a natural gas detector and/or gas tight housing is mandatory."~~
4. *Insert a new paragraph 18.14* as follows:
"18.14 A safety system shall be provided so components downstream of the regulator shall not be exposed to pressures higher than they were designed for. For a vehicle operating on LNG a further safety system shall be provided so that components downstream from the vaporizer shall not be exposed to temperatures lower than they were designed for."
5. *Correct Annex 3B* as follows:
"in point 3.3.6 renumber 6.11 to 4.11;
in point 3.4.1 renumber 6.10 to 4.10
in point 3.4.2 renumber 6.10 to 4.10 and
in point 4.15.1 renumber 6.11 to 4.11".

II. Justification

Proposals 1 and 2, Paragraphs 18.4.3 and 18.4.3.2: Justification for proposed additions regarding the LNG fuel tank mounting designed not to touch the ground.

The requirement for mounting the LNG fuel tank 200mm above the road surface is broadly adequate; however, the addition of new language is intended to ensure that the fuel tank cannot, under any normal driving or stationary working situations, come in contact with the ground. The new wording provides more definitive conditions, including the possibility of a vehicle having one or more flat tires as well as for those vehicles that have ‘kneeling’ capability or variable suspension, both of which lower the frame of the vehicle closer to the ground.

Proposal 3, Paragraphs 18.12 and 18.13: Justification for proposed additions.

Unlike section 18.12 where the word ‘trapping’ is used in reference to LNG trapping in a pipe within the LNG fuel system, new section 18.13 elaborates further safety requirements taking into consideration possible gas leaks into any enclosed area of the vehicle, such as the engine compartment, cargo area or passenger compartment. Additionally, since there is no definition of a "cargo area," "load compartment," or "passenger compartment" (see the Consolidated Resolution on the Construction of Vehicles (R.E.3) document ECE/TRANS/WP.29/78/Rev.2) the use of ‘enclosed area or volume’ covers the complete spectrum of possible enclosed areas on the vehicle that may or may not be specified in this or other regulations.

Proposal 4, Paragraph 18.14: Justification for new language preventing LNG from coming into contact with system parts not designed for cryogenic fuel.

Even for natural gas vehicles equipped to operate on LNG there are components downstream of the LNG vaporizer that have been designed only for operation on high pressure or atmospheric pressure natural gas (‘the CNG system’) and not for cryogenic LNG. NGV stakeholders feel it is important to specify the inclusion of a safety system that prevents cryogenic-temperature fuel from coming into contact with components designed only for temperatures above -40oC. There is divergence, however, as to the specific safety systems that are currently in use or that might be available. These include systems that force a complete engine shut down, one that would provide a warning signal to the driver (visual or audio), or possibly other temperature-sensitive safety systems that in one way or another avoid damage to non-cryogenic components coming into contact with cryogenic LNG. Each approach has its merits, therefore, rather than prescribe or mandate one system or method, the new amending language specifically provides flexibility that both ensures safety yet is discretionary in design, hence the wording ‘a safety system shall...’