

UN Regulation No. 110 – CNG vehicles UN Regulation No. 118 – Burning behaviour

Introduction

The existing provisions for buses and coaches are focusing on a rapid evacuation of the vehicle in cases of emergency. A fire accident in the Netherlands however showed that nevertheless a serious risk remains for other road users and the surroundings of the vehicle. In the accident concerned the pressure relief device produced a horizontal jet flame during several minutes which could have serious consequences for other road users and the area around the vehicle. The Netherlands considers it necessary not only to regulate the direction of discharging the pressure relief devices of the CNG containers but also to take more preventive measures. These measures should focus on new type approval of vehicles; retrofitting is regarded to belong to the national responsibility of the countries.

Possible options are:

- a) limit the direction of discharging the containers via the pressure relief devices,
- b) mandate smoke detectors and fire alarm for buses and coaches with NG propulsion,
- c) mandate automatic fire extinguishers for buses and coaches with NG propulsion,
- d) mandate the provisions of UN Regulation No. 118 for buses and coaches with NG propulsion.

A. Regulation No. 110, to be amended as follows:

Limitation of discharging direction CNG containers could be based on existing provisions within the EU on hydrogen vehicles.

“17.5.2. Pressure relief device

17.5.2.1. **The CNG gas discharge from pressure relief device (temperature triggered) shall not be directed:**

- (a) **towards exposed electrical terminals, exposed electrical switches or other ignition sources;**
- (b) **into or towards the vehicle passenger or luggage compartments;**
- (c) **towards any class 0 component;**
- (d) **forward from the vehicle, or horizontally from the back or sides of the vehicle.**

17.5.2.2. In case the container(s) is (are) fitted inside the vehicle the pressure relief device (temperature triggered) shall, in addition to the provisions of paragraph 15.5.2.1., be fitted to the fuel container(s) in such a manner that it can discharge the CNG into an atmospheric outlet that vents outside the vehicle. ”

B. Smoke detectors and fire alarm

UN Regulation No. 107, Revision 3 already requires since 31-12-2012 an acoustic and visual fire alarm in case of excess temperatures for the engine compartment when it is situated behind the drivers compartment and for other separate heating compartments. The European Union has mandated this Rev.3 for new type approvals via the General Safety Regulation as from 1-11-2012 and for new registrations as from 1-11-2014.

In addition, Revision 3, amendment 4 mandates smoke/fire detection in toilet compartments, driver's sleeping compartments and other separate compartments as from 26 July 2014 for new types and as from 26 July 2015 Contracting Parties may refuse registration of new vehicles when these provisions are not met.

C. Automatic fire extinguishers

At the moment there exist no legal provisions within the EU that mandate the fitting of automatic fire extinguishers for buses and coaches. However, this topic is under discussion in the GRSG and a first draft regulation from Sweden might be available in October 2013.

D. Burning behavior of materials used in buses and coaches

UN Regulation 118 contains provisions for the burning behavior of materials used in the interior of vehicles class II and III of category M₃ but excluding class I vehicles (city buses). It could be proposed to apply this regulation also to all bus classes with a CNG propulsion in order to slow down the extension of a fire or to extinguish a fire which might prevent the discharging of the CNG containers. A possible amendment to the scope of Regulation No. 118 could be:

“1. Scope

- 1.1. This Regulation applies to the burning behaviour (ignitibility, burning rate and melting behaviour) and to the capability to repel fuel or lubricants of materials used in vehicles of categories M₃, Classes II and III¹ **and in vehicles of category M₂ or M₃ using compressed natural gas (CNG) in their propulsion system.**

Type approvals are granted according to:

- 1.2. Part I - Approval of a vehicle type with regard to the burning behaviour and/or the capability to repel fuel or lubricant of the components used in the interior compartment, the engine compartment and any separate heating compartment.
- 1.3. Part II – Approval of a component with regard to its burning behaviour and/or its capability to repel fuel or lubricant installed in the interior compartment, the engine compartment or any separate heating compartment.”

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¹As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.2, para. 2.