

Proposal for amendments to UN Regulation No. 110

The text reproduced below has been prepared by the experts from Germany and the Netherlands to require a mandatory exterior protection of cylindrical gas tanks instead of leaving the decision up to the manufacturer and to regulate the venting directions of the pressure relieve devices. The text is based on the informal document GRSG-108-08 rev. 1 and document ECE/TRANS/WP.29/2015/6 and takes into account the comments received during the 108th session of GRSG. The modifications to the current text of the Regulation are marked in bold for new or strikethrough for deleted characters.

I. Proposal

Paragraph 7.2., amend to read:

"7.2. An approval number shall be assigned to each type of component or multifunctional component approved. Its first two digits (at present **02** corresponding to the **02** series of amendments) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same alphanumeric code to another type of component."

Paragraph 18.5.2.1., amend to read:

"18.5.2.1. The pressure relief device (temperature triggered) shall be fitted to the CNG fuel container(s) in such a manner that can discharge into the gas-tight housing if that gas-tight housing fulfils the requirements of paragraph 18.5.5. below.

However, in case of vehicles of categories M and N where the container(s) is (are) fitted outside the vehicle and on the roof or top of the bodywork of the vehicle, the pressure relief device (temperature triggered) shall be fitted to the fuel container(s) in such a manner that it can discharge the CNG only in a vertical upward direction."

Paragraph 18.5.6.2., amend to read:

"18.5.6.2. The PRD (pressure triggered) shall be fitted to the fuel container(s) in such a manner that it can discharge into the gas-tight housing if that gas-tight housing fulfils the requirements of paragraph 18.5.5. above.

However, in case of vehicles of category M and N where the container(s) is (are) fitted outside the vehicle and on the roof or on the top of the bodywork of the vehicle, the pressure relief device (pressure triggered) shall be fitted to the fuel container(s) in such a manner that it can discharge the CNG only in a vertical upward direction."

Insert new paragraphs 24.8. to 24.13., to read:

"24.3 Type approvals of components other than fuel rail, as defined in paragraph 4.74., granted according to the original version of this Regulation or of components granted according the 01 series of amendments, shall remain valid and shall be accepted for the purpose of their installation on vehicles as long as the requirements for the specific component have not changed by any series of amendments.

24.8. As from the official date of entry into force of the 02 series of amendments to this Regulation, no Contracting Party applying this

Regulation shall refuse to grant or refuse to accept type approval under this Regulation as amended by the 02 series of amendments.

- 24.9. As from **1 September 2017** Contracting Parties applying this Regulation shall grant approvals only if the type of components to be approved meets the requirements of Part I of this Regulation as amended by the 02 series of amendments to this Regulation.
- ~~24.10. Type approvals of components other than fuel rail, as defined in paragraph 4.74., granted according to the original version of this Regulation or of components granted according the 01 series of amendments, shall remain valid and shall be accepted for the purpose of their installation on vehicles.~~
- 24.10. As from **1 September 2018** Contracting Parties applying this Regulation shall grant approvals only if the vehicle type to be approved meets the requirements of Part II of this Regulation as amended by the 02 series of amendments to this Regulation.
- 24.11. As from **1 September 2019** Contracting Parties applying this Regulation may refuse to recognize approvals of a type of vehicle which have not been granted in accordance with Part II of this Regulation as amended by the 02 series of amendments to this Regulation.
- 24.12. Contracting Parties applying this Regulation shall not refuse to grant extensions of type approvals for existing types of component or vehicle types which have been issued according to this Regulation without taking into account the provisions of the 02 series of amendments to this Regulation."

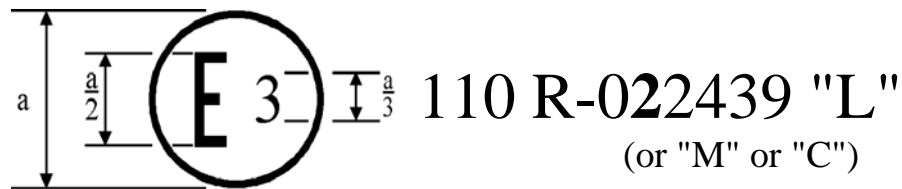
Throughout Annex 2, replace the number "01" with "02".

Annex 2A, amend to read:

"Annex 2A

Arrangement of the CNG/LNG component type approval mark

(See paragraph 7.2. of this Regulation)



$$a \geq 8 \text{ mm}$$

The above approval mark affixed to the CNG and or LNG component shows that this component has been approved in Italy (E3), pursuant to Regulation No. 110 under approval number 022439. The first two digits of the approval number indicate

that the approval was granted in accordance with the requirements of Regulation No. 110 as amended by the 02 series of amendments.

The letter "L" indicates that the product is suitable for the use with LNG.

The letter "M" indicates that the product is suitable in moderate temperatures.

The letter "C" indicates that the product is suitable in cold temperatures"

Annex 2C, amend to read:

"Annex 2C

Arrangement of approval marks

Model A

(See paragraph 17.2. of this Regulation)



110 R-022439 "L"
(or "M" or "C")

$a \geq 8 \text{ mm}$

The above approval mark affixed to a vehicle shows that the vehicle has, with regard to the installation of CNG/LNG system for the use of natural gas for propulsion, been approved in Italy (E3), pursuant to Regulation No. 110 under approval number 022439. The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of Regulation No. 110 as amended by the 02 series of amendments.

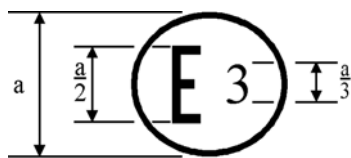
The letter "L" indicates that the product is suitable for the use with LNG.

The letter "M" indicates that the product is suitable in moderate temperatures.

The letter "C" indicates that the product is suitable in cold temperatures."

Model B

(See paragraph 17.2. of this Regulation)



110 022439 "L"
83 051628
(or "M" or "C")

$a \geq 8 \text{ mm}$

The above approval mark affixed to a vehicle shows that the vehicle has, with regard to the installation of CNG/LNG system for the use of natural gas for propulsion, been approved in Italy (E3), pursuant to Regulation No. 110 under approval number 022439. The first two digits of the approval number indicate that at the date the approval was granted in accordance with the requirements of Regulation No. 110 as amended by the 02 series of amendments and that Regulation No. 83 included the 05 series of amendments.

The letter "L" indicates that the product is suitable for the use with LNG.

The letter "M" indicates that the product is suitable in moderate temperatures.

The letter "C" indicates that the product is suitable in cold temperatures."

Annex 3, paragraph 6.12., amend to read:

"6.12. Exterior environmental protection

The exterior of cylinders shall meet the requirements of the environmental test conditions of paragraph A.14. (Appendix A). Exterior protection ~~may~~ **shall** be provided by using any of the following:

- (a) A surface finish giving adequate protection (e.g. metal sprayed on aluminium, anodizing); or
- (b) The use of a suitable fibre and matrix material (e.g. carbon fibre in resin); or
- (c) A protective coating (e.g. organic coating, paint) that shall meet the requirements of paragraph A.9. (Appendix A).

Any coatings applied to cylinders shall be such that the application process does not adversely affect the mechanical properties of the cylinder. The coating shall be designed to facilitate subsequent in service inspection and the manufacturer shall provide guidance on coating treatment during such inspection to ensure the continued integrity of the cylinder.

Manufacturers are advised that an environmental performance test that evaluates the suitability of coating systems is provided in the informative Appendix H to this annex."

II. Justifications

1. The existing provisions for buses and coaches focus on a rapid evacuation of the vehicle in case of an emergency. Nevertheless, a fire accident in the Netherlands showed that a serious risk still remains for the passengers of the vehicle, other road users and the area of the vehicle. In a fire event, the Thermally activated Pressure Relief Devices (TPRDs) provide a controlled release of

the gas from the compressed natural gas storage containers, before the high temperatures weaken the containers and cause a hazardous rupture. TPRDs are designed to vent the entire contents of the container rapidly. In an accident, the pressure relief device of the roof mounted CNG containers can produce a horizontal jet flame during several minutes, which could have serious consequences for other road users and the area around the vehicle. The experts from the Netherlands consider it necessary to regulate the direction of discharge of all pressure relief devices (temperature and pressure triggered) of CNG containers fitted on the roof. Taking into account of the ongoing research conducted by the United States of America on this matter, the provisions on discharging the TPRDs for fitting positions other than the roof shall be stipulated in a separate amendment to this Regulation.

2. This proposal regulating the discharge direction of the CNG container(s) has to be considered as a new series of amendments, with consequent administrative amendments of paragraphs 7.2. and 24. as well as Annexes 2A and 2C (type approval mark).

3. In Germany, a case of damage occurred due to corrosion of cylinders which led to a dangerous situation (explosion). This amendment aims to increase protection against corrosion with requirements regarding the exterior of cylinders.

To take into account the comments received at the 108th session of GRSG a new series of amendments and transitional provisions have been introduced to the previous documents.
