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UN Regulation No. 122 (Heating systems)

Proposal for Supplement 7 to the Original Version of UN Regulation No. 122 (Heating systems)

Submitted by the expert from the Republic of Korea *

The text reproduced below was submitted by the representative from the Republic of Korea with the aim of amending UN Regulation No. 122 in order to adopt the new technology of "Radiation Warmer" which can be apply to the Electric Vehicle (EV). The radiation warmer is expected to increase energy efficiency of EV and is also able to prevent the sharp reduction of All Electric Range (AER). This proposal is based on informal document GRSG-124-04 and GRSG-124-05, introduced at the 124th session of the Working Party on General Safety Provisions (GRSG) (ECE/TRANS/WP.29/GRSG/103, paragraph 41). The modifications to the current text of UN Regulation No. 122 are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2023 as outlined in proposed programme budget for 2023 (A/77/6 (Sect. 20), table 20.6), 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

Insert new paragraph 2.10., to read:

"**2.10. "Radiation warmer" means a device that is mounted on the surface of the interior of the vehicle and transmits heat to the human body in the way which radiates heat without direct contact with the human body and without an intermediate medium**."

Paragraph 6.1.5., amend to read:

"6.1.5. "Electric heater" means a device using electric energy from an on-board or external source to increase the temperature of the interior of the vehicle. Electrical devices which are installed in addition to the main heating system and whose main function is not to heat the interior of the vehicle are not considered as electric heaters according to this Regulation. For example, electric devices installed in components for the sole purpose of heating that component**, or a device that uses radiant heat to warm the human body, such as radiation warmer,** are not considered as electric heaters according to this Regulation."

Paragraph 6.2., the specification: General, amend to read:

"6.2. Specifications: General

The requirements for heating systems are that:

- The heated air entering the passenger compartment shall be no more polluted than the air at the point of inlet to the vehicle,
- The driver and passengers, during road use, will not be able to come into contact with part of parts of the vehicle or heated air liable to cause burns, **especially for radiation warmer, it must be turned off immediately if any part of the skin comes into contact with the surface of the radiation warmer,**
- The exhaust emissions from combustion heaters are within acceptable limits.

The test procedures for verification of each of these requirements are set out in Annexes 4, 5 and 6."

II. Justification

1. As part of a plan to respond to climate change such as carbon neutrality, the sales of electric vehicles are gradually increasing. However, electric vehicles, unlike internal combustion engine vehicles, have a structural problem that requires separate energy consumption to warm the interior of the vehicle since they have no heating source.

2. Currently, Positive Temperature Coefficient heater (PTC) or heat pump, which converts electric energy into a heat source to warm the air in the vehicle inside are mainly used as heating systems for electric vehicles. As a result, AER reduces sharply.

3. To overcome this problem, some automobile manufacturers and research institutes around the world are actively researching the application of radiation warmer as the way to increase heating energy efficiency, and it is shown that they are already achieving tangible results. To understand the benefit of this device, informal document GRSG-124-05 was introduced at the 124th GRSG session.

4. However, considering the characteristics of the radiant warmer, to achieve the best efficiency, the surface temperature of the device must be raised above a certain level. Therefore, in this way it is not possible to meet the non-metallic material limit temperature mentioned in annex 5 of this UN Regulation.

5. Therefore, the above text proposes to exclude the radiation warmer, which is clearly helpful in increasing AER in an electric vehicle, from the category of the electric heater.

Moreover, it introduces new a safety requirement to turn off the radiation warmer immediately if there is contact with the human body.

6. Lastly, in addition to continuous efforts to improve the performance of electric vehicles, which are environmentally friendly, it is expected that this UN Regulation can be quickly amended to maximize energy efficiency by applying new technologies such as radiation warmer.