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**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Lighting and Light-Signalling****Seventy-seventh session**

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Item 5 of the provisional agenda

**Regulations Nos. 37 (Filament lamps), 99 (Gas discharge light sources), 128 (Light emitting diodes light sources) and the Consolidated Resolution on the common specification of light source categories****Proposal for a collective amendment to Regulations Nos. 48, 53, 74 and 86****Submitted by the expert from the International Automotive Lighting and Light Signalling Expert Group (GTB)\***

The text reproduced below was prepared by the expert from GTB to introduce requirements for light emitting diode (LED) substitute light sources into Regulations Nos. 48, 53, 74 and 86. The modifications to the existing text of the Regulations are marked in bold for new or strikethrough for deleted characters. Some text is shown in square brackets to indicate that discussion and a decision are required.

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\* In accordance with the programme of work of the Inland Transport Committee for 2016–2017 (ECE/TRANS/254, para. 159 and ECE/TRANS/2016/28/Add.1, cluster 3.1), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



## I. Proposal

### A. Supplement 9 to the 06 series of amendments to Regulation No. 48 (Installation of lighting and light-signalling devices)

*Insert a new paragraph 2.7.1.1.8., to read:*

**“2.7.1.1.8. “LED substitute light source” means a LED light source of a category which has a counterpart light source category producing light by another light generating technology.”**

*Paragraph 3.2.5., amend to read:*

**“3.2.5. ~~The application shall include a~~ statements:**

**3.2.5.1. of the method used for the definition of the apparent surface (see paragraph 2.10.);**

**3.2.5.2. whether lamps approved for [and equipped with] LED substitute light sources are allowed to be installed on the vehicle or not and, if this is allowed, which lamps.”**

*Insert a new paragraph 5.30., to read:*

**“5.30. The use of lamps approved for [and equipped with] LED substitute light source(s), is allowed exclusively in the case where the statement indicated in paragraph 3.2.5.2. is present and positive.**

**To verify that this statement is respected, both at the type approval and in the conformity of production verification, the [presence of the marking on the lamps related to the use of LED substitute light source(s)] shall be checked.”**

*Annex 1, insert a new item 9.30., to read:*

**“9.30. Lamps approved for [and equipped with] LED substitute light source(s) are allowed to be installed on this vehicle type: yes/no<sup>2,3</sup>**

.....  
<sup>3</sup> If yes, list the applicable lamps.”

### B. Supplement 11 to the 05 series of amendments to Regulation No. 48 (Installation of lighting and light-signalling devices)

*Insert a new paragraph 2.7.1.1.8., to read:*

**“2.7.1.1.8. “LED substitute light source” means a LED light source of a category which has a counterpart light source category producing light by another light generating technology.”**

*Paragraph 3.2.5., amend to read:*

**“3.2.5. ~~The application shall include a~~ statements:**

**3.2.5.1. of the method used for the definition of the apparent surface (see paragraph 2.10.);**

**3.2.5.2.** whether lamps approved for [and equipped with] LED substitute light sources are allowed to be installed on the vehicle or not and, if this is allowed, which lamps.”

*Insert a new paragraph 5.30., to read:*

**“5.30.** The use of lamps approved for [and equipped with] LED substitute light source(s), is allowed exclusively in the case where the statement indicated in paragraph 3.2.5.2. is present and positive.

To verify that this statement is respected, both at the type approval and in the conformity of production verification, the [presence of the marking on the lamps related to the use of LED substitute light source(s) ] shall be checked.”

*Annex 1, add a new item 9.29., to read:*

**“9.29.** Lamps approved for [and equipped with] LED substitute light source(s) are allowed to be installed on this vehicle type: yes/no<sup>2,3</sup>

.....  
<sup>3</sup> If yes, list the applicable lamps.”

**C. Supplement 18 to the 04 series of amendments to Regulation No. 48 (Installation of lighting and light-signalling devices)**

*Insert a new paragraph 2.7.1.1.8., to read:*

**“2.7.1.1.8.** “LED substitute light source” means a LED light source of a category which has a counterpart light source category producing light by another light generating technology.”

*Paragraph 3.2.5., amend to read:*

**“3.2.5.** ~~The application shall include a statements:~~

**3.2.5.1.** of the method used for the definition of the apparent surface (see paragraph 2.10.);

**3.2.5.2.** whether lamps approved for [and equipped with] LED substitute light sources are allowed to be installed on the vehicle or not and, if this is allowed, which lamps.”

*Insert a new paragraph 5.30., to read:*

**“5.30.** The use of lamps approved for [and equipped with] LED substitute light source(s), is allowed exclusively in the case where the statement indicated in paragraph 3.2.5.2. is present and positive.

To verify that this statement is respected, both at the type approval and in the conformity of production verification, the [presence of the marking on the lamps related to the use of LED substitute light source(s)] shall be checked .”

*Annex 1, insert a new item 9.29., to read:*

**“9.29.** Lamps approved for [and equipped with] LED substitute light source(s) are allowed to be installed on this vehicle type: yes/no<sup>2,3</sup>

.....

<sup>3</sup> If yes, list the applicable lamps.”

**D. Supplement 6 to the 03 series of amendments to Regulation No. 48  
(Installation of lighting and light-signalling devices)**

*Insert a new paragraph 2.7.1.1.8., to read:*

**“2.7.1.1.8. “LED substitute light source” means a LED light source of a category which has a counterpart light source category producing light by another light generating technology.”**

*Paragraph 3.2.5., amend to read:*

- ~~“3.2.5. The application shall include a Statements:~~
- 3.2.5.1.** of the method used for the definition of the apparent surface (see paragraph 2.10.);
- 3.2.5.2.** whether lamps approved for [and equipped with] LED substitute light sources are allowed to be installed on the vehicle or not and, if this is allowed, which lamps.”

*Insert a new paragraph 5.27., to read:*

**“5.27. The use of lamps approved for [and equipped with] LED substitute light source(s), is allowed exclusively in the case where the statement indicated in paragraph 3.2.5.2. is present and positive.**

**To verify that this statement is respected, both at the type approval and in the conformity of production verification, the [presence of the marking on the lamps related to the use of LED substitute light source(s)] shall be checked.”**

*Annex 1, insert a new item 9.28., to read:*

**“9.28. Lamps approved for [and equipped with] LED substitute light source(s) are allowed to be installed on this vehicle type: yes/no<sup>2,3</sup>**

.....

<sup>3</sup> If yes, list the applicable lamps.”

**E. Supplement 2 to the 02 series of amendments to Regulation No. 53  
(Installation of lighting and light-signalling devices for L<sub>3</sub> vehicles)\*\***

*Insert a new paragraph 2.5.20., to read:*

**“2.5.20. “LED substitute light source” means a LED light source of a category which has a counterpart light source category producing light by another light generating technology.”**

*Paragraph 3.2.5., amend to read:*

~~“3.2.5. The application shall include a Statements:~~

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\*\* GRE is also invited to consider whether similar amendments should be introduced as a draft Supplement 20 to the 01 series of amendments to Regulation No. 53 (note by the secretariat).

- 3.2.5.1.** of the method used for the definition of the apparent surface (see paragraph 2.10.);
- 3.2.5.2.** whether lamps approved for [and equipped with] LED substitute light sources are allowed to be installed on the vehicle or not and, if this is allowed, which lamps.”

*Insert a new paragraph 5.21., to read:*

- “5.21.** The use of lamps approved for [and equipped with] LED substitute light source(s), is allowed exclusively in the case where the statement indicated in paragraph 3.2.5.2. is present and positive.

To verify that this statement is respected, both at the type approval and in the conformity of production verification, the [presence of the marking on the lamps related to the use of LED substitute light source(s)] shall be checked.”

*Annex 1, insert a new item 9.22., to read:*

- “9.22.** Lamps approved for [and equipped with] LED substitute light source(s) are allowed to be installed on this vehicle type: yes/no<sup>2,4</sup>

.....  
<sup>4</sup> If yes, list the applicable lamps.”

## **F. Supplement 10 to the 01 series of amendments to Regulation No. 74 (Installation of lighting and light-signalling devices (mopeds))**

*Insert a new paragraph 2.5.15., to read:*

- “2.5.15.** “LED substitute light source” means a LED light source of a category which has a counterpart light source category producing light by another light generating technology.”

*Paragraph 3.2.5., amend to read:*

- “3.2.5.** ~~The application shall include a~~ statements:

- 3.2.5.1.** of the method used for the definition of the apparent surface (see paragraph 2.10.);
- 3.2.5.2.** whether lamps approved for [and equipped with] LED substitute light sources are allowed to be installed on the vehicle or not and, if this is allowed, which lamps.”

*Insert a new paragraph 5.19., to read:*

- “5.19.** The use of lamps approved for [and equipped with] LED substitute light source(s), is allowed exclusively in the case where the statement indicated in paragraph 3.2.5.2. is present and positive.

To verify that this statement is respected, both at the type approval and in the conformity of production verification, the [presence of the marking on the lamps related to the use of LED substitute light source(s)] shall be checked.”

*Annex 1, insert a new item 5.12., to read:*

“5.12. Lamps approved for [and equipped with] LED substitute light source(s) are allowed to be installed on this vehicle type: yes/no<sup>2,5</sup>

.....

<sup>5</sup> If yes, list the applicable lamps.”

**G. Supplement 7 to the original version of Regulation No. 86 (Installation of lighting and light-signalling devices for agricultural vehicles)\*\*\***

*Amend paragraph 2.6.28., to read:*

“2.6.28. *“Light source”* means one or more elements for visible radiation, ~~which may be assembled with one or more transparent envelopes and~~ with a base for mechanical and electrical connection, **possibly assembled with one or more components to control the elements for visible radiation.**

~~A light source may also be constituted by the extreme outlet of a light guide, as part of a distributed lighting or light signalling system not having a built in outer lens.~~

*Insert a new paragraph 2.6.28.1., to read:*

2.6.28.1. **“LED substitute light source”** means a LED light source of a category which has a counterpart light source category producing light by another light generating technology.”

*Paragraph 3.2.5., amend to read:*

“3.2.5. ~~The application shall include a statements:~~

3.2.5.1. of the method used for the definition of the apparent surface (see paragraph 2.10.);

3.2.5.2. **whether lamps approved for [and equipped with] LED substitute light sources are allowed to be installed on the vehicle or not and, if this is allowed, which lamps.”**

*Insert a new paragraph 5.20., to read:*

“5.20. **The use of lamps approved for [and equipped with] LED substitute light source(s), is allowed exclusively in the case where the statement indicated in paragraph 3.2.5.2. is present and positive.**

**To verify that this statement is respected, both at the type approval and in the conformity of production verification, the [presence of the marking on the lamps related to the use of LED substitute light source(s)] shall be checked.”**

*Annex 1, insert a new item 5.26., to read:*

“5.26. Lamps approved for [and equipped with] LED substitute light source(s) are allowed to be installed on this vehicle type: yes/no<sup>2,4</sup>

.....

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\*\*\* GRE is also invited to consider whether similar amendments should be introduced as a draft Supplement 1 to the 01 series of amendments to Regulation No. 86

<sup>4</sup> If yes, list the applicable lamps.”

## II. Justification

1. The use of LED substitute light sources in lamps and on vehicles for which such a kind of light sources was not foreseen during the original design of the lamp/vehicle needs to be verified to guarantee the correct operation of both the lamp and the vehicle.

2. For these reasons, in parallel to the introduction in Regulation No. 128 and in the Consolidated Resolution on the common specification of light source categories (R.E.5) of the LED substitute light sources, amendments to the Regulations for the type approval of lamps and for the type approval of vehicles for their lamp installation are necessary.

3. For all Regulations Nos. 48 (for all series of amendments 03, 04, 05 and 06), 53, 74 and 86 the same changes are necessary and the only difference between the texts proposed for each of these Regulations is the paragraph numbering. The only exception is for Regulation No. 86, in which also the definition for “Light source” has been updated to the one present in the Consolidated Resolution R.E.5.

4. The main changes proposed are as follows:

- The definition of a “LED substitute light source”, aligned to the one introduced in parallel into the Consolidated Resolution R.E.5, is added to the above Regulations. This definition (as well as all the other ones related to light sources) probably will be no longer necessary once, in a future revision of these Regulations, a direct reference to the definitions contained in the Consolidated Resolution R.E.5 is introduced;
- The allowance to use, on a certain vehicle type, lamps approved with LED substitute light sources has to be stated in the description and in the communication form of the vehicle. In case this statement is not present in the already existing type approval, it is necessary to extend the vehicle approval to allow the use of lamps with LED substitute light source or, where necessary, to specifically forbid this use;
- Verification of the compliance with the statement is required to be carried on, both for type approval and for Conformity of Production (CoP), by checking the presence or absence on the lamp of the indication for the LED substitute light source.

5. In the following pages, a schematic explanation of the sequence to be followed to approve a lamp with a LED substitute light source and to allow its installation on a vehicle is presented. It also clearly shows why the changes proposed to the installation Regulations and to the lamp Regulations are necessary.

Figure 1

### Sequence to approve a lamp with a LED substitute light source and to allow its installation on a vehicle

Key:

No statement on light source(s).
Filament light source(s) only.
<b>Extended</b> for LED substitute light source(s)
Both light source(s)

Lamp originally approved for filament light source(s) only	Installation in case of:	Vehicle approved without any statement on allowance of light source(s).	OK			
		Vehicle approved allowing installation of lamps with filament light source(s) only.	OK			
		Vehicle approved allowing installation of lamps with both filament and LED substitute light source(s).	OK			
Lamp approval <b>extended</b> for LED substitute light source(s)	Installation in case of:	Vehicle approved allowing installation of lamps with both filament and LED substitute light source(s).	OK			
		Vehicle approved without any statement on allowance of light source(s).	NOT OK	Installation <b>after extension</b> of vehicle approval in case of:	Vehicle approval <b>extended</b> allowing installation of lamps with both filament and LED substitute light source(s).	OK
					Vehicle approved <b>extended</b> allowing installation of lamps with filament light sources only.	NOT OK
		Vehicle approved allowing installation of lamps with filament light source(s) only.	NOT OK	Installation <b>after extension</b> of vehicle approval in case of:	Vehicle approval <b>extended</b> allowing installation of lamps with both filament and LED substitute light source(s).	OK
	Lamp originally approved for both filament and LED substitute light source(s)	Installation in case of:	Vehicle approved allowing installation of lamps with both filament and LED substitute light source(s).	OK		
			Vehicle approved without any statement on allowance of light source(s).	NOT OK	Installation <b>after extension</b> of vehicle approval in case of:	Vehicle approval <b>extended</b> allowing installation of lamps with both filament and LED substitute light source(s).
				Vehicle approved <b>extended</b> allowing installation of lamps with filament light sources only.		NOT OK
	Vehicle approved allowing installation of lamps with filament light source(s) only.	NOT OK	Installation <b>after extension</b> of vehicle approval in case of:	Vehicle approval <b>extended</b> allowing installation of lamps with both filament and LED substitute light source(s).	OK	