**SLR-26-02**

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| Subject | IMMA Comments on 5.6 to 5.8 LWG |
| legend | Note : Text highlighted in red are deletion proposed , Text highlighted in blue are addition proposed by IMMA |

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| Sr No | Text of LSD as per GRE 2018-02 with IMMA proposal | Justification/Comments |
| 1 | 5.6. TECHNICAL REQUIREMENTS CONCERNING DIRECTION-INDICATOR LAMPS  (Symbols 1, 1a, 1b, 2a, 2b, 5, 6, 11, 11a, 11b, 11c, 12) | No Comments |
| 2 | 5.6.1.The light emitted by each of the two lamps supplied shall be at least equal to the minimum values and not exceed the maximum values ~~meet the requirements~~ in Table 8 where the ~~minimum~~ luminous intensities shall be fulfilled:  (a) In the case of direction indicators of categories 1, 1a, 1b, 2a, 2b, 11, 11a, 11b, 11c and 12 in the reference axis; or  (b) ~~i~~In the case of direction indicators of categories 5 and 6 ~~in~~ towards direction A according to Annex 2.  Table 8: Luminous intensities for direction indicator lamps   | *Direction indicator lamp of category* | *Minimum luminous intensity (values in cd)* | *Maximum luminous intensity in any direction when used as (values in cd)* | | | --- | --- | --- | --- | | *A single lamp* | *A lamp marked “D” (paragraph 3.3.2.5.2.)* | | 1 | 175 | 1000 | 500 | | 1a | 250 | 1200 | 600 | | 1b | 400 | 1200 | 600 | | 2a (steady) | 50 | 500 | 250 | | 2b (variable) | 50 | 1000 | 500 | | 5 | 0.6 | 280 | 140 | | 6 | 50 | 280 | 140 | | 11 | 90 | 1000 | N.A. | | 11a | 175 | 1000 | N.A. | | 11b | 250 | 1200 | N.A. | | 11c | 400 | 1200 | N.A. | | 12 | 50 | 500 | N.A. | | 1. This Text added to bring the clarity that table contains both minimum and maximum intensity compliance, please see Sr no 2 for Justification on removal of text ‘minimum’. 2. The text ‘minimum’ should be deleted since both minimum and maximum requirements are to be met. 3. Editorial correction for better clarity |
| 3 | 5.6.2. Outside the reference axis the intensity of the light emitted by each lamp shall, in each direction corresponding to the points in the table of standard light distribution reproduced in:   1. Paragraph 2.1. of Annex 3 for categories 1, 1a, 1b, 2a, 2b, 11, 11a, 11b, 11c and 12.; or 2. Paragraph 2.4. of Annex 3 for category 6.   Be not less than the minimum specified in paragraph 5.6.1., multiplied by the percentage specified in the said table of the direction in question.  5.6.3. Failure provisions  For direction-indicator lamps of categories 1, 1a, 1b, 2a, 2b, 11, 11a, 11b, 11c and 12 a signal for activation of the tell-tale prescribed in paragraph 6.5.8. of Regulation No. 48 or paragraph 6.3.8. Of Regulation No. 53 shall be produced if (notwithstanding the provisions stated in paragraph 4.6.):  (a) Any one light source has failed; or  (b) In the case of a lamp designed for only two light sources, the intensity in the axis of reference is less than 50 per cent of the minimum intensity; or  (c) As a consequence of a failure of one or more light sources, the intensity in one of the following directions as indicated in paragraph 2.1. of Annex 3, is less than the minimum intensity required:  (i) H=0°, V=0°  (ii) H=20° to the outside of the vehicle, V= +5°  (iii) H=10° to the inside of the vehicle, V= 0°. | No Comments |
| 4 | 5.6.4. Test procedure:  In divergence from paragraphs 4.8.3. and 4.8.3.1., for category 5 direction indicators, to the rear, a minimum value of 0.6 cd is required throughout the fields specified in Part A of Annex 2; | No Comments |
| 5 | 5.6.5. Throughout the fields defined in the diagrams in Part A of Annex 2, the intensity of the light emitted shall be not less than 0.7 cd for lamps of category 1b, not less than 0.3 cd for lamps of categories 1, 1a, 2a, 11, 11a, 11b, 11c, 12 and for those of category 2b by day; it shall not be less than 0.07 cd for lamps of category 2b by night; | No Comments |
| 6 | 5.6.6. In general, the intensities shall be measured with the light source(s) continuously alight.  However, depending on the construction of the lamp, for example, the use of light-emitting diodes (LED), or the need to take precautions to avoid overheating, it is allowed to measure the lamps in flashing mode.   1. This shall be achieved by switching with a frequency of f = 1.5 ± 0.5 Hz with the pulse width greater than 0.3 s, measured at 95 per cent peak light intensity. In all other cases the voltage as required in paragraph 4.7.1. shall be switched with a rise time and fall time shorter than 0.01 s; no overshoot is allowed; 2. In the case of measurements taken in flashing mode the reported luminous intensity shall be represented by the maximum intensity. | No Comments |
| 7 | 5.6.7. In the case of lamps of category 2b the time that elapses between energizing the light source(s) and the light output measured on the reference axis to reach 90 per cent of the value measured in accordance with paragraph 5.6.2. shall be measured for the extreme levels of luminous intensity produced by the direction indicator. The time measured to obtain the lowest luminous intensity shall not exceed the time measured to obtain the highest luminous intensity. | No Comments |
| 8 | 5.6.8. The variable intensity control shall not generate signals which cause luminous intensities outside the range specified in paragraph 5.6.1. and exceeding the category 2a maximum specified in paragraph 5.6.1.:  (a) For systems depending only on daytime and night time conditions: under night time conditions;  (b) For other systems: under reference conditions as demonstrated by the manufacturer. | No Comments |
| 9 | 5.6.9. The colour of the light emitted shall be amber. This requirement shall also apply within the range of variable luminous intensity produced by rear direction indicator lamps of category 2b. | No Comments |
| 10 | 5.6.10. For any direction indicator lamp except those equipped with filament light source(s), the luminous intensities measured after one minute and after 30 minutes of operation in flashing mode (f = 1.5 Hz, duty factor 50 per cent), shall comply with the minimum and maximum requirements. The luminous intensity distribution after one minute of operation can be calculated by applying at each test point the ratio of luminous intensity measured in HV after one minute and after 30 minutes of operation as above described. | No Comments |
| 11 | 5.6.11. For direction indicator lamps of categories 1, 1a, 1b, 2a or 2b the flash may be produced by sequential activation of their light sources if the following conditions are met:  (a) Each light source, after its activation, shall remain lit until the end of the ON cycle;  (b) The sequence of activation of the light sources shall produce a signal which proceeds in a uniform progressive manner from inboard towards the outboard edge of the light emitting surface;  (c) It shall be one signal with no interruption and no vertical oscillations (e.g. not more than one change of direction along the vertical axis). The distance between two adjacent/tangential distinct parts of the light emitting surface of the sequential direction indicator shall not exceed 50mm, when measured perpendicularly to the reference axis, instead of the values defined in paragraph 5.7.2. of UN Regulation 48. These interruptions of the signal shall not create any overlap in the vertical axis between the different parts, from inboard towards the outboard of the vehicle, and shall not be used for any other lighting or light signalling functions;  (d) The variation shall finish no more than 200ms after the beginning of the ON cycle;  (e) The orthogonal projection of the light emitting surfaces of the direction indicator in the direction of the axis of reference shall be circumscribed by a rectangle on a plane normal to the axis of reference and having its longer sides parallel to the H-plane. The ratio of the horizontal to the vertical sides shall not be less than 1.7.  Compliance to the conditions mentioned above shall be verified in flashing mode. | No Comments |
| 12 | 5.7. TECHNICAL REQUIREMENTS CONCERNING SIDE MARKER LAMPS (SYMBOLS SM1, SM2) | No Comments |
| 13 | 5.7.1.The light emitted by each of the two lamps supplied shall meet the requirements in Table 9.  Table 9: Luminous intensities for side marker lamps   | Side marker lamp of category | | SM1 | SM2 | | --- | --- | --- | --- | | Minimum intensity | In the axis of reference | 4.0 cd | 0.6 cd | | Within the specified angular field, other than above | 0.6 cd | 0.6 cd | | Maximum intensity | Within the specified angular field1 | 25.0 cd | 25.0 cd | | Angular field | Horizontal | ±45 deg. | ±30 deg. | | Vertical | ±10 deg. | ±10 deg. |   **1**In addition, for red side marker lamp, in the angular field from 60° to 90° in horizontal direction and ±20° in vertical direction towards the front of the vehicle, the maximum intensity is limited to 0.25 cd. | Editorial reference number for note added. |
| 14 | 5.7.2. Outside the reference axis and within the angular fields defined in the diagrams in Part C of Annex 2, the intensity of the light emitted by each of the two side marker lamps supplied shall:   1. In each direction corresponding to the points in the light distribution table reproduced in paragraph 2.7. of Annex 3, be not less than the product of the minimum specified in paragraph 5.7.1. by the percentage specified in the said table for the direction in question; 2. In no direction within the space from which the side marker lamp is visible, exceed the maximum specified in paragraph 5.7.1. | No Comments |
| 15 | 5.7.3. For SM1 and SM2 categories of side marker lamps it may be sufficient to check only five points selected by the Type Approval Authority. | No Comments |
| 16 | 5.7.4. The colour of the light emitted shall be amber. However, it can be red, if the rearmost side marker lamp is grouped or combined or reciprocally incorporated with the rear position lamp, the rear end-outline marker lamp, the rear fog lamp, the stop lamp, or is grouped with or has part of the light emitting surface in common with the rear retro-reflector. | No Comments |
| 17 | 5.8. TECHNICAL REQUIREMENTS CONCERNING REVERSING LAMPS (SYMBOLS AR) | No Comments |
| 18 | 5.8.1.The light emitted by each of the two lamps supplied shall meet the requirements in Table 10.  Table 10: Luminous intensities for reversing lamps   |  | *Minimum luminous intensity in H-V (values in cd)* | *Maximum luminous intensity in any direction (values in cd)* | | | | --- | --- | --- | --- | --- | | in or above the h plane | below the h plane, down to 5°D | below 5°D | | Reversing lamps | 80 | 300 | 600 | 8000 | | No Comments |
| 19 | 5.8.2. In every other direction of measurement shown in paragraph 2.5. of Annex 3, the luminous intensity shall be not less than the minima specified in that annex.  However, in the case where the reversing lamp is intended to be installed on a vehicle exclusively in a pair of devices, the photometric intensity may be verified only up to an angle of 30° inwards where a photometric value of at least 25 cd shall be satisfied.  This condition shall be clearly explained in the application for approval and relating documents (see paragraph 3.1.).  Moreover, in the case where the type approval will be granted applying the condition above, a statement in paragraph 9.1.3. of the communication form (see Annex 1) will inform that the device shall only be installed in a pair. | No Comments |
| 20 | 5.8.3 The colour of the light emitted shall be white. | No Comments |