**SLR-71-04**

**German proposal to improve the visibility of direction indicators**

**UN Regulation No. 48:**

5.7.1.2. Stop lamps and direction-indicator lamps are not permitted to be reciprocally incorporated.

5.7.1.3. Where stop lamps and direction-indicator lamps are grouped, the following conditions shall be met:

5.7.1.3.1. Any horizontal or vertical straight line passing through the projections of the apparent surfaces of these functions on a plane perpendicular to the reference axis, shall not intersect more than two borderlines separating adjacent areas of different colour;

5.7.1.3.2. Their apparent surfaces in the direction of the reference axis, based upon the areas bounded by the outline of their light emitting surfaces, do not overlap.

**5.7.1.3.3. a minimum of 75% of the apparent surface of the rear direction-indicator lamps shall be at more than 25mm from the stop lamp, provided that:**

 **(a) The geometrical visibility prescribed for the rear direction indicator lamp in 6.5.5.;**

 **and**

 **(b) the minimum photometric values according to the angle of light distribution**

 **are fulfilled without considering the area at the distance less than 25 mm from the stop lamp.**

**5.7.1.3.4. Appropriate evidence demonstrating compliance with the requirements indicated in paragraph 5.7.1.3.3. is provided in the test reports of the rear direction indicator.**

**6.5.4.1. In width:**

**for direction indicators of category 2a or 2b,**

**near to the extreme outer edge of the vehicle, however if the distance from the outer edge is more than 200 mm** the distance from the edge of the apparent surface in the direction of the reference axis farthest from the median longitudinal plane to the extreme outer edge of the vehicle shall not be more than ~~400 mm from the extreme outer edge of the vehicle~~ **the distance from that point on the apparent surface in the direction of the reference axis from the stop lamp which is farthest from the vehicle’s median longitudinal plane to the extreme outer edge of the vehicle.**

**UN Regulation No. 148:**

5.6.3. Minimum or maximum area of apparent surface:

 ~~No requirements.~~

 **The area of the apparent surface in the direction of the axis of reference of the rear direction indicator category 2 shall be not less than 30 cm2.**

Justification:

1. Already approved and installed light signalling devices shows the existing requirements are not suitable for preventing poor arrangement that do not provide a clear signal.

The requirements for the Direction indicator (DI) are tested at component level, the visibility can be worse at installation state due to the proximity to the stop lamp (see SL-66-09, SLR-69-15, SLR-70-15). Considering the discussion at SLR 70 (SLR-69-13), the DI may be placed next to the stop lamp under the condition that 75% (SLR-60-13 provides only 50%) of the apparent surface is more than 25 mm from the stop lamp, assuming this 75 % fulfil the requirements at component level. Taking this into account the minimum distance of DI to SL is no longer considered.

1. The DI is activated to show other Road user the change of the direction of a car. From a logical point of view the DI shall be positioned as far as possible in the direction whose change of direction they indicate. The proposal from SLR-66-08 is adapted considering the discussion so that in a distance larger than 200 mm the DI is at least at the same distance from the outer edge as the stop lamp.
2. Further the Regulation do not require any minimum area of the DI. Researches have shown the light intensity of rear DI is between 80 to 200 cd. Not to consider a min. area of the apparent surface means that there is no limitation of the luminance. According to a study of D. Armbruster\* the optimal Luminance of SL at a distance of 130 m in a stationary test is 47.000 cd/m2, this value may be used as a reference for DI.

Based on a value of 150 cd for a good DI and rounded luminance value of 50.000 cd/m2, this result to an area of 30 cm2 which shall be the min. area to be required ensuring a good visibility.

\*Daniel Armbruster, Optimierung der visuellen Informationsübermittlung durch adaptive Kraftfahrzeugsignalleuchten