

## Proposal for amendments to GRRF-84-02 Regulation No. 79 (steering equipment) Requirements applicable to ACSF of Category C1

### I. Proposal

*Amendment of paragraph 5.6.4.8.1., to read:*

#### [5.6.4.8. Minimum distance and minimum operation speed

5.6.4.8.1. The ACSF of Category [C1] shall be able to detect vehicles approaching from the rear in an adjacent lane up to a distance  $S_{rear}$  as specified below:

The minimum distance  $S_{rear}$  shall be declared by the vehicle manufacturer. The declared value shall not be less than 55m.

The declared distance shall be tested according to the relevant test in Annex 8 using a two-wheeled motor vehicle of Category L3 as the approaching vehicle. ~~✗~~

The minimum operation speed  $V_{smin}$ , down to which the ACSF C is permitted to perform a lane change manoeuvre, shall be calculated with minimum distance  $S_{rear}$  using the following formula:

$$V_{Smin} = a * (t_B - t_G) + v_{app} - \sqrt{a^2 * (t_B - t_G)^2 - 2 * a * (v_{app} * t_G - S_{rear})}$$

Where:

$S_{rear}$  = Minimum distance declared by the manufacturer in [m]

$v_{app}$  = ~~36.1 m/s~~ (Speed of the approaching vehicle = 130 km/h (36,1 m/s) or Maximum allowed speed of each Contracting Party)

$a$  = 3 m/s<sup>2</sup> (Deceleration of the approaching vehicle)

$t_B$  = [0.0 or 1.2]s (Time after the start of the manoeuvre at which the deceleration of the approaching vehicle starts)

$t_G$  = [1]s (Remaining gap of the vehicles after the deceleration of the approaching vehicle)

$V_{smin}$  = x [m/s] Resulting minimum activation speed of the ACSF of Category C1

Notwithstanding the requirements above, the system may become active also at speeds lower than the calculated  $V_{smin}$  provided that the following conditions are met:

- (a) The system has detected another vehicle in the adjacent lane into which the lane change is planned at a distance lower than  $S_{rear}$  and

(b) The situation is not deemed to be critical according to paragraph 5.6.5.7 (e.g. at low speed differences and  $V_{app} < 130$  km/h)

(c)  $[S_{rear} = (v_{app} - v_{Smin}) * t_B + (v_{rear} - v_{Smin})^2 / (2 * a) + v_{Smin} * t_G]$  ]

~~[Footnote:~~

~~\* Until a uniform test target, having the radar cross section (rcs) characteristics of an appropriate L3 vehicle have been agreed, the motorcycle used for type approval shall have an engine capacity greater than 500cm<sup>3</sup>. The choice of the motorcycle shall be agreed with the Technical Service and the details recorded in the Test Report.]~~

Insert a new paragraph 3.5.x in Annex 8, to read:

"[3.5. Tests for ACSF of Category [C1] Systems

**3.5.x. Test target of Category [C1] Systems**

**The target used for the tests shall be a two-wheeled motor vehicle of Category L3 as the approaching vehicle. \*/**

**Footnote:**

**\* Until a uniform test target, having the radar cross section (rcs) characteristics of an appropriate L3 vehicle have been agreed, the motorcycle used for type approval shall have an engine capacity greater than 500cm<sup>3</sup>. The choice of the motorcycle shall be agreed with the Technical Service and the details recorded in the Test Report.**

3.5.1. Lane change functional test

3.5.2. Suppression of lane change procedure test

3.5.3. Overriding test

3.5.4. Deactivation test

3.5.5. Sensor performance test

3.5.6. Sensor blindness test

3.5.7. "Engine start/run cycle test"]"

**Remark: Details of the tests will be defined in 15th ACSF session (November 2017)**

## II. Justification

1. For some Contracting Parties, 130km/h as the speed of the approaching vehicle is not appropriate, because it is much higher than the maximum allowed speed in their traffic rules. For these contracting parties, operating speed range of Category C1 becomes narrow, and the situations not to be used of the system will increase. Therefore another option of  $V_{app}$  should also be taken into account.

2. The footnote means the requirement of the test target for Category C1 used in Annex 8. Therefore the footnote should be specified in Annex 8 in order to interpret appropriately its subject for Technical Services as well as UN Regulation No. 131.

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