



**Economic and Social
Council**

Distr.
GENERAL

TRANS/WP.29/584
4 August 1997

ENGLISH
Original: ENGLISH
and FRENCH

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

Working Party on the Construction of Vehicles

DRAFT SUPPLEMENT 5 TO THE 02 SERIES OF AMENDMENTS
TO REGULATION No. 3

(Retro-reflecting devices)

Note: The text reproduced below was adopted by the Administrative Committee (AC.1) of the amended 1958 Agreement at its sixth session, following the recommendation by the Working Party at its one-hundred-and-twelfth session. It is based on document TRANS/WP.29/R.817 (and TRANS/WP.29/R.817/Corr.1, French only), not amended (TRANS/WP.29/566, paras. 71 and 133).

Contents,

Title of annex 1, amend to read:

"Annex 1 Retro-reflecting devices, symbols, units"

Insert a new title of annex 16, to read:

"Annex 16 Test procedure for Class IB devices"

Text of the Regulation,

Paragraph 2.15., amend to read:

"2.15. Retro-reflecting devices are divided into three classes according to their photometric characteristics: Class IA or IB, Class IIIA and Class IVA."

Insert a new paragraph 2.16., to read:

"2.16. Retro-reflecting devices of Class IB are devices combined with other signal lamps which are not watertight according to annex 8, paragraph 1.1., and which are integrated into the body of a vehicle."

Paragraph 3.1.3., amend to read:

"3.1.3. Samples of the retro-reflecting device of a colour specified by the manufacturer and, if necessary, the means of fixation; the number of samples to be submitted is specified in annex 4."

Paragraph 5.5.1.3., amend to read:

"5.5.1.3. a group of symbols IA, IB, IIIA or IVA showing the class of the approved retro-reflecting device."

Insert new paragraph 6.6., to read:

"6.6. There shall be no access to the inner surface of the retro-reflectors when in normal use."

Paragraph 7.1., amend to read:

".....The test procedures are described in annex 4 (Class IA, IIIA), annex 14 (Class IVA) and annex 16 (Class IB)."

Annex 3,

The note, amend to read:

".....The competent authorities shall avoid using approval numbers IA, IB, IIIA and IVA which might be confused with the class symbols IA, IB, IIIA and IVA.

These sketches"

Annex 4,

Paragraph 2, amend to read:

".....
First Group: The two samples shall be subjected successively to the water penetration test (Annex 8, paragraph 1.1.) and"

Annex 5,

Paragraph 1, amend to read:

"1. SHAPE AND DIMENSIONS OF RETRO-REFLECTING DEVICES IN CLASS IA OR IB"

Annex 7,

Paragraph 2., amend to read:

- "2. For photometric measurements only the illuminating surface contained within a circle of 200 mm diameter for Class IA or IB shall be considered,

Paragraph 3.1., amend to read:

- "3.1. Class IA, Class IB and Class IIIA"

Paragraph 3.1.1., the table, in the column "Class" on the second line, amend the entry "IA" to read "IA, IB".

Paragraphs 3.1.2. and 3.1.3., amend the words "class IA" to read "class IA or IB" (twice).

Annex 8, Paragraphs 1. to 1.3., replace by the following text:

"Annex 8

RESISTANCE TO EXTERNAL AGENTS

1. Resistance to water and dirt penetration
 - 1.1. Water submersion test
 - 1.1.1. Retro-reflecting devices whether part of a lamp or not, shall be stripped of all removable parts and immersed for 10 minutes in water at a temperature of 50 ± 5 °C, the highest point of the upper part of the illuminating surface being 20 mm below the surface of the water. This test shall be repeated after turning the retro-reflecting device through 180°, so that the illuminating surface is at the bottom and the rear face is covered by about 20 mm of water. These optical units shall then be immediately immersed in the same conditions in water at a temperature of 25 ± 5 °C.
 - 1.1.2. No water shall penetrate to the reflecting surface of the retro-reflecting optical unit. If visual inspection clearly reveals the presence of water, the device shall not be considered to have passed the test.
 - 1.1.3. If visual inspection does not reveal the presence of water or in case of doubt, the CIL shall be measured by the method described in annex 4, paragraph 3.2., or annex 14, paragraph 4.2., the retro-reflecting device being first lightly shaken to remove excess water from the outside.
 - 1.2. Alternative Test Procedure for Class IB devices

As an alternative, at the request of the manufacturer, the following test (moisture and dust test) shall be applied instead of the submersion-test specified in paragraph 1.1. above.

 - 1.2.1. Moisture Test

The test evaluates the ability of the sample device to resist moisture penetration from a water spray and determines the drainage capability of those devices with drain holes or other exposed openings in the device.

 - 1.2.1.1. Water spray test equipment

A water spray cabinet with the following characteristics shall be used:

 - 1.2.1.1.1. Cabinet

The cabinet shall be equipped with a nozzle(s) which provides a solid

cone water spray of sufficient angle to completely cover the sample device. The centreline of the nozzle(s) shall be directed downward at an angle of $45 \pm 5^\circ$ to the vertical axis of a rotating test platform.

1.2.1.1.2. Rotating test platform

The rotating test platform shall have a minimum diameter of 140 mm and rotate about a vertical axis in the centre of the cabinet.

1.2.1.1.3. Precipitation rate

The precipitation rate of the water spray at the device shall be $2.5 (+1.6/-0)$ mm/min as measured with a vertical cylindrical collector centred on the vertical axis of the rotating test platform. The height of the collector shall be 100 mm and the inside diameter shall be a minimum of 140 mm.

1.2.1.2. Water spray test procedure

A sample device mounted on a test fixture, with initial CIL measured and recorded shall be subjected to a water spray as follows:

1.2.1.2.1. Device openings

All drain holes and other openings shall remain open. Drain wicks, when used, shall be tested in the device.

1.2.1.2.2. Rotational speed

The device shall be rotated about its vertical axis at a rate of $4.0 \pm 0.5 \text{ min}^{-1}$.

1.2.1.2.3. If the retro-reflector is reciprocally incorporated with signalling or lighting functions, these functions shall be operated at design voltage according to a cycle of 5 min ON (in flashing mode, where appropriate), 55 min OFF.

1.2.1.2.4. Test duration

The water spray test shall last 12h (12 cycles of 5/55 min).

1.2.1.2.5. Drain period

The rotation and the water spray shall be turned OFF and the device allowed to drain for 1 h with the cabinet door closed.

1.2.1.2.6. Sample evaluation

Upon completion of the drain period. The interior of the device shall be observed for moisture accumulation. No standing pool of water shall be allowed to be formed, or which can be formed by tapping or tilting the device. The CIL shall be measured according to the method specified in annex 4 paragraph 3.2. after having dried the exterior of the device with a dry cotton cloth.

1.2.2. Dust exposure test

This test evaluates the ability of the sample device to resist dust penetration which could significantly affect the photometric output of the retro-reflector.

1.2.2.1. Dust exposure test equipment

The following equipment shall be used to test for dust exposure:

1.2.2.1.1. Dust exposure test chamber

The interior of the test chamber shall be cubical in shape in size 0.9 to 1.5 m per side. The bottom may be "hopper shaped" to aid in

collecting the dust. The internal chamber volume, not including a "hopper shaped" bottom shall be 2 m³ maximum and shall be charged with 3 to 5 kg of the test dust. The chamber shall have the capability of agitating the test dust by means of compressed air or blower fans in such a way that the dust is diffused throughout the chamber.

1.2.2.1.2. The dust

The test dust used shall be fine powdered cement in accordance with standard ASTM C 150-84. ^{*}/

1.2.2.2. Dust exposure test procedure

A sample device, mounted on a test fixture, with the initial CIL measured and recorded, shall be exposed to dust as follows:

1.2.2.2.1. Device openings

All drain holes and other openings shall remain open. Drain wicks, when used, shall be tested in the device.

1.2.2.2.2. Dust exposure

The mounted device shall be placed in the dust chamber no closer than 150 mm from a wall. Devices with a length exceeding 600 mm shall be horizontally centred in the test chamber. The test dust shall be agitated as completely as possible by compressed air or blower(s) at intervals of 15 min for a period of 2 to 15 s for the duration of 5 hours. The dust shall be allowed to settle between the agitation periods.

1.2.2.2.3. Measured sample evaluation

Upon completion of the dust exposure test, the exterior of the device shall be cleaned and dried with a dry cotton cloth and the CIL measured according to the method specified in annex 4 paragraph 3.2."

Add a new Annex 16, to read:

"Annex 16

TEST PROCEDURE FOR CLASS IB DEVICES

Retro-reflecting devices of Class IB shall be tested according to the test procedures specified in annex 4, following the chronological order of tests given in annex 12, with the exception of the test according to annex 8, paragraph 1, which for Class IB devices may be replaced by the test specified in annex 8, paragraph 1.2."

^{*}/ American Society for Testing and Materials