3-3 The installation of lighting and light-signaling devices: Effective date from 2013/1/1

Refer to: R48 04-S16, R53 01-R3-C1-A1, R74 01-S9, R104 00-S8

3-3.1 Effective date and Scope:

3-3.1.1 Effective date from 2013/01/01, the new vehicle types of category symbols M, N and O, shall comply with paragraphs 3-3.4, 3-3.6 to 3-3.8 specified in this regulation. Category symbols M, N and O confirmed to “3-2 The installation of lighting and light-signaling devices” regard as conform to this regulation.

3-3.1.2 Effective date from 2015/01/01, the new vehicle types of category symbols L1 and L3, and all vehicle types L2 and L5, shall comply with paragraphs 3-3.5 to 3-3.8 specified in this regulation. Category symbols L1, L2, L3 and L5 confirmed to “3-2 The installation of lighting and light-signaling devices” regard as conform to this regulation.

3-3.1.3 Effective date from 2017/01/01, the all vehicle types of category symbols L1, L2, L3 and L5, which were confirmed to ”3-2 The installation of lighting and light-signaling devices” shall be conform to paragraphs 3-3.5.2.5 in addition.

3-3.1.4 The same applicant applying for low volume safety approval and the vehicle amount is not over 20 at same year and with same type and specification; or the same applicant applying for vehicle-by-vehicle low volume safety approval and the vehicle amount is not over 20 at same year and with same type and specification, could exempt from the requirement of horizontal orientation in 3-3.4.2.5.2 and/or adaptive front lighting system (AFS) in 3-3.6.16 and the electric power supply conditions in 3-3.4.1.10、3-3.4.2.7.7、3-3.4.3.9、3-3.4.4.8、3-3.4.6.9.

3-3.1.5 As for the vehicle category O3 and O4 from 2010/7/1, the dimensions and marking shape and mounting requirements of its body’s side and rear retro-reflective marking with strips shall comply with paragraph 3-3.6.14.2 and 3-3.6.14.3.1 specified below in this regulation, and the retro-reflective markings used shall comply with the requirements for “retro-reflective markings” in these Directions.

3-3.2 Definitions:

3-3.2.1 "Lamp" means a device designed to illuminate the road or to emit a light signal to other road users. Rear registration plate lamps and retro-reflectors are likewise to be regarded as lamps. For the purpose of this Regulation, light-emitting rear registration plates and the service-door-lighting system are not considered as lamps.

3-3.2.1.1 "A single lamp" means:

3-3.2.1.1.1 a device or part of a device having one lighting or light-signalling function, one or more light source(s) and one

apparent surface in the direction of the reference axis, which may be a continuous surface or composed of two or more distinct parts, or

3-3.2.1.1.2 Any assembly of two lamps marked "D", whether identical or not, having the same function; or

3-3.2.1.1.3 Any assembly of two independent retro-reflectors, whether identical or not, that have been approved separately; or

3-3.2.1.1.4 Any interdependent lamp system composed of two or three interdependent lamps marked "Y" approved together and providing the same function.

3-3.2.1.2 "Two lamps" or "an even number of lamps" in the shape of a band or strip, means two lamps with a single light emitting surface, providing such a band or strip is placed symmetrically in relation to the median longitudinal plane of the vehicle.

3-3.2.2 Light emitting surface: means the surface as declared in the request for approval by the manufacturer of the device on the drawing, Fig 1.

This shall be declared according to one of the following conditions:

(1) In the case where the outer lens is textured, the declared light emitting surface shall be all or part of the exterior surface of the outer lens;

(2) In the case where the outer lens is non-textured the outer lens may be disregarded and the light emitting surface shall be as declared on the drawing, Fig 1;

3-3.2.3 Illuminating surface: means the orthogonal projection of the full aperture of the reflector with an ellipsoidal reflector of the "projection lens" on a transverse plane, Fig 1. For illuminating surface of adaptive front lighting system: where a lighting function is produced by two or more simultaneously operated lighting units on a given side of the vehicle, the individual illuminating surfaces are taken together to constitute the illuminating surface

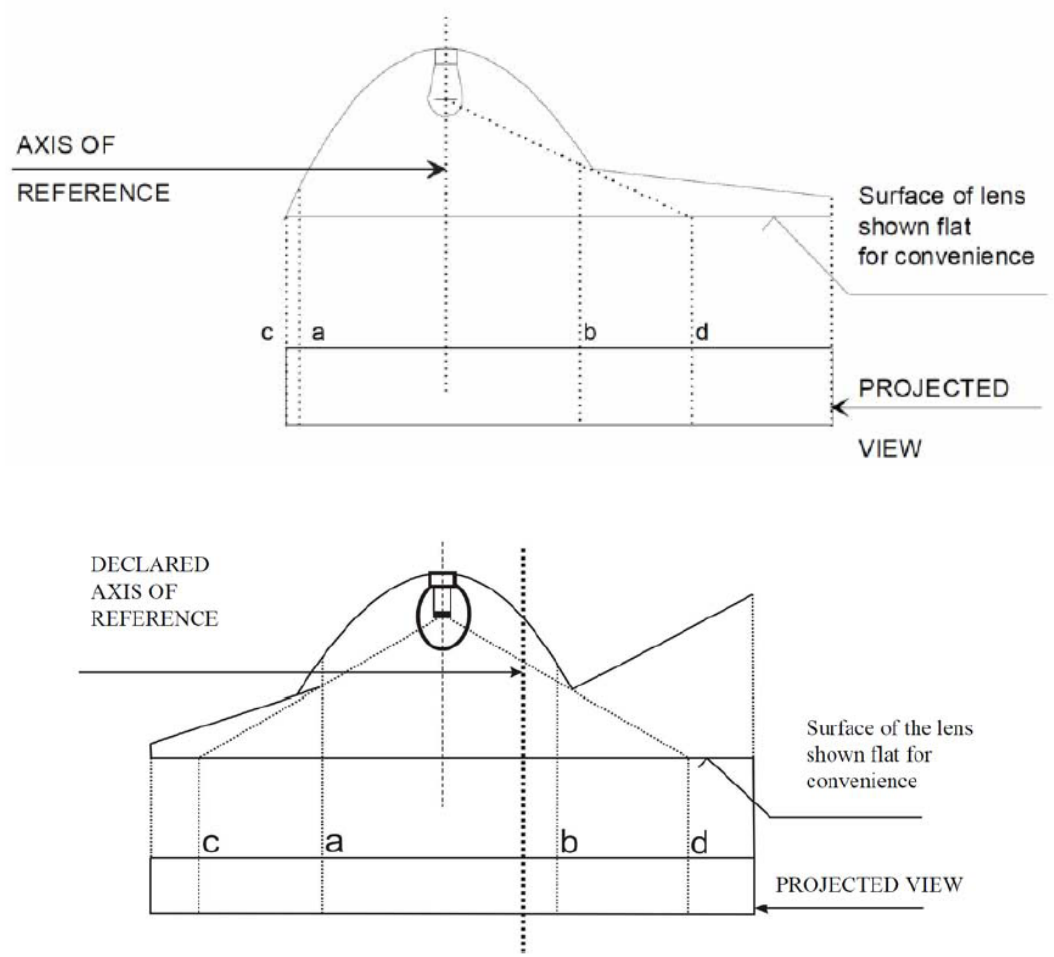


Fig 1

3-3.2.4 Bend lighting: means a lighting function to provide enhanced illumination in bends.

3-3.2.5 Apparent surface: means the orthogonal projection of: either the boundary of the illuminating surface projected on the exterior surface of the lens, or the light-emitting surface, in a plane perpendicular to the direction of observation and tangential to the most

exterior point of the lens. For light-signalling device producing variable luminous intensities, its variable apparent surface under all possible conditions of the variable intensity control shall be considered.

3-3.2.6 Height above the ground: The maximum height above the ground shall be measured from the highest point and the minimum height from the lowest point of the apparent surface in the direction of the reference axis. Where the (maximum and minimum) height above the ground clearly meets the requirements of the Regulation, the exact edges of any surface need not be determined.

3-3.2.6.1 For the purposes of reducing the geometric visibility angles, the position of a lamp with regard to height above the ground, shall be measured from the H plane.

3-3.2.6.2 In the case of dipped-beam headlamp, the minimum height in relation to the ground is measured from the lowest point of the effective outlet of the optical system (e.g. reflector, lens, projection lens) independent of its utilization.

3-3.2.6.3 The position, as regards width, will be determined from that edge of the apparent surface in the direction of the reference axis which is the furthest from the median longitudinal plane of the vehicle when referred to the overall width, and from the inner edges of the apparent surface in the direction of the reference axis when referred to the distance between lamps.

Where the position, as regards width, clearly meets the requirements of the Regulation, the exact edges of any surface need not be determined.

3-3.2.7 Tell-tale:

3-3.2.7.1 Operating tell-tale means a visual or auditory signal (or any equivalent signal) indicating that a device has been switched on and is operating correctly or not.

3-3.2.7.2 Closed-circuit tell-tale means a visual (or any equivalent signal) indicating that a device has been switched on, but not indicating whether it is operating correctly or not.

3-3.2.8 Angles of geometric visibility: the angles which determine the field of the minimum solid angle in which the apparent surface of the lamp is visible.

3-3.2.9 Device: means an element or an assembly of elements used to perform one or more functions.

3-3.2.9.1 Lighting function: means the light emitted by a device to illuminate the road and objects in the direction of vehicle movement.

3-3.2.9.2 Light-signalling function: means the light emitted or reflected by a device to give to other road users visual information on the presence, identification and/or the change of movement of the vehicle.

3-3.2.10 Light source

3-3.2.10.1 "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.

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.

3-3.2.10.1.1 Non-replaceable light source: means a light source which can only be replaced by replacement of the device to which this light source is fixed;

- in case of a light source module: a light source which can only be replaced by replacement of the light source module to which this light source is fixed;
- in case of adaptive front-lighting systems (AFS): a light source which can only be replaced by replacement of the lighting unit to which this light source is fixed;"

3-3.2.11 "Light-emitting diode (LED) light source" means a light source where the element for visible radiation is one or more solid state junctions producing injection-luminescence/ fluorescence;

3-3.2.12 "LED module" means a light source module containing as light sources only LEDs. However it may optionally contain one or more holders for approved replaceable light sources;

3-3.2.13 "Principal passing beam (principal dipped beam)" means the dipped beam produced without the contribution of infrared (IR) emitter and/or additional light sources for bend lighting.

3-3.2.14 Variable intensity control: means the device which automatically controls rear light signaling devices producing variable luminous intensities to assure the unvarying perception of their signals. The variable intensity control is part of the lamp, or part of the vehicle, or split between the said lamp and the vehicle.

3-3.2.15 Adaptive front lighting system (or "AFS"): means a lighting device type-approved according to Regulation No. 59, providing beams with differing characteristics for automatic adaptation to varying conditions of use of the dipped-beam (passing beam) and, if it applies, and the main-beam (driving-beam);

3-3.2.15.1 Lighting unit: means a light-emitting component designed to provide or contribute toone or more front lighting function(s) provided by the AFS;

3-3.2.15.2 Installation unit: means an indivisible housing (lamp body) which contains one or more lighting unit(s);

3-3.2.15.3 Lighting mode or mode: means a state of a front lighting function provided by the AFS, as specified by the manufacturer and

intended for adaptation to specific vehicle and ambient conditions;

3-3.2.15.4 System control: means that part(s) of the AFS receiving the AFS control signals from the vehicle and controlling the operation of the lighting units automatically;

3-3.2.15.5 AFS control signal (V, E, W, T): means the input to the AFS in accordance with the paragraph 3-3.6.16.7.4 of this Regulation;

3-3.2.15.6 Neutral state: means the state of the AFS when a defined mode of the class C passing beam (basic passing beam) or of the main beam in the maximum condition of activation, if any, is produced, and no AFS control signal applies.

3-3.2.15.7 Adaptive main-beam: means a main-beam of the AFS that adapts its beam pattern to the presence of oncoming and preceding vehicles in order to improve the long-range visibility for the driver without causing discomfort, distraction or glare to other road users.

3-3.2.16 The verification of lamp position and lighting direction：In the absence of specific instructions, the height and orientation of the lamps shall be verified with the vehicle unladen and placed on a flat, horizontal surface in the condition defined in paragraphs 3-3.2.18, 3-3.2.18.1.and 3-3.3.18.2. If AFS is also fitted, then the system shall be in normal situation.

3-3.2.17 Normal position of use of a movable component: means the position(s) of a movable component specified by the vehicle manufacturer for the normal condition of use and the park condition of the vehicle.

3-3.2.18 Normal condition of use of a vehicle means:

3-3.2.18.1 for a motor vehicle, when the vehicle is ready to move with its propulsion engine running and its movable components in the normal position(s) as defined in paragraph 3-3.2.17

3-3.2.18.2 and for a trailer, when the trailer is connected to a drawing motor vehicle in the conditions as prescribed in paragraph 3-3.2.18.1 and its movable components are in the normal position(s) as defined in paragraph 3-3.2.17.

3-3.2.19 Emergency stop signal: means a signal to indicate to other road users to the rear of the vehicle that a high retardation force has been applied to the vehicle relative to the prevailing road conditions.

3-3.2.20 Colour of the light emitted from a device

3-3.2.20.1 "White" means the chromaticity coordinates (x,y) of the light emitted that lie inside the chromaticity areas defined by the boundaries:

W12 green boundary: y = 0.150 + 0.640 x

W23 yellowish green boundary: y = 0.440

W34 yellow boundary: x = 0.500

W45 reddish purple boundary: y = 0.382

W56 purple boundary: y = 0.050 + 0.750 x

W61 blue boundary: x = 0.310

with intersection points:

	x	y
W_1:	0.310	0.348
W_2:	0.453	0.440
W_3:	0.500	0.440
W_4:	0.500	0.382
W_5:	0.443	0.382
W_6:	0.310	0.283

3-3.2.20.2 "Selective-yellow" means the chromaticity coordinates (x,y) of the light emitted that lie inside the chromaticity areas defined by the boundaries:

SY12 green boundary: y = 1.290 x - 0.100

SY23 the spectral locus

SY34 red boundary: y = 0.138 + 0.580 x

SY45 yellowish white boundary: y = 0.440

SY51 white boundary: y = 0.940 - x

with intersection points:

	x	y
SY_1:	0.454	0.486
SY_2:	0.480	0.519
SY_3:	0.545	0.454
SY_4:	0.521	0.440
SY_5:	0.500	0.440

3-3.2.20.3 "Amber" means the chromaticity coordinates (x,y) of the light emitted that lie inside the chromaticity areas defined by the

boundaries:

A12 green boundary: y = x - 0.120

A23 the spectral locus

A34 red boundary: y = 0.390

A41 white boundary: y = 0.790 - 0.670 x

with intersection points:

	x	y
A_1:	0.545	0.425
A_2:	0.557	0.442
A_3:	0.609	0.390
A_4:	0.597	0.390

3-3.2.20.4 "Red" means the chromaticity coordinates (x,y) of the light emitted that lie inside the chromaticity areas defined by the boundaries:

R12 yellow boundary: y = 0.335

R23 the spectral locus

R34 the purple line (its linear extension across the purple range of colours between the red and the blue extremities of the spectral locus).

R41 purple boundary: y = 0.980 - x

with intersection points:

	x	y
R_1:	0.645	0.335
R_2:	0.665	0.335
R_3:	0.735	0.265
R_4:	0.721	0.259

3-3.2.21 Day-time Colour of the light reflected from a device

3-3.2.21.1 "White" means the chromaticity coordinates (x,y) of the light reflected that lie inside the chromaticity areas defined by the boundaries

W12 violet boundary y = x - 0.030

W23 yellow boundary y = 0.740 - x

W34 green boundary y = x + 0,050

W41 blue boundary y = 0.570 - x

With intersection points:

	x	y
W_1	0.300	0.270
W_2	0.385	0.355
W_3	0.345	0.395
W_4	0.260	0.310

3-3.2.21.2 "Yellow" means the chromaticity coordinates (x,y) of the light reflected that lie inside the chromaticity areas defined by the boundaries:

Y12 red boundary y = 0.534 x + 0.163

Y23 white boundary y = 0.910 - x

Y34 green boundary y =1.342 x - 0.090

Y41 the spectral locus

With intersection points:

	x	y
Y_1	0.545	0.454
Y_2	0.487	0.423
Y_3	0.427	0.483
Y_4	0.465	0.534

3-3.2.21.3 "Red" means the chromaticity coordinates (x,y) of the light reflected that lie inside the chromaticity areas defined by the boundaries:

R12 red boundary y = 0.346 - 0.053 x

R23 purple boundary y = 0.910 - x

R34 yellow boundary y = 0.350

R41 the spectral locus

With intersection points:

	x	y
R_1	0.690	0.310
R_2	0.595	0.315
R_3	0.560	0.350
R_4	0.650	0.350

3-3.2.22 "Exterior Courtesy lamp" means a lamp used to provide supplementary illumination to assist the entry and exit of the vehicle driver and passenger or in loading operations;

3-3.2.23 "Interdependent lamp system" means an assembly of two or three interdependent lamps providing the same function.

3-3.2.23.1 "Interdependent lamp marked "Y"" means a device operating as part of an interdependent lamp system. Interdependent lamps operate together when activated, have separate apparent surfaces in the direction of the reference axis and separate lamp bodies, and may have separate light source(s).

3-3.2.24 "Rear-end collision alert signal (RECAS)" means an automatic signal given by the leading vehicle to the following vehicle. It warns that the following vehicle needs to take emergency action to avoid a collision.

3-3.2.25 "Horizontal inclination adjustment system (HIAS)" means a device that adjusts the horizontal inclination of the headlamp towards zero;

3-3.2.26 Grouped lamps:

(1) Vehicle of category symbol M, N and O: Means devices having separate apparent surfaces in the direction of the reference axis and separate light sources, but a common lamp body;

(2) Vehicle of category symbol L: Means devices having separate illuminating surfaces and separate light sources, but a common lamp body;

3-3.2.27 Combined lamps:

(1) Vehicle of category symbol M, N and O: Means devices having separate apparent surfaces in the direction of the reference axis, but a common light source and a common lamp body;

(2) Vehicle of category symbol L: Means devices having separate illuminating surfaces, but a common light source and a common lamp body;

3-3.2.28 Reciprocally incorporated lamps:

(1) Vehicle of category symbol M, N and O: Means devices having separate light sources or a single light source operating under different conditions (for example, optical, mechanical, electrical differences), totally or partially common apparent surfaces in the direction of the reference axis and a common lamp body;

(2) Vehicle of category symbol L: Means devices having separate light sources or a single light source operating under different conditions (for example, optical, mechanical, electrical differences), totally or partially common illuminating surfaces and a common lamp body;

3-3.2.29 Hazard warning signal" means the simultaneous operation of all of a vehicle's direction-indicator lamps to show that the vehicle temporarily constitutes a special danger to other road users;

3-3.2.30 "Light source module" means an optical part of a device which is specific to that device. It contains one or more non-replaceable light sources and it may optionally contain one or more holders for approved replaceable light sources.

3-3.2.31 "Electronic light source control gear" means one or more components between supply and light source, whether or not integrated with the light source or the applied lamp, to control voltage and/ or electrical current of the light source.

3-3.2.32 "Ballast" means an electronic light source control gear between supply and light source, whether or not integrated with the light source or applied lamp, to stabilise the electrical current of a gas-discharge light source.

3-3.2.33 "*Objective luminous flux*" means:

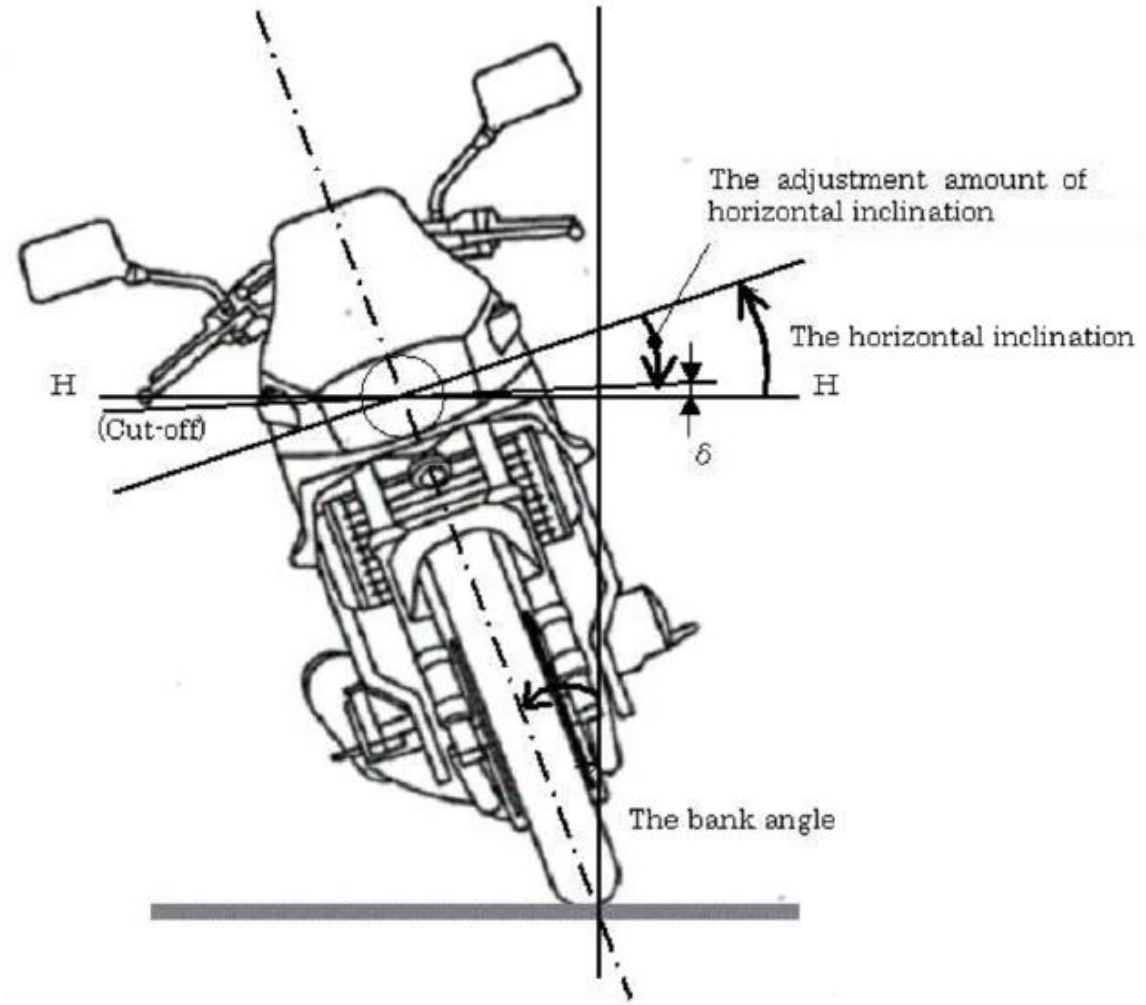
(a) In the case of a light source:

The value of the objective luminous flux, not including any tolerances, as indicated in the relevant data sheet of the applicable light source Regulation according to which the light source is approved;

(b) In the case of an LED module:

The value of the objective luminous flux as indicated in the technical specification submitted with the LED module for approval of the lamp

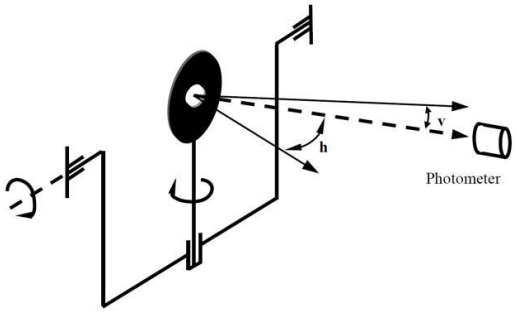
3-3.2.34 "Bank angle" means: the angle made with the vertical by the vertical longitudinal median plane of the motorcycle, when the motorcycle is rotated about its longitudinal axis.



Note: This figure shows the motorcycle is banked to the right side.

3-3.2.35 "Gonio(photo)meter system (If not otherwise specified in a particular Regulation)" means a system used for the photometric measurements specified by the angular coordinates in degrees on a sphere with a vertical polar axis according to CIE publication No. 70,

Vienna 1987, i.e. corresponding to a gonio(photo)meter system with a horizontal ("elevation") axis fixed to the ground and a second, moveable ("rotation") axis perpendicular to the fixed horizontal axis (see Annex 14 to this Regulation). Note: The above mentioned CIE publication specifies a procedure to correct the angular coordinates in the case where an alternative gonio(photo)meter system is used.



3-3.2.36 Sequential activation" means an electrical connection where the individual light sources of a lamp are wired such that they are activated in a predetermined sequence.

3-3.2.37 "Lamps marked "D"" means independent lamps, approved as separate devices in such a way that they are allowed to be used either independently or in an assembly of two lamps to be considered as a "single lamp ".

3-3.3 The principles for regarding applicable types and scope of the installation of lighting and light-signaling devices are as below：

3-3.3.1 The same vehicle category symbol.

3-3.3.2 The same type of vehicle body.

3-3.3.3 The same axle set type.

3-3.3.4 The same brand and vehicle type.

3-3.3.5 The chassis vehicle have had same axle set type.

3-3.3.6 The same chassis brand.

3-3.3.7 Chassis manufacturers announced that the same chassis vehicle type .

3-3.3.8 If use chassis vehicle instead of completed vehicle for entire or partial testing, which shall according to suitable types and range of principle are as below：

3-3.3.8.1 The chassis vehicle have had same axle set type.

3-3.3.8.2 The same brand.

3-3.3.8.3 Chassis manufacturers announced that the same chassis vehicle type.

3-3.4 In the case of motor vehicles and trailers

3-3.4.1 Main-beam headlamp: Prohibited on trailers. Where an AFS is fitted and if it provides main-beam function(s), it shall be considered equivalent to a pair of main-beam headlamps.

3-3.4.1.1 The main-beam headlamp shall conform to requirements concerning “Headlamps” or “Gas-discharge Headlamps” regulated in VSTD.

3-3.4.1.2 Number: Two or four installed symmetrically on vehicle’s both sides. The main-beam headlamp shall conform to requirements concerning “Headlamps (headlamps of gas-discharge type excluded)” or “Gas-discharge Headlamps” regulated in ” VSTD”. For vehicles of the category N3: Two extra main-beam headlamps may be installed. Where a vehicle is fitted with four concealable headlamps the installation of two additional headlamps shall only be authorized for the purpose of light-signalling, consisting of intermittent illumination, at short intervals in daylight.

3-3.4.1.3 The colour of the light emitted by the lamps: white and for both the two side lamps it shall be identical.

3-3.4.1.4 In length: at the front of the vehicle and fitted in such a way that the light emitted does not cause discomfort to the driver either directly or indirectly through the rear-view mirrors and/or other reflecting surfaces of the vehicle.

3-3.4.1.5 Geometric visibility: The visibility of the illuminating surface, including its visibility in areas which do not appear to be illuminated in the direction of observation considered, must be ensured within a divergent space defined by generating lines based on the perimeter of the illuminating surface and forming an angle of not less than 5 degrees with the axis of reference of the headlamp.

3-3.4.1.6 Orientation: Towards the front. Not more than one main-beam headlamp on each side of the vehicle may swivel to produce bend lighting.

3-3.4.1.7 Electrical connections:

3-3.4.1.7.1 The control of the main-beam headlamps may be automatic regarding their activation and deactivation, the control signals being produced by a sensor system which is capable of detecting and reacting to each of the following inputs:

(a) Ambient lighting conditions;

(b) The light emitted by the front lighting devices and front light-signalling devices of oncoming vehicles;

(c) The light emitted by the rear light-signalling devices of preceding vehicles.

Additional sensor functions to improve performance are allowed.

For the purpose of this paragraph, "vehicles" means vehicles of categories L, M, N, O, as well as bicycles, such vehicles being equipped with retro-reflectors, with lighting and light-signalling devices, which are switched ON.

3-3.4.1.7.2 It shall always be possible to switch the main-beam headlamps ON and OFF manually and to manually switch off the automatic control of the main beam head lamps. Moreover, the switching OFF, of the main-beam headlamps and of their automatic control, shall be by means of a simple and immediate manual operation; the use of submenus is not allowed.

3-3.4.1.7.3 The main-beam headlamps may be switched on either simultaneously or in pairs. For changing over from the dipped to the main beam at least one pair of main-beam headlamps shall be switched on. For changing over from the main-beam to the dipped-beam all main-beam headlamps shall be switched off simultaneously. In case the extra two main-beam headlamps are installed, as permitted for vehicles of the category N3 only, no more than two pairs may be simultaneously lit. The dipped-beams may remain switched on at the same time as the main beams.

3-3.4.1.7.4 The electrical connections shall be such that the main-beam and dipped-beam headlamps and the front fog lamps cannot be switched on unless the lamps referred to in paragraph 3-3.4.23. are also switched on. This requirement shall not apply, however, to main-beam or dipped-beam headlamps when their luminous warnings consist of the intermittent lighting up at short intervals of the main-beam headlamp or the intermittent lighting up at short intervals of the dipped-beam headlamp or the alternate lighting up at short intervals of the main-beam and dipped-beam headlamps.

3-3.4.1.7.5 Where four concealable headlamps are fitted their raised position shall prevent the simultaneous operation of any additional headlamps fitted, if these are intended to provide light signals consisting of intermittent illumination at short intervals (paragraph 3-3.4.1.7.4.) in daylight.

3-3.4.1.8 Tell-tale: Circuit-closed tell-tale mandatory.

3-3.4.1.8.1 If the control of the main-beam headlamps is automatic as described in paragraph 3-3.4.1.7.1. above an indication shall be provided to the driver that the automatic control of the main-beam function is activated. This information shall remain displayed as long as the automatic operation is activated.

3-3.4.1.9 Other requirements:

3-3.4.1.9.1 The aggregate maximum intensity of the lighting units that can be energized simultaneously to provide the main-beam lighting or its modes, if any, shall not exceed 430,000 cd, which corresponds to a reference value of 100.

This maximum intensity shall be obtained by adding together the individual reference marks which are indicated on the several headlamps. The reference mark "10" shall be given to each of the headlamps marked "R" or "CR".

3-3.4.1.9.2 The main-beam headlamps may substitute the function of the front position lamps, provided that:

3-3.4.1.9.2.1 Their electrical connections are such that in case of failure of any of these lighting devices the front position lamps are automatically re-activated; and

3-3.4.1.9.2.2 The substituting lamp/function meets, for the respective position lamp, the requirements concerning:

(1) The geometric visibility prescribed for the front position lamps in 3-3.4.3.4; and

(2) The minimum photometric values according to the angles of light distribution; and

3-3.4.1.9.2.3 Appropriate evidence demonstrating compliance with the requirements indicated in paragraph3-3. 4.1.9.2.2. above is provided in the test reports of the substituting lamp.

3-3.4.1.9.3 Automatic activation and deactivation of the main-beam headlamps:

3-3.4.1.9.3.1 The sensor system used to control the automatic activation and deactivation of the main-beam headlamps, as described in paragraph 3-3.4.1.7.1., shall comply with the following requirements:

3-3.4.1.9.3.1.1 The boundaries of the minimum fields in which the sensor is able to detect light emitted or retro reflected from other vehicles defined in paragraph 3-3.4.1.7.1. are defined by the angles indicated below.

3-3.4.1.9.3.1.1.1 Horizontal angles: 15 degrees to the left and 15 degrees to the right.

Vertical angles:

Upward angle	5 deg.		
Mounting height of the sensor (centre of sensor aperture above the ground)	Less than 2 m	Between 1.5 m and 2.5 m	Greater than 2.0 m
Downward angle	2 deg.	2 deg. to 5 deg.	5 deg.

These angles are measured from the centre of the sensor aperture relative to a horizontal straight line through its centre and parallel to the longitudinal median plane of the vehicle.

3-3.4.1.9.3.1.2 The sensor system shall be able to detect on a straight level road:

(a) An oncoming power driven vehicle at a distance extending to at least 400 m;

(b) A preceding power driven vehicle or a vehicle-trailers combination at a distance extending to at least 100 m;

(c) An oncoming bicycle at a distance extending to at least 75 m, its illumination represented by a white lamp with a luminous intensity of 150 cd with a light emitting area of $10cm^2$ +/- $3cm^2$ and a height above a ground of 0.8 m.

To verify compliance with (a) and (b) above, the oncoming and preceding power driven vehicle (or vehicle-trailer combination) shall have position lamps (if applicable) and dipped-beam headlamps switched ON.

3-3.4.1.9.3.2 The transition from main-beam to dipped-beam and vice versa according to the conditions indicated in paragraph 3-3.4.1.7.1. above may be performed automatically and shall not cause discomfort, distraction or glare.

3-3.4.1.9.3.3 The overall performance of the automatic control shall be verified by:

3-3.4.1.9.3.3.1 Means of simulation provided by the applicant. or

3-3.4.1.9.3.3.2 Other means of verification accepted by the authority responsible for type approval testing, or

3-3.4.1.9.3.3.3 A test drive according to paragraph 3-3.9.1 The performance of the automatic control shall be documented and checked against the applicant's description.

3-3.4.1.9.3.4 The control of the main-beam headlamps may be such that the main-beam headlamps are switched ON automatically only when:

(a) No vehicles, as mentioned in paragraph 3-3.4.1.7.1. above, are detected within the fields and distances according to paragraphs 3-3.4.1.9.3.1.1. and 3-3.4.1.9.3.1.2.; and

(b) The detected ambient lighting levels are as prescribed in paragraph 3-3.4.1.9.3.5. below.

3-3.4.1.9.3.5 In the case where main-beam headlamps are switched ON automatically, they shall be switched OFF automatically when oncoming or preceding vehicles, as mentioned in paragraph 3-3.4.1.7.1. above, are detected within the fields and distances according to paragraphs 3-3.4.1.9.3.1.1. and 3-3.4.1.9.3.1.2.

Moreover, they shall be switched OFF automatically when the illuminance produced by ambient lighting conditions exceeds 7000 lx.

Compliance with this requirement shall be demonstrated by the applicant, using simulation or other means of verification accepted by the authority responsible for type approval. If necessary the illuminance shall be measured on a horizontal surface, with a cosine corrected sensor on the same height as the mounting position of

the sensor on the vehicle. This may be demonstrated by the manufacturer by sufficient documentation or by other means accepted by the authority responsible for type approval.

3-3.4.1.10 The applicant shall demonstrate to the Technical Service responsible for type approval testing that the electric power supply conditions for the devices indicated , when the electrical system of the vehicle is in a constant voltage operating condition, representative for the relevant category of powered vehicle as specified by the applicant, with the following provisions:

3-3.4.1.10.1 The voltage supplied at the terminals of devices which, according to their type approval documentation, have been tested by the application of a special power supply/electronic light source control gear, or in a secondary operating mode or at a voltage requested by the applicant, shall not exceed the voltage specified for the relevant devices or functions as they have been approved.

3-3.4.1.10.2 In all cases of electric power supply conditions not covered by paragraph 3-3.4.1.10.1., the voltage at the terminals of the device(s) or function(s) shall not exceed 6.75V (6 Volt- Systems), 13.5V (12 Volt-Systems) or 28.V (24 Volt-Systems) by more than 3 per cent.

The means of controlling the maximum voltage at the terminals of the device may, for convenience, be located within the body of the device.

3-3.4.1.10.3 The provisions of paragraphs 3-3.4.1.10.1 and 3-3.4.1.10.2. shall not apply to devices which include an electronic light source control gear or a variable intensity control being part of the device.

3-3.4.1.10.4 A report shall be attached to the approval documentation describing the methods used to demonstrate compliance and the results obtained.

3-3.4.2 Dipped-beam headlamp: Prohibited on trailers. Where an AFS is fitted, it shall be considered equivalent to a pair of dipped-beam headlamps.

3-3.4.2.1 Number: Two. And the dipped-beam headlamp shall conform to requirements concerning “Headlamps“ or “Gas-discharge Headlamps” regulated in VSTD.

3-3.4.2.2 The colour of the light emitted by the lamps: white and for both the two side lamps it shall be identical.

3-3.4.2.3 Position:

3-3.4.2.3.1 In width: that edge of the apparent surface in the direction of the reference axis which is farthest from the vehicle's

median longitudinal plane shall be not more than 400 mm from the extreme outer edge of the vehicle. The inner edges of the apparent surfaces in the direction of the reference axes shall be not less than 600 mm apart. This does not apply, however, for M1 and N1 category vehicles; for all other categories of motor vehicles this distance may be reduced to 400 mm where the overall width of the vehicle is less than 1,300 mm.

3-3.4.2.3.2 In height: not less than 500 mm and not more than 1,200 mm above the ground. For category N3G (off-road) vehicles, the maximum height may be increased to 1,500 mm.

3-3.4.2.3.3 In length: at the front of the vehicle. This requirement shall be deemed to be satisfied if the light emitted does not cause discomfort to the driver either directly, or indirectly through the rear-view mirrors and/or other reflecting surfaces of the vehicle.

3-3.4.2.4 Geometric visibility:

3-3.4.2.4.1 15 degrees upwards and 10 degrees downwards, 45 degrees outwards and 10 degrees inwards.

3-3.4.2.4.2 The presence of partitions or other items of equipment near the headlamp shall not give rise to secondary effects causing discomfort to other road users.

3-3.4.2.5 Orientation: Towards the front.

3-3.4.2.5.1 Vertical orientation:

3-3.4.2.5.1.1 The initial downward inclination of the cut-off of the dipped-beam to be set in the unladen vehicle state with one person in the driver's seat shall be specified within an accuracy of 0.1 per cent by the manufacturer and indicated in a clearly legible and indelible manner on each vehicle close to either headlamp or the manufacturer's plate by the symbol.

3-3.4.2.5.1.2 Depending on the mounting height in metres (h) of the lower edge of the apparent surface in the direction of the reference axis of the dipped-beam headlamp, measured on the unladen vehicles, the vertical inclination of the cut-off of the dipped-beam shall, under all the static conditions, remain between the following limits and the initial aiming shall have the following values:

3-3.4.2.5.1.2.1 h < 0.8:

limits : between -0.5 % and -2.5 %

initial aiming: between -1.0 % and -1.5 %

3-3.4.2.5.1.2.2 0.8≤h≤1.0:

limits : between -0.5 % and -2.5 %

initial aiming: between -1.0 % and -1.5 %

or, at the discretion of the manufacturer,

limits : between -1.0 % and -3.0 %

initial aiming: between -1.5 % and -2.0 %

3-3.4.2.5.1.2.3 h > 1.0:

limits : between -1.0 % and -3.0 %

initial aiming: between -1.5 % and -2.0 %

3-3.4.2.5.1.2.4 The above limits and the initial aiming values are summarized in the diagram Fig 2 below:

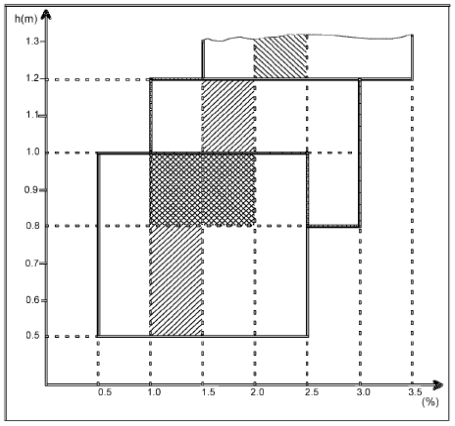


Fig 2

3-3.4.2.5.1.2.5 For category N3G (off-road) vehicles where the headlamps exceed a height of 1,200 mm, the limits for the vertical inclination of the cut-off shall be between: -1.5 % and -3.5 %. The initial aim shall be set between: -2 % and -2.5 %.

3-3.4.2.5.2 Horizontal orientation: The horizontal orientation of one or both dipped-beam headlamps may be varied to produce bend lighting, provided that if the whole beam or the kink of the elbow of the cut-off is moved, the kink of the elbow of

the cut-off shall not intersect the line of the trajectory of the centre of gravity of the vehicle at distances from the front of the vehicle which are larger than 100 times the mounting height of the respective dipped-beam headlamps.

3-3.4.2.6 Electrical connections:

3-3.4.2.6.1 The control for changing over to the dipped-beam must switch off all main-beam headlamps simultaneously.

3-3.4.2.6.2 The dipped beam may remain switched on at the same time as the main beams. In the case of dipped-beam headlamps of the gasdischarge light sources, it shall remain switched on during the main beam operation.

3-3.4.2.6.3 One additional light source or one or more LED module(s), located inside the dipped-beam headlamps or in a lamp (except the main-beam headlamp) grouped or reciprocally incorporated with the respective dipped-beam headlamps, may be activated to produce bend lighting, provided that the horizontal radius of curvature of the trajectory of the centre of gravity of the vehicle is 500 m or less.

3-3.4.2.6.4 Dipped-beam headlamps may be switched ON or OFF automatically. However, it shall be always possible to switch these dipped-beam headlamps ON and OFF manually.

3-3.4.2.6.5 The electrical connections shall be such that the main-beam and dipped-beam headlamps and the front fog lamps cannot be switched on unless the lamps referred to in paragraph 3-3.4.23. are also switched on. This requirement shall not apply, however, to main-beam or dipped-beam headlamps when their luminous warnings consist of the intermittent lighting up at short intervals of the main-beam headlamp or the intermittent lighting up at short intervals of the dipped-beam headlamp or the alternate lighting up at short intervals of the main-beam and dipped-beam headlamps.

3-3.4.2.7 Other requirements:

3-3.4.2.7.1 Headlamp levelling device

3-3.4.2.7.1.1 In the case where a headlamp levelling device is necessary to satisfy the requirements of paragraphs 3-3.4.2.5.1. the device shall be automatic.

3-3.4.2.7.1.2 If comply with following paragraph that paragraph 3-3.4.2.7.1.1 shall be manually, devices which are adjusted manually, either continuously or non-continuously, shall be permitted, provided they have a stop position at which the lamps can be returned to the initial inclination defined in paragraph 3-3.4.2.5.1.1 by means of the usual adjusting screws or similar means. These manually adjustable devices must be operable from the driver's seat.

3-3.4.2.7.1.3 In the event of a failure of devices, the dipped-beam shall not assume a position in which the dip is less than it was at the time when the failure of the device occurred.

3-3.4.2.7.2 Be symmetrical to one another in relation to the median longitudinal plane, this requirement is not valid with regard to the interior structure of the lamp;

3-3.4.2.7.3 With respect to vertical inclination the provisions of paragraph 3-3.4.2.7.1.2. above shall not be applied for dipped-beam headlamps with a light source or LED module(s) producing the principal dipped beam and having an objective luminous flux which exceeds 2,000 lumens.

In the case of filament lamps for which more than one test voltage is specified, the objective luminous flux which produces the principal dipped beam, as indicated in the communication form for the type approval of the device, is applied.

In the case of dipped-beam headlamps equipped with an approved light source, the applicable objective luminous flux is the value at the relevant test voltage as given in the relevant data sheet in the Regulation, according to which the applied light source was approved, without taking into account the tolerances to the objective luminous flux specified on this data sheet.

3-3.4.2.7.4 Only the dipped-beam headlamp that conforms to the gas-discharging type headlamp or asymmetric headlamp may be used to produce bend lighting. And it should have the function to adjust to the normal using position for fail-safe.

3-3.4.2.7.5 If bend lighting is produced by a horizontal movement of the whole beam or the kink of the elbow of the cut-off, it shall be activated only if the vehicle is in forward motion; this shall not apply if bend lighting is produced for a right turn.

3-3.4.2.7.6 The dipped-beam headlamps may substitute the function of the front position lamps, provided that:

3-3.4.2.7.6.1 Their electrical connections are such that in case of failure of any of these lighting devices the front position lamps are automatically re-activated; and

3-3.4.2.7.6.2 The substituting lamp/function meets, for the respective position lamp, the requirements concerning:

(1) The geometric visibility prescribed for the front position lamps in 3-3.4.3.4; and

(2) The minimum photometric values according to the angles of light distribution; and

3-3.4.2.7.6.3 Appropriate evidence demonstrating compliance with the requirements indicated in paragraph 3-3.4.2.7.6.2. above is provided in the test reports of the substituting lamp.

3-3.4.2.7.7 The applicant shall demonstrate to the Technical Service responsible for type approval testing that the electric power supply conditions for the devices indicated , when the electrical system of the vehicle is in a constant voltage operating condition, representative for the relevant category of powered vehicle as specified by the applicant, with the following provisions:

3-3.4.2.7.7.1 The voltage supplied at the terminals of devices which, according to their type approval documentation, have been tested by the application of a special power supply/electronic light source control gear, or in a secondary operating mode or at a voltage requested by the applicant, shall not exceed the voltage specified for the relevant devices or functions as they have been approved.

3-3.4.2.7.7.2 In all cases of electric power supply conditions not covered by paragraph 3-3.4.2.7.7.1., the voltage at the terminals of the device(s) or function(s) shall not exceed 6.75V (6 Volt- Systems), 13.5V (12 Volt-Systems) or 28.V (24 Volt-Systems) by more than 3 per cent.

3-3.4.2.7.7.3 The provisions of paragraphs 3-3.4.2.7.7.1 and 3-3.4.2.7.7.2 shall not apply to devices which include an electronic light source control gear or a variable intensity control being part of the device.

3-3.4.2.7.7.4 A report shall be attached to the approval documentation describing the methods used to demonstrate compliance and the results obtained.

3-3.4.2.8 Tell-tale

3-3.4.2.8.1 Tell-tale optional

3-3.4.2.8.2 A visual tell-tale whether flashing or not is mandatory:

(a) in the case where the whole beam or the kink of the elbow of the cut-off is moved to produce bend lighting, or

(b) if one or more LED modules are used to produce the principal dipped-beam.

It shall be activated:

(a) in the event of a malfunction of the displacement of the kink of the elbow of the cut-off, or

(b) in case of a failure of any one of the LED module(s) producing the principal dipped-beam.

It shall remain activated while the failure is present. It may be cancelled temporarily, but shall be repeated whenever the device, which starts and stops the engine, is switched on and off.

3-3.4.3 Front position lamp: Optional on trailers which are not more than 1,600 mm wide.

3-3.4.3.1 Number: Two. And the front position lamp shall conform to requirements concerning “Front position lamps” regulated in VSTD.

3-3.4.3.2 The colour of the light emitted by the lamps: white.

3-3.4.3.3 Position:

3-3.4.3.3.1 In width: that point on the apparent surface in the direction of the reference axis which is farthest from the vehicle's median longitudinal plane shall not be more than 400 mm from the extreme outer edge of the vehicle. In the case of a trailer, that point on the apparent surface in the direction of the reference axis which is farthest from the median longitudinal plane shall not be more than 150 mm from the extreme outer edge of the vehicle. The distance between the inner edges of the two apparent surfaces in the direction of the reference axes shall: For M1 and N1 category vehicles: have no special requirement; For all other categories of vehicles: be not less than 600 mm. This distance may be reduced to 400 mm where the overall width of the vehicle is less than 1,300 mm.

3-3.4.3.3.2 In height: above the ground, not less than 250 mm nor more than 1,500 mm (2,100 mm for O1 and O2 categories of vehicles, or if for any other categories of vehicles the shape of the bodywork makes it impossible to keep within 1,500 mm).

3-3.4.3.4 Geometric visibility:

3-3.4.3.4.1 Horizontal angle for the two position lamps: 45 degrees inwards and 80 degrees outwards. For M1 and N1 category vehicles where the lower edge of the apparent surface of the lamps is less then 750 mm above the ground, the value of 45 degrees inward may be reduced to 20 degrees under the horizontal plane containing the reference axis of this lamp. In the case of trailers, the angle inwards may be reduced to 5 degrees.

3-3.4.3.4.2 Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees in the case of lamps less than 750 mm above the ground.

3-3.4.3.4.3 For M1 and N1 category vehicles, as an alternative to paragraph 3-3.4.3.4.1 and 3-3.4.3.4.2, at the discretion of the manufacturer or his duly accredited representative, and only if a front side-marker lamp is installed on the vehicle. Horizontal angle: 45 degrees outwards to 45 degrees inwards. Where the lower edge of the apparent surface of the lamps is less then 750 mm above the ground, the value of 45 degrees inward may be reduced to 20 degrees under the horizontal plane containing the reference axis of this lamp. Vertical angle: 15 degrees above and below the

horizontal. The vertical angle below the horizontal may be reduced to 5 degrees if the lamps are less than 750 mm above the ground. To be considered visible, the lamp must provide an unobstructed view of the apparent surface of at least 12.5 cm^2. The illuminating surface area of any retro reflector that does not transmit light shall be excluded.

3-3.4.3.5 Orientation: Forwards.

3-3.4.3.6 Electrical connections: The electrical connections must be such that the front and rear position lamps, the end outline marker lamps, if they exist, the side-marker lamps, if they exist, and the rear registration plate lamp can only be switched on and off simultaneously. This condition does not apply when using front and rear position lamps, as well as side-marker lamps when combined or reciprocally incorporated with said lamps, as parking lamps and when side-marker lamps are permitted to flash. However, if a front position lamp is reciprocally incorporated with a direction-indicator the electrical connection of the front position lamp on the relevant side of the vehicle or the reciprocally incorporated part of it may be such that it is switched off during the entire period (both ON and OFF cycle) of activation of the direction-indicator lamp.

3-3.4.3.7 Tell-tale: Circuit-closed tell-tale mandatory. This tell-tale shall be non-flashing and shall not be required if the instrument panel lighting can only be turned on simultaneously with the front position lamps.

3-3.4.3.8 If one or more infrared radiation generator(s) is (are) installed inside the front position lamp, it (they) is (are) allowed to be activated only when the headlamp on the same side of the vehicle is switched on and the vehicle is in forward motion. In the event that the front position lamp or the headlamp on the same side fails, the infrared radiation generator(s) shall be automatically switched off. In case an AFS providing a bending mode is installed, the front position lamp may be swivelled together with the lighting unit to which it is reciprocally incorporated.

3-3.4.3.9 The applicant shall demonstrate to the Technical Service responsible for type approval testing that the electric power supply conditions for the devices indicated , when the electrical system of the vehicle is in a constant voltage operating condition, representative for the relevant category of powered vehicle as specified by the applicant, with the following provisions:

3-3.4.3.9.1 The voltage supplied at the terminals of devices which, according to their type approval documentation, have been tested by the application of a special power supply/electronic light source control gear, or in a secondary operating mode or at a voltage requested by the applicant, shall not exceed the voltage specified for the relevant devices or functions as they have been approved.

3-3.4.3.9.2 In all cases of electric power supply conditions not covered by paragraph 3-3.4.3.9.1., the voltage at the terminals of the device(s) or function(s) shall not exceed 6.75V (6 Volt- Systems), 13.5V (12 Volt-Systems) or 28.V (24 Volt-Systems) by more than 3 per cent.

3-3.4.3.9.3 The provisions of paragraphs 3-3.4.3.9.1. and 3-3.4.3.9.2. shall not apply to devices which include an electronic light source control gear or a variable intensity control being part of the device.

3-3.4.3.9.4 A report shall be attached to the approval documentation describing the methods used to demonstrate compliance and the results obtained.

3-3.4.4 Rear position lamp

3-3.4.4.1 Number: Two. And the rear position lamp shall conform to requirements concerning “Tail lamps (rear position (side) lamps)” regulated in VSTD.

3-3.4.4.2 The colour of the light emitted by the lamps: red.

3-3.4.4.3 Position: Except the case where end-outline marker lamps are installed, two optional position lamps may be installed on all vehicles in categories M2, M3, N2, N3, O2, O3, and O4.

3-3.4.4.3.1 In width: that point on the apparent surface in the direction of the reference axis which is farthest from the vehicle's median longitudinal plane shall not be more than 400 mm from the extreme outer edge of the vehicle; this condition shall not apply to the optional rear lamps. The distance between the inner edges of the two apparent surfaces in the direction of the reference axes shall: For M1 and N1 category vehicles: have no special requirement; For all other categories of vehicles: be not less than 600 mm. This distance may be reduced to 400 mm where the overall width of the vehicle is less than 1,300 mm.

3-3.4.4.3.2 In height: above the ground, not less than 350 mm nor more than 1,500 mm (2,100 mm if the shape of the bodywork makes it impossible to keep within 1,500 mm and if the optional lamps are not installed. If the optional lamps are installed, they shall be placed at a height compatible with the applicable requirements of the symmetry of the lamps, and at a vertical distance as large as the shape of the bodywork makes it possible, but not less than 600 mm above the mandatory.

3-3.4.4.4 Geometric visibility:

3-3.4.4.4.1 Horizontal angle: 45 degrees inwards and 80 degrees outwards.

3-3.4.4.4.2 Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees in the case of lamps less than 750 mm above the ground. The vertical angle above the horizontal may be reduced to 5 degrees in the case of optional lamps not less than 2,100 mm above the ground.

3-3.4.4.4.3 For M1 and N1 category vehicles, as an alternative to paragraph 3-3.4.4.4.1 and 3-3.4.4.4.2, at the discretion of the manufacturer or his duly accredited representative, and only if a rear side-marker lamp is installed on the vehicle, Horizontal angle: 45 degrees outwards to 45 degrees inwards. Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees if the lamps are less than 750 mm above the ground. To be considered visible, the lamp must provide an unobstructed view of the apparent surface of at least 12.5 cm^2. The illuminating surface area of any retro-reflector that does not transmit light shall be excluded.

3-3.4.4.5 Orientation: Rearwards.

3-3.4.4.6 Electrical connections: The electrical connections must be such that the front and rear position lamps, the end-outline marker lamps, if they exist, the side-marker lamps, if they exist, and the rear registration plate lamp can only be switched on and off simultaneously. This condition does not apply when using front and rear position lamps, as well as side-marker lamps when combined or reciprocally incorporated with said lamps, as parking lamps and when side-marker lamps are permitted to flash. However, if a rear position lamp is reciprocally incorporated with a direction-indicator, the electrical connection of the rear position lamp on the relevant side of the vehicle or the reciprocally incorporated part of it may be such that it is switched OFF during the entire period (both ON and OFF cycle) of activation of the direction-indicator lamp.

3-3.4.4.7 Tell-tale: Circuit-closed tell-tale mandatory. It must be combined with that of the front position lamps.

3-3.4.4.8 The applicant shall demonstrate to the Technical Service responsible for type approval testing that the electric power supply conditions for the devices indicated , when the electrical system of the vehicle is in a constant voltage operating condition, representative for the relevant category of powered vehicle as specified by the applicant, with the following provisions:

3-3.4.4.8.1 The voltage supplied at the terminals of devices which, according to their type approval documentation, have been tested by the application of a special power supply/electronic light source control gear, or in a secondary operating mode or at a voltage requested by the applicant, shall not exceed the voltage specified for the relevant devices or functions as they have been approved.

3-3.4.4.8.2 In all cases of electric power supply conditions not covered by paragraph 3-3.4.4.8.1., the voltage at the terminals of the device(s) or function(s) shall not exceed 6.75V (6 Volt- Systems), 13.5V (12 Volt-Systems) or 28.V (24 Volt-Systems) by more than 3 per cent.

3-3.4.4.8.3 The provisions of paragraphs 3-3.4.4.8.1. and 3-3.4.4.8.2. shall not apply to devices which include an electronic light source control gear or a variable intensity control being part of the device.

3-3.4.4.8.4 A report shall be attached to the approval documentation describing the methods used to demonstrate compliance and the results obtained.

3-3.4.4.9 Any temporary fail-safe replacement of the light-signalling function of a rear position lamp is allowed, provided that it shall:

3-3.4.4.9.1 The replacement function in case of a failure is similar in colour, main intensity and position to the function that has ceased to operate and provided that the replacement device remains operational in its original safety function.

3-3.4.4.9.2 During replacement, a tell-tale on the dashboard (paragraph 3-3.2.7.1 of this Regulation) shall indicate occurrence of a temporary replacement and need for repair.

3-3.4.5 Rear fog lamp:

3-3.4.5.1 Number: One or two shall conform to requirements concerning “rear fog lamp” regulated in VSTD.

3-3.4.5.2 The colour of the light emitted by the lamps: red.

3-3.4.5.3 Position: In length: at the rear of the vehicle.

3-3.4.5.3.1 In width: if there is only one rear fog-lamp, it must be on the opposite side of the median longitudinal plane of the vehicle to the direction of traffic, which is driver’s side, the centre of reference may also be situated on the median longitudinal plane of the vehicle.

3-3.4.5.3.2 In height: not less than 250 mm nor more than 1,000 mm above the ground. For rear fog lamps grouped with any rear lamp or for category N3G (off-road) vehicles, the maximum height may be increased to 1,200 mm.

3-3.4.5.3.3 In all cases, the distance between the rear fog-lamp and each stop-lamp must be greater than 100 mm.

3-3.4.5.4 Geometric visibility:

3-3.4.5.4.1 The horizontal angle: 25 degrees to right and to left.

3-3.4.5.4.2 The vertical angle: 5 degrees upwards and 5 degrees downwards;

3-3.4.5.5 Orientation: Rearwards.

3-3.4.5.6 Electrical connections:

3-3.4.5.6.1 These must be such that: The rear fog-lamp(s) cannot be switched on unless the main beams, dipped beams or front fog-lamps are lit;

3-3.4.5.6.2 The rear fog-lamp(s) can be switched off independently of any other lamp;

3-3.4.5.6.3 Either of the following applies:

3-3.4.5.6.3.1 The rear fog lamp(s) may continue to operate until the position lamps are switched off, and the rear fog lamp(s) shall then remain off until deliberately switched on again;

3-3.4.5.6.3.2 A warning, at least audible, additional to the mandatory tell-tale shall be given if the ignition is switched off or the ignition key is withdrawn and the driver's door is opened, whether the lamps in are on or off, whilst the rear fog lamp switch is in the "on" position.

3-3.4.5.6.4 Except as provided in paragraphs3-3.4.5.6.1, 3-3.4.5.6.3 and 3-3.4.5.6.5, the operation of the rear fog lamp(s) shall not be affected by switching on or off any other lamps.

3-3.4.5.6.5 The rear fog lamp(s) of a drawing motor vehicle may be automatically switched off while a trailer is connected and the rear fog lamp(s) of the trailer is (are) activated.

3-3.4.5.7 Tell-tale: Circuit-closed tell-tale mandatory. An independent non-flashing warning light.

3-3.4.6 Stop lamp:

3-3.4.6.1 The stop lamp shall conform to requirements concerning “Stop-lamp” regulated in VSTD.

3-3.4.6.2 Number: Two S1 or S2 category devices. Except the case where category S3 or S4 device is installed, two optional category S1 or S2 devices may be installed on vehicles in categories M2, M3, N2, N3, O2, O3, and O4.

3-3.4.6.3 The colour of the light emitted by the lamps: red.

3-3.4.6.4 Position:

3-3.4.6.4.1 In width:

3-3.4.6.4.1.1 For M1 and N1 category vehicles: For S1 or S2 categories devices that point on the apparent surface in the direction of the reference axis which is farthest from the vehicle's median longitudinal plane shall not be more than 400 mm from the extreme outer edge of the vehicle;

3-3.4.6.4.1.2 For all other categories of vehicles: For S1 or S2 categories devices the distance in between the inner

edges of the apparent surfaces in the direction of the reference axes shall be not less than 600 mm. This distance may be reduced to 400 mm if the overall width of the vehicle is less than 1,300 mm.

3-3.4.6.4.2 In height: For S1 or S2 categories devices: above the ground, not less than 350 mm nor more than 1,500 mm (2,100 mm if the shape of the bodywork makes it impossible to keep within 1,500 mm and if the optional lamps are not installed. If the optional lamps are installed, they shall be positioned at a height compatible with the requirements of the width and the symmetry of the lamps, and at a vertical distance as large as the shape of the bodywork makes it possible, but not less than 600 mm above the mandatory lamps.)

3-3.4.6.5 Geometric visibility:

3-3.4.6.5.1 Horizontal angle: For S1 or S2 categories devices: 45 degrees to the left and to the right of the longitudinal axis of the vehicle;

3-3.4.6.5.2 Vertical angle: For S1 or S2 categories devices: 15 degrees above and below the horizontal. However, the vertical angle below the horizontal may be reduced to 5 degrees, if the height of the lamp is less than 750 mm. The vertical angle above the horizontal may be reduced to 5 degrees in the case of optional lamps not less than 2,100 mm above the ground;

3-3.4.6.6 Orientation: Towards the rear of the vehicle.

3-3.4.6.7 Electrical connections: All stop lamps must be lighted up simultaneously when the braking system provides the relevant signal defined in regulation of 「Dynamic braking」. The stop lamps need not function if the device which starts and/or stops the engine is in a position which makes it impossible for the engine to operate.

3-3.4.6.8 Tell-tale: Tell-tale optional; where fitted, this tell-tale must be an operating tell-tale consisting of a non-flashing warning light which comes on in the event of the malfunctioning of the stop lamps.

3-3.4.6.9 The applicant shall demonstrate to the Technical Service responsible for type approval testing that the electric power supply conditions for the devices indicated , when the electrical system of the vehicle is in a constant voltage operating condition, representative for the relevant category of powered vehicle as specified by the applicant, with the following provisions:

3-3.4.6.9.1 The voltage supplied at the terminals of devices which, according to their type approval documentation, have been tested by the application of a special power supply/electronic light source control gear, or in a secondary operating

mode or at a voltage requested by the applicant, shall not exceed the voltage specified for the relevant devices or functions as they have been approved.

3-3.4.6.9.2 In all cases of electric power supply conditions not covered by paragraph 3-3.4.6.9.1., the voltage at the terminals of the device(s) or function(s) shall not exceed 6.75V (6 Volt- Systems), 13.5V (12 Volt-Systems) or 28.V (24 Volt-Systems) by more than 3 per cent.

3-3.4.6.9.3 The provisions of paragraphs 3-3.4.6.9.1. and 3-3.4.6.9.2. shall not apply to devices which include an electronic light source control gear or a variable intensity control being part of the device.

3-3.4.6.9.4 A report shall be attached to the approval documentation describing the methods used to demonstrate compliance and the results obtained.

3-3.4.7 High mounted /S3/S4 lamp:

3-3.4.7.1 Number：

3-3.4.7.1.1 Devices of S3 category: one mandatory on M1 category of vehicles and the high mounted /S3 lamp shall conform to requirements concerning “High mounted /S3 lamp” regulated in VSTD, optional on other categories of vehicles.

3-3.4.7.1.2 Only, when the median longitudinal plane of the vehicle is not located on a fixed body panel but separates one or two movable parts of the vehicle (e.g. doors), and lacks sufficient space to install a single device of the S3 or S4 category on the median longitudinal plane above such movable parts, either:

two devices of the S3 or S4 category type "D" may be installed; or

One device of the S3 or S4 category may be installed offset to the left or to the right of the median longitudinal plane, or

an interdependent lamp system of category S3 or S4 may be installed.

3-3.4.7.2 The colour of the light emitted by the lamps: red.

3-3.4.7.3 Position: high mounted /S3 lamp can be installed in externally or internally of the motor vehicle.

3-3.4.7.3.1 In width: For S3 category devices: the centre of reference shall be situated on the median longitudinal plane of the vehicle. However, in the case where the two devices of the S3 category are installed, they shall be positioned as close as possible to the median longitudinal plane, one on each side of this plane. In the case where one S3 category lamp offset from the median longitudinal plane is permitted, this offset shall not exceed 150 mm from the median

longitudinal plane to the centre of reference of the lamp.

3-3.4.7.3.2 In height: For S3 category devices, the horizontal plane tangential to the lower edge of the apparent surface shall: either not be more than 150 mm below the horizontal plane tangential to the lower edge of the exposed surface of the glass or glazing of the rear window, or not be less than 850 mm above the ground.

3-3.4.7.3.3 However, the horizontal plane tangential to the lower edge of the apparent surface of S3 category device shall be above the horizontal plane tangential to the upper edge of the apparent surface of S1 or S2 categories devices specified in paragraph 3-3.4.6.

3-3.4.7.4 Geometric visibility:

3-3.4.7.4.1 Horizontal angle: For S3 category devices: 10 degrees to the left and to the right of the longitudinal axis of the vehicle;

3-3.4.7.4.2 Vertical angle: For S3 category devices: 10 degrees above and 5 degrees below the horizontal.

3-3.4.7.5 Electrical connections: Must light up when the service brake is applied. The stop lamps need not function if the device which starts and/or stops the engine is in a position which makes it impossible for the engine to operate.

3-3.4.7.6 Tell-tale: Tell-tale optional; where fitted, this tell-tale must be an operating tell-tale consisting of a non-flashing warning light which comes on in the event of the malfunctioning of the stop lamps.

3-3.4.7.7 Other requirements

3-3.4.7.7.1 May not be reciprocally incorporated with any other lamp.

3-3.4.7.7.2 May be installed outside or inside the vehicle.

3-3.4.7.7.2.1 In the case where it is installed inside the vehicle: The light emitted shall not cause discomfort to the driver through the devices for indirect vision and/or other surfaces of the vehicle (i.e. rear window).

3-3.4.8 Direction-indicator lamp: Optional on trailers' front direction-indicator lamp.

3-3.4.8.1 The direction-indicator lamp shall conform to requirements concerning "Direction indicator" regulated in VSTD.

3-3.4.8.2 The colour of the light emitted by the lamps: amber.

3-3.4.8.3 Types of direction-indicator lamps fall into categories (1, 1a, 1b, 2a, 2b, 5 and 6) the assembly of which on one vehicle constitutes an arrangement ('A' and 'B') as Fig 3.

3-3.4.8.3.1 Arrangement 'A' shall apply to all motor vehicles: 1, 1a, 1b, 2a, 2b, 5 and 6.

3-3.4.8.3.1.1 Two front direction-indicator lamps of the following categories:

3-3.4.8.3.1.1.1 1 or 1a or 1b, if the distance between the edge of the apparent surface in the direction of the reference axis of this lamp and that of the apparent surface in the direction of the reference axis of the dipped-beam headlamp and/or the front fog lamp, if there is one, is at least 40 mm;

3-3.4.8.3.1.1.2 1a or 1b, if the distance between the edge of the apparent surface in the direction of the reference axis of this lamp and that of the apparent surface in the direction of the reference axis of the dipped-beam headlamp and/or the front fog lamp, if there is one, is greater than 20 mm and less than 40 mm;

3-3.4.8.3.1.1.3 1b, if the distance between the edge of the apparent surface in the direction of the reference axis of this lamp and that of the apparent surface in the direction of the reference axis of the dipped-beam headlamp and/or the front fog lamp, if there is one, is less than or equal to 20 mm;

3-3.4.8.3.1.2 Two rear direction-indicator lamps (category 2a or 2b); two optional lamps (category 2a or 2b) on all vehicles in categories M2, M3, N2, N3;

3-3.4.8.3.1.3 Two side direction-indicator lamps of the categories:

3-3.4.8.3.1.3.1 5, for all M1 vehicles; for N1, M2 and M3 vehicles not exceeding 6 m in length. It is permitted to replace category 5 side direction-indicator lamps by category 6 side direction-indicator lamps in all instances.

3-3.4.8.3.1.3.2 6, for all N2 and N3 vehicles; for N1, M2 and M3 vehicles exceeding 6 m in length.

3-3.4.8.3.1.3.3 For concerns of safety or specific operation of category symbols M and N, two or four optional side direction-indicator lamps (category 5 or 6) may be fitted symmetrically（except 3-3 4.8.3.1.3.4）.

3-3.4.8.3.1.3.4 A maximum of three optional Category 5 or one optional Category 6 device per side on vehicles of type M2, M3, N2 and N3 exceeding 9 m in length.

3-3.4.8.3.1.4 Where lamps combining the functions of front direction-indicator lamps (categories 1, 1a, 1b) and side direction-indicator lamps (categories 5 or 6) are fitted, two additional side direction-indicator lamps (categories 5 or 6) may be fitted to meet the visibility requirements.

3-3.4.8.3.2 Arrangement 'B' shall apply to trailers only. Two rear direction-indicator lamps (categories 2a or 2b). Two or four optional lamps (category 2a or 2b) on all vehicles in categories O2, O3 and O4.

3-3.4.8.3.2.1 A maximum of three optional Category 5 or one optional Category 6 device per side on vehicles of type O2, O3 and O4 exceeding 9 m in length.

3-3.4.8.3.3 Where an AFS is fitted, the distance to be considered for the choice of the category is the distance between the front direction indicator lamp and the closest lighting unit in its closest position contributing to or performing a passing beam mode.

3-3.4.8.4 Position:

3-3.4.8.4.1 In width: the edge of the apparent surface in the direction of the reference axis farthest from the median longitudinal plane of the vehicle must not be more than 400 mm from the extreme outer edge of the vehicle. This condition shall not apply to the optional rear lamps. The distance between the inner edges of the two apparent surfaces in the direction of the reference axes shall not be less than 600 mm. This distance may be reduced to 400 mm where the overall width of the vehicle is less than 1,300 mm.

3-3.4.8.4.2 In height:

3-3.4.8.4.2.1 The height of the light-emitting surface of the side direction-indicator lamps of categories 5 or 6 must not be: less than: 350 mm for M1 and N1 category of vehicles, and 500 mm for all other categories of vehicles, both measured from the lowest point; and more than: 1,500 mm, measured from the highest point.

3-3.4.8.4.2.2 The height of the direction-indicator lamps of categories 1, 1a, 1b, 2a and 2b, shall not be less than 350 mm or more than 1,500 mm.

3-3.4.8.4.2.3 If the structure of the vehicle does not permit these upper limits, measured as specified above, to be respected, and if the optional rear lamps are not installed, they may be increased to 2,300 mm for side direction-indicator lamps of categories 5 and 6, and to 2,100 mm for the direction-indicator lamps of categories 1, 1a, 1b, 2a and 2b.

3-3.4.8.4.2.4 If optional rear lamps are installed, they shall be placed at a height compatible with the applicable requirements of the symmetry of the lamps, and at a vertical distance as large as the shape of the bodywork makes it possible, but not less than 600 mm above the mandatory lamps.

3-3.4.8.4.3 In length: The distance between the light-emitting surface of the side direction-indicator lamp (categories 5 and 6) and the transverse plane which marks the forward boundary of the vehicle's overall length, shall not exceed 1,800 mm. However, this distance shall not exceed 2,500 mm:

(a) for M1 and N1 category vehicles;

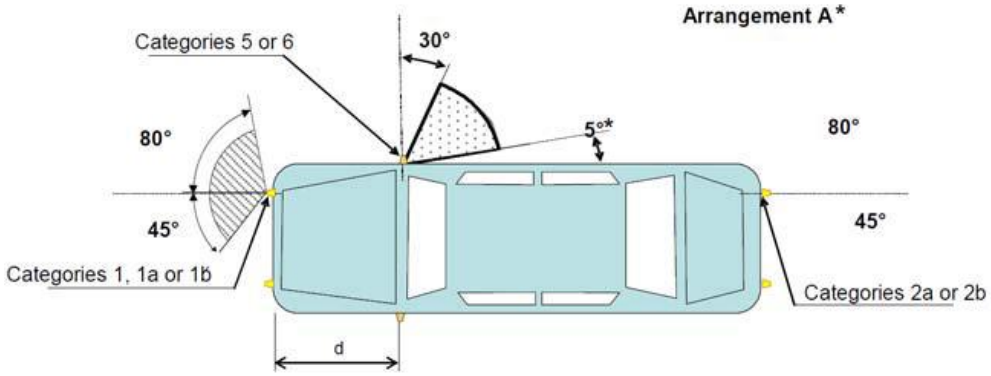
(b) for all other categories of vehicles if the structure of the vehicle makes it impossible to comply with the minimum angles of visibility.

Optional Category 5 side direction indicator lamps, shall be fitted, spaced evenly, along the length of the vehicle.

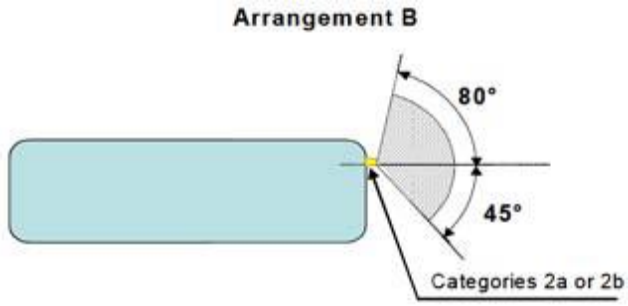
Optional Category 6 side direction indicator lamp shall be fitted in the area between the first and last quartiles of the length of a trailer.

3-3.4.8.5 Geometric visibility:

3-3.4.8.5.1 Horizontal angle: as shown in Fig 3 or, at the discretion of the manufacturer, for M1 and N1 category vehicles: Front and rear direction-indicator lamps, as well as side-marker lamps as shown in Fig 4. To be considered visible, the lamp must provide an unobstructed view of the apparent surface of at least 12.5 cm^2, except for side direction-indicators of categories 5 and 6. The illuminating surface area of any retro-reflector that does not transmit light shall be excluded. The value of 5 degrees given for dead angle of visibility to the rear of the side direction-indicator is an upper limit. d < 1.80 m (for M1 and N1 category vehicles d < 2.50 m).



Arrangement A



Arrangement B

Fig 3. The visibility of direction-indicator lamp -- Horizontal angle

Remark：For M1 and N1 category vehicles, the value of 45 degrees inward for the direction-indicator lamps of categories 1, 1a or 1b, whose lower edge of the apparent surface is less then 750 mm above the ground, may be reduced to 20 degrees under the horizontal plane containing the reference axis of this lamp.

3-3.4.8.5.2 Vertical angles: 15 degrees above and below the horizontal for direction-indicator lamps of categories 1, 1a, 1b, 2a, 2b and 5. The vertical angle below the horizontal may be reduced to 5 degrees if the lamps are less than 750 mm above the ground; 30 degrees above and 5 degrees below the horizontal for direction-indicator lamps of category 6. The vertical angle above the horizontal may be reduced to 5 degrees if the optional rear lamps are not less than 2,100 mm above the ground.

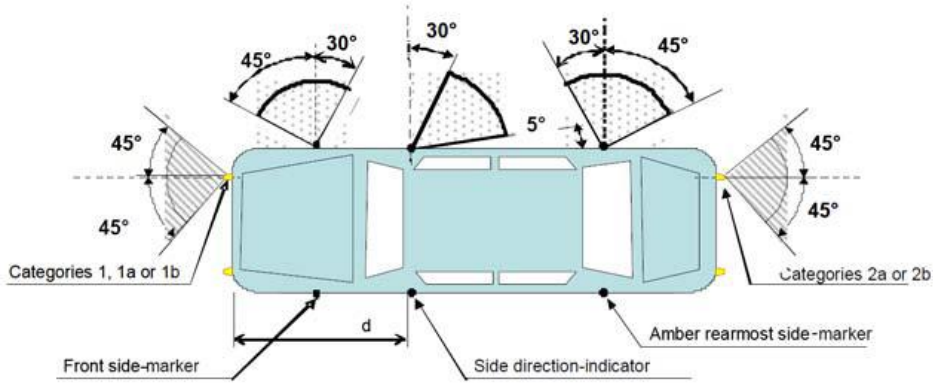


Fig 4. Horizontal angle of front/rear direction-indicator lamp and side-marker lamp

Remark：The value of 45 degrees inward for the direction-indicator lamps of categories 1, 1a or 1b, whose lower edge of the apparent surface is less then 750 mm above the ground, may be reduced to 20 degrees under the horizontal plane containing the reference axis of this lamp.

3-3.4.8.6 Electrical connections: Direction-indicator lamps shall switch on independently of the other lamps. All direction-indicator lamps on one side of a vehicle shall be switched on and off by means of one control and shall flash in phase. On M1 and N1 vehicles less than 6 m in length, the amber side-marker lamps, when mounted, shall also flash at the same frequency (in phase) with the direction indicator lamps.

3-3.4.8.7 The light shall be a flashing light flashing 90 +/- 30 times per minute. Operation of the light-signal control shall be followed within not more than one second by the emission of light and within not more than one and one-half seconds by its first extinction. In the event of failure, other than short-circuit, of one direction-indicator lamp, the others shall continue to flash, but the frequency in this condition may be different from that prescribed.

If a motor vehicle is equipped to draw a trailer, the control of the direction-indicator lamps on the drawing vehicle shall also operate the indicator lamps of the trailer.

3-3.4.8.8 Tell-tale:

3-3.4.8.8.1 Operating tell-tale mandatory for direction indicator lamps of categories 1, 1a, 1b, 2a and 2b. It may be visual or auditory or both. If it is visual it shall be a flashing light which, at least in the event of the malfunction of any of these

direction indicator lamps, is either extinguished, or remains alight without flashing, or shows a marked change of frequency. If it is entirely auditory it shall be clearly audible and shall show a marked change of frequency, at least in the event of the malfunction of any of these direction indicator lamps.

3-3.4.8.8.2 It shall be activated by the signal according to “Direction indicator” regulated in “Directions” or another suitable way.”.

3-3.4.8.8.3 If a motor vehicle is equipped to draw a trailer, it must be fitted with a special visual operational tell-tale for the direction-indicator lamps on the trailer unless the tell-tale of the drawing vehicle allows the failure of any one of the direction-indicator lamps on the vehicle combination thus formed to be detected.

3-3.4.8.8.4 For the optional pair of direction-indicator lamps on trailers, operating tell-tale shall not be mandatory.

3-3.4.9 Rear registration plate lamp:

3-3.4.9.1 The colour of the light emitted by the lamps: white.

3-3.4.9.2 The lamp shall be installed at the upper, lower, right or left side of the rear registration plate.

3-3.4.9.3 The lamp shall be properly shielded, and its light model, shall not affect the vehicles coming from backside.

3-3.4.9.4 Electrical connections: The electrical connections must be such that the front and rear position lamps, the end-outline marker lamps, if they exist, the side-marker lamps, if they exist, and the rear registration plate lamp can only be switched on and off simultaneously. This condition does not apply when using front and rear position lamps, as well as side-marker lamps when combined or reciprocally incorporated with said lamps, as parking lamps and when side-marker lamps are permitted to flash.

3-3.4.9.5 Tell-tale optional. If it exists, its function shall be carried out by the tell-tale required for the front and rear position lamps.

3-3.4.9.6 Other requirements: When the rear registration plate lamp is combined with the rear position lamp, reciprocally incorporated in the stop lamp or in the rear fog lamp, the photometric characteristics of the rear registration plate lamp may be modified during the illumination of the stop lamp or the rear fog lamp.

3-3.4.10 Reversing lamp: Mandatory on M, N, O2, O3 and O4. Optional on O1.

3-3.4.10.1 One device mandatory and a second device optional on motor vehicles of category M1 and on all other vehicles with a length not exceeding 6,000 mm.

3-3.4.10.2 Two devices mandatory and two devices optional on all vehicles with a length exceeding 6,000 mm, except vehicles of category M1.

3-3.4.10.3 The colour of the light emitted by the lamps: white.

3-3.4.10.4 In height: within 250 mm and 1,200 mm above the ground.

3-3.4.10.5 In length: at the back of the vehicle. However, if installed, the two optional devices mentioned in paragraph 3-3.4.10.2 shall befitted on the side or rear of the vehicle, in conformity with the requirements of paragraphs 3-3.4.10.6.

3-3.4.10.6 Geometric visibility: 15 degrees upwards and 5 degrees downwards, 45 degrees to right and to left if there is only one light, 45 degrees outwards and 30 degrees inwards if there are two. The reference axis of the two optional devices mentioned in paragraph 3-3.4.10.2, if fitted on the side of the vehicle shall be orientated sideward horizontally with an inclination of 10 degrees +/- 5 degrees in relation to the median longitudinal plane of the vehicle.

3-3.4.10.7 Orientation: Rearwards or rear-sidewards. In the case of the two optional devices mentioned in paragraph 3-3.4.10.2, if fitted on the side of the vehicle, the requirements of geometric visibility in paragraph 3-3 4.10.6. shall not be applied. However, the reference axis of these devices shall be orientated outwards not more than 15 degrees horizontally towards the rear in relation to the median longitudinal plane of the vehicle.

3-3.4.10.8 They shall be such that the lamp can light up only if the reverse gear is engaged and if the device which controls the starting and stopping of the engine is in such a position that operation of the engine is possible. It shall not light up or remain lit if either of the above conditions is not satisfied.

Moreover, the electrical connections of the two optional devices shall be such that these devices cannot illuminate unless the lamps are switched on.

The devices fitted on the side of the vehicle may be switched on for slow manoeuvres in forward motion of the vehicle up to a maximum speed of 10 km/h, provided that the following conditions are fulfilled:

(a) the devices shall be activated and deactivated manually by a separate switch;

(b) if the switch is activated, they may remain illuminated if the reverse gear is disengaged;

(c) they shall be automatically switched off if the forward speed of the vehicle exceeds 10 km/h, regardless of the position of the separate switch; in this case they shall remain switched off until deliberately being switched on again.

3-3.4.11 Hazard warning signal:

3-3.4.11.1 means the simultaneous operation of all of a vehicle's direction-indicator lamps.

3-3.4.11.2 Electrical connections:

3-3.4.11.2.1 The signal shall be operated by means of a separate control enabling all the direction indicator lamps to flash in phase.

3-3.4.11.2.2 The hazard warning signal may be activated automatically in the event of a vehicle being involved in a collision or after the de-activation of the emergency stop signal, as specified in paragraph 3-3.6.17. In such cases, it may be turned "off" manually.

The hazard warning signal may be switched on automatically to indicate to other road-users the risk of imminent danger; in this case, the signal shall remain switched "on" until it is manually or automatically switched "off".

3-3.4.11.2.3 On M1 and N1 vehicles less than 6 m in length, with an arrangement complying with paragraph 3-3.4.8.5 above, the amber side-marker lamps, when mounted, shall also flash at the same frequency (in phase) with the direction indicator lamps.

3-3.4.11.3 Tell-tale: Flashing circuit-closed tell-tale mandatory.

3-3.4.11.4 If a power-driven vehicle is equipped to draw a trailer the hazard warning signal control shall also be capable of bringing the direction indicator lamps on the trailer into action.

3-3.4.11.5 The hazard warning signal shall be able to function even if the device which starts or stops the engine is in a position which makes it impossible to start the engine.

3-3.4.12 Top lamp of commercial passenger vehicle:

3-3.4.12.1 The lamp should be single lamp.

3-3.4.12.2 The colour of the light emitted by the lamps: not be red.

3-3.4.12.3 Using bolt (the drilling type isn't restricted), metal pressing-stripe or roof frame to fix the lamp at the proper location of roof's front half. Magnetic connection is not allowed.

3-3.4.12.4 The lamp's switch should be connected to interact with the charge counter.

3-3.4.13 Rear retro-reflector, non-triangular: Mandatory on motor vehicles. Provided that they are grouped together with the other rear light-signalling devices, optional on trailers.

3-3.4.13.1 Number: Two, the performances of which shall conform to the requirements of "Retro-reflector" concerning Class IA or IB retro-reflectors regulated in VSTD. If it doesn't influence lights and reflectors' effectiveness that it allow additionally installed retro-reflector and retro-reflective material. (including two retro-reflectors not specified in paragraph 3-3.4.13.3 below),

3-3.4.13.2 The colour of the light emitted by the lamps: red.

3-3.4.13.3 Position: In length: at the rear of the vehicle.

3-3.4.13.3.1 In width: that point on the illuminating surface which is farthest from the vehicle's median longitudinal plane shall not be more than 400 mm from the extreme outer edge of the vehicle. The distance between the inner edges of the two apparent surfaces in the direction of the reference axes shall: For M1 and N1 category vehicles: have no special requirement; For all other categories of vehicles: be not less than 600 mm. This distance may be reduced to 400 mm where the overall width of the vehicle is less than 1,300 mm.

3-3.4.13.3.2 In height: above the ground, not less than 250 mm nor more than 900 mm (not more than 1,200 mm if grouped with any rear lamp(s), 1,500 mm if the shape of the bodywork makes it impossible to keep within 900 mm or 1200 mm respectively).

3-3.4.13.4 Geometric visibility:

3-3.4.13.4.1 Horizontal angle: 30 degrees inwards and outwards.

3-3.4.13.4.2 Vertical angle: 10 degrees above and below horizontal. The vertical angle below the horizontal may be reduced to 5 degrees in the case of a retro-reflector less than 750 mm above the ground.

3-3.4.13.5 The illuminating surface of the retro-reflector may have parts in common with the apparent surface of any other lamp situated at the rear.

3-3.4.14 Rear retro-reflector, triangular: Mandatory on trailers. Prohibited on motor vehicles.

3-3.4.14.1 Number: Two, the performances of which shall conform to the requirements of “Retro-reflector” concerning Class IIIA retro-reflectors regulated in VSTD. If it doesn’t influence lights and reflectors’ effectiveness that it allow additionally installed retro-reflector and retro-reflective material. (including two retro-reflectors not specified in paragraph 3-3.4.14.3 below),

3-3.4.14.2 The colour of the light emitted by the lamps: red.

3-3.4.14.3 Position: In length: at the rear of the vehicle. The apex of the triangle shall be directed upwards.

3-3.4.14.3.1 In width: that point on the illuminating surface which is farthest from the vehicle's median longitudinal plane shall not be more than 400 mm from the extreme outer edge of the vehicle. The inner edges of the retro-reflectors shall not be less than 600 mm apart. This distance may be reduced to 400 mm if the overall width of the vehicle is less than 1,300 mm.

3-3.4.14.3.2 In height: above the ground, not less than 250 mm nor more than 900 mm (not more than 1,200 mm if grouped with any rear lamp(s), 1,500 mm if the shape of the bodywork makes it impossible to keep within 900 mm or 1200 mm respectively).

3-3.4.14.4 Geometric visibility:

3-3.4.14.4.1 Horizontal angle: 30 degrees inwards and outwards.

3-3.4.14.4.2 Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees in the case of a retro-reflector less than 750 mm above the ground.

3-3.4.14.5 The illuminating surface of the retro-reflector may have parts in common with the apparent surface of any other lamp situated at the rear.

3-3.4.15 Front retro-reflector, non-triangular: Mandatory on trailers. Mandatory on motor vehicles having all forward facing lamps with reflectors concealable. Optional on other motor vehicles.

3-3.4.15.1 Number: Two, the performances of which shall conform to the requirements of “Retro-reflector” concerning Class IA or IB retro-reflectors regulated in VSTD. If it doesn’t influence lights and reflectors’ effectiveness that it allow additionally installed retro-reflector and retro-reflective material. (including two retro-reflectors not specified in paragraph 3-3.4.15.3 below),

3-3.4.15.2 Color: identical to incident light (i.e., white or colorless).

3-3.4.15.3 Position: In length: at the front of the vehicle.

3-3.4.15.3.1 In width: that point on the illuminating surface which is farthest from the vehicle's median longitudinal plane shall not be more than 400 mm from the extreme outer edge of the vehicle. In the case of a trailer, the point of the illuminating surface which is farthest from the vehicle's median longitudinal plane shall not be farther than 150 mm from the extreme outer edge of the vehicle. The distance between the inner edges of the two apparent surfaces in the direction of the reference axes shall: For M1 and N1 category vehicles: have no special requirement; For all other categories of vehicles: be not less than 600 mm. This distance may be reduced to 400 mm where the overall width of the vehicle is less than 1,300 mm.

3-3.4.15.3.2 In height: above the ground, not less than 250 mm nor more than 900 mm (1,500 mm if the shape of the bodywork makes it impossible to keep within 900 mm).

3-3.4.15.3.3 Geometric visibility:

3-3.4.15.3.3.1 Horizontal angle: 30 degrees inwards and outwards. In the case of trailers, the angle inwards may be reduced to 10 degrees. If because of the construction of the trailers this angle cannot be met by the mandatory retro-reflectors, then additional (supplementary) retro-reflectors shall be fitted, without the width limitation (paragraph3-3.4.15.3.1), which shall, in conjunction with the mandatory retro-reflectors, give the necessary visibility angle.

3-3.4.15.3.3.2 Vertical angle: 10 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees in the case of a retro-reflector less than 750 mm above the ground.

3-3.4.15.4 The illuminating surface of the retro-reflector may have parts in common with the apparent surface of any other lamp situated at the front.

3-3.4.16 Side retro-reflector, non-triangular: Mandatory: On all motor vehicles the length of which exceeds 6 m. On all trailers. Optional: On motor vehicles the length of which does not exceed 6 m.

3-3.4.16.1 The performances of these devices shall conform to the requirements of “Retro-reflector” concerning Class IA or IB retro-reflectors regulated in VSTD. If it doesn’t influence lights and reflectors’ effectiveness that it allow additionally installed retro-reflector and retro-reflective material. (including two retro-reflectors not specified in paragraph 3-3.4.16.3 below),

3-3.4.16.2 Color: amber; however the rearmost side retro-reflector can be red if it is grouped or has part of the light emitting surface in common with the rear position lamp, the rear end-outline marker lamp, the rear fog lamp, the stop-lamp, the red rearmost side-marker lamp or the rear retro-reflector, non- triangular.

3-3.4.16.3 Position: Side of vehicle.

3-3.4.16.3.1 In height: above the ground, not less than 250 mm nor more than 900 mm (not more than 1,200 mm if grouped with any lamp(s), 1,500 mm if the shape of the bodywork makes it impossible to keep within 900 mm or 1200 mm respectively or if the presence of the device is not mandatory according to paragraph 3-3.4.16).

3-3.4.16.3.2 In length:

3-3.4.16.3.2.1 At least one side retro-reflector must be fitted to the middle third of the vehicle, the foremost side retro-reflector being not further than 3 m from the front; in the case of trailers, account shall be taken of the length of the drawbar for the measurement of this distance.

3-3.4.16.3.2.2 The distance between two adjacent side retro-reflectors shall not exceed 3 m. This does not, however, apply

to M1 and N1 category vehicles. If the structure , design or the operational use of the vehicle make it impossible to comply with such a requirement, this distance may be increased to 4 m. The distance between the rearmost side retro-reflector and the rear of the vehicle shall not exceed 1 m.

3-3.4.16.3.2.3 However, for motor vehicles the length of which does not exceed 6 m, it is sufficient to have one side retro-reflector fitted within the first third and/or one within the last third of the vehicle length. For M1 vehicles the length of which exceeds 6 m but does not exceed 7 m it is sufficient to have one side retro-reflector fitted not further than 3 m from the front and one within the last third of the vehicle length.

3-3.4.16.4 Geometric visibility:

3-3.4.16.4.1 Horizontal angle: 45 degrees to the front and to the rear.

3-3.4.16.4.2 Vertical angle: 10 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees in the case of a retro-reflector less than 750 mm above the ground.

3-3.4.16.5 The illuminating surface of the side retro-reflector may have parts in common with the apparent surface of any other side lamp.

3-3.4.17 Side-marker lamp:

3-3.4.17.1 Mandatory: On all vehicles the length of which exceeds 6 m, except for chassis-cabs; the length of trailers shall be calculated including the drawbar. The SM1 type of side-marker lamp shall be used on all categories of vehicles, and the side-marker lamp shall conform to requirements concerning “Side-marker lamp” regulated in VSTD; however the SM2 type of side-marker lamps may be used on the M1 category of vehicles.

3-3.4.17.2 In addition, on M1 and N1 category vehicles less than 6 m in length, side-marker lamps shall be used, if they supplement the reduced geometric visibility requirements of front position lamps conforming to paragraph 3-3.4.3.4.3 and rear position lamps conforming to paragraph 3-3.4.4.4.3. Optional: On all other vehicles. The SM1 or SM2 types of side-marker lamps may be used and shall conform to requirements concerning “Side-marker lamp” regulated in VSTD.

3-3.4.17.3 The side-marker lamp fitted to other motor vehicles, shall conform to requirements concerning “Side-marker lamp” regulated in VSTD.

3-3.4.17.4 Color: amber; however the rearmost side-marker lamp can be red if it 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 or has part of the

light emitting surface in common with the rear retro-reflector.

3-3.4.17.5 Position:

3-3.4.17.5.1 In height: above the ground, not less than 250 mm nor more than 1,500 mm (2,100 mm if the shape of the bodywork makes it impossible to keep within 1,500 mm).

3-3.4.17.5.2 In length:

3-3.4.17.5.2.1 At least one side-marker lamp must be fitted to the middle third of the vehicle, the foremost side-marker lamp being not further than 3 m from the front; in the case of trailers account shall be taken of the length of the drawbar for the measurement of this distance.

3-3.4.17.5.2.2 The distance between two adjacent side-marker lamps shall not exceed 3 m. If the structure , design or the operational use of the vehicle makes it impossible to comply with such a requirement, this distance may be increased to 4 m. The distance between the rearmost side-marker lamp and the rear of the vehicle shall not exceed 1 m.

3-3.4.17.5.2.3 However, for vehicles the length of which does not exceed 6 m and for chassis-cabs, it is sufficient to have one side-marker lamp fitted within the first third and/or within the last third of the vehicle length. For M1 vehicles the length of which exceeds 6 m but does not exceed 7 m it is sufficient to have one side-marker lamp fitted not further than 3 m from the front and one within the last third of the vehicle length.

3-3.4.17.6 Geometric visibility:

3-3.4.17.6.1 Horizontal angle: 45 degrees to the front and to the rear; however for vehicles on which the installation of the side-marker lamps is optional this value can be reduced to 30 degrees. If the vehicle is equipped with side-marker lamps used to supplement the reduced geometric visibility of front and rear direction indicator lamps conforming to Fig.4 of paragraph 3-3.4.8.5 and/or position lamps conforming to paragraphs 3-3.4.3.4.3 and 3-3.4.4.4.3, the angles are 45 degrees towards the front and rear ends of the vehicle and 30 degrees towards the centre of the vehicle.

3-3.4.17.6.2 Vertical angle: 10 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees in the case of a side-marker lamp less than 750 mm above the ground.

3-3.4.17.7 Orientation: Towards the side.

3-3.4.17.8 Electrical connections: On M1 and N1 category vehicles less than 6 m in length amber side-marker lamps may be wired to

flash, provided that this flashing is in phase and at the same frequency with the direction indicator lamps at the same side of the vehicle.

3-3.4.17.9 Tell-tale: optional. If it exists its function shall be carried out by the tell-tale required for the front and rear position lamps.

3-3.4.17.10 Other requirements: When the rearmost side-marker lamp is combined with the rear position lamp reciprocally incorporated with the rear fog-lamp or stop lamp, the photometric characteristics of the side-marker lamp may be modified during the illumination of the rear fog lamp or stop lamp.

Rear side-marker lamps shall be amber if they flash with the rear direction-indicator lamp.

3-3.4.18 End outline marker lamp:

(a) Devices of A or AM categories (visible from the front), and devices of R, R1, R2, RM1 or RM2 Categories (visible from the rear):

(b)Mandatory on vehicle exceeding 2.10 m in width. Optional on vehicles between 1.80 and 2.10 m in width.

3-3.4.18.1 Number: Two, and the end outline marker lamp shall conform to requirements concerning “End outline marker lamp”, ” Front position lamps” or ” Rear position lamps” regulated in VSTD, and visible from the front and two visible from the rear.

Optional: additional lamps may be fitted as follows:

(a) two visible from the front;

(b) two visible from the rear.

3-3.4.18.2 The colours of the light emitted by the lamps: white in front, red at the rear.

3-3.4.18.3 Position:

3-3.4.18.3.1 In width: Front and rear: as close as possible to the extreme outer edge of the vehicle. This condition is deemed to have been met when the point on the apparent surface in the direction of the reference axis which is farthest from the vehicle's median longitudinal plane is not more than 400 mm from the extreme outer edge of the vehicle.

3-3.4.18.3.2 In height:

3-3.4.18.3.2.1 Front: Motor vehicles - the horizontal plane tangential to the upper edge of the apparent surface in the direction of the reference axis of the device must not be lower than the horizontal plane tangential to the upper edge of the transparent zone of the wind-screen.

Trailers and semi-trailers - at the maximum height compatible with the requirements relating to the width, design and operational requirements of the vehicle and to the symmetry of the lamps.

3-3.4.18.3.2.2 Rear: At the maximum height compatible with the requirements relating to the width, design and operational requirements of the vehicle and to the symmetry of the lamps.

Both optional and mandatory (as applicable) lamps to be fitted as far separated in height as practicable and compatible with design/operational requirements of the vehicle and symmetry of the lamps.

3-3.4.18.3.3 In length, no special requirement.

The additional lamps visible from the front, as specified in paragraph 3-3.4.18.3.2, as close as practicable to the rear. However, the distance between the additional lamps and the rear of the vehicle shall not exceed 400 mm.

3-3.4.18.4 Geometric visibility:

3-3.4.18.4.1 Horizontal angle: 80 degrees outwards.

3-3.4.18.4.2 Vertical angle: 5 degrees above and 20 degrees below the horizontal.

3-3.4.18.5 Electrical connections: The electrical connections must be such that the front and rear position lamps, the end-outline marker lamps, the side-marker lamps, if they exist, and the rear registration plate lamp can only be switched on and off simultaneously. This condition does not apply when using front and rear position lamps, as well as side-marker lamps when combined or reciprocally incorporated with said lamps, as parking lamps and when side-marker lamps are permitted to flash.

3-3.4.18.6 Tell-tale: Tell-tale optional. If it exists, its function shall be carried out by the tell-tale required for the front and rear position lamps.

3-3.4.18.7 Other requirements：

3-3.4.18.7.1 Provided that all other requirements are met, the mandatory or optional lamps, visible from the front and the mandatory or optional lamps visible from the rear on the same side of the vehicle may be combined into one device.

Two of the lamps visible from the rear may be grouped, combined or reciprocally incorporated.

The position of an end-outline marker lamp in relation to corresponding position lamp shall be such that the distance between the projections on a transverse vertical plane of the points nearest to one another on the apparent surfaces in the direction of the respective reference axes of the two lamps considered is not less than 200 mm.

3-3.4.18.7.2 Those who assembled front mirror’s vehicle and the end outline marker lamp that stand with front mirror the same side can except for paragraph 3-3.4.1.8.4, but the others end outline marker lamp shall comply with paragraph 3-3.4.1.8.4.

3-3.4.19 Requirements for lamps and movable components：

3-3.4.19.1 Rear position lamps, rear direction-indicators and rear retro-reflectors（triangular as well as non triangular）may be installed on

movable components in the following conditions:

3-3.4.19.1.1 At any fixed position of the movable components, the position of installation, geometric visibility, colorimetric and photometric requirements for those lamps shall meet the requirements.

3-3.4.19.1.2 In the case where the functions referred to in paragraph 3-3.4.19 are obtained by an assembly of two lamps marked "D", only one of the lamps needs to meet the position, geometric visibility and photometric requirements for those lamps at all fixed positions of the movable components. or

3-3.4.19.1.3 where additional lamps for the above functions are fitted and can be activated at any fixed position, the position of installation, geometric visibility and photometric requirements of the lamps shall meet the requirements applicable to the lamps installed on the movable component.

3-3.4.19.1.4 In the case where the functions referred to in paragraph 3-3.4.19. are obtained by an interdependent lamp system either of the following conditions shall apply:

(a) Should the complete interdependent lamp system be mounted on the moving component(s), the requirements of paragraph 3-3.4.19.1. shall be satisfied. However, additional lamps for the above functions may be activated, when the movable component is in any fixed open position, provided that these additional lamps satisfy all the position, geometric visibility, colorimetric and photometric requirements applicable to the lamps installed on the movable component. or

(b) Should the interdependent lamp system be partly mounted on the fixed component and partly mounted on a movable component, the interdependent lamp(s) specified by the Applicant during the device approval procedure shall meet all the position, outwards geometric visibility, colorimetric and photometric requirements for those lamps, at all fixed positions of the movable component(s). The inwards geometric visibility requirement(s) is(are) deemed to be satisfied if this(these) interdependent lamp(s) still conform(s) to the photometric values prescribed in the field of light distribution for the approval of the device, at all fixed positions of the movable component(s).

3-3.4.19.2 When the movable components are in a position other than a "normal position of use", the lamps installed on the movable components shall not cause discomfort to other road users.

3-3.4.19.3 When the lamp is installed on a movable component and the movable component is in the "normal position(s) of use", the lamp must always return to the position(s) to comply with this Regulation specified by the manufacturer. In the case of dipped-beam headlamps and front fog lamps, this requirement shall be considered satisfactory if, when the movable components are moved and returned to the normal position 10 times, no value of the angular inclination of these lamps, relative to its support, measured after each operation of the movable component, differs by more than 0.15 per cent from the average of the 10 measured values. If above requirement can not be met, when conducting perpendicular illuminating test for dipped-beam lamps, the exceeding value shall be corrected for the limit values according to paragraph 3-3.4.2.5.1.1 to reduce the allowable range of inclinations.

3-3.4.19.4 The apparent surface in the direction of the reference axis of front and rear position lamps, front and rear direction-indicator lamps and retro-reflectors shall not be hidden for more than 50% on any movable component, with or without a light-signalling device installed on it, in any fixed position from the "use range". Fixed position of a movable component means the stable or natural rest position(s) of the movable component specified by the vehicle manufacturer, whether locked or not. If the above requirement can not be met, shall follow at least one of the requirements as below:

3-3.4.19.4.1 Additional lamps satisfying the installation position, geometric visibility, colorimetric and photometric requirements for the above indicated lamps shall be activated when the apparent surface in the direction of the reference axis of these lamps is hidden by the movable component for more than 50% ; or

3-3.4.19.4.2 a remark that more than 50 percent of the apparent surface in the direction of the reference axis can be hidden by the movable components shall be specified in the test report.; and a notice in the vehicle shall inform the driver that in specific position(s) of the movable components other road users shall be warned of the presence of the vehicle on the road; for example by means of a warning triangle or other devices according to national requirements for use on the road. This stipulation does not apply to retro-reflectors; or

3-3.4.19.4.3 Additional installed retro-reflective markings that conform to this regulation.

3-3.4.20 Rear direction indicator lamps, rear position lamps, stop lamps (except stop lamps of category S4) and rear fog lamps with variable luminous intensity control are allowed, which respond simultaneously to at least one of the following external influences: ambient lighting, fog, snowfall, rain, spray, dust clouds, contamination of the light emitting surface, provided that their prescribed intensity relationship is maintained throughout variation transitions. No sharp variation of intensity shall be observed during transition. Stop lamps of category

S4 may produce variable luminous intensity independent from the other lamps. It may be possible for the driver to set the functions above to luminous intensities corresponding to their steady category and to return them to their automatic variable category.

3-3.4.21 In the absence of specific instructions, the photometric characteristics (e.g. intensity, colour, apparent surface, etc.) of a lamp shall not be intentionally varied during the period of activation of the lamp.

3-3.4.21.1 Direction-indicator lamps, the vehicle-hazard warning signal, amber side-marker lamps complying with paragraph6.18.7. below, and the emergency stop signal shall be flashing lamps.

3-3.4.21.2 The photometric characteristics of any lamp may vary in the following condition:

(a) to react to the ambient light;

(b) as a consequence of the activation of other lamps, or

(c) when the lamps is being used to provide another lighting function,

provided that any variation in the photometric characteristics is in compliance with the technical provisions for the lamp concerned.

3-3.4.21.3 The photometric characteristics of a direction indicator lamp of categories 1, 1a, 1b, 2a or 2b may be varied during a flash by sequential activation of light sources as specified in paragraph 31.5.1.10. of “Direction indicator” of VSTD.

This provision shall not apply when direction indicator lamps of categories 2a and 2b are operated as emergency stop signal according to paragraph 3-3.6.17.

3-3.4.22 Grouped, combined or reciprocally incorporated or single lamps

3-3.4.22.1 Lamps may be grouped, combined or reciprocally incorporated with one another provided that all requirements regarding colour, position, orientation, geometric visibility, electrical connections and other requirements, if any, are fulfilled.

3-3.4.22.1.1 The photometric and colorimetric requirements of a lamp shall be fulfilled when all other functions with which this lamp is grouped, combined or reciprocally incorporated are switched OFF.

However, when a front or rear position lamp is reciprocally incorporated with one or more other function(s) which can be activated together with them, the requirements regarding colour of each of these other functions shall be fulfilled when the reciprocally incorporated function(s) and the front or rear position lamps are switched ON.

3-3.4.22.1.2 Stop lamps and direction-indicator lamps are not permitted to be reciprocally incorporated.

3-3.4.22.1.3 Where stop lamps and direction-indicator lamps are grouped, the following conditions shall be met:

3-3.4.22.1.3.1 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;

3-3.4.22.1.3.2 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.

3-3.4.22.2 Single lamps

3-3.4.22.2.1 Single lamps as defined in paragraph 3-3.2.1.1.1, composed of two or more distinct parts, shall be installed in such a way that:

(1) Either the total area of the projection of the distinct parts on a plane tangent to the exterior surface of the outer lens and perpendicular to the reference axis shall occupy not less than 60 per cent of the smallest quadrilateral circumscribing the said projection; or

(2) The minimum distance between the facing edges of two adjacent/tangential distinct parts shall not exceed 75 mm when measured perpendicularly to the reference axis.

These requirements shall not apply to a single retro-reflector."

3-3.4.22.2.2 Single lamps as defined in paragraph 3-3.2.1.1.2 or 3-3.2.1.1.3, composed of two lamps marked "D" or two independent retro reflectors, shall be installed in such a way that:

(1) Either the projection of the apparent surfaces in the direction of the reference axis of the two lamps or retro reflectors occupies not less than 60 per cent of the smallest quadrilateral circumscribing the projections of the said apparent surfaces in the direction of the reference axis; or

(2) The minimum distance between the facing edges of the apparent surfaces in the direction of the reference axis of two lamps or two independent retro reflectors does not exceed 75 mm when measured perpendicularly to the reference axis.

3-3.4.22.2.3 Single lamps as defined in paragraph 3-3.2.1.1.4 shall fulfil the requirements of paragraph 3-3.4.22.2.1.

Where two or more lamps and/or two or more separate apparent surfaces are included into the same lamp body and/or have a common outer lens these shall not be considered as an interdependent lamp system.

However, a lamp in the shape of a band or strip may be part of an interdependent lamp system.

3-3.4.22.2.4 Two lamps or an even number of lamps in the shape of a band or strip shall be placed symmetrically in relation to the median longitudinal plane of the vehicle, extending on both sides to within at least 0.4 m of the extreme outer edge of the vehicle, and are not less than 0.8 m long;

the illumination of such a surface shall be provided by not less than two light sources placed as close as possible to the ends; the light-emitting surface may be constituted by a number of juxtaposed elements on condition that these individual light-emitting surfaces, when projected on a transverse plane fulfil the requirements of paragraph 3-3.4.22.2.1.

3-3.4.23 The electrical connections shall be such that the front and rear position lamps, the endoutline marker lamps, if they exist, the side-marker lamps, if they exist, and the rear registration plate lamp can only be switched ON and OFF simultaneously.

3-3.4.23.1 This condition does not apply:

3-3.4.23.1.1 when front and rear position lamps are switched ON, as well as side-marker lamps when combined or reciprocally incorporated with said lamps, as parking lamps; or

3-3.4.23.1.2 when side-marker lamps flash in conjunction with direction indicators; or

3-3.4.23.2 To front position lamps when their function is substituted under the provisions of paragraph 3-3.4.1.9.2、3-3.4.2.9.1 or 3-3.6.5.8.2 below.

3-3.4.23.3 In the case of an interdependent lamp system, all light sources shall be switched ON and OFF simultaneously.

3-3.4.24 General provisions relating to Geometric Visibility

3-3.4.24.1 There shall be no obstacle on the inside of the angles of geometric visibility to the propagation of light from any part of the apparent surface of the lamp observed from infinity. However, no account is taken of obstacles, if they were already presented when the lamp was type-approved.

3-3.4.24.2 If measurements are taken closer to the lamp, the direction of observation shall be shifted parallel to achieve the same accuracy.

3-3.4.24.3 If, when the lamp is installed, any part of the apparent surface of the lamp is hidden by any further parts of the vehicle, proof shall be furnished that the part of the lamp not hidden by obstacles still conforms to the photometric values prescribed for the approval of the device.

3-3.4.24.4 When the vertical angle of geometric visibility below the horizontal may be reduced to 5 degrees (lamp at less than 750 mm above the ground) the photometric field of measurements of the installed optical unit may be reduced to 5 degrees below the

horizontal.

3-3.4.24.5 In the case of an interdependent lamp system the geometric visibility requirements shall be fulfilled when all its interdependent lamps are operated together.

3-3.4.25 A LED module does not need to be replaceable, if so stated in the communication sheet of the component type approval.

3-3.4.26 Lamps approved with light source(s) according to “Filament lamps” of VSTD, except when such light sources are used as non-replaceable light source(s) as defined in paragraph 3-3.2.10.1.1., shall be fitted in a vehicle in such a way that the light source can be correctly replaced without the need for expert assistance and without the need for special tools, other than those provided with the vehicle by the applicants. The vehicle manufacturer shall provide with the vehicle a detailed description of the procedure for replacement(e.g. owner’s manual of the vehicle).

3-3.4.26.1 In the case where a light source module includes a holder for an approved replaceable light source according to “Filament lamps” of VSTD, this light source shall be replaceable as required in paragraph 3-3.4.26.

3-3.4.27 The lighting and light-signalling devices shall be so fitted that under normal conditions of use as defined in paragraphs 3-3.2.18., 3-3.2.18.1. and 3-3.2.18.2. and notwithstanding any vibrations to which they may be subjected, they retain the characteristics prescribed by this Regulation and enable the vehicle to comply with the requirements of this Regulation. In particular, it shall not be possible for the lamps to be inadvertently maladjusted.

3-3.4.28 The dipped-beam headlamp, driving beam headlamp and front fog lamp shall be so installed that correct adjustment of their orientation can easily be carried out.

3-3.4.29 For all light-signalling devices, including those mounted on the side panels, the reference axis of the lamp when fitted to the vehicle shall be parallel to the bearing plane of the vehicle on the road; in addition it shall be perpendicular to the median longitudinal plane of the vehicle in the case of side retro-reflectors and of side-marker lamps and parallel to that plane in the case of all other signalling devices. In each direction a tolerance of +/- 3 deg. shall be allowed. In addition, any specific instructions as regards fitting laid down by the manufacturer shall be complied with.

3-3.4.30 In the absence of specific instructions lamps constituting a pair shall:

3-3.4.30.1 Be fitted to the vehicle symmetrically in relation to the median longitudinal plane (this estimate to be based on the exterior geometrical form of the lamp and not on the edge of its illuminating surface referred to in paragraph 2.9.);

3-3.4.30.2 Be symmetrical to one another in relation to the median longitudinal plane, this requirement is not valid with regard to the

interior structure of the lamp;

3-3.4.30.3 Satisfy the same colorimetric requirements and have substantially identical photometric characteristics. This shall not apply to a matched pair of Class F3 front fog lamps;

3-3.4.31 On vehicles whose external shape is asymmetrical the above requirements shall be satisfied so far as is possible.

3-3.4.32 Tell-tale

Where a closed-circuit tell-tale is prescribed by this Regulation it may be replaced by an "operating" tell-tale.

3-3.4.33 If the lamp is concealable lamps, the lamp shall:

3-3.4.33.1 The concealment of lamps shall be prohibited, with the exception of the main-beam headlamps, the dipped-beam headlamps and the front fog lamps, which may be concealed when they are not in use.

3-3.4.33.2 In the event of any failure affecting the operation of the concealment device(s) the lamps shall remain in the position of use, if already in use, or shall be capable of being moved into the position of use without the aid of tools.

3-3.4.33.3 It shall be possible to move the lamps into the position of use and to switch them on by means of a single control, without excluding the possibility of moving them into the position of use without switching them on. However, in the case of grouped main-beam and dipped-beam headlamps, the control referred to above is required only to activate the dipped-beam headlamps.

3-3.4.33.4 It shall not be possible deliberately, from the driver's seat, to stop the movement of switched-on lamps before they reach the position of use. If there is a danger of dazzling other road users by the movement of the lamps, they may light up only when they have reached their position of use.

3-3.4.33.5 When the concealment device has a temperature of -30 deg. C to +50 deg. C the headlamps shall be capable of reaching the position of use within three seconds of initial operation of the control.

3-3.4.34 The colours of the light emitted by the lamps are the following:

The colours of the light emitted by the lamps shall comply with each lamp of regulations in VSTD.

3-3.4.35 Number of lamps

3-3.4.35.1 The number of lamps shall comply with each lamp of regulations in VSTD.

3-3.4.36 With the exception of retro-reflectors, a lamp even bearing an approval mark is deemed not to be present when it cannot be made to operate by the sole installation of a light source and/or a fuse.

3-3.5 In the case of motorcycles

3-3.5.1 Driving beam headlamp: Mandatory on L3 and L5. Optional on L1 and L2.

3-3.5.1.1 Number: One or two symmetrically, and the driving beam headlamp shall conform to requirements concerning "Headlamps" or "Gas-discharge Headlamps" regulated in VSTD.

3-3.5.1.1.1 The exhaust amount ≦125 cm^3 of L3 and L5 category motorcycles：shall be two lamps or four lamps installed symmetrically.

3-3.5.1.1.1.1 For class B, C, D or E of symmetrical-beam headlamps。

3-3.5.1.1.1.2 Asymmetrical-beam headlamp。

3-3.5.1.1.2 The exhaust amount ＞125 cm^3 of L3 and L5 category motorcycles：

3-3.5.1.1.2.1 Who installed one or two symmetrically, however, in the case of category L5 with a maximum width exceeding 1,300 mm, two main-beam headlamps symmetrically are required.

3-3.5.1.1.2.1.1 For class B, D or E of symmetrical-beam headlamps。

3-3.5.1.1.2.1.2 Asymmetrical-beam headlamp。

3-3.5.1.1.2.2 Four lamps installed symmetrically：For class C of symmetrical-beam headlamps。

3-3.5.1.1.3 L1 and L2 category motorcycles：shall be two lamps or four lamps installed symmetrically.

3-3.5.1.1.3.1 Symmetrical-beam headlamps。

3-3.5.1.1.3.2 For class A of asymmetrical-beam headlamps。

3-3.5.1.2 The colours of the lights: shall be white. The two lamps installed therein shall have the identical color.

3-3.5.1.3 Position:

3-3.5.1.3.1 Width:

3-3.5.1.3.1.1 an independent driving lamp may be fitted above or below or to one side of another front lamp: if these lamps are on top of the other the reference centre of the driving lamp must be located within the medium longitudinal plane of the vehicle; if these lamps are side by side their reference centre must be symmetrical in relation to the median longitudinal plane of the vehicle.

3-3.5.1.3.1.2 a driving beam headlamp, that is reciprocally incorporated with another front lamp, must be fitted in such a way that its reference centre lies within the median longitudinal plane of the vehicle. However, when the

vehicle is also fitted with an independent principal passing beam headlamp, or a principal passing beam headlamp that is reciprocally incorporated with a front position lamp alongside the driving beam headlamp, their reference centres must be symmetrical in relation to the median longitudinal plane of the vehicle.

3-3.5.1.3.1.3 two driving lamps of which either one or both are reciprocally incorporated with another front lamp must be fitted in such a way that their reference centres are symmetrical in relation to the median longitudinal plane of the vehicle.

3-3.5.1.3.2 The length: at the front of the vehicle. This requirement is regarded as satisfied if the light emitted does not cause discomfort to the driver either directly or indirectly by means of the rear-view mirrors and/or reflective surfaces on the vehicle.

3-3.5.1.3.3 In any case, the distance between the edge of the illumination surface of any independent driving lamp and the edge of that of the lamp producing the principal passing lamp must not exceed 200 mm.

3-3.5.1.3.4 The distance between the edge of the illuminating surface of any independent driving lamp and the ground must be from 500 mm to 1,300 mm.

3-3.5.1.3.5 In the case of two driving lamps: the distance separating the illuminating surfaces of two driving lamps must not exceed 200 mm.

3-3.5.1.4 The visibility of the illuminating surface, including its visibility in areas which do not appear to be illuminated in the direction of observation considered, shall be ensured within a divergent space defined by generating lines based on the perimeter of the illuminating surface and forming an angle of not less than 5 degrees with the axis of reference of the headlamp.

3-3.5.1.5 Orientation:

3-3.5.1.5.1 Forwards. The lamp(s) may move with the steering angle.

3-3.5.1.5.2 An HIAS may be installed for the driving beam.

3-3.5.1.6 Electrical connections: The headlamp may automatically be switched on when the engine is running and the passing beam(s) may remain illuminated with the driving beam(s).

3-3.5.1.7 "Circuit-closed" tell-tale:

3-3.5.1.7.1 Mandatory, non-flashing blue signal lamp.

3-3.5.1.7.2 "HIAS failure" tell-tale：Mandatory, flashing amber signal lamp, which may be combined with the tell-tale referred to

in paragraph 3-3.5.2.7.2. It shall be activated whenever a failure is detected with respect to the HIAS signals. It shall remain activated while the failure is present.

3-3.5.1.8 Other requirements of the L3 category vehicles：

3-3.5.1.8.1 The aggregate maximum intensity of the driving beam headlamps which can be switched on simultaneously shall not exceed 430,000. (The approval value).

3-3.5.1.8.2 In the event of a driving beam HIAS failure, without the use of any special tools, it shall be possible to:

3-3.5.1.8.2.1 Deactivate the HIAS until it is reset according to the applicant instructions; and

3-3.5.1.8.2.2 Re-position the driving beam so that its horizontal and vertical alignments are the same as a headlamp not equipped with HIAS.

The applicant shall provide a detailed description of the procedure for resetting the HIAS.

Alternatively, the applicant may choose to install an automatic system that either achieves both the tasks specified above or resets the HIAS. In this case, the manufacture shall provide the test house with a description of the automatic system and, until such time as harmonized requirements have been developed, demonstrate the means of verifying that the automatic system works as described.

3-3.5.2 Passing beam headlamp:

3-3.5.2.1 Number: One or two symmetrically, and the passing beam headlamp shall conform to requirements concerning “Headlamps” or “Gas-discharge Headlamps” regulated in VSTD.

3-3.5.2.1.1 The exhaust amount ≦125 cm^3 of L3 and L5 category motorcycles：shall be two lamps or four lamps installed symmetrically.

3-3.5.2.1.1.1 For class B, C, D or E of symmetrical-beam headlamps。

3-3.5.2.1.1.2 Asymmetrical-beam headlamp。

3-3.5.2.1.2 The exhaust amount ＞125 cm^3 of L3 and L5 category motorcycles：

3-3.5.2.1.2.1 Who installed one or two symmetrically, however, in the case of category L5 with a maximum width exceeding 1,300 mm, two main-beam headlamps symmetrically are required.

3-3.5.2.1.2.1.1 For class B, D or E of symmetrical-beam headlamps。

3-3.5.2.1.2.1.2 Asymmetrical-beam headlamp。

3-3.5.2.1.2.2 Four lamps installed symmetrically：For class C of symmetrical-beam headlamps。

3-3.5.2.1.3 L1 and L2 category motorcycles：shall be two lamps or four lamps installed symmetrically.

3-3.5.2.1.3.1 Symmetrical-beam headlamps. Headlamps of Class A with LED modules only on vehicles with a maximum design speed not exceeding 25 km/h.

3-3.5.2.1.3.2 For class A of asymmetrical-beam headlamps。

3-3.5.2.2 The colours of the lights: shall be white. The two lamps installed therein shall have the identical color.

3-3.5.2.3 Position:

3-3.5.2.3.1 Width:

3-3.5.2.3.1.1 an independent passing lamp may be installed above, below or to one side of another front lamp: if these lamps are one above the other the reference centre of the lamp producing the principal passing beam must be located within the medium longitudinal plane of the vehicle; if these lamps are side by side their reference centre must be symmetrical in relation to the median longitudinal plane of the vehicle.

3-3.5.2.3.1.2 A headlamp producing the principal passing beam, that is reciprocally incorporated with another front lamp, must be fitted in such a way that its reference centre lies within the median longitudinal plane of the vehicle; However, when the vehicle is also fitted with an independent driving beam headlamp, or a driving beam headlamp that is reciprocally incorporated with a front position lamp alongside the headlamp producing the principal passing beam, their reference centers must be symmetrical in relation to the median longitudinal plane of the vehicle.

3-3.5.2.3.1.3 two headlamps producing the principal passing beam, of which either one or both are reciprocally incorporated with another front lamp must be installed in such a way that their reference centres are symmetrical in relation to the median longitudinal plane of the vehicle.

3-3.5.2.3.1.4 If installed, additional lighting unit(s) which provide bend lighting, type approved as part of the passing beam according to symmetrical-beam headlamp of regulation, shall be installed under the following conditions:

In the case of (a) pair(s) of additional lighting units, they shall be installed so that their reference centre(s) are symmetrical in relation to the median longitudinal plane of the vehicle.

In the case of a single additional lighting unit, its reference center shall be coincident with the medium

longitudinal plane of the vehicle.

3-3.5.2.3.2 Height: a minimum of 500 mm and a maximum of 1,200 mm above the ground.

3-3.5.2.3.3 Length: at the front of the vehicle. This requirement is regarded as satisfied if the light emitted does not cause discomfort to the driver either directly or indirectly by means of the rear-view mirrors and/or reflective surfaces of the vehicle.

3-3.5.2.3.4 In the case of two headlamps producing the principal passing beam the distance separating the illuminating surfaces must not exceed 200 mm. In the case of category vehicles L2 and L5 with two main-beam headlamps, the edges of the illuminating surfaces furthermost from the median longitudinal plane of the vehicle shall not be more than 400 mm from the outermost edge of the vehicle, the internal edges of the illuminating surfaces must be at least 400 mm apart. If the maximum width of the category L5 is more than 1,300 mm, the innermost edges of the illuminating surfaces must be at least 500 mm apart.

3-3.5.2.4 Geometric visibility:

3-3.5.2.4.1 Horizontal angle: 45 degrees to the left and to the right for a single lamp; 45 degrees outwards and 10 degrees inwards for each pair of lamps.

3-3.5.2.4.2 Vertical angle: 15 degrees upwards and 10 degrees downwards;

3-3.5.2.5 Orientation:

3-3.5.2.5.1 Forwards. The lamp(s) may move in line with the steering angle. The vertical inclination of the passing beam headlamp must remain between -0.5 and -2.5 percent, except in the case where an external adjusting device is present.

3-3.5.2.5.2 For headlamp producing the principal passing beam with a light source having an objective luminous flux which exceeds 2,000 lumen, the vertical inclination of the passing beam headlamp shall remain between -0.5 and -2.5 per cent. A headlamp levelling device may be used to satisfy the requirements of this paragraph but its operation shall be automatic.

3-3.5.2.5.3 The requirement in paragraph 3-3.5.2.5.2. shall be tested on the vehicle in the following conditions:

3-3.5.2.5.3.1 Condition A (rider alone): A mass of 75 kg +/- 1 kg, simulating the rider, shall be placed on the vehicle in such a way as to reproduce the axle loads declared by the manufacturer for this loading condition. The vertical inclination

(initial aiming) of the passing beam headlamp shall be set, following the manufacturer's instructions, between -1.0 and -1.5 per cent.

3-3.5.2.5.3.2 Condition B (fully laden motorcycle): Masses, simulating the manufacturer's maximum total mass, shall be placed on the vehicle in such a way as to reproduce the axle loads declared by the manufacturer for this loading condition. Before making the measurements, the vehicle shall be rocked 3 times up and down and then moved backwards and forwards for at least a complete wheel revolution.

3-3.5.2.5.4 An HIAS may be installed for the passing beam. The HIAS shall not adjust the horizontal inclination by more than the vehicle's bank angle.

3-3.5.2.5.5 The requirement in paragraph 3-3.5.2.5.4. shall be tested under the following conditions:

In the absence of specific instructions, the height and orientation of the lamps shall be verified with the vehicle unladen and placed on a flat horizontal surface, its median longitudinal plane being vertical and the handlebars being in the position corresponding to the straight ahead movement. The tyre pressures shall be those prescribed by the applicant for the particular conditions of loading required in this Regulation.

The vehicle shall be tested in the following two conditions:

3-3.5.2.5.5.1 The maximum horizontal inclination adjustment angle specified by the applicant (to left and to right);

3-3.5.2.5.5.2 Half of the maximum horizontal inclination adjustment angle specified by the applicant (to left and to right).

And when the test vehicle is returned to the position as specified in paragraph 3-3.5.2.5.5, the HIAS test angle shall return to zero quickly.

The handlebar may be fixed in the straight ahead position so as not to move during the vehicle inclination.

For the test the HIAS shall be activated by means of an HIAS signal generator.

The system shall be considered to satisfy the requirements of paragraph 3-3.5.2.5.4., if all measured HIAS test angles are not less than zero. This may be demonstrated by the applicant using other means accepted by the authority responsible for type approval.

3-3.5.2.5.6 Additional light source(s) or additional lighting unit(s) may be activated only in conjunction with the principal passing beam to produce bend lighting. The illumination provided by the bend lighting shall not extend above the horizontal plane, that is parallel with the ground and containing the reference axis of the headlamp producing the principal passing beam for

all bank angles as specified by the manufacture during type approval of the device according to symmetrical-beam headlamp of regulation.

3-3.5.2.5.7 The requirement in paragraph 3-3.5.2.5.6. shall be tested as follows:

The test vehicle shall be set as specified in paragraph 3-3.5.2.5.5.

Measure the bank angles on both sides of the vehicle under every condition where the bend lighting is activated. The bank angles to measure are the bank angles specified by the manufacturer during type approval of the device according to symmetrical-beam headlamp of regulation.

The handlebar may be fixed in the straight ahead position so as not to move during the vehicle inclination.

For the test, the bend lighting may be activated by means of a signal generator provided by the manufacturer.

The system is considered to satisfy the requirements of paragraph 3-3.5.2.5.6., if all measured bank angles on both sides of the vehicle are greater than or equal to the minimum bank angles given in the communication form for the type approval of the device according to symmetrical-beam headlamp of regulation. Conformity to paragraph 3-3.5.2.5.6. may be demonstrated by the manufacturer using other means accepted by the authority responsible for type approval.

3-3.5.2.6 Electrical connections:

3-3.5.2.6.1 The headlamp may automatically be switched on when the engine is running and the control for passing beam(s) shall be switched off when changing over to the driving beam(s) , Passing beam headlamps with a HID light source approved in accordance with ”Filament Lamps” of VSTD shall remain switched on when the driving-beam is illuminated.

3-3.5.2.6.2 The additional light source(s) or additional lighting unit(s) used to produce bend lighting shall be so connected that it (they) cannot be activated unless the headlamp(s) producing the principal passing beam is(are) also activated.

The additional light source(s) or additional lighting unit(s) used to produce bend lighting on each side of the vehicle may only be automatically activated when the bank angle(s) is(are) greater or equal to the minimum bank angle(s) given in the communication form for the type approval of the device according to symmetrical-beam headlamp of regulation.

However, the additional light source(s) or additional lighting unit(s) shall not be activated when the bank angle is less

than 5 degrees.

The additional light source(s) or additional lighting unit(s) shall be deactivated when the bank angle(s) is (are) less than the minimum bank angle(s) given in the communication form for the type approval of the device according to symmetrical-beam headlamp of regulation.

3-3.5.2.6.3 The electrical connections shall be such that the front position lamp or the passing beam headlamp, if there is no front position lamp, the rear position lamp and the rear-registration- plate illuminating device cannot be switched ON or OFF otherwise than simultaneously.

3-3.5.2.6.4 In the absence of specific instructions, the electrical connection shall be such that the driving beam headlamp, the passing beam headlamp and the fog lamp cannot be switched on unless the lamps referred to in paragraph 3-3.5.2.6.3. above are likewise switched on. This requirement need not, however, be satisfied in the case of the driving beam headlamp and passing beam headlamp where their luminous warnings consist in switching on the passing beam headlamp intermittently, at short intervals, or in switching on the driving beam headlamp intermittently, or in switching on the passing beam headlamp and driving-beam headlamp alternately at short intervals.

3-3.5.2.6.4.1 If installed, the daytime running lamp shall automatically be ON when the engine is running. If the headlamp is switched on, the daytime running lamp shall not come on when the engine is running.

If no daytime running lamp is installed, the headlamp shall automatically be on when the engine is running.

3-3.5.2.7 Tell-tale:

3-3.5.2.7.1 "Circuit-closed" tell-tale. Optional; non-flashing green signal lamp.

3-3.5.2.7.2 "HIAS failure" tell-tale：Mandatory, flashing amber signal lamp, which may be combined with the tell-tale referred to in paragraph 3-3.5.1.7.2. It shall be activated whenever a failure is detected with respect to the HIAS signals. It shall remain activated while the failure is present."

3-3.5.2.7.3 In the event of a control system failure, additional light source(s) or additional lighting unit(s) producing bend lighting shall be switched OFF automatically.

3-3.5.2.8 Other requirements：

In the event of a passing beam HIAS failure, without the use of any special tools, it shall be possible to:

3-3.5.2.8.1 Deactivate the HIAS until it is reset according to the applicant s instructions; and

3-3.5.2.8.2 Re-position the passing beam so that its horizontal and vertical alignments are the same as a headlamp not equipped with HIAS.

The applicant shall provide a detailed description of the procedure for resetting the HIAS.

Alternatively, the applicant may choose to install an automatic system that either achieves both tasks specified above or resets the HIAS. In this case, the manufacture shall provide the test house with a description of the automatic system and, until such time as harmonized requirements have been developed, demonstrate the means of verifying that the automatic system works as described.

3-3.5.3 Rear position lamp:

3-3.5.3.1 Number: One or two, however, in the case of category L5 with a maximum width exceeding 1,300 mm, two rear position lamps symmetrically are required, and the rear position lamp shall conform to requirements concerning “Tail lamps (rear position (side) lamps)” regulated in VSTD.

3-3.5.3.2 The colours of the lights: red.

3-3.5.3.3 Position: in height: not less than 250 mm nor more than 1,500 mm above the ground; In the case of L2 and L5 category vehicles, the reference centre must be located within the median longitudinal plane of the vehicle if there is only one position lamp; if there are two position lamps these must be symmetrical to the median longitudinal plane of the vehicle. In the case of vehicles with two rear wheels these must be at least 600 mm apart. This distance must be reduced to 400 mm if the maximum width of the vehicle is less than 1,300 mm.

3-3.5.3.4 Geometric visibility:

3-3.5.3.4.1 Horizontal angle: 80 degrees to left and to right for a single lamp: the horizontal angle may be 80 degrees outwards and 45 degrees inwards for each pair of lamps.

3-3.5.3.4.2 Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees , however, if the height of the lamp is less than 750 mm.

3-3.5.3.5 Orientation: Rearwards.

3-3.5.3.6 "Circuit-closed" tell-tale: Optional: Its function shall be performed by the device prescribed for the front position lamp.

3-3.5.3.7 If a rear position lamp is reciprocally incorporated with a direction indicator, the electrical connection of the rear position lamp on the relevant side of the vehicle or the reciprocally incorporated part of it may be such that it is switched OFF during the

entire period (both ON and OFF cycle) of activation of the direction indicator lamp.

3-3.5.4 Stop lamp:

3-3.5.4.1 Number: One or two, however, in the case of category L5 with a maximum width exceeding 1,300 mm, two stop lamps symmetrically are required, and the stop lamp shall conform to requirements concerning "Stop lamp" regulated in VSTD.

3-3.5.4.1.1 Grouped, combined or reciprocally incorporated lamps

3-3.5.4.1.1.1 Lamps may be grouped, combined or reciprocally incorporated with one another provided that all requirements regarding colour, position, orientation, geometric visibility, electrical connections and other requirements, if any, are fulfilled.

3-3.5.4.1.1.1.1 The photometric and colorimetric requirements of a lamp shall be fulfilled when all other functions with which this lamp is grouped, combined or reciprocally incorporated are switched OFF.

However, when a front or rear position lamp is reciprocally incorporated with one or more other function(s) which can be activated together with them, the requirements regarding colour of each of these other functions shall be fulfilled when the reciprocally incorporated function(s) and the front or rear position lamps are switched ON.

3-3.5.4.1.1.1.2 Stop lamps and direction indicator lamps are not permitted to be reciprocally incorporated.

3-3.5.4.1.1.1.3 However, where stop lamps and direction indicator lamps are grouped, 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.

3-3.5.4.1.2 Where the apparent surface of a single lamp is composed of two or more distinct parts, it shall satisfy the following requirements: Either the total area of the projection of the distinct parts on a plane tangent to the exterior surface of the transparent material and perpendicular to the reference axis shall occupy not less than 60 per cent of the smallest quadrilateral circumscribing the said projection, or the distance between two adjacent/tangential distinct parts shall not exceed 15 mm when measured perpendicularly to the reference axis.

3-3.5.4.2 The colours of the lights: red.

3-3.5.4.3 Position: in height: not less than 250 mm nor more than 1,500 mm above the ground; In the case of L2 and L5 category vehicles, if there is only one stop lamp its centre of reference must lie within the median longitudinal plane of the vehicle, or if

there are two stop lamps they must be symmetrical to the median longitudinal plane of the vehicle. In the case of vehicles with two rear wheels these must be at least 600 mm apart. This distance must be reduced to 400 mm if the maximum width of the vehicle is less than 1,300 mm.

3-3.5.4.4 Geometric visibility:

3-3.5.4.4.1 Horizontal angle: 45 degrees to left and to right for a single lamp; 45 degrees outwards and 10 degrees inwards for each pair of lamps;

3-3.5.4.4.2 Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees , however, if the height of the lamp is less than 750 mm.

3-3.5.4.5 Orientation: Towards the rear of the vehicle.

3-3.5.4.6 Electrical connections: Shall light up at any service brake application.

3-3.5.4.7 Tell-tale optional; where fitted, this tell-tale shall be a tell-tale consisting of a non-flashing warning light which comes on in the event of the malfunctioning of the stop lamps.

3-3.5.5 Direction-indicator lamp: Mandatory on L2 with closed bodywork , L3 and L5. Optional on L1 and L2 without closed bodywork.

3-3.5.5.1 Number and arrangement: Two front indicators (category 1 or category 11 shall conform to requirements concerning “Direction-indicator lamp” regulated in “Stardards”); Two rear indicators (category 2 or category 12 conform to requirements concerning “Direction-indicator lamp” regulated in VSTD).

3-3.5.5.2 The colours of the lights: orange (amber).

3-3.5.5.3 Position:

3-3.5.5.3.1 In width:

3-3.5.5.3.1.1 For front indicators, there shall be a minimum distance of 240 mm between illuminating surfaces,

3-3.5.5.3.1.2 For front indicators, the indicators shall be situated outside the longitudinal vertical plane tangential to the outer edges of the illuminating surface of the driving beam(s) and/or principal passing beam(s),

3-3.5.5.3.1.3 For front indicators, there shall be a minimum distance between the illuminating surface of the indicators and headlamp producing the principal passing beam closest to one another as follows:

Minimum Indicator intensity (cd)	Minimum Separation (mm)
90	75
175	40
250	20
400	≦20

3-3.5.5.3.1.4 For rear indicators, the clearance between the inner edges of the two illuminating surfaces shall be at least 180 mm; in case of vehicles of L1 category symbol, the clearance between the inner edges of the two apparent surfaces shall be at least 160mm.

3-3.5.5.3.1.5 Category symbols L2 and L5: the edges of the illuminating surface furthest from the median longitudinal plane must also not be more than 400 mm from the outermost part of the vehicle, the internal edges of the illuminating surfaces must be at a distance of at least 500 mm.

3-3.5.5.3.2 In height: not less than 350 mm nor more than 1,200 mm above the ground; In the case of L2 and L5 category vehicles, minimum 350 mm, maximum 1,500 mm above the ground.

3-3.5.5.3.3 In length: the forward distance between the centre reference of the rear indicators and the transverse plane which constitutes the rearmost limit of the vehicle's over-all length shall not exceed 300 mm.

3-3.5.5.4 Geometric visibility:

3-3.5.5.4.1 Horizontal angle: 20 degrees inwards and 80 degrees outwards.

3-3.5.5.4.2 Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees, however, if the height of the lamp is less than 750mm.

3-3.5.5.5 Orientation: The front direction-indicators may move in line with the steering angle. May not be "reciprocally incorporated" with any other lamp, except amber front position lamp.

3-3.5.5.6 Electrical connections: Direction-indicator lamps shall switch on independently of the other lamps. All direction-indicator lamps on one side of a vehicle shall be switched on and off by means of one control.

3-3.5.5.7 The light flashing frequency shall be 90 +/- 30 times per minute; operation of the light-signal control shall be followed within

not more than one second by the appearance of the light and within not more than one-and-one half seconds by the first extinction of the light.

3-3.5.5.8 Tell-Tale: Mandatory. This may be optical or auditory or both. If it is optical it shall be (a) flashing green lamp(s), which, in the event of defective operation of any of the direction indicators, is extinguished, remains alight without flashing, or shows a marked change of frequency.

3-3.5.6 Rear-Registration-Plate illuminating device:

3-3.5.6.1 The colours of the lights: white.

3-3.5.6.2 Number: One. The device may consist of several optical components designed to illuminate the space reserved for the registration plate.

3-3.5.6.3 Position: Such that the device illuminates the space reserved for the registration plate.

3-3.5.7 Front position lamp: Mandatory on L2, L3 and L5. Optional on L1.

3-3.5.7.1 The front position lamp shall conform to requirements concerning “Front position lamp” regulated in VSTD.

3-3.5.7.2 The colours of the lights: white. Number: One or two if coloured white, however, in the case of category L5 with a maximum width exceeding 1,300 mm, two front position lamps symmetrically are required; or two (one per side) if coloured amber. This regulation is not included in paragraph 3-3.5.7.2.1.

3-3.5.7.2.1 The colour of the lights is white for L1.

3-3.5.7.3 Position: in length: at the front of the vehicle.

3-3.5.7.3.1 In width:

3-3.5.7.3.1.1 an independent front position lamp may be fitted above or below, or to one side of another front lamp: if these lamps are one above the other, the reference centre of the front position lamp must be located within the median longitudinal plane of the vehicle; if these lamps are side by side, their reference centres must be symmetrical in relation to the median longitudinal plane of the vehicle;

3-3.5.7.3.1.2 a front position lamp, that is reciprocally incorporated with another front lamp, must be installed in such a way that its reference centre is situated in the median longitudinal plane of the vehicle. However, when the vehicle is also fitted with another front lamp alongside the front position lamp, their reference centres must be symmetrical in relation to the median longitudinal plane of the vehicle.

3-3.5.7.3.1.3 Two front position lamps, one or both of them reciprocally incorporated with another front lamp, must be installed in such a way that their reference centres are symmetrical in relation to the median longitudinal plane of the vehicle.

3-3.5.7.3.1.4 In the case of a L2 and L5 category vehicles with two front position lamps: the edges of the illuminating surface furthest from the median longitudinal plane of the vehicle must not be more than 400 mm from the outermost part of the vehicle, the internal edges of the illuminating surfaces must be at least 400 mm apart. The internal edges of the illuminating surfaces must be at least 500 mm apart if the maximum width of the category L5 is more than 1,300 mm.

3-3.5.7.3.2 In height: in height: not less than 350 mm nor more than 1,200 mm above the ground.

3-3.5.7.4 Geometric visibility:

3-3.5.7.4.1 Horizontal angle: 80 degrees to the left and to the right for a single lamp: the horizontal angle may be 80 degrees outwards and 20 degrees inwards for each pair of lamps.

3-3.5.7.4.2 Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees , however, if the height of the lamp is less than 750 mm.

3-3.5.7.5 Orientation: Forwards. The lamp(s) may move in line with the steering angle.

3-3.5.7.6 "Circuit-closed" tell-tale: Mandatory. Non-flashing green signal lamp. This tell-tale shall not be required if the instrument illumination lighting can be switched on or off only simultaneously with the position lamp(s).

3-3.5.7.7 Other requirements: When the front position lamp is reciprocally incorporated in the front direction indicator lamp, the electrical connection shall be such that the position lamp on the same side as the direction indicator lamp is switched off when the direction indicator lamp is flashing.

3-3.5.8 Rear retro-reflector, non-triangular:

3-3.5.8.1 Number: One or two, however, in the case of L2 and L5 category vehicles with a maximum width exceeding 1,000 mm, two non-triangular rear reflectors are required. The performances of which shall conform to the requirements of “Retro-reflector” concerning Class IA or IB retro-reflectors regulated in VSTD. In the case of a L2 and L5 category vehicles with two rear retro-reflectors: the point of the illuminating surface furthest from the median longitudinal plane of the vehicle must not be more than 400 mm from the outermost part of the vehicle, the internal edges of the retro-reflectors must be at least 400 mm

apart. The internal edges of the illuminating surfaces must be at least 500 mm apart if the maximum width of the category L5 is more than 1,300 mm.

3-3.5.8.2 The colours of the lights: red.

3-3.5.8.3 Position: in height: not less than 250 mm nor more than 900 mm above the ground;

3-3.5.8.4 Geometric visibility:

3-3.5.8.4.1 Horizontal angle: 30 degrees to left and to right for a single reflector; 30 degrees outwards and 10 degrees inwards for each pair of reflectors;

3-3.5.8.4.2 Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees , however, if the height of the lamp is less than 750 mm.

3-3.5.8.5 Orientation: Rearwards.

3-3.5.9 Side retro-reflector, non-triangular:

3-3.5.9.1 Number: One or two, the performances of which shall conform to the requirements of “Retro-reflector” concerning Class IA or IB retro-reflectors regulated in VSTD.

3-3.5.9.2 The colours of the lights: amber at the front, amber or red at the rear

3-3.5.9.3 Position: on the side of the vehicle.

3-3.5.9.3.1 In height: in case of vehicles of L1 category symbol, not less than 300mm or more than 1,000mm above the ground;

3-3.5.9.3.2 In height: in case of L2, L3 and L5 category vehicles, not less than 300mm nor more than 900mm above the ground;

3-3.5.9.3.3 In length: should be placed in such a position that under normal conditions it may not be masked by the driver's or passenger's clothes.

3-3.5.9.4 Geometric visibility:

3-3.5.9.4.1 Horizontal angle: 30 degrees to the front and to the rear.

3-3.5.9.4.2 Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees , however, if the height of the retro-reflector is less than 750 mm.

3-3.5.9.5 Orientation: The reference axis of the retro-reflectors must be perpendicular to the vehicle's median longitudinal plane and directed outwards. The front side retro-reflectors may move with the steering angle.

3-3.5.10 Pedal retro-reflectors: Mandatory on L1 and L2.

3-3.5.10.1 Number: Four retro-reflectors or retro-reflector groups, the performances of which shall conform to the requirements of “Retro-reflector” concerning Class IA or IB retro-reflectors regulated in the VSTD.

3-3.5.10.2 The colours of the lights: orange (amber).

3-3.5.10.3 Other requirements:

3-3.5.10.3.1 The outer faces of the illuminating surface of the retro-reflectors shall be recessed into the body of the pedal.

3-3.5.10.3.2 The retro-reflectors shall be mounted in the pedal body in such a way as to be clearly visible both to the front and to the rear of the vehicle. The reference axis of such retro-reflectors, the shape of which shall be adapted to that of the pedal body, shall be perpendicular to the pedal axis.

3-3.5.10.3.3 Pedal retro-reflectors shall be fitted only to those pedals of the vehicle which, by means of cranks or similar devices, can be used to provide a means of propulsion alternative to the engine.

3-3.6 The motor vehicle can install the auxiliary lamps and marks that can conform to the following regulations, under the consideration of driving safety or specific operations.

3-3.6.1 Identification lamp for large vehicles:

3-3.6.1.1 The colours of the lights: red, yellow or green at the front; red at the rear. The identification lamp that has no speed-indicating function at the vehicle’s front side shall not use green color.

3-3.6.1.2 Number: three at the front and three at the rear. The one with the speed-indicating function shall orient forwards.

3-3.6.2 Cornering lamp:

3-3.6.2.1 Number: Two.

3-3.6.2.2 The colours of the lights: white.

3-3.6.2.3 Position:

3-3.6.2.3.1 In width: one cornering lamp shall be located on each side of the vehicle's median longitudinal plane.

3-3.6.2.3.2 In height: minimum: Not less than 250 mm above the ground; maximum: Not more than 900 mm above the ground; However, no point on the apparent surface in the direction of the reference axis shall be higher than the highest point on the apparent surface in the direction of the reference axis of the dipped-beam headlamp.

3-3.6.2.3.3 In length: not further than 1,000 mm from the front.

3-3.6.2.4 Geometric visibility:

3-3.6.2.4.1 Horizontal angle: 30 degrees to 60 degrees outwards.

3-3.6.2.4.2 Vertical angle: 10 degrees upwards and downwards.

3-3.6.2.5 Orientation: Such that the lamps meet the requirements for geometric visibility.

3-3.6.2.6 Electrical connections:

The cornering lamps must be so connected that they cannot be activated unless the mainbeam headlamps or the dipped-beam headlamps are switched ON at the same time.

3-3.6.2.6.1 The cornering lamps must be so connected that they cannot be activated unless the mainbeam headlamps or the dipped-beam headlamps are switched ON at the same time. The cornering lamp on one side of the vehicle may only be switched ON automatically when the direction indicators on the same side of the vehicle are switched ON and/or when the steering angle is changed from the straight-ahead position towards the same side of the vehicle. The cornering lamp shall be switched OFF automatically when the direction indicator is switched OFF and/or the steering angle has returned in the straight-ahead position.

3-3.6.2.6.2 When the reversing lamp is switched ON, both cornering lamps may be switched on simultaneously, independently from the steering wheel or direction indicator position. In this case, the cornering lamps shall be switched OFF when the reversing lamp is switched OFF.

3-3.6.2.7 The cornering lamps shall not be activated at vehicle speeds above 40 km/h.

3-3.6.3 Daytime running lamp:

3-3.6.3.1 Number: Two.

3-3.6.3.2 The colours of the lights: white.

3-3.6.3.3 Position:

3-3.6.3.3.1 In width: that point on the apparent surface in the direction of the reference axis which is farthest from the vehicle's median longitudinal plane shall not be more than 400 mm from the extreme outer edge of the vehicle. The distance between the inner edges of the apparent surfaces in the direction of the reference axes shall not be less than 600 mm. This distance may be reduced to 400 mm where the overall width of the vehicle is less than 1,300 mm.

3-3.6.3.3.2 In height: above the ground not less than 250 mm nor more than 1,500 mm.

3-3.6.3.3.3 In length: at the front of the vehicle. This requirement shall be deemed to be satisfied if the light emitted does not

cause discomfort to the driver either directly, or indirectly through the rear-view mirrors and/or other reflecting surfaces of the vehicle.

3-3.6.3.4 Geometric visibility:

3-3.6.3.4.1 Horizontal angle: outwards 20 degrees and inwards 20 degrees.

3-3.6.3.4.2 Vertical angle: upwards 10 degrees and downwards 10 degrees.

3-3.6.3.5 Orientation: Towards the front.

3-3.6.3.6 Electrical connections:

3-3.6.3.6.1 The daytime running lamps shall be switched ON automatically when the device which starts and/or stops the engine (propulsion system) is set in a position which makes it possible for the engine (propulsion system) to operate. However, the daytime running lamps may remain OFF while the following conditions exist:

3-3.6.3.6.1.1 The automatic transmission control is in the park position; or

3-3.6.3.6.1.2 The parking brake is in the applied position; or

3-3.6.3.6.1.3 Prior to the vehicle being set in motion for the first time after each manual activation of the propulsion system.

3-3.6.3.6.2 The daytime running lamps may be switched OFF manually when the vehicle speed does not exceed 10 km/h provided they switch ON automatically when the vehicle speed exceeds 10 km/h or when the vehicle has travelled more than 100 m and they remain ON until deliberately switched off again.

3-3.6.3.6.3 The daytime running lamp shall switch OFF automatically when the device which starts and/or stops the engine (propulsion system) is set in a position which makes it impossible for the engine (propulsion system) to operate or the front fog lamps or headlamps are switched ON, except when the latter are used to give intermittent luminous warnings at short intervals.

3-3.6.3.6.4 If the distance between the front direction-indicator lamp and the daytime running lamp is equal or less than 40 mm, the electrical connections of the daytime running lamp on the relevant side of the vehicle may be such that either:

(1) It is switched OFF; or

(2) Its luminous intensity is reduced during the entire period (both ON and OFF cycle) of activation of a front direction-indicator lamp.

3-3.6.3.6.5 If a direction-indicator lamp is reciprocally incorporated with a daytime running lamp, the electrical connections of the daytime running lamp on the relevant side of the vehicle shall be such that the daytime running lamp is switched OFF during the entire period (both ON and OFF cycle) of activation of the direction-indicator lamp.

3-3.6.3.7 Tell-tale

Closed-circuit tell-tale optional.

3-3.6.4 Working/cargo lamp, spot lamp:

3-3.6.4.1 The colours of the lights: white or light yellow. It’s installed in correspondence to the actual demand. (It's not apply to passenger vehicle and motorcycle.)

3-3.6.4.2 The lamp’s switch shall not interact with other lamps.

3-3.6.4.3 If the lamp will affect the driver’s visual sight of other motor vehicles passing by, then a fixed shielding device shall be required.

3-3.6.5 Front fog lamp for motor vehicles:

3-3.6.5.1 Number: Two, the performances of which shall conform to the requirements concerning “Front fog lamp” regulated in “Standads”.

3-3.6.5.2 The colours of the light emitted by the lamps: white or selective yellow

3-3.6.5.3 Position:

3-3.6.5.3.1 In width: that point on the apparent surface in the direction of the reference axis which is farthest from the vehicle's median longitudinal plane shall not be more than 400 mm from the extreme outer edge of the vehicle.

3-3.6.5.3.2 In height: Minimum: Not less than 250 mm above the ground. Maximum: For M1 and N1 category vehicles: not more than 800 mm above the ground. For all other categories except N3G (off-road) vehicles: not more than 1,200 mm above the ground. For category N3G vehicles: the maximum height may be increased to 1,500 mm. no point on the apparent surface in the direction of the reference axis must be higher than the highest point on the apparent surface in the direction of the reference axis of the dipped-beam headlamp.

3-3.6.5.3.3 In length: at the front of the vehicle. This requirement shall be deemed to be satisfied if the light emitted does not cause discomfort to the driver either directly, or indirectly through the rear-view mirrors and/or other reflecting surfaces of the vehicle.

3-3.6.5.4 Geometric visibility:

3-3.6.5.4.1 Horizontal angle: 45 degrees outwards and 10 degrees inwards.

3-3.6.5.4.2 Vertical angle: 5 degrees upwards and downwards.

3-3.6.5.4.3 The presence of partitions or other items of equipment near the front fog lamp shall not give rise to secondary effects causing discomfort to other road users.

3-3.6.5.5 Orientation: Towards the front.

3-3.6.5.5.1 Vertical orientation.

3-3.6.5.5.1.1 In the case of class "B" front fog lamps the vertical inclination of the cut-off to be set in the unladen vehicle state with one person in the driver's seat shall be -1.5 per cent or lower.

3-3.6.5.5.1.2 In the case of class "F3" front fog lamps:

3-3.6.5.5.1.2.1 When the total objective luminous flux of the light source does not exceed 2,000 lumens:

3-3.6.5.5.1.2.1.1 The vertical inclination of the cut-off to be set in the unladen vehicle state with one person in the driver's seat shall be 1.0 per cent or lower

3-3.6.5.5.1.2.2 When the total objective luminous flux of the light source exceeds 2,000 lumens:

3-3.6.5.5.1.2.2.1 Depending on the mounting height in metre (h) of the lower edge of the apparent surface in the direction of the reference axis of the front fog lamp, measured on the unladen vehicles, the vertical inclination of the cut-off shall under all the static conditions of paragraph 3-3.6.23 automatically remain between the following value(s):

h < 0.8

Limits: between -1.0 per cent and -3.0 per cent

Initial aiming: between -1.5 per cent and -2.0 per cent

h > 0.8

Limits: between -1.5 per cent and -3.5 per cent

Initial aiming: between -2.0 per cent and -2.5 per cent

3-3.6.5.5.1.2.2.2 The initial downward inclination of the cut-off to be set in the unladen vehicle state with one person in the driver's seat shall be specified within an accuracy of one decimal place by the manufacturer and

indicated in a clearly legible and indelible manner on each vehicle close to either the front fog lamp or the manufacturer's plate or in combination with the indication by the symbol to this Regulation. The value of this indicated downward inclination shall be no more than 0.1%.

3-3.6.5.5.1.3 Front fog lamp leveling device

3-3.6.5.5.1.3.1 Where a leveling device is fitted for a front fog lamp, independent or grouped with other front lighting and light signaling functions, it shall be such that the vertical inclination, under all the static loading conditions, shall remain between the limits prescribed in paragraph 3-3.6.5.5.1.2.2.1

3-3.6.5.5.1.3.2 In the case where the front fog lamp of category "F3" is part of the dipped beam headlamp or is part of an AFS system, the requirements of paragraph 3-3.4.2.5. shall be applied during the use of the front fog beam as part of the dipped beam.

In this case the leveling limits defined in paragraph 3-3.4.2.5. may be applied also when this front fog lamp is used as such.

3-3.6.5.5.1.3.3 The leveling device may also be used to automatically adapt the inclination of the front fog beam in relation to the prevailing ambient conditions, provided that the limits for the downward inclination specified in paragraph 3-3.6.5.5.1.2.2.1. are not exceeded.

3-3.6.5.5.1.3.4 In the case of a failure of the leveling device, the front fog beam shall not assume a position in which the cut off is less inclined than it was at the time when the failure of the device occurred.

3-3.6.5.5.2 Vertical orientation: When a beam from a front fog lamp is activated as part of a dipped beam provided by an AFS, it has to comply with the requirements of paragraph 3-3.6.16.6.1 of this Regulation.

3-3.6.5.6 Electrical connections:

3-3.6.5.6.1 It must be possible to switch the front fog lamps ON and OFF independently of the main-beam headlamps, the dipped-beam headlamps or any combination of main- and dipped-beam headlamps, unless

(a) The front fog lamps are used as part of another lighting function in an AFS. However, the switching ON of the front fog lamps function shall have the priority over the function for which the front fog lamps are used as a part, or

(b) The front fog lamps cannot be simultaneously lit with any other lamps with which they are reciprocally incorporated as indicated by the relevant symbol ("/") according to ” Front fog lamp” of VSTD.

3-3.6.5.6.2 The electrical connections shall be such that the main-beam and dipped-beam headlamps and the front fog lamps cannot be switched on unless the lamps referred to in paragraph 3-3.4.23. are also switched on.

3-3.6.5.7 Tell-tale: Circuit-closed tell-tale mandatory. An independent non-flashing warning light.

3-3.6.5.8 Other requirements:

3-3.6.5.8.1 In the case where there is a positive indication in the communication the alignment and the luminous intensities of the class "F3" front fog beam may be automatically adapted in relation to the prevailing ambient conditions. Any variations of the luminous intensities or alignment shall be performed automatically and in such a way that no discomfort, neither for the driver nor to other road users, is caused.

3-3.6.5.8.2 The front fog lamps may substitute the function of the front position lamps, provided that:

3-3.6.5.8.2.1 Their electrical connections are such that in case of failure of any of these lighting devices the front position lamps are automatically re-activated; and

3-3.6.5.8.2.2 The substituting lamp/function meets, for the respective position lamp, the requirements concerning:

(1) The geometric visibility prescribed for the front position lamps in 3-3.4.3.4; and

(2) The minimum photometric values according to the angles of light distribution; and

3-3.6.5.8.2.3 Appropriate evidence demonstrating compliance with the requirements indicated in paragraph 3-3.6.5.8.2.2. above is provided in the test reports of the substituting lamp.

3-3.6.6 Parking lamp: On motor vehicles not exceeding 6 m in length and not exceeding 2 m in width, optional. On all other vehicles, prohibited.

3-3.6.6.1 Number and arrangement: Either two lamps at the front and two lamps at the rear, or one lamp on each side, the performances of which shall conform to the requirements concerning “Parking lamp” or “clearance /front （side）position lamp” / “tail/ rear （side）position lamp” regulated in VSTD.

3-3.6.6.2 The colour of the light emitted by the lamps: white in front, red at the rear, amber if reciprocally incorporated in the side direction-indicator lamps or in the side-marker lamps.

3-3.6.6.3 Position:

3-3.6.6.3.1 In width: that point on the apparent surface in the direction of the reference axis which is farthest from the vehicle's median longitudinal plane shall not be more than 400 mm from the extreme outer edge of the vehicle. Furthermore, if

there are two lamps, they shall be on the sides of the vehicle.

3-3.6.6.3.2 In height: For M1 and N1 category vehicles: no special requirement; For all other categories of vehicles: above the ground, not less than 350 mm nor more than 1,500 mm (2,100 mm if the shape of the bodywork makes it impossible to keep within 1,500 mm).

3-3.6.6.4 Geometric visibility:

3-3.6.6.4.1 Horizontal angle: 45 degrees outwards, forwards and rearwards.

3-3.6.6.4.2 Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees, however, if the height of the lamp is less than 750 mm.

3-3.6.6.5 Electrical connections: The connection must allow the parking lamp(s) on the same side of the vehicle to be lit independently of any other lamps. The parking lamp(s) and, if applicable, the front and rear position lamps on the same side which can be switched on according to paragraph 3-3.6.6.7 shall still be able to be activated even if the engine power switch is on the “off” position. A device which automatically deactivates these lamps using timer switch is prohibited.

3-3.6.6.6 Tell-ale: Circuit-closed tell-tale optional. If there is one, it must not be possible to confuse it with the tell-tale for the front and rear position lamps.

3-3.6.6.7 Other requirements: The functioning of this lamp may also be performed by simultaneously switching on the front and rear position lamps on the same side of the vehicle. In this case, lamps that meet the requirements of front or rear (side) position lamps are deemed to meet the requirements of parking lamps. In this case, lamps that meet the requirements of front or rear (side) position lamps are deemed to meet the requirements of parking lamps.

3-3.6.7 Front fog lamp for motorcycle: Optional on vehicles of category symbol L3 and L5.

3-3.6.7.1 Number: One or two, the performances of which shall conform to the requirements concerning “Front fog lamp” regulated in VSTD.

3-3.6.7.2 The colour of the light: white or selective yellow.

3-3.6.7.3 The installing location:

3-3.6.7.3.1 In width: for a single lamp the centre of reference shall be in the median longitudinal plane of the vehicle; or the edge of the illuminating surface which is nearest to that plane shall be not more than 250 mm away from it; In the case of L5 category vehicles, the edges of the illuminating surfaces furthermost from the median longitudinal plane of the

vehicle must not be more than 400 mm from the outermost edge of the vehicle.

3-3.6.7.3.2 In height: not less than 250 mm above the ground. No point on the illuminating surface shall be higher than the highest point on the illuminating surface of the passing beam headlamp.

3-3.6.7.3.3 In length: at the front of the vehicle. This requirement shall be deemed to be satisfied if the light emitted does not cause discomfort to the driver either directly, or indirectly through the rear-view mirrors and/or other reflecting surfaces of the vehicle.

3-3.6.7.4 Geometric visibility:

3-3.6.7.4.1 Horizontal angle: 45 degrees to left and to right for a single lamp, except for an off-centre light, in which case the inward angle 10 degrees ; 45 degrees outwards and 10 degrees inwards for each pair of lamps

3-3.6.7.4.2 Vertical angle: 5 degrees upwards and downwards;

3-3.6.7.5 Orientation: Forwards. The lamp(s) may move in line with the steering angle.

3-3.6.7.6 May not be combined with any other front lamp.

3-3.6.7.7 Tell-tale: "Circuit-closed" tell-tale. Optional; non-flashing green signal.

3-3.6.7.8 Electrical connections: It shall be possible to switch the fog lamp(s) on or off independently of the driving beam headlamp(s) and/or passing beam headlamp(s).

3-3.6.8 Rear fog lamp for motorcycle: Optional on vehicles of category symbol L3 and L5.

3-3.6.8.1 Number: One or two.

3-3.6.8.2 The colour of the light: red.

3-3.6.8.3 Position:

3-3.6.8.3.1 In height: not less than 250 mm nor more than 900 mm above the ground; In the case of L5 category vehicles, minimum 250 mm, maximum 1000 mm above the ground.

3-3.6.8.3.2 In length: at the rear of the vehicle. The distance between the illuminating surface of the rear fog lamp and that of the stop lamp shall not be less than 100 mm.

3-3.6.8.3.3 Width: the reference centre must be situated in the median longitudinal plane of the L5 category vehicle if there is a single rear fog lamp or, if there are two fog lamps, they must be symmetrical in relation to the median longitudinal plane of the vehicle. In the case of vehicles with two rear wheels: at least 600 mm between the two lamps. This

distance may be reduced to 400 mm if the maximum width of the vehicle is less than 1,300 mm.

3-3.6.8.4 Geometric visibility:

3-3.6.8.4.1 Horizontal angle: 25 degrees to left and to right for a single lamp; 25 degrees outwards and 10 degrees inwards for each pair of lamps;

3-3.6.8.4.2 Vertical angle: 5 degrees upwards and downwards.

3-3.6.8.5 Orientation: Rearwards.

3-3.6.8.6 Electrical connections: They shall be such that the rear fog lamp can light up only when one or more of the following lamps are switched on: driving beam headlamp, passing beam headlamp, front fog lamp. If there is a front fog lamp, it shall be possible to switch off the rear fog lamp independently of the front fog lamp. The rear fog lamp(s) may continue to operate until the position lamps are switched off and they shall remain off until deliberately switched on again.

3-3.6.8.7 Tell-tale: "Circuit-closed" tell-tale. Mandatory. Non-flashing amber signal lamp.

3-3.6.9 Front retro-reflector, non-triangular: Optional on vehicles of category symbol L1.

3-3.6.9.1 Number: One, the performances of which shall conform to the requirements of “Retro-reflector” concerning Class IA or IB retro-reflectors regulated in VSTD.

3-3.6.9.2 The colour of the light: white.

3-3.6.9.3 Position: in height: not less than 400mm nor more than 1,200mm above the ground;

3-3.6.9.4 Geometric visibility:

3-3.6.9.4.1 Horizontal angle: 30 degrees to the left and to the right.

3-3.6.9.4.2 Vertical angle: 15 degrees above and below the horizontal. The vertical angle below the horizontal may be reduced to 5 degrees, however, if the height of the reflector is less than 750mm.

3-3.6.9.5 Orientation: Forwards. The reflector may move in line with the steering angle.

3-3.6.10 Auxiliary stop lamp for motorcycle:

3-3.6.10.1 The colour of the light: red.

3-3.6.10.2 Its reference centre lies within the median longitudinal plane of the vehicle and above other rear lamps.

3-3.6.10.3 The light emitted shall be Non-flashing.

3-3.6.11 Hazard warning signal for motorcycle:

3-3.6.11.1 The hazard warning signal shall be given by simultaneous operation of the direction-indicator lamps.

3-3.6.11.2 The colour of the light emitted by the lamps: amber.

3-3.6.11.3 Electrical connections

The signal shall be given by means of a separate control enabling all the direction indicators to be supplied with current simultaneously.

3-3.6.11.4 Mandatory flashing red signal lamp or, in the case of separate tell-tales, the simultaneous operation of the tell-tale prescribed in paragraph 3-3.5.5.8.

3-3.6.11.5 Light flashing 90 +/- 30 times per minute. Operation of the lamp-signal control shall be followed within not more than one second by the appearance of the light and within not more than one-and-a-half seconds by the first extinction of the light.

3-3.6.12 Daytime running lamp:

3-3.6.12.1 Number: One, or two symmetrically.

3-3.6.12.2 The colour of the light: white. For the two-lamp case the two lamps' color should be identical.

3-3.6.12.3 Position:

3-3.6.12.3.1 In width:

3-3.6.12.3.1.1 An independent daytime running lamp may be installed above, below or to one side of another front lamp: If these lamps are one above the other, the reference centre of the daytime running lamp shall be located within the medium longitudinal plane of the vehicle; if these lamps are side by side, the edge of the illuminating surface shall not be more than 250 mm from the median longitudinal plane of the vehicle.

3-3.6.12.3.1.2 A daytime running lamp, that is reciprocally incorporated with another front lamp (driving beam headlamp or front position lamp), shall be fitted in such a way that the edge of the illuminated surface lies not more than 250 mm from the median longitudinal plane of the vehicle.

3-3.6.12.3.1.3 Two daytime running lamps, of which either one or both are reciprocally incorporated with another front lamp, shall be installed in such a way that their reference centres are symmetrical in relation to the median longitudinal plane of the vehicle.

3-3.6.12.3.1.4 In the case of two daytime running lamps, the distance separating the illuminating surfaces shall not exceed

420 mm.

3-3.6.12.3.1.5 The maximum separation distance is not applicable when the daytime running lamps:

3-3.6.12.3.1.5.1 Are grouped, combined or reciprocally incorporated with another headlamp, or

3-3.6.12.3.1.5.2 Are within the projection of the frontal silhouette of the motorcycle on an orthogonal plane perpendicular to the longitudinal median plane of the vehicle.

3-3.6.12.3.2 In height: Above the ground not less than 250 mm and not more than 1,500 mm.

3-3.6.12.3.3 In length: At the front of the vehicle.

3-3.6.12.4 Geometric visibility

3-3.6.12.4.1 Horizontal: Outwards 20 degrees and inwards 10 degrees.

3-3.6.12.4.2 Vertical: Upwards 10 degrees and downwards 10 degrees.

3-3.6.12.5 Orientation: Towards the front. The lamp(s) may move in line with the steering angle.

3-3.6.12.6 Electrical connections:

3-3.6.12.6.1 The daytime running lamp shall switch OFF automatically when the headlamps are switched ON, except when the latter are used to give intermittent luminous warnings at short intervals.

The rear position lamp shall be switched ON when the daytime running lamp(s) is/are switched ON. The front position lamp(s) and the rear-registration-plate illuminating device may be switched ON individually or together, when the daytime running lamp(s) is/are switched ON.

3-3.6.12.6.2 If the distance between the front direction-indicator lamp and the daytime running lamp is equal or less than 40 mm, the electrical connections of the daytime running lamp on the relevant side of the vehicle may be such that either:

(1) It is switched OFF; or

(2) Its luminous intensity is reduced during the entire period (both ON and OFF cycle) of activation of a front direction-indicator lamp.

3-3.6.12.6.3 If a direction indicator lamp is reciprocally incorporated with a daytime running lamp, the electrical connections of the daytime running lamp on the relevant side of the vehicle shall be such that the daytime running lamp is switched OFF during the entire period (both ON and OFF cycle) of activation of the direction-indicator lamp.

3-3.6.12.7 Tell-tale: Closed-circuit green tell-tale, optional.

3-3.6.12.8 Other requirements

The DRL symbol in ISO 2575:2004 - Road vehicles. Symbols for controls, indicators and tell-tales, may be used to inform the driver that the daytime running lamp is on.

3-3.6.13 Parking lamp for motorcycle:

3-3.6.13.1 While stationary, the light emitted shall be non- flashing.

3-3.6.13.2 The colour of the light: white or light yellow at the front, and red at the rear.

3-3.6.14 Retro-reflective markings for heavy and long vehicles and their trailers: Vehicles of category symbols M2, M3, N and O, the performances of which shall conform to the requirements concerning retro-reflective marking regulated in VSTD.

3-3.6.14.1 It may consist of marking materials of class "D" if the total retro-reflective area is less than 2m2; if the total retro-reflective area is at least 2m2 class "E" shall be used.

3-3.6.14.2 The width of a side and/or rear marking material shall be 50 mm +10/-0 mm. The markings shall be made of strips of retro-reflective material.

3-3.6.14.3 Guidelines for the marking shape and mounting requirements:

3-3.6.14.3.1 Side and rear marking with strips:

3-3.6.14.3.1.1 Retro-reflective marking materials installed on vehicles may be made up of an element or several elements preferably continuously, parallel or as close as possible parallel to the ground. The same rule applies for tractors, semi-trailers and other vehicle combinations.

3-3.6.14.3.1.2 Those installed on the rear of vehicles may be red or yellow in colour.

3-3.6.14.3.1.3 Those installed on the sides of vehicles shall be white or yellow in colour.

3-3.6.14.3.1.4 The mounting of the markings should identify as close as possible the entire length and width of the vehicle. "Entire" means at least 80 % of the length and/or width.

3-3.6.14.3.1.5 In case of non-continuous strips the distance between single elements should be as small as possible and should not exceed 50 % of the shortest element length.

However, if the manufacturer can prove to the satisfaction of the authority responsible for type approval that it is impossible to respect the value of 50 per cent, the distance between adjacent elements may be larger than 50 per cent of the shortest adjacent element, and it shall be as small as possible and not exceed 1000

mm.

3-3.6.14.3.1.6 Retro-reflective marking materials shall have a minimum height above the ground of at least 250 mm and a maximum height of 1,500 mm. However, 2,100 mm may be accepted in cases where technical conditions forbid the compliance with the maximum value of 1,500 mm.

3-3.6.14.3.1.7 The distance between the retro-reflective marking materials fitted to the rear of a vehicle and each obligatory stop lamp should be greater than 200mm.

3-3.6.14.3.2 Contour marking:

3-3.6.14.3.2.1 The mounting of the contour markings should identify as close as possible the overall shape of the vehicle to the side and rear.

3-3.6.14.3.2.2 Contour markings installed on the rear of vehicles may be red in colour.

3-3.6.14.3.2.3 Contour markings installed on the sides of vehicles shall be white or yellow in colour.

3-3.6.14.3.2.4 In case of non-continuous strips, the distance between single elements should be as small as possible and should not exceed 50 % of the shortest element length.

However, if the manufacturer can prove to the satisfaction of the authority responsible for type approval that it is impossible to respect the value of 50 per cent, the distance between adjacent elements may be larger than 50 per cent of the shortest adjacent element, and it shall be as small as possible and not exceed 1000 mm.

3-3.6.14.3.2.5 The lower part of the retro-reflective marking materials should have a minimum height above the ground of at least 250 mm and a maximum height of 1,500 mm.

3-3.6.14.3.2.6 The distance between the retro-reflective marking materials fitted to the rear of a vehicle and each obligatory stop lamp should be greater than 200mm.

3-3.6.14.3.3 Distinctive markings and graphics:

Retro-reflective distinctive markings and/or graphics should only be placed within the contour marking on the side of a vehicle, provided they do not impair the effectiveness of the contour marking and the mandatory lighting and light-signaling devices. Compared to the contour marking, the distinctive markings and/or graphics should be decent as specified below:

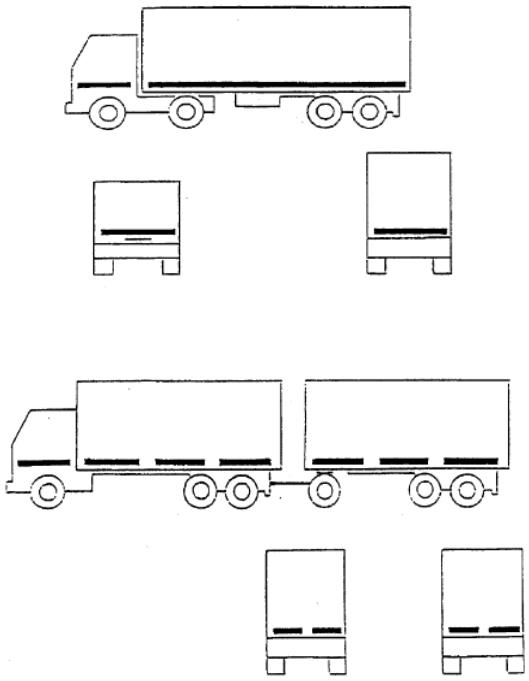
3-3.6.14.3.3.1 The number of the letters/characters is less than 15;

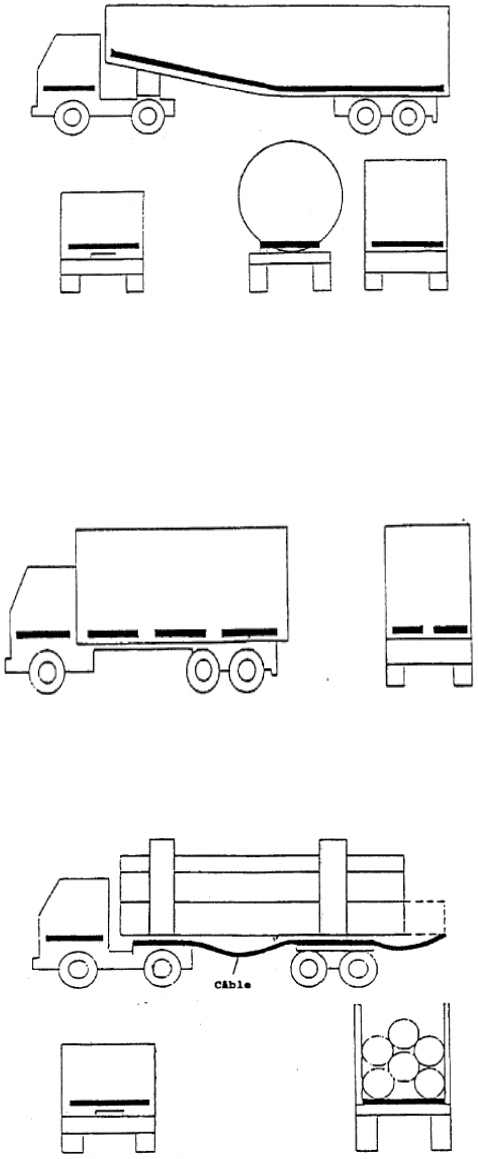
3-3.6.14.3.3.2 The height of the letters/characters is between 300 mm and 1,000 mm;

3-3.6.14.3.3.3 The whole retro-reflective area is not larger than 2.0 m^2.

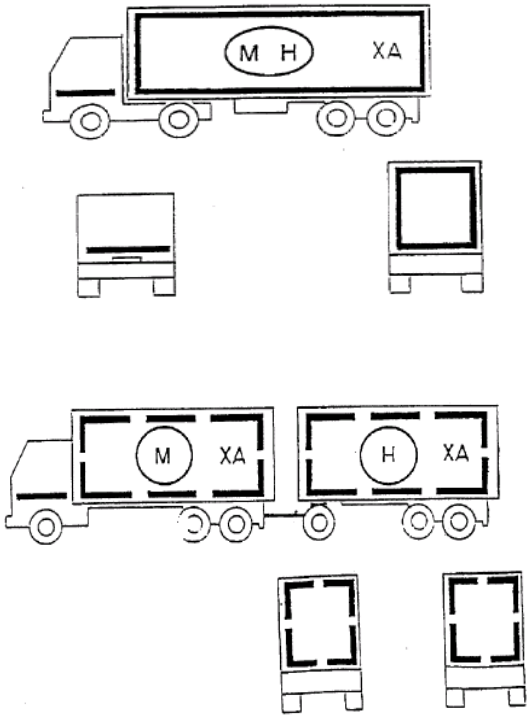
3-3.6.14.4 Examples of retro-reflective markings:

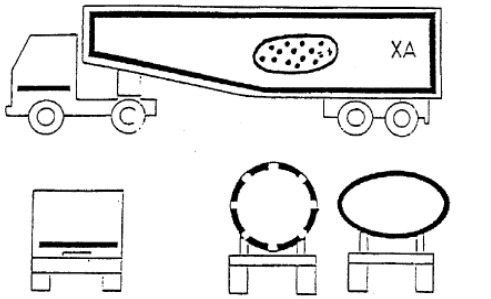
3-3.6.14.4.1 Examples of retro-reflective markings with strips

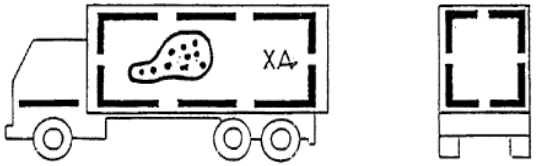




3-3.6.14.4.2 Examples of retro-reflective contour markings (with distinctive markings and graphics)


M H
XA
M
XA
H
XA





3-3.6.15 Side direction-indicator lamps ：The category of O2, O3 and O4 vehicles could add two or four lamps for conform to side direction-indicator lamps (categories 5 or 6) stipulate in “Direction indicator” regulated in VSTD.

3-3.6.16 ADAPTIVE FRONT LIGHTING SYSTEM (AFS)

Where not otherwise specified below, the requirements for main-beam headlamps and for dipped-beam headlamps of this Regulation apply to the relevant part of the AFS.

3-3.6.16.1 Presence

Optional on motor vehicles. Prohibited on trailers.

3-3.6.16.2 Number

One

3-3.6.16.3 Arrangement

No special requirements.

3-3.6.16.4 Position

The AFS shall, prior to the subsequent test procedures, be set to the neutral state;

3-3.6.16.4.1 In width and height:

for a given lighting function or mode the requirements indicated in the paragraphs 3-3.6.16.4.1.1 through 3-3.6.16.4.1.4 below shall be fulfilled by those lighting units which are energized simultaneously for that lighting function or mode of a function, according to the applicant's description. All dimensions refer to the nearest edge of the apparent surface(s) observed in the direction of the reference axis, of the lighting unit(s).

3-3.6.16.4.1.1 Two lighting units shall be positioned symmetrically at a height in compliance with the requirements of the relevant paragraphs 3-3.4.1 and 3-3.4.2.(where "Two symmetrically placed lighting units" shall be understood to be two lighting units, one on each side of the vehicle, positioned such that the (geometric) centres of gravity of their apparent surfaces are at the same height and at the same distance from the vehicle's longitudinal median plane within a tolerance of 50 mm, each; their light emitting surfaces, illuminating surfaces, and light outputs, however, may differ.)

3-3.6.16.4.1.2 Additional lighting units, if any, on either side of the vehicle shall be positioned at a distance not exceeding 140 mm in horizontal direction (E in the figure) and 400 mm in vertical direction above or below (D in the figure) from the nearest lighting unit;

3-3.6.16.4.1.3 None of the additional lighting units described in paragraph 3-3.6.16.4.1.2 above shall be positioned lower than 250 mm (F in the figure) nor higher than indicated in paragraph 3-3.4.2.3.2 of this Regulation (G in the figure) above the ground;

3-3.6.16.4.1.4 Additionally, in width: for each mode of the passing beam lighting: the outer edge of the apparent surface of at least one lighting unit on each side of the vehicle shall not be more than 400 mm from the extreme outer edge of the vehicle (A in the figure); and, the inner edges of the apparent surfaces in the direction of the reference axes shall be not less than 600 mm apart. This does not apply, however, for M1 and N1 category vehicles; for all other categories of motor vehicles this distance may be reduced to 400 mm where the overall width of the vehicle is less than 1300 mm.

3-3.6.16.4.2 In length:

all lighting units of an AFS shall be mounted at the front. This requirement is deemed to be satisfied if the light emitted does not cause discomfort to the driver either directly, or indirectly through the rear-view mirrors and/or other reflecting surfaces of the vehicle.

3-3.6.16.5 Geometric visibility:

On each side of the vehicle, for each lighting function and mode provided: the angles of geometric visibility prescribed for the respective lighting functions according to paragraphs 3-3.4.1.5 and 3-3.4.2.4 of this Regulation, shall be met by at least one of the lighting units that are simultaneously energized to perform said function and mode(s), according to the description of the applicant. Individual lighting units may be used to comply with the requirements for different angles.

3-3.6.16.6 Orientation: Towards the front.

The AFS shall, prior to the subsequent test procedures, be set to the neutral state, emitting the basic passing beam.

3-3.6.16.6.1 Vertical orientation:

3-3.6.16.6.1.1 The initial downward inclination of the cut-off of the basic passing beam to be set in the unladen vehicle state with one person in the driver's seat shall be specified with a precision of 0.1 per cent by the manufacturer and indicated in clearly legible and indelible manner on each vehicle, close to either the front lighting system or the manufacturer's plate.

Where differing initial downward inclinations are specified by the manufacturer for different lighting units that provide or contribute to the cut-off of the basic passing beam, these values of downward inclination shall be specified with a precision of 0.1 per cent by the manufacturer and indicated in clearly legible and indelible manner on each vehicle, close to either the relevant lighting units or on the manufacturers plate, in such a way that all the lighting units concerned can be unambiguously identified.

3-3.6.16.6.1.2 The horizontal part of the "cut-off" of the basic passing beam shall remain between the limits indicated in paragraph 3-3.4.2.5.1.2 of this Regulation under all the static loading conditions of the vehicle of Annex 5 of this Regulation; and the initial aiming shall be within the specified values.

3-3.6.16.6.1.2.1 in case the passing beam is generated by several beams from different lighting units, the provisions according to paragraph 3-3.6.16.6.1.2 above apply to each said beam's "cut-off" (if any).

3-3.6.16.6.2 Headlamp levelling device: In the case where a vertical inclination adjusting device is necessary to satisfy the requirements of paragraph 3-3.4.2.5.1 the device shall be automatic headlamp levelling device. In the event of a failure of this device, the passing beam shall not assume a position in which the dip is less than it was at the time when the failure of the device occurred.

3-3.6.16.6.3 Horizontal orientation:

For each lighting unit the kink of the elbow of the cut-off line, if any, when projected on the screen, shall coincide with the vertical line through the reference axis of said lighting unit. A tolerance of 0.5 degrees to that side which is the side of the traffic direction shall be allowed. Other lighting units shall be adjusted according to the applicant's specification.

3-3.6.16.6.4 Measuring procedure:

After adjustment of the initial setting of beam orientation, the vertical inclination of the passing beam or, when applicable, the vertical inclinations of all the different lighting units that provide or contribute to the cut-off(s) according to paragraph 3-3.6.16.6.1.2.1 above of the basic passing beam, shall be verified for all loading conditions of the vehicle in accordance with the specifications in paragraphs 3-3.4.2.5.1.2 of this Regulation.

3-3.6.16.7 Electrical connections

3-3.6.16.7.1 Main beam lighting (if provided by the AFS)

3-3.6.16.7.1.1 The lighting units for the main-beam may be activated either simultaneously or in pairs. For changing over from the dipped-beam to the main-beam at least one pair of lighting units for the main-beam shall be activated. For changing over from the main-beam to the dipped-beam all lighting units for the main-beam shall be de-activated simultaneously.

3-3.6.16.7.1.2 The main-beam may be designed to be adaptive, subject to the provisions in paragraph 3-3.6.16.9.5., the control signals being produced by a sensor system which is capable of detecting and reacting to each of the following inputs:

(a) Ambient lighting conditions ;

(b) The light emitted by the front lighting devices and front light-signalling devices of oncoming vehicles;

(c) The light emitted by the rear light-signalling of preceding vehicles;

Additional sensor functions to improve performance are allowed.

For the purpose of this paragraph, "vehicles" means vehicles of categories L, M, N, O, T, as well as bicycles, such

vehicles being equipped with retro-reflectors, with lighting and light-signalling devices, which are switched ON.

3-3.6.16.7.1.3 It shall always be possible to switch the main-beam headlamps, adaptive or non adaptive, ON and OFF manually and to manually switch off the automatic control.

Moreover, the switching OFF, of the main-beam headlamps and of their automatic control, shall be by means of a simple and immediate manual operation; the use of submenus is not allowed.

3-3.6.16.7.1.4 The dipped-beams may remain switched on at the same time as the main-beams.

3-3.6.16.7.1.5 Where four concealable lighting units are fitted their raised position must prevent the simultaneous operation of any additional headlamps fitted, if these are intended to provide light signals consisting of intermittent illumination at short intervals (see paragraph 3-3.4.1.7.5) in daylight.

3-3.6.16.7.2 Passing beam lighting

(a) The control for changing over to the dipped-beam must switch off all main-beam headlamps or de-activate all AFS lighting units for the main-beam simultaneously.

(b) The dipped-beam may remain switched on at the same time as the main-beams.

(c) In the case of lighting units for the dipped-beam being equipped with gas discharge light sources, the gas-discharge light sources shall remain switched on during the main-beam operation.

3-3.6.16.7.3 Switching ON and OFF the passing beam may be automatic, however, the electrical connections must be such that the front and rear position lamps, the endoutline marker lamps, if they exist, the side-marker lamps, if they exist, and the rear registration plate lamp can only be switched on and off simultaneously.

3-3.6.16.7.4 Automatic operation of the AFS

The changes within and between the provided classes and their modes of the AFS lighting functions as specified below, shall performed automatically without causing discomfort, distraction or glare, neither for the driver nor for other road users.

The following conditions apply for the activation of the classes and their modes of the passing beam and, where applicable, of the main-beam and/or the adaptation of the main-beam..

3-3.6.16.7.4.1 The class C mode(s) of the passing beam shall be activated if no mode of another passing beam class is activated.

3-3.6.16.7.4.2 The class V mode(s) of the passing beam shall not operate unless one or more of the following conditions is/are automatically detected (V-signal applies):

(a) roads in built-up areas and the vehicle's speed not exceeding 60 km/h;

(b) roads equipped with a fixed road illumination, and the vehicle's speed not exceeding 60 km/h;

(c) a road surface luminance of 1 cd/m2 and/or a horizontal road illumination of 10 lx being exceeded continuously;

(d) the vehicle's speed not exceeding 50 km/h.

3-3.6.16.7.4.3 The class E mode(s) of the passing beam shall not operate unless the vehicle's speed exceeds 70 km/h and one or more of the following conditions is/are automatically detected.

(a) The road characteristics correspond to motorway conditions 8/ and/or the vehicle's speed exceeds 110 km/h (E-signal applies).

(b) In case of a class E mode of the passing beam which, according to the system's approval documents /communication sheet, complies with a 'data set' of Table 7 in VSTD 'AFS'.

Data set E1: the vehicle's speed exceeds 100 km/h (E1-signal applies);

Data set E2: the vehicle's speed exceeds 90 km/h (E2-signal applies);

Data set E3: the vehicle's speed exceeds 80 km/h (E3-signal applies).

3-3.6.16.7.4.4 The class W-mode(s) of the passing beam shall not operate unless the front fog lamps, if any, are switched OFF and one or more of the following conditions is/are automatically detected (W-signal applies):

(a) the wetness of the road has been detected automatically;

(b) the windshield wiper is switched ON and its continuous or automatically controlled operation has occurred for a period of at least two minutes.

3-3.6.16.7.4.5 A mode of a class C, V, E, or W passing beam shall not be modified to become a bending mode of said class (T-signal applies in combination with the signal of said passing beam class according to paragraphs 6.22.7.4.1. through 6.22.7.4.4. above) unless at least one of the following characteristics (or equivalent indications) are evaluated:

(a) the angle of lock of the steering;

(b) the trajectory of the centre of gravity of the vehicle.

In addition the following provisions apply:

(i) a horizontal movement of the asymmetric cut-off side-wards from the longitudinal axis of the vehicle, if any, is allowed only when the vehicle is in forward motion 9/ and shall be such that the longitudinal vertical plane through the kink of the elbow of the cut-off does not intersect the line of the trajectory of the centre of gravity of the vehicle at distances from the front of the vehicle which

are larger than 100 times the mounting height of the respective lighting unit;

(ii) one or more lighting units may be additionally energized only when the horizontal radius of curvature of the trajectory of the centre of gravity of the vehicle is 500 m or less.

3-3.6.16.7.5 It shall always be possible for the driver to set the AFS to the neutral state and to return it to its automatic operation.

3-3.6.16.8 Tell-tale:

3-3.6.16.8.1 The provisions of paragraphs 3-3.4.1.8 (for the main-beam headlamp) and 3-3.4.2.8 (for the dipped-beam headlamp) of this Regulation apply to the respective parts of an AFS.

3-3.6.16.8.2 A visual failure tell-tale for AFS is mandatory. It shall be non-flashing. It shall be activated whenever a failure is detected with respect to the AFS control signals or when a failure signal is received in accordance with paragraph 3-3.4.5 of Regulation. It shall remain activated while the failure is present. It may be cancelled temporarily, but shall be repeated whenever the device which starts and stops the engine is switched on and off.

3-3.6.16.8.3 If the main-beam is adaptive, a visual tell-tale shall be provided to indicate to the driver that the adaptation of the main beam is activated. This information shall remain displayed as long as the adaptation is activated.

3-3.6.16.8.4 A tell-tale to indicate that the driver has set the system into a state is optional.

3-3.6.16.9 Other requirements

3-3.6.16.9.1 If the lighting intensity for each side is over 2000 lumen and be of class C (basic) passing beam , then the lighting element of AFS shall be permitted only in conjunction with the installation of headlamp cleaning device(s).

3-3.6.16.9.2 Verification of compliance with AFS automatic operating requirements

3-3.6.16.9.2.1 The applicant shall demonstrate with a concise description or other means acceptable to the Authority responsible for type approval:

(a) the correspondence of the AFS control signals

- to the respective AFS control signals specified in the AFS type approval documents, and,

(b) compliance with the automatic operating requirements according to paragraphs 3-3.6.16.7.4.1to 3-3.6.16.7.4.5 above.

3-3.6.16.9.2.2 To verify, whether, according to the paragraph 3-3.6.16.7.4., the AFS automatic operation of the passing beam functions does not cause any discomfort, the technical service shall perform a test drive which comprises any situation relevant to the system control on the basis of the applicants description; it shall be notified whether all modes are activated, performing and de-activated according to the applicant's description; obvious malfunctioning, if any, shall be contested (e.g. excessive angular movement or flicker).

3-3.6.16.9.3 The overall performance of the automatic control shall be demonstrated by the applicant by documentation or by other means accepted by the authority responsible for type approval. Furthermore the manufacturer shall provide a documentation package which gives access to the design of "the safety concept" of the system. This "safety concept" is a description of the measures designed into the system, for example within the electronic units, so as to address system integrity and thereby ensure safe operation even in the event of mechanical or electrical failure which could cause any discomfort, distraction or glare, either to the driver or to oncoming and preceding vehicles. This description shall also give a simple explanation of all the control functions of the "system" and the methods employed to achieve the objectives, including a statement of the mechanism(s) by which control is exercised.

A list of all input and sensed variables shall be provided and the working range of these shall be defined. The possibility of a fall-back to the basic passing beam (class C) function shall be a part of the safety concept.

The functions of the system and the safety concept, as laid down by the manufacturer, shall be explained. The documentation shall be brief, yet provide evidence that the design and development has had the benefit of expertise from all the system fields which are involved.

For periodic technical inspections, the documentation shall describe how the current operational status of the "system" can be checked.

For Type Approval purposes this documentation shall be taken as the basic reference for the verification process.

3-3.6.16.9.4 To verify, that the adaptation of the main-beam does not cause any discomfort, distraction or glare, neither to the driver nor to oncoming and preceding vehicles, the technical service shall perform a test drive according to paragraph

3-3.9.2. This shall include any situation relevant to the system control on the basis of the applicant's description. The performance of the adaptation of the main-beam shall be documented and checked against the applicant's description. Any obvious malfunctioning shall be contested (e.g. excessive angular movement or flicker).

3-3.6.16.9.5 Adaptation of the main-beam

3-3.6.16.9.5.1 The sensor system used to control the adaptation of the main-beam, as described in paragraph 3-3.6.16.7.1.2., shall comply with the following requirements:

3-3.6.16.9.5.1.1 The boundaries of the minimum fields in which the sensor is able to detect light emitted from other vehicles as defined in paragraph 3-3.6.16.7.1.2. are given by the angles indicated in paragraph 3-3.4.1.9.3.1.1. to this Regulation.

3-3.6.16.9.5.1.2 The sensor system sensitivity shall comply with the requirements in Paragraph 3-3.4.1.9.3.1.2. to this Regulation.

3-3.6.16.9.5.1.3 The adaptive main-beam shall be switched off when the illuminance produced by ambient lighting conditions exceeds 7000 lx.

Compliance with this requirement shall be demonstrated by the applicant, using simulation or other means of verification accepted by the authority responsible for type approval. If necessary the illuminance shall be measured on a horizontal surface, with a cosine corrected sensor on the same height as the mounting position of the sensor on the vehicle. This may be demonstrated by the manufacturer by sufficient documentation or by other means accepted by the authority responsible for type approval.

3-3.6.16.9.6 The aggregate maximum intensity of the lighting units that can be energized simultaneously to provide the main-beam lighting or its modes, if any, shall not exceed 430000 cd.

3-3.6.17 Emergency stop signal

3-3.6.17.1 The emergency stop signal shall be given by the simultaneous operation of all the stop or direction indicator lamps fitted as described in paragraph 3-3.6.17.7.

3-3.6.17.2 Number and color

The same as requirements of “STOP LAMP” or “DIRECTION-INDICATOR LAMP”.

3-3.6.17.3 Arrangement

The same as requirements of “STOP LAMP” or “DIRECTION-INDICATOR LAMP”.

3-3.6.17.4 Position

The same as requirements of “STOP LAMP” or “DIRECTION-INDICATOR LAMP”.

3-3.6.17.5 Geometric visibility

The same as requirements of “STOP LAMP” or “DIRECTION-INDICATOR LAMP”

3-3.6.17.6 Orientation

The same as requirements of “STOP LAMP” or “DIRECTION-INDICATOR LAMP”

3-3.6.17.7 Electrical connections

3-3.6.17.7.1 All the lamps of the emergency stop signal shall flash in phase at a frequency of 4.0 +/- 1.0 Hz.

3-3.6.17.7.1.1 However, if any of the lamps of the emergency stop signal to the rear of the vehicle use filament light sources the frequency shall be 4.0 +0.0/-1.0 Hz.

3-3.6.17.7.2 The emergency stop signal shall operate independently of other lamps.

3-3.6.17.7.3 The emergency stop signal shall be activated and deactivated automatically.

3-3.6.17.7.3.1 The emergency stop signal shall be activated only when the vehicle speed is above 50 km/h and the braking system is providing the emergency braking logic signal defined in “Dynamic Braking”.

3-3.6.17.7.3.2 The emergency stop signal shall be automatically deactivated if the emergency braking logic signal is no longer provided “Dynamic Braking” or if the hazard warning signal is activated.

3-3.6.17.8 Tell-tale: Optional

3-3.6.17.9 Other requirements

3-3.6.17.9.1 Except as provided in paragraph 3-3.6.17.9.2 below, if a motor vehicle is designed to tow a trailer, the control of emergency stop signal on the motor vehicle shall also be capable of operating the emergency stop signal on the trailer. When the motor vehicle is electrically connected to a trailer, the flickering frequency of the emergency stop signal for the combination vehicle shall be limited to the frequency specified in paragraph 3-3.6.17.7.1.1 However, if the motor vehicle can detect that filament light sources are not being used on the trailer for the emergency stop signal, the frequency may be that specified in paragraph 3-3.6.17.7.1

3-3.6.17.9.2 If a motor vehicle is designed to tow a trailer fitted with a service braking system of either continuous or

semi-continuous type, it shall be ensured that a constant power supply is provided via the electrical connector for the stop lamps to such trailers while the service brake is applied.

The emergency stop signal on any such trailer may operate independently of the towing vehicle and is not required to operate either at the same frequency as, or in phase with that on the towing vehicle.

3-3.6.18 Retro-reflectors: on the front of vehicle that shall be white, on the side of vehicle the retro-reflectors' color shall be white or yellow and on the rear of vehicle that shall be red or yellow. The retro-reflectors used on vehicles have to comply with「Retro-reflective material」Regulation.

3-3.6.18.1 Applicable vehicles：

3-3.6.18.1.1 Prohibited: on vehicles of categories M1 and O1.

3-3.6.18.1.2 For the vehicles which may be fitted with Retro-reflector：

3-3.6.18.1.2.1 to the rear:

full contour marking shall be used on vehicles exceeding 2,100 mm in width of the following categories:

(a) N2 with a maximum mass exceeding 7.5 tons and all N3 (with the exception of chassis-cabs, incomplete vehicles and tractors for semi-trailers)

(b) O3 and O4

3-3.6.18.1.2.2 to the vehicle side:

3-3.6.18.1.2.2.1 partial contour marking shall be used on vehicles exceeding 6,000 mm in length (including the drawbar for trailers) of the following categories:

(a) N2 with a maximum mass exceeding 7.5 tonnes and all N3 (with the exception of chassis-cabs, incomplete vehicles and tractors for semi-trailers)

(b) O3 and O4

3-3.6.18.1.2.3 However, where the shape, structure, design or operational requirements make it impossible to install the mandatory contour marking, a line marking may be installed.

3-3.6.18.1.2.4 In cases where the manufacturer, after verification by the Technical Service, can prove to the satisfaction of the authority responsible for type approval that it is impossible, due to the operational requirements which may require special shape, structure or design of the vehicle, to comply with the requirements contained in paragraphs 3-3.6.18.2.

to 3-3.6.18.7., then partial fulfilment of some of these requirements is acceptable. This is conditional upon a portion of the requirements being met where possible, and the application of conspicuity markings that partially meet requirements maximised on the vehicle structure. This may include fitting of additional brackets or plates containing material compliant with “Retro-reflective markings” of VSTD where structure is available to ensure clear and uniform signalling compatible with the objective of conspicuity.

Where partial fulfilment is deemed acceptable, retro-reflective devices like retroreflectors of class IVA or brackets containing retro-reflecting material compliant with photometric requirements of Class C of “Retro-reflective markings” of VSTD may substitute part of the required conspicuity markings. In this case, at least one of these retro-reflective devices shall be installed per 1,500 mm.

The necessary information shall be indicated in the test reports.

3-3.6.18.1.3 Others

3-3.6.18.1.3.1 To the rear and to the side:

On all other categories of vehicles, not otherwise specified in paragraphs 3-3.6.18.1.1 and 3-3.6.18.1.2 above, including the cab of tractor units for semi-trailers and the cab of chassis cabs.

Partial or full contour marking may be applied instead of line markings, and full contour marking may be applied instead of partial contour marking.

3-3.6.18.1.3.2 To the front:

Line marking on vehicles of categories O2, O3 and O4.

Partial or full contour marking may not be applied to the front.

3-3.6.18.2 Number: according to the 3-3.6.18.1.

3-3.6.18.3 Arrangement

The conspicuity markings shall be as close as practicable to horizontal and vertical, compatible with the shape, structure, design and operational requirements of the vehicle.

3-3.6.18.4 Position

3-3.6.18.4.1 Width

3-3.6.18.4.1.1 The conspicuity marking shall be as close as practicable to the edge of the vehicle.

3-3.6.18.4.1.2 The cumulative horizontal length of the conspicuity marking elements, as mounted on the vehicle, shall equate to at least 70% of the overall width of the vehicle, excluding any horizontal overlap of individual elements.

3-3.6.18.4.2 Length

3-3.6.18.4.2.1 The conspicuity marking shall be as close as practicable to the ends of the vehicle and reach to within 600 mm of each end of the vehicle (or cab in the case of tractor units for semi-trailers).

3-3.6.18.4.2.1.1 for motor vehicles, each end of the vehicle, or in the case of tractors for semi-trailers the each end of the cab;

An alternative marking mode within 2400 mm from the front end of the motor vehicle is allowed where a series of retro-reflectors of Class IVA or Class C are mounted followed by the required conspicuity marking as follows:

(a) Retro-reflector size minimum 25 cm^2;

(b) One retro-reflector mounted not more than 600 mm from the front end of the vehicle;

(c) Additional retro-reflectors spaced not more than 600 mm apart;

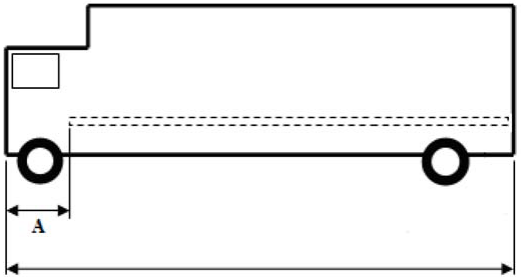
(d) The distance between the last retro-reflector and the start of the conspicuity marking shall not exceed 600 mm;

3-3.6.18.4.2.1.2 for trailers, each end of the vehicle (excluding the drawbar).

3-3.6.18.4.2.2 The cumulative horizontal length of the conspicuity marking elements, as mounted on the vehicle, excluding any horizontal overlap of individual elements, shall equate to at least 70 per cent of: :

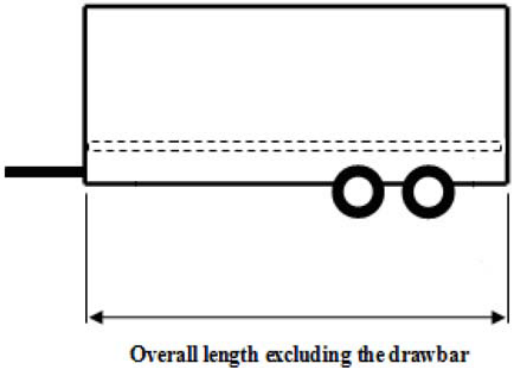
3-3.6.18.4.2.2.1 for motor vehicles, the length of the vehicle excluding the cab, or in the case of tractors for semi-trailers, if fitted, the length of the cab; however, when using the alternative marking mode per paragraph 6.21.4.2.1.1., the distance beginning within 2,400 mm from the front end of vehicle to its rear end.

Motor vehicle



A is the distance between the foremost conspicuity marking and the front end of the vehicle. The maximum value of A is 2400 mm.

3-3.6.18.4.2.2.2 for trailers, the length of the vehicle (excluding the drawbar).



3-3.6.18.4.3 Height

3-3.6.18.4.3.1 Line markings and contour markings lower element(s):

As low as practicable within the range:

Minimum: not less than 250 mm above the ground.

Maximum: not more than 1,500 mm above the ground.

However, a maximum mounting height of 2,100 mm may be accepted where technical conditions prevent compliance with the maximum value of 1,500 mm or, if necessary, to fulfil the requirements of paragraphs 3-3.6.18.4.1.2, 3-3.6.18.4.1.3, 3-3.6.18.4.2.2 and 3-3.6.18.4.2.3, or the horizontal positioning of the line marking or the

lower element(s) of the contour marking.

3-3.6.18.4.3.2 Contour markings upper element(s):

As high as practicable, but within 400 mm of the upper extremity of the vehicle.

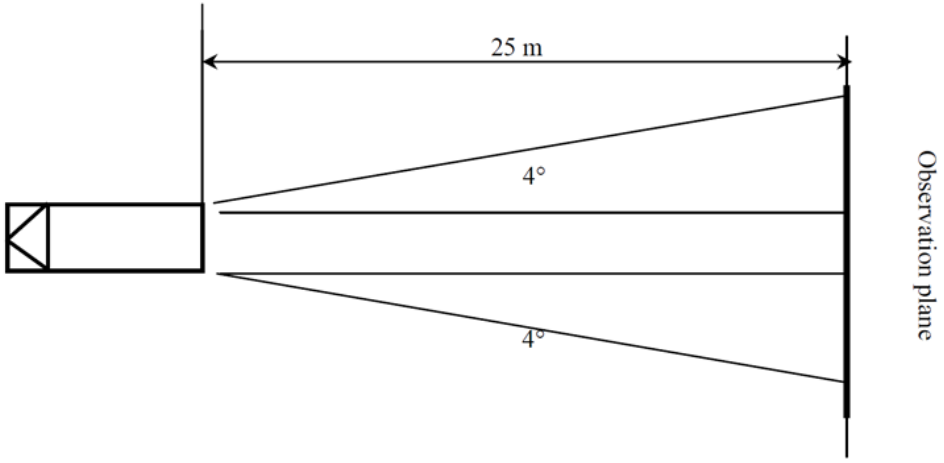
3-3.6.18.5 Visibility

The conspicuity marking shall be considered visible, if at least 70 per cent of the illuminating surface of the marking is visible when viewed by an observer positioned at any point within the observation planes defined below:

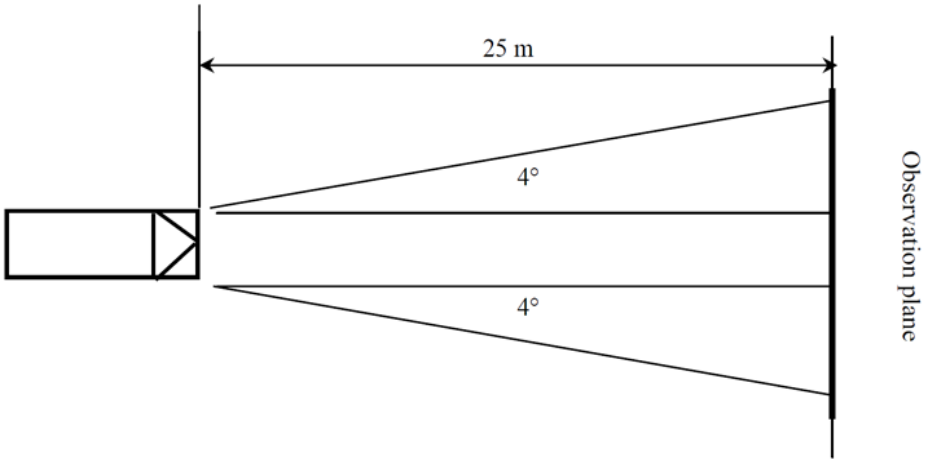
3-3.6.18.5.1 for rear and front conspicuity markings the observation plane is perpendicular to the longitudinal axis of the vehicle situated 25 m from the extreme end of the vehicle and bounded by:

3-3.6.18.5.1.1 in height, by two horizontal planes 1 m and 3.0 m respectively above the ground,

3-3.6.18.5.1.2 in width, by two vertical planes which form an angle of 4 degrees outwards from the vehicle's median longitudinal plane and which pass through the intersection of the vertical planes parallel to the vehicle's median longitudinal plane delimiting the vehicle's overall width, and the plane perpendicular to the longitudinal axis of the vehicle that delimits the end of the vehicle.



Visibility of Conspicuity Markings to the Rear of a Vehicle

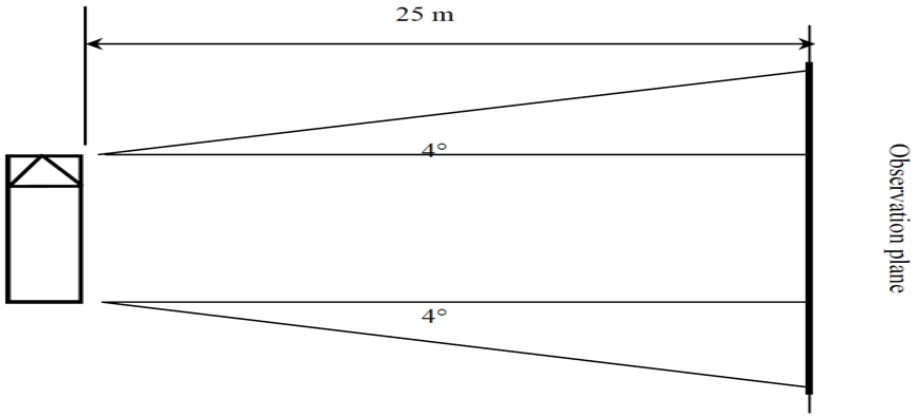


Visibility of Conspicuity Markings to the Front of a Vehicle (trailers only)

3-3.6.18.5.2 for side conspicuity markings the observation plane is parallel to the longitudinal median plane of the vehicles situated 25 m from the extreme outer edge of the vehicle and bounded by:

3-3.6.18.5.2.1 In height, by two horizontal planes 1.0 m and 1.5 m respectively above the ground; In cases where the applicant, after verification by the Technical Service, can prove to the satisfaction of the authority responsible for type approval that it is impossible, due to the operational requirements which may require special shape, structure or design of the vehicle, then it can be in horizontal planes 1.0 m and 3.0 m respectively above the ground.

3-3.6.18.5.2.2 In width, by two vertical planes which form an angle of 4 degrees outwards from a plane perpendicular to the vehicle's longitudinal axis and which pass through the intersection of the vertical planes perpendicular to the vehicle's longitudinal axis delimiting the vehicle's overall length and the extreme outer edge of the vehicle.



Visibility of Conspicuity Markings to the Side of a Vehicle

3-3.6.18.6 Orientation

3-3.6.18.6.1 To the side:

Parallel to the median longitudinal plane of the vehicle, compatible with the shape, structure, design and operation requirements of the vehicle.

3-3.6.18.6.2 To the rear and to the front:

Parallel to the transverse plane of the vehicle, compatible with the shape, structure, design and operation requirements of the vehicle.

3-3.6.18.7 Other requirements

3-3.6.18.7.1 Conspicuity markings shall be considered continuous if the distance between adjacent elements are as small as possible and do not exceed 50 percent of the shortest adjacent element length.

However, if the applicant can prove to the satisfaction of the authority responsible for type approval that it is impossible to respect the value of 50 per cent, the distance between adjacent elements may be larger than 50 per cent of the shortest adjacent element, and it shall be as small as possible and not exceed 1000 mm.

3-3.6.18.7.2 In the case of a partial contour marking, each upper corner shall be described by two lines at 90 degrees to each other and each at least 250 mm in length.

3-3.6.18.7.3 The distance between the conspicuity marking fitted to the rear of a vehicle and each mandatory stop lamp should be greater than 200 mm.

3-3.6.18.7.4 Where rear marking plates conforming to the 01 series of amendments to Regulation No. 70 are installed these may be considered, at the discretion of the manufacturer, as part of the conspicuity marking to the rear, for the purposes of calculating the length of the conspicuity marking and its proximity to the side of the vehicle.

3-3.6.18.7.5 The locations on the vehicle designated for reflective markings shall allow for the installation of markings of at least 60 mm in width.

3-3.6.19 Exterior Courtesy lamp：

3-3.6.19.1 The colour of the light emitted by the lamps: white.

3-3.6.19.2 Other requirements: The exterior courtesy lamp shall not be activated unless the vehicle is stationary and one or more of the following conditions is satisfied:

(1) The engine is stopped; or

(2) A driver or passenger door is opened; or

(3) A load compartment door is opened.

The provisions of paragraph 3-3.8. shall be met in all fixed positions of use.

3-3.6.20 Reversing lamp: Optional on vehicles of category symbols L2 and L5.

3-3.6.20.1 Number: one or two.

3-3.6.20.2 Arrangement drawing: no individual specifications.

3-3.6.20.3 The colour of the light emitted by the lamps: white.

3-3.6.20.4 Position

3-3.6.20.4.1 At the rear of the vehicle.

3-3.6.20.4.2 Height: minimum 250 mm, maximum 1,200 mm above the grounds.

3-3.6.20.5 Geometric visibility

alpha = 15 degrees upwards and 5 degrees downwards;

beta = 45 degrees to the right and to the left if there is only one lamp;

beta = 45 degrees outwards and 30 degrees inwards if there a two lamps.

3-3.6.20.6 Alignment: towards the rear.

3-3.6.20.7 Electrical connections

The lamp may not be alight unless the reverse gear is engaged and the device for switching off the engine is in a position such that it is possible for the engine to operate. It must not be possible for the lamp to be alight or remain lit if one of these conditions is unverified.

3-3.6.20.8 Circuit-closed telltale: optional.

3-3.6.21 Rear-end collision alert signal

3-3.6.21.1 The rear-end collision alert signal shall be given by the simultaneous operation of all the direction indicator lamps fitted as described in paragraph3-3. 6.21.7.

3-3.6.21.2 Number：The same as requirements of “DIRECTION-INDICATOR LAMP”.

3-3.6.21.3 Arrangement：The same as requirements of “DIRECTION-INDICATOR LAMP”.

3-3.6.21.4 Position：The same as requirements of “DIRECTION-INDICATOR LAMP”.

3-3.6.21.5 Geometric visibility：The same as requirements of “DIRECTION-INDICATOR LAMP”.

3-3.6.21.6 Orientation：The same as requirements of “DIRECTION-INDICATOR LAMP”.

3-3.6.21.7 Electrical connections. Compliance with these requirements shall be demonstrated by the applicant, by simulation or other means of verification accepted by the Technical Service responsible for type approval.

3-3.6.21.7.1 All the lamps of the rear-end collision alert signal shall flash in phase at a frequency of 4.0 +/- 1.0 Hz.

3-3.6.21.7.1.1 However, if any of the lamps of the rear end collision alert signal to the rear of the vehicle use filament light sources the frequency shall be 4.0 +0.0/-1.0 Hz.

3-3.6.21.7.2 The rear-end collision alert signal shall operate independently of other lamps.

3-3.6.21.7.3 The rear-end collision alert signal shall be activated and deactivated automatically.

3-3.6.21.7.4 The rear-end collision alert signal shall not be activated if the direction indicator lamps, the hazard warning signal or the emergency stop signal is activated.

3-3.6.21.7.5 The rear-end collision alert signal may only be activated under the following conditions:

Vr	activation
Vr>30km/h	TTC≤1.4
Vr≤30km/h	TTC≤1.4/30xVr

"Vr (Relative Speed)": means the difference in speed between a vehicle with rear-end collision alert signal and a following vehicle in the same lane.

"TTC (Time to collision)": means the estimated time for a vehicle with rear-end collision alert signal and a following vehicle to collide assuming the relative speed at the time of estimation remains constant.

3-3.6.21.7.6 The activation period of the rear-end collision alert signal shall be not more than 3 seconds.

3-3.6.21.8 Tell-tale：Optional

3-3.6.22 Manoeuvring lamps

3-3.6.22.1 The Manoeuvring lamp shall conform to requirements concerning “Manoeuvring lamps” regulated in VSTD.

3-3.6.22.2 The colour of the light emitted by the lamps: white.

3-3.6.22.3 Number: One or two (one per side)

3-3.6.22.4 Arrangement：The requirements of paragraph 3-3.6.22.7 apply.

3-3.6.22.5 Orientation: Downwards, however the requirements of paragraph 3-3.6.22.7 apply.

3-3.6.22.6 Electrical Connections：Manoeuvring lamps shall be so connected that they cannot be activated unless the mainbeam headlamps or the dipped-beam headlamps are switched ON at the same time.

The manoeuvring lamp(s) shall be activated automatically for slow manoeuvres up to 10 km/h provided that one of the following conditions is fulfilled：

(a) Prior to the vehicle being set in motion for the first time after each manual activation of the propulsion system; or

(b) Reverse gear is engaged; or

(c) A camera based system which assists parking manoeuvres is activated.

The manoeuvring lamps shall be automatically switched off if the forward speed of the vehicle exceeds 10 km/h and they shall remain switched off until the conditions for activation are met again.

3-3.6.22.7 Other requirements

3-3.6.22.7.1 The Technical Service shall, to the satisfaction of the authority responsible for type approval, perform a visual test to verify that there is no direct visibility of the apparent surface of these lamps, if viewed by an observer moving on the boundary of a zone on a transverse plane 10 m from the front of the vehicle, a transverse plane 10 m from the rear of the vehicle , and two longitudinal planes 10 m from each side of the vehicle; these four planes to extend from 1 m to 3 m above and parallel to the ground as shown in figure 7.

3-3.6.22.7.2 At the request of the applicant and with the consent of the Technical Service the requirement of 3-3.6.22.7.1 may be verified by a drawing or simulation or deemed be satisfied if the manoeuvring lamp installation conditions comply with paragraph 69.4.2 of “Manoeuvring lamps”.

3-3.6.23 States of loading to be taken into consideration in determining variations in the vertical orientation of the dipped-beam headlamps

3-3.6.23.1 For the following tests, the mass of the passengers shall be calculated on the basis of 75 kg per person.

3-3.6.23.2 Loading conditions for different types of vehicles:

3-3.6.23.2.1 Vehicles in category M1:

3-3.6.23.2.1.1 The angle of the light beam of the dipped-beam headlamps shall be determined under the following load conditions:

3-3.6.23.2.1.1.1 One person in the driver's seat;

3-3.6.23.2.1.1.2 The driver, plus one passenger in the front seat farthest from the driver;

3-3.6.23.2.1.1.3 The driver, one passenger in the front seat farthest from the driver, all the seats farthest to the rear occupied;

3-3.6.23.2.1.1.4 All the seats occupied;

3-3.6.23.2.1.1.5 All the seats occupied, plus an evenly distributed load in the luggage boot, in order to obtain the permissible load on the rear axle or on the front axle if the boot is at the front. If the vehicle has a front and a rear boot, the additional load shall be appropriately distributed in order to obtain the permissible axle loads. However, if the maximum permissible laden mass is obtained before the permissible load on one of the axles, the loading of the boot(s) shall be limited to the figure which enables that mass to be reached;

3-3.6.23.2.1.1.6 Driver, plus an evenly distributed load in the boot, in order to obtain the permissible load on the

corresponding axle.

However, if the maximum permissible laden mass is obtained before the permissible load on the axle, the loading of the boot(s) shall be limited to the figure which enables that mass to be reached.

3-3.6.23.2.1.2 In determining the above loading conditions, account shall be taken of any loading restrictions laid down by the manufacturer.

3-3.6.23.2.2 Vehicles in categories M2 and M3;

The angle of the light beam from the dipped-beam headlamps shall be determined under the following loading conditions:

3-3.6.23.2.2.1 Vehicle unladen and one person in the driver's seat;

3-3.6.23.2.2.2 Vehicles laden such that each axle carries its maximum technically permissible load or until the maximum permissible mass of the vehicle is attained by loading the front and rear axles proportionally to their maximum technically permissible loads, whichever occurs first.

3-3.6.23.2.3 Vehicles in category N with load surfaces:

3-3.6.23.2.3.1 The angle of the light beam from the dipped-beam headlamps shall be determined under the following loading conditions;

3-3.6.23.2.3.1.1 Vehicle unladen and one person in the driver's seat;

3-3.6.23.2.3.1.2 Driver, plus a load so distributed as to give the maximum technically permissible load on the rear axle or axles, or the maximum permissible mass of the vehicle, whichever occurs first, without exceeding a front axle load calculated as the sum of the front axle load of the unladen vehicle plus 25 per cent of the maximum permissible payload on the front axle. Conversely, the front axle is so considered when the load platform is at the front.

3-3.6.23.2.4 Vehicles in category N without a load surface:

3-3.6.23.2.4.1 Drawing vehicles for semi-trailers:

3-3.6.23.2.4.1.1 Unladen vehicle without a load on the coupling attachment and one person in the driver's seat;

3-3.6.23.2.4.1.2 One person in the driver's seat: technically permissible load on the coupling attachment in the position of the attachment corresponding to the highest load on the rear axle.

3-3.6.23.2.4.2 Drawing vehicles for trailers:

3-3.6.23.2.4.2.1 Vehicle unladen and one person in the driver's seat;

3-3.6.23.2.4.2.2 One person in the driver's seat, all the other places in the driving cabin being occupied.

3-3.7 The lamps not included in the above three chapters (3-3.4, 3-3.5 and 3-3.6) should acquire the approval of in-charge authority before installing them into the motor vehicles, trailers or motorcycles.

3-3.8 No red light which could give rise to confusion shall be emitted from a lamp in a forward direction and no white light which could give rise to confusion, other than from the reversing lamp, shall be emitted from a lamp in a rearward direction. No account shall be taken of lighting devices fitted for the interior lighting of the vehicle. In case of doubt, this requirement shall be verified as follows:

3-3.8.1 For the visibility of red light towards the front of a vehicle, with the exception of a red rearmost side-marker lamp, there must be no direct visibility of the apparent surface of a red lamp if viewed by an observer moving within Zone 1 (see Figure 5-1);

3-3.8.2 For the visibility of white light towards the rear of the vehicle, with the exception of white conspicuity markings fitted to the vehicle, there must be no direct visibility of the apparent surface of a white lamp if viewed by an observer moving within Zone 2 in a transverse plane situated 25 m behind the vehicle (see Figure 5-2);

3-3.8.3 In their respective planes, the zones 1 and 2 explored by the eye of the observer are bounded:

3-3.8.3.1 in height, by two horizontal planes 1 m and 2.2 m respectively above the ground;

3-3.8.3.2 in width, by two vertical planes which, forming to the front and to the rear respectively an angle of 15 degrees outwards from the vehicle's median longitudinal plane, pass through the point or points of contact of vertical planes parallel to the vehicle's median longitudinal plane delimiting the vehicle's overall width; if there are several points of contact, the foremost shall correspond to the forward plane and the rearmost to the rearward plane.

3-3.9 Declaration of design compliance of automatic control of the main-beam headlamps and adaptive main-beam headlamps

3-3.9.1 Test drive specifications for the automatic control of the main-beam headlamps

3-3.9.1.1 The test drive shall be carried out in clear atmosphere and with clean head-lamps

3-3.9.1.2 The test course shall comprise test sections with traffic conditions, at speed corresponding to the relevant type of road, as described in table 1 below:

3-3.9.1.3 Urban areas shall comprise roads with and without illumination.

3-3.9.1.4 Country roads shall comprise sections having two lanes and sections having four or more lanes and shall include junctions,

hills and/or slopes, dips and winding roads.

3-3.9.1.5 Multi lane roads (e.g. motorways) and country roads shall comprise sections having straight level parts with a length of more than 600m. Additionally they shall comprise of sections having curves to the left and to the right.

3-3.9.1.6 Dense traffic situations shall be taken into account.

3-3.9.2 Test drive specifications for adaptive main-beam headlamps

3-3.9.2.1 The test drive shall be carried out in clear atmosphere[2] and with clean head-lamps.

3-3.9.2.2 The test course shall comprise test sections with traffic conditions, at speed corresponding to the relevant type of road, as described in table 2 below:

3-3.9.2.3 Urban areas shall comprise roads with and without illumination.

3-3.9.2.4 Country roads shall comprise sections having two lanes and sections having four or more lanes and shall include junctions, hills and/or slopes, dips and winding roads.

3-3.9.2.5 Multi lane roads (e.g. motorways) and country roads shall comprise sections having straight level parts with a length of more than 600m. Additionally they shall comprise of sections having curves to the left and to the right.

3-3.9.2.6 Dense traffic situations shall be taken into account

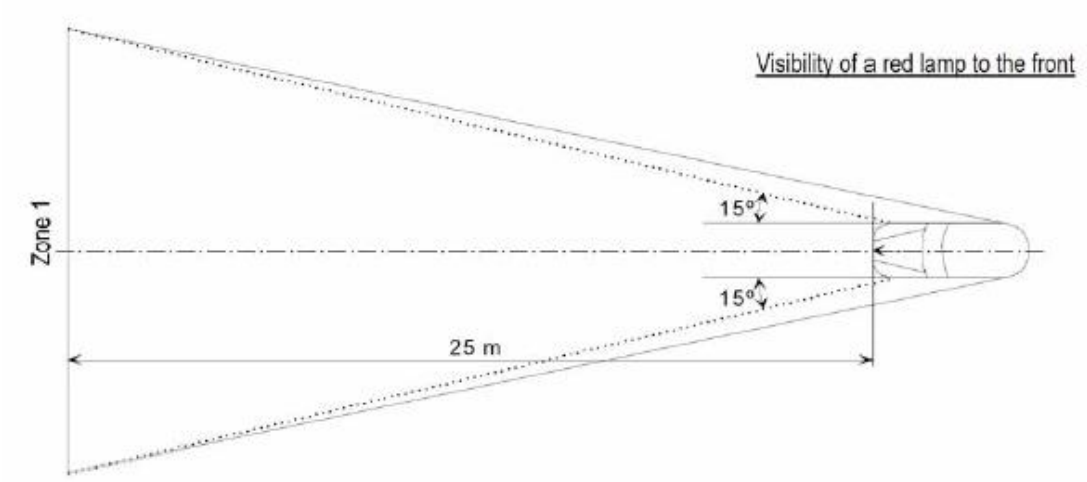
3-3.9.2.7 For the test sections A and B in the table above the engineers conducting the tests shall evaluate and record the acceptability of the performance of the adaptation process in relation to oncoming and preceding road users. This means that the test engineers shall be seated in the vehicle being tested and additionally be seated in the oncoming and preceding vehicles.

Table 1

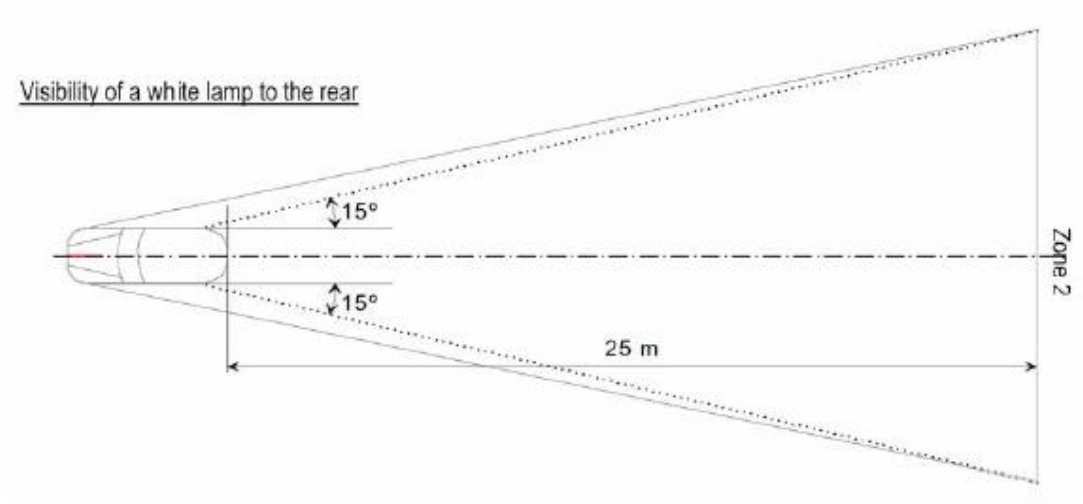
Test Section	Traffic conditions	Road type		
		Urban areas	Multi lane road, e.g. motorway	Country road
	Speed	50 +/- 10 km/h	100 +/- 20 km/h	80 +/- 20 km/h
	Average percentage of the full test course length	10 per cent	20 per cent	70 per cent
A	Single oncoming vehicle or single preceding vehicle in a frequency so that the main beam will switch ON and OFF.		X	X
B	Combined oncoming and preceding traffic situations, in a frequency so that the main beam will switch ON and OFF.		X	X
C	Active and passive overtaking manoeuvres, in a frequency so that the main beam will switch ON and OFF.		X	X
D	Oncoming bicycle, as described in paragraph 6.1.9.3.1.2.			X
E	Combined oncoming and preceding traffic situations	X		

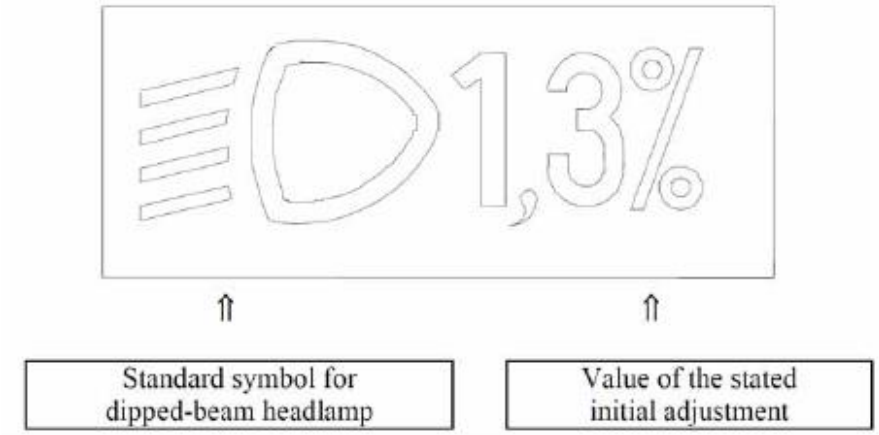
Table 2

Test Section	Traffic conditions	Road type		
		Urban areas	Multi lane road, e.g. motorway	Country road
	Speed	50 +/- 10km/h	100 +/- 20km/h	80 +/- 20km/h
	Average percentage of the full test course length	10 per cent	20 per cent	70 per cent
A	Single oncoming vehicle or single preceding vehicle in a frequency so that the adaptive main beam will react to demonstrate the adaptation process.		X	X
B	Combined oncoming and preceding traffic situations. in a frequency so that the adaptive main beam will react to demonstrate the adaptation process.		X	X
C	Active and passive overtaking manoeuvres, in a frequency so that the adaptive main beam will react to demonstrate the adaptation process.		X	X
D	Oncoming bicycle, as described in paragraph 6.22.9.3.1.2.			X
E	Combined oncoming and preceding traffic situations	X		



The official directions are written in lighting and light-signaling devices..

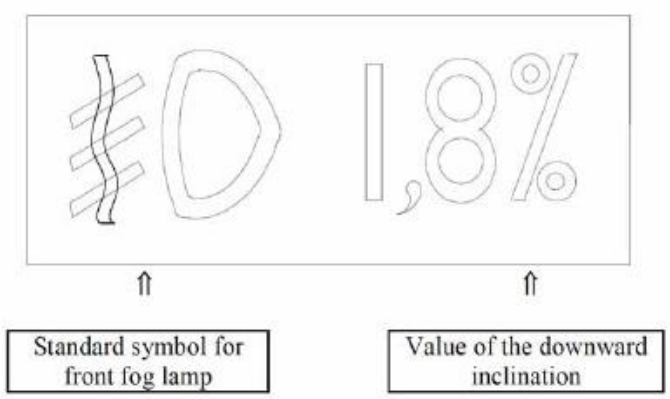




The size of the symbol and characters is left to the discretion of the manufacturer.

The official directions are written

Figure 6-1

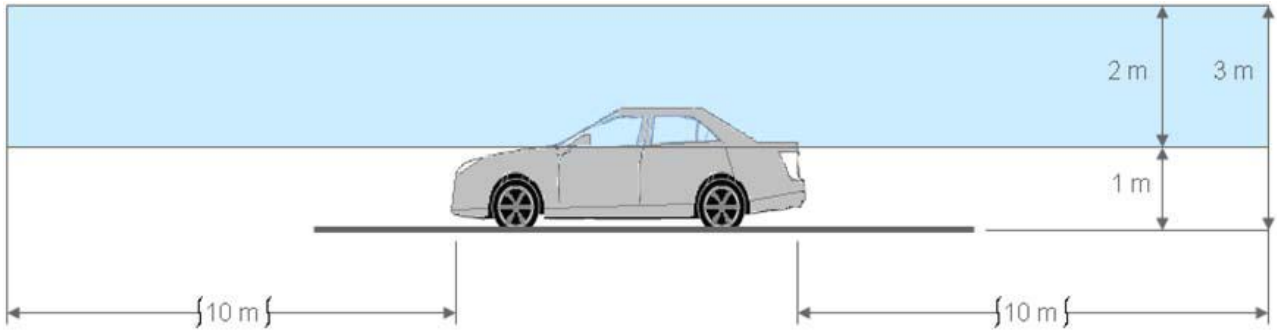


The size of the symbol and characters is left to the discretion of the manufacturer.

Figure 6-2

Zones of observation

This drawing shows the zone from one side, the other zones are from the front, the rear and from the other side of the vehicle



Boundaries of the zones

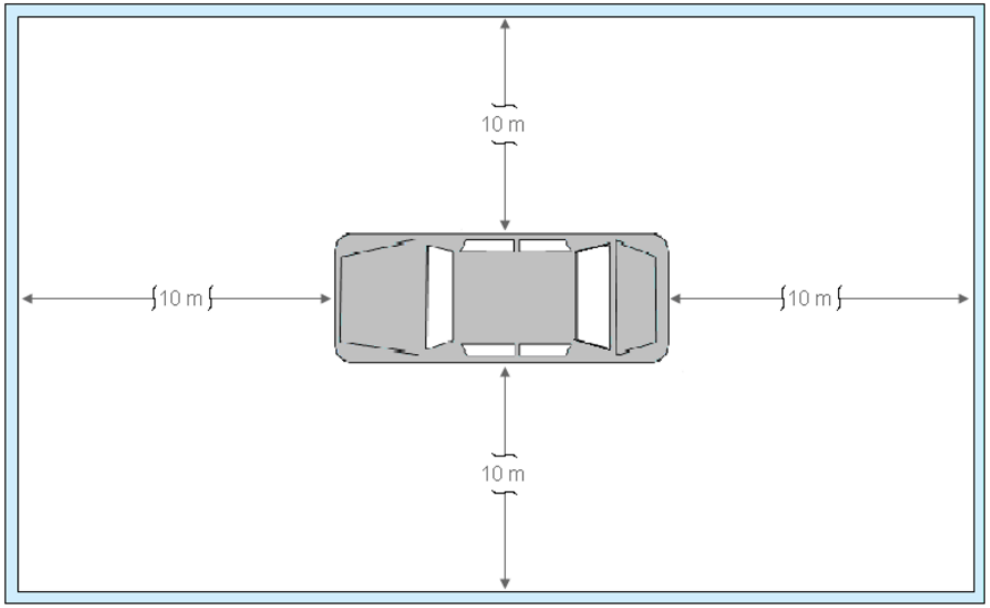


Figure 7 Zones of observation for apparent surface of manoeuvring lamps