Transmitted by the expert from OICA

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OICA'S PROPOSAL FOR A NEW GLOBAL TECHNICAL REGULATION (gtr)

LIGHTING AND LIGHT-SIGNALLING DEVICES FOR ROAD VEHICLES: INSTALLATION PROVISIONS FOR VEHICLES OTHER THAN MOTORCYCLES

Note: The text reproduced below contains the non-complete draft proposal from OICA for a global technical regulation (gtr) on the installation of lighting and light-signalling devices for road vehicles. It is based on document TRANS/WP29/GRE/2001/6/Rev.1 as last edited on 12 August 2005. Changes compared to the above-mentioned document are highlighted in tables; comments and justifications to the proposed amendments are to be found at the bottom of each table. The present document is produced as a basis for negotiations with the interested Contracting Parties to the 1998 Agreement, however some items are still under discussions within OICA.

DRAFT GLOBAL TECHNICAL REGULATION ON
LIGHTING AND LIGHT-SIGNALLING DEVICES FOR ROAD VEHICLES:
INSTALLATION PROVISIONS FOR VEHICLES OTHER THAN MOTORCYCLES

TABLE OF CONTENT:

1. SCOPE AND PURPOSE

This global technical regulation (gtr) specifies requirements for the location, geometric visibility, electric connection and operation of lighting and light-signalling devices installed on new road vehicles.

The purpose of this regulation is to ensure the effectiveness, visibility (both in daylight and darkness or other condition of reduced visibility) and functioning of lighting and light-signalling devices in order to reduce the safety hazards caused by (a) inadequate illumination of the roadway or glare caused by vehicle lighting devices; and (b) diversion of the driver's attention from the driving task caused by **confusion** of information from the vehicle's light-signalling devices as they relate to presence, identification and/or behaviour of the vehicle on the road.

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
	The lighting and light-signalling devices shall be so fitted that during the operation of the vehicle 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.
Comment	
	As the former para. 4.3 describes only general requirements OICA proposes to transfer this into chapter 1. Under para. 4.3 it may lead to discussions how this general requirement has to/can be checked.

2. APPLICATION

This regulation applies to road vehicles category 1 and 2 [1]/ and their trailers. This regulation does not apply to installation of additional lighting and light-signalling devices on special purpose vehicles, including but not limited to, police, medical and other emergency or public service vehicles.

1/ per "**Special Resolution No. 1 Concerning the common definitions of the vehicle categories, masses and dimensions (S.R.1)**"

3. DEFINITIONS

For the purpose of this regulation:

3.1. "Contracting Party" means a country or a regional economic integration organization, as prescribed by the AGREEMENT CONCERNING THE ESTABLISHING OF GLOBAL TECHNICAL REGULATIONS FOR WHEELED VEHICLES, EQUIPMENT AND PARTS WHICH CAN BE FITTED AND/OR BE USED ON WHEELED VEHICLES done at Geneva on 25 June 1998, that has adopted this regulation, and in whose jurisdiction the vehicle would be registered.

3.2. VEHICLE CHARACTERISTICS

3.2.1. "Transverse plane" means a vertical plane perpendicular to the median longitudinal plane of the vehicle.

3.2.2. "Unladen vehicle" means a vehicle at its "Unladen Vehicle Mass" 1/.

3.2.3. "Structural length" 1/.

3.2.4. "Structural width" 1/.

3.2.5.

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
"Operating tell-tale" means a visual or auditory signal indicating that a device has been switched on and is operating correctly or not.	"Operating tell-tale" means a visual or auditory signal **(or any equivalent signal e.g a text display)** indicating that a device has been switched on and is operating correctly or not.
Comments	
	The phrase “or any equivalent signal” is already mentioned in ECE R48. The example should only make clear what an equivalent signal could be.

3.2.6.

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
"Failure tell-tale" means a visual or auditory signal indicating that a device is not operating correctly. Operating tell-tale or circuit-closed tell-tale may be used to indicate failure of a device.	"Failure tell-tale" means a visual or auditory signal **(or any equivalent signal e.g. text display)** indicating that a device is not operating correctly. Operating tell-tale or circuit-closed tell-tale may be used to indicate failure of a device.
Comments	
	See para. 3.2.5

3.2.7.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
"Circuit-closed tell-tale" means a visual signal indicating that a device has been switched on **[in the paragraph above circuit-closed tell-tale is allowed as failure tell-tale.]**	"Circuit-closed tell-tale" means a visual signal indicating that a device has been switched on.
Comments	
	The hint "in the paragraph above circuit-closed tell-tale is allowed as failure tell-tale" is obsolete

3.2.8. "Ground" means a horizontal surface on which the vehicle stands.

3.2.9. "Movable components" means those vehicle body components, including but not limited to, doors, bonnet (hood), boot (trunk lid), roof, rear hatch, tailgate, retractable spoiler, bus storage compartment door and other exterior access panels, or other vehicle parts that can be removed or change position(s) by tilting, rotating or sliding without the use of tools. Forward-tilting truck cabs are not moveable components.

3.2.10.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
"Normal position of use of a movable component" means the position(s) of a movable component specified by the vehicle manufacturer for the time when the vehicle is **moving under its own power or is towed by another vehicle**.	"Normal position of use of a movable component" means the position(s) of a movable component specified by the vehicle manufacturer for the time when the vehicle is **moving.**
Comments	
	The hint "under its own power or is towed by another vehicle" is obsolete. It is only of interest that the vehicle is moving.

3.2.11.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
"Front" means that part of the vehicle between the transverse **vertical** plane tangent to the extreme front-end including all original equipment components and the transverse **vertical** plane passing through the centre of the foremost axle.	"Front" means that part of the vehicle between the transverse **vertical** plane tangent to the extreme front-end including all original equipment components and the transverse **vertical** plane passing through the centre of the foremost axle.
Comments	
	Vertical is necessary for clarification.

3.2.12.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
"Rear" means that part of the vehicle between the transverse **vertical** plane tangent to the extreme rear-end including all original equipment components and the transverse **vertical** plane passing through the centre of the rearmost axle.	"Rear" means that part of the vehicle between the transverse **vertical** plane tangent to the extreme rear-end including all original equipment components and the transverse **vertical** plane passing through the centre of the rearmost axle.
Comments	
	Vertical is necessary for clarification.

3.2.13.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
"**Outer edge**" means the plane parallel to the median longitudinal plane of the vehicle and touching the vehicle's side, disregarding the projection of: - any anti-skid devices mounted on the wheels; - headlamp cleaners; - door handles; customs sealing devices and their protection; - devices for securing the tarpaulin and their protection; - tyre failure tell-tale devices; - protruding flexible parts of a spray-suppression system **(mud flaps)**; - lighting and light signalling devices; - for buses, access ramps, lifting platforms and similar equipment in their stowed position; - rear-view mirrors or other devices for indirect vision; - tyre-pressure indicators; - retractable steps; - the deflected part of the tyre walls immediately above the point of contact with the ground; - external lateral guidance devices of guided buses; - running boards; - de-mountable mudguard broadening.	"**Outer edge**" means the plane parallel to the median longitudinal plane of the vehicle and touching the vehicle's side, disregarding the projection of: - any anti-skid devices mounted on the wheels; - headlamp cleaners; - door handles; customs sealing devices and their protection; - devices for securing the tarpaulin and their protection; - tyre failure tell-tale devices; - protruding flexible parts of a spray-suppression system **(mud flaps)**; - lighting and light signalling devices; - for buses, access ramps, lifting platforms and similar equipment in their stowed position; - rear-view mirrors or other devices for indirect vision; - tyre-pressure indicators; - retractable steps; - the deflected part of the tyre walls immediately above the point of contact with the ground; - external lateral guidance devices of guided buses; - running boards; - de-mountable mudguard broadening.
Comments	
	Adding mud flaps makes the things clearer.

3.3. LIGHTING AND LIGHT SIGNALLING DEVICES CHARACTERISTICS

3.3.1. "Device" means an element or an assembly of elements used to perform one or more functions.

3.3.2. Function

3.3.2.1. "Lighting function" means the light emitted by a device to illuminate the road and objects in the direction of vehicle movement, as defined in paragraph 3.4.;

3.3.2.2. "Light-signalling function" means the light emitted or reflected by a device to give to other road users visual information on the presence and/or the change of movement of the vehicle, as defined in paragraph 3.5.

3.3.3. "Lamp" means a device designed to illuminate the road or to emit a light signal to other road users. Rear registration plate illuminating device and retro-reflectors are also lamps. Light emitting or reflective registration plates are not lamps.

3.3.4. Light source (see Annex 4)

3.3.4.1. "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 the extreme outlet of a light-guide, as part of a distributed lighting or light-signalling system not having a built-in outer lens;

3.3.4.2.

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
"Replaceable light source" means a light source which is designed to be installed in and removed from the holder of **the light source** without the use of tool(s);	"Replaceable light source" means a light source which is designed to be installed in and removed from the holder of **the light source** without the use of tool(s);
Comments	
	Wording is ok to OICA.

3.3.4.3. "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;

3.3.4.4.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
"Light source module" means an optical part of a device which is specific to that device, is containing one or more non-replaceable light sources, and is only removable from its device with the use of tool(s). **A light source module is so designed that regardless the use of tool(s), it is not mechanically interchangeable with any replaceable approved light source**;	"Light source module" means an optical part of a device which is specific to that device, is containing one or more non-replaceable light sources, and is only removable from its device with the use of tool(s). **A light source module is so designed that regardless the use of tool(s), it is not mechanically interchangeable with any replaceable approved light source**;
Comments	
	Wording is ok to OICA.

3.3.4.5. "Filament light source" (filament lamp) means a light source where the element for visible radiation is one or more heated filaments producing thermal radiation;

3.3.4.6. "Gas-discharge light source" means a light source where the element for visible radiation is a discharge arc producing electro-luminescence / fluorescence;

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

3.3.4.8. "Electronic light source control gear" means one or more components between supply and light source to control voltage and/ or electrical current of the light source;

3.3.4.9. "Ballast" means an electronic light source control gear between supply and light source to stabilise the electrical current of a gas-discharge light source;

3.3.4.10. "Ignitor" means an electronic light source control gear to start the arc of a gas-discharge light source.

3.3.5.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
"Objective luminous flux" means a design value of the luminous flux of a replaceable light **source achieved**, within the specified tolerances, when the replaceable light source is energised by the power supply at the specified test voltage, as indicated in the data sheet of the light source.	"Objective luminous flux" means a design value of the luminous flux of a replaceable light **source achieved**, within the specified tolerances, when the replaceable light source is energised by the power supply at the specified test voltage, as indicated in the data sheet of the light source.
Comments	
	Wording is ok to OICA.

3.3.6. "Independent lamps" means devices having separate illuminating surfaces [2]/, separate light sources and separate lamp bodies.

3.3.7. "Grouped lamps" means devices having separate illuminating surfaces 2/ and separate light sources, but a common lamp body.

3.3.8. "Combined lamps" means devices having separate illuminating surfaces, 2/ but a common light source and a common lamp body.

3.3.9. "Reciprocally incorporated lamps" 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 2/ and a common lamp body.

3.3.10.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
"Concealable lamp" means a lamp capable of being partly or completely **concealed or retracted when not in use**.	"Concealable lamp" means a lamp capable of being partly or completely **concealed or retracted when not in use**.
Comments	
	Wording is ok to OICA.

3.3.11. "Light emitting surface" of a lighting device light-signalling device or a retro-reflector means all or part of the exterior surface of the transparent material as defined by the manufacturer of the device (see Annex 1).

3.3.12. "Illuminating surface" (see Annex 1).

3.3.12.1. "Illuminating surface of a lighting device" (paragraphs 3.4.1. to 3.4.5.) means the orthogonal projection of the full aperture of the reflector, or in the case of headlamps with an ellipsoidal reflector of the "projection lens" on a transverse plane. If the lighting device has no reflector, the definition of paragraph 3.3.12.2. shall be applied. If the light-emitting surface of the lamp extends over part only of the full aperture of the reflector, then the projection of that part only is taken into account.

In the case of a passing beam headlamp, the illuminating surface is limited by the apparent trace of the cut-off on to the lens. If the reflector and lens are adjustable relative to one another, the mean adjustment should be used.

2/ In the case of lighting devices for the rear registration plate and the side direction indicators, replace by "light-emitting surface" in the absence of an illuminating surface.

3.3.12.2.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
"Illuminating surface of a light-signalling device other than a retro-reflector" (paragraphs 3.5.1. to 3.5.13. and 3.5.15. to 3.5.18.) means the orthogonal projection of the lamp in a plane perpendicular to its axis of reference and in contact with the exterior light-emitting surface of the lamp, this projection being bounded by the edges of screens situated in this plane, each allowing only 98 per cent of the total luminous intensity of the light to persist in the direction of the axis of reference.	"Illuminating surface of a light-signalling device other than a retro-reflector" (~~paragraphs 3.5.1. to 3.5.13. and 3.5.15. to 3.5.18.~~ **paragraphs 3.5.1. to 3.5.9. and 3.5.11. to 3.5.13.**) means the orthogonal projection of the lamp in a plane perpendicular to its axis of reference and in contact with the exterior light-emitting surface of the lamp, this projection being bounded by the edges of screens situated in this plane, each allowing only 98 per cent of the total luminous intensity of the light to persist in the direction of the axis of reference.
Comments	
	Changes in the numbering of the corresponding paragraphs

To determine the lower, upper and lateral limits of the illuminating surface, only screens with horizontal or vertical edges shall be used.

3.3.12.3.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
"Illuminating surface of a retro-reflector" (paragraph 3.5.14.) means the orthogonal projection of a retro-reflector in a plane perpendicular to its axis of reference and delimited by planes contiguous to the outermost parts of the retro-reflector's optical system and parallel to that axis. For the purposes of determining the lower, upper and lateral edges of the device, only horizontal and vertical planes shall be considered.	"Illuminating surface of a retro-reflector" (~~paragraph 3.5.14.~~ **paragraphs 3.5.10. and 3.5.14.**) means the orthogonal projection of a retro-reflector in a plane perpendicular to its axis of reference and delimited by planes contiguous to the outermost parts of the retro-reflector's optical system and parallel to that axis. For the purposes of determining the lower, upper and lateral edges of the device, only horizontal and vertical planes shall be considered.
Comments	
	Changes in the numbering of the corresponding paragraphs

3.3.13. "Apparent surface" for a defined direction of observation means the orthogonal projection of either:

- the boundary of the illuminating surface projected on the exterior surface of the lens (a-b), or

- the light-emitting surface (c-d),

in a plane perpendicular to the direction of observation and tangential to the most exterior point of the lens (see Annex 1).

3.3.14. "Axis of reference (reference axis)" means the characteristic axis of the lamp determined by the manufacturer (of the lamp) for use as the direction of reference (H=0°, V=0°) for angles of field for photometric measurements and for installing the lamp on the vehicle.

3.3.15. "Centre of reference" means the intersection of the axis of reference with the exterior light-emitting surface.

3.3.16. "Angles of geometric visibility" means the angles, which determine the field of the minimum solid angle in which the apparent surface of the lamp must be visible. That field of the solid angle is determined by the segments of the sphere, the centre of which coincides with the centre of reference of the lamp, and the equator is parallel with the ground. These segments are determined in relation to the axis of reference. The horizontal angles β (beta) correspond to the longitude and the vertical angles α (alpha) to the latitude (see Annex 3).

3.3.17. The following shall be deemed to be:

3.3.17.1. "A single lamp" means 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.

3.3.17.2. "Two lamps (an even number of lamps)", means a single light-emitting surface in the shape of a band or strip if such band or strip is placed symmetrically in relation to the median longitudinal plane of the vehicle, extends on both sides to within at least 400 mm of the adjacent outer edge of the vehicle, and is not less than 0.8 m long; the illumination of such surface shall be provided by not less than two light sources placed as close as possible to its ends; the light-emitting surface may be constituted by a number of juxtaposed elements on condition that the projections of the several individual light-emitting surfaces on a transverse plane occupy not less than 60 per cent of the area of the smallest quadrilateral circumscribing the projections of the said individual light-emitting surfaces.

3.4. LIGHTING DEVICES

3.4.1. "Driving beam (main-beam, high-beam) headlamp" means a lamp used to illuminate the road a long distance ahead of the vehicle.

3.4.2. "Passing beam (dipped-beam, low-beam) headlamp" means a lamp used to illuminate the road ahead of the vehicle in the presence of other road users.

3.4.3. "Front fog lamp" means a lamp used to improve the illumination of the road ahead of the vehicle in case of fog or any other similar condition of reduced visibility.

3.4.4. "Cornering lamp" means a lamp used to provide supplementary illumination of that part of the road which is located near to the forward corner of the vehicle at the side towards which the vehicle is going to turn.

3.4.5. "Reversing lamp" means a lamp used to illuminate the road to the rear of the vehicle and to warn pedestrians and other road-users that the vehicle is reversing or is about to reverse.

3.4.6. "Bend lighting" means a lighting function to provide enhanced illumination in bends.

3.5. LIGHT SIGNALLING DEVICES

~~3.5.5.~~ **3.5.1.** "Direction indicator lamp" means a lamp used to indicate to other road-users that the driver intends to change direction to the right or to the left.

~~3.5.6.~~ **3.5.2.**

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
"Hazard warning signal" means the simultaneous operation of all of a vehicle's direction indicator lamps to **indicate** that the vehicle temporarily constitutes a special danger to other road-users.	"Hazard warning signal" means the simultaneous operation of all of a vehicle's direction indicator lamps to **indicate** that the vehicle temporarily constitutes a special danger to other road-users.
Comments	
	Wording is ok to OICA.

~~3.5.7.~~ **3.5.3.** "Stop lamp" means a lamp used to indicate to other road-users to the rear of the vehicle that the service brake is applied and/or longitudinal movement of the vehicle is intentionally retarded.

~~3.5.8.~~ **3.5.4.** "Rear registration plate illuminating device" means a device used to illuminate the space reserved for the rear registration plate; such a device may consist of several optical components.

~~3.5.9.~~ **3.5.5.** "Front position lamp" means a lamp used to indicate the presence and the width of the vehicle when viewed from the front.

~~3.5.10.~~ **3.5.6.** "Rear position lamp (tail lamp)" means a lamp used to indicate the presence and width of the vehicle when viewed from the rear.

~~3.5.11.~~ **3.5.7.** "Rear fog lamp" means a lamp used to improve the conspicuity of a vehicle from the rear in case of dense fog.

~~3.5.12.~~ **3.5.8.** "Parking lamp" means a lamp, which is used to draw attention to the presence of a stationary vehicle.

~~3.5.13.~~ **3.5.9.** "End-outline marker lamp (clearance lamp)" means a lamp fitted near to the outer edge and as close as possible to the top of the vehicle and used to indicate clearly the vehicle's overall width. This lamp is intended, for certain vehicles and trailers, to complement the vehicles' front and rear position lamps.

~~3.5.14.~~ **3.5.10.** "Retro-reflector" means a device used to indicate the presence of a vehicle by the reflection of light emanating from a light source not connected to the vehicle, the observer being situated near the source.

For the purposes of this regulation the following are not considered as retro-reflectors:

~~3.5.14.1.~~ **3.5.10.1.** retro-reflecting registration plates;

~~3.5.14.2.~~ **3.5.10.2.** the retro-reflecting signals mentioned in the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR);

~~3.5.14.3.~~ **3.5.10.3.**

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
other retro-reflecting **plates and signals** which must be used to comply with national requirements for use as regards certain categories of vehicles or certain methods of operation.	other retro-reflecting **plates and signals** which must be used to comply with national requirements for use as regards certain categories of vehicles or certain methods of operation.
Comments	
	Wording is ok to OICA.

~~3.5.15.~~ **3.5.11.** "Side-marker lamp" means a lamp used to indicate the presence of the vehicle when viewed from the side.

~~3.5.16.~~ **3.5.12.** "Daytime running lamp" means a lamp facing in a forward direction used to make the vehicle more conspicuous when driving during daytime.

~~3.5.17.~~ **3.5.13.**

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
"Identification lamp (ID lamp)" means a device **affixed** at the top and about the centreline of a vehicle to draw particular attention to its **width**. It is intended to complement the vehicle's front and rear position and end outline marker lamps.	"Identification lamp (ID lamp)" means a device **affixed** at the top and about the centreline of a vehicle to draw particular attention to its **width**. It is intended to complement the vehicle's front and rear position and end outline marker lamps.
Comments	
	Wording is ok to OICA.

~~3.5.18.~~ **3.5.14.** "Conspicuity treatment" means a system of retro-reflective devices providing information regarding presence, width, length and bulk of a certain type of vehicles under condition of low or no ambient light.

4. GENERAL SPECIFICATIONS

4.1.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Lighting and light signalling devices listed in paragraph 5. shall conform and shall be marked in conformity with the applicable regulations of the Contracting Party.	Lighting and light signalling devices listed in paragraph 5. shall conform and shall be marked in conformity with the applicable **component** regulations ~~**of the Contracting Party.**~~
Comments	
	This gtr has to be complemented by requirements for the components. As long as this has not been done the national requirements for the components are valid for a transitional time period.

4.2.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
[Each Contracting Party may require, allow or prohibit installation of devices listed in paragraph 5.] Installation of lamps not listed in paragraph 5. is prohibited except on special purpose vehicles, including but not limited to, police, medical and other emergency or public service vehicles**; however,** a Contracting Party may allow the fitting of such lamps on vehicles to be registered in its territory. **[bold text added in case of deletion of paragraph 4.22.]**	**No additional lighting device or light signalling device shall be installed that impairs the effectiveness of lighting equipment required by this regulation.**
Comments	
This is the requirement out of ECE Regulation No. 48 with the possibility of each contracting party to allow additional lamps.	OICA prefers the requirement out of FMVSS 108 because this will avoid that some countries will allow things which are not allowed in another country.

4.3

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
The lighting and light-signalling devices shall be so fitted that during the operation of the vehicle 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.] **[is this enforceable? – if not – should such statement be in a regulation?]**	~~The lighting and light-signalling devices shall be so fitted that during the operation of the vehicle 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.]~~ ~~[is this enforceable? – if not – should such statement be in a regulation?]~~
Comments	
	See Para. 1.

4.4.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
All lighting devices, except reversing and cornering lamps, shall allow for adjustment of their orientation in accordance with the instructions provided with the vehicle by the vehicle manufacturer without the use of special tools other than those provided with the vehicle by the vehicle manufacturer.	All lighting devices, except reversing and cornering lamps, shall **be so installed that** ~~allow for~~ **correct** adjustment of their orientation **can easily be carried out**. ~~in accordance with the instructions provided with the vehicle by the vehicle manufacturer without the use of special tools other than those provided with the vehicle by the vehicle manufacturer.~~
Comments	
	Consistency with para. 5.2.5.3. and 5.3.5.2. (adjustment of dipped beam headlamps and front fog lamps)

4.5.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
For all light-signalling devices **when fitted to the vehicle**, including those mounted on the side panels, the reference axis of the lamp must be parallel to the ground **and** 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 light-signalling devices. In each direction, a tolerance of ± 3° shall be allowed. In addition, any specific instructions, laid down by the lamp manufacturer with regard to fitting of the light-signalling device on a vehicle, must be complied with.	For all light-signalling devices **when fitted to the vehicle**, including those mounted on the side panels, the reference axis of the lamp must be parallel to the ground **and** 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 light-signalling devices. In each direction, a tolerance of ± 3° shall be allowed. In addition, any specific instructions, laid down by the lamp manufacturer with regard to fitting of the light-signalling device on a vehicle, must be complied with.
Comments	
	Wording ok to OICA.

4.6.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
In the absence of specific instructions, the height and orientation of the lamps shall be **measured** with the unladen vehicle placed on level ground and with the movable components in their normal position of use.	In the absence of specific instructions, the height and orientation of the lamps shall be **measured** with the unladen vehicle placed on level ground and with the movable components in their normal position of use.
Comments	
	Wording ok for OICA.

4.7. In the absence of specific instructions, lamps of the same function, installed on the vehicle in an even number shall:

4.7.1. 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);

4.7.2. be symmetrical to one another in relation to the median longitudinal plane, this requirement does not apply to the interior structure of the lamp;

4.7.3. satisfy the same colorimetric requirements; and

4.7.4. have substantially identical photometric characteristics.

4.8.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
On vehicles whose external shape is asymmetrical, the requirements in paragraphs 4.7.1. and 4.7.2. shall be satisfied **to the extent practicable**.	On vehicles whose external shape is asymmetrical, the requirements in paragraphs 4.7.1. and 4.7.2. shall be satisfied **as far as is** ~~to the extent~~ **practicable.**
Comments	
	To replace "to the extent" by "as far as" makes the wording clearer.

4.9. Grouped, combined or reciprocally incorporated lamps

4.9.1. Subject to paragraphs 4.9.2. and 4.9.3., lamps may be grouped, combined or reciprocally incorporated with one another provided that all requirements of this regulation are fulfilled.

4.9.2. 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.

4.9.3. Where the apparent surface of a single lamp is composed of two or more distinct parts, it shall satisfy one of the following requirements:

4.9.3.1. 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

4.9.3.2. The distance between two adjacent/tangential distinct parts shall not exceed 15 mm when measured perpendicularly to the reference axis.

4.10. Measurements (see Annex 3)

4.10.1. In height:

"H1" – the maximum height above the ground shall be measured from the highest point of the apparent surface, in the direction of the reference axis; and
"H2" – the minimum height from the lowest point of the apparent surface, in the direction of the reference axis.

In the case of passing beam headlamp,
"H2" is measured from the lowest point of the effective outlet of the optical system (e.g. reflector, lens, projection lens) independent of its utilization.

4.10.2. In width:

"E" – the maximum distance of the lamp from the adjacent outer edge of the vehicle shall be measured 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.

4.10.3. In length:

"K" – the maximum distance between the lamp and the transverse plane which marks the forward or rearward boundary of the vehicle's structural length 1/ shall be measured from that edge of the apparent surface in the direction of the reference axis which is the closest, respectively, to the front-end or rear-end of the vehicle.

4.10.4. Distance between two lamps:

"D" – unless otherwise specified in this document, the distance between two lamps, which face in the same direction, shall be measured between those edges of the two apparent surfaces of these two lamps in the direction of the reference axis, which are the closest to each other.

4.10.5.

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
Where the position, as regards maximum or minimum height, width, length, or distance between lamps, **clearly** meets the requirements of the regulation, the exact edges of any apparent surface need not be determined. **[what is considered "clearly"?]**	Where the position, as regards maximum or minimum height, width, length, or distance between lamps, ~~**clearly**~~ meets the requirements of the regulation, the exact edges of any apparent surface need not be determined.
Comments	
	The word "clearly" is obsolete.

4.11.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
No red light, other than from the rearmost side marker lamp [**or infrared light source allowed for the night vision**,] shall be emitted from a lamp in a forward direction and no white light, 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:	No red light, other than from the rearmost side marker lamp [**or infrared light source allowed for the night vision**,] shall be emitted from a lamp in a forward direction and no white light, 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:
Comments	
Comments from the Japanese government: "The provision that allows red light for the night vision contradicts with what is being discussed at Geneva, i.e., the prohibition of red light emitted in a forward direction. Therefore, for the reason of safety, our stance is against this modified paragraph. There is room for compromise, however, if a quantitative upper limit is specified."	[OICA reluctant to the above wording because it prohibits remote infrared lamps.]

4.11.1. For the visibility of red light towards the front of a vehicle, with the exception of red rearmost side-marker lamps, there must be no direct visibility of the apparent surface of a red lamp if viewed by an observer moving within Zone 1 as specified in Annex 2.

4.11.2. For the visibility of white light towards the rear of the vehicle, with exception of the reversing lamp, there must be no direct visibility of the apparent surface of a white lamp if viewed by an observer moving within Zone 2 as specified in Annex 2.

4.12. Electrical connections

4.12.1. The electrical connections must be such that the front and rear position lamps, the side-marker lamps, the rear registration plate illuminating device and the end-outline marker lamps and the identification lamps, if they exist, 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.

4.12.2. The electrical connections must be such that the lighting function for driving beam, passing beam or the front fog lamp cannot be switched on unless the front and rear position lamps, the side-marker lamps, the rear registration plate illuminating device and the end-outline marker lamps and the identification lamps, if they exist, are also switched on.

This requirement shall not apply, however, to the driving or passing beams when they are flashed momentarily.

4.12.3. Unless otherwise specified in this regulation, lighting and light-signalling devices shall be steady burning when activated.

4.13. Tell-tale

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

4.14. Concealable lamps

4.14.1. Lamps shall not be concealable with the exception of the driving beam headlamps, the passing beam headlamps and the front fog lamps, which may be concealed when they are not in use.

4.14.2. 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.

4.14.3. It must 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 driving beam and passing beam headlamps, the control referred to above is required only to activate the passing beam headlamps.

4.14.4.

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
It must 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 shall light up only when they have reached their position of use. **[definition of "dazzle" – is there one?]**	It must 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 **dazzle to ~~dazzling~~** other road users by the movement of the lamps, they shall light up only when they have reached their position of use.
Comments	
	The wording dazzle is clear and needs no explanation. It is already used in ECE R48.

4.14.5. When the concealment device has a temperature of –30 °C to + 50 °C the headlamps must be capable of reaching the position of use within three seconds of initial operation of the control.

4.15. Number of lamps

When installed on a vehicle, the number of lamps and retro-reflective devices described by this regulation shall be equal to the number specified in paragraph 5. below.

4.16. With the exception of retro-reflectors, a lamp is deemed to be installed on the vehicle if it can be operated after the installation of the required light source. A lamp is deemed not to be installed on the vehicle if additional steps, other than light source installation, are necessary to make the lamp operational.

4.17. Lighting devices installed on, or covered by, movable components:

4.17.1.

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
Rear position lamps, rear direction-indicators and rear retro-reflectors, triangular as well as non triangular, may be installed on movable components only: **[text from TRANS/WP.29/2005/12]**	
Comments	
	Study reservation.

4.17.1.1.

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
- if at all fixed positions of the movable components the lamps on the movable components meet all the position, geometric visibility and photometric requirements for those lamps. Should the above functions be obtained by an assembly of two lamps only one of these lamps needs to meet the above-mentioned requirements. or **[text from TRANS/WP.29/2005/12]**	
Comments	
	Study reservation.

4.17.1.2.

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
- where additional lamps for the above functions are fitted and are activated, when the movable component is in any fixed open position, provided that these additional lamps satisfy all the position, geometric visibility and photometric requirements applicable to the lamps installed on the movable component. **[text from TRANS/WP.29/2005/12]**	
Comments	
	Study reservation.

4.17.1.3.

-	**OICA proposal**
When the movable components are in a position other than a "Normal position of use", the devices installed on them shall not cause undue discomfort to road users.	
Comments	
Proposal from Japanese Government.	Wording is ok for OICA

4.17.2. There must not be any movable component, with or without a light-signalling device installed on it, which in any fixed position hides more than 50 per cent of the apparent surface of front and rear position lamps, front and rear direction indicator lamps, side-marker lamps or any retro-reflector when viewed in the reference axis of this specific device. If this is not practicable:

4.17.2.1. an alternative device meeting all requirements for those lamps shall be installed; or in case of position lamps, direction indicator lamps or mandatory side-marker lamps:

4.17.2.2. a clear notice in the vehicle shall inform the user that in certain position(s) of the movable components other road users shall be warned of the presence of the vehicle on the road by means provided by the manufacturer with the vehicle.

4.17.3. No road illumination device (driving beam headlamp, passing beam headlamp, front fog lamp, etc.) shall be mounted on movable component whose movement causes the beam pattern of the device to move upwards, unless the device mounted on such movable component will be automatically switched off while the movable component is moved out of its normal position of use specified for a moving vehicle.

4.17.4. When a 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) specified by the manufacturer in accordance with this regulation. In the case of passing beam headlamps and front fog lamps, this requirement shall be considered satisfied 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.

4.18. As fitted on a vehicle, lamps shall allow light source replacement in accordance with the instructions provided with the vehicle by the vehicle manufacturer without the use of special tools other than those provided with the vehicle by the vehicle manufacturer. This requirement is not applicable to devices equipped with a non-replaceable light source or gas discharge light source.

4.19.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
In case of a failure, a light-signalling function can be automatically substituted, provided that this temporary substituting function is similar in colour, main intensity and position to the function that has ceased to operate and provided that the substituting device remains operational in its original safety function. During substitution, a tell-tale **or display** on the dashboard shall indicate occurrence of a temporary replacement and need for repair. **[permits use of a message centre to provide information to the driver.]**	In case of a failure, a light-signalling function can be automatically substituted, provided that this temporary substituting function is similar in colour, main intensity and position to the function that has ceased to operate and provided that the substituting device remains operational in its original safety function. During substitution, a tell-tale ~~**or display**~~ on the dashboard shall indicate occurrence of a temporary replacement and need for repair.
Comments	
	If the amendment of the definition of tell-tales (see paras. 3.2.5 and 3.2.6) is accepted "display" can be deleted. TG to re-write the text. Issue is "how long must the driver be warned?"

4.20. Geometric visibility

4.20.1. There must be no obstacle on the inside of the angles of geometric visibility, as described in paragraph 3.3.16., 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 present when the lamp was photometrically tested.

4.20.2. If measurements are taken closer to the lamp, the direction of observation must be shifted parallel to achieve the same accuracy.

4.20.3. If, when the lamp is installed, any part of the apparent surface of the lamp is hidden by any further parts of the vehicle, the part of the lamp not hidden by obstacles must still conform to the photometric values prescribed for the device.

4.20.4. When the vertical angle of geometric visibility below the horizontal may be reduced to 5° (lamp at less than 750 mm above the ground) the photometric field of measurements of the installed device may be reduced to 5° below the horizontal.

4.22. Presence (M = mandatory; O = optional; P = prohibited)

Lighting and light-signalling device	Position or shape	Motor vehicles			Trailers		
		M	O	P	M	O	P
Driving beam headlamp		X					X
Passing beam headlamp		X					X
Front fog lamp			X				X
Reversing lamp		X			X		
Direction indicator lamp and Hazard warning signal	front	X				X	
	side	X				X*/	
	middle side on Cat. 2 vehicles with GVW > 8,000 kg		X			X	
	rear	X			X		
Stop lamp		X			X		
Center stop lamp • Cat. 1-1 • Cat. 1-2 and 2 • Trailer		X	X			X	
Rear registration plate Illuminating device		X			X		
Front position lamp		X			X		
Rear position lamp		X			X		
Rear fog lamp		~~X~~	X		X		
End-outline marker lamp	width > 2,100 mm	X			X		
	1,800mm < width < 2,100 mm		X			X	
	width < 1,800mm			X			X
Rear retro reflector	non-triangular	X				X	
	triangular			X	X		
Front retro- Reflector **/			X		X		
Side retro-reflector		~~X~~	X		X		
Side-marker lamp		~~X~~	X		X		
Daytime running lamp		~~X~~	X				X
Identification lamp	width > 2,100 mm		X			X	
Cornering lamp			X				X

*/ The number of this device may vary on the basis of national, or regional regulations.

**/ In the case motor vehicles having all forward facing lamps with reflectors concealable, this device is mandatory.

5. INDIVIDUAL SPECIFICATIONS

5.1. DRIVING BEAM HEADLAMP

5.1.1. Number

Two or four

5.1.2. Arrangement:

5.1.2.1.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
No point on the apparent surface in the direction of the reference axis of the driving beam headlamp shall be further outboard than the point, which is closest to the adjacent outer edge of the vehicle, on the apparent surface in the direction of reference axis of the passing beam headlamp.	~~No point on the apparent surface in the direction of the reference axis of the driving beam headlamp shall be further outboard than the point, which is closest to the adjacent outer edge of the vehicle, on the apparent surface in the direction of reference axis of the passing beam headlamp.~~
Comments	
	Should be deleted because too design-restrictive and has no safety benefit.

5.1.2.2. Driving beam headlamps shall be fitted in such a way that the light emitted is not illuminating the driver either directly or indirectly through the rear-view mirrors and/or other reflecting surfaces of the vehicle.

5.1.3. Position

5.1.3.1.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
In width: subject the provisions in paragraph 5.1.2.1. and	In width: ~~subject the provisions in paragraph 5.1.2.1. and~~ **no special requirement**
Comments	
	As 5.1.2.1 is deleted the hint to this paragraph meaningless.

5.1.3.2. In height: no individual specifications.

5.1.3.3. In length: no individual specifications.

5.1.4. Geometric visibility

5.1.4.1. 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° with the axis of reference of the headlamp.

5.1.4.2. The origin of the angles of geometric visibility is the perimeter of the projection of the illuminating surface on a transverse plane tangent to the foremost part of the lens of the headlamp.

5.1.5. Orientation

Towards the front.

5.1.6. Electrical connections

5.1.6.1. If there are two pairs of the driving beam headlamps they may be switched on either simultaneously or in pairs. For changing over from the passing to the driving beam at least one pair of driving beam headlamps shall be switched on. For changing over from the driving beam to the passing beam all driving beam headlamps shall be switched off simultaneously.

5.1.6.2. The passing beam headlamps may remain switched on at the same time as the driving beam headlamps.

5.1.6.3.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Where four concealable headlamps 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 in daylight	Where four concealable headlamps 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 in daylight
Comments	
Not clear language – what is the reason for this paragraph?	Ok to OICA.

5.1.6.4.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Each vehicle subject to this regulation must be equipped with a manual on/off switch for the driving beam headlamps.	Each vehicle subject to this regulation must be equipped with a manual on/off switch for the driving beam headlamps.
Comments	
Remark: the allowance for automatic switching was removed, there are currently no regulatory provisions in the world for automatic switching of this device. Once such provisions are discussed and agreed upon, they will be added to this gtr.	No problem for OICA.

5.1.6.5.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
5.1.6.5. In addition to the manual switch, driving beam headlamps may be operated by an automatic device. The driver shall be informed when the device is controlling the headlamp beams automatically.	~~5.1.6.5. In addition to the manual switch, driving beam headlamps may be operated by an automatic device. The driver shall be informed when the device is controlling the headlamp beams automatically.~~
5.1.6.5.1. (a) The device shall switch to the passing beam in accordance with the "dip" limits shown.	~~5.1.6.5.1. (a) The device shall switch to the passing beam in accordance with the "dip" limits shown.~~
(b) The device shall switch to the driving beam in accordance with the "hold" limits shown.	~~(b) The device shall switch to the driving beam in accordance with the "hold" limits shown.~~
Operating Limits (foot-candles)	~~Operating Limits (foot-candles)~~
Test Position* (degrees) Dip Hold	~~Test Position* (degrees) Dip Hold~~
H-V 0.0015-adjust 0.00015 min. to 0.000375 max.	~~H-V 0.0015-adjust 0.00015 min. to 0.000375 max.~~
H-2L 0.0025 max. 0.00015 min.	~~H-2L 0.0025 max. 0.00015 min.~~
H-4L 0.0040 max. 0.00015 min.	~~H-4L 0.0040 max. 0.00015 min.~~
H-6L 0.0075 max. 0.00015 min.	~~H-6L 0.0075 max. 0.00015 min.~~
H-2R 0.0025 max. 0.00015 min.	~~H-2R 0.0025 max. 0.00015 min.~~
H-5R 0.0150 max. to 0.0040 min. 0.00015 min.	~~H-5R 0.0150 max. to 0.0040 min. 0.00015 min.~~
1D-V 0.0030 max. 0.00015 min.	~~1D-V 0.0030 max. 0.00015 min.~~
1U-V 0.0030 max. 0.00015 min.	~~1U-V 0.0030 max. 0.00015 min.~~
* For right hand traffic; symmetrically opposite for left hand traffic.	~~* For right hand traffic; symmetrically opposite for left hand traffic.~~
(c) A set of constant foot-candle curves throughout the required vertical and horizontal angles shall be made at "dip" sensitivities of 0.0017, 0.0025 and .01 foot-candles. There shall be no sensitivity voids within the test angles shown.	~~(c) A set of constant foot-candle curves throughout the required vertical and horizontal angles shall be made at "dip" sensitivities of 0.0017, 0.0025 and .01 foot-candles. There shall be no sensitivity voids within the test angles shown.~~
5.1.6.5.2. Means shall be provided to override whichever headlamp beam is activated automatically.	~~5.1.6.5.2. Means shall be provided to override whichever headlamp beam is activated automatically.~~
5.1.6.5.3. The device shall not affect the function of the circuit-closed tell-tale.	~~5.1.6.5.3. The device shall not affect the function of the circuit-closed tell-tale.~~

Comments	
	As suggested during the Washington informal GRE/gtr meeting, the vehicle manufacturers have provided automatic switching provisions from SAE J565b referenced in US and Canadian regulations FMVSS 108 and CMVSS 108. This paragraph (5.1.6.5.) is a device operating performance specification and it may be not appropriate for a vehicle installation gtr; however, creating a separate device regulation would further delay the time schedule for this gtr.

5.1.7. Tell-tale

Circuit-closed tell-tale mandatory.

5.1.8. Other provisions

5.1.8.1. No more than one driving beam headlamp and/or its beam pattern on each side of the vehicle may swivel to produce bend lighting.

5.1.8.2. Where a vehicle is fitted with four concealable driving beam headlamps the installation of two more headlamps shall be allowed only for the purpose of providing light-signalling, consisting of intermittent illumination, at short intervals in the daylight.

5.1.8.3. The aggregate maximum intensity of all driving beam headlamps which can be switched on simultaneously shall not exceed 225,000 cd at any point in the beam pattern when measured at 12.0 V, based on documentation supplied by the vehicle manufacturer.

5.2. PASSING BEAM HEADLAMP

5.2.1. Number

Two.

5.2.2. Arrangement

Passing beam headlamps shall be fitted in such a way that the light emitted is not illuminating the driver either directly or indirectly through the rear-view mirrors and/or other reflecting surfaces of the vehicle.

5.2.3. Position

5.2.3.1.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
In width: E less than or equal to 400 mm;	In width: E less than or equal to 400 mm; **D more than or equal to 600 mm, may be reduced to 400 mm when the structural width of the vehicle is less than or equal to 1,300 mm** **There is no requirement for D on vehicles of Category 1-1 and Category 2 with GVM ≤ 3.500 kg.**
Comments	
	The requirements for D are out of ECE Regulation No. 48.

5.2.3.2. In height:

H2 more than or equal to 500 mm; and

H1 less than or equal to 1,200 mm.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
In the case of motor vehicles equipped with passing beam headlamps with light sources having an objective luminous flux exceeding 2,000 lumens per vehicle side, H1 may be reduced to 950 mm based on the determination by each Contracting Party.	**H1 less or equal to 1,500 mm for vehicles of Cat. 2 with a GVM > 7,5 to.** ~~**In the case of motor vehicles equipped with passing beam headlamps with light sources having an objective luminous flux exceeding 2,000 lumens per vehicle side, H1 may be reduced to 950 mm based on the determination by each Contracting Party.**~~
Comments	
	Because of the geometry of vehicles of cat. 2 with GVM > 7,5 to it is necessary to raise H1 to 1,500 mm. A reduction H1 to 950 mm leads to an decrease of visibility in front of the vehicle and is very design-restrictive. In addition there is no evidence that passing beams mounted at 1,200 mm will cause glare. Therefore it has to be deleted.

5.2.3.3. In length:

at the front of the vehicle.

5.2.4. Geometric visibility

Horizontal angles:

β1 equal to 45° and
β2 equal to 10°.

Vertical angles:

α1 equal to 15° and
α2 equal to 10°,

5.2.5. Orientation

5.2.5.1. Towards the front.

5.2.5.2.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Each vehicle shall be equipped **with the means to ensure that** the vertical inclination of the passing beam headlamp beam pattern can be adjusted in accordance with the instructions provided with the vehicle by the vehicle manufacturer without the use of special tools other than those provided with the vehicle by the vehicle manufacturer and according to the **applicable regulations** of the Contracting Party.	Each vehicle shall be equipped ~~**with the means to ensure that**~~ **to enable** the vertical inclination of the passing beam headlamp ~~**beam pattern can be adjusted**~~ **to be set**, ~~in accordance with the instructions provided by the vehicle manufacturer~~ without the use of special tools other than those provided with the vehicle by the vehicle manufacturer~~ and according to the **applicable regulations** of the Contracting Party~~. **The initial vertical aim in the unladen vehicle shall be adjustable within the range of 0 degrees/0% to -1.15 degrees/-2%.**
Comments	
	With this approach the vehicle manufacturer has to enable each vehicle to fulfil the mentioned range of vertical inclination. The thresholds themselves have to be mentioned in the laws of the Contracting Parties. It is not necessary that the vehicle manufacturer provides these instructions with the vehicle. Reference to national applicable regulations would be contrary to harmonization.

5.2.5.3.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Based on the determination by each Contracting Party, the vertical aim of passing beam headlamps against initial position indicated by manufacturer may be required to be manually adjusted from the driver's seat or shall be automatically maintained [within + 0.3/ - 0.8 degree] under all vehicle loading conditions. **Moreover, in the case of the passing beam headlamps with a light sources having combined objective luminous flux, which exceeds 2,000 lumens per vehicle side their vertical aim against initial position indicated by manufacturer may be required to be automatically maintained [within + 0.6/ - 0.8 degree] under all vehicle loading conditions ~~and to be installed only in conjunction with the installation of headlamp cleaning device(s) specified by the Contracting Party.~~**	**The vertical aim may be manually adjusted from the driver's seat or may be automatically maintained within the range of +0.3 degrees/+0.53% to -1.43 degrees/-2.5% under all other vehicle loading conditions**
Comments	
The above requirements are from para. 5.2.8.3. Concerning the headlamp cleaning devices see the following para. 5.2.5.4.	The thresholds in between which the passing beams should be adjustable have to be regulated in this gtr and not by each Contracting Party. The thresholds have to be fulfilled independent of the combined objective luminous flux. As long as there is no component regulation for passing beams no requirements for Conformity of Production (COP) are defined. To avoid problems in the production the above thresholds have to fulfil a wider range. As soon as there is a component regulation available the thresholds can be changed.

5.2.5.4.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Moreover, in the case of the passing beam headlamps with a light sources having combined objective luminous flux, which exceeds 2,000 lumens per vehicle side ~~**their vertical aim against initial position indicated by manufacturer may be required to be automatically maintained [within + 0.6/ -0.8 degree] under all vehicle loading conditions and**~~ to be installed only in conjunction with the installation of headlamp cleaning device(s) specified by the Contracting Party.	Passing beam headlamps with light sources having combined objective luminous flux which exceeds 2,000 lumens per vehicle side, **may** be installed only in conjunction with the installation of headlamp cleaning device(s).
Comments	
See para. 5.2.8.3.	Not all contracting parties to the 1998 Agreement have this requirement.

5.2.6. Electrical connections

5.2.6.1. The control for changing over to the passing beam headlamps must switch off all driving beam headlamps simultaneously.

5.2.6.2. The passing beam headlamps may remain switched on at the same time as the driving beam headlamps.

5.2.6.3. Passing beam headlamps equipped with gas-discharge light sources shall remain switched on during the driving beam headlamps operation.

5.2.6.4. Passing beam headlamps may be switched on or off automatically. However, it shall always be possible to manually override the automatic operation.

5.2.6.5.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
One additional light source, 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.	One additional light source, located inside the ~~dipped-beam~~ **passing beam** headlamps or in a lamp (except the ~~main-beam~~ **driving beam** headlamp) grouped or reciprocally incorporated with the respective ~~dipped-beam~~ **passing 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.
Comments	
	To align the paragraph with the nomenclature of the gtr.

5.2.7. Tell-tale

Tell-tale optional.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
However, in the case where the whole beam or the kink of the elbow of the cut-off is moved to produce bend lighting, a failure tell-tale is mandatory; it shall be a flashing warning light which comes on in the event of a malfunction of the displacement of the kink of the elbow of the cut-off.	However, in the case where the whole beam or the kink of the elbow of the cut-off is moved to produce bend lighting, a failure tell-tale is mandatory; it shall operate in the event ~~be a flashing warning light which comes on in the event~~ of a malfunction of the displacement of the kink of the elbow of the cut-off.
Comments	
	It is not necessary to specify whether the tell-tall has to flash or not.

5.2.8. Other provisions

5.2.8.1. The requirements of paragraph 4.7.2. shall not apply to passing beam headlamps.

5.2.8.2. 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 in right hand traffic (left turn in left hand traffic).

5.2.8.3.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Based on the determination by each Contracting Party, the vertical aim of passing beam headlamps against initial position indicated by manufacturer may be required to be manually adjusted from the driver's seat or shall be automatically maintained [within + 0.3/ -0.8 degree] under all vehicle loading conditions. Moreover, in the case of the passing beam headlamps with a light sources having combined objective luminous flux, which exceeds 2,000 lumens per vehicle side their vertical aim against initial position indicated by manufacturer may be required to be automatically maintained [within + 0.3/ -0.8 degree] under all vehicle loading conditions and to be installed only in conjunction with the installation of headlamp cleaning device(s) specified by the Contracting Party.	~~The initial position vertical aim of passing beam headlamps shall be based on the determination by each Contracting Party. The vertical aim against initial position indicated by manufacturer may be required to be manually adjusted from the driver's seat or shall be automatically maintained [within +0.3/ -0.8 degree] under [all vehicle loading conditions*].~~ ~~Moreover, in the case of the passing beam headlamps with a light sources having combined objective luminous flux, which exceeds 2,000 lumens per vehicle side their vertical aim against initial position indicated by manufacturer may be required to be automatically maintained [within + 0.6/ -0.8 degree] under all vehicle loading conditions and to be installed only in conjunction with the installation of headlamp cleaning device(s) specified by the Contracting Party.~~

Comments	
Tolerance values to be confirmed or deleted if deemed unnecessary.	See paras. 5.2.5.2., 5.2.5.3. and 5.2.5.4.

5.2.8.**3**. Mechanical headlamp cleaning devices (wipers) shall not be installed on headlamps with plastic lenses.

5.3. FRONT FOG LAMP

5.3.1. Number

Two.

5.3.2. Arrangement

5.3.2.1. No point on the apparent surface in the direction of the reference axis may be higher than the highest point on the apparent surface in the direction of the reference axis of the passing beam headlamp.

5.3.2.2. Front fog lamps shall be fitted in such a way that the light emitted is not illuminating the driver either directly or indirectly through the rear-view mirrors and/or other reflecting surfaces of the vehicle.

5.3.3. Position

5.3.3.1. In width:

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
E less than or equal to 400 mm	~~E less than or equal to 400 mm~~ **D more than or equal to 600 mm may be reduced to 400 mm when the structural width of the vehicle is less than or equal to 1,300 mm.**
Comments	
	Rationale The function of front position lamps, rear position lamps and end-outline marker lamps is to indicate the presence of the vehicle and to demarcate the size/extent of the vehicle from the front and rear. Similarly, the purpose of front retro-reflectors and rear retro-reflectors is to indicate the presence of the vehicle and to demarcate the size/extent of the vehicle when electrical power is not supplied. Therefore these are the only devices that should be located within a specified distance from the edge of the vehicle so that they can perform their intended function. There is no justification and it is not necessary for other devices to be

	located within a specified distance from the edge of the vehicle. End-outline marker lamps are mandatory on vehicles with structural width greater than 2,100 mm and therefore it is not necessary to locate front and rear position lamps within a specified distance from the edge on these vehicles. Direction indicator lamps should be separated by a minimum specified distance so that they can perform their intended function of indicating a right or left turn, but do not need to be located within a specified distance from the edge of the vehicle to perform this function.

5.3.3.2. In height:

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
H1 more than or equal to 250 mm H2 less than or equal to 800 mm	**H2** more than or equal to 250 mm **H1** less than or equal to 800 mm
Comments	
	This is only an editorial correction.

5.3.3.3. In length:

at the front of the vehicle.

5.3.4. Geometric visibility

Horizontal angles:

β1 equal to 45°
β2 equal to 10°

Vertical angles:

α1 equal to 5°
α2 equal to 5°

5.3.5. Orientation

5.3.5.1. Towards the front.

5.3.5.2.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Each vehicle fitted with the front fog lamps shall be equipped with the means to ensure that the vertical inclination of the front fog lamp beam pattern can be maintained in accordance with the instructions provided with the vehicle by the vehicle manufacturer without the use of special tools other than those provided with the vehicle by the vehicle manufacturer and according to the **applicable regulations** of the Contracting Party.	Each vehicle shall be equipped ~~**with the means to ensure that**~~ **to enable** the vertical inclination of the front fog lamp beam pattern ~~**can be adjusted**~~ **to be set**, ~~in accordance with the instructions provided by the vehicle manufacturer~~ without the use of special tools other than those provided with the vehicle by the vehicle manufacturer~~ and according to the **applicable regulations** of the Contracting Party~~. **The initial vertical aim in the unladen vehicle shall be adjustable within the range of 0 degrees/0% to -1.15 degrees/-2%.**
Comments	
	Consistency with para. 5.2.5.2. With this approach the vehicle manufacturer has to enable each vehicle to fulfil the mentioned range of vertical inclination. The thresholds themselves have to be mentioned in the laws of the Contracting Parties. It is not necessary that the vehicle manufacturer provides these instructions with the vehicle. Reference to national applicable regulations would be contrary to harmonization.

5.3.6. Electrical connections

Shall be such that:

5.3.6.1. The front fog lamps may be switched on and off independently of driving and/or passing beam headlamps.

5.3.6.2. The front fog lamps may continue to operate until the position lamps are switched off, and the front fog lamps shall then remain off until deliberately switched on again.

5.3.6.3. Each vehicle fitted with the front fog lamps must be equipped with a manual on/off switch for the front fog lamps.

5.3.7. Tell-tale

Circuit-closed tell-tale mandatory.

5.3.8. Other provisions

None.

5.4. REVERSING LAMP

5.4.1. Number

5.4.1.1. motor vehicles of category 1-1 and on all other vehicles with a structural length not exceeding 6,000 mm:

One device - second device optional;

5.4.1.2. Other vehicles with a structural length exceeding 6,000 mm, except vehicles of category 1-1:

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
Two.	Two devices – two other devices optional.
Comments	
	Consistency with para. 5.4.5.

5.4.2. Arrangement

No special requirement.

5.4.3. Position

5.4.3.1. In width:

no special requirement.

5.4.3.2. In height:

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
H1 more than or equal to 250 mm H2 less than or equal to 1,200 mm	**H2** more than or equal to 250 mm **H1** less than or equal to 1,200 mm
Comments	
	This is only an editorial correction.

5.4.3.3. In length:

at the rear of the vehicle.

However, if installed, the additional pair of reversing lamps shall be fitted one on each side of the vehicle or on the rear of the vehicle.

5.4.4. Geometric visibility

5.4.4.1.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Reversing lamps must be mounted so that the optical center of at least one lamp is visible from any eye point elevation from at least 1828 mm (6 ft) to 610 mm (2 ft) above the horizontal plane on which the vehicle is standing and from any position in the area rearward of a vertical plane perpendicular to the longitudinal axis of the vehicle 914 mm (3 ft) to the rear of the vehicle and extending 914 mm (3 ft) beyond each side of the vehicle.	Reversing lamps must be mounted so that the ~~optical~~ center **of references** of at least one lamp is visible from any eye point elevation from at least 1828 mm (6 ft) to 610 mm (2 ft) above the horizontal plane on which the vehicle is standing and from any position in the area rearward of a vertical plane perpendicular to the longitudinal axis of the vehicle 914 mm (3 ft) to the rear of the vehicle and extending 914 mm (3 ft) beyond each side of the vehicle.
Comments	
	Optical centre is not defined and it gives no additional information. Therefore it has to be deleted.

5.4.4.2. In case of additional two reversing lamps:

Horizontal angles:

if only one lamp

β1 equal to 45°
β2 equal to 45°

if two lamps

β1 equal to 45°
β2 equal to 10°

Vertical angles:

α1 equal to 5°
α2 equal to 5°

5.4.5. Orientation

Rearwards.

In case of the two optional devices, mentioned in paragraph 5.4.1.2., if fitted on the side of the vehicle the above mentioned requirements of paragraph 5.4.4.2. shall not be applied. However, the reference axis of these devices shall be orientated sideward 10° ± 5° horizontally towards the rear in relation to the median longitudinal plane of the vehicle.

5.4.6. Electrical connection

5.4.6.1. Electrical connections shall be such that the lamp(s) can illuminate automatically only if the reverse gear is engaged and if the device that activates the propulsion system of the vehicle is in a position, which makes it possible for the vehicle to operate. It shall not illuminate or remain illuminated if either of the above conditions is not satisfied.

5.4.6.2. Moreover, the electrical connections of the two optional devices mentioned in paragraph 5.4.2.2. shall be such that these devices cannot illuminate unless the lamps referred to in paragraph 4.12.1. are switched on.

5.4.6.3. It is allowed to switch on the additional reversing lamps fitted on the side of the vehicle, for slow manoeuvres in forward motion. For such purposes, these lamps shall be activated and deactivated manually by a separate control and may remain illuminated even when reverse gear is disengaged. However, if the forward speed of the vehicle exceeds 10 km/h the additional reversing lamps shall be switched off automatically and shall remain switched off until deliberately switched on again.

5.4.7. Tell-tale

Tell-tale optional.

5.5. DIRECTION INDICATOR LAMP AND HAZARD WARNING SIGNAL

5.5.1. Number

Two front direction indicator lamps;
Two side direction indicator lamps;
Two rear direction indicator lamps;
Two additional rear direction indicator lamps allowed on other than category 1-1 vehicles.

5.5.2. Arrangement

5.5.2.1. Where lamps combining the functions of front direction indicator lamps and side direction indicator lamps are fitted, in addition two side direction indicator lamps may be installed to meet the visibility requirements of paragraph 5.5.5.

5.5.2.2.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
If the distance between the edge of the apparent surface in the direction of the reference axis of the direction indicator lamp and that of the apparent surface in the direction of the reference axis of the passing-beam headlamp, daytime running lamp and/or the front fog lamp is less than 100 mm, the photometric output of the direction indicator must be increased according to the **applicable** regulation of the Contracting Party.	Where the distance between the edge of the apparent surface in the direction of the reference axis of the front direction indicator lamp and that of the apparent surface in the direction of the reference axis of the passing-beam headlamp, the front fog lamp and/or daytime running lamp with a luminous intensity higher then 2,600 cd at any location of the beam pattern is: 5.5.2.2.1 - greater than 20 mm but less than 40 mm, the minimum photometric output of the front direction indicator lamp must be multiplied by a factor of 1.5. 5.5.2.2.2 - equal to or less than 20 mm, the minimum photometric output of the front direction indicator lamp must be multiplied by a factor of 2.3. 5.5.2.2.3 - the photometric output of the front direction indicator lamp needs not be increased if the daytime running lamp is not operated when the adjacent front direction indicator lamp is switched on.
Comments	
	The above requirements are combined requirements from ECE Regulation No. 48 and FMVSS 108

5.5.3. Position

5.5.3.1. In width (front and all rear):

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
In width (front and all rear):	~~In width (front and all rear):~~
E less than or equal to 400 mm	~~E less than or equal to 400 mm~~
D more than or equal to 600 mm	~~D more than or equal to 600 mm~~
vehicles less than 1,300 mm in structural width	~~vehicles less than 1,300 mm in structural width~~
D more than or equal to 400 mm	~~D more than or equal to 400 mm~~

	D more than or equal to 600 mm may be reduced to 400 mm when the structural width of the vehicle is less than or equal to 1,300 mm.
Comments	
	See para. 5.3.3.1.

5.5.3.2. In height (all):

H2 more than or equal to 350 mm

H1 less than or equal to 1,500 mm

If the structure of the vehicle does not permit the upper limit to be respected, and if the optional lamps are not installed,

H1 less than or equal to 2,100 mm.

If optional rear direction indicator lamps are installed, they shall be placed at a height compatible with the applicable requirements of paragraph 5.5.4.1. 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 direction indicator lamps.

5.5.3.3. In length:

Front direction indicator lamps:

at the front.

Side direction indicator lamps:

K less than or equal to 2,500 mm

For trailers with drawbars, as an alternative

K less than or equal to 400 mm excluding drawbar

Rear direction indicator lamps:

at the rear.

5.5.4. Geometric visibility

5.5.4.1. Horizontal angles:

Front direction indicators:

β1 equal to 80° (45° if direction indicator is supplemented by flashing front side-marker lamp of the same colour)

β2 equal to 45°

Rear direction indicator:

Motor vehicles:

$\beta 1$ equal to 80° (45° if direction indicator is supplemented by flashing rear side-marker lamp of the same colour)
$\beta 2$ equal to 45°

Trailer:

$\beta 1$ equal to 80°
$\beta 2$ equal to 45°

Side direction indicator:

β_3 equal to 60°
η equal to 5°

(angles β_3 and η are measured from the plane tangent to the lens of the side turn signal lamp and parallel to the longitudinal plane of the vehicle)

5.5.4.2. Vertical angles:

$\alpha 1$ equal to 15° (5° if H1 of the optional direction indicator lamps is more than 2,100 mm)
α_2 equal to 15° (5° if H1 is less then 750 mm)

side direction indicator lamps:

α_1 equal to 30° (15° for vehicles of less than 6,000 mm in structural length)
α_2 equal to 15° (5° if H1 is less then 750 mm)

5.5.4.3. For the direction indicator to be considered visible throughout the angles of geometric visibility one of the following shall be met:

The minimum luminous intensity within the above angles must not be less than 0.3 cd;

or

Throughout the angles of geometric visibility, with the outward angle up to 45º, the lamp must provide an unobstructed view of the apparent surface of at least 12.5 cm^2, except for the side direction indicator. The apparent surface of any retro-reflector shall be excluded.

5.5.5. <u>Orientation</u>

According to the specifications for installation by the manufacturer, if any.

5.5.6. <u>Electrical connections</u>

5.5.6.1. Direction indicator

5.5.6.1.1. Direction indicator lamps shall switch on independently of the other lamps.

5.5.6.1.2.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
It shall be possible to switch the direction indicator lamps on and off manually. The automatic switching of direction indicator lamps **is permissible** only for their deactivation.	
Comments	
	Wording ok for OICA.

5.5.6.1.3. 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 and at the same frequency.

5.5.6.1.4. When the direction indicator lamps must be supplemented per paragraph 5.5.**4**.1. by flashing side-marker lamps of the same colour, these side-marker lamps shall flash at the same frequency and in phase with the direction indicator lamps on the same side of the vehicle.

5.5.6.1.5. All direction indicator lamps may also flash simultaneously in association with vehicle alarm systems and/or immobilisers to draw attention to the vehicle and/or during the arming and disarming of the vehicle's alarm system.

5.5.6.2. Hazard warning signal

5.5.6.2.1. The hazard warning signal shall be operated by means of a separate, manual control enabling all direction indicators on both sides of the vehicle to flash in accordance with the requirements of paragraph 5.5.7.3. above.

5.5.6.2.2. The hazard warning signal may be activated automatically in the event of the vehicle being involved in a collision. In such case it shall only be turned off manually.

5.5.6.2.3.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
As specified in paragraph 5.5.9., if a power-driven vehicle is equipped to draw a trailer the hazard warning signal control shall also enable all direction indicator on the trailer. The hazard warning signal shall be able to function even if the device that activates the propulsion system of the vehicle is in a position which makes it impossible for the vehicle to operate.	~~As specified in paragraph 5.5.9., if~~ **If** a power-driven vehicle is equipped to draw a trailer the hazard warning signal control shall also enable all direction indicator on the trailer. The hazard warning signal shall be able to function even if the device that activates the propulsion system of the vehicle is in a position which makes it impossible for the vehicle to operate.
Comments	
	There is no para. 5.5.9.

5.5.7. Tell-tale

5.5.7.1.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Operating tell-tale mandatory for front and rear direction indicator lamps. It **shall** be visual; **it may be accompanied by an** auditory **signal**. **The** visual **tell-tale** shall be a flashing light which, in the event of the malfunction of any of the front or rear direction indicator lamps, is either extinguished, or remains alight without flashing, or shows a marked **change of frequency**.	
Comments	
	Wording ok for OICA.

[5.5.7.2.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
If a motor vehicle is equipped to draw a trailer, it must be fitted with a special visual operating 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.]	
Comments	
[Remark: is this necessary? This would be a new requirement for NA vehicles. Can anybody provide the safety justification/rationale (beyond common sense) for this mandatory requirement?]	This requirement is only acceptable for the time there will be a solution for LED direction indicators.

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

5.5.7.4. For the hazard warning signal a circuit-closed tell-tale mandatory. The hazard warning signal tell-tale can operate in conjunction with the tell-tale(s) specified in paragraph 5.5.7.1.

5.5.8. Other provisions

5.5.8.1.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
The direction indicator shall emit light at a steady rate of 90 ± 30 flashes per minute. The duration of each flash and the interval between any two successive flashes shall be constant. Minimum duration of each flash shall be 0.2 seconds.	The direction indicator shall emit light at a steady rate of 90 ± 30 flashes per minute. The duration of each flash and the interval between any two successive flashes shall be constant. ~~Minimum duration of each flash shall be 0.2 seconds.~~
Comments	
[Neither ECE Regulation No. 48 nor FMVSS/CMVSS 108 specify minimum duration of 0.2 seconds. The safety justification/rationale for this mandatory requirement should be provided. F/CMVSS 108 requires the lamp top be energized over 30-75% of time {SAE J590}.]	No existing regulation requires something like this.

5.5.8.2. 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.

5.5.8.3. 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 direction indicator lamps of the trailer.

5.5.8.4. In case of failure, other than short-circuit, of one direction indicator lamp, the others **must continue to flash**, but the frequency in this condition may be different from that prescribed.

5.5.8.5.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
~~5.5.8.5. **Rear direction indicator lamps must not be reciprocally incorporated with stop lamps**~~	~~5.5.8.5. **Rear direction indicator lamps must not be reciprocally incorporated with stop lamps**~~
Comments	
[Remark: study was supplied by Canada (separation of functions) to NA industry – depending on the result of the discussions this requirement may stay or be deleted.]	This requirement is too design restrictive.

5.6. MIDDLE-SIDE DIRECTION INDICATOR

5.6.1. Number

Two.

5.6.2. Arrangement

One on each side of the vehicle.

5.6.3. Position

5.6.3.1. In width:

no requirement

5.6.3.2. In height:

H2 more than or equal to 350 mm

H1 less than or equal to 2,300 mm

5.6.3.3. In length:

Motor vehicle: within 2,500 mm rearward of the cab's rear end

Trailer: within 4,500 mm from the front end including a drawbar.

5.6.4. Geometric visibility (see figure 1-1 and 1-2)

5.6.4.1. The middle-side direction indicator shall be visible from any point on the vertical plane 1,000 mm outwards of the vehicle's outermost point and parallel to the median longitudinal plane of the vehicle, and between a height of 1,000 mm and 1,600 mm from the ground and between the vertical line 1,000 mm forward of the installation position of the middle-side direction indicator and the other vertical line equidistant with the vehicle's rear end from the installation position of the middle-side direction indicator (see Figure 1-1).

5.6.4.2. For the middle-side direction indicator to be considered visible throughout the angles of geometric visibility one of the following shall be met:

The minimum luminous intensity within the above angles must not be less than 3 cd;

or

The apparent surface of the middle-side direction indicator shall be at least 40 cm^2 as projected onto the vehicle's median longitudinal plane, onto the second plane intersecting with the median longitudinal plane at 45 degrees from forward, and onto the third plane intersecting with the median longitudinal plane at 45 degrees from rearward (see Figure 1-2).

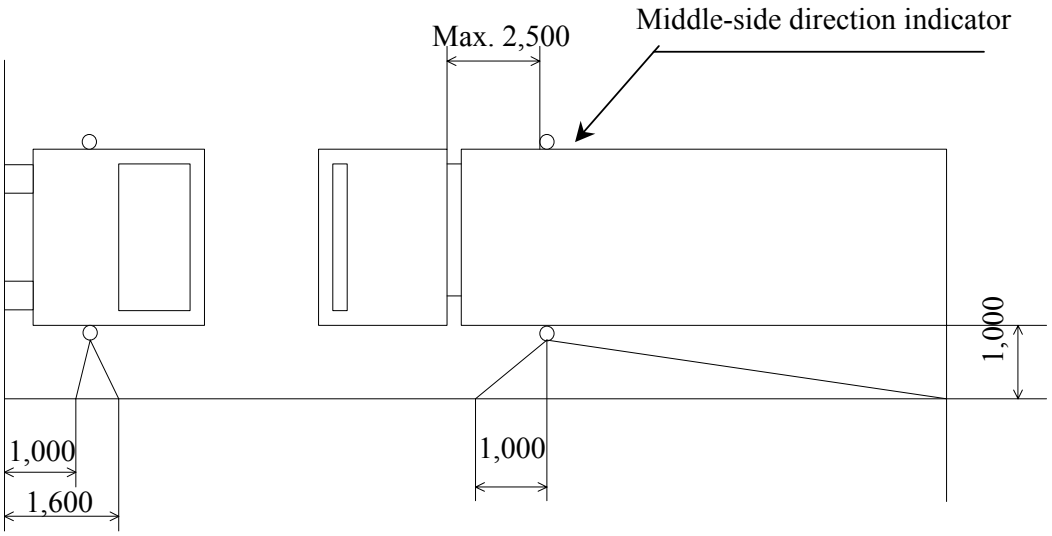


Figure 1-1

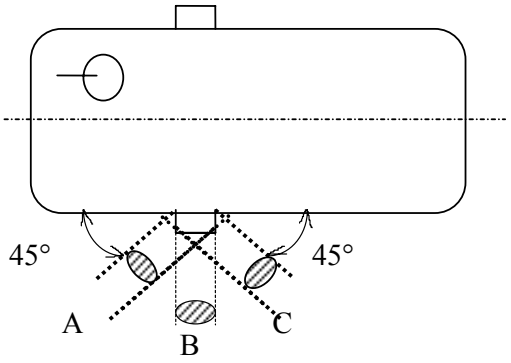


Figure 1-2

5.6.5. Orientation

According to the specifications for installation by the manufacturer, if any.

5.6.6. Electrical connections

Middle-side direction indicator lamps shall function simultaneously with the other direction indicator lamps per paragraph 5.5.7.

5.6.7. Tell-tale

No special requirements.

5.6.8. Other provisions

Per paragraphs 5.5.8.1. to 5.5.8.4.

5.7. STOP LAMP AND CENTRE STOP LAMP

5.7.1. Number

Per paragraph 5.7.2.

5.7.2. Arrangement

5.7.2.1. Two stop lamps:

Per paragraph 5.7.3.

5.7.2.2. **One centre stop lamp**:

Per paragraph 5.7.3.

Only, when the median longitudinal plane of the vehicle is not located on a fixed body panel but separates one or two movable components of the vehicle (e.g. doors), and lacks sufficient surface to install a single centre stop lamp on the median longitudinal plane above or below such movable components, either:

centre stop lamp composed of two devices may be installed, one on each movable component, or

one centre stop lamp may be installed offset to the left or to the right of the median longitudinal plane.

5.7.2.3. Two optional stop lamps:

Per paragraph 5.7.3.

5.7.3. Position

5.7.3.1. In width:

For each lamp of the pair of stop lamps:

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
E less than or equal to 400 mm;	~~E less than or equal to 400 mm;~~ **D more than or equal to 600 mm may be reduced to 400 mm when the structural width of the vehicle is less than or equal to 1,300 mm.** **There is no requirement for D on vehicles of Category 1-1 and Category 2 with GVM < 3,500 kg.**
Comments	
	See para. 5.3.3.1.

For centre stop lamp:

the centre of reference shall be situated on the median longitudinal plane of the vehicle.

However, in the case where a centre stop lamp composed of two devices is installed, according to paragraph 5.7.2.2., the inner edges are positioned no more than 75 mm from the median longitudinal plane, one on each side of this plane.

In the cases where one centre stop lamp offset from the median longitudinal plane is permitted according to paragraph 5.7.2.2., this offset shall not exceed 150 mm from the median longitudinal plane to the centre of reference of the lamp.

5.7.3.2. In height:

5.7.3.2.1. For the pair of stop lamps:

H2 more than or equal to 350 mm;

H1 less than or equal to 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 the vertical distance as large as the shape of the bodywork makes it possible, but not less than 600 mm above the mandatory lamps).

5.7.3.2.2. For centre stop lamp the horizontal plane tangential to the lower edge of the apparent surface shall be:

not 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 at the centreline of the vehicle, or

H2 more than or equal to 850 mm.

However, the horizontal plane tangential to the lower edge of the apparent surface of centre stop lamp shall be above the horizontal plane tangential to the upper edge of the apparent surface of the symmetrical pair of stop lamps.

5.7.3.3. In length:

For a pair of stop lamps:

at the rear of the vehicle.

For centre stop lamp:

no special requirement.

5.7.4. Geometric visibility

5.7.4.1. Horizontal angles:

For a pair of stop lamps:

β1 equal to 45°
β2 equal to 45°

For centre stop lamp:

10° to the left and to the right of the longitudinal axis of the vehicle;

5.7.4.2. Vertical angles:

For the pair of stop lamps:

α1 equal to 15° (5° if H1 of the optional stop lamps is more than 2,100 mm)
α2 equal to 15° (5° if H1 is less than 750 mm)

For centre stop lamp:

α1 equal to 10°
α2 equal to 5°

5.7.4.3.

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
For any stop lamp of the pair of stop lamps to be considered visible throughout the angles of geometric visibility one of the following shall be met: The minimum luminous intensity within the above angles must not be less than 0.3 cd; or Throughout the angles of geometric visibility, with the outward angle up to 45º, the lamp must provide an unobstructed view of the apparent surface of at least 12.5 cm^2, except for the side direction indicator. The apparent surface of any retro-reflector shall be excluded.	For any stop lamp of the pair of stop lamps to be considered visible throughout the angles of geometric visibility one of the following shall be met: The minimum luminous intensity within the above angles must not be less than 0.3 cd; or Throughout the angles of geometric visibility, with the outward angle up to 45º, the lamp must provide an unobstructed view of the apparent surface of at least 12.5 cm^2, ~~except for the side direction indicator. The apparent surface of any retro-reflector shall be excluded.~~
Comments	
[<u>Remark</u>: requirement of NA regulations]	This text was taken from the direction indicator paragraph. Deletion of the wording not applicable to the stop lamps.

5.7.5. Orientation

Towards the rear of the vehicle.

5.7.6. Electrical connections

5.7.6.1. All stop lamps must light up simultaneously when either the service brake or endurance brake (e.g. retarder) is activated and when a complete or partial braking system is activated for the purpose of generating vehicle speed retardation with or without a direct action of the driver. They must switch off automatically once the above conditions ceased to exist.

5.7.6.2. The stop lamps need not function if the device that activates the propulsion system of the vehicle is in a position, which makes it impossible for the vehicle to operate.

5.7.7. Tell-tale

Failure tell-tale **optional**;

5.7.8. Other provisions

5.7.8.1. The centre stop lamp may be installed outside or inside the vehicle.

5.7.8.2. In the case where it is installed inside the vehicle:

the light emitted shall not illuminate the driver through the rear-view mirrors and/or other surfaces of the vehicle (i.e. rear window); and

the photometric requirements of the centre stop lamp must be met with the glazing behind which the lamp is to be installed.

5.7.8.3. A centre stop lamp shall be independent of any other lamp defined in this regulation.

5.7.8.4.

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
Any stop lamp must not be reciprocally incorporated with rear direction indicator lamp.	~~5.7.8.4. Any stop lamp must not be reciprocally incorporated with rear direction indicator lamp~~
Comments	
[same as direction indicator].	Consistency with para. 5.5.8.5. This requirement is too design restrictive.

5.8. REAR REGISTRATION PLATE ILLUMINATING DEVICE

5.8.1. Number

Such that the device illuminates the site of the registration plate.

5.8.2. Arrangement

Such that the device illuminates the site of the registration plate.

The device shall be located above or on the side(s) of the site of the registration plate.

5.8.3. Position

5.8.3.1. In width:

such that the device illuminates the site of the registration plate.

5.8.3.2. In height:

such that the device illuminates the site of the registration plate.

5.8.3.3. In length:

such that the device illuminates the site of the registration plate.

5.8.4. Geometric visibility

Such that the device illuminates the site of the registration plate.

5.8.5. Orientation

Such that the device illuminates the site of the registration plate.

5.8.6. Electrical connections

In accordance with paragraph 4.12.1.

5.8.7. Tell-tale

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

5.8.8. Other provisions

When the rear registration plate illuminating device is combined with the rear position lamp, reciprocally incorporated in the stop lamp, direction indicator or in the rear fog lamp, the photometric characteristics of the rear registration plate illuminating device may be modified during the illumination of the stop lamp or the rear fog lamp.

5.9. FRONT POSITION LAMP

5.9.1. Number

Two.

5.9.2. Arrangement

No special requirement.

5.9.3. Position

5.9.3.1. In width:

as close as practicable to the adjacent outer edge of the vehicle.
This condition is only met when:

motor vehicles:

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
E less than or equal to 400 mm; Except for vehicle category 1-1 and category 2 with GVM not exceeding 3,500 kg. D more than or equal to 600 mm may be reduced to 400 mm when the structural width of the vehicle is less than or equal to 1,300 mm.	E less than or equal to 400 mm; ~~Except for vehicle category 1-1 and category 2 with GVM not exceeding 3,500 kg.~~ **Except for Vehicle with structural width greater than 2,100 mm**. D more than or equal to 600 mm may be reduced to 400 mm when the structural width of the vehicle is less than or equal to 1,300 mm. There is no requirement for D on vehicles of Category 1-1 and Category 2 with GVM < 3,500 kg.
Comments	
	See para. 5.3.3.1. An exception is kept for trucks. The vehicle width is taken as the relevant parameter for consistency throughout the document hence consistency for the manufacturers.

trailers:

E less than or equal to 150 mm.

5.9.3.2. In height:

H2 more than or equal to 350 mm.

H1 less than or equal to 1,500 mm (2,100 mm if the shape of the bodywork makes it impossible to keep within 1,500 mm).

5.9.3.3. In length:

no individual specification.

5.9.3.4. Where the front position lamp and another lamp are reciprocally incorporated, the apparent surface in the direction of the reference axis of the other lamp must be used to verify compliance with the positioning requirements (paragraphs 5.9.4.1. to 5.9.4.3.).

5.9.4. Geometric visibility

5.9.4.1. Horizontal angles:

$\beta 1$ equal to 80° (45° if side marker lamps are present)
$\beta 2$ equal to 45° (5° for trailers)

Vertical angles:

$\alpha 1$ equal to 15°
$\alpha 2$ equal to 15° (5° if H1 less than 750 mm)

5.9.4.2. For the front position lamp to be considered visible throughout the angles of geometric visibility the following shall be met:

The minimum luminous intensity within the above angles must not be less than 0.05 cd;

or

The lamp must provide an unobstructed view of the projected 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.

5.9.5. Orientation

Forwards.

5.9.6. Electrical connections

In accordance with paragraph 4.12.1.

5.9.7. Tell-tale

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Circuit-closed tell-tale is 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.	**Circuit-closed tell tale is mandatory and shall be non-flashing.** **It shall not be required if the instrument panel lighting can only be turned on and off simultaneously with the front position lamps.** ~~**C**ircuit-closed tell-tale is 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.~~
Comments	
[Remark: electronic instrument panel displays may be illuminated at all times independent of exterior lighting activation; **Paragraph 5.9.7. would require additional tell-tale where space is at a premium. FMVSS/CMVSS 101 requires controls and displays to be illuminated when the ignition and/or headlamps; not front position lamps, are activated. The safety justification/rationale for this mandatory requirement should be provided.]**	The proposed wording clarifies the situation of the electronic instrument panels.

5.9.8. Other provisions

5.9.8.1. 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 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.

5.9.8.2.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
-	**The simultaneous switching on of front- and rear positions lamps on the same side of the vehicle may be used to perform the function of "parking lamp".**
Comments	
	Permits the use of the front and rear position lamps for the function of parking lamps. This paragraph would better be placed in para. 5.12.6. (parking lamps)

5.10. REAR POSITION LAMP

5.10.1. Number

Two.

Two optional rear position lamps on vehicles other than:
- category 1-1 vehicles;
- category 2 vehicles with GVW under 3,500 kg; or
- vehicles on which end-outline marker lamps are installed.

5.10.2. Arrangement

No special requirement.

5.10.3. Position

5.10.3.1. In width:

5.10.3.1.1. mandatory rear position lamps;

as close as practicable to the adjacent outer edge of the vehicle.
This condition is only met when:

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
E less than or equal to 400 mm; Except for vehicle category 1-1 and category 2 with GVM not exceeding 3,500 kg. D more than or equal to 600 mm may be reduced to 400 mm when the structural width of the vehicle is less than or equal to 1,300 mm.	E less than or equal to 400 mm; ~~Except for vehicle category 1-1 and category 2 with GVM not exceeding 3,500 kg.~~ **Except for vehicle with structural width greater than 2,100 mm**. D more than or equal to 600 mm may be reduced to 400 mm when the structural

	width of the vehicle is less than or equal to 1,300 mm. There is no requirement for D on vehicles of Category 1-1 and Category 2 with GVM < 3,500 kg.
Comments	
	See para. 5.3.3.1. An exception is kept for trucks and trailers. The vehicle width is taken as the relevant parameter for consistency throughout the document hence consistency for the manufacturers.

5.10.3.1.2. optional rear position lamps;

D more than or equal to 600 mm.

5.10.3.2. In height:

H2 more than or equal to 350 mm.

H1 less than or equal to 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 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.

5.10.3.3. In length:

at the rear of the vehicle.

5.10.4. Geometric visibility

5.10.4.1. Horizontal angles:

β1 equal to 80° (45° if side marker lamps are present)
β2 equal to 45°

Vertical angles:

α1 equal to 15° (5° if H1 of the optional rear position lamps more than 2,100 mm)
α2 equal to 15° (5° if H1 less than 750 mm)

5.10.4.2. For the rear position lamp to be considered visible throughout the angles of geometric visibility the following shall be met:

The minimum luminous intensity within the above angles must not be less than 0.05 cd;

or

The lamp must provide an unobstructed view of the projected 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.

5.10.5. Orientation

Rearwards.

5.10.6. Electrical connections

In accordance with paragraph 4.12.1.

5.10.7. Tell-tale

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Circuit-closed tell-tale mandatory. It must be combined with that of the front position lamps **per paragraph 5.9.7.**	**Circuit-closed tell tale is mandatory and shall be non-flashing.** **It shall not be required if the instrument panel lighting can only be turned on and off simultaneously with the front position lamps.** ~~Circuit-closed tell-tale is 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.~~
Comments	
[Remark: electronic instrument panel displays may be illuminated at all times independent of exterior lighting activation; **Paragraph 5.9.7. would require additional tell-tale where space is at a premium. FMVSS/CMVSS 101 requires controls and displays to be illuminated when the ignition and/or headlamps; not front position lamps, are activated. The safety justification/rationale for this mandatory requirement should be provided.]**	The proposed wording clarifies the situation of the electronic instrument panels.

5.10.8. Other provisions

5.10.8.1. Rear position lamp shall not be combined with a rear end outline marker lamp.

5.10.8.2.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
-	**The simultaneous switching on of front- and rear positions lamps on the same side of the vehicle may be used to perform the function of "parking lamp".**
Comments	
	Permits the use of the front and rear position lamps for the function of parking lamps. This paragraph would better be placed in para. 5.12.6. (parking lamps)

5.11. REAR FOG LAMP

5.11.1. Number

One or two.

5.11.2. Arrangement

No special requirement.

5.11.3. Position

5.11.3.1. In width:

two lamps:

no specific requirements

one lamp:

it must be on the opposite side of the median longitudinal plane of the vehicle to the direction of traffic prescribed in the country of registration, the centre of reference may also be situated on the median longitudinal plane of the vehicle.

5.11.3.2. In height:

H2 more than or equal to 250 mm.

H1 less than or equal to 1,000 mm.

5.11.3.3. In length:

at the rear of the vehicle.

5.11.4. Geometric visibility

Horizontal angles:

β1 equal to 25°
β2 equal to 25°

Vertical angles:

α1 equal to 5°
α2 equal to 5°

5.11.5. Orientation

Rearwards.

5.11.6. Electrical connections

5.11.6.1. Each vehicle fitted with the rear fog lamps must be equipped with a manual on/off switch for the rear fog lamps.

5.11.6.2. Rear fog lamp(s) shall not switch on unless the driving beams, passing beams or front fog lamps are lit.

5.11.6.3. The rear fog lamp(s) may be switched off independently of any other lamp.

5.11.6.4. After being manually switched on, either of the following applies:

5.11.6.4.1. 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.

5.11.6.4.2. a warning, at least audible, additional to the mandatory tell- tale (paragraph 5.11.7.) 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 paragraph 5.11.6.2. are on or off, whilst the rear fog lamp switch is in the "on" position.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
	~~[Remark: Allowance for automatic switching was deleted. At present time there are no provisions regulating the automatic switching of this device. Once such provisions are discussed and agreed upon, they may be added to this gtr.]~~

Comments	
[Remark: Allowance for automatic switching was deleted. At present time there are no provisions regulating the automatic switching of this device. Once such provisions are discussed and agreed upon, they may be added to this gtr.]	This remark brings few value to the text of the draft gtr.

5.11.6.6. Except as provided in paragraph 5.11.6.2. and 5.11.6.4.1. the operation of the rear fog lamp(s) shall not be affected by switching on or off any other lamps.

5.11.7. Tell-tale

Circuit-closed tell-tale mandatory. An independent non-flashing warning light.

5.11.8. Other provisions

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

5.12. PARKING LAMP

5.12.1. Number

According to the arrangement.

5.12.2. Arrangement

Four lamps: two lamps at the front and two lamps at the rear,
or
Two lamps: one lamp on each side.

5.12.3. Position

5.12.3.1. In width:

E less than or equal to 400 mm.

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

5.12.3.2. In height:

no special requirement.

5.12.3.3. In length:

no special requirement.

5.12.4. Geometric visibility

Horizontal angles:

For lamps mounted on the front and rear of the vehicle:
β1 equal to 45°

For lamps mounted on the side of the vehicle:

45° outwards - forwards and rearwards

Vertical angles:

α1 equal to 15°
α2 equal to 15 (5° if H1 less than 750 mm)

5.12.5. Orientation

Such that the lamps meet the requirements for visibility forwards and rearwards.

5.12.6. 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) must be able to function even if the device that activates the propulsion system of the vehicle is in a position, which makes it impossible for the vehicle to operate.

The parking lamps may be operated automatically.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
	The simultaneous switching on of front- and rear positions lamps on the same side of the vehicle may be used to perform the function of "parking lamp".
Comments	
	Follows the proposal to transfer the amendments to para. 5.9.8.2. and 5.10.8.2. to the parking lamps chapter.

5.12.7. Tell-tale

Circuit-closed tell-tale optional. If there is one, it must not be the same as the tell-tale for the front and rear position lamps.

5.12.8. Other provisions

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.

5.13. END-OUTLINE MARKER LAMP

5.13.1. Number

Two or four towards the front; at least one pair of the front end outline marker lamps must meet the requirements of paragraphs 5.13.3 to 5.13.8

and

two or four towards the rear; at least one pair of the rear end outline marker lamps must meet the requirements of paragraphs 5.13.3 to 5.13.8.

5.13.2. Arrangement

No special requirement.

5.13.3. Position

5.13.3.1. In width:

Front:

as close as practicable to the adjacent outer edge of the vehicle.

This condition is deemed to have been met when:

Motor vehicles:

E less than or equal to 400 mm

Trailers:

E less than or equal 100 mm

Rear:

as close as practicable to the adjacent outer edge of the vehicle.

This condition is deemed to have been met when:

E less than or equal to 100 mm

5.13.3.2. In height:

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.

Rear (all vehicles):

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.

5.13.3.3. In length:

no special requirement.

5.13.4. Geometric visibility

Horizontal angles:

β_1 equal to 80°

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
β_2 equal to 45°	**β_2 equal to 0°**
Comments	
	End outline marker lamps do not require 125° of geometric visibility. In particular there is no safety justification for requiring inboard visibility. In addition, ECE Regulation No. 48 does require β_2 equal to 0°

Vertical angles:

α1 equal to 10° (5° if H1 of the end outline marker lamp is more than 2,100 mm)
α2 equal to 20°

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
-	If the shape of the bodywork, or any projected item listed in paragraph 3.2.13, makes it impossible to meet the requirements for geometric visibility, the end-outline marker lamps shall be installed to meet the requirements as much as possible.
Comments	
Japan: **If the shape of the bodywork makes it impossible to meet the requirements for geometric visibility by rear view mirror or other devices for indirect vision regulated by each Contracting Party, they shall be installed as they meet the requirements as much as possible**	Proposal to meet the Japanese concerns.

5.13.5. Orientation

Such that the lamps meet the requirements for visibility forwards and rearwards.

5.13.6. Electrical connections

In accordance with paragraph 4.12.1.

5.13.7. 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.

5.13.8. Other provisions

Provided that all other requirements are met, the lamp visible from the front and the lamp visible from the rear on the same side of the vehicle may be combined in one device.

Rear end outline marker lamp shall not be combined or reciprocally incorporated with a rear position lamp.

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.

5.14. REAR RETRO-REFLECTOR

5.14.1. Number

Two.

5.14.2. Arrangement

In case of the triangular rear retro-reflector, the apex of the triangle shall be directed upwards.

For other retro-reflectors there are no special provisions.

5.14.3. Position

5.14.3.1. In width:

as close as practicable to the adjacent outer edge of the vehicle.
This condition is deemed to have been be met when:

Motor vehicles:

E less than or equal to 400 mm.

Trailers:

E less than or equal to 150 mm (400 mm if the shape of the bodywork makes it impossible to keep within 150 mm).

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
D more than or equal to 600 mm (400 mm if the structural width of the vehicle is less than 1,300 mm).	~~D more than or equal to 600 mm (400 mm if the structural width of the vehicle is less than 1,300 mm).~~ **D more than or equal to 600 mm may be reduced to 400 mm when the structural width of the vehicle is less than or equal to 1,300 mm.**
Comments	
	Makes the paragraph consistent with the rest of the text.

5.14.3.2. In height:

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
H2 more than or equal to 300 mm	H2 more than or equal to ~~300~~ **250** mm
Comments	
	Aligns on ECE Regulation No. 48. Permits in addition sooner detection of the preceding vehicle.

H1 less than or equal to 900 mm (1,500 mm if the shape of the bodywork makes it impossible to keep within 900 mm).

5.14.3.3. In length:

at the rear of the vehicle.

5.14.4. Geometric visibility

Horizontal angles:

β1 equal to 30°
β2 equal to 30°

Vertical angles:

α1 equal to 15°
α2 equal to 15° (5° H1 less than 750 mm)

5.14.5. Orientation

Rearwards.

5.14.6. Other provisions

5.14.6.1. In case of triangular retro-reflector, no other lamp shall be placed inside the triangle.

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

5.14.6.3. Additional retro-reflecting devices and materials are permitted provided they do not impair the effectiveness of the mandatory lighting and light-signalling devices.

5.16. FRONT RETRO-REFLECTOR

5.16.1. Number

Two.

5.16.2. Arrangement

No special requirement.

5.16.3. Position

5.16.3.1. In width:

as close as practicable to the adjacent outer edge of the vehicle.
This condition is deemed to have been met when:

motor vehicle:

E less than or equal to 400 mm.

trailer:

E less than or equal to 150 mm.

5.16.3.2. In height:

H2 more than or equal to 250 mm.

H1 less than or equal to 900 mm (1,500 mm if the shape of the bodywork makes it impossible to keep within 900 mm).

5.16.3.3. In length:

at the front of the vehicle.

5.16.4. Geometric visibility

Horizontal angles:

β1 equal to 30°
β2 equal to 30°

In the case of trailers:
β2 may be reduced to 10°.

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 (paragraph 5.16.4.1.), which shall, in conjunction with the mandatory retro-reflectors, give the necessary visibility angle.

Vertical angles:

α1 equal to 10°
α2 equal to 10° (5° H1 less than 750 mm)

5.16.5. Orientation

Towards the front.

5.16.6. Other provisions

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

5.16.6.2. Additional retro-reflecting devices and materials are permitted provided they do not impair the effectiveness of the mandatory lighting and light-signalling devices.

5.17. SIDE RETRO-REFLECTOR

5.17.1. Number

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
If required vehicles less than 6,000 mm in structural length: Two on each side of the vehicle. Vehicles 6,000 mm or more in structural length: Such that the requirements for longitudinal positioning are complied with.	~~If required~~ Vehicles less than 6,000 mm in structural length: Two on each side of the vehicle. ~~Vehicles 6,000 mm or more in structural length:~~ ~~Such that the requirements for longitudinal positioning are complied with.~~ **On vehicles 6,000 mm or more in structural length such that the requirements of paragraph 5.18.3.3. are met. The length of trailers shall be calculated including the drawbar.**

Comments	
	(Per 4.22. Table of Presence - these are Optional but requirements are necessary if fitted) See para. 5.18.3.3.

5.17.2. Arrangement

No special requirement.

5.17.3. Position

5.17.3.1. In width:

no special requirement.

5.17.3.2. In height:

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
H2 more than or equal to 300 mm	H2 more than or equal to ~~300~~ **250** mm
Comments	
	Aligns on ECE Regulation No. 48. Permits also to detect the vehicle from a longer distance as the beam crosses the device sooner.

H1 less than or equal to 900 mm (1,500 mm if the shape of the bodywork makes it impossible to keep within 900 mm).

5.17.3.3. In length:

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
K less than or equal to 400 mm from the front (800 mm if the shape of the bodywork makes it impossible to keep within 400 mm); in the case of trailers, account shall be taken of the length of the drawbar for the measurement of this distance. K less than or equal to 400 mm from the rear.	K less than or equal to ~~400~~ **800** mm from the front, (3000 mm for category 1-2 vehicles and category 2 vehicles with GVP > 3,500 kg) ~~(800 mm if the shape of the bodywork makes it impossible to keep within 400 mm)~~ **however, in cases where this cannot practicably be achieved, as near to the front as possible**; in the case of trailers, account shall be taken of the length of the drawbar for the measurement of this distance. K less than or equal to 400 mm from the rear **(1,000 mm for category 1-2 vehicles and category 2 vehicles with GVP > 3,500 kg) however, in cases where this cannot practicably be achieved, as near to the rear as possible**.

Comments	
	ECE Regulation No. 48 requires 3,000 mm for the foremost retro-reflector. For commercial vehicles the limitations for fixing the foremost device are as follows: To the front, the bumper and the front lighting prevent the fixing of the device Further to the rear, the steps must be just in front of the wheel to comply with some cab access national regulations (EC Directive). In addition, the retro-reflector cannot be placed on the step where it is subject to shocks and premature failure. Further to the rear, the wheel and its arch makes it impossible to place the reflector. The wheel cannot be moved for evident architectural reasons and because of national regulations on load repartition. Hence the foremost side reflector must be located rearward the front wheel and its arch.

D_n less than or equal to 3,000 mm (if the structure of the vehicle makes it impossible to comply with such a requirement, this distance may be increased to 4,000 mm).

5.17.4. Geometric visibility

Horizontal angles:

$\beta 1$ equal to 45°
$\beta 2$ equal to 45°

Vertical angles:

$\alpha 1$ equal to 10°
$\alpha 2$ equal to 10° (5° if H1 less than 750 mm)

5.17.5. Orientation

Towards the side.

5.17.6. Other provisions

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

5.17.6.2. Additional retro-reflecting devices and materials are permitted provided they do not impair the effectiveness of the mandatory lighting and light-signalling devices.

5.18. SIDE-MARKER LAMPS

5.18.1. Number

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Two on each side, if required. On vehicles **6,000** mm or more in structural length such that the requirements of paragraph 5.18.3.3. are met. The length of trailers shall be calculated including the drawbar.	~~Two on each side, if required.~~ **Vehicles less than 6,000 mm in structural length:** Two on each side **of the vehicle**. On vehicles 6,000 mm or more in structural length: such that the requirements of paragraph 5.18.3.3. are met. The length of trailers shall be calculated including the drawbar.
Comments	
	Meets the concerns of Japan expressed at GRE-55. The proposal from OICA follows the philosophy of ECE Regulation No. 48

5.18.2. Arrangement

No individual specifications.

5.18.3. Position

5.18.3.1. In width:

no individual specifications.

5.18.3.2. In height:

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
H2 more than or equal to 300 mm	H2 more than or equal to ~~300~~ **250** mm
Comments	
	Aligns on ECE Regulation No. 48. Permits also to detect the vehicle from a longer distance as the beam crosses the device sooner.

H1 less than or equal to 1,500 mm (2,100 mm if the shape of the bodywork makes it impossible to keep within 1,500 mm).

5.18.3.3. In length:

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Foremost side-marker lamp: K less than or equal to 400 mm (800 mm if the shape of the bodywork makes it impossible to keep within 400 mm). on trailers equipped with a drawbar: K more than or equal to 1,000 mm from the front of the drawbar and less than or equal to 1,500 mm from the front of the drawbar. Rearmost side marker lamp: K less than or equal to 400 mm.	Foremost side-marker lamp: K less than or equal to ~~400~~ **800** mm **from the front (3,000 mm for category 1-2 vehicles and category 2 vehicles with GVP > 3,500 kg). However, in cases where this cannot practicably be achieved, as near to the front as possible**. **O**n trailers equipped with a drawbar: K more than or equal to 1,000 mm from the front of the drawbar and less than or equal to 1,500 mm from the front of the drawbar. Rearmost side marker lamp: K less than or equal to 400 mm **from the rear (1,000 mm for category 1-2 vehicles and category 2 vehicles with GVP > 3,500 kg) however, in cases where this cannot practicably be achieved, as near to the rear as possible**.
Comments	
	See para. 5.17.3.3.

vehicles over 6,000 mm long

D_n less than or equal to 3,000 mm (if the structure of the vehicle makes it impossible to comply with such a requirement, this distance may be increased to 4,000 mm).

5.18.4. Geometric visibility

Horizontal angles:

β1 equal to 45°
β2 equal to 45°

β2 for the forward side marker lamps and for the rearward side marker lamp and both β1 and β2 angles for the intermediate side marker lamps may be reduced to 30°.

Vertical angles:

$\alpha 1$ equal to 10°
$\alpha 2$ equal to 10° (5° if H1 less than 750 mm)

5.18.5. Orientation

Only towards the side.

5.18.6. Electrical connections

5.18.6.1. In accordance with paragraph 4.12.1.

[5.18.6.2. The side-marker lamps of the same colour as direction indicator lamps shall/may be wired to flash per paragraph 5.5.6.1.]

5.18.6.3. The side-marker lamps may be wired to flash simultaneously in association with vehicle alarm system and/or immobiliser to draw attention to the vehicle and/or during the arming and disarming of the vehicle's alarm system.

5.18.7. 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.

5.18.8. Other provisions

When a side-marker lamp is combined with another lighting or light signalling device the side marker lamp need not meet the applicable photometric requirements when this other lighting or light signalling device is illuminated.

5.19. DAYTIME RUNNING LAMP

5.19.1. Number

Two.

5.19.2. Arrangement

No special requirement.

5.19.3. Position

5.19.3.1. In width:

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
D more than or equal to 600 mm (400 mm where the structural width of the vehicle is less than 1,300 mm).	~~D more than or equal to 600 mm (400 mm where the structural width of the vehicle is less than 1,300 mm).~~ D more than or equal to 600 mm may be reduced to 400 mm when the structural width of the vehicle is less than or equal to 1,300 mm.
Comments	
	Consistency with para. 5.3.3.1.

5.19.3.2. In height:

H2 more than or equal to 300 mm.

H1 less than or equal to 1,200 mm – may be higher if another, regulated lighting or light signalling device accomplishes daytime running light function.

5.19.3.3. In length:

at the front of the vehicle.

5.19.4. Geometric visibility

Horizontal angles:

$\beta 1$ equal to 20°
$\beta 2$ equal to 20°

Vertical angles:

$\alpha 1$ equal to 10°
$\alpha 2$ equal to 10°

5.19.5. Orientation

Towards the front.

5.19.6. Electrical connections

5.19.6.1.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
If installed, the daytime running lamps shall be switched on automatically each time the device that activates the propulsion system of the vehicle is in a position, which makes it possible for the vehicle to operate, unless the automatic transmission control is in the park or neutral position, the parking brake is applied, or the propulsion system is activated but the vehicle was not set in motion for the first time.	If installed, the daytime running lamps shall be switched on automatically each time the device that activates the propulsion system of the vehicle is in a position, which makes it possible for the vehicle to operate**. Daytime running lamps need not be activated when** ~~unless~~ the automatic transmission control is in the park or neutral position, the parking brake is applied, or the propulsion system is activated but the vehicle was not set in motion for the first time.
Comments	
	Clarifies the wording.

5.19.6.2.

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Based on a determination by each Contracting Party, means may be required such that the daytime running lamps can be manually switched off either for the remainder of the trip or for 10 seconds or 100 m of vehicle travel.	~~Based on a determination by each Contracting Party, means may be required such that the daytime running lamps can be manually switched off either for the remainder of the trip or for 10 seconds or 100 m of vehicle travel.~~
Comments	
	Wording contradicts harmonization.

5.19.6.3. The daytime running lamps shall switch off automatically when the headlamps are switched on, except when the latter are used to give intermittent luminous warnings at short intervals.

5.19.7. Tell-tale

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
Mandatory if a vehicle is not equipped with a device automatically activating all lamps required for operation of a vehicle at diminished ambient lighting condition or if all devices listed in paragraph 4.12.1. are not operating together with daytime running lamps.	Optional.
Comments	
	Consistent with the OICA position for DRLs to be presented at GRE-56 (April 2006)

5.20. IDENTIFICATION LAMPS (Front and rear)

5.20.1. Number

Three facing forward

Three facing rearward

5.20.2. Arrangement

As specified in paragraph 5.20.3.1.

5.20.3. Position

5.20.3.1. In width:

The lamps shall form a three-lamp group with lamp centres spaced evenly and horizontally with distance of 150 mm to 300 mm between optical centres of each two adjacent lamps. This group shall be mounted horizontally with the optical centre of the middle lamp positioned within 50 mm of the median longitudinal plane of the vehicle.

5.20.3.2. In height:

as high as practicable.

The rear identification lamps may be located lower if the door header is narrower than 25 mm, however, H2 shall be more than or equal to 350 mm.

5.20.3.3. In length:

no specific requirement.

5.20.4. Geometric visibility

Horizontal angles:

$\beta 1$ equal to 45º
$\beta 2$ equal to 45º

Vertical angles:

$\alpha 1$ equal to 20º
$\alpha 2$ equal to 20º

5.20.5. Orientation

Front facing forward and rear facing rearward.

5.20.6. Electrical connections

In accordance with paragraph 4.12.1.

5.20.7. Tell-tale

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

5.21. CORNERING LAMP

5.21.1. Number

Two.

5.21.2. Arrangement

No special requirement.

5.21.3. Position

5.21.3.1. In width:

TRANS/WP.29/GRE/2001/6/Rev.5	OICA proposal
E less than or equal to 400 mm.	~~E less than or equal to 400 mm.~~ **No special requirement.**
Comments	
	See para. 5.3.3.1.

5.21.3.2. In length:

K less than or equal to 1,000 mm from the front of the vehicle

5.21.3.3. In height:

H2 more than or equal to 250 mm;

H1 less than or equal to 900 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 passing-beam headlamp.

5.21.4. Geometric visibility

Horizontal angles:

30° to 60° outwards.

Vertical angles:

$\alpha 1$ equal to 10º
$\alpha 2$ equal to 10º

5.21.5. Orientation

Towards the front side.

5.21.6. Electrical connections

The cornering lamps must be so connected that they cannot be on unless the driving-beam headlamps or the passing-beam headlamps are on the same time. The cornering lamp on one side of the vehicle shall be activated 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. They shall switch off automatically when the steering wheel returns to its normal position for straight driving and/or when the direction indicators are switched off.

5.21.7. Tell-tale

None.

5.21.8. Other provisions

5.21.8.1. The cornering lamps shall not be activated at the vehicle speed above 40 km/h.

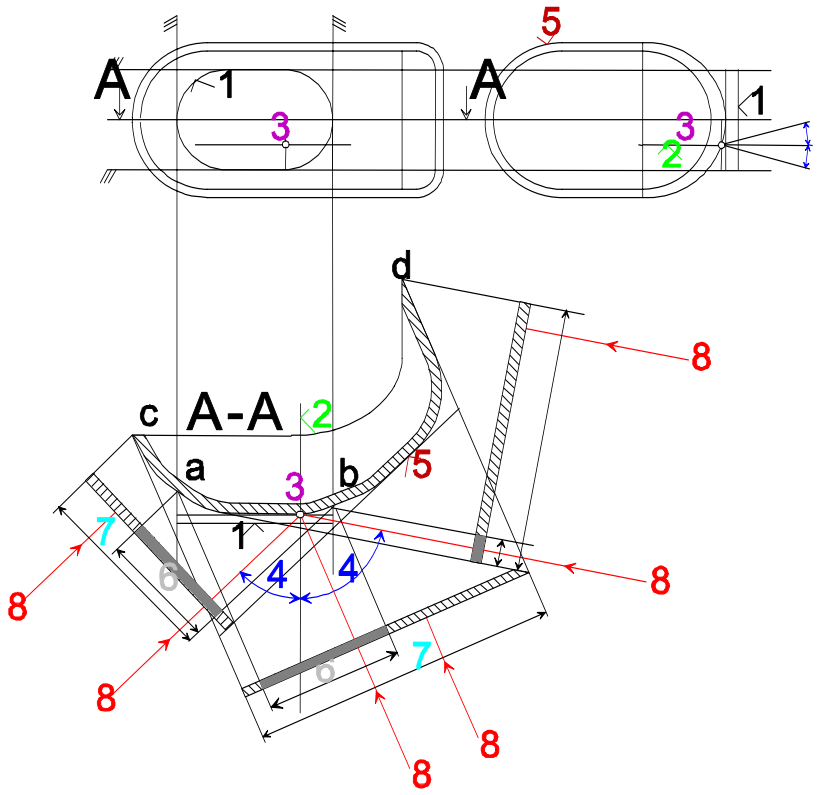
5.21.8.2. The vertical inclination shall be specified by the manufacturer.
For height, see paragraph 5.21.3.3. above.

5.22. CONSPICUITY TREATMENT

TRANS/WP.29/GRE/2001/6/Rev.5	**OICA proposal**
Based on a determination by each Contracting Party, specific conspicuity treatment (line marking, contour marking etc.) may be required.	Note: Any proposed amendment for ECE Regulation No. 48 for conspicuity marking, FMVSS-108 and CMVSS-108. Conspicuity requirements need to be harmonized for incorporation into the gtr.
Comments	
	Final wording will be subject to further discussions.

Annex 1

LAMP SURFACES, AXIS AND CENTRE OF REFERENCE,
AND ANGLES OF GEOMETRIC VISIBILITY

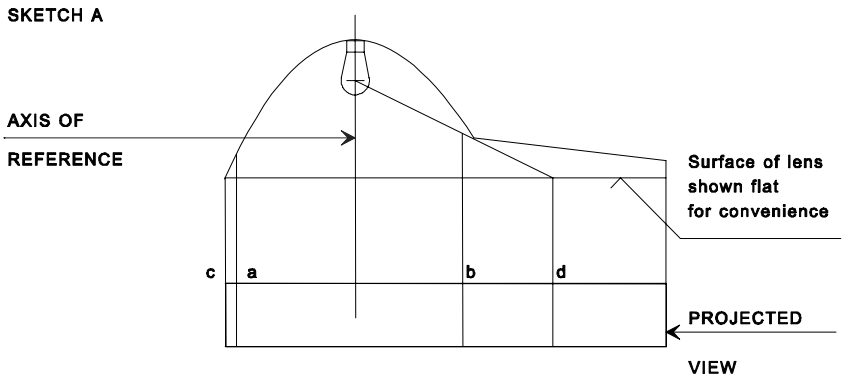


KEY

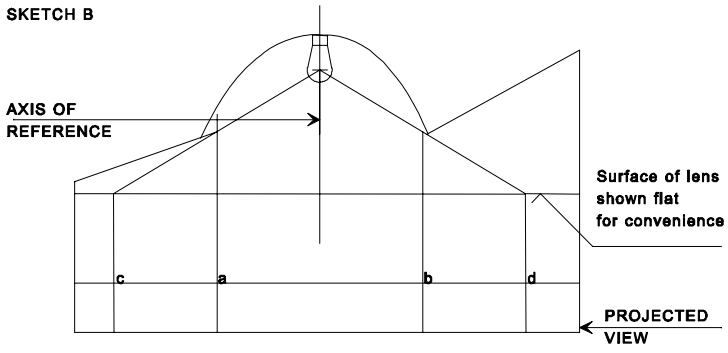
1. Illuminating surface
2. Axis of reference
3. Centre of reference
4. Angle of geometric visibility
5. Light-emitting surface
6. Apparent surface based on illuminating surface
7. Apparent surface based on light-emitting surface
8. Direction of visibility

Note: Notwithstanding the drawing, the apparent surface is to be considered as tangent to the light-emitting surface.

ILLUMINATING SURFACE IN COMPARISON WITH LIGHT-EMITTING SURFACE
(See paragraphs 3.3.12. and 3.3.13. of this regulation)



	Illuminating surface	Light-emitting surface
Edges are	a and b	c and d



	Illuminating surface	Light-emitting surface
Edges are	a and b	c and d

Annex 2

VISIBILITY OF A LAMP OTHER THAN WHITE TO THE FRONT
AND VISIBILITY OF LAMP OTHER THAN RED TO THE REAR
(See paragraphs 4.11.1. and 4.11.2. of this regulation)

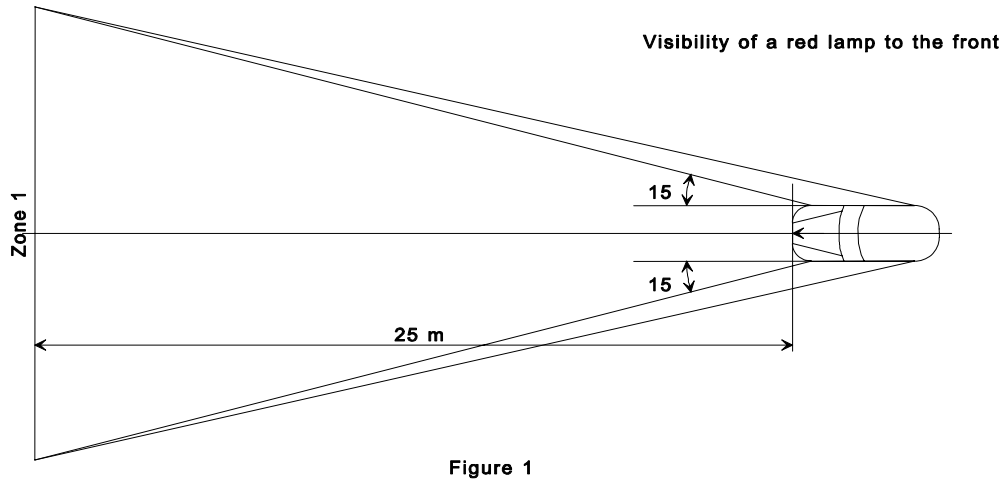


Figure 1

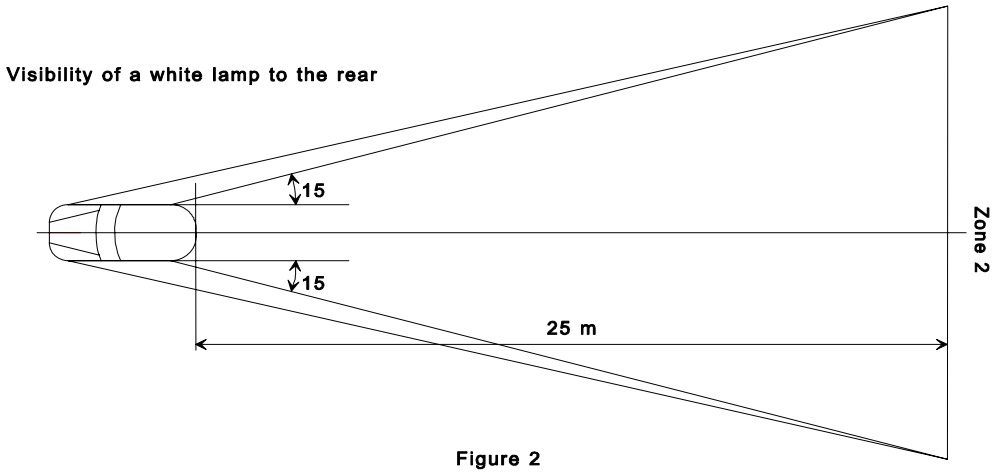


Figure 2

In their respective planes, the Zones 1 and 2 explored by the eye of the observer are bounded;

In height: by two horizontal planes 1 m and 2.2 m respectively above the ground,

In width: by two vertical planes which, forming to the front and to the rear respectively an angle of 15° 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 structural width; if there are several points of contact, the foremost shall correspond to the forward plane and the rearmost to the rearward plane.

Annex 3

IDENTIFICATION OF SYMBOLS REGARDING MEASUREMENTS AND ANGLES OF GEOMETRIC VISIBILITY DESCRIBED IN THIS REGULATION

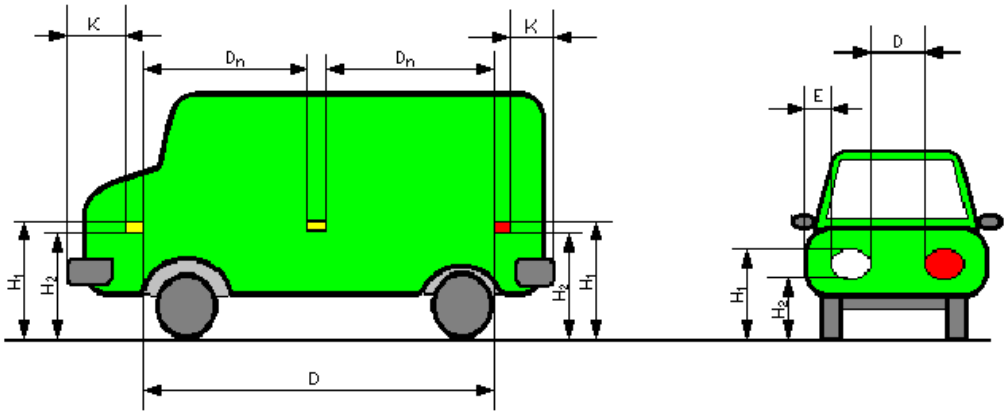


Figure 1. Identification of symbols regarding measurements described in this regulation

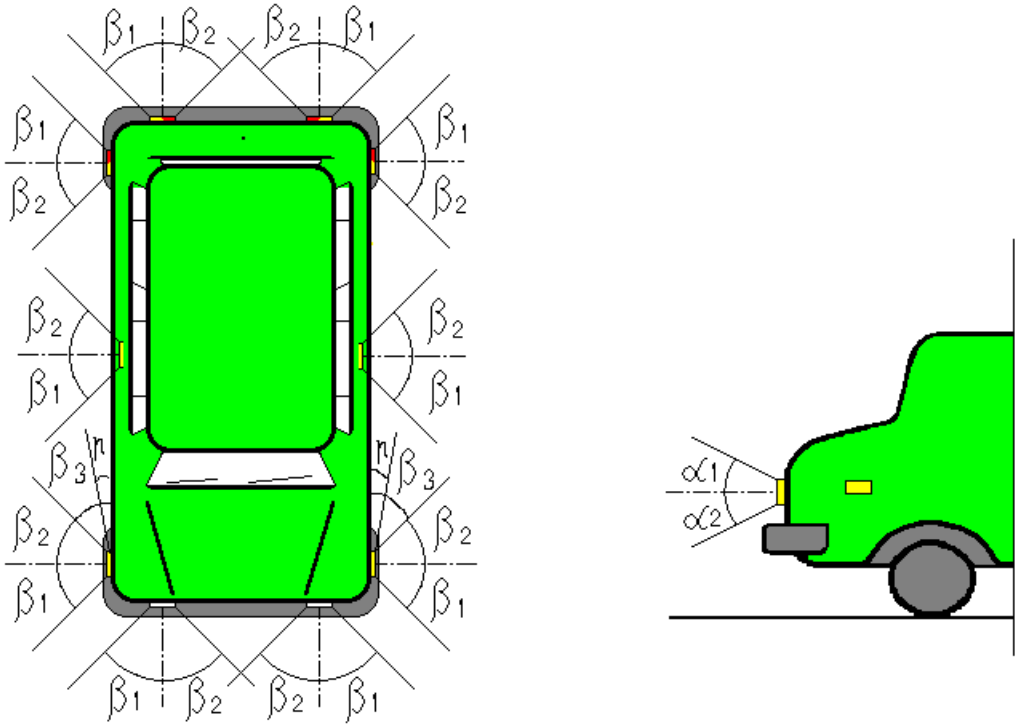
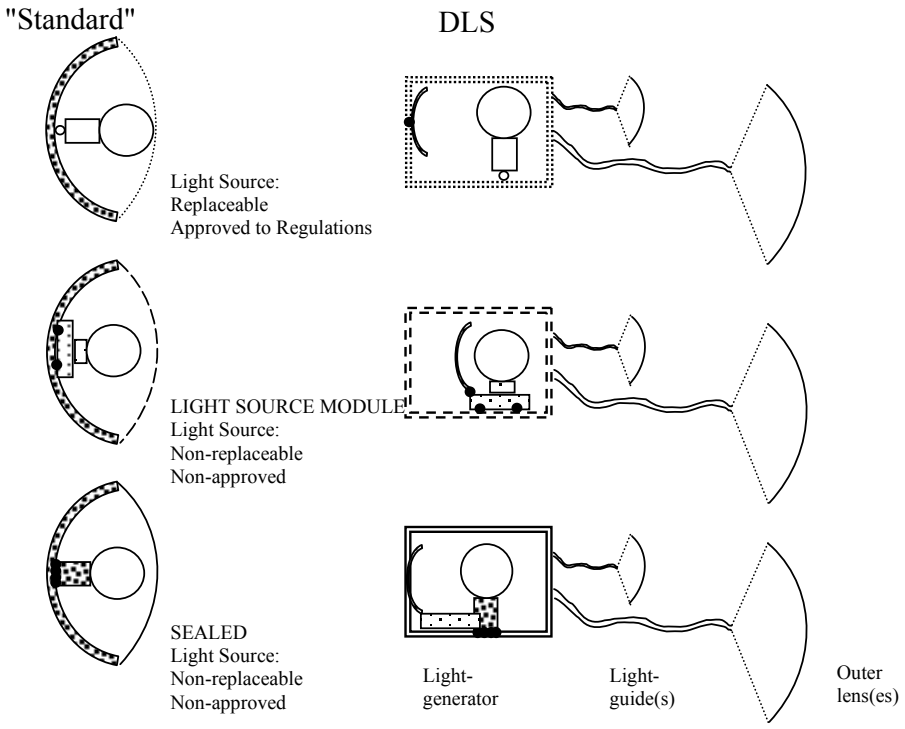


Figure 2. Identification of symbols regarding angles of geometric visibility described in this regulation

Annex 4

EXAMPLES OF LIGHT SOURCE OPTIONS



Annex 5

SHAPE AND DIMENSIONS OF TRIANGULAR RETRO-REFLECTOR

1.1. The illuminating surfaces of a triangular retro-reflector must have the shape of an equilateral triangle. If the word "TOP" is inscribed in one corner, the apex of that corner must be directed upwards.

1.2. The illuminating surface may or may not have at its centre a triangular, non-retro-reflecting area, with sides parallel to those of the outer triangle.

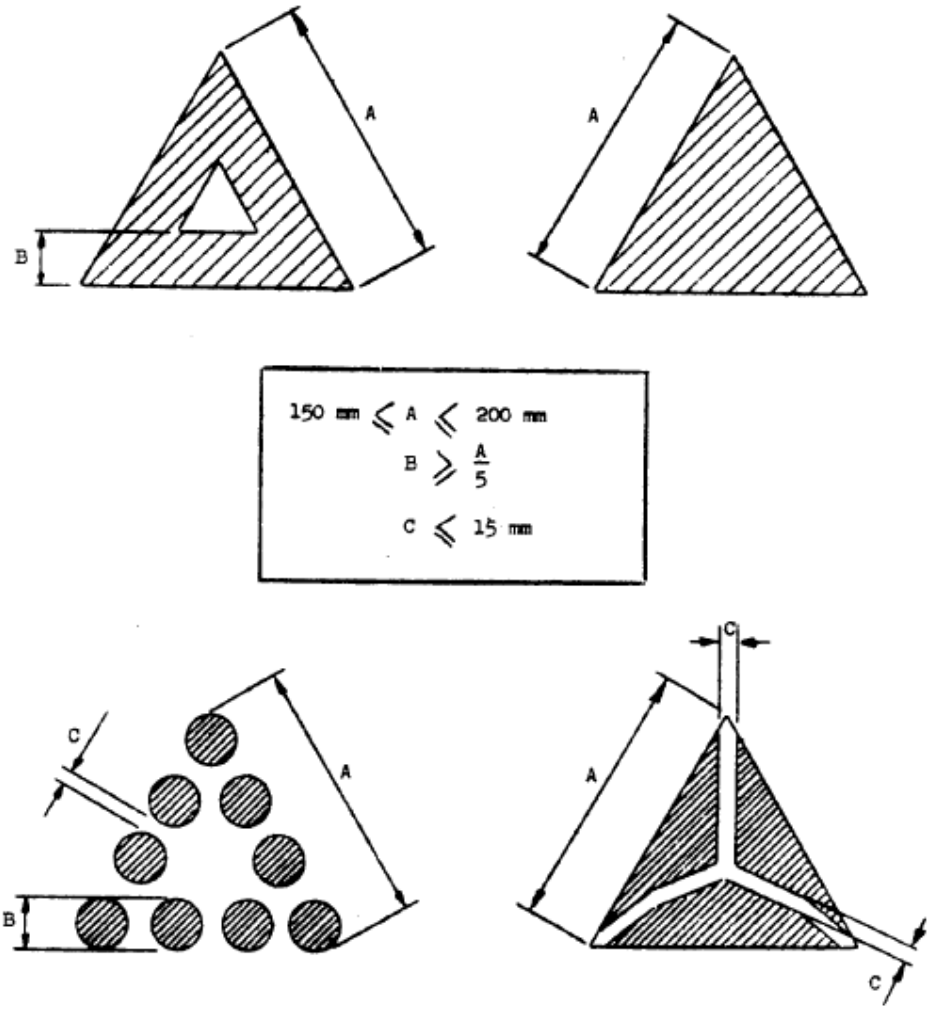
1.3. The illuminating surface may or may not be continuous. In any case, the shortest distance between two adjacent retro-reflecting optical units must not exceed 15 mm.

1.4. The illuminating surface of a retro-reflecting device shall be considered to be continuous if the edges of the illuminating surfaces of adjacent separate optical units are parallel and if the said optical units are evenly distributed over the whole solid surface of the triangle.

1.5. If the illuminated surface is not continuous, the number of separate retro-reflecting optical units including the corner units shall not be less than four on each side of the triangle.

1.6. The outside edges of the illuminating surfaces of triangular retro-reflector shall be between 150 and 200 mm long. In the case of devices of hollow-triangle type, the width of the sides, measured at right angles to the latter, shall be equal to at least 20 per cent of the effective length between the extremities of the illuminating surface.

EXAMPLES OF TRIANGULAR RETRO-REFLECTORS



Note: These sketches are for illustration purpose only.

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