

# UN R-53 Lamp Installation

The 57<sup>th</sup> Asia Expert Meeting in Thailand

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JAPAN AUTOMOBILE STANDARDS INTERNATIONALIZATION CENTER

1. Scope
2. Definitions
3. Application for approval
4. Approval
5. General specifications
6. Individual specifications
7. Modifications of the vehicle type or of the installation of its lighting and light-signalling devices
8. Conformity of production
9. Penalties for non-conformity of production
10. Production definitively discontinued
11. Transitional provisions
12. Names and addresses of Technical Services responsible for conducting approval tests, and of Type Approval Authorities

## Annex 1- Communication

Concerning about the approval or extension or refusal or withdrawal of approval or production definitely discontinued of a type of category L3 vehicle with regard to the installation of lighting and light-signalling devices, pursuant to Regulation No.53

## Annex 2- Arrangement of approval marks

## Annex 3- Lamp surface, axis and centre of reference, and angle of geometric visibility

## Annex 4- Forward visibility of red light and rearward visibility of white lights

## Annex 5- Control of conformity of production

## Annex 6- Explanation about "the horizontal inclination", "the bank angle" and the angle "delta"

## I . Explanation of the ECE R53

First is Scope.

This Regulation applies to vehicles of category L3 <sup>1/</sup> with regard to the installation of lighting and light-signalling devices.

<sup>1/</sup> As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.2, para. 2. - [www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html](http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html)

## Category L3 :

A two-wheeled vehicle with an engine cylinder capacity in the case of a thermic engine exceeding 50 cm<sup>3</sup> or whatever the means of propulsion a maximum design speed exceeding 50 km/h.

## I . Explanation of the ECE R53

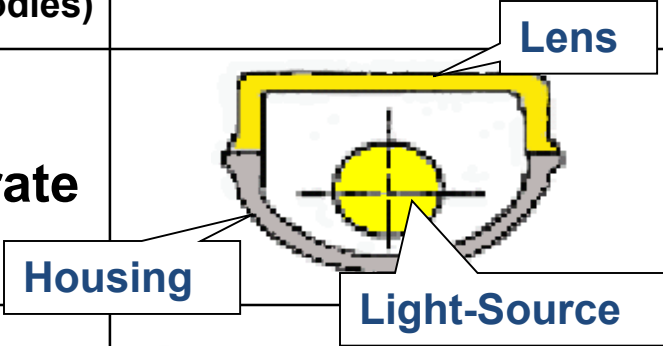

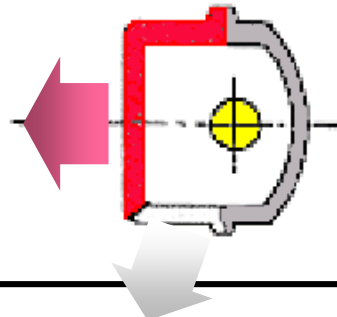
Next is Definition.

- 2.1. Approval of a vehicle
- 2.2. Vehicle type
- 2.3. Transverse plane
- 2.4.  
vehicle
- 2.5. Lamp
  - 2.5.1. Equivalent lamps
  - 2.5.2. Independent lamps
  - 2.5.3. Grouped lamps
  - 2.5.4. Combined
  - 2.5.5. Reciprocally incorporated
- 2.6. Light-emitting surface
- 2.7. Illuminating surface of a lighting device
- 2.8. Apparent surface
- 2.9. Axis of reference or reference axis
- 2.10. Centre of reference
- 2.11. Angles of geometric visibility
- 2.12. Extreme outer edge
- 2.13. Over-all width
- 2.14. A single lamp

2.5.2. Independent lamps

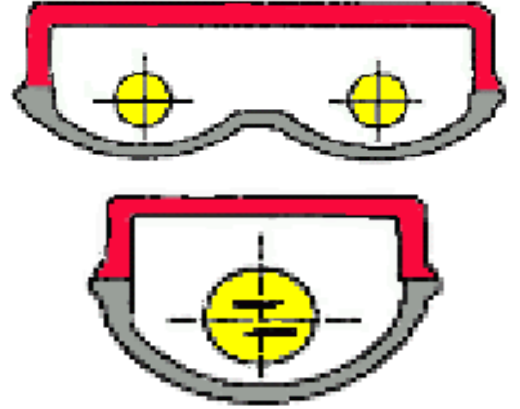
2.5.3. Grouped lamps

2.5.4. Combined

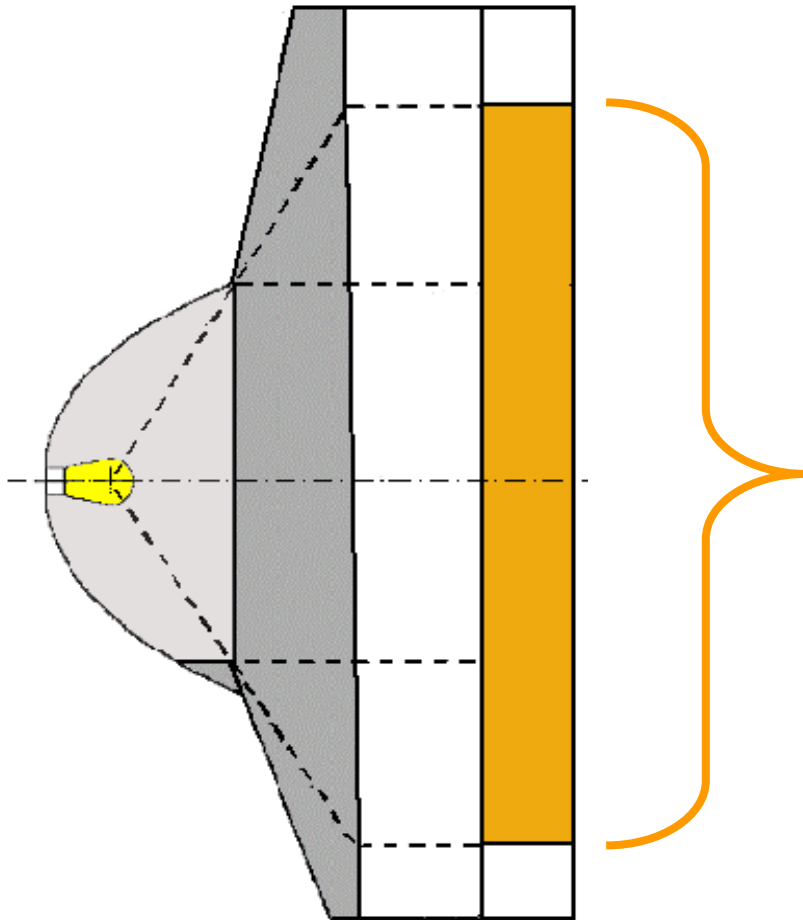
	<b>Lens</b> (Apparent surfaces)	<b>Light source</b>	<b>Housing</b> (Lamp bodies)	<b>Example</b>
<b>2.5.2. Independent Lamps</b>	<b>Separate</b>	<b>Separate</b>	<b>Separate</b>	
<b>2.5.3. Grouped Lamps</b>	<b>Separate</b>	<b>Separate</b>	<b>Common</b>	
<b>2.5.4. Combined Lamps</b>	<b>Separate</b>	<b>Common</b>	<b>Common</b>	



## 2.5.5. Reciprocally incorporated lamps

	<b>Lens</b> (Apparent surfaces)	<b>Light source</b>	<b>Housing</b> (Lamp body)	<b>Example</b>
<b>2.5.5. Reciprocally Incorporated Lamps</b>	<b>Common</b>	<b>Separate</b>	<b>Common</b>	

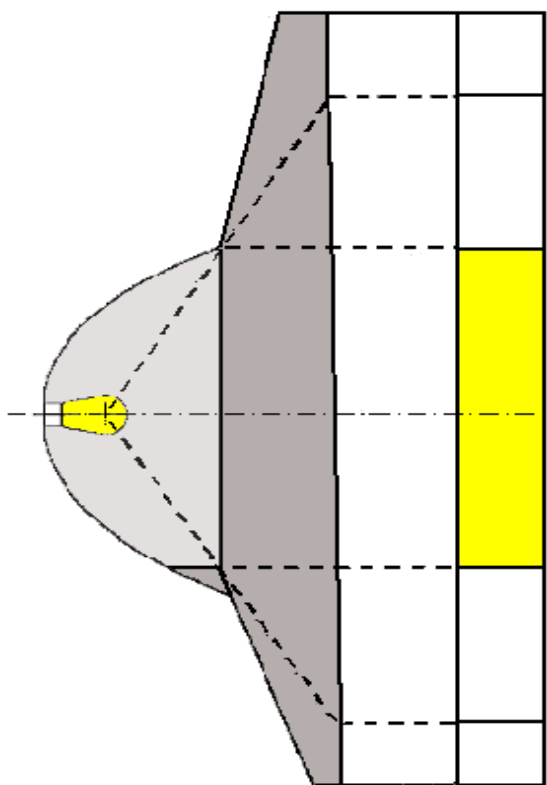
## 2.6. Light-emitting surface



**All or part of the exterior surface of the transparent material (lens) declared by the design of the manufacturer.**

## 2.7. Illuminating surface

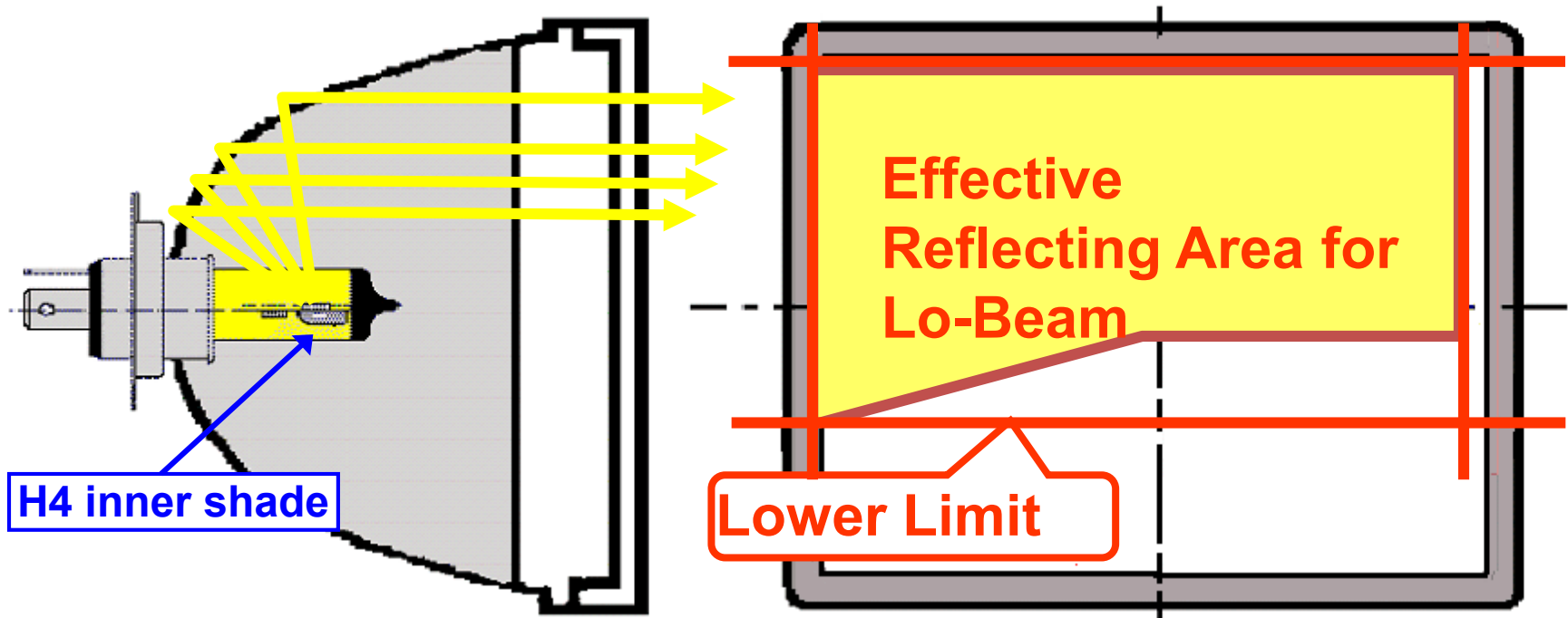
### - Head Lamp, Fr. Fog Lamp,



**Orthogonal projection of  
the full aperture of the  
reflector.**

**If the lighting device has no  
reflector, apply to illuminating  
surface definition for signal lamp  
(light- devices)**

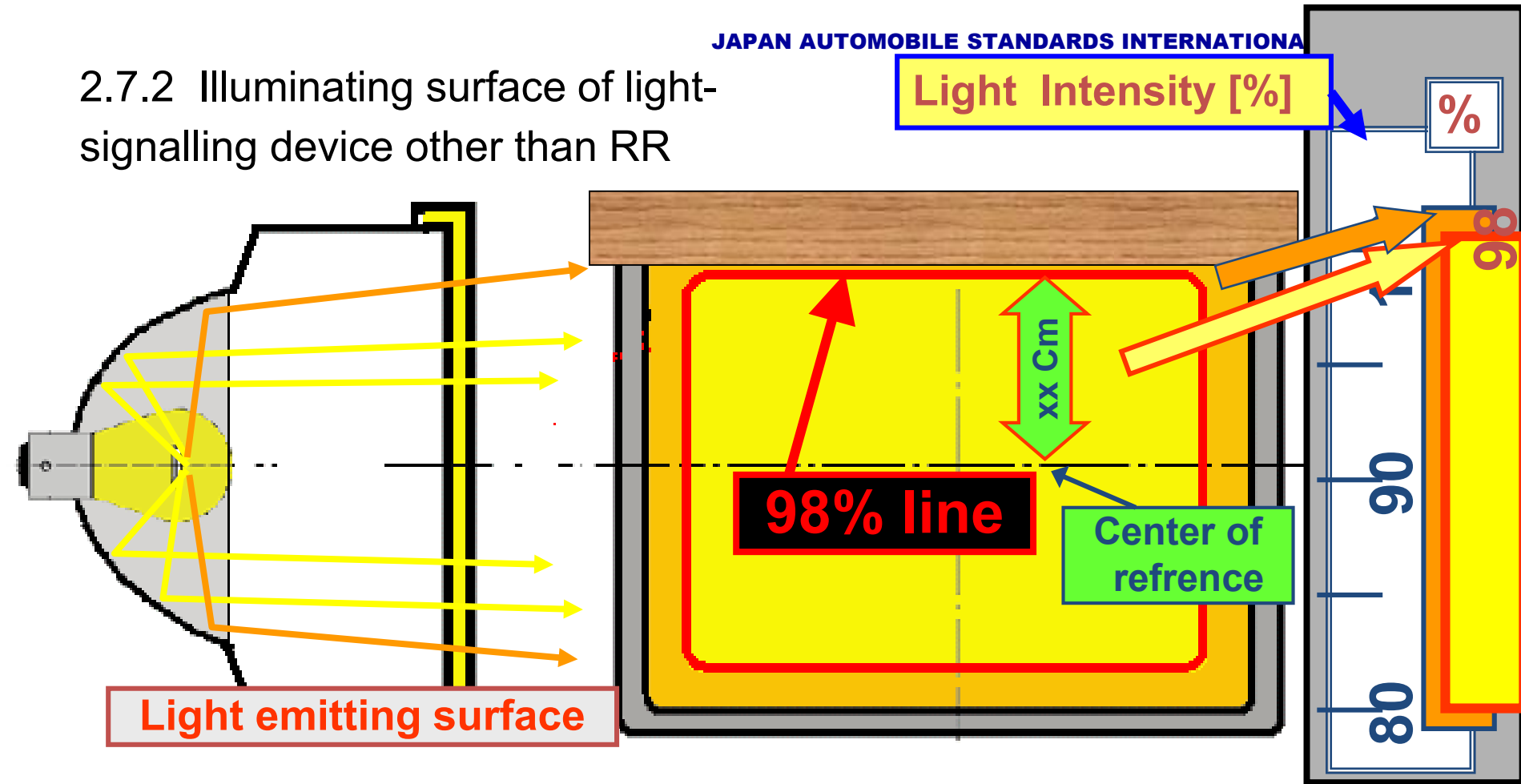
### 2.7.1. Illuminating surface of lighting device



In case of a Lo-beam headlamp, the illuminating surface is limited by the apparent projection of the cut-off on to the lens.

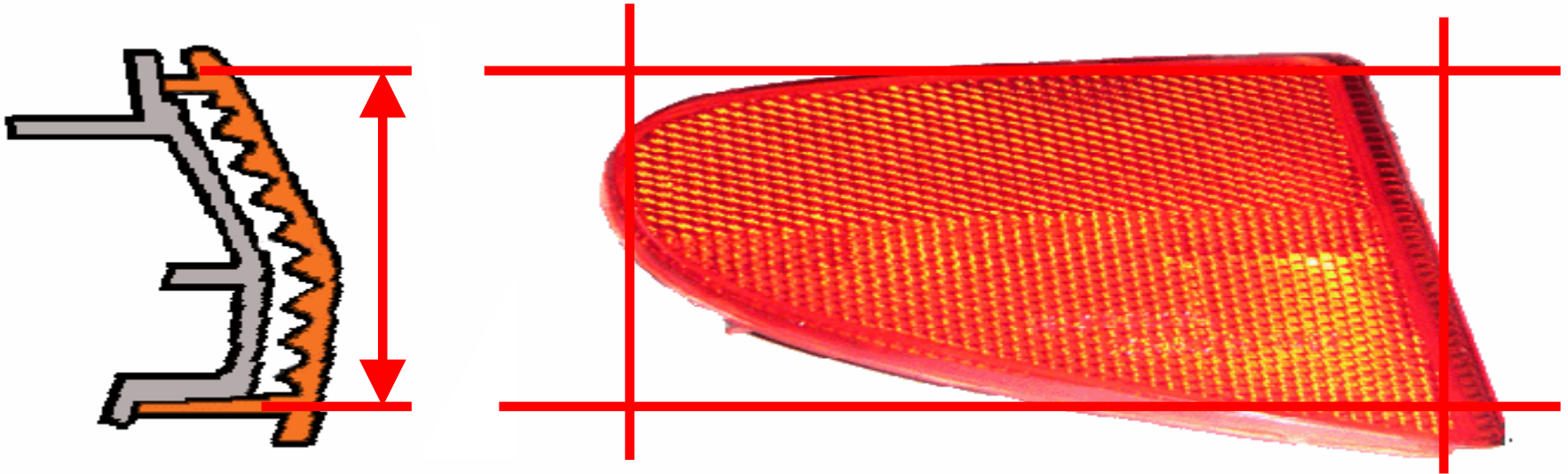
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## 2.7.2 Illuminating surface of light-signalling device other than RR



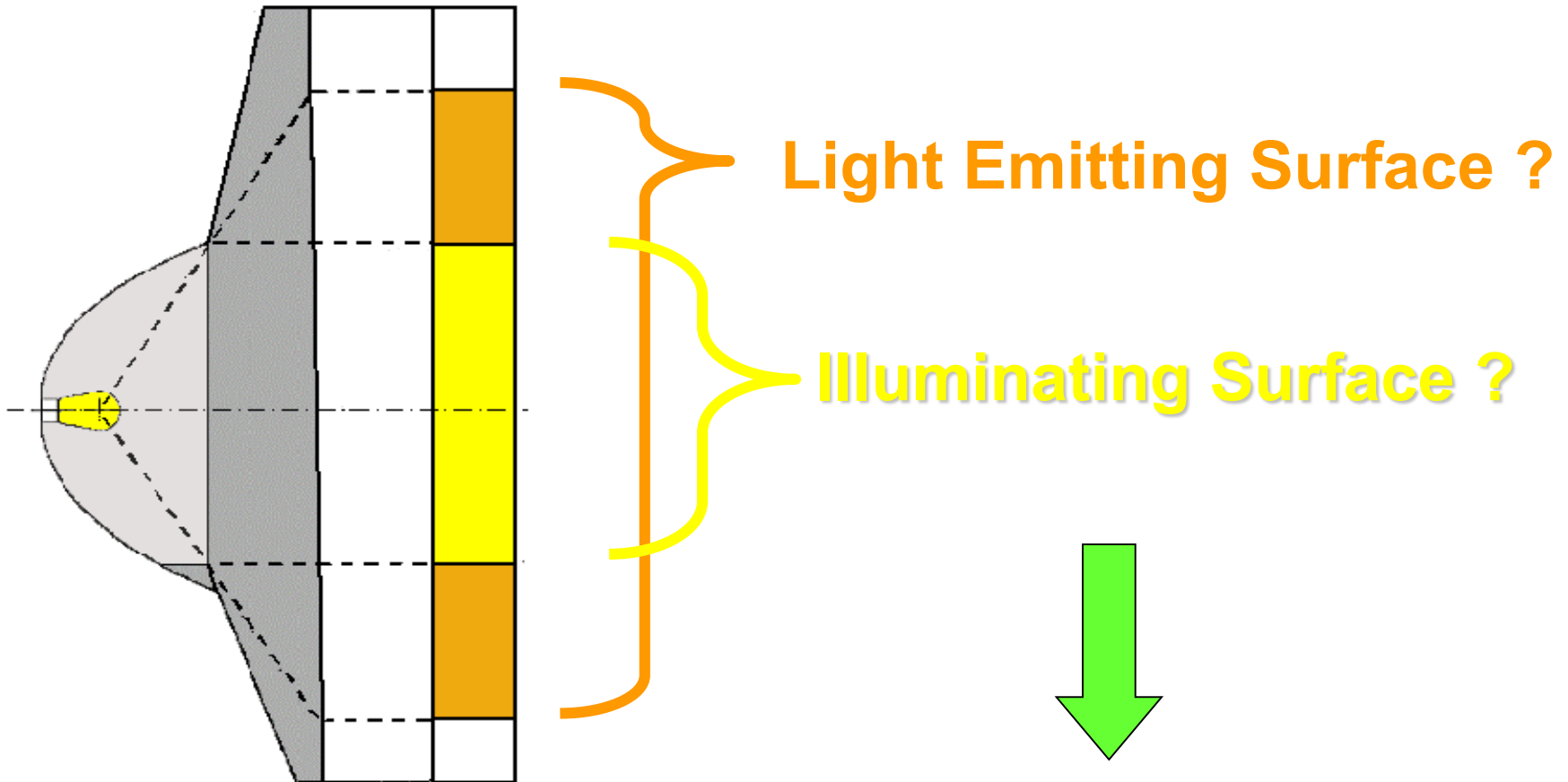
Illuminating surface is that each side of the rectangle of the light emitting surface allowing only 98% of the total luminous intensity of the light in the direction of the axis of reference.

## 2.7.3. Illuminating surface of Retro-reflector (RR)



Orthogonal projection of a RR in a plane perpendicular to its axis of reference and delimited by planes contiguous to the outermost parts of the RR's optical system and parallel to that axis.

## 2.8. Apparent surface



**Declare by the manufacturer**

2.9. Axis of reference or reference axis

2.10. Centre of reference

### Axis of Reference ( $H=0$ $V=0$ )

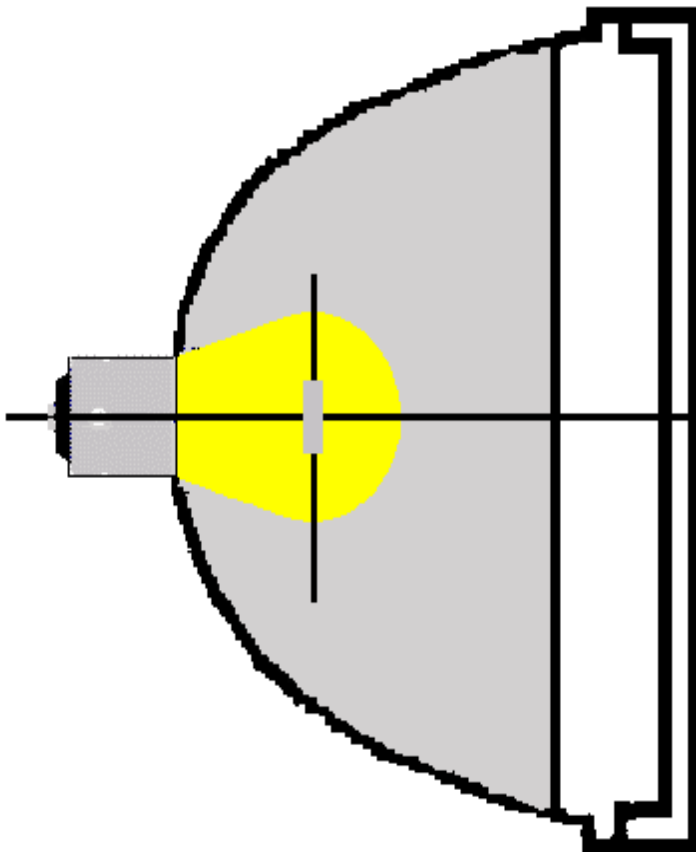
- Photometric measurement
- Installing the lamp on vehicle

**Use this axis to both above  
as the direction of reference**

$H=0$   $V=0$

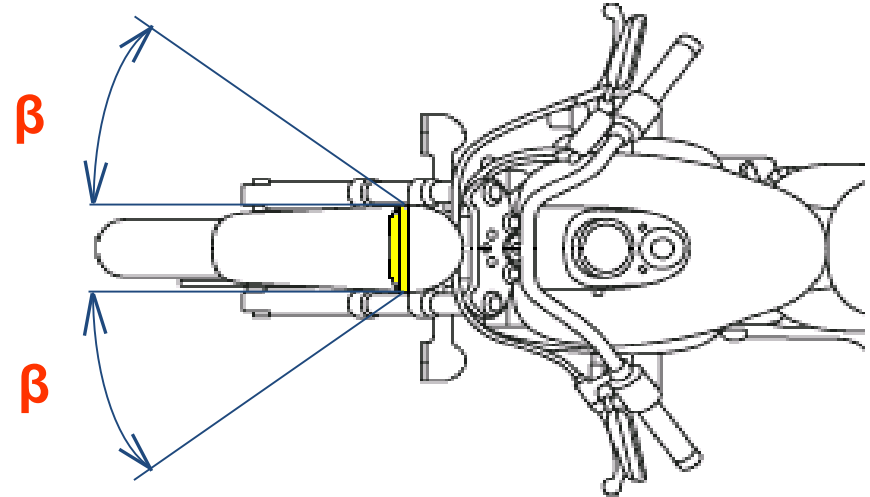
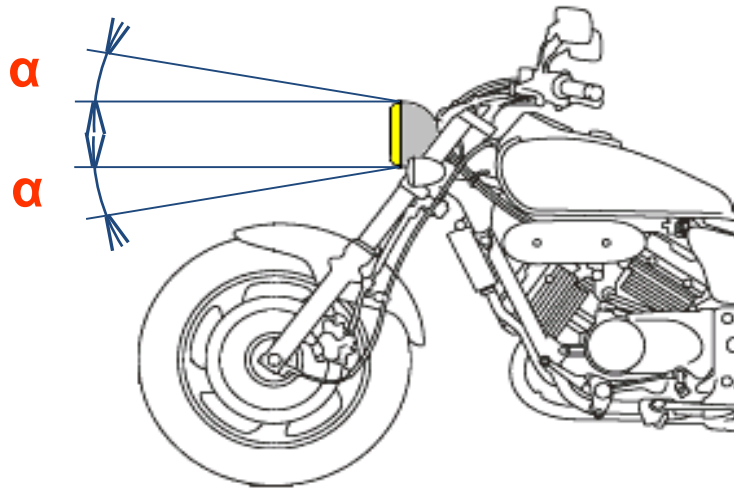
### Center of Reference

Intersection of the axis of reference  
on the lens





## 2.11. Angle of geometric visibility



- The field of the minimum solid angle in which the **apparent surface** of the lamp **must be visible**.
- There must be **no obstacles** inside the angle of geometric visibility.

I . Explanation of the ECE R53

Next is General Specifications.

### 5.4. Height and orientation of the lamps

- Condition :
- verify with the vehicle unladen
  - placed on a flat horizontal surface
  - median longitudinal plane being vertical
  - handlebars being in straight ahead movement.
  - Tyre pressure : prescribed by the manufacturer

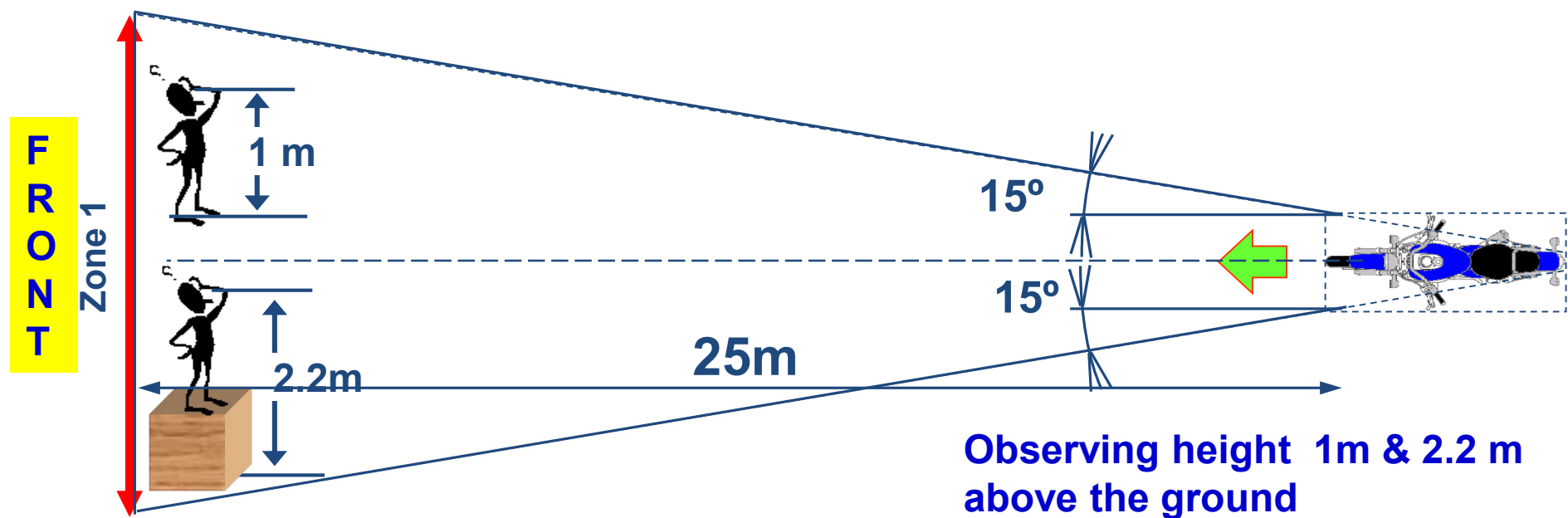


Example of a vehicle

## 5.9, 5.9.1~5.9.3.2

### Visibility of red lamps from the front

- There must be no direct visibility of the light-emitting surface of red lamps in the area shown in the figure.

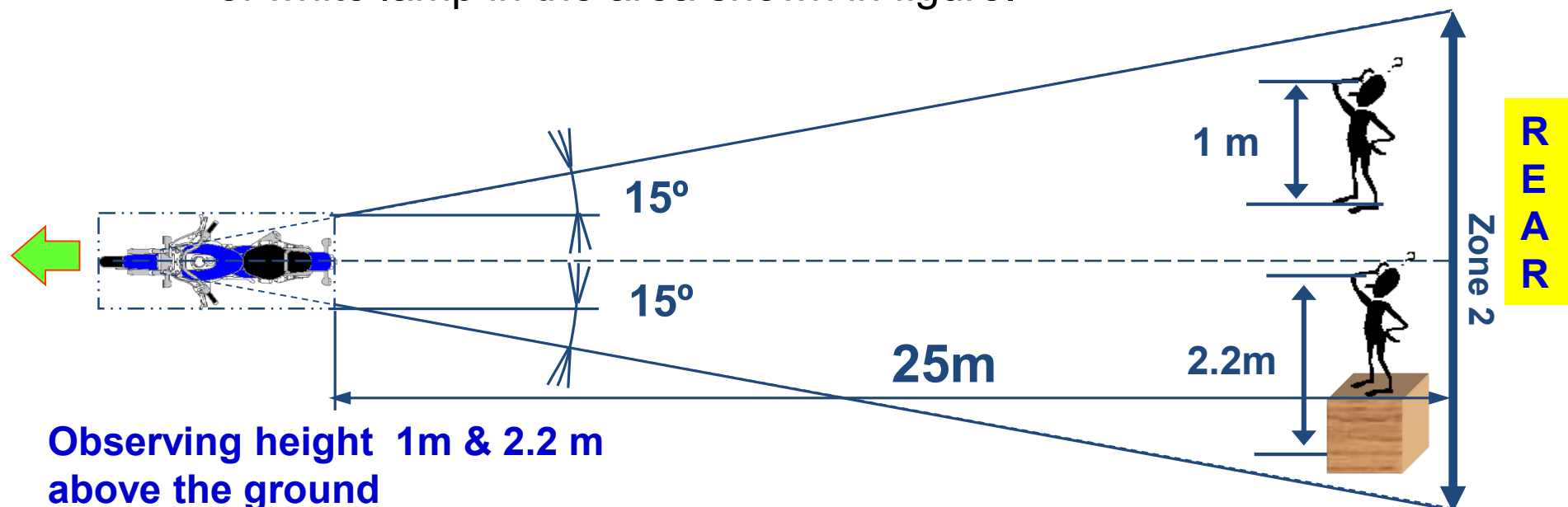


No red light which could give rise to confusion shall be emitted towards the front.

## 5.9, 5.9.1~5.9.3.2

## Visibility of white lamps from the rear

- There must be no direct visibility of the light-emitting surface of white lamp in the area shown in figure.



- No white light which could give rise to confusion shall be emitted towards to the rear.

## 5.11.1.

The headlamp or (if installed) the DRL shall automatically be ON when engine is running.

If the headlamp is switched ON, the DRL shall become OFF and vice versa.

Automatic Headlamp ON (AHO)

Daytime Running Lamp (DRL)

### 5.13. Colors of the lights

5.14. Every vehicle submitted for approval pursuant to this Regulation shall be equipped with the following lighting and light-signalling devices

5.17. The fitting of any lighting and light-signalling devices other than those mentioned in paragraphs 5.14 and 5.15 is prohibited for the purposes of type approval

driving beam headlamp: white

passing beam headlamp: white

direction-indicator lamp: amber

stop lamp: red

rear-registration plate lamp: white

front position lamp: white or amber

rear position lamp: red

rear retro-reflector, non-triangular: red

side retro-reflector, non-triangular: amber at the front, amber or red at the rear

vehicle-hazard warning signal: amber

front fog lamp: white or selective yellow

rear fog lamp: red

daytime running lamp: white

stop lamp (R7-S3 category ): red

emergency stop signal: amber(direction) or red(stop)

**RED:** mandatory lamps

**BLUE:** optional lamps

I . Explanation of the ECE R53

Next is Individual Specification.



## Contents

- 6.1. Driving beam headlamp
- 6.2. Passing beam headlamp
- 6.3. Direction-indicator lamp
- 6.4. Stop lamp
- 6.5. Rear-registration-plate illuminating device
- 6.6. Front position lamp
- 6.7. Rear position lamp
- 6.8. Rear retro-reflector, non-triangular
- 6.9. Vehicle-hazard warning signal
- 6.10. Front fog lamp
- 6.11. Rear fog lamp
- 6.12. Side retro-reflector, non-triangular
- 6.13. Daytime running lamp
- 6.14. Emergency stop signal

< **Mandatory lamps** >

Lamp	Color	Number	Position	Others
driving beam	white	1 or 2	500 – 1300 mm	Max 430,000 cd
passing beam	white	1 or 2	500 – 1200 mm	
direction-indicator	amber	2 / side	350 – 1200 mm	Min separation Fr : 240 mm Rr : 180 mm
stop : R7-S1 category device or R50 device	red	1 or 2	250 – 1500 mm	
rear-registration-plate illuminating device	white	1 *1	500 – 1200 mm	
front position	white amber	1 or 2 2(1/side)	350 – 1200 mm	
rear position	red	1 or 2	250 – 1500 mm	
rear retro reflector	red	1 or 2	250 – 900 mm	
side retro reflectors	Fr : amber Rr : red or amber	1 or 2 / side	300 – 900 mm	

\*1 : may consist of several optical components

## < Optional lamps >

Lamp	Color	Number	Position	Others
vehicle-hazard warning signal	amber	2 / side	350 – 1200 mm	Min separation Fr : 240 mm Rr : 180 mm
front fog lamp	white	1 or 2	250 – 1200 mm	
rear fog lamp	red	1 or 2	250 – 900 mm	
daytime running lamp	white	1 or 2	250 – 1500mm	
stop : R7-S3 category device	red	1	not be less than 850 mm	
emergency stop signal	amber or red	Same as direction-indicator or stop	Same as direction-indicator or stop	

## 6.1. Driving beam headlamp

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

*An independent driving lamp*

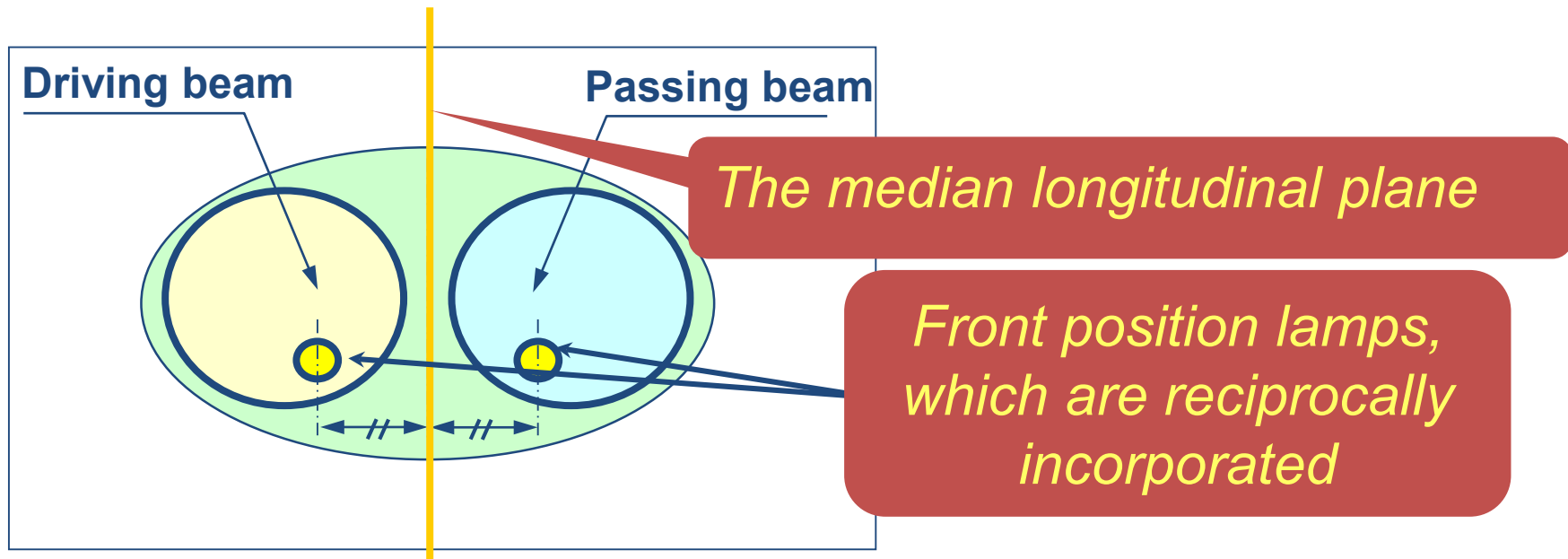


*Passing beam headlamp*

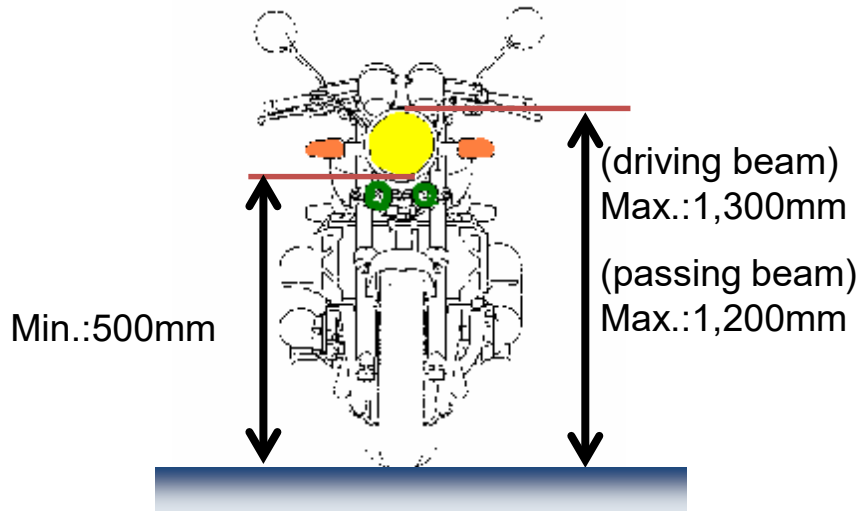
*An independent driving lamp*

*Only for the purpose of explanation*

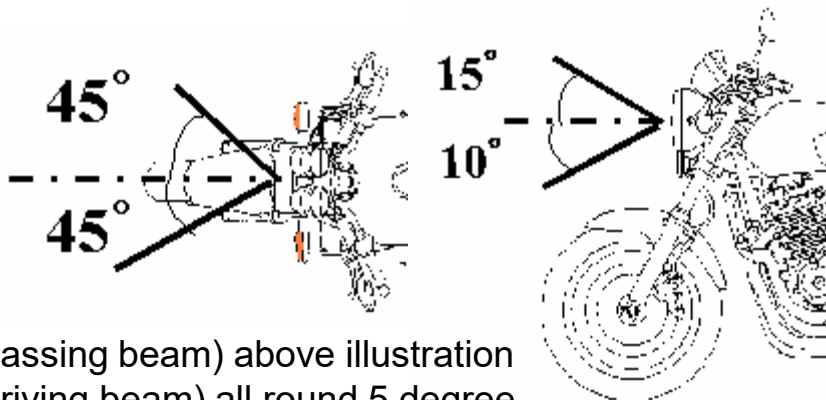
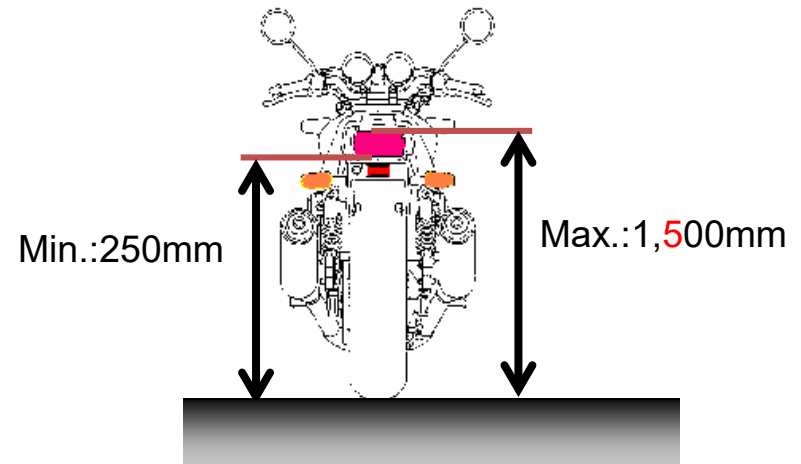
- 6.1.3.1.2. a driving beam headlamp, that is reciprocally incorporated with another front lamp, must be fitted in such a way that its reference centre lies within the median longitudinal plane of the vehicle. However, when the vehicle is also fitted with an independent passing beam headlamp, or a passing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



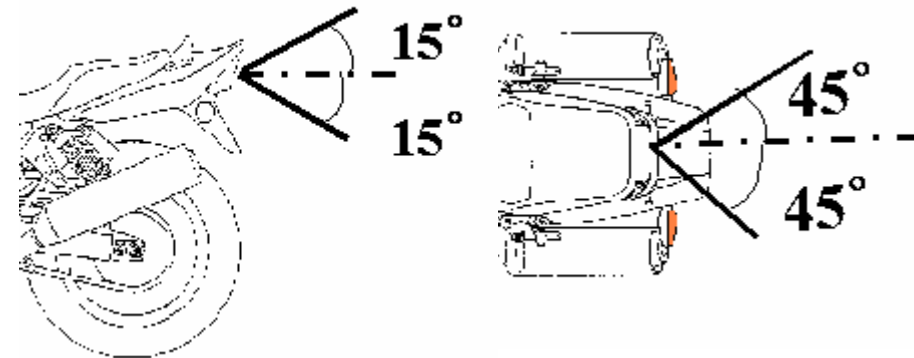
## Head lamp



## Stop lamp

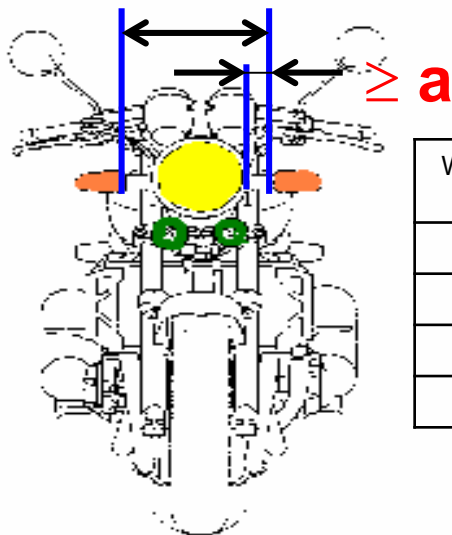


(passing beam) above illustration  
(driving beam) all round 5 degree



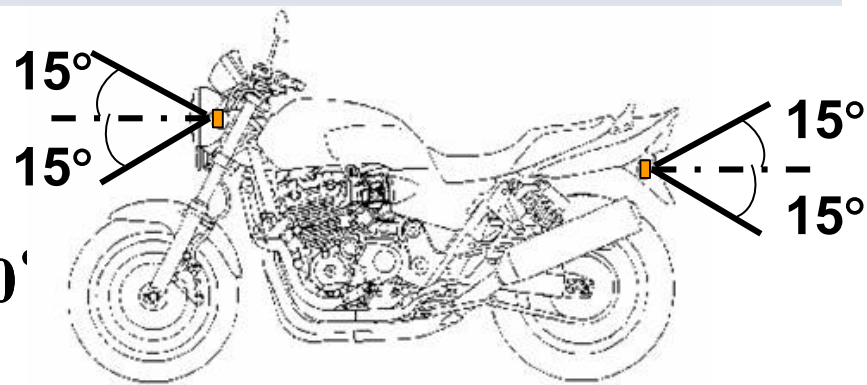
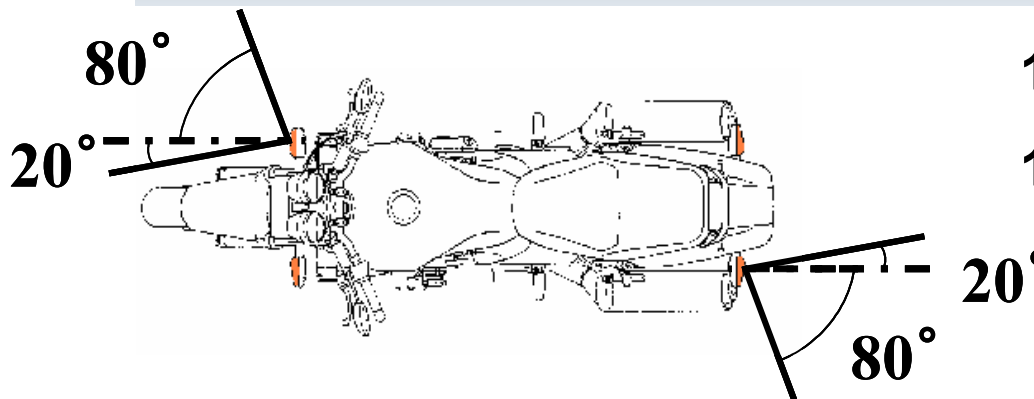
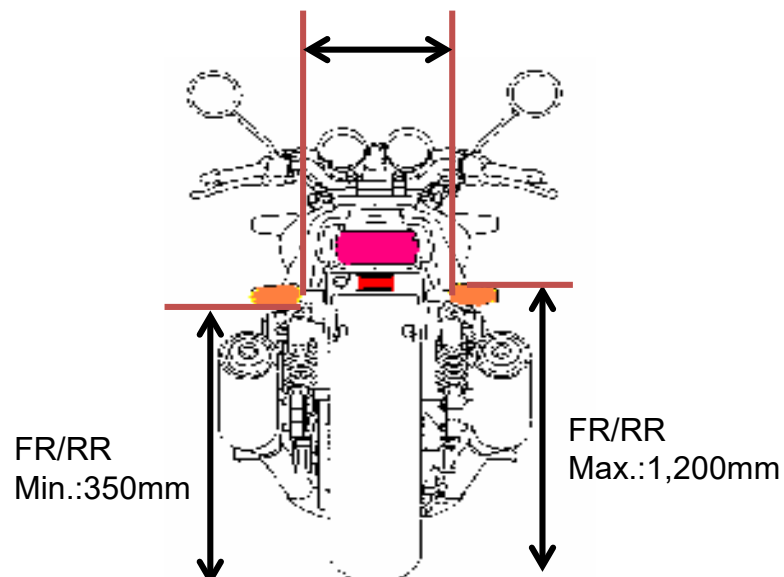
direction-indicator lamp

$\geq 240\text{mm}$

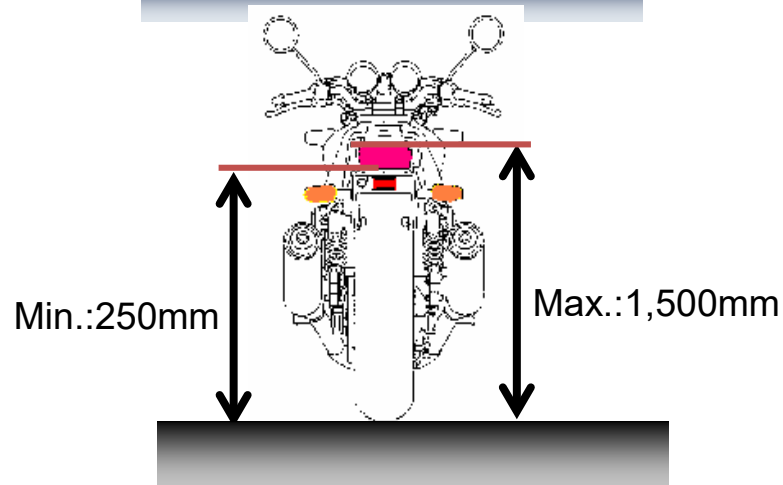
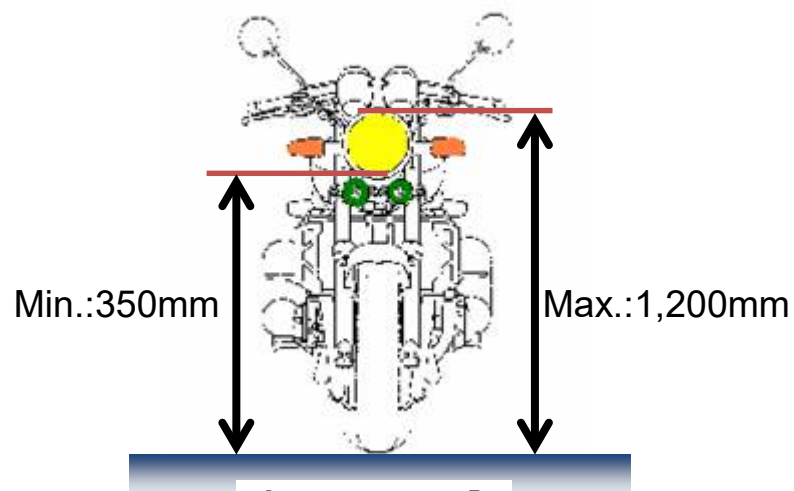
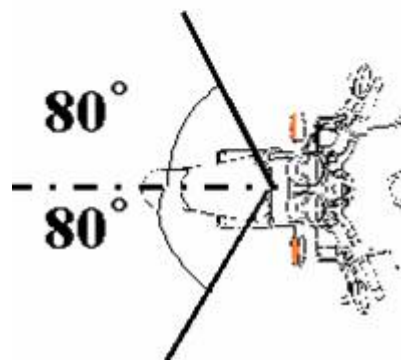
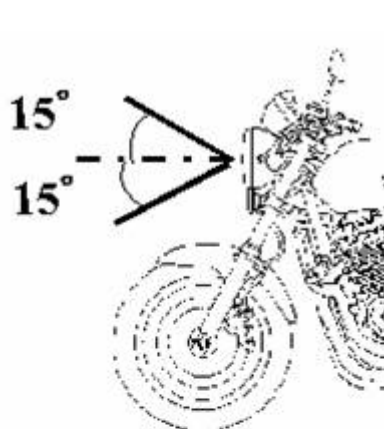


WL min. luminous intensity (cd)	a (mm)
90	75
175	40
250	20
400	$\leq 20$

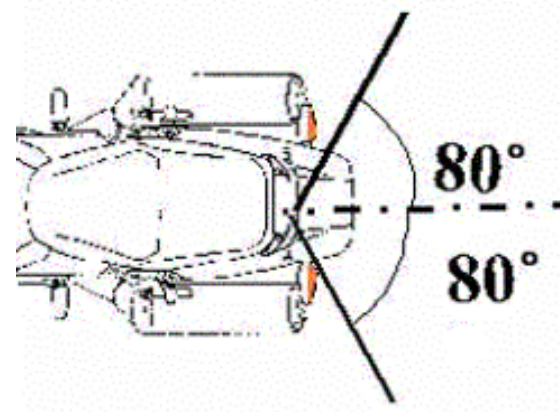
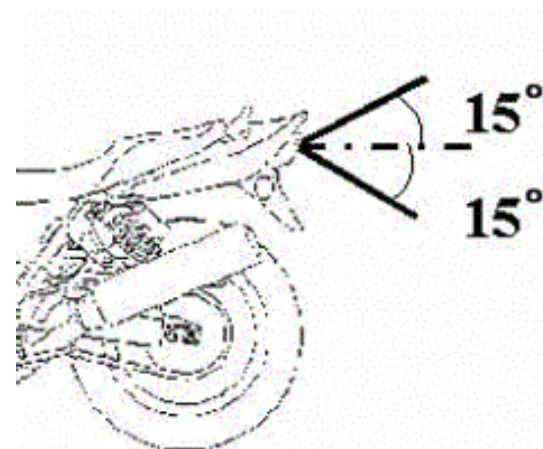
$\geq 180\text{mm}$



## front position lamp

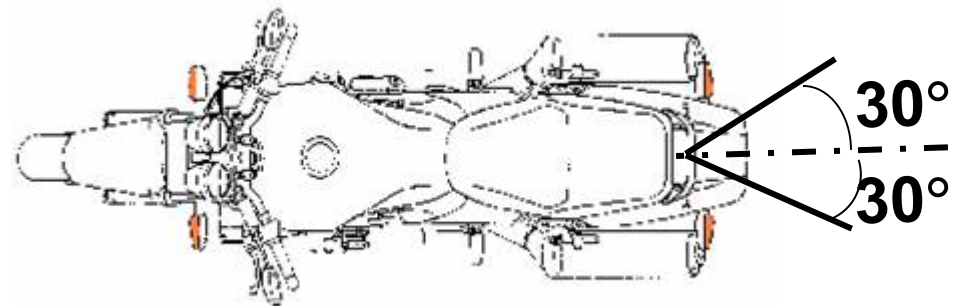
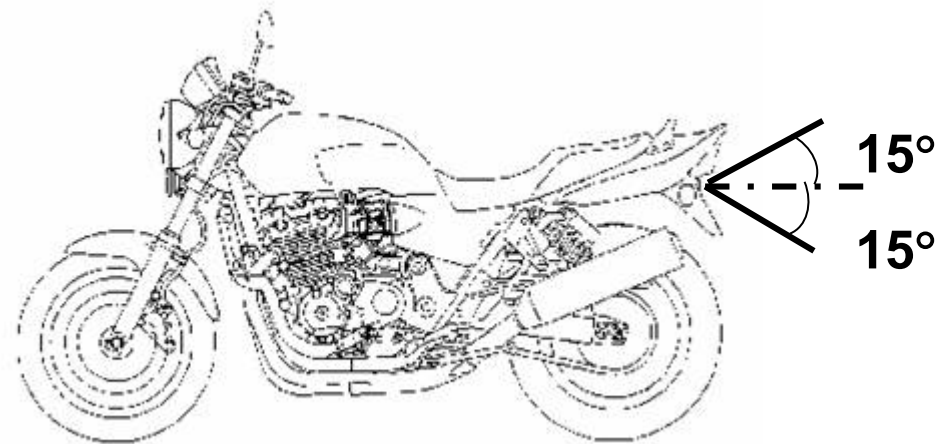
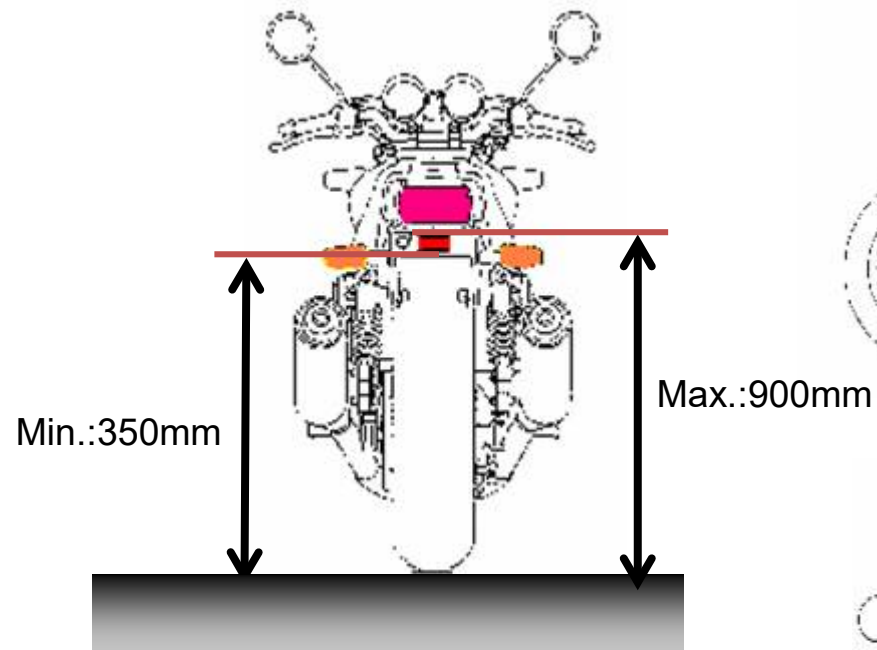


## rear position lamp

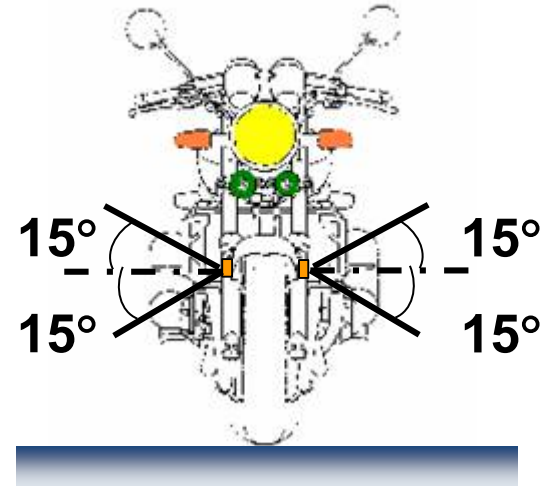
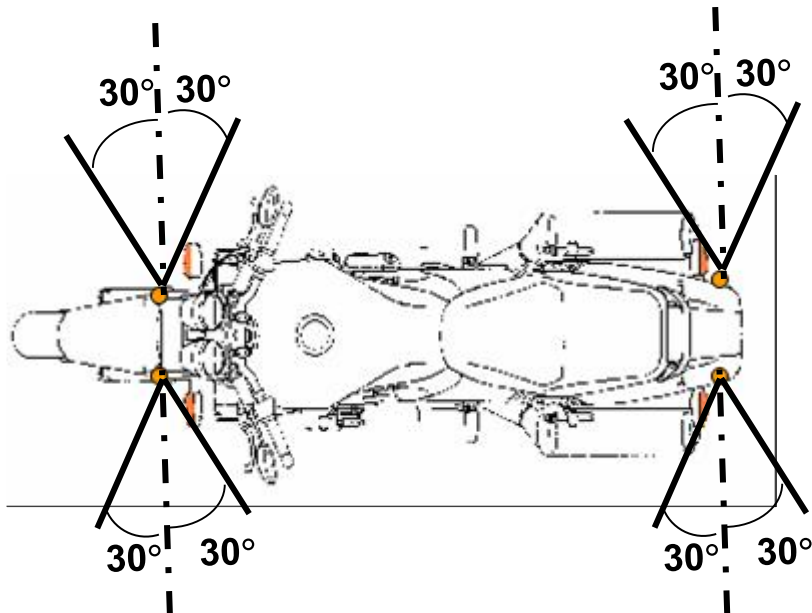
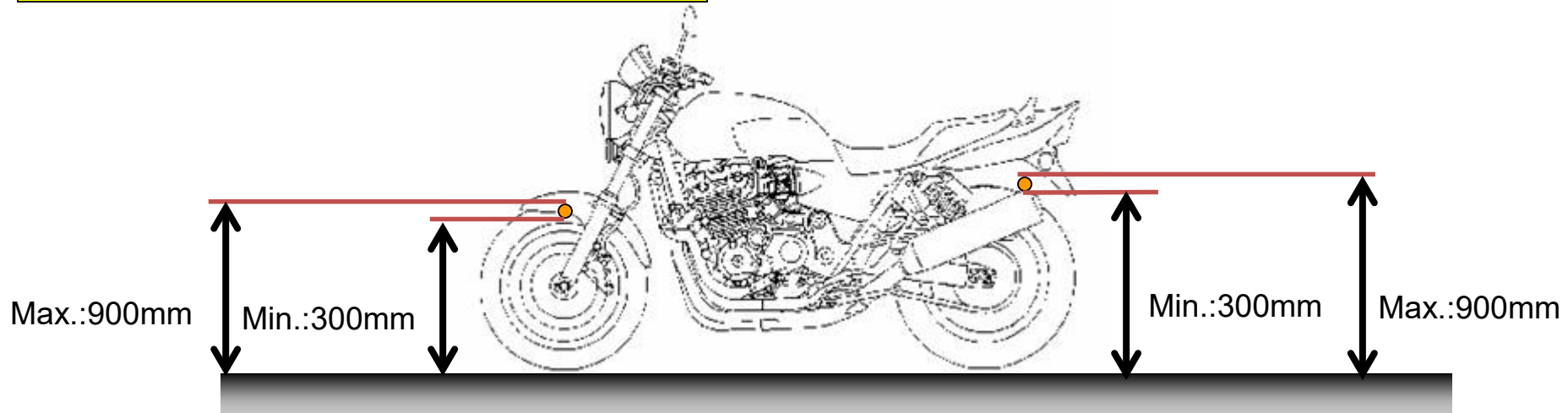




## rear retro reflector, non-triangular



## side retro reflectors



Finally,

Currently, the latest R53 is the 02 series.

As for headlamps, in the 01 series so far, among the lamps specified in UN-R113, headlamp of Class B, Class C, Class D, and Class E has been able to installed.

However, since the 02 revision series, "Class B" (has been used widely in the ASEAN region so far) headlamp can not be installed.

(Refer to Section 6.1.1.1, Section 6.1.1.2, Section 6.2.1.1, Section 6.2.1.2)

Please keep in mind.

# END

Thank you for your attention