

23 Installation of devices for indirect vision

Refer to: R46 02-S5, R81 00-S1

23.1 Effective date and Scope:

- 23.1.1 Effective date from 2006/7/1, the new vehicle variants of category symbols L1 and L3, and from 2008/7/1 all vehicle variants of category symbols L1, L2, L3 and L5, shall comply with this regulation and the requirements for devices for indirect vision (rear-view mirror) regulated in these Directions.
- 23.1.2 Effective date from 2011/1/1, the new vehicle variants of category symbols M and N, shall comply with this regulation and the requirements for devices for indirect vision regulated in these Directions, except Class VI-A, shall comply with the regulation in these Directions.
- 23.1.3 Effective date from 2012/1/1, the existing vehicle variants of category symbols M2 and M3, applicants shall provide documents which declare to conform to 23.5.1.6 and 23.5.1.7 of this regulation, and the Certification Institution may make an on-site surveillance check if necessary.
- 23.1.4 Effective date from 2013/1/1, all vehicle variants of category symbols M and N, shall comply with this regulation and their devices for indirect vision, except Class VI-A, shall comply with the regulation in these Directions.

23.2 Definition:

- 23.2.1 Devices for indirect vision: means devices to observe the traffic area adjacent to the vehicle which cannot be observed by direct vision. These can be conventional mirrors, camera-monitors or other devices able to present information about the indirect field of vision to the driver. The category symbols L use mirror (rear-view mirror) able to provide the field of vision.
 - 23.2.1.1 Mirror: means any device intended to give a clear view to the rear and side of the vehicle (usually from rear-view mirror provide this function) or front (usually from front-view mirror provide this function, except for the category symbols L), excluding complex optical systems such as periscopes.
 - 23.2.1.2 Interior mirror: means a device, which can be fitted in the passenger compartment of a vehicle.
 - 23.2.1.3 Exterior mirror: means a device, which can be mounted on the external surface of a vehicle.
 - 23.2.1.4 Rear-view mirror of the category symbols L: means any mirror device can provide for the category symbols L's clear view to the rear and side of the vehicle; excluding complex optical systems such as periscopes.
- 23.2.2 Driver's ocular points: means two points 65 mm apart and 635 mm vertically above point "R" of the driver's seat. The straight line joining these points runs perpendicular to the vertical longitudinal median plane of the vehicle. The center of the segment joining the two ocular points is in the longitudinal vertical plane which shall pass by the center of the seating position of the driver designated by the vehicle manufacturer;
- 23.2.3 Ambinocular vision: means the total field of vision obtained by the superimposition of the monocular fields of view of the right eye and the left eye.
- 23.2.4 Vision support system: means a system to enable the driver to detect and/or see objects in the area adjacent to the vehicle.
- 23.2.5 "Camera-monitor device for indirect vision" means a device as defined in paragraph 23.2.1., where the field of vision is obtained by means of a camera-monitor combination as defined in paragraphs 23.2.6. and 23.2.7.
- 23.2.6 "Camera" means a device that renders an image of the outside world and then converts this image into a signal (e.g. video signal).
- 23.2.7 "Monitor" means a device that converts a signal into images that are rendered into the visual spectrum.

23.3 Installation of devices for indirect vision shall according to suitable variants and range of principle are as below :

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- 23.3.1 The same vehicle category symbol.
- 23.3.2 The same brand and vehicle type.
- 23.3.3 The same chassis brand.
- 23.3.4 Chassis manufacturers announced that the same chassis vehicle type.
- 23.3.5 If use chassis vehicle instead of completed vehicle for entire or partial testing, which shall according to suitable variants and range of principle are as below :
 - 23.3.5.1 The same brand.
 - 23.3.5.2 Chassis manufacturers announced that the same chassis vehicle type.

23.4 Minimum number of mandatory mirrors:

- 23.4.1 The fields of vision prescribed in paragraph 23.7 shall be obtained from the minimum number on mandatory mirrors set out in the following Figure 1. Where the presence of a mirror is not requested on a mandatory base, this means that no other system for indirect vision can be requested on a mandatory base. Figure 1 : The amount of installation devices' table. (Only Figure 1 was revised. Refer to Figure 1 for revised contents)
- 23.4.2 In case the described field of vision of a front mirror prescribed in paragraph 23.7.6 and/or a close proximity mirror described in paragraph 23.8 can be obtained by another device for indirect vision t, this device can be used instead of the relevant mirror or mirrors. In case a camera/monitor device is used, the monitor must exclusively show:
 - (a) the field of vision prescribed in paragraph 23.7.5 when the close proximity mirror has been substituted,
 - (b) the field of vision prescribed in paragraph 23.7.6. when the front mirror has been substituted while the vehicle is moving forward with a speed up to 30 km/ h, or
 - (c) simultaneously the fields of vision prescribed in paragraphs 23.7.5 and 23.7.6 when the close proximity mirror and the front mirror have been substituted. In the case of the vehicle is moving forward at a higher speed than 30 km/h or moving backwards, the monitor may be used for other information, provided that the field of vision prescribed in paragraph 23.7.5 is permanently displayed.
- 23.4.3 In case the described field of vision of a front mirror prescribed in paragraph 23.7.6. can be obtained by another device for indirect vision that is approved according to paragraph 23.8. Other device can be used instead of a mirror.
 In case a camera/ monitor device is used the monitor must exclusively show the field of vision prescribed in paragraph 23.7.6. while the vehicle is moving forward with a speed up to 30 km/h.
 In case the vehicle is moving with higher speed or moving backwards the monitor can be used to display the field of vision of other cameras mounted to the vehicle.
- 23.4.4 Motor vehicles having less than four wheels fitted with bodywork which partly or wholly encloses the driver shall be equipped: either with an interior rear-view mirror of Class I and an exterior rear-view mirror of Class II or Class III, which shall be fitted to the drivers side of the vehicle, or with two exterior rear-view mirrors of Class II or Class III, one at each side of the vehicle. The provisions of below are not applicable to the above-mentioned vehicles.
- 23.4.5 All the vehicles of category symbols L1, L2, L3 and L5 must be fitted with two rear-view mirrors of vehicle category L, one on the left and one on the right of the vehicle.

23.5 Position:

- 23.5.1 Vehicle of category symbols M and N

23.5.1.1 mirrors shall be so placed that the driver, when sitting in the driving seat in a normal driving position, has a clear view of the

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road to the rear and side(s) of the vehicle.

23.5.1.2 Exterior mirrors shall be visible through the side windows or through the portion of the windscreen that is swept by the windscreen wiper. Nevertheless, for design reasons, this last provision (i.e. the provisions relating the cleaned part of the windscreen) shall not apply to:

23.5.1.2.1 exterior mirrors on the passenger side and optional exterior mirrors on the driver side of vehicles of categories M2 and M3;

23.5.1.2.2 Class VI mirrors.

23.5.1.3 In the case of any vehicle, which is in chassis/cab form when the field of vision is measured, the minimum and maximum body widths shall be stated by the manufacturer and, if necessary, simulated by dummy headboards. All vehicles and mirror configurations taken into consideration during the tests shall be shown on the type approval certificate for a vehicle with regard to the installation of mirrors.

23.5.1.4 The prescribed exterior rear-view mirror on the driver side of the vehicle shall be located so as to form an angle of not more than 55 degrees between the vertical longitudinal median plane of the vehicle and the vertical plane which passes through the center of the rear-view mirror and through the center of the straight 65 mm line which joins the driver's two ocular points (see Fig 1).

23.5.1.5 Mirrors must not project beyond the external bodywork of the vehicle substantially more than is necessary to comply with the requirements concerning fields of vision.

23.5.1.6 Where the bottom edge of an exterior mirror is less than 2 m above the ground when the vehicle is laden, this rear-view mirror shall not project more than 250 mm beyond the overall width of the vehicle when not fitted with the rear-view mirror. However, for Class VI-A mirror mounted on M2 and M3, where the bottom edge of Class VI-A mirror is less than 1.8 m above the ground, this Class VI-A mirror shall not project out of the overall width of the vehicle, and if it's equipped with impact buffering design (to make it shrunk or extended), Class VI-A mirror shall not project more than 50 mm from the vehicle.

23.5.1.7 Class V and Class VI mirrors shall be mounted on vehicles in such a way that, regardless of their position after adjustment, no part of these mirrors or their holders is less than 2 m from the ground when the vehicle is under a load corresponding to its technically permissible maximum laden mass.. In this case an other device for indirect vision is not requested.

23.5.1.8 Subject to the requirements of paragraphs 23.5.1.5, 23.5.1.6. and 23.5.1.7, mirrors may project beyond the permissible maximum widths of vehicles.

23.5.2 Vehicle of category L: rear-view mirrors must be mounted or adjusted in such a way that the distance of the center of the reflective surface, as measured in a horizontal plane, is at least 280 mm outward from the longitudinal vertical plane passing through the center of the steering head of the vehicle. Before the measurement, the handlebar shall be placed in the straight ahead position and the mirror(s) shall be adjusted to its (their) normal position.

23.6 mirror(s) shall be kept firm and stable.

23.6.1 In case of vehicles of category symbols M and N, the interior rear-view mirror shall be such that the driver can adjust it when in his driving position. The exterior rear-view mirror on the driver's side shall be capable of adjustment from inside the vehicle, the door being closed, although the window may be open. The former requirements do not apply to exterior mirrors which, after having been knocked out of alignment, can be returned to their former position without the need for adjustment.

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23.6.2 In case of vehicles of categories L1 and L3, mirror(s) shall be such that the driver can adjust it (them) in the normal driving position.

23.7 Vehicle's vision of mirrors

23.7.1 Interior mirrors (Class I):

The field of vision shall be such that the driver can see at least a 20m-wide flat horizontal portion of the road centered on the vertical longitudinal median plane of the vehicle, from 60 m behind the driver's ocular points (see Figure 2) to the horizon.

23.7.2 Main exterior mirrors (Class II) :

23.7.2.1 Exterior mirror (Class II) on the driver's side, the field of vision must be such that the driver can see at least a 5 m wide, flat, horizontal portion of the road, which is bounded by a plane which is parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle on the driver's side of the vehicle and extends from 30 m behind the driver's ocular points to the horizon. In addition, the road must be visible to the driver over a width of 1 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 4 m behind the vertical plane passing through the driver's ocular points (see Figure3).

23.7.2.2 Exterior mirror (Class II) on the passenger's side .The field of vision must be such that the driver can see at least a 5 m wide, flat, horizontal portion of the road, which is bounded on the passenger's side by a plane parallel to the median longitudinal vertical plane of the vehicle and passing through the outermost point of the vehicle on the passenger's side and which extends from 30 m behind the driver's ocular points to the horizon. In addition, the road must be visible to the driver over a width of 1 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 4 m behind the vertical plane passing through the driver's ocular points (see Figure 3).

23.7.3 Main exterior mirrors Class III

23.7.3.1 Exterior mirror (Class III) on the driver's side. The field of vision must be such that the driver can see at least a 4 m wide, flat, horizontal portion of the road, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle on the driver's side of the vehicle and extends from 20 m behind the driver's ocular points to the horizon. In addition, the road must be visible to the driver over a width of 1 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 4 m behind the vertical plane passing through the driver's ocular points (see Figure 4).

23.7.3.2 Exterior mirror (Class III) on the passenger's side. The field of vision must be such that the driver can see at least a 4 m wide flat, horizontal portion of the road which is bounded by a plane parallel to the median longitudinal vertical plane passing through the outermost point of the vehicle on the passenger's side and which extends from 20 m behind the driver's ocular points to the horizon. In addition, the road must be visible to the driver over a width of 1 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 4 m behind the vertical plane passing through the driver's ocular points (see Figure 4).

23.7.4 Wide-angle exterior mirrors (Class IV):

23.7.4.1 Wide-angle: exterior mirror on the driver's side. The field of vision must be such that the driver can see at least a 15 m wide,

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flat, horizontal portion of the road, which is bounded by a plane parallel to the median longitudinal vertical plane of the vehicle and passing through the outermost point of the vehicle on the driver's side and which extends from at least 10 m to 25 m behind the driver's ocular points. In addition, the road must be visible to the driver over a width of 4.5 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 1.5 m behind the vertical plane passing through the driver's ocular points (see Figure 5).

23.7.4.2 Wide-angle: exterior mirror on the passenger's side. The field of vision must be such that the driver can see at least a 15 m wide, flat, horizontal portion of the road, which is bounded by a plane parallel to the median longitudinal vertical plane of the vehicle and passing through the outermost point of the vehicle on the passenger's side and which extends from at least 10 m to 25 m behind the driver's ocular points. In addition, the road must be visible to the driver over a width of 4.5 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 1.5 m behind the vertical plane passing through the driver's ocular points (see Figure 5).

23.7.5 Close-proximity: exterior mirror (Class V)

The field of vision must be such that the driver can see a flat horizontal portion of the road along the side of the vehicle, bounded by

the following vertical planes (see Figures 6a and 6b):

23.7.5.1 The plane parallel to the median longitudinal vertical plane of the vehicle which passes through the outermost point of the vehicle cab on the passenger's side;

23.7.5.2 in the transverse direction, the parallel plane passing at a distance of 2 m in front of the plane mentioned in paragraph 23.15.2.4.5.1.

23.7.5.3 to the rear, the plane parallel to the vertical plane passing through the driver's ocular points and situated at a distance of 1.75 m behind that plane;

23.7.5.4 to the front, the plane parallel to the vertical plane passing through the driver's ocular points and situated at a distance of 1 m in front of that plane. If the vertical transverse plane passing through the leading edge of the vehicle bumper is less than 1 m in front of the vertical plane passing through the driver's ocular points, the field of vision shall be limited to that plane.

23.7.5.5 In case the field of vision described in Figures 6a and 6b can be perceived through the combination of the field of vision from a Class IV wide-angle mirror and that of a Class VI front mirror, the installation of a Class V close proximity mirror is not compulsory.

23.7.6 Front mirror (Class VI)

23.7.6.1 The field of vision shall be such that the driver can see at least a flat horizontal portion of the road, which is bounded by:

(a) a transverse vertical plane through the outermost point of the front of the vehicle,

(b) a transverse vertical plane 2,000 mm in front of the plane defined in (a),

(c) a longitudinal vertical plane parallel to the longitudinal vertical median plane going through the outermost side of the vehicle at the driver's side and,

(d) a longitudinal vertical plane parallel to the longitudinal vertical median plane 2000 mm outside the outermost side of the vehicle opposite to the driver's side.

The front of this field of vision opposite to the driver's side may be rounded off with a radius of 2 000 mm (see figure 7)

The provisions for front mirrors are compulsory for forward controlled vehicles of categories N2 > 7.5 t and N3.

If vehicles of these categories cannot fulfill the requirements by using a front mirror or a camera/monitor device, a vision support system shall be used. In the case of a vision support system this device must be able to detect an object of 50 height and with a diameter of 30 cm within the field defined in figure 7.

Forward control means a configuration in which more than half of the engine length is rearward of the foremost point of the windshield base and the steering wheel hub in the forward quarter of the vehicle length.

23.7.6.2 However, if the driver can see, taking into account the obstructions by the A-pillars, a straight line 300 mm in front of the vehicle at a height of 1,200 mm above the road surface, a front mirror of Class VI is not mandatory.

(1) and which is situated between a longitudinal vertical plane parallel to the longitudinal vertical median plane going through the outermost side of the vehicle at the driver's side.

(2) a longitudinal vertical plane parallel to the longitudinal vertical median plane 900 mm outside the outermost side of the vehicle opposite to the driver's side.

23.7.6.3 For the purpose of paragraphs 23.7.6.1 and 23.7.6.2 parts permanently attached to the vehicle that are situated both above the driver's eye points and in front of the transverse vertical plane passing through the foremost surface of the vehicle's front bumper shall not be taken into account when defining the front of the vehicle.

23.7.7 Front mirror of cab-over-type vehicle (Class VI-A): cab-over-type vehicle shall install a front mirror of class VI-A except the vehicle having front mirror of class VI.

23.7.8 In the case of mirrors consisting of several reflecting surfaces which are either of different curvature or make an angle with each other, at least one of the reflecting surfaces must provide the field of vision and have the dimensions.

23.7.9 Obstructions

23.7.9.1 Interior rear-view mirror (Class I)

The field of vision may be reduced by the devices such as, in particular, sun visors, rear windscreen wipers and heating elements, these devices shall not cover more than 15% of vision except headrests, body and components of bodywork such as window columns of rear split doors. This requirement shall be tested by projection on to a vertical plane at right angles to the longitudinal centreplane of the vehicle. The degree of obstruction shall be measured with the headrests adjusted to their lowest possible position and with the sun visors folded back.

23.7.9.2 Exterior mirrors (Classes II, III, IV, V and VI)

In the fields of vision specified above, obstruction due to the bodywork and its components, such as other cab mirrors, door handles, outline marker lights, direction indicators and front and rear bumpers, as well as reflective-surface cleaning components, shall not be taken into account if they are responsible for a total obstruction of less than 10 per cent of the specified field of vision. In the case of a vehicle designed and constructed for special purposes where, due to its special features, it is not possible to meet this requirement, the obstruction of the required field of vision of a Class VI mirror caused by the special features may be more than 10 per cent but not more than necessary for its special function.

23.8 Devices for indirect vision other than mirrors

23.8.1 A device for indirect vision shall give such performances that a critical object can be observed within the described field of vision, taking into account the critical perception.

23.8.2 Obstruction of the driver's direct view caused by the installation of a device for indirect vision shall be restricted to a minimum.

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23.8.3 For the determination of the detection distance in case of camera-monitor devices for indirect vision, the procedure of 23.9 shall be applied.

23.8.4 Installation requirements for the monitor

The viewing direction of the monitor shall roughly be the same direction as the one for the main mirror.

23.8.5 Vehicles may be equipped with additional devices for indirect vision.

23.8.6 The provisions of this Regulation do not apply to the surveillance camera-monitor-recording devices defined in paragraph 23.2.12.

Exterior surveillance cameras either shall be mounted at least 2 m above the ground when the vehicle is under a load corresponding to its announced mass, or, if their lower edge is less than 2 m from the ground, shall not project more than 50 mm beyond the overall width of the vehicle measured without this device and have a radii of curvature of not less than 2.5 mm.

23.9 Calculation of the distance detection of camera/monitor device

23.9.1 The resolution threshold of a camera is defined by the formula:

$$\omega_c = 60 \frac{\beta_c}{2N_c}$$

where:

omegac - resolution threshold (arc-min)

betac - angle of vision (°)

Nc - number of video lines of the camera (#)

The manufacturer shall supply the values for betac and Nc

23.9.2 Determination of the critical viewing distance of the monitor

For a monitor having certain dimensions and properties, a distance to the monitor can be calculated within which the detection distance is dependent only on the performances of the camera. This critical viewing distance $r_{m,c}$ is defined by:

$$r_{m,c} = \frac{H_m}{N_m \cdot 2 \cdot \tan\left(\frac{\omega_{eye}}{2.60}\right)}$$

where:

$r_{m,c}$ - critical viewing distance (m)

H_m - height of the monitor image (m)

N_m - number of video lines of the monitor (-)

ω_{eye} - resolution threshold of the observer (minutes of arch)

The number 60 is for conversion from minutes of arches to degrees.

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The manufacturer shall supply the values for Hm and Nm.

$\omega_{eye} = 1$

23.9.3 Determination of the distance detection

23.9.3.1 For maximum detection distance within the critical viewing distance where, due to then installation, the distance eye-monitor is less than the critical viewing distance, the maximum attainable detection distance shall be defined by:

$$r_d = \frac{D_0}{\tan\left(\frac{f \cdot \omega_c}{60}\right)} = \frac{D_0}{\tan\left(\frac{f \beta_c}{2 \cdot N_c}\right)}$$

where:

r_d - detection distance [m]

D_0 - diameter of the object [m]

f - threshold increasing factor

$D_0 = 0.8$ m

$f = 8$

ω_c = resolution threshold of the camera (arc-min)

β_c = angle of vision of the camera (degrees)

N_c - number of video lines of the camera (#)

The manufacturer shall provide the values for β_c and N_c

23.9.3.2 For detection distance greater than the critical viewing distance. Where, due to the installation, the distance eye-monitor is more than the critical viewing distance, the maximum obtainable detection distance shall be defined:

$$r_d = \frac{D_0}{\tan\left[\frac{f \cdot \beta_c}{2 N_c} \cdot \frac{N_m}{0.01524 \cdot D_m} \cdot r_m \cdot \tan\left(\frac{\omega_{eye}}{60}\right)\right]}$$

where:

r_m - viewing distance to the monitor (m)

D_m - diagonal of the monitor screen (inch)

N_m - number of video lines of the monitor (-)

β_c = angle of vision of the camera (degrees)

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Nc - number of video lines of the camera (#)
 ω_{eye} - resolution threshold of the observer (minutes of arch)
 $\omega_{eye} = 1$

23.9.4 Secondary functional requirements : Based on the installation conditions, a verification shall be made to discover whether the entire device can still satisfy the functional requirements listed in paragraph 23.10.2. of these Directions, especially the glare correction, the maximum and the minimum luminance of the monitor. It shall also be verified the degree to which the glare correction will be addressed and the angle at which sunlight can strike a monitor and these shall be compared to the corresponding measuring results from the system measurements. This can be either based on a CAD-generated model, a determination of the angles of light for the device when mounted on the relevant vehicle, or by carrying out relevant measurements on the relevant vehicle as described in paragraph 23.10.2.2 of this Direction.

Chart 1 :The amount of installation devices' table

Vehicle category	Interior mirror	Exterior mirrors					
	Interior mirror Class I	Main mirror (large) Class II	Main mirror (small) Class III	Wide-angle mirror Class IV	Close-proximity mirror Class V	Front mirror Class VI	Front mirror of cab-over-type vehicle class VI-A
M1	Compulsory Unless the vehicle is fitted with anything other than safety glazing material in the field of vision prescribed in paragraph 23.7.1	Optional	Compulsory 1 on the driver's side and 1 on the passenger's side Class II mirrors may be fitted as an alternative.	Optional 1 on the driver's side and / or 1 on the passenger's side	Optional 1 on the driver's side and 1 on the passenger's side (both must be fitted at least 2 m above the ground)	Optional (must be fitted at least 2 m above the ground)	Optional 1 front mirror; except the vehicle having front mirror of class VI.
M2	Optional	Compulsory 1 on the driver's side and 1 on the passenger's side	Not permitted	Optional 1 on the driver's side and / or 1 on the passenger's side	Optional 1 on the driver's side and 1 on the passenger's side (both must be fitted at least 2 m above the ground)	Optional (must be fitted at least 2 m above the ground)	Compulsory 1 front mirror; except the vehicle having front mirror of class VI.
M3	Optional	Compulsory	Not permitted	Optional	Optional	Optional	Compulsory

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		1 on the driver's side and 1 on the passenger's side		1 on the driver's side and / or 1 on the passenger's side	1 on the driver's side and 1 on the passenger's side (both must be fitted at least 2 m above the ground)	(must be fitted at least 2 m above the ground)	1 front mirror; except the vehicle having front mirror of class VI.
N1	Compulsory Unless the vehicle is fitted with anything other than safety glazing material in the field of vision prescribed in paragraph 23.7.1	Optional	Compulsory 1 on the driver's side and 1 on the passenger's side Class II mirrors may be fitted as an alternative.	Optional 1 on the driver's side and / or 1 on the passenger's side	Optional 1 on the driver's side and 1 on the passenger's side (both must be fitted at least 2 m above the ground)	Optional (must be fitted at least 2 m above the ground)	Optional 1 front mirror; except the vehicle having front mirror of class VI.
N2 ≤ 7.5t	Optional	Compulsory 1 on the driver's side and 1 on the passenger's side	Not permitted	Compulsory: For both sides if a Class V mirror can be fitted Optional: For both sides together if not	Compulsory: (See the note) 1 on the passenger's side Optional: 1 on the driver's side (both must be fitted at least 2 m above the ground). A tolerance of +10 cm may be applied.	Optional 1 front mirror (must be fitted at least 2 m above the ground).	Compulsory 1 front mirror; except the vehicle having front mirror of class VI.
N2 > 7.5t	Optional	Compulsory 1 on the driver's side and 1 on the passenger's side	Not permitted	Compulsory 1 on the driver's side and 1 on the passenger's side	Compulsory, (See the note) 1 on the passenger's side Optional 1 on Driver's side (both must be fitted at least 2 m above the ground)	Compulsory, 1. front mirror (must be fitted at least 2 m above the ground)	Compulsory 1 front mirror; except the vehicle having front mirror of class VI.
N3	Optional	Compulsory 1 on the driver's side and 1 on the passenger's side	Not permitted	Compulsory 1 on the driver's side and 1 on the passenger's side	Compulsory, (See the note) 1 on the passenger's side Optional 1 on driver's side (both must be fitted	Compulsory, 1. front mirror (must be fitted at least 2 m above the ground)	Compulsory 1 front mirror; except the vehicle having front mirror of class VI.

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					at least 2 m above the ground)		
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- Note: 1. Class V and Class VI mirrors shall be mounted on vehicles in such a way that, regardless of their position after adjustment, no part of these mirrors or their holders is less than 2 m from the ground when the vehicle is under a load corresponding to its technically permissible maximum laden mass. These mirrors shall not, however, be mounted on vehicles the cab height of which is such as to prevent compliance with this requirement. In this case an other device for indirect vision is not requested.
2. In case the field of vision described in Figures 6a and 6b can be perceived through the combination of the field of vision from a Class IV wide-angle mirror and that of a Class VI front mirror, the installation of a Class V close proximity mirror is not compulsory.
3. Optional, no requirements for the field of vision.

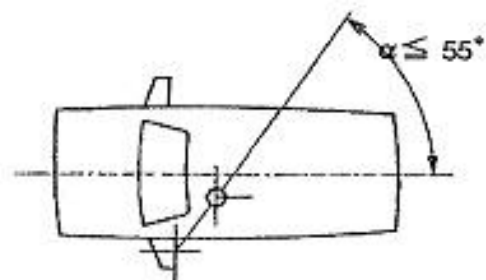
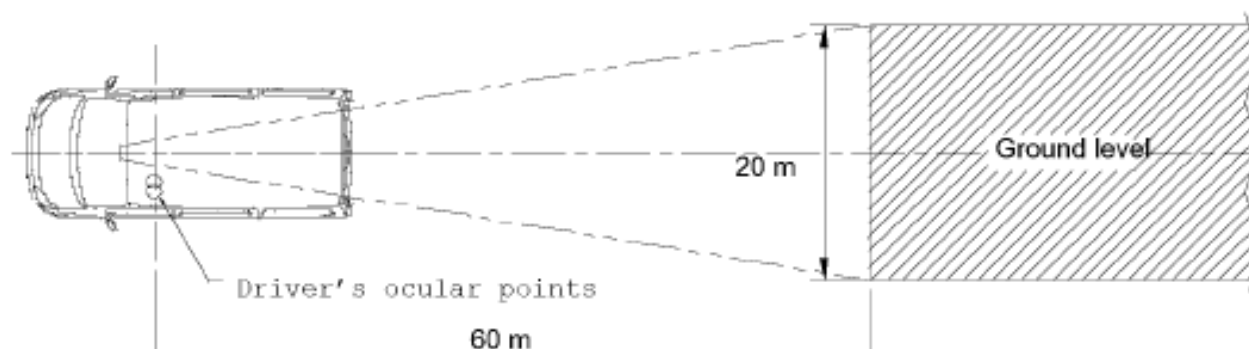


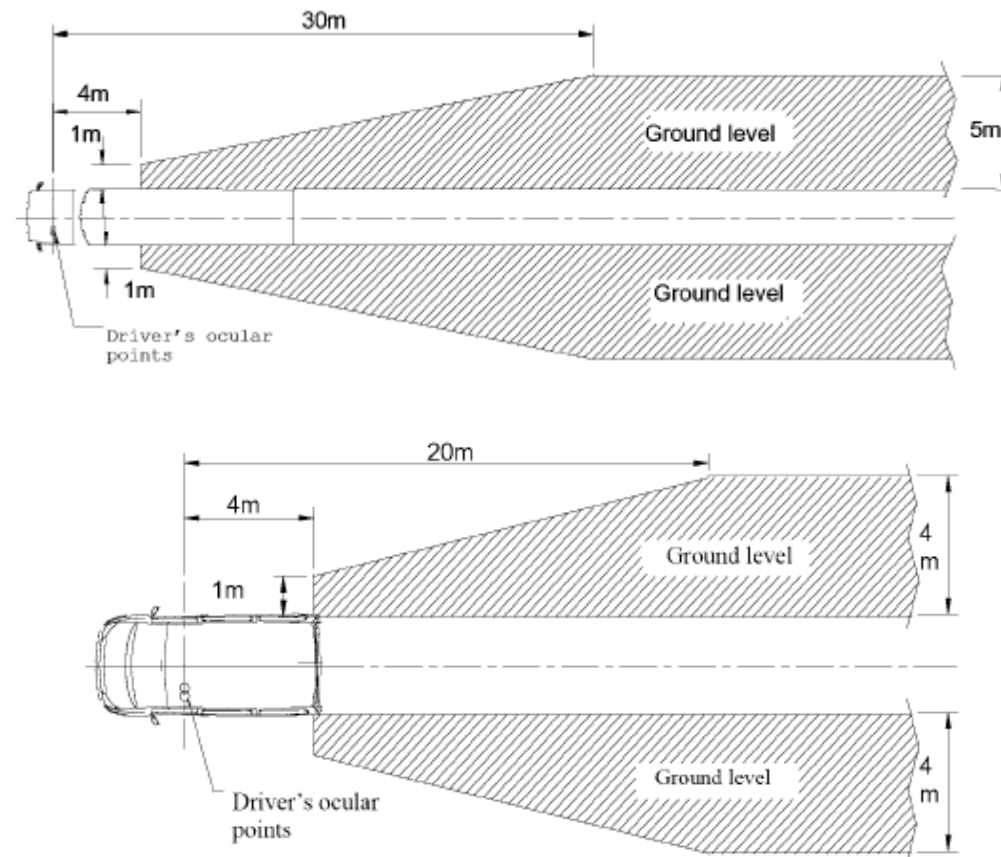
Figure 1: A vehicle
the rear-view mirror and line which joins the driver's two ocular points
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Figure 2: Field of vision of ClassImirror



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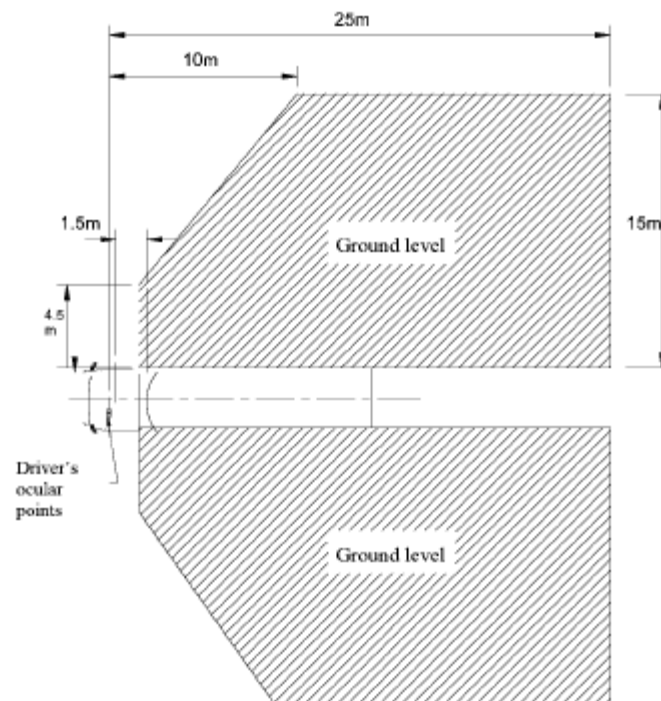


Figure 5:

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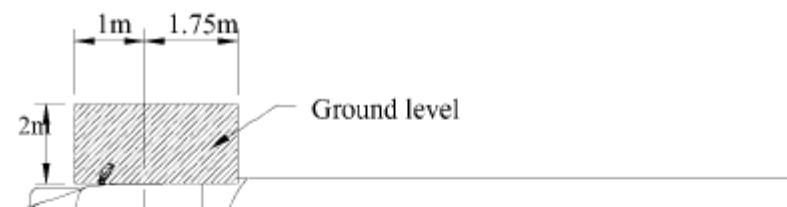
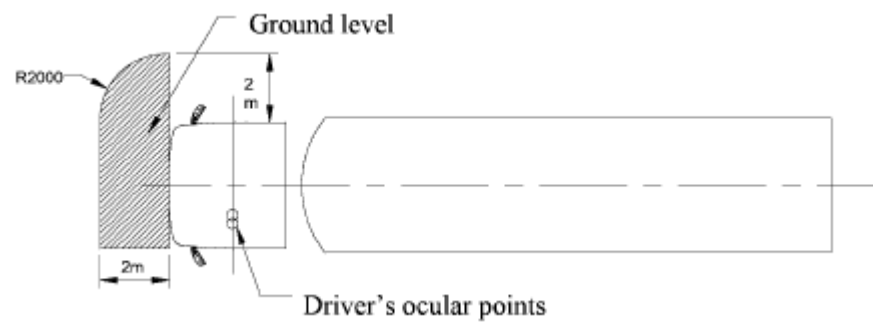


Figure 5: Field of vision of IV wide-angle mirrors

Figure 6A and 6B: Field of vision of Class V closed-proximity mirror



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