

## CHAPTER 28

## LAMPS, LIGHT SIGNALS, REFLECTORS

## SECTION 28-1

REQUIREMENTS FOR LIGHTING EQUIPMENT ON VEHICLES  
AND VEHICLE TRAILERS

## 1. Coming into Effect

The regulations in this Section come into effect as mentioned in the table below.

Table 1

Directive (Base Directive)	Last amended by	Coming into effect when type approving a new type of vehicle	Coming into effect new registrations
76/756/EEC	91/663/EEC	01.10.1998	01.10.1999
76/756/EEC	97/28/EC	01.10.1998	01.10.2000
76/757/EEC	97/29/EC	01.10.1998	01.10.1999
76/758/EEC	97/30/EC	01.10.1998	01.10.1999
76/759/EEC	89/277/EEC	01.10.1998	01.10.1999
76/759/EEC	1999/15/EC	01.04.2001	
76/760/EEC	97/31/EC	01.10.1998	01.10.1999
76/761/EEC	89/517/EEC	01.10.1998	01.10.1999
76/761/EEC	1999/17/EC	01.04.2001	
76/762/EEC	87/354/EEC	01.10.1998	01.10.1999
76/762/EEC	1999/18/EC	01.04.2001	
77/538/EEC	1999/14/EC	01.04.2001	
77/539/EEC	97/32/EC	01.10.1998	01.10.1999
77/540/EEC	1999/16/EC	01.04.2001	

Irrespective of new lamp Directives coming into effect, it is permitted to sell and to take into use spare part lamps approved according to the respective lamp Directives which applied at the time the vehicle was registered for the first time.

2. All lamps, light signals and reflectors on vehicles and trailers towed by vehicles, except as given in Numbers 3 and 4, must be approved and fitted in such a way that they meet the requirements of the Directives given in the table.

Table 2

Lamp for:	Marking: (Code on lamp)	Directive (base Directive)	Latest amended by (applicable requirement level)
Lighting installation		76/756/EEC	91/663/EEC and 97/28/EC
Main beam	R	76/761/EEC	89/517/EEC and 1999/17/EC
Dipped beam	C	76/761/EEC	89/517/EEC and 1999/17/EC
Fog lamps, front	B	76/762/EEC	87/354/EEC and 1999/18/EC
Reversing lamps	AR	77/539/EEC	97/32/EC
Direction indicators	1, 2 or 5	76/759/EEC	89/277/EEC and 1999/15/EC
Hazard flashers	1, 2 or 5	76/759/EEC	89/277/EEC and 1999/15/EC
Stop lamps	S1 or S2	76/758/EEC	97/30/EC
Stop lamps, centre mounted	S3	76/758/EEC	97/30/EC
Registration plate lamp, rear		76/760/EEC	97/31/EC
End-outline marker lamp-front, position (side) lamps	A	76/758/EEC	97/30/EC
End-outline marker lamp-rear, position (side) lamps	R	76/758/EEC	97/30/EC
Fog lamps, rear	F	77/538/EEC	89/518/EEC and 1999/14/EC
Parking lamps (for built up areas)		77/540/EEC	1999/16/EC
High mounted marker lamps	A	76/758/EEC	97/30/EC
Side marker lamps	SM	76/758/EEC	97/30/EC
Reflectors	I	76/757/EEC	97/29/EC
Driving lamps	RL	76/758/EEC	97/30/EC

The table shows the type approval requirements for the various types of lamps and reflectors. Regarding the number of lamps and on which group of vehicles they must or may be used, reference is made to the Light Installation Directive (Council Directive 76/756/EEC, with latest amendment by Commission Directive 97/28/EC).

## 3. Alternative Standard to the Directives in the Table 2

Table 3

Lamp for:	Marking (code on lamp)	ECE regulation	Series:	Supplement:	Correction:
Lighting installation		48	01	1 and 2	1-4 incl. to 0.1
Main beam	R	1	01	1-6 incl.	1 to 0.1, 1 to supplement 3 and 1 to revision 4.
		5	02	1-3 incl.	1 to revision 3
		8	04	1-7 incl.	1 to supplement 4 and 1 to revision 3
		20	02	1-5 incl.	1 to supplement 3 and 1 to revision 2
		31	02	1-3 incl.	1 to revision 1
		37	03	1-14 incl.	1 to supplement 9
		98	00		
		99	00		
Dipped Beam	C	1	01	1-6 incl.	1 to 01, 1 to supplement 3 and 1 to revision 4
		5	02	1-3 incl.	1 to revision 3
		8	04	1-7 incl.	1 to supplement 4 and 1 to revision 3
		20	02	1-5 incl.	1 to supplement 3 and 1 to revision 2
		31	02	1-3 incl.	1 to revision 1
		37	03	1-14 incl.	1 to supplement 9
		98	00		
		99	00		
Fog lamps, front	B	19	02	1-6 incl.	1 to revision 3
Reversing lamps	AR	23	00	1-5 incl.	1 to supplement 4
Direction indicators	1, 2 or 5	6	01	1-7 incl.	1 and 2 to 01

Table 3 (Continued)

Lamp for:	Marking (code on lamp)	ECE regulation	Series:	Supplement:	Correction:
Hazard flashers	1, 2 or 5	6	01	1-7 incl.	1 and 2 to 01
Stop lamps	S1 or S2	7	02	1-4 incl.	1 to supplement 2
Stop lamps, centre mounted	S3	7	02	1-4 incl.	1 to supplement 2
Registration plate lamp rear		4	00	1-6 incl.	
Marker lamps, front (position lamps)	A	7	02	1-4 incl.	1 to supplement 2
Marker lamps, rear (position lamps)	R	7	02	1-4 incl.	1 to supplement 2
Fog lamps, rear	F	38	00	1-5 incl.	1 to supplement 3
Parking lamps (for built up areas)		77	00	1-4 incl.	1 to 00
High mounted marker lamps	A	7	02	1, 2, 3, and 4	1 to supplement 2
Side marker lamps	SM	91	00	1 and 2	
Reflectors	I	3	02	1, 2 and 3	
Driving lamps	RL	87	00	1	1 to 00

4. In addition to the requirements in the Directives and alternative standards (the deviations do not apply in connection with EEC type-approval), the following lamps and reflectors are permitted:
- 4.1. The Regulations in Section 28-4 No. 11 apply to front driving lamps.
  - 4.2. The Regulations in Section 28-3 No. 2 apply to blue warning lamps.
  - 4.3. The Regulations in Section 28-3 No. 3 apply to yellow warning lamps.
  - 4.4. The Regulations in Section 28-4 No. 12 apply to taxi roof lamps.
  - 4.5. The Regulations in Section 28-5 No. 7 apply to illuminated advertising signs.
  - 4.6. The Regulations in Section 28-5 No. 8 apply to work lamps.
  - 4.7. The Regulations in Section 28-5 No. 11 apply to instrument lamps.

4.8. The Regulations in Section 28-5 No. 15 and Section 28-20 No. 1 apply to reflecting plate at the rear, indicating the size of the vehicle/vehicle train.

4.9. The Regulations in Section 28-1 Nos. 2 and 3, apply to main beams, with the following additions:

Number of: Up to 4 additional, i.e. 6 in total for N<sub>3</sub> vehicles.

Requirements regarding brightness: maximum brightness for all lamps for main beam which may be on simultaneously (permitted with a switch), must not exceed 480 lux.

Other requirements: as laid down in Directive/Standards as given in Section 28-1, Nos. 2 and 3.

#### 4.10. High Mounted Marker Lamps

1. At the front of a vehicle having a width of 1.80 m or more, up to 2 additional high mounted marker lamps (i.e. 4 in all) are permitted in addition to the requirements in Section 28-1, Nos. 2 and 3. These must be distributed with up to two on the cab and/or two on any built-up body. The lamps must be positioned as stated in the Directives/Standards mentioned in Section 28-1, Nos. 2 and 3.

2. On vehicles having a width of 2.10 m or more, 3 high mounted marker lamps are allowed, in addition to the lamps mentioned in No. 1.

Position:

In Width:

Symmetrically to the longitudinal centreline of the vehicle.

In Height:

As given in the Directives/Standards mentioned in Section 28-1, Nos. 2 and 3.

In Length:

At the front, on the upper limit of the cab. The horizontal plane which is tangent to the upper edge of the light emitting surface of the lamp must not be lower than the horizontal plane tangent to the upper edge of the transparent zone of the windscreen.

4.11. The Regulations in the Directives/Standards mentioned in Section 28-1, Nos. 2 and 3 apply to side marker lamps. But vehicles with a width of 1.80 m or more may in addition have 2 lamps on each side of the vehicle. These lamps must be of the type combined high mounted marker lamps, emitting a white light to the front, and a red light to the rear. Requirements regarding position height: as for side marker lamps; length no more than 1 000 mm from the front most and rearmost edge/limitation respectively of the cargo carrier (or goods/passenger compartment). The distance in respect of the lamps fitted on the front limitation, may possibly be increased so that the lamps can be seen from the driving seat through the external rear-view mirrors of the vehicle. The distance to other lamps must be at least 200 mm. The distance from the vehicles outer side-plane and out to the light emitting surface of the lamp may in addition be max. 50 mm if it is mounted on a rubber arm or similar, flexing when subjected to a force of 2 kp, applied in the centre of the lamp, and so that the direction of the force follows the horizontal plane in the vehicles longitudinal direction.

Trailers may have lamps as mentioned above, on both sides, front and rear. The mounting requirements are the same as for vehicles.

- 4.12.** The Regulations in Section 28-1, Nos. 2 and 3, apply to marker lamps (rear lamps) on vehicles and trailers, with the following additions:

Number of: Up to 10 extra (i.e. 12 in total), distributed with up to 6 down and 6 up.

Position:

In Width:

As laid down in the Directives/Standards mentioned in Section 28-1, Nos. 2 and 3.

For lamps fitted low down the height above the ground must be: Not less than 350 mm, and not more than 1 500 mm, or not more than 2 100 mm if the shape of the body makes it impossible to keep within the limit of 1 500 mm (as given in the Directive). For lamps fitted higher up, the distance from the uppermost edge of the lamp's light emitting surface must not be more than 400 mm from the horizontal plane tangent to the upper, rearmost edge.

In Length:

As laid down in the Directives/Standards mentioned in Section 28-1, Nos. 2 and 3.

Alternative Standards:

Lamps approved and marked according to the SAE or DOT Standard shall be accepted, provided that the colour is more or less in accordance with the Directives/Standards mentioned in Section 28-2, Nos. 2 and 3.

- 4.13.** The Regulations in Section 28-1, Nos. 2 and 3, apply to rear fog lamps, with the following addition: Vehicles and trailers may have rear fog lamps.

- 4.14.** The Regulations in Section 28-1, Nos. 2 and 3, apply to direction indicators on the rear of vehicles and trailers, with the following additions:

Number of: 2 additional ones on top.

Position:

In Width:

As given in the Directives/Standards mentioned in Section 28-1, Nos. 2 and 3.

In Height:

The distance from the upper edge of the lamp's light emitting surface must not be more than 40 cm from the horizontal plane tangent to the upper, rearmost edge.

Alternative Standards:

Lamps approved and marked according to the SAE or DOT Standard shall be accepted, provided that the colour is more or less in accordance with the Directives/Standards mentioned in Section 28-2, Nos. 2 and 3.

- 4.15.** The Regulations in Section 28-1, Nos. 2 and 3, apply to stop lamps on vehicles and trailers, with the following additions:

Number of: 2 additional ones on top.

Position:

In Width:

As given in the Directives/Standards mentioned in Section 28-1, Nos. 2 and 3.

In Height:

The distance from the upper edge of the lamp's light emitting surface must not be more than 40 cm from the horizontal plane tangent to the upper, rearmost edge

Alternative Standards:

Lamps approved and marked according to the SAE or DOT Standard shall be accepted, provided that the colour is more or less in accordance with the Directives/Standards mentioned in Section 28-1, Nos. 2 and 3.

## SECTION 28-2

### REQUIREMENTS FOR LIGHTING EQUIPMENT ON TWO OR THREE-WHEEL VEHICLES

1. Coming into effect

The regulations in this Section come into effect as mentioned in the table below.

Directive (Base Directive)	Last amended by	Coming into effect when type approving a new type of vehicle	Coming into effect new registrations
93/92/EEC	Not Amended	01.10.1999	17.06.2003
93/92/EEC	2000/73/EC	01.07.2002	—
97/24/EC Chapter 2	Not Amended	01.10.1999	17.06.2003

2. Scope:

All vehicles as defined in Article 1 of Directive 92/61/EEC, from November 9, 2003 replaced by Directive 2002/24/EC.

## 3. Requirement level:

Council Directive 93/92/EEC (on the installation of lighting and light-signalling devices on two- or three-wheeled motor vehicles) from July 1, 2002 as amended by Directive 2000/73/EC, and Directive 97/24/EC, Chapter 2 (lighting and light-signalling devices of two- or three-wheeled motor vehicles).

All lighting, light signalling and reflectors on two- or three-wheeled motor vehicles, except as stated in Nos. 4 and 5, must be approved and fitted in such a way that they satisfy the requirements of the Directives given in the table. No vehicle may have any other lamps or reflectors than those which are obligatory or permitted according to this Section.

Lamp for:	Marking (Code on lamp in addition to e-marking)	Directive: (current requirement level)
Lighting installation		93/92/EEC
Main beam	(no requirements on moped) R, HR, MB or MBH	97/24/EC, Chapter 2
Dipped beam	R, HR, MB or MBH No code for moped	97/24/EC, Chapter 2
Front fog lamp	B	97/24/EC, Chapter 2
Direction Indicators	11 front and 12 rear	97/24/EC, Chapter 2
Hazard flashers	11 front and 12 rear	97/24/EC, Chapter 2
Stop lamp	S1 or S2	97/24/EC, Chapter 2
Rear registration plate lamp	No code	97/24/EC, Chapter 2
Marker lamp-front position (side) lamp	A	97/24/EC, Chapter 2
Marker lamp-rear position (side) lamp	R	97/24/EC, Chapter 2
Rear fog lamp	F	97/24/EC, Chapter 2
Reflectors (front, rear, side and pedals)	I	97/24/EC, Chapter 2
Bulbs	No code	97/24/EC, Chapter 2

The table shows the type approval requirements for the different types of lamps and reflectors. Regarding the number of lamps and the type of vehicles on which they are to be used, see the Installation of lighting Directive (Directive 93/92/EEC as amended by Directive 2000/73/EC).



## 4. Alternative standard:

Lamp for:	Marking (Code on lamp in addition to e-marking)	ECE Regulation Number:: (current requirement level)
Lighting installation		53.00
Main beam	(no requirements for moped) R or HR No code MB MBH HS2	1.00, 8.00 or 20.02 56.00 (for moped) 57.00 72.00 82
Dipped beam	C or CR No code MB MBH HS2	1.00, 8.00 or 20.02 56.00 (for moped) 57.00 72.00 82.00
Front fog lamp	B	19.02
Direction Indicators	50R in addition to 11 front, 12 rear and 31 combined. 1 front and 2 rear	50.00 6.01
Hazard flashers	50R in addition to 11 front, 12 rear and 31 combined. 1 front and 2 rear	5.00 6.01
Stop lamp	50R S	50.00 7.01
Rear registration plate lamp	50R No code	50.00 4.00
Marker lamp-front position (side) lamp	50R A	50.00 7.01
Marker lamp-rear position (side) lamp	50R R	50.00 7.01
Rear fog lamp	F	38.00
Reflectors (front, rear, side and pedals	I	3.02
Bulbs		37.03

## 5. Other lights permitted.

Dipped beam/main beam may be connected so that they come on automatically when the engine is running. The lights may also be switched on by the vehicle beginning to move.

The regulations in Sections 28-6, No. 9, and 28-7, No. 8, apply to blue, flashing lamps.

The regulations in Section 28-3, No. 3, apply to yellow, flashing lamps.

The regulations in Section 28-9 apply to advertising lamps.

The regulations in Section 28-9 apply to instrument lighting etc.

Bulbs for rear lamps, stop lamps, and direction indicators, approved and marked according to the SAE or DOT Standard, shall be accepted if the colour is more or less in accordance with the Directives/Standards mentioned in Section 28-2, Nos. 3 or 4.

## 6. Approval:

Confirmation from the manufacturer or from a competent, independent laboratory that the motor vehicle meets the above requirements, must be presented in connection with the approval. This does not apply where the motor vehicle displays a valid Certificate of Conformity and/or is marked with a type approval number according to Directive 92/61/EEC, from November 9, 2003 replaced by Directive 2002/24/EC. The motor vehicle, parts or technical units may, as an alternative, be approved and marked in accordance with the above requirements.

**SECTION 28-3****GENERAL CONCERNING LIGHTING EQUIPMENT (THE REGULATIONS IN THIS SECTION DO NOT APPLY TO VEHICLES COVERED BY SECTIONS 28-1 AND 28-2)**

1. No vehicle must have any other lamps/lights or reflectors than those which are obligatory or permitted according to Chapter 28.

Vehicles or a trailer towed by a vehicle which meets requirements in Council Directive 76/756/EEC, as amended by Commission Directive 80/233/EEC, Commission Directive 82/244/EEC, Council Directive 83/276/EEC, Commission Directive 84/8/EEC, Commission Directive 89/278/EEC and Commission Directive 91/663/EEC, or the requirements in the ECE Regulation No. 48, Supplement 2, are regarded as meeting the regulations in this Chapter with regard to installation (including number of) lamps/lights, light signals and reflex reflectors.

Agricultural or forestry tractors meeting the requirements in Council Directive 78/933/EEC, possibly as amended by Council Directive 82/890/EEC or Directive 97/54/EC of the European Parliament and of the Council or Commission Directive 1999/56/EC, are regarded as meeting the regulations in this Chapter with regard to installation (including number of) lamps/lights, light signals and reflex reflectors. Stop lamps are, however, required on agricultural or forestry tractors type approved after January 1, 2001 and/or which are being registered after January 1, 2002. Lamps on agricultural or forestry tractors satisfying 79/532/EEC, as amended by Council Directive 82/890/EEC or 97/54/EC of the European Parliament and of the Council shall be regarded as satisfying the requirements to lamps in this Chapter.

Two and three-wheel motor vehicles which meet the requirements in Council Directive 93/92/EEC are regarded as meeting the regulations in this Chapter with regard to the installation of lamps/lights, light signals and reflex reflectors (including number of).

2. Any motor vehicle used as an emergency vehicle must have at least one warning lamp emitting a flashing blue light all round. For two and three-wheel motor vehicles it is sufficient that this light is emitted in a forward direction.
  - 2.1 The lamps must meet at least one of the following requirements:
    - a) they must be E-marked with the symbol A or B according to ECE Regulation No. 65.
    - b) they must be approved and marked according to SAE J595, SAE J845 or SAE J1318.
    - c) they must be approved and marked according to some other standard with equivalent requirements to a).
  - 2.2 The light must be visible to all sides and within a vertical angle from at least 5° above to at least 5° below the horizontal plane through the centre of the lamp.
  - 2.3 The lamp(s) must be fitted so that they are clearly visible and so that the light inconveniences the driver as little as possible. They must be so fitted that the centre line of the light beam forms a horizontal plane when rotating.
  - 2.4 The warning lamp must be connected to a tell-tale lamp clearly visible from the driver's seat, showing when the warning lamp is on. This does not apply to warning lamps with a magnetic fixing where the socket for the cigarette lighter is used as the power source.
  - 2.5 Separate regulations, see Section 28-5 Number 12, Section 28-6 Number 9, Section 28-7 Number 8, Section 28-9 Number 8, Section 28-10 Number 8, and Section 28-15 Number 1 apply to lamps emitting a light in a forward direction only, and not Numbers 2.2-2.4.
3. A motor vehicle which, during road works, is used contrary to the traffic regulations (see Section II of the Road Traffic Act), or which is used in such a way that it may constitute a special danger to other traffic, must have at least one warning lamp emitting a flashing, yellow light to all sides.

A motor vehicle used to accompany and to warn special transports which may constitute a special risk to other traffic, must also have at least one such lamp.

  - 3.1 The lamps must meet at least one of the following requirements:
    - a) they must be E-marked with the symbol A or B according to ECE Regulation No. 65.
    - b) they must be approved and marked according to some other standard with equivalent requirements to a).
  - 3.2 The light must be visible to all sides and within a vertical angle from at least 5° above to at least 5° below the horizontal plane through the centre of the lamp.
  - 3.3 The lamp(s) must be fitted so that they are clearly visible and so that the light inconveniences the driver as little as possible. They must be so fitted that the centre line of the light beam forms a horizontal plane when rotating.

- 3.4 The warning lamp must be connected to a tell-tale lamp clearly visible from the driver's seat, showing when the warning lamp is on.
4. Lamps or reflex reflectors (except on motorcycles with side cars) which have the same function and of which there are two or more, must be fitted in an equal number and in pairs be situated at the same height, one on either side of the vehicle and at the same distance from the outer edges of the vehicle. The light or reflection from these must have the same colour and approximately the same intensity. Lamps having the same function must be so connected that they can only be lit simultaneously.
5. The total light strength for main beam which may be on simultaneously, must be less than 225 000 candelas (equivalent to 360 lux at a distance of 25 m from the lamp).
6. Luminosity and light intensity as given in these regulations shall regarding lamps with halogen bulbs be measured at the voltage given in the column for test voltage in Table 1, and with the lamps correctly adjusted. Other lamps must be measured at a voltage equal to the rated voltage (except when adjusting/setting the lamps) and when the lamps have been correctly adjusted.
7. Lamps with different functions can be incorporated together (combined) provided each individual lamp meet the stipulated requirements.

Reflex reflectors can be incorporated into lamps (combined with lamps) provided the requirements which apply to the lamps and the reflex reflectors are met.

8. A combination of two or more lamps, whether identical or not, having the same function and colour, shall be regarded as being one single lamp if the projection of their light-emitting surfaces on the vertical plane perpendicular to the longitudinal axis of the vehicle amounts to 50% or more of the smallest rectangle which can be surrounded by the projections of the said light-emitting surfaces.

One single light-emitting surface in the shape of a strip is to be regarded as two or an equal number of lamps if it is symmetrical to the longitudinal axis of the vehicle and it extends so far out towards each side of the vehicle that the outer edge of the light emitting surface is less than 40 cm from the outer edge of the vehicle and the strip has a length of at least 80 cm. The illumination of such a surface must be by means of at least 2 sources of light positioned as close as possible to the outer edges. The light emitting surface may consist of several elements provided the conditions mentioned in the first paragraph have been met.

Regulations in this paragraph do not apply however to dipped-beam, curve/fog lamps, auxiliary main-beam lamps and reversing lamps.

9. Lamp lenses and reflectors must have a surface which can easily be kept clean and the surfaces must be colourfast.
10. Lamps and reflectors must be strong and as dust and water tight as possible. They must be so made and so well fixed to the vehicle that their position cannot unintentionally be changed because of vibration or similar. Lamps emitting a dipped-beam, curve/fog lamps or reversing lamps must be so made that they can be accurately adjusted in a reliable manner. All lamps and reflectors on vehicles must be in a good condition.
11. On vehicles where it is not practically possible to fit the lamps in such a way that these regulations are met, a special "light beam" may be used (i.e. a beam onto which the lamps are fitted and which can be fitted and removed from the vehicle.)

12. The respective colours of the light must be so that these lie within an area of the colour diagram limited by lines through the points with colour co-ordinates as given in Table 2.

Except for a yellow dipped beam/main beam, no coloured bulbs in order to give the light the correct colour is permitted. However, this does not apply to bulbs which are marked to ECE Regulation No. 37 or some other standard with equivalent requirements, for example e-marked.

13. Bulbs for lamps must be approved and marked according to ECE Regulation No. 37 or some other standard with equivalent requirements, for example e-marked.

Table 1

Rated voltage	Watt consumption	Test voltage	Type of bulb
6 volts	55 watts	6,3 volts	H <sub>1</sub> -H <sub>2</sub> -H <sub>3</sub>
12 volts	55 watts	13,2 volts	H <sub>1</sub> -H <sub>2</sub> -H <sub>3</sub>
24 volts	70 watts	28,0 volts	H <sub>1</sub> -H <sub>2</sub> -H <sub>3</sub>
12 volts	60/55 watts	13,2 volts	H <sub>4</sub>
24 volts	75/70 watts	28,0 volts	H <sub>4</sub>

Table 2

White light	x	y
Point 1:	0,310	0,348
Point 2:	0,310	0,282
Point 3:	0,442	0,382
Point 4:	0,500	0,382
Point 5:	0,500	0,440
Point 6:	0,453	0,440
Yellow light	x	y
Point 1:	0,524	0,442
Point 2:	0,540	0,452
Point 3:	0,476	0,516
Point 4:	0,466	0,500
Orange light	x	y
Point 1:	0,546	0,426
Point 2:	0,612	0,382
Point 3:	0,618	0,382
Point 4:	0,560	0,440
Red light	x	y
Point 1:	0,645	0,335
Point 2:	0,721	0,259
Point 3:	0,735	0,265
Point 4:	0,665	0,335
Blue light		
Point 1:	0,090	0,137
Point 2:	0,148	0,025
Point 3:	0,233	0,167
Point 4:	0,186	0,214

## SECTION 28-4

### LIGHTING EQUIPMENT WHICH VEHICLES MUST HAVE (THE REGULATION IN THIS SECTION DO NOT APPLY TO VEHICLES COVERED BY SECTION 28-1)

#### MAIN BEAM LAMPS

1. All vehicles must have either two or four lamps emitting a white or yellow main beam.
- 1.1 The lamps must meet at least one of the following requirements (the lamps may be marked in combination with the dipped beam):
  - a) Be E-marked with the symbols R (ECE Regulation No. 1), SR (ECE Regulation No. 5), HR (ECE Regulation No. 8), or HC/R or HR (ECE Regulation No. 20), series 01/03/02/04/02 respectively, supplement 3/-/2/4/3, correction 1/1/-/-.
  - b) Be e-marked with the symbol R according to Council Directive 76/761/EEC, as amended by Council Directive 87/354/EEC and Commission Directive 89/517/EEC,
  - c) Be approved and marked according to some other standard with equivalent requirement as in a) or b) above.
- 1.2 The lamps must be so adjusted that they illuminate the road at least 100 m ahead.
- 1.3 The lamps must be so connected that they cannot be illuminated without the front position (side) lamps, the rear position (side) lamps and the registration plate lamps being switched on at the same time. However, this requirement does not apply for the use of the main-beam flasher.
- 1.4 The main-beam must be connected to a tell-tale lamp which must be visible from the driver's seat and which is illuminated when the main-beam is switched on.
- 1.5 Lamps for main beam must be positioned on the front of the vehicle and be fitted in such a way that the light beam does not irritate the driver, neither directly nor indirectly via internal or external mirrors and/or any other reflecting surfaces the car.
- 1.6 The lamps may be on either simultaneously or in pairs. At least two lamps for main beam must come on when switching from dipped beam to main beam. When changing from main beam to dipped beam, all lamps for main beam go out simultaneously.

#### DIPPED BEAM LAMPS

2. Vehicles must have two front dipped-beam headlamps emitting white or yellow light.
- 2.1 The lamps must meet one of the following requirements (the lamps may be marked in combination with main beam):
  - a) Be E marked with the symbols C (ECE Regulation No. 1), HC (ECE Regulation No. 5), or SC (ECE Regulation No. 8), or HC/R or HR (ECE Regulation No. 20), series 01/03/02/04/02 respectively, supplement 3/-/2/4/3, correction 1/1/-/-.

- b) Be e-marked with the symbol C according to Council Directive 76/761/EEC, as amended by Council Directive 87/354/EEC or Commission Directive 89/517/EEC,
- c) Be approved and marked according to some other standard with equivalent requirement as in a) or b) above.

**2.2** The lamps must be so adjusted that they illuminate the road at least 40 m ahead.

**2.3** The lamps must be positioned so that the height from the ground to the lower edge of the light-emitting surface is at least 50 cm but the height from the ground to the upper edge of the light-emitting surface must be less than 120 cm. All measurements to be taken with the vehicle unladen.

If the vehicle is equipped with special equipment i.e. a snow plough obstructing the obligatory dipped-beam headlamps extra lamps may be fitted for dipped-beam at the necessary height.

**2.4** Lamps must be positioned on each side so that the outer edge of the light-emitting surface is less than 40 cm from the outer edge of the vehicle and so that the outer edge of the light emitting surface does not lie within the outer edge of the light emitting surface of the main-beam.

**2.5** The distance between the inner edges of the light-emitting surfaces of the lamps must be at least 60 cm.

**2.6** Lamps positioned on the vehicle so that the upper edge is more than 120 cm above the road (See Number 2.3 last paragraph), must be adjusted so that the illumination 25 m in front of the lamps is less than 0,7 lux at any point 110 cm or more above the road.

**2.7** Lamps must be connected so that they cannot be illuminated without the front position (side) lamps, rear position (side) lamps and registration plate lamps being switched on at the same time.

If separate lamps are used for main-beam and dipped-beam the dipped-beam must be connected so they are illuminated when the main-beam is switched on.

**2.8** The dip switch must be made and placed so that it can be easily and safely operated.

#### **FRONT POSITION (SIDE) LAMPS**

**3.** Vehicle must have two front position (side) lamps emitting white light.

**3.1** The lamps must meet at least one of the following requirements:

- a) Be E-marked with a symbol A according to ECE Regulation No. 7, 01 Series, Supplement 4, Correction 2.
- b) Be e-marked with a symbol A according to Council Directive 76/758/EEC, as amended by Council Directive 87/354/EEC and Commission Directive 89/516/EEC.
- c) Be approved and marked according to some other standard with equivalent requirements as a) or b) above.



- 3.2 The light from each of the lamps must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the lamps, and within a horizontal angle at least 45° inwards and at least 80° outwards measured from the vertical plane through the centre of the lamps which is parallel with the longitudinal axis of the vehicle.
- 3.3 Lamps must be positioned so that the height from the ground to the lower edge of the light-emitting surface is 40 cm or more, but the height from the ground to the upper edge of the light-emitting surface must be less than 150 cm. All measurements to be taken with the vehicle unladen.
- 3.4 Lamps must be positioned on each side so that the outer edge of the light-emitting surface is less than 40 cm from the outer edge of the vehicle.
- 3.5 Lamps must be connected so that they are always illuminated when the main-beam, dipped-beam rear position (side) lamps, registration plate lamps auxiliary main-beam, curve fog lamps. marker lamps, working lamps or rear fog lamps are switched on.

#### **FRONT END-OUTLINE MARKER LAMPS**

4. All vehicles must have at least two lamps at the front emitting a white marking light to the front if the vehicle has a width of 230 cm or more.
- 4.1 The lamps must meet at least one of the following requirements:
- a) Be E-marked with a symbol A according to ECE Regulation No. 7, 01 Series, Supplement 4, Correction 2.
  - b) Be e-marked with a symbol A according to Council Directive 76/758/EEC, as amended by Council Directive 87/354/EEC and Commission Directive 89/516/EEC.
  - c) Be approved and marked according to some other standard with equivalent requirements as a) or b) above.
- 4.2 Lamps must be positioned in the upper corners of the cab or body so that the outer edge of the light-emitting surface is less than 40 cm from the outer edge of the vehicle.
- 4.3 Lamps must be so connected that they are always illuminated when the main-beam, dipped-beam headlamps, front position (side) lamps, rear position (side) lamps, registration plate lamps, auxiliary main-beam, curve/fog lamps, permitted marker lamps, working lamps or rear fog lamps are switched on.

#### **DIRECTION INDICATOR LAMPS**

5. Vehicles must have at least two direction indicator lamps at the front and at least two at the rear and at least one on either side emitting orange flashing light.
- 5.1 The lamps must meet at least one of the following requirements (see Figure 1 - the arrows in the mark of approval point in the direction given for the relevant category of lamp):
- a) Be E-marked with symbols given by means of combinations shown on Figure 1 according to the ECE Regulation No. 6, 01 Series, Supplement 5, Correction 2.

- b) Be e-marked with symbols given by means of combinations shown in Figure 1 according to Council Directive 76/759/EEC, as amended by Council Directive 87/354/EEC, and Commission Directive 89/277/EEC.
- c) Be approved and marked according to some other standard with equivalent requirements as mentioned in a) or b) above.

**5.2** Indicator lamps at the front and on the side may be combined in one lamp if the light is visible within the angles given in Number 5.3.

**5.3** Light from each of the lamps at the front and at the rear must be visible within a vertical angle at least 15° above at least 15° below the horizontal plane through the centre of the lamp and within a horizontal angle from at least 45° inwards to at least 80° outwards from the vertical plane through the centre of the lamp which is parallel to the longitudinal axis of the vehicle.

Light from each of the lamps on the side must be visible within a vertical angle at least 15° above and at least 5° below the horizontal plane through the centre of the lamps when the lamps are so placed that the height from the ground to the lower edge of the light emitting surface is less than 100 cm, and from at least 15° above to at least 15° below this plane when the height is 100 cm or more.

Light must furthermore be visible to the rear and out from the vehicle within a horizontal angle from not less than 5° to at least 60°, measured from a vertical plane through the centre of the lamps which is parallel to the longitudinal axis of the vehicle.

**5.4** The lamps must be so positioned that the height from the ground to the lower edge of the light-emitting surface is 35 cm or more for front and rear lamps and 50 cm or more for side lamps. The height from the ground to the upper edge of the light-emitting surface, must be less than 150 cm. When it is necessary, because of the construction of the motor vehicle, however, the height from the ground to the upper edge of the light-emitting surface can be increased to a maximum of 190 cm. Measurements to be taken when the vehicle is unladen.

The distance from the forward limit of the motor vehicles to the nearest part of the light-emitting surface of the side direction indicator lamps must be less than  $\frac{1}{4}$  of the total length of the vehicle.

**5.5** Front and rear lamps must be so positioned on either side that the outer edge of the light-emitting surface is less than 40 cm from the outer edge of the vehicle.

**5.6** Direction indicator lamps must be connected to a tell-tale lamp and/or sound signal which must be visible and/or audible from the driver's seat, and come into operation simultaneously with the direction indicator lamps and show if these are functioning correctly.

**5.7** The flash frequency for direction indicator lamps must be  $90 \pm 30$  flashes per minute.

**5.8** The operating device for the direction indicator lamps must be such that the lamps on the right-hand side operate when it is moved clockwise or towards the right, and the lamps on the left-hand side operate when it is moved anti-clockwise or towards the left.

#### HAZARD WARNING LAMPS

- 6. Vehicles must have at least two hazard warning lamps at the front and at the rear and also permitted at least one on each side emitting orange flashing light.
- 6.1 The lamps must meet requirements given in Numbers 5.1 - 5.5 and Number 5.8.
- 6.2 When the hazard warning lamps are working, they must either all be flashing simultaneously, or the lamps in front must flash alternately with the lamps at the rear.
- 6.3 If the hazard warning lamps can be illuminated whilst the motor vehicle is in motion these must be connected to a tell-tale lamp and/or audible signal which can be seen, heard from the driver's seat, and which must operate simultaneously with the emergency lamps.

#### REAR POSITION (SIDE) LAMPS

- 7. Vehicles must have at least two rear position (side) lamps emitting red light
- 7.1 The lamps must meet at least one of the following requirements:
  - a) Be E-marked with the symbol RD according to the ECE Regulation No. 7, 01 Series, Supplement 4, Correction 2.
  - b) Be e-marked with the symbol R according to Council Directive 76/758/EEC, as amended by Council Directive 87/354/EEC and Commission Directive 89/516/EEC.
  - c) Be approved and marked according to some other standard with equivalent requirements as a) or b) above.
- 7.2 The light from each of the lamps must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the lamp, and within a horizontal angle from at least 45° inwards to at least 80° outwards from the vertical plane through the centre of the lamp which is parallel with the longitudinal axis of the vehicle.
- 7.3 Lamps must be so positioned that the height from the ground to the lower edge of the light-emitting surface is at least 35 cm, but the height from the ground to the upper edge of the light-emitting surface is at most 150 cm. If the construction of the vehicle make it necessary, however, the height from the ground to the upper edge of the light-emitting surface may be increased to a maximum of 190 cm. Measurements to be taken with the vehicle unladen.
- 7.4 At least one lamp must be positioned on each side so that the outer edge of the light-emitting surface is less than 40 cm from the outer edge of the vehicle.
- 7.5 The distance from the rearmost point of the motor vehicle to the nearest part of the lamp lens must be less than 100 cm.
- 7.6 The lamps must be so connected that they are always illuminated when main-beam (except the main-beam flasher) dipped-beam, front position (side) lamps, registration plate lamps, auxiliary main-beam, curve/fog lamps, marker lamps, working lamp or rear fog lamps are switched on.

### STOP LAMPS

8. Vehicles must have at least two rear stop lamps emitting red light which are illuminated immediately the service brake is applied.
- 8.1 The lamps must meet at least one of the following requirements:
- a) Be E-marked with the symbol S1/S2 according to ECE Regulation No. 7, 01 Series, Supplement 4, Correction 2.
  - b) Be e-marked with the symbol S according to Council Directive 76/758/EEC, as amended by Council Directive 87/354/EEC, and Commission Directive 89/516/EEC.
  - c) Be approved and marked according to some other standard with equivalent requirements as a) or b) above.
- 8.2 The light from each of the lamps must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the lamp, and within a horizontal angle at least 45° inwards and at least 45° outwards measured from the vertical plane through the centre of the lamp which is parallel with the longitudinal axis of the vehicle.
- 8.3 The lamps must be so positioned that the height from the ground to the lower edge of the light-emitting surface is at least 35 cm but the height from the ground to the upper edge of the light-emitting surface is at most 150 cm. When the design of the motor vehicle requires it, however, the height from the ground to the upper edge of the light-emitting surface may be increased to a maximum of 190 cm. Measurements to be taken with the vehicle unladen.
- 8.4 If an extra lamp is used for the brake light, this must be fitted in the centre, and, when viewed from the rear, it must be positioned no higher than the roof of the vehicle and no lower than 15 cm below the lower edge of the rear window. The lamp must meet Number 8.1 or the American specifications.

### REAR REFLEX REFLECTORS

9. Vehicles must have at least two rear red reflex reflectors:
- 9.1 The reflectors must meet at least one of the following requirements:
- a) Be E-marked and of Class I according to ECE Regulation No. 3, 02 Series, Supplement 1.
  - b) Be e-marked and of Class I according to Council Directive 76/757/EEC, possibly as amended by Council Directive 87/354/EEC.
  - c) Be approved and marked according to some other standard with equivalent requirements as a) or b) above.
- 9.2 The illumination from each of the reflex reflectors must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the reflex reflectors. and within a horizontal angle at least 30° inwards and at least 30° outwards, measured from the vertical plane through the centre of the reflex reflector which is parallel with the longitudinal axis of the vehicle.

- 9.3 The reflex reflectors must be so positioned that the height from the ground to the lower edge of the reflecting surface is at least 35 cm but the height from the ground to the upper edge of the reflecting surface must be less than 90 cm. Measurements to be taken with the vehicle unladen.
- 9.4 At least one reflex reflector must be positioned on each side of the motor vehicle so that the outer edge of the reflecting surface is less than 40 cm from the outer edge of the vehicle.
- 9.5 The reflex reflectors must be fitted so that the light reflecting surface is vertical and perpendicular to the longitudinal axis of the vehicle. When it is necessary, however, due to the construction of the vehicle, a deviation of  $\pm 5^\circ$  is permitted in both horizontal and vertical direction.
- 9.6 The reflex reflectors must have a basic and regular shape. They must not be triangular.

#### REAR REGISTRATION PLATE LAMPS

10. Vehicles must have rear registration plate lamps emitting white light.
- 10.1 The lamps must meet at least one of the following requirements:
- a) Be E-marked according to ECE Regulation No. 4, Supplement 4.
  - b) Be e-marked according to Council Directive 76/760/EEC, possibly as amended by Council Directive 87/354/EEC.
  - c) Be approved and marked according to some other standard with equivalent requirements as a) or b) above.
- 10.2 The lamp must be positioned so that the light from a point in the light-emitting area of the lamp which is furthest from the registration plate, forms an angle at any point of  $8^\circ$  or more with the registration plate.
- If several lamps are used to illuminate the registration plate, each lamp must be so positioned that the requirement is fulfilled at any point of that part of the registration plate which the specified lamp is to illuminate.
- 10.3 The light intensity must be such that all letters and numbers on the registration plate are easy to read in darkness at a distance of at least 20 m. The lamp(s) must not cast a light in a rearward direction and reflected light from the registration plate, bumper etc., must not annoy any drivers behind.
- 10.4 The lamp(s) must be connected so that it (they) is (are) always illuminated when the main-beam (except main-beam flasher) dipped-beam, front position (side) lamps, rear position (side) lamps, auxiliary main-beam, curve/fog lamps, marker lamps, working lamps or rear fog lamps are switched on.

**FRONT DRIVING LAMPS**

11. Vehicles must have two driving lamps in front emitting white or yellow light. The following may be used as driving lamps: Dipped-beam, dipped-beam with reduced voltage, special approved lamps or curve/fog lamps.
- 11.1 Special approved lamps must carry the Vegdirektoratet's approval Number engraved into the lamp lens. Lamps approved in Sweden and Finland and marked with a national approval Number may also be approved. Curve/fog lamps emitting light must meet the requirements of Section 28-5 Number 1.

When reducing the dipped-beam the voltage at the bulb must be at least 5,5V - 11V - 22V at 6V - 12V - 24V systems respectively at full charging without any other electrical source connected.

If the driving lamp is built into the vehicle by the manufacturer, no special approval is required if these regulations can be documented as complying.

- 11.2 Special approved lamps must, when being approved/type approved, have a light intensity immediately in front of the lamp of at least 600 cd. but less than 1 200 cd. Lamps must always emit a diffused light with an intensity of at least 400 cd. Towards the limit the lamps must have at least a light intensity shown in Diagram 1. It must be possible to document that these requirements have been complied with, either by the vehicle manufacturer or by an independent competent laboratory.
- 11.3 The lamps must have a light emitting service of at least 40 cm<sup>3</sup> measured according to Swedish Standard SS 3110.
- 11.4 The lamps must be positioned on the front of the vehicle so that the distance between the light emitting surfaces of the lamps is at least 60 cm.
- 11.5 The lamps must be connected so that they are automatically illuminated when the engine is running. The driving lamp may also be illuminated by the vehicle being set in motion. The rear lamp must always be illuminated together with the driving lamp. Driving lamps must be so connected that they automatically extinguish when the light switch of the vehicle is switched on. It must be possible to control the other lamps on the vehicle by means of a light switch in the normal way independent of the driving lamp.

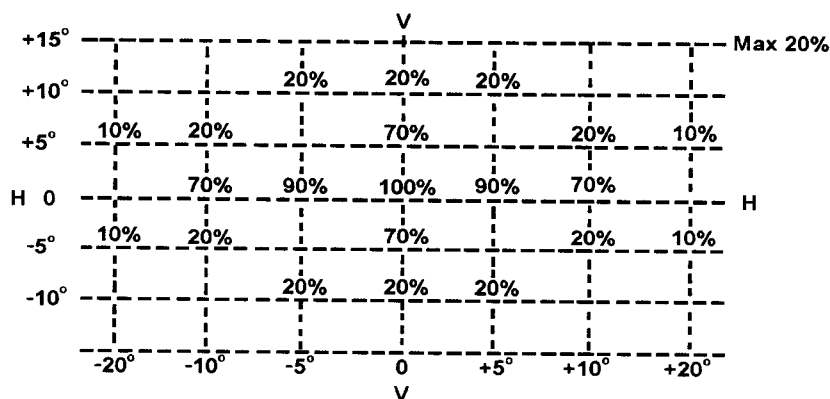


Diagram 1

**TAXI ROOF LAMPS**

12. All taxis must have a faintly illuminated roof light which, when seen from the front and the rear, has the word "TAXI" and possibly also a licence number.
- 12.1 The glass cover of the lamp shall be of a material which emits a white light, and the license number shall be black, minimum height 40 mm. The word "TAXI" may be integrated into the Company's logo. The colour and the geometrical design of both "TAXI" and logo as desired. The same applies to the size of the characters. The logo may cover up to 40% of the area on which it is mounted.
- 12.2 The lamp must not be more than 400 mm long, 20 mm high, and 150 mm wide. The lamp shall be positioned externally on the roof of the vehicle, and symmetrically on the vehicles centre line in front of the rear edge of the front side door. The lamp must be so securely fixed to the vehicle that it cannot fall off. Magnetic fixing may be acceptable.
- 12.3. The lamp must be connected in such a way that it can be lit even when no other lamps on the vehicle are lit. It must meet the following requirements:
- 12.3.1 On taxis with a taximeter the lamp must be connected to the taximeter in such a way that it can only be illuminated when the taximeter is off.
- 12.3.2 On other taxis the lamp must be connected via a separate switch and connected to a tell-tale lamp easily visible from the driver's seat and indicates when the lamp is on.

**SECTION 28-5****LIGHTING EQUIPMENT WHICH VEHICLES MAY HAVE (THE REGULATIONS IN THIS SECTION DO NOT APPLY TO VEHICLES COVERED BY SECTION 28-1)****CURVE/FOG LAMPS**

1. Vehicles may have two front curve/fog lamps emitting white or yellow light.
- 1.1 The lamps must meet at least one of the following requirements:
- a) They must be E-marked with a symbol B according to ECE Regulation No. 19.
  - b) They must be e-marked with the symbol B according to Council Directive 76/762/EEC, as last amended by Council Directive 87/354/EEC or Commission Directive 1999/18/EC.
  - c) They must be approved and marked according to some other standard with equivalent requirements as mentioned in a) or b) above.
- 1.2 The lamps shall be fitted in such a way that the setting is not affected by the normal use of the motor vehicles and that no vibrations occur under normal driving conditions. These requirements are regarded as satisfied if and point of the lamp can be loaded with a rearward acting force of 150 N (15,3 kp) parallel to the longitudinal axis of the motor vehicles, without the elastic movement exceeding 5 mm. When the force is removed, the lamps shall return to their original position.
- 1.3 The lamp must be positioned so that the height from the ground to the lower edge of the light-emitting surface is at least 25 cm but the upper edge of the light-emitting surface must not be more than the upper edge of the light-emitting surface of the dipped-beam.

- 1.4 The lamps must be positioned on either side so that the outer edge of the light emitting surface is less than 40 cm from the outer edge of the vehicle.
- 1.5 The lamps shall be connected via their own switch in such a way that they cannot be illuminated without the parking lamps, rear position (side) lamps and registration plate lamp being switched on at the same time.

#### **FRONT WARNING LAMPS**

- 2. Lamp(s) in front to warn that motor vehicle is towing a trailer or trailer equipment
- 2.1 The lamp(s) must be approved by Vegdirektoratet.

#### **MAIN BEAM FLASHER**

- 3. Vehicles may have a main beam flasher
- 3.1 The main-beam flasher must be connected so that only the main-beam is illuminated when the switch is operated.
- 3.2 The operating device which may be connected to a flashing relay, must be spring-loaded so that it returns to neutral after use.

#### **OUTLINE MARKER LAMPS**

- 4. Vehicles may have marker lamps on the sides, front and/or at the rear emitting white light to the front and red light to the rear.
- 4.1 The lamps must meet at least one of the following requirements:
  - a) They must be E-marked with a symbol A according to ECE Regulation No. 7, 01 Series, Supplement 4, Correction 2.
  - b) They must be e-marked with the symbol A according to Council Directive 76/758/EEC, as amended by Council Directive 87/354/EEC, and Commission Directive 89/516/EEC.
  - c) They must be approved and marked according to some other standard with equivalent requirements as mentioned in a) and b) above.
- 4.2 The lamps must be so positioned that the height from the ground to the lower edge of the light emitting surface is at least 35 cm but the height from the ground to the upper edge of the light-emitting surface is at most 190 cm. When it is necessary because of the design of the vehicle or the equipment fitted to it the height from the ground to the uppermost edge of the light-emitting surface of the lamps at the front and at the rear of the vehicle can be increased to the necessary height. All measurements to be taken with vehicle unladen.
- 4.3 The lamps to be fitted in pairs, and to be positioned on either side so that the outer edge of the light-emitting surface is less than 15 cm from the outer edge of the vehicle.
- 4.4 The lamps must be connected so that they cannot be illuminated without the front position (side) lamps, rear position (side) lamps and the registration plate lamps being switched on at the same time.



#### **REFLEX REFLECTORS - FRONT**

5. Vehicles may have two or more front white reflex reflectors.
- 5.1 The reflectors must meet at least one of the following requirements:
- a) They must be E-marked and of Class I according to ECE Regulation No. 3, 02 Series, Supplement 1.
  - b) They must be e-marked and of Class I according to Council Directive 76/757/EEC, possibly as amended by Council Directive 87/354/EEC.
  - c) They must be approved and marked according to some other standard with equivalent standards as mentioned in a) and b) above.
- 5.2 The reflex reflectors must be positioned so that the height from the ground to the lower edge of the reflecting area is 35 cm or more, but the height from the ground to the upper edge of the reflecting surface must be less than 90 cm. Measurements to be taken with the vehicle unladen.
- 5.3 At least one reflex reflector must be positioned on either side so that the outer edge of the reflecting surface is less than 40 cm from the outer edge of the vehicle.

#### **REFLEX REFLECTORS - SIDE**

6. Vehicles may have two or more side yellow reflex reflectors:
- 6.1 The reflectors must meet at least one of the following requirements:
- a) They must be E-marked and of Class I according to ECE Regulation No. 3, 02 Series, Supplement 1.
  - b) They must be e-marked and of Class 1 according to Council Directive 76/757/EEC, possibly as amended by Council Directive 87/354/EEC.
  - c) They must be approved and marked according to some other standard with equivalent standards as mentioned in a) and b) above.
- 6.2 The reflex reflectors must be positioned so that the height from the ground to the lower edge of the reflecting area is 35 cm or more, but the height from the ground to the upper edge of the reflecting surface must be less than 90 cm. Measurements to be taken with the vehicle unladen.
- 6.3 The reflectors must be positioned at the front and at the rear on the side of the vehicle, less than 1 m from the outer limits of the vehicle in the longitudinal direction.

#### **ILLUMINATED ADVERTISING SIGNS**

7. Vehicles may have faintly lit or illuminated advertising sign etc.
- 7.1 The light from advertising signs etc., or those parts of advertising signs etc. which are illuminated, must not confuse other traffic nor must it in any way be possible to confuse the light/parts mentioned with traffic lamps.

### **WORK LAMPS**

- 8. Vehicles may have one or several work lamps emitting white or yellow light.
- 8.1 The lamps must give ample spreading and it must be possible to adjust them in various positions.
- 8.2 The lamp(s) must be so connected that they cannot be illuminated without the front position (side) lamps, rear position (side) lamps and registration plate lamps being switched on at the same time.
- 8.3 The work lamp must be connected to a separate tell-tale lamp which is easily visible from the driver's seat and which is illuminated when the working lamp is illuminated.

### **REVERSING LAMPS**

- 9. Vehicles may have one or two reversing lamps emitting white or yellow light.
- 9.1 The lamps must give ample spread and must not dazzle.
- 9.2 Each lamp must be designed and adjusted so that the illumination 25 m in front of the lamp is less than 1 lux at any point which lies above the horizontal plane through the centre of the lamp.
- 9.3 The lamp(s) must be positioned so that the height from the ground to the lower edge of the light-emitting surface is at least 25 cm but the height from the ground to the upper edge of the light-emitting surface must be less than 120 cm. Measurements to be taken with the vehicle unladen.
- 9.4 The lamp(s) must be connected so that they can only be illuminated when the ignition is on and when either the transmission is engaged in reverse or the vehicle is moving backwards.
- 9.5 Reversing lamps which satisfy Council Directive 77/539/EEC are regarded as meeting the above requirements.

### **REAR FOG LAMPS**

- 10. Vehicles may have one or two rear fog lamps emitting red light.
- 10.1 The lamps must satisfy at least one of the following requirements:
  - a) They must be E-marked with the symbol F according to ECE Regulation No. 38, Supplement 2 (possibly B according to previously approved marking).
  - b) They must be e-marked with the symbol F according to Council Directive 77/538/EEC, as amended by Council Directive 87/354/EEC, and Commission Directive 89/518/EEC and Commission Directive 1999/14/EC.
  - c) They must be approved and marked according to some other standards with equivalent standards as mentioned in a) and b) above.
- 10.2 The lamp(s) must be positioned so that the height from the ground to the lower edge of the light-emitting surface is at least 25 cm but the height from the ground to the upper edge of the light-emitting surface must be less than 150 cm. Measurements to be taken with the vehicle unladen.
- 10.3 The lamp(s) must be so positioned that the minimum distance between the light-emitting surface of the rear fog lamp and the nearest stop lamp is 10 cm or more.

**10.4** If the vehicle has one rear fog lamp it must be positioned to the left of the longitudinal symmetrical plane of the vehicle.

**10.5** It must be possible to switch the lamps on when the main beam, dipped beam or the fog lamp are on, and it must be possible to turn them off independent of these.

When the rear fog lamp is on, the operation of the switching contact for dipped beam/main beam must not cause the rear fog light to be turned off.

**10.6** Rear fog lamps must be connected through a separate switch and together with a tell tale lamp which is easily visible from the driver's seat and which shows when the rear fog lamp is illuminated.

#### **INTERIOR AND INSTRUMENT LAMPS**

**11.** Vehicles may have interior lamp(s) emitting white light for illumination of instruments and to give light in passenger/goods compartment.

**11.1** The light must not irritate the driver or other traffic.

#### **EMERGENCY BLUE LAMPS**

**12.** A vehicle used as an emergency vehicle may in addition to the obligatory warning lamp (See Number 28-3 Number 2) have two warning lamps emitting a flashing blue light in a forward direction. The lamps must meet the requirements of Section 28-3 Number 2.1.

**12.1** The light from the lamp must be visible in a forward direction and within a vertical angle at least 5° above and at least 5° below the horizontal plane through the centre of the lamps and within a horizontal angle at least 45° inwards and at least 45° outwards. The horizontal angle must be measured from the vertical plane through the centre of the lamps, parallel to the longitudinal axis of the vehicle.

**12.2** The lamps must be fitted to the front centre part of the vehicle at equal distance from the ground and equal distance from the outermost edge of the vehicle. The lamps must be so placed that the minimum distance between the light-emitting surfaces of the lamps and the light-emitting surfaces for the main beam/dipped beam is 10 cm or more.

**12.3** The flash frequency must be at least 100 flashes per minute but less than 200 flashes per minute.

**12.4** The warning lamp must be connected so that it cannot be illuminated unless the obligatory warning lamps (See Section 28-3 Number 2) are switched on.

**12.5** The warning lamp must be clearly and durably marked with the manufacturer, type and voltage.

#### **SIDE MARKER LAMPS**

**13.** Vehicles may have two lamps emitting a yellow marking light to each side.

**13.1** The lamps must emit a faint light and they must not have a light-emitting surface larger than 30 cm<sup>2</sup>.

**13.2** The lamps for the marker lights must be screened/inset so that they are not visible in a straight line ahead or to the rear.

- 13.3** There must be one lamp at the front edge of the vehicle and one lamp at the rear of the vehicle, less than 1 m from the centres outermost point in the longitudinal direction.

The lamps must also be positioned as described for side reflex reflectors in Number 6.

- 13.4** The lamps must be connected so that they cannot be on without the position lamps, rear lamps and registration plate lamps also being on.

- 13.5** The lamps may be combined with approved reflex reflector on the side.

- 13.6** Irrespective of the regulations above, a vehicle may have a side marker lamp according to Council Directive 76/756/EEC, as amended by Commission Directive 91/663/EEC.

#### **PARKING LIGHT FOR "DENSELY POPULATED AREAS"**

- 14.** Vehicles may have a position lamp according to Council Directive 77/540/EEC, See Council Directive 76/756/EEC, with later amendments.

- 15.** Vehicles in Categories N<sub>2</sub> and N<sub>3</sub> may have reflectors on the side or at the rear, indicating the size of the vehicle. A reflecting plate at the rear must have been approved according to ECE Regulation No. 70.00. Reflectors like stripes or contour markings on the side and/or at the rear, must have been approved according to ECE Regulation No. 104.00. Reflecting graphics are permitted within the contour marking according to the Regulations.

### **SECTION 28-6**

#### **LIGHTING EQUIPMENT FOR TWO AND THREE-WHEEL MOTOR VEHICLES WITH A WIDTH OVER 130 CM (THE REGULATIONS IN THIS SECTION DO NOT APPLY TO VEHICLES COVERED BY SECTION 28-2)**

##### **MAIN BEAM LAMPS**

- 1.** Two and three-wheel motor vehicles must have at least two front main-beam lamps emitting white or yellow light.

- 1.1** The lamps must meet at least one of the following requirements:

- a) They must be E-marked with the symbol MB according to ECE Regulation No. 57, or MBH according to ECE Regulation No. 72.
- b) They must be E-marked with the symbol R according to ECE Regulation No. 1, or HR according to ECE Regulation No. 8.
- c) They must be e-marked with the symbol R according to Council Directive 76/761/EEC, as amended by Council Directive 87/354/EEC and Commission Directive 89/517 EEC.
- d) They must be approved and marked according to some other standards or equivalent standards as mentioned in a), b) or c) above.
- e) For mopeds the lamp may be E-marked according to ECE Regulation No. 56.

- 1.2** Motorcycle with sidecar may have only one lamp as mentioned if the necessary marking lamps according to Section 28-8 are fitted.

- 1.3 The lamps must be so adjusted that they illuminate the road at least 100 m ahead. For mopeds the requirement is 50 m.
- 1.4 The lamps must be connected so that they cannot be illuminated without front position (side) lamps, rear position (side) lamps and registration plate lamp being illuminated at the same time. This requirement, however, does not apply to main-beam flasher.
- 1.5 When the vehicle is enclosed, the main-beam must be connected to a tell-tale lamp which must be visible from the driver's seat, and indicates when the main-beam is switched on.

#### **DIPPED BEAM LAMPS**

- 2. Two and three-wheel motor vehicles must have two front dipped-beam lamps emitting white or yellow light.
- 2.1 The lamps must meet at least one of the following requirements:
  - a) They must be E-marked with the symbol MB according to ECE Regulation No. 57, or MBH according to ECE Regulation No. 72.
  - b) They must be E-marked with the symbol C according to ECE Regulation No. 1 or HC according to ECE Regulation No. 8.
  - c) They must be e-marked with the symbol C according to Council Directive 76/761/EEC, as amended by Council Directive 87/354/EEC and Commission Directive 89/517/EEC.
  - d) they must be approved and marked according to some other standards or equivalent standards as mentioned in a), b) or c) above.
  - e) for mopeds the lamp may be E-marked according to ECE Regulation No. 56.
- 2.2 The lamps must be so adjusted that they illuminate the road at least 40 m ahead. For mopeds the requirement is 20 m.
- 2.3 The lamps must be positioned so that the height from the ground to the lower edge of the light-emitting surface is 50 cm or more, but the height from the ground to the upper edge of the light-emitting surface must be less than 120 cm. All measurements to be taken with the vehicle unladen.
- 2.4 The lamps must be positioned on each side so that the outer edge of the light-emitting surface is less than 40 cm from the outer edge of the vehicle and so that the outer edge of the light-emitting surface does not lie inside the outer edge of the light-emitting surface of the main-beam.
- 2.5 The distance between the inner edges of the light-emitting surfaces of the lamps must be at least 60 cm.
- 2.6 Lamps must be so connected that they cannot be illuminated without the front position (side) lamps, rear position (side) lamps and registration plate lamp being switched on at the same time.

If separate lamps for main-beam and dipped-beam are being used, the dipped-beam must be so connected that it is also illuminated when the main-beam is switched on.
- 2.7 The dipped-beam switch must be designed and positioned so that it can be easily and safely operated without the driver having to take his hand off the handlebars.

### FRONT POSITION (SIDE) LAMPS

3. Two and three-wheel motor vehicles must have two front position (side) lamps emitting white light.
- 3.1 The lamps must meet at least one of the following requirements:
- a) They must be E-marked according to ECE Regulation No. 57, Supplement 2, Correction 1.
  - b) They must be E-marked with the symbol A according to ECE Regulation No. 7.
  - c) they must be e-marked with the symbol P according to Council Directive 77/540/EEC, possibly as amended by Council Directive 87/354/EEC.
  - d) They must be approved and marked according to some other standard with equivalent requirements as in a), b) or c) above.
- 3.2 The light from each of the lamps must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the lamp, and within a horizontal angle at least 45° inwards and at least 80° outwards measured from the vertical plane through the centre of the light which is parallel with the longitudinal axis of the vehicle.
- 3.3 Lamps must be positioned so that the height front the ground to the lower edge of the light-emitting surface is at least 40 cm, but the height from the ground to the upper edge of the light-emitting surface must be at least 150 cm. Measurements to be taken with the vehicle unladen.
- 3.4 Lamps must be so positioned on each side so that the light-emitting surface is less than 40 cm from the outer edge of the vehicle.
- 3.5 Lamps must be connected so that they are always illuminated when main-beam, dipped-beam, rear position (side) lamp, registration plate lamp, auxiliary main-beam, curve/fog lamp, marker lamp or rear fog lamp are switched on.

### DIRECTION INDICATOR LAMPS

4. Two and three-wheel motor vehicles must have at least two direction indicator lamps at the front and at the rear and/or at least one on either side emitting an orange flashing light when the vehicle is enclosed.
- 4.1 The lamps must meet at least one of the following requirements:
- a) They must be E-marked according to ECE Regulation No. 50.
  - b) They must be E-marked with a symbol A according to ECE Regulation No. 6, 01 Series, Supplement 5, Correction 2.
  - c) They must be e-marked according to Council Directive 76/759/EEC, as amended by Council Directive 87/354/EEC and Commission Directive 89/277/EEC.
  - d) They must be approved and marked according to some other standard with equivalent requirements as in a), b) or c) above.
- 4.2 The indicator lamps at the front and on the side may combine into one lamp if the light is visible within the angles given in Number 4.3.

- 4.3** The light from each of the lamps must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the lamp.

The light from each of the lamps at the front and at the rear must be visible within a horizontal angle at least 45° inwards and at least 80° outwards.

The light from each of the lamps on the sides must in a forward direction be visible with a horizontal angle at least 10° inwards and at least 80° outwards and in a rearward direction be visible within a horizontal angle at least 45° inwards and at least 80° outwards.

The horizontal angle to be measured from the vertical plane through the centre of the lamp which is parallel with the longitudinal axis of the vehicle.

- 4.4** The lamps must be positioned so that the height from the ground to the lower edge of the light-emitting surface is at least 35 cm for front and rear lamps and at least 50 cm for side lamps. The height from the ground to the upper edge of the light-emitting surface must be less than 150 cm. If, however, the construction of the vehicle makes it necessary, the height from the ground to the upper edge of the light-emitting surface may be increased to a maximum of 190 cm. Measurements to be taken with the vehicle unladen.
- 4.5** The lamps at the front and at the rear must be so positioned on either side so that the outer edge of the light-emitting surface is less than 40 cm from the outer edge of the vehicle.
- 4.6** Direction indicator lamps must be connected to a tell-tale lamp and/or sound signal which must be visible and/or audible from the driving seat and operate simultaneously with the direction indicator lamps and show if these are working correctly.
- 4.7** The flash frequency for direction indicator lamps must be  $90 \pm 30$  flashes per minute.
- 4.8** The operating device for the direction indicator lamps must be made so that the lamps on the right-hand side come into operation when it is moved clockwise or towards the right, and the lamps on the left-hand side come into operation when it is moved anti-clockwise or towards the left.

#### REAR POSITION (SIDE) LAMPS

- 5.** Two and three-wheel motor vehicles must have two rear position (side) lamps emitting red light.
- 5.1** The lamps must meet at least one of the following requirements:
- They must be E-marked according to ECE Regulation No. 50.
  - They must be E-marked with a symbol R according to ECE Regulation No. 7, 01 Series, Supplement 4, Correction 2.
  - They must be e-marked with a symbol R according to Council Directive 76/758/EEC, as amended by Council Directive 87/354/EEC and Commission Directive 89/516/EEC.
  - They must be approved and marked according to some other standard with equivalent requirements as in a), b) or c) above.

- 5.2** The light from each of the lamps must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the lamp, and within a horizontal angle at least 45° inwards and at least 80° outwards from the vertical plane through the centre of the lamp which is parallel with the longitudinal axis of the vehicle.
- 5.3** The lamps must be positioned so that the height from the ground to the lower edge of the light-emitting surface is at least 35 cm, but the height from the ground to the upper edge of the light-emitting surface is at most 150 cm. However, if the design of the vehicle make it necessary, the height from the ground to the upper edge of the light-emitting surface may be increased to a maximum of 190 cm. Measurements to be taken with the vehicle unladen.
- 5.4** At least one lamp must be positioned on each side so that the outer edge of the light-emitting surface is less than 40 cm from the outer edge of the vehicle.
- 5.5** The distance from the rearmost position the vehicle to the nearest part of the lamp glass must be less than 100 cm.
- 5.6** Lamps must be so connected that they are always illuminated when the main-beam (except main-beam flasher) dipped-beam, front position (side) lamps, registration plate lamp, auxiliary main-beam, curve/fog lamp, marker lamps or rear fog lamps are switched on.

#### **STOP LAMPS**

- 6.** Two and three-wheel motor vehicles must have at least two stop lamps emitting red light. which are illuminated as soon as the service brake is operated.

On vehicles with two service brake systems (i.e. separate service brake systems for the front and rear wheels) the stop lamp shall act on both service brake systems.

- 6.1** The lamps must meet at least one of the following requirements:
- a) They must be E-marked according to ECE Regulation No. 50.
  - b) They must be E-marked with a symbol S according to ECE Regulation No. 7.
  - c) They must be e-marked according to Council Directive 76/758/EEC, as amended by Council Directive 87/354/EEC and Commission Directive 89/516/EEC.
  - d) They must be approved and marked according to some other standard with equivalent requirements as in a), b) or c) above.
- 6.2** The light from each of the lamps must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the lamp, and within a horizontal angle at least 45° inwards and at least 45° outwards measured from the vertical angle through the centre of the lamps, which is parallel with the longitudinal axis of the vehicle.
- 6.3** The lamps must be so positioned that the height from the ground to the lower edge of the light-emitting surface is at least 35 cm. but the height from the ground to the upper edge of the light-emitting surface is at most 150 cm. When the design of the vehicle make it necessary, however, the height from the ground to the upper edge of the light-emitting surface may be increased to a maximum of 190 cm. Measurements to be taken with the vehicle unladen.



## REFLEX REFLECTORS

7. Two and three-wheel motor vehicles must have at least two rear red reflex reflectors.
- 7.1 The reflectors must meet at least one of the following requirements:
- a) They must be E-marked and of Class I according to ECE Regulation No. 3, 02 Series, Supplement 1.
  - b) They must be e-marked and of Class I according to Council Directive 76/757/EEC, possibly as amended by Council Directive 87/354/EEC.
  - c) They must be approved and marked according to some other standard with equivalent standards as mentioned in a) or b).
- 7.2 The illumination from each of the reflex reflectors must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the reflex reflector and within a horizontal angle at least 30° inwards and at least 30° outwards measured from the vertical plane through the centre of the reflex reflector which is parallel with the longitudinal axis of the vehicle.
- 7.3 The reflex reflector must be positioned so that the height from the ground to the lower edge of the reflecting surface is at least 40 cm, but the height from the ground to the upper edge of the reflecting surface must be at most 90 cm. Measurements to be taken with the vehicle unladen.
- 7.4 At least one reflex reflector must be positioned on each side so that the outer edge of the reflecting area is less than 40 cm from the outer edge of the vehicle.
- 7.5 The reflex reflectors must be fitted so that the light reflecting surface is vertical and perpendicular to the longitudinal axis of the vehicle. However, if the design of the vehicle makes it necessary, a deviation of  $\pm 5^\circ$  is permitted both in horizontal and vertical directions.
- 7.6 The reflex reflectors must have a basic and regular form. They must not be triangular.

## REAR REGISTRATION PLATE LAMPS

8. Two and three-wheel motor vehicles must have rear registration plate lamps emitting white light.
- 8.1 The lamps must meet at least one of the following requirements:
- a) They must be E-marked in accordance with ECE Regulation No. 4, Supplement 4.
  - b) They must be e-marked according to Council Directive 76/760/EEC, possibly as amended by Council Directive 87/354/EEC.
  - c) They must be approved and marked according to some other standard with equivalent standards as mentioned in a) or b) above.

- 8.2 The lamp must be so positioned that the light from a point in the light-emitting surface of the lamp which is furthest from the registration plate, forms an angle of 8° or more with the registration plate.

If several lamps are being used to illuminate the registration plate, each lamp must be positioned so that this requirement is fulfilled at any given point on the part of the registration plate which the lamp in question is designed to illuminate.

- 8.3 The light intensity must be such that all letters and numbers on the registration plate are easy to read in darkness at a distance of at least 20 m. The lamp(s) must not cast a light in a rearward direction and reflected light from the registration plate, bumper etc., must not irritate any drivers behind.
- 8.4 The lamp(s) must be connected that it (they) are always illuminated when the main-beam (except main-beam flasher) dipped-beam, front position (side) lamp, rear position (side) lamp, auxiliary main-beam, curve/fog lamp, marker lamp or rear fog lamps are illuminated.

#### FLASHING BLUE LAMPS

9. Two and three-wheel motor vehicles used as an emergency vehicle, See Section 11 of the Road Traffic Act, must have at least one warning lamp emitting a flashing, blue light in a forward direction. These lamps must meet the requirements of Section 28-3 Number 2.1.

- 9.1 The light from the lamp(s) must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the lamp, and within a horizontal angle of at least 80° to either side, measured from the vertical plane through the centre of the lamp parallel with the longitudinal axis of the vehicle.

- 9.2 The light from each of the lamps must, within any point within the area where the light is visible, have an intensity less than 700 candelas.

Straight ahead, the light intensity from each of the lamps must be 10 candelas or more.

Out towards the external limitation of the area within which the light must be visible. the light intensity may gradually fall to 0,3 candela.

- 9.3 The light intensity to be measured when the lamps emit a steady light.
- 9.4 Each of the lamps must have a light emitting area to the front which is at least 30 cm<sup>2</sup>.
- 9.5 The lamps must be positioned so that the height from the ground to the lower edge of the light-emitting surface is 40 cm or more, but the height from the road surface to the upper edge of the light-emitting surface must be less than 190 cm. The measurements to be taken when the vehicle is unladen.
- 9.6 The flashing frequency must be 90 ± 30 flashes per minute.
- 9.7 Warning lamps must be clearly and durably marked with manufacturer, type and voltage.

## SECTION 28-7

### LIGHTING EQUIPMENT FOR TWO AND THREE-WHEEL MOTOR VEHICLES WITH A WIDTH NOT OVER 130 CM (THE REGULATIONS IN THIS SECTION DO NOT APPLY TO VEHICLES COVERED BY SECTION 28-2)

#### MAIN BEAM LAMPS

1. Two and three-wheel motor vehicles must have at least one front main-beam lamp emitting white or yellow light.
  - 1.1 The lamps must meet the requirements in Section 28-6, Number 1.1.
  - 1.2 The lamps must be so adjusted that they illuminate the road at least 100 m ahead. For mopeds the requirement is 50 m.
  - 1.3 The lamp(s) must be so connected that it (they) cannot be illuminated without the front position (side) lamps (if the vehicle has such lamps) rear position (side) lamps and registration plate lamps being switched on at the same time. However, this does not apply to use of the main-beam flasher.

#### DIPPED-BEAM LAMPS

2. Two and three-wheel motor vehicles must have one front dipped-beam lamp emitting white or yellow light.
  - 2.1 A lamp emitting a dipped beam must meet the requirements in Section 28-6, Number 2.1.
  - 2.2 The lamp must be so adjusted that it illuminates the road at least 40 m ahead. For mopeds the requirement is 20 m.
  - 2.3 The lamp must be positioned so that the height from the ground to the lower edge of the light-emitting surface is 50 cm or more, but the height from the ground to the upper edge of the light-emitting surface must be less than 120 cm. All measurements to be taken with the vehicle unladen.
  - 2.4 The lamp must be positioned so that the distance from the outer edge of the light-emitting surface to the outer edge of the vehicle is equal on both sides. However, two lamps for dipped beam having a smaller distance between the light emitting surfaces than 200 mm may be permitted. The lamps must be symmetrically positioned round the longitudinal axis through the centre of the vehicle.
  - 2.5 The lamp must be so connected that it cannot be illuminated without the front position (side) lamps (for vehicles having such lamps), rear position (side) lamps and registration plate lamps being switched on at the same time.
  - 2.6 The dipped-beam switch must be designed and placed so that it can be easily and safely operated without the driver having to let go of the steering device.

#### **DIRECTION INDICATOR LAMPS**

3. Two and three-wheel motor vehicles must have at least two direction indicator lamps at the front and at the rear and/or at least one on either side emitting orange flashing light when the vehicle is enclosed.

- 3.1 The lamps must fulfill the requirements given in Section 28-6 Number 4.

#### **REAR POSITION (SIDE) LAMPS**

4. Two and three-wheel motor vehicles must have at least one lamp emitting a red light to the rear.

- 4.1 The lamp(s) must meet the requirements in Section 28-6 Number 5.1.

- 4.2 If one lamp is used, the requirements in this number must be met. If two or more lamps are used, the requirements in Section 28-6, Number 5 must be met.

- 4.3 The light must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the lamp, and within a horizontal angle of at least 80° measured from the vertical angle through the centre of the lamp which is parallel with the longitudinal axis of the vehicle.

- 4.4 The lamp must be positioned so that the height from the ground to the lower edge of the light-emitting surface is at least 35 cm, but the height from the ground to the upper edge of the light-emitting surface is at most 150 cm. Measurements to be taken with the vehicle unladen.

- 4.5 The lamp must be positioned so that the distance from the outer edge of the light-emitting surface to the outer edge of the vehicle is equal on both sides.

- 4.6 The lamp must be so connected that it is always illuminated when the main-beam (except main-beam flasher) dipped-beam, front position (side) lamp (where vehicles have such lamps) registration plate lamp, auxiliary main-beam, curve/fog lamps, marker lamps or rear fog lamps are switched on.

#### **STOP LAMPS**

5. Two and three-wheel motor vehicles must have at least one stop lamp emitting red light, which is illuminated as soon as the service brake is applied.

On vehicles with two service brake systems (i.e. separate brake systems for the front and rear wheels the stop lamp shall act on both service brake systems.

- 5.1 The lamps must meet the requirements in Section 28-6, Number 6.1.

- 5.2 If only one lamp is used, the requirements in this number must be met. If two or more lamps are used, the requirements in Section 28-6 Number 6 must be met.

- 5.3 The light from the lamp must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the lamp, and within a horizontal angle at least 45° to either side, measured from the vertical plane through the centre of the light which is parallel with the longitudinal axis of the vehicle.

- 5.4** The lamp must be positioned so that the height from the ground to the lower edge of the light-emitting surface is 35 cm or more, but the height from the ground to the upper edge of the light-emitting surface must be less than 150 cm. Measurements to be taken with the vehicle unladen.
- 5.5** The lamp must be positioned so that the distance from the outermost edge of the light-emitting surface to the outermost edge of the vehicle is the same on both sides.

#### **REFLEX REFLECTORS**

- 6.** Two and three-wheel motor vehicles must have at least one rear red reflex reflector.
- 6.1** The reflex reflectors must meet the requirements in Section 28-6 Number 7.1. If only one reflex reflector is used, the requirement in this number must be met. If two or more reflex reflectors are used, the requirements in Section 28-6 Number 7 must be met.
- If a reflecting device is used, the requirements in this paragraph must be met. If two or more reflecting devices are used, the requirements in Section 28-5 Number 7 must be met.
- 6.2** The reflections from each of the reflex reflectors must be visible within a vertical angle at least 15° above and at least 15° below the horizontal plane through the centre of the reflex reflector and within a horizontal angle at least 30° to either side measured from the vertical plane through the centre of the reflex reflector which is parallel to the longitudinal axis of the vehicle.
- 6.3** The reflex reflector must be positioned so that the height from the ground to the lowest of the reflecting surface is at least 40 cm, but the height from the ground to the upper edge of the reflecting surface is at most 90 cm. Measurements to be taken with the vehicle unladen.
- 6.4** The reflex reflector must be positioned so that the distance from the outer edge of the reflecting surface to the outer edge of the vehicle is equal to both sides.
- 6.5** The reflex reflectors must be fitted in such a way that the light reflecting surface stands vertically and at right-angles on the longitudinal axis of the vehicle. However, if the design of the vehicle makes it necessary, a deviation of  $\pm 5^\circ$  is permitted both in a horizontal and vertical direction.
- 6.6** The reflex reflectors must have a regular and basic form. They must not be triangular.

#### **REAR REGISTRATION PLATE LAMPS**

- 7.** Two and three-wheel motor vehicles must have rear registration plate lamps emitting white light.
- 7.1** The lamp(s) must fulfill the requirements given in Section 28-6 Number 8.

#### **FLASHING BLUE LAMP**

- 8.** Two and three-wheel motor vehicles used as an emergency vehicle, See Section 11 of the Road Traffic Act, must have at least one warning lamp emitting a flashing blue light in a forward direction.
- 8.1** The lamp(s) must meet the requirements given in Section 28-6 Number 9.