

German Regulation on the Approval of Road Vehicles (StVZO) and explanatory Directives for the Field of Vision of Road Vehicles

StVZO § 35b

Devices for safe vehicle control

- (1) The devices for driving the vehicles must be easy and safe to operate.
- (2) **A sufficient field of vision must be ensured for the driver under all operating and weather conditions.**

As explanation and in addition to §35b the requirements of the following directives have to be considered:

Directives for the Field of Vision of Road Vehicles

Original, 04th of Dec.1962, publ. Verkehrsblatt, Page 669

Corrigendum 1963, publ. Verkehrsblatt, Page 131,

Amendment, 06th of Aug.1975, publ. Verkehrsblatt, Page 443,

Amendment, 15th of Oct.1987, publ. Verkehrsblatt, Page 723

- (1) The forward field of vision is considered sufficient when the limit of vision is within a semi-circle of 12.0 m radius (semi-circle of vision). The limit of vision is described by the boundary of the surface on the road, which cannot be seen by the driver due to the design of the vehicle (see figure 1).
- (2) In order to determine the limit of vision, the driver's eyes shall be unified at one point (eye point). This point is located on a vertical line at a height of 700 mm above the unoccupied driver's seat in its middle position. The vertical is to be placed at a distance of 130 mm from the front edge of the backrest on the centre line of the seat. From this point, the limit of vision on the road surface when the vehicle is un-laden is to be determined. Seats whose height is adjusted as a function of the load, such as, for example, suspension seats, shall be fixed at a height corresponding to a normal driving position indicated by the vehicle manufacturer for the purpose of determining the eye point. This procedure does not apply to self-propelled working machines and to agricultural or forestry machines. Existing devices on the vehicle which are used for visual enhancement (e.g., mirrors) shall not be used when determining the limit of vision. The point plumb perpendicular from the eye point on the surface of the road is the centre point of the coordinate system into which the limit of vision is inscribed.
- (3) The unimpeded forward vision must be ensured from the baseline of a "sector of vision". The length of the baseline, measured as a chord on the semi-circle of vision, must be at least 9.5 m (see figure 1). In general obstructions due to the regulated rear-view mirrors may be ignored.
- (4) Obstructions by components (e.g. A-Pillars, Roof components or supporting structures ...) are only permissible when the obstructions caused by them on the semi-circle of vision comply with the following requirements:
 1. The obstruction shall not exceed the values resulting from figure 2 for the lower limit. The distance of the obstructive component from the driver eye shall be measured on the line of sight that leads to the semi-circle of vision, and the width corresponding to this shall be measured at the point of intersection of the component with the line of sight.
 2. In the case of components that affect the vision and have a width of more than 80 mm, a minimum distance of 2.5 m - measured as a chord on the semi-circle of vision - must be present between the centres of two adjacent obstructions.
 3. In the area of the "sector of vision" referred to in paragraph 3, no more than two obstructions areas shall occur.

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- 4. There should be no more than six obstructions areas on the entire semi-circle of vision.
 - 5. Obstructions that result from the values between the lower and upper limit curves (see figure 2) are permitted only when they are caused by components, which are unavoidable for reasons of vehicle strength. But such obstruction shall be located outside the "sector of vision" and must be limited to one on each side.
- (5) The admissibility of the obstruction of individual obstructing components can also be determined as follows:
- 6. An obstruction in accordance with paragraph (4) No 1 is permitted, if $\frac{a}{b-65} \geq 22,4$
 - 7. An obstruction in accordance with paragraph (4) No 5 is permitted, if $\frac{a}{b-65} \geq 10,6$

a = Distance of the obstructing component from the eye point in mm;
 b = Width of the obstructing component in mm.

Note: A permitted obstruction of 600 mm (respectively 1200 mm) on the semi-circle of vision was defined as a basis with binocular vision (eye distance 65 mm).

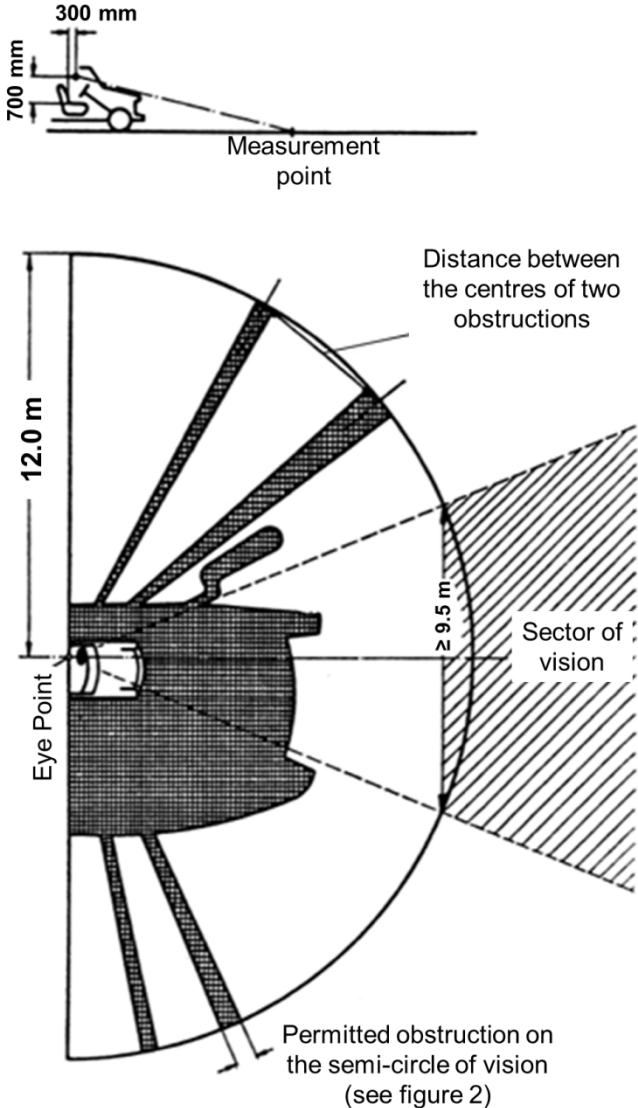
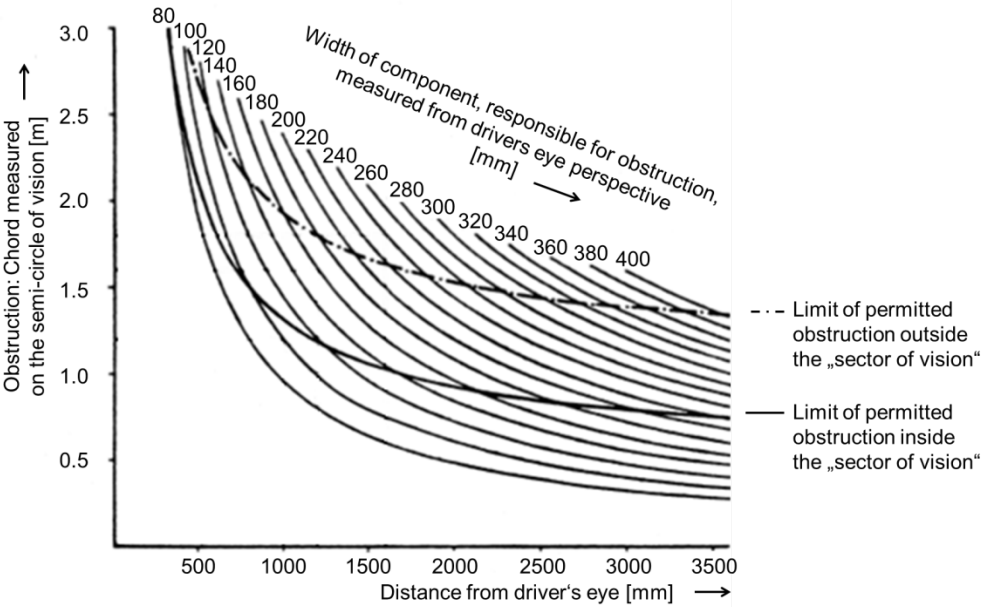


Figure 1

German Regulation on the Approval of Road Vehicles (StVZO) and explanatory Directives for the Field of Vision of Road Vehicles

Figure 2: Obstruction on the semi-circle of vision
(Driver' eyes aggregated in one point)



Examples:

Width of component [mm]	Distance between eye-point and component [mm]	Obstruction [m]	Note
100	1000	1.2	permitted
160	1200	1.6	not permitted within the "sector of vision" but partially permitted outside the "sector of vision"
240	1600	1.8	not permitted

German Regulation on the Approval of Road Vehicles (StVZO) and explanatory Requirements for school buses

StVZO § 34a

Occupancy, loading and marking of buses

- (1) In buses, no more passengers and luggage shall be carried than the number of seats and stances as registered in the Certificate of Approval Part I and as the total number of passengers and the maximum mass of luggage labelled in the bus.
- (2) Notwithstanding the provisions of paragraph 1 and at the request of the authorized person or due to other regulations, the number of seats and stances can be reduced based on the operation of the vehicle. The reduced number of seats and stances must be registered in the Certificate of Approval Part I and clearly visible labelled in the vehicle.

As explanation and in addition to §34a the following requirements for school buses have to be considered:

Excerpt from the Requirements for buses and minibuses which are specially used for transporting pupils and children

Excerpt; Final version, 14th of July 2005 (published Verkehrsblatt, Page 604)

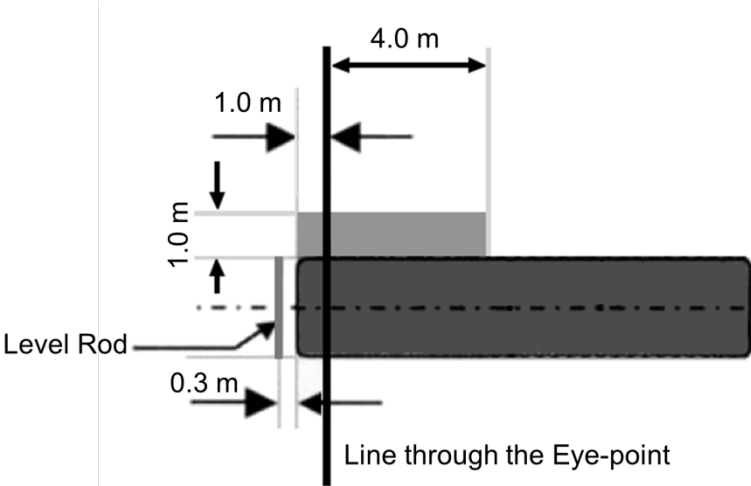
2.4 Field of vision for the driver

In addition to complying with the legal requirements of §§ 35b and 56 StVZO, the driver must be able to observe the safety-relevant external and internal area of the bus from normal seating position.

This is deemed to be fulfilled if

- 2.4.1 a level rod arranged at a height of 1200 mm above the ground and at a distance of 300 mm in front of the vehicle can be seen directly or indirectly via additional front-end mirrors (minor obstruction of the field of vision, for example by window stay bars or windshield wipers are permitted); Or can be seen indirectly via sufficiently large camera-monitor systems (see picture 1);
- 2.4.2 the bus is also equipped with rear-view mirrors or sufficient large camera monitor systems on the right side whose fields of vision are such that the driver can see on the outside of the vehicle at least one flat and horizontal part of the road surface which is defined by the following vertical planes (see light-grey area picture 1);
- 2.4.3 the outer obstructions of the entrances and exits can be observed with the regulatory required exterior mirrors or additional exterior mirrors.

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Picture 1: Additional Field of Vision for School Buses