

Specification for

Headlamp optical aiming devices

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Foreword

This British Standard has been prepared under the authority of the Automobile Industry Standards Committee of BSI.

Motor vehicle headlamps are optically precise devices for producing light in directions specific to each type of unit. When mounted on the vehicle, these directions must relate correctly to the surface supporting the vehicle and the vertical median plane of the vehicle.

Vehicle headlamps are designed to produce either a long-range main beam for open road driving or a short-range dipped beam. Aimed too high, the dipped beams will give increased range but will also dazzle. On the other hand, aimed too low the beams will not dazzle but will give inadequate range. Both conditions are equally dangerous and the correct result can only be achieved by correct alignment of the beam.

Therefore, headlamps must be correctly mounted and orientated on the vehicle and maintained so that the beams are directed as specified.

Certification. Attention is drawn to the certification facilities described on the inside back cover of this standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Amendments issued since publication

Amd. No.	Date of issue	Comments
2247	March 1977	Indicated by a sideline in the margin

This British Standard, having been prepared under the direction of the Automobile Industry Standards Committee, was published under the authority of the Executive Board on 30 July 1976

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The following BSI references relate to the work on this standard:
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1 Scope

This British Standard specifies minimum performance and test requirements for headlamp optical aiming devices intended to facilitate quick, accurate aiming and checking of headlamps installed on road vehicles, leading, through correct alignment of the lamp, to safer night driving conditions.

The standard is restricted to headlamp optical aiming devices that employ a collimating lens to collect a representative amount of the luminous flux emitted by a headlamp. Such devices are constructed to give an image of the angular distribution of luminous flux from a headlamp.

2 References

The following standards publication is referred to in this standard.

BS AU 156, *Recommendations for aiming of headlamps and auxiliary lamps on motor vehicles*.

3 Definitions

For the purposes of this British Standard the following definitions apply.

3.1

headlamp

a lighting device mounted on a vehicle to provide illumination on the road

3.2

vertical median plane

a plane passing through the longitudinal centre line of the vehicle and perpendicular to the plane on which the vehicle is standing

3.3

optical axis

the axis of the device, joining the intersection of the H and V lines (HV point) (see Figure 1) of the screen and the optical centre of the lens when the screen is not offset

3.4

hot-spot

the zone of highest intensity of a beam as it appears to an observer viewing the beam thrown upon a screen or other aiming surface

3.5

four-headlamp system

four headlamps mounted in pairs, one pair on each side of the longitudinal plane of symmetry of the vehicle. In each pair, one headlamp contains a filament providing the main beam and the other headlamp contains a filament providing the dipped beam and, in certain types, an additional main beam filament

4 Mechanical design

4.1 The device shall consist basically of a frame and an optical assembly; it should be of robust construction.

4.2 The frame shall allow the optical assembly to be moved in front of each of the vehicle headlamps in succession.

4.3 The frame shall permit the height of the centre of the collimating lens to be adjusted, without altering its alignment, over the range 0.30 m to 1.20 m above ground level.

4.4 The device shall possess means enabling its optical axis to be set parallel to the vertical median plane of the vehicle the headlamps of which are to be tested. The angular error in the horizontal plane shall be not more than 5 cm in 10 m (0.3°).

4.5 The manufacturer shall specify the means to be adopted to set up and check the alignment of the optical axis of the device to the plane supporting the vehicle. Adjustment of not less than $\pm 3^\circ$ for portable devices and $\pm 1.5^\circ$ for rail mounted devices shall be provided between the optical axis and the supporting plane and alignment shall be possible to an accuracy of $\pm 0.1^\circ$.

4.6 The device shall be capable of correctly aiming headlamps having a reflector aperture with a horizontal dimension of 235 mm and a vertical dimension of 150 mm. It shall be possible to inscribe a circle of at least 165 mm diameter or a rectangle 190 mm horizontally and 120 mm vertically within the "light-accepting" area of the optical assembly.

5 Optical design

5.1 The optical assembly shall be equipped with one or more screens with minimum markings, as shown in Figure 1, which will indicate the aiming requirements for auxiliary driving lamps, headlamps to ECE regulations and for headlamps with the "Anglo-American" type of beam.

One or more photocells shall be provided for aiming headlamps by means of the hot-spot.

5.2 Observation of the screen shall be possible whilst the operator is aiming the headlamps.