

**SPECIFICATION**  
**HEADLAMP BEAM TESTERS**  
**FOR TESTING**  
**ALL CLASSES OF VEHICLE**

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## 1. INTRODUCTION

This Specification details the MINIMUM performance and constructional requirements for Headlamp Beam Testers (HBTs) intended to be used for the statutory annual MOT testing of all vehicle Classes in accordance with the Motor Vehicle (Tests) Regulations 1981, as amended. The Specification is also applicable for HBTs intended to be used for the statutory annual headlamp aim testing of Heavy Goods Vehicles (HGVs) in accordance with the Goods Vehicles (Plating and Testing) Regulations 1988, as amended, but note Section 2.3(b) below.

The Specification does not rule out additional features supplied with the equipment provided that the features are acceptable on health and safety grounds and do not prevent or make it more difficult to carry out the MOT Test as prescribed.

## 2. TECHNICAL REQUIREMENTS

The HBT shall comprise of a fully adjustable optical collimating lens assembly robustly constructed to acceptable engineering standards, with all wheels rail mounted, at least one of these rails must accurately guide the HBT.

The supporting body and framework of the equipment shall be robustly constructed so that distortion does not occur in general use, such as aligning the lens to the vehicle or manoeuvring the equipment along the rails.

If computer controlled assessment of headlamp aim is available as an option the position of any photoelectric cells used on the aiming screen shall not unduly impair visual assessment of headlamp aim. (see Section 1, para 2 above)

*Note 1: This Specification is based on a traditional HBT. Any alternative approach that does not meet the requirements specified below will be considered and assessed on its merits. Details of any alternative approach must be submitted with initial application*

*Note 2: A separate specification details the option of two sizes of wall mounted screens which are acceptable only for testing Class I/II vehicles (motorcycles).*

### 2.1 Rails

The HBT rails shall:

- a. be sturdy, robust and capable of being secured flat, and level within +/-2 mm over the traverse length detailed in 'b' below.
- b. allow the lens assembly to traverse as follows:

Class I & II	at least 1 metre
Class III & IV	at least 2.5 metres.
Class VL & VII	at least 3.5 metres
Class V, VI & HGV	at least 4 metres
- c. without distorting or collapsing, be capable of supporting a drive-over axle load of

Class I & II	at least 1000 kgs
Class III & IV	at least 2000 kgs
Class VL & VII	at least 3500 kgs
Class V, VI & HGV	at least 13000 kgs

It is recommended that rails are designed to be recessed into the floor if drive-over will occur.

## 2.2 Lens Assembly

*Note 1: The HBT's lens-assembly must be capable of accurately focusing all current types of headlights, including clear-lens and gas discharge methods of projection*

- a. the lens assembly shall be adjustable so that the centre of the lens can be set to any height in the range 500 mm to 1500 mm above the vehicle standing area. When set to the correct height the lens assembly shall be capable of being maintained in the set position without intervention
- b. the lens assembly shall be attached to the HBT in a sturdy manner with no detectable rock or flexing of the lens assembly when the unit is mounted on the HBT rails
- c. the HBT shall remain stable throughout the full vertical travel of the lens assembly.
- d. the HBT shall include an eye level mirror arrangement incorporating two parallel lines or a laser that enables the HBT to be accurately aligned with the longitudinal axis of the vehicle. To achieve this, the lens assembly shall be able to rotate in the horizontal plane (yaw) and when correctly aligned it shall be capable of being temporarily locked in the set position

*Note 2: A 'gun sight' alignment referencing the side of the vehicle is not acceptable.*

- e. for calibration purposes only, the lens assembly shall be adjustable in rotation in the vertical plane (pitch). Adjustment shall be possible only with the use of tools and after adjustment the mechanism shall be lockable.

## 2.3 Aiming Screen

- a. the aiming screen shall be positively located within the HBT and adjustable only with tools; attachment by adhesive is not acceptable as adjustment, either vertical or horizontal, may be necessary during calibration

*Note 1 There shall be no fixings contained within any of the area inside of the bandwidth lines*

- b. the aiming screen shall be marked with bandwidth lines coloured in accordance with the diagram shown in Annex A, Pages 1 & 2.

HBTs intended to be used for MOT testing of any vehicle other than HGVs shall be fitted with a **standard** screen with only the four solid red or blue lines showing the 0.5%, 1.25%, 2% and 2.75% positions (see Annex A, Page 1).

only when a HBT is to be supplied for testing HGV motor vehicles, a **special** screen which includes the two broken lines showing the 3.25% and 4% positions, which are relevant only to HGV motor vehicles, shall be necessary (see Annex A, Page 2)

*Note 2: Screens showing all six lines shall be acceptable only when the classes of vehicle tested include HGV motor vehicles*

- c. the markings shall be positioned within a tolerance of +/- 0.15 mm and line thickness for defining bandwidths shall not exceed 0.35 mm.
- d. all markings shall be permanent, durable, clear and legible.
- e. the aiming screen shall be clearly and permanently marked with the HBT manufacturer's logo in a position that can be seen easily when installed but away from the main screen markings; a suggested position is shown in Annex A
- f. if computer controlled assessment of headlamp aim is available as an option, the position of any photoelectric cells used on the aiming screen shall not impair visual assessment of headlamp aim. (See Section 1, para 2 above)
- g. the focal length of the lens assembly shall be provided along with the calculations used to derive the bandwidth spacing.

### **3. CALIBRATION**

- a. Calibration equipment shall be available to enable the lens and aiming screen of the HBT to be aligned accurately with the plane of the vehicle standing area. For the purposes of calibration it can be assumed that the vehicle standing area is flat and level. The provision of a horizontal beam of light will be acceptable to ensure that the HBT is set correctly
- b. The accuracy of the calibration equipment shall be traceable to an acceptable quality standard. For example, if a spirit level is used to set the test beam level, certification that the beam and spirit level correspond shall be provided.

### **4. OPERATING INSTRUCTIONS**

Comprehensive operating instructions will be supplied with each HBT and shall:

- a. be written in English
- b. explain how to operate the HBT, including the function of each control, and how to interpret the results.
- c. make reference to the need to follow the headlamp aim test procedure detailed in the latest version of the relevant MOT Inspection Manual when carrying out a statutory MOT test.

- d. state the focal distance of the HBT and the operational tolerance limits for positioning the vehicle headlamp in relation to the HBT for all types of headlamp, including clear-lens and gas-discharge types.
- e. detail the procedure for calibrating the HBT in relation to the vehicle standing area.

## **5. IDENTIFICATION**

The HBT shall be marked with a durable identification as shown on the approval certificate, on the exterior, clearly identifying the make, model and serial number and, which must be readily visible after the equipment has been installed. A copy of the approval certificate will also be issued to the Vehicle Testing Station after installation, showing the make/ model / serial number, and the address of the place of installation.