

	SURFACE VEHICLE RECOMMENDED PRACTICE	
	SAE	J600 AUG2009
	Issued Revised	1952-12 2009-08
Superseding J600 FEB1993		
(R) Headlamp Aim Test Machines		

RATIONALE

Revisions to SAE J600:

Added "This specification does not apply to motorcycle headlamps." to the Scope

Removed "bonded" from RBHL definition of Section 3.3

Added reference to SAE J1383 regarding Group I and Group II aim pads of Section 3.4

Modified 5.1.1 changing "specified" to "the following"

Expanded to the use of photometry test results as a method for determining equipment compliance in Section 5.1.3.

Added relevant definitions and updated terminology from SAE J387 and SAE J1383

Included a broader range of test lamps to include recently developed types of headlamps

Included SAE J599 aim method since the headlamp aimer often is a screen replacement

Permit compliance of aim accuracy if the headlamp aim machine positions the test lamp such that it complies with the relevant photometric requirements

Decreased the accuracy required for alignment

Increased the lower limit of aim machine vertical height range

Removed references to SAE J582 "Auxiliary Low Beam Lamps" which was cancelled July 2005

FOREWORD

Relationship of SAE Standard to ISO Standard—Not applicable.

1. SCOPE

This SAE Recommended Practice provides laboratory test procedures for testing headlamp aim test machines to verify their ability to aim or to inspect the aim of headlamps, fog lamps, and auxiliary high beam lamps. This specification does not apply to aiming devices of the kind covered by SAE J602. This specification does not apply to motorcycle headlamps.

2. REFERENCES

2.1 Applicable Publications

The following publications form a part of this specification to the extent specified herein. Unless otherwise specified, the latest issue of SAE publications shall apply.

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2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J387	Terminology—Motor Vehicle Lighting
SAE J575	Test Methods and Equipment for Lighting Devices and Components for Use on Vehicles Less than 2032 mm in Overall Width
SAE J581	Auxiliary High Beam Lamps
SAE J583	Front Fog Lamp
SAE J599	Lighting Inspection Code
SAE J602	Headlamp Aiming Device for Mechanically Aimable Headlamp Units
SAE J1383	Performance Requirements for Replaceable Bulb Motor Vehicle Headlamps
SAE J2595	Performance Requirements for Sealed Beam Motor Vehicle Headlamps

2.2 Related Publications

The following publications are provided for information purposes and are not a required part of this document.

2.2.1 Federal Publications

Available from the Superintendent of Documents, U.S. Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, Tel: 202-512-1800, <http://www.gpoaccess.gov/cfr/retrieve.html>.

49CFR571.108 (FMVSS 108) Lamps, Reflective Devices, and Associated Equipment

3. DEFINITIONS

3.1 Headlamp Aim Test Machine

A headlamp aim test machine is an optical or photoelectric device used to aim or check the aim of forward lighting devices. The headlamp aim test machine shall permit an operator to aim a forward lighting device without the use of specialized aim equipment such as a mechanical aimer or aim screen.

A headlamp aim test machine will aim a headlamp in which the original lamp aim system is no longer functional, such as chipped aiming pads or VHAD systems out of calibration.

The preferred aim method is the design method. Headlamps with VHAD aim should be aimed using the VHAD system.

3.2 Headlamp Optical Axis

The line formed by the intersection of a horizontal and a vertical plane through the light source parallel to the longitudinal axis of the vehicle. If the optical axis of the headlamp is not at the geometric center of the lens, then the location will be indicated by the manufacturer on the headlamp.

3.3 Replaceable Bulb Headlamp (RBHL)

Replaceable bulb headlamp means a headlamp comprising a lens and reflector assembly and one or two replaceable headlamp light sources.

3.4 Mechanically Aimable Headlamp

A headlamp having three pads on the lens, forming an aiming plane or an aiming ring, the aiming plane or aiming ring being used for laboratory photometric testing and for inspecting the aim of the headlamp when installed on the vehicle. The pads shall be grouped into Group I or Group II locations as defined in SAE J1383.

3.5 Vehicle Headlamp Aiming Device (VHAD)

An aiming device incorporated in the headlamp system which allows for inspection and adjustment of headlamp aim without the use of aim measuring equipment external to the vehicle.

3.6 Visually/Optically Aimable Headlamp

A headlamp which is designed to be aimed visually by placing the beam pattern onto a specified location onto a screen or optically aimed by the placement of the cutoff gradient maximum at a designated location.

3.6.1 Headlamps intended to be aimed vertically using the left side of the low beam pattern, marked "VOL."

3.6.2 Headlamps intended to be aimed vertically using the right side of the low beam pattern, marked "VOR."

3.6.3 Headlamps intended to be aimed via the high beam pattern, marked "VO."

3.6.4 Headlamps intended to be aimed horizontally using a 0.2°D scan and be aimed vertically via the right side of the low beam pattern, marked "VORH1."

3.6.5 Headlamps intended to be aimed horizontally using a 0.2°D scan and be aimed vertically via the left side of the low beam pattern, marked "VOLH1."

3.6.6 Headlamps intended to be aimed horizontally using a 3-line scan shall be aimed vertically via the left side of the low beam pattern, marked "VOLH2."

3.7 Auxiliary High Beam Lamp

A lighting device intended to supplement the high beam of the headlamps in providing illumination forward of the vehicle. It is not intended for use alone or with the low beam of headlamps.

3.8 Front Fog Lamp

A lighting device designed to provide illumination forward of the vehicle under conditions of fog, rain, snow, or dust.

4. TESTS

4.1 Samples for Test

4.1.1 Headlamp aim test machines submitted for laboratory verification tests should be representative of the device as regularly manufactured and marketed, except that in the case of a machine using a track, an abbreviated section of track may be supplied for the test. Each sample shall include all accessory equipment for the device both necessary to its service operation and calibration. Full assembly and operating instructions shall be provided, including information on how to check accuracy and maintain the device in calibration.

4.1.2 Sample lamps for test shall meet SAE and FMVSS 108 specifications and should include the following:

A group of sealed beam headlamp units (high beam and low beam).

A group of RBHL that use mechanical (Group I and II), VHAD, VOL and VOR aim procedures.

A group of fog lamps that represent older style and second generation types with sharp cutoffs.

A group of auxiliary high beam lamps.

The lamps should have at least 120% of all the minimum test point values and no more than 90% of all the maximum test point values under standard aim (not necessarily when using the headlamp aim test machine).

4.2 Laboratory Facilities

The laboratory shall be equipped with facilities to make physical and optical tests required in this report, in accordance with established laboratory practice. It will include a goniometer, an aim screen located at 7.6 m from the goniometer, and calibrated photometer(s).

4.3 Test Procedures

4.3.1 The sample lamp and test fixture shall be mounted on a goniometer which meets the requirement of the Photometry Test in SAE J575.

4.3.2 The sample lamp should be operated at rated voltage. The lamp shall be kept burning through the end of test.

4.3.3 Lamp Aim (Initial)

4.3.3.1 The headlamp shall be aimed using one of the two following methods:

- a. Mechanical aim, VHAD aim, or VO aim per the lamp design
- b. Visual alignment per SAE J599 section *Headlamp Aim and Inspection of Aim*

4.3.3.2 The auxiliary high beam lamp shall be aimed using one of the two following methods:

- a. The procedure specified in SAE J581.
- b. Visual alignment per SAE J599 section *Aim and Inspection of Aim for Foglamps and Auxiliary High Beam (Driving) Lamps*.

4.3.3.3 The foglamp shall be aimed using one of the two following methods:

- a. The procedure specified in SAE J583. The version of SAE J583 used shall be appropriate for the type of fog lamp used (see lens marking for indication of version).
- b. Visual alignment per SAE J599 section *Aim and Inspection of Aim for Foglamps and Auxiliary High Beam (Driving) Lamps*.

4.3.4 Goniometer initial readings (H_i , V_i) shall be recorded.

4.3.5 The headlamp aim test machine shall be positioned in front of the sample lamp according to the manufacturer's instructions.

4.3.6 The sample lamp shall be aimed according to the aim test machine manufacturer's instructions, using the goniometer to position the lamp.

4.3.7 The final goniometer reading (H_f , V_f) shall be recorded after the above aim.

4.3.8 The aim test machine shall be removed from its position in the front of the lamp.