SURFACE VEHICLE RECOMMENDED PRACTICE

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(R) Off-Highway Vehicle Headlamps

RATIONALE

The SAE J1623 rewrite rationale which was named All-Terrain Vehicle Headlamps is being rewritten and it is proposed to be named as Off-Highway Vehicle Headlamps. The reason for the change in title is to expand the scope of the document to better match the products that use this document. The rationale also includes new areas that:

- provide an alternative beam pattern for faster vehicles while keeping the existing beam pattern for slower vehicles
- make the references to light sources as opposed to bulbs
- with the development of LED Technology, add some new sections specifically to address the use of light sources (to allow new technology)
- include new elements to allow for the safe application of LEDs and more sophisticated drive circuits.

FOREWORD

This SAE Recommended Practice is intended as a guide toward standard practice, but may be subject to frequent change to keep pace with experience and technical advances. Hence, its use where flexibility of revision is impractical is not recommended.

1. SCOPE

This SAE Recommended Practice provides test procedures and performance requirements for off-highway vehicle headlamps.

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2. REFERENCES

2.1 Applicable Documents

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

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 J575 Test Methods and Equipment for Lighting Devices for Use on Vehicles Less than 2032 mm in Overall Width

SAE J577 Vibration Test Machine and Operation Procedure

SAE J578 Color Specification

SAE J759 Lighting Identification Code

SAE 2357 Application guide lines for electronically driven and/or controlled exterior automotive lighting equipment

SAE J2650 Performance Requirements for LED Road Illumination Devices

3. DEFINITIONS

3.1 OFF-HIGHWAY VEHICLE (OHV)

An off-highway vehicle is any motorized vehicle less than 2032 mm (80 in) in overall width, with a Gross Vehicle Weight Rating of 1,814 kg (4,000 lb) or less, designed to travel on four or more off-road tires/wheels, with handlebars or a steering wheel for steering control, and which is intended by the manufacturer to be used exclusively off-highway. Width and weight shall be exclusive of accessories and optional equipment.

3.2 OFF-HIGHWAY VEHICLE (OHV) HEADLAMP

An off-highway vehicle headlamp is one or more lamps used as the major lighting device to provide general illumination ahead of an off-highway vehicle. The photometric requirements stated for Class 1 (in Tables 1 and 2) or Class 2 (in Tables 3 and 4) represent the illumination requirement for an OHV.

3.2.1 If multiple headlamps are used to meet this document,

3.2.1.1 The combination of lamps, as mounted on the OHV, shall meet the requirements when treated as one lamp, or

3.2.1.2 Each independent lamp shall meet the requirements individually. However, for the test points at 0.5U in Table 2 and Table 4, the sum of the values of all lamps must be below two times the maximum requirement.

3.2.2 The headlamp shall not be obstructed by any part of the OHV throughout the photometric test angles unless the lamp is designed to comply with all photometric requirements with these obstructions considered.

4. GENERAL REQUIREMENTS

4.1 The following sections from SAE J575 are a part of this document:

a. Definitions

b. Light Sources

c. Vibration

d. Moisture Test

e. Dust Test

f. Corrosion Test

g. Photometry Test

h. Warpage Test Devices with Plastic Components

i. Color Test - Light shall be white as per SAE J578.

NOTE: For LED light sources, the "Red Spectral Content" requirement of SAE J2650 shall be met.

NOTE: Sealed Beam headlamps need not comply with Sections 4.3 and 4.4 of SAE J575.

4.2 Off-highway vehicle lamps meeting the requirements of Photometry Class 1 of this document may be identified by the code "OHV-1" in accordance with SAE J759. Off-highway vehicle lamps meeting the requirements of Photometry Class 2 of this document may be identified by the code "OHV-2" in accordance with SAE J759.

5. VIBRATION TEST

5.1 Scope

This test evaluates the ability of the sample headlamp to resist damage from vibration-induced stresses. This test is not intended to test the vibration resistance of bulbs or the internal components of sealed-beam units.

5.2 Test Equipment

Any vibration test machine which provides the displacement and frequency specified in 5.3 may be used.

5.3 Test Procedure

A sample unit shall be mounted to a vibration test machine and vibrated at12.5 Hz through a distance of 3.2 mm.

5.4 Test Duration

The test shall be continuous for 1 h.

5.5 Requirements

Upon completion of test procedure 5.3 and 5.4, any unit showing evidence of material physical weakness, lens or reflector rotation, displacement, cracking or rupture of parts except bulb failure(s), shall be considered to have failed. Any rotation of a lens or reflector that occurs does not constitute failure of the test if the device still meets the photometric requirements with the component(s) in their rotated, post-vibration test position.

6. AIMING ADJUSTMENT TESTS

6.1 A minimum aiming adjustment of ±4 degrees shall be provided in the vertical plane from a basic aiming position of 0.5D-V (±0.5 degrees) with the machine on a hard surface and the suspension adjusted to the manufacturer's recommended setting and the machine loaded to simulate a 77-82 kg (170-180 lb) operator at the designated seating position.

6.2 The headlamp mounting mechanism, including the aiming adjustment, shall be so designed as to prevent the unit from permanently receding into the lamp body or housing when an inward force of 222 N (50 lb) is exerted at the geometric center of the outer surface of the lens.

6.3 When adjusting screws are employed, they shall be equipped with self-locking devices which will operate satisfactorily for a minimum of 10 adjustments on each screw, over a length of screw thread.

6.4 Headlamp Mounting

The headlamp shall be mounted on the OHV as high as practicable above the surface of the ground and below the operator's line of sight.

In order to facilitate setting and maintaining the proper adjustment of the headlamp on OHVs in use, the following requirements for a headlamp design and mounting shall be adopted and followed in general practice and be equally applicable to new designs of headlamps and mountings. Headlamps and headlamp mountings shall be designed and constructed so that:

6.4.1 The axis of the light beam may be adjusted conveniently by one person using ordinary tools, up and down from the designed setting.

6.4.2 When the headlamp is secured, the aim will not be disturbed under ordinary conditions of operation.

6.5 Visual Service Aiming

The geometric center of the high intensity zone of the upper beam of the multiple beam headlamps shall be deemed sufficiently defined for the purpose of service aiming if it can be set by three experienced observers/technicians on a vertical screen at 7.6 m (25 ft) within a maximum vertical deviation of ±0.2 degrees {25.4 mm (1 in)} and within a maximum horizontal deviation of ±0.4 degrees {50.5 mm (2 in)} The aim for each observer/technician shall be taken as the average of at least three observations.

7. PHOTOMETRIC TEST

7.1 Scope

This test evaluates the ability of the headlamp or headlamps to meet the applicable luminous intensity requirements of Class 1 (in Tables 1 and 2) or Class 2 (in Tables 3 and 4).

Tables 3 and 4 (Class 2) provide alternative photometrics that can be used, but are not required.

7.2 Beam Aim

The upper beam of a multiple beam headlamp shall be aimed photo electrically so that the center of the zone of highest intensity falls 0.5 degrees vertically below the lamp axis and centered laterally. A headlamp unit having only a single beam shall be aimed with the top of the cutoff of the beam at horizontal and centered by balancing the points 6 degrees left and 6 degrees right.

The single beam headlamp shall meet the candela requirements of Table 2 or Table 4.