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Superseding J584 JAN2003

## Motorcycle Headlamps

1. **Scope**—This SAE Standard provides design parameter and general requirements for motorcycle headlamps.

2. **References**

2.1 **Applicable Publications**—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, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J107—Operator Controls and Displays on Motorcycles

SAE J213—Motorcycle Classification

SAE J565—Semiautomatic Headlamp Beam Switching Devices

SAE J575—Test Methods and Equipment for Lighting Devices and Components for Use on Vehicles Less Than 2032 mm in Overall Width

SAE J576—Plastic Materials for Use in Optical Parts Such as Lenses and Reflectors of Motor Vehicle Lighting Devices

SAE J578—Color Specification

SAE J1383—Performance Requirements for Motor Vehicle Headlamps

3. **Definitions**

3.1 A Motorcycle Headlamp is a major lighting device used to provide general illumination ahead of the vehicle.

4. **Laboratory Requirements**

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

4.1.1 SECTION 3.1—VIBRATION TEST

4.1.2 SECTION 3.2—MOISTURE TEST

4.1.3 SECTION 3.3—DUST EXPOSURE TEST

4.1.4 SECTION 3.4—CORROSION TEST

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SAE WEB ADDRESS:

4.1.5 SECTION 3.5—WARPAGE TEST ON DEVICES WITH PLASTIC COMPONENTS

4.1.6 SECTION 3.6—PHOTOMETRY TEST

**4.2 Plastic Materials**—Any plastic material used in optical parts shall comply with the requirements set forth in SAE J576.

**4.3 Color Test**—Color of the light from a motorcycle headlamp shall be white, as defined in SAE J578.

**4.4 Aiming Adjustment Tests**

4.4.1 A minimum aiming adjustment of 4 degrees in each direction from the vertical and horizontal planes shall be provided.

4.4.2 Headlamps with independent vertical and horizontal aiming adjusting mechanisms:

4.4.2.1 The headlamp unit mounting shall be provided with independent vertical and horizontal aiming adjustments. The adjustment mechanisms shall be designed so that neither the vertical nor horizontal aim will deviate more than 100 mm (4 in) from the horizontal or vertical planes, respectively, at a distance of 7.6 m (25 ft) through an angle of  $\pm 4$  degrees.

4.4.2.2 When adjusting screws are employed, they shall be equipped with self-locking devices which operate satisfactorily for a minimum of 10 adjustments on each screw, over a length of screw thread of  $\pm 3$  mm ( $\pm 1/8$  in).

4.4.3 Headlamps with ball and socket or equivalent adjustment means need not conform with 3.4.2.

**4.5 Inward Force Test**—The mechanism, including the aiming adjusters, shall be designed to prevent the unit from receding permanently by more than 2.5 mm (0.1 in) into the lamp body or housing when an inward force of 222 N (50 lbf) is exerted at the geometric center of the outer surface of the lens.

**4.6 Clarity of Hot Spot Definition**—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 on a vertical screen at 7.6 m (25 ft) within a maximum vertical deviation of  $\pm 0.3$  degrees and within a maximum horizontal deviation of  $\pm 0.4$  degrees. The aim for each observer shall be taken as the average of at least three observations.

**4.7 Beam Aim During Photometric Test**

4.7.1 The upper beam of a multiple beam headlamp shall be aimed photoelectrically so that the center of the zone of highest intensity falls 0.4 degrees vertically below the lamp axis and is centered laterally. The center of the zone of highest intensity shall be established by the intersection of a horizontal plane passing through the point of maximum intensity, and the vertical plane established by balancing the photometric values at 3 degrees left and 3 degrees right.

4.7.2 The beam of a single beam, SAE J213 Classification A + L (moped) lamp shall be aimed photoelectrically so that the center of the zone at highest intensity falls 1.5 degrees vertically below the lamp axis and is centered laterally. The center of the zone of highest intensity shall be established by the intersection of a horizontal plane passing through the point of maximum intensity, and the vertical plane established by balancing the photometric values at 3 degrees left and 3 degrees right.

#### 4.8 Photometric Design Requirements

- 4.8.1 TEST PROCEDURES—Photometric tests shall be made with photometer at a distance of at least 18.3 m (60 ft) from the unit. The bulb or unit shall be operated at 6.4 V for a 6 V system and 12.8 V for a 12 V system during the test.
- 4.8.2 DESIGN INTENSITY REQUIREMENTS—The beam or beams from the unit shall be designed to conform to the intensity specifications in Tables 1, 2, or 3. A tolerance of  $\pm 0.25$  degree in location may be allowed for any test point.

**TABLE 1—HEADLAMP CANDELA INTENSITY REQUIREMENT (cd)  
CLASS C, D, AND H MOTORCYCLE**

| Test Points<br>(Degrees) | Min cd | Max cd |
|--------------------------|--------|--------|
| <b>Upper Beam</b>        |        |        |
| 2U-V                     | 1000   |        |
| 1U-3L and 3R             | 2000   |        |
| H-V                      | 12 500 |        |
| 1/2D-V                   | 20 000 |        |
| 1/2D-3L and 3R           | 10 000 |        |
| 1/2D-6L and 6R           | 3300   |        |
| 1/2D-9L and 9R           | 1500   |        |
| 1/2D-12L and 12R         | 800    |        |
| 1D-V                     | 17 500 |        |
| 2D-V                     | 5000   |        |
| 3D-V                     | 2500   |        |
| 3D-9L and 9R             | 1500   |        |
| 3D-12L and 12R           | 300    |        |
| 4D-V                     | 1500   | 7500   |
| Anywhere                 |        | 75 000 |
| <b>Lower Beam</b>        |        |        |
| 1-1/2U-1R to R           |        | 1400   |
| 1U-1-1/2L to L           |        | 700    |
| 1/2U-1-1/2L to L         |        | 1000   |
| 1/2U-1R to 3R            |        | 2700   |
| 1-1/2D-9L and 9R         | 700    |        |
| 2D-V                     | 7000   |        |
| 2D-3L and 3R             | 4000   |        |
| 2D-6L and 6R             | 1500   |        |
| 2D-12L and 12R           | 700    |        |
| 3D-6L and 6R             | 800    |        |
| 4D-V                     | 2000   |        |
| 4D-4R                    |        | 12 500 |

**TABLE 2—HEADLAMP CANDELA INTENSITY REQUIREMENT (cd)  
CLASS B, C, AND L MOTORCYCLE**

| Test Points<br>(Degrees) | Class B<br>C + H<br>Min cd | Class B<br>C + H<br>Max cd | Class A, B, E<br>+ L Min cd | Class A, B, E<br>+ L Max cd |
|--------------------------|----------------------------|----------------------------|-----------------------------|-----------------------------|
| <b>Upper Beam</b>        |                            |                            | 1000                        |                             |
| 1U-3L and 3R             | 2000                       |                            | 5000                        |                             |
| H-V                      | 10 000                     |                            | 7500                        |                             |
| 1/2D-V                   | 20 000                     |                            | 3000                        |                             |
| 1/2D-3L and 3R           | 5000                       |                            | 800                         |                             |
| 1/2D-6L and 6R           | 2000                       |                            | 5000                        |                             |
| 1D-V                     | 15 000                     |                            | 3000                        |                             |
| 2D-V                     | 5000                       |                            | 1000                        |                             |
| 3D-V                     | 2500                       |                            | 500                         |                             |
| 3D-6L and 6R             | 800                        |                            |                             |                             |
| 4D-V                     |                            | 7500                       |                             | 7500                        |
| Anywhere                 |                            | 75 000                     |                             | 75 000                      |
| <b>Lower Beam</b>        |                            |                            |                             |                             |
| 1-1/2U-1R to R           |                            | 1400                       |                             | 1400                        |
| 1U-1-1/2L to L           |                            | 700                        |                             | 700                         |
| 1/2U-1-1/2L to L         |                            | 1000                       |                             | 1000                        |
| 1/2U-1R to 3R            |                            | 2700                       |                             | 2700                        |
| 2D-V                     | 5000                       |                            | 4000                        |                             |
| 2D-3L and 3R             | 3000                       |                            | 3000                        |                             |
| 2D-6L and 6R             | 1500                       |                            | 1500                        |                             |
| 3D-6L and 6R             | 800                        |                            | 800                         |                             |
| 4D-V                     | 2000                       |                            | 2000                        |                             |
| 4D-4R                    |                            | 12 500                     |                             | 12 500                      |

**TABLE 3—HEADLAMP CANDELA INTENSITY REQUIREMENT (cd)  
CLASS C AND E MOTORCYCLE**

| Test Points<br>(Degrees) | Min cd | Max cd |
|--------------------------|--------|--------|
| <b>Single Beam</b>       |        |        |
| 1-1/2U-1R to 3R          |        | 1400   |
| 1U-1-1/2L to L           |        | 700    |
| 1/2U-1-1/2L to L         |        | 1000   |
| 1/2U-1R to 3R            |        | 2700   |
| 2D-V                     | 4000   |        |
| 2D-3L and 3R             | 3000   |        |
| 2D-6L and 6R             | 1500   |        |
| 4D-V                     | 1000   |        |
| 4D-4R                    |        | 12 500 |