The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

# SURFACE VEHICLE STANDARD

SAE J587 | REV. MAR93

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Superseding J587 AUG85

Submitted for recognition as an American National Standard

## (R) LICENSE PLATE ILLUMINATION DEVICES (REAR REGISTRATION PLATE ILLUMINATION DEVICES)

1. ***Scope***—This SAE Standard provides test procedures, requirements, and guidelines for vehicular license plate illumination devices.

2. ***References***

**2.1 Applicable Documents**—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J567—Lamp Bulb Retention System
SAE J575—Tests for Motor Vehicle Lighting Devices and Components
SAE J576—Plastic Materials for Use in Optical Parts Such as Lenses and Reflectors of Motor Vehicle Lighting Devices
SAE J578—Color Specification
SAE J759—Lighting Identification Code

2.1.2 ASTM PUBLICATION—Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM E 179—Selection of Geometric Conditions for Measurement of Reflection and Transmission Properties of Materials

**2.2 Definitions**

2.2.1 A LICENSE PLATE ILLUMINATION DEVICE is a device that illuminates the license plate on the rear of a vehicle.

3. ***Lighting Identification Code***—License plate illumination devices may be identified by the code "L" in accordance with SAE J759.

4. ***Tests***

4.1 SAE J575 is a part of this document. The following tests are applicable with modifications as indicated.





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4.1.1 VIBRATION TEST

4.1.2 MOISTURE TEST

4.1.3 DUST TEST

4.1.4 CORROSION TEST

4.1.5 WARPAGE TEST ON DEVICES WITH PLASTIC COMPONENTS

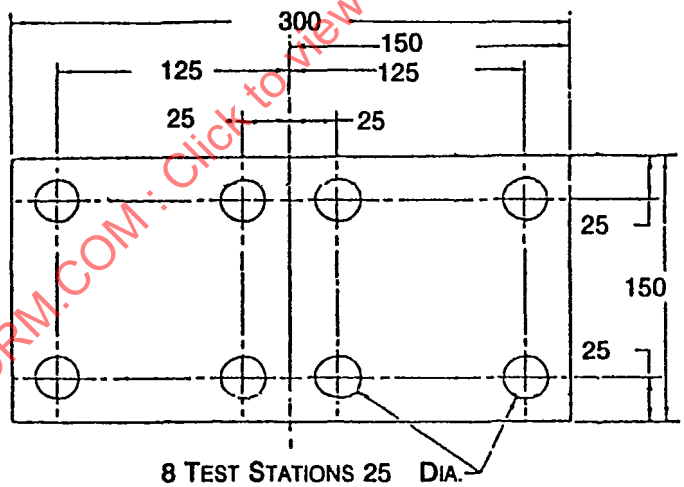
**4.2 Color Test**—SAE J578 is part of this document.

**4.3 Photometry Test**

4.3.1 TEST EQUIPMENT

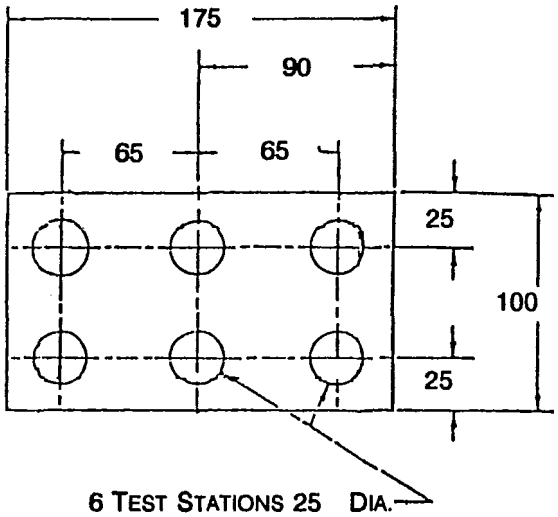
*4.3.1.1 Test Plate*—All luminance measurements shall be made on a rectangular test plate of clean, smooth, matte white blotting paper or an equivalent material with a diffuse white surface. The test plate shall have a total reflectance factor of 85% ± 5% when measured in accordance with ASTM E 179 (0/t illumination/viewing geometry). The size of the test plate is shown in Figure 1 or 2, as applicable. For devices used on vehicles other than motorcycles and motor-driven cycles, test stations shall be located on the face of the test plate as shown in Figure 1. For devices used on motorcycles and motor-driven cycles, the test stations shall be located on the face of the test plate as shown in Figure 2.






NOTE—DIMENSIONS ARE IN mm

FIGURE 1—TEST PLATE FOR VEHICLES OTHER THAN MOTORCYCLES AND MOTOR-DRIVEN CYCLES




NOTE—DIMENSIONS ARE IN mm

FIGURE 2—TEST PLATE FOR MOTORCYCLES AND MOTOR-DRIVEN CYCLES

*4.3.1.2 Luminance Meter*—A luminance meter shall be used to measure the luminance over the entire area of each circular test station on the test plate. The meter shall be calibrated to measure luminance in cd/m$^2$. Measurements shall not include any area beyond that of the test station.

4.3.2 TEST PROCEDURE

*4.3.2.1* The test plate shall be mounted in the position ordinarily taken by the license plate. The face of the test plate shall be located 2 mm from the plane of the license plate holder toward the luminance meter.

*4.3.2.2* Luminance measurements shall be made with the optical axis of the luminance meter perpendicular to the test plate surface within ±5 degrees. Measurements shall be recorded at each of the circular test station areas specified in Figure 1 or Figure 2, as applicable.

*4.3.2.3* Calculate and record the ratio of the maximum to the minimum luminance over all specified test points. For test plates conforming to Figure 1, the average of the two highest and the two lowest luminance values recorded at the eight test stations shall be taken as maximum and minimum, respectively. For test plates conforming to Figure 2, the highest luminance value and the average of the two lowest luminance values recorded at the six test stations shall be taken as maximum and minimum, respectively.

## *5. Requirements*

**5.1 Performance Requirements**—A device, when tested in accordance with the test procedures specified in Section 4, shall meet the following requirements:

5.1.1 VIBRATION—SAE J575

5.1.2 MOISTURE—SAE J575

5.1.3 DUST—SAE J575

5.1.4 CORROSION—SAE J575

5.1.5 WARPAGE—SAE J575

**5.2 Color**—The color of the light from the license plate illumination device(s) shall be white as specified in SAE J578.

**5.3 Photometry**—Upon completion of the photometry test procedure (paragraph 4.3), the following requirements shall apply:

5.3.1 The luminance at each of the test station areas on the applicable test plate shall be at least 2.5 cd/$m^2$.

5.3.2 For tests based on Figure 1, the ratio of maximum to minimum luminance shall not exceed 20/1. For tests based on Figure 2, the ratio of maximum to minimum luminance shall not exceed 15/1.

5.3.3 If a tail or stop lamp is combined with a license plate illumination device, the combination shall also meet the requirements for these devices.

**5.4 Materials Requirements**—Plastic materials used in the optical parts shall meet the requirements of SAE J576. Since some license plate illumination devices are mounted in shaded or protected locations, attention is called to the section of SAE J576 which covers exposure time and conditions.

**5.5 Design Requirements**

5.5.1 License plate illumination devices for vehicles other than motorcycle and motor-driven cycles shall be of such size and design as to provide illumination on all parts of a 150 x 300 mm test plate, except for a 13 mm wide border around the plate periphery. License plate illumination devices for motorcycle and motor-driven cycles shall be of such size and design as to provide illumination on all parts of a 100 x 175 mm test plate.

5.5.2 The design shall be such that, when the plate is mounted on a vehicle as intended, the angle between the plane of the license plate and the plane on which the vehicle stands shall be 90 degrees ± 15 degrees.

**5.6 Installation Requirements**

5.6.1 The license plate illumination device(s) for vehicles other than motorcycles or motor-driven cycles shall be mounted so as to illuminate the plate without obstruction from any designed feature unless the device(s) is designed to comply with the obstructions considered.

5.6.2 Except for a 13 mm wide border around its periphery, visibility of the license plate shall not be obstructed by any part of the vehicle when any point on the license plate is projected directly to the rear of the vehicle.

5.6.3 The license plate illumination device(s) shall be installed so that no white light is projected from the illumination device(s) directly to the rear of the vehicle.

5.6.4 The license plate illumination device(s) for vehicles other than motorcycles and motor-driven cycles shall be mounted so as to illuminate the plate from the top or sides. Illumination from the bottom of the plate is permitted provided other illumination is also provided from the top or sides of the plate.

***6. Guidelines***

**6.1 Installation Guidelines**—The following apply to license plate illumination devices as used on the vehicle and shall not be considered part of the requirements.

6.1.1 The license plate holding device shall be designed and constructed to provide a substantial plane surface on which to mount the plate.

## 7. *Notes*

**7.1 Marginal Indicia**—The (R) is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.



PREPARED AND APPROVED BY THE SAE SIGNALLING AND MARKING DEVICES STANDARDS COMMITTEE

## APPENDIX A

*A.1* As a matter of information, attention is called to SAE J567 for requirements and gages to be used in socket design.