

Submitted for recognition as an American National Standard

**Stop Lamps for Use on Motor Vehicles  
Less Than 2032 mm in Overall Width**

**1. Scope**—This SAE Standard provides test procedures, requirements, and guidelines for stop lamps intended for use on vehicles of less than 2032 mm in overall width.

**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 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 J579—Lighting Code Identification

SAE J1050—Describing and Measuring the Driver's Field of View

**2.2 Related Publications**—The following publications are provided for information purposes only and are not a required part of this document.

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

SAE J222—Parking Lamps (Front Position Lamps)

SAE J585—Tail Lamps (Rear Position Lamps) for Use on Motor Vehicles Less Than 2032 mm in Overall Width

SAE J586 FEB84—Stop Lamps for Use on Motor Vehicles Less Than 2032 mm in Overall Width

SAE J588 NOV84—Turn Signal Lamps for Use on Motor Vehicles Less Than 2032 mm in Overall Width

SAE J592—Clearance, Side Marker, and Identification Lamps

SAE J594—Reflex Reflectors

SAE J1395 MAY85—Front and Rear Turn Signal Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width

SAE J1398—Stop Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width

SAE J1957—Central High Mounted Stop Lamp Standard for Use on Vehicles Less than 2032 mm Overall Width

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## SAE J586 Revised MAR2000

SAE J2040—Tail Lamps (Rear Position Lamps) for Use on Vehicles 2032 mm or More in Overall Width  
SAE J2042—Clearance, Sidemarker, and Identification Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width

2.2.2 NHTSA PUBLICATION—Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

FMVSS108 56 FR 64733 – 64737

### 3. **Definitions**

3.1 **Stop Lamps**—Lamps giving a steady light to the rear of a vehicle to indicate the intention of the operator of a vehicle to stop or diminish speed by braking.

4. **Lighting Identification Code**—Stop lamps for use on vehicles less than 2032 mm in overall width may be identified by the code “S” in accordance with SAE J759.

### 5. **Tests**

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

5.1.1 VIBRATION TEST

5.1.2 MOISTURE TEST

5.1.3 DUST TEST

5.1.4 CORROSION TEST

5.1.5 PHOTOMETRY TEST

5.1.5.1 Photometric measurements shall be made with the light source of the signal lamp at least 3 m from the photometer. The H-V axis shall be taken as parallel to the longitudinal axis of the vehicle.

5.1.5.2 Photometric measurements shall be made with the bulb filament steadily burning. Photometric measurements of multiple compartment lamps or multiple lamp arrangements shall be made by either of the following methods by aligning the axis of each lamp or compartment with the photometer:

5.1.5.2.1 All compartments or lamps shall be photometered together provided that a line from the light source of each compartment or lamp to the center of the photometer sensing device does not make an angle of more than 0.6 degree with the photometer H-V axis. When compartments or lamps are photometered together, the H-V axis shall intersect the midpoint between their light sources.

5.1.5.2.2 Each compartment or lamp shall be photometered separately. The photometric measurement for the entire multiple compartment lamp or multiple lamp arrangement shall be determined by adding the photometric outputs from each individual lamp or component at corresponding test points.

5.1.6 WARPAGE TEST FOR DEVICES WITH PLASTIC COMPONENTS

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

**6. Requirements**

**6.1 Performance Requirements**—A device when tested in accordance with the test procedures specified in Section 5, shall meet the following requirements:

6.1.1 VIBRATION—SAE J575

6.1.2 MOISTURE—SAE J575

6.1.3 DUST—SAE J575

6.1.4 CORROSION—SAE J575

6.1.5 PHOTOMETRY—SAE J575

6.1.5.1 The lamp shall be designed to conform to the zone total photometric requirements of Table 1 and its footnotes. The summation of the luminous intensity measurements at the test points in a zone shall be at least the value shown.

6.1.5.2 A multiple compartment lamp or multiple lamps may be used to meet the photometric requirements of a stop lamp. If a multiple compartment or multiple lamps are used and the distance between adjacent light sources does not exceed 560 mm for two compartments or lamp arrangements and does not exceed 410 mm for three compartments or lamp arrangements, then the combination of the compartments or lamps must be used to meet the photometric requirements for the corresponding number of lighted sections (Table 1). If the distance between adjacent light sources exceeds the dimensions, each compartment or lamp shall comply with the photometric requirements for one lighted section (Table 1).

6.1.5.3 When a tail lamp is combined with the stop lamp, the stop lamp shall not be less than three times the luminous intensity of the tail lamp at any test point; except that at H-V, H-5L, H-5R, and 5U-V, the stop lamp shall not be less than five times the luminous intensity of the tail lamp. If a multiple compartment or multiple lamp arrangement is used and the distance between optical axis for both the tail lamp and stop lamp is within the dimensions specified in 6.1.5.2, the ratio of the stop lamp to the tail lamp shall be computed with all the compartments or lamps lighted. If a multiple compartment or multiple lamp arrangement is used and the distance between optical axes for one of the functions exceeds the dimensions specified in 6.1.5.2, the ratio shall be computed for only those compartments or lamps where the tail lamp and stop lamp are optically combined. When the tail lamp is combined with the stop lamp, and the maximum luminous intensity of the tail lamp is located below horizontal and within an area generated by a 0.5 degree radius around a test point, the ratio for the test point may be computed using the lowest value of the tail lamp luminous intensity within the generated area.

6.1.6 WARPAGE—SAE J575

6.1.7 COLOR—The color of light from the stop lamps shall be red as specified in SAE J578.

**6.2 Materials Requirements**—Plastic materials used in the optical parts shall meet the requirements of SAE J576.

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TABLE 1—PHOTOMETRIC REQUIREMENTS<sup>(1)(2)</sup>

Zone	Test Points (degrees)		Minimum Luminous Intensity (cd)	Minimum Luminous Intensity (cd)	Minimum Luminous Intensity (cd)	Zone Total Luminous Intensity (cd)	Zone Total Luminous Intensity (cd)	Zone Total Luminous Intensity (cd)
			Number Lighted Sections <sup>(3)</sup>	Number Lighted Sections <sup>(3)</sup>	Number Lighted Section <sup>(3)</sup>	Number Lighted Sections <sup>(4)</sup>	Number Lighted Sections <sup>(3)</sup>	Number Lighted Section <sup>(3)</sup>
			1	2	3	1	2	3
I	10U	5L	16	19	22	52	62	74
	5U	20L	10	12	15			
	5D	20L	10	12	15			
	10D	5L	16	19	22			
II	5U		30	35	40	100	117	135
	H	10L	40	47	55			
	5D		30	35	40			
III	5U	V	70	82	95	380	449	520
	H	5L	80	95	110			
	H	V	80	95	110			
	H	5R	80	95	110			
	5D	V	70	82	95			
IV	5U		30	35	40	100	117	135
	H	10R	40	47	55			
	5D		30	35	40			
V	10U	5R	16	19	22	52	62	74
	5U	20R	10	12	15			
	5D	20R	10	12	15			
	10D	5R	16	19	22			
Maximum Luminous Intensity (cd) <sup>(5)</sup>						300	360	420

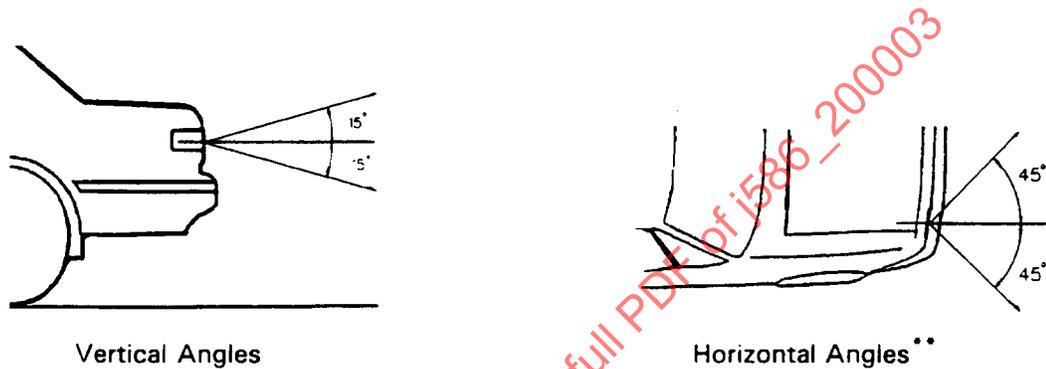
- Ratio requirements of 6.1.5.3 apply.
- A multiple device signalling unit gives its indication by two or more separately lighted sections which may be separate lamps, or areas that are joined by common parts. The photometric values are to apply when all sections that provide the same signal are considered as a unit except when the dimensions between optical centers exceed those given in 6.1.5.2. For a separate lamp arrangement, where lamps are interchangeable, each lamp shall be of approximately the same performance.
- The measured values at each individual test point shall not be less than 60% of the required minimum value shown for that individual test point location.
- The sum of the luminous measurements at each test point within a zone shall not be less than the Zone Total Luminous Intensity shown according to the number of lighted sections.
- The listed maximum shall not be exceeded over any area larger than that generated by a 0.5 degree radius within the solid angle defined by the test points in Table 1.

### 6.3 Design Requirements

- 6.3.1 If a stop signal is optically combined with the tail lamp and a two-filament bulb used, the bulb shall have an indexing base and the socket shall be designed so that bulbs with nonindexing bases cannot be used. Removable sockets shall have an indexing feature so that they cannot be reinserted into lamp housings in random positions, unless the lamp will perform its intended function with random light source orientation.
- 6.3.2 The functional lighted lens area of a single compartment lamp shall be at least 37.5 cm<sup>2</sup>.
- 6.3.3 If a multiple compartment lamp or multiple lamps are used to meet the photometric requirements, the functional lighted lens area of each compartment or lamp shall be at least 22 cm<sup>2</sup> provided the combined area is at least 37.5 cm<sup>2</sup>.

**6.4 Installation Requirements**—Stop lamps shall meet the following requirements as installed on the vehicle:

- 6.4.1 Each stop lamp shall be designed to comply with all photometric requirements of Table 1 with all vehicular obstructions considered.
- 6.4.2 Each stop lamp shall be designed to comply with one of the following visibility requirements:
  - a. Each lamp must provide a minimum of 13 cm<sup>2</sup> of unobstructed projected area when the light emitting surface area of the lens, excluding reflex reflector area, is projected parallel to a horizontal plane in any direction from 45 degrees outboard to 45 degrees inboard of the vehicle longitudinal axis, and parallel to a longitudinal, vertical plane in any direction from 15 degrees above to 15 degrees below<sup>1</sup> (see Figure 1).

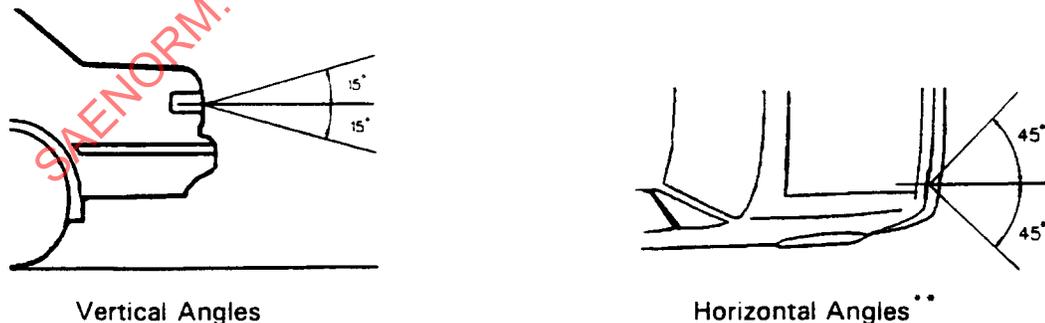


\* The downward angle may be reduced to 5 degrees if the lower lighted edge of the lamp is less than 750 mm above the ground.  
 \*\* Left side shown; right side symmetrically opposite.

FIGURE 1—TAIL LAMP VISIBILITY REQUIREMENTS—UNOBSTRUCTED PROJECTED AREA

- b. Each lamp must provide a luminous intensity not less than 0.3 cd throughout the photometric pattern defined by the corner points specified in Figure 2:

15 degrees above horizontal, 45 degrees inwards and outwards  
 15 degrees below horizontal\*, 45 degrees inwards and outwards



\* The downward angle may be reduced to 5 degrees if the lower lighted edge of the lamp is less than 750 mm above the ground.  
 \*\* Left side shown; right side symmetrically opposite.

FIGURE 2—TAIL LAMP VISIBILITY REQUIREMENTS—LUMINOUS INTENSITY

1. The downward angle may be reduced to 5 degrees if the lower lighted edge of the lamp is less than 750 mm above the ground.

**7. Guidelines**

**7.1 Installation Guidelines**—The following apply to stop lamps as used on the vehicle and shall not be considered part of the requirements:

- 7.1.1 Stop lamps on the rear of the vehicle should be spaced as far apart laterally as practicable, so that the signal will be clearly visible.
- 7.1.2 The luminous intensity of incandescent filament bulbs will vary with applied voltage. The electrical power system of the vehicle should, under normal running conditions, provide design voltage to the lamp as closely as practical bearing in mind the inherent variability of such systems.
- 7.1.3 Performance of lamps may deteriorate significantly as a result of dirt, grime, and/or snow accumulation on the optical surfaces. Installation of lamps on vehicles should be considered to minimize the effect of these factors.
- 7.1.4 Where it is expected that lamps must perform in severe environments, for example, be totally immersed in water periodically, the user should specify lamps designed for such use.

**8. Additional Information**—As a matter of additional information, attention is called to SAE J567 for requirements and gages to be used in socket design.

**9. Notes**

**9.1 Marginal Indicia**—The change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. An (R) symbol to the left of the document title indicates a complete revision of the report.

PREPARED BY THE SAE SIGNALING AND MARKING DEVICES STANDARDS COMMITTEE  
AND THE SAE LIGHTING COORDINATING COMMITTEE

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**Rationale**—The changes are as follows:

For many years a majority of the SAE Signalling and Marking Lamp Standards have had two photometric tables usually titled Table 1—Photometric Requirements and Table 2—Photometric Design Guidelines. Table 1 Requirements are linked very closely to Table 2 Design Guidelines components. Having two separate tables causes some confusion as to just what are “requirements” and what are “guidelines.” By combining the two tables it should better clarify the intent of the photometric “requirements.”

At the April 1999 SAE meeting in Denver, Colorado, the SAE Coordinating Committee assigned the Signal and Marking Committee the task of combining the two photometric tables. The first proposal was presented at the Cleveland, OH meeting in September 1999 and it was agreed that the combined tables, as presented, should be balloted to the membership. It was subsequently balloted and unanimously approved by the SAE Coordinating, Signal and Marking, and Heavy-Duty Lighting Standards committees.

The new combined Table 1—Photometric Performance Requirements, retains the same “Zonal cd values” as the old SAE Table 1 with the exception of:

Zone Total cd values that were rounded (not exact summations of the corresponding test point cd values within their respective zone) in the current standards (old Table 1) have been adjusted to become exact summations in the new combined table:

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- Zones I and V (1 Lighted Section) changed from 50 cd to 52 cd (+4.0%).
- Zones I and V (2 Lighted Sections) changed from 60 cd to 62 cd (+3.3%).
- Zones II and IV (2 Lighted Sections) changed from 115 cd to 117 cd (+1.7%).
- Zones III (2 Lighted Sections) changed from 445 cd to 449 cd (+0.9%).
- Zone I and V (3 Lighted Sections) changed from 70 cd to 74 cd (+5.7%).

Photometry Requirements—SAE Standard versus FMVSS 108—Exhibit B shows the FMVSS 108 “Zone Total only” cd requirements as underlined values in the Table for SAE J586. The same information is shown as follows with the addition of the “% variance” between FMVSS and SAE.

### Exhibit B SAE J586 Stop Lamps

- Zones I and V (2 Lighted Sections) SAE 62 cd versus FMVSS 108 61.7 cd (+0.4%).
- Zones I and V (3 Lighted Sections) SAE 74 cd versus FMVSS 108 71.5 cd (+3.5%).
- Zones II and IV (2 Lighted Sections) SAE 117 cd versus FMVSS 108 118.7 cd (−1.5%).
- Zones II and IV (3 Lighted Sections) SAE 135 cd versus FMVSS 108 137.5 cd (−1.8%).
- Zone III (2 Lighted Sections) SAE 449 cd versus FMVSS 108 451.2 cd (−0.5%).
- Zone III (3 Lighted Sections) SAE 520 cd versus FMVSS 108 522.5 cd (−0.5%).