

**(R) STOP LAMPS FOR USE ON MOTOR VEHICLES 2032 mm
OR MORE IN OVERALL WIDTH**

Foreword—This Document has also changed to comply with the new SAE Technical Standards Board format.

1. **Scope**—This SAE Standard provides test procedures, requirements, and guidelines for stop lamps intended for use on vehicles 2032 mm or more in overall width. Stop lamps conforming to the requirements of this document may be used on vehicles 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. 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 for Requirements and Gages Used in Socket Design

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

SAE J578—Color Specification

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

SAE J759—Lighting Identification Code

SAE J2139—Tests for Lighting Devices, Reflective Devices and Components Used on Vehicles 2032 mm or More in Overall Width

SAE Technical Paper 830566, "Motor Vehicle Conspicuity," R.L. Henderson, K. Ziedman, W.J. Burger, and K.E. Cavey, National Highway Traffic Safety Administration

2.1.2 OTHER PUBLICATIONS—Attention is called to the following documents for additional information on lamp design and installation.

FMVSS 108

FHWA 393 Subpart B

TTMA #RP-9

TMC #RP-702

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3. Definitions

3.1 A stop lamp is a lamp giving a steady light to the rear of a vehicle to indicate the intention of the operator of the vehicle to stop or diminish speed by braking.

4. Lighting Identification Code—Stop lamps for use on vehicles 2032 mm or more in overall width may be identified by the code "S2" in accordance with SAE J759.

5. Tests

5.1 SAE J2139 is a part of this document. The following tests are applicable with modification as indicated.

5.1.1 VIBRATION

5.1.2 MOISTURE

5.1.3 DUST

5.1.4 CORROSION

5.1.5 PHOTOMETRY

5.1.5.1 Photometric measurements shall be made with the light source of the device at least 3 m from the photometer.

5.1.5.2 The H-V axis of the device shall be taken to be parallel to the longitudinal axis of the vehicle, when the device is mounted in its design position.

5.1.5.3 Photometric measurements shall be made with the light source 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.

5.1.5.3.1 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 degrees 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.

5.1.5.3.2 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 ON DEVICES WITH PLASTIC COMPONENTS

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

5.3 Plastic Materials—SAE J576 is a part of this document.

6. Requirements

6.1 Performance Requirements—The device when tested in accordance with the test procedures of this report shall meet the requirements of SAE J2139 or as indicated.

6.1.1 VIBRATION

6.1.2 MOISTURE

6.1.3 DUST

6.1.4 CORROSION

6.1.5 PHOTOMETRY—The device tested shall meet the photometric performance requirements of Table 1 and its footnotes.

The summation of the luminous intensity measurements at the specified test points in a zone shall be at least the value shown.

6.1.5.1 A multiple compartment lamp or multiple lamps may be used to meet the photometric requirements of a stop lamp. If multiple compartments 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 of Table 1. If the distance between adjacent light sources exceeds the above dimensions, each compartment or lamp shall comply with the photometric requirements of Table 1.

6.1.5.2 When a tail lamp or a clearance lamp is combined with the stop lamp, the stop lamp intensity shall be not less than three times the luminous intensity of the tail lamp or clearance lamp at any test point, except that at H-V, H-5L, H-5R, and 5U-V, the stop lamp intensity shall be not less than five times the luminous intensity of the tail lamp or clearance lamp.

When a tail lamp is combined with the stop lamp, and the maximum luminous intensity of the tail lamp is located below the horizontal and is within an area generated by a 1.0 degree radius around the test point, the ratio for the test point may be computed using the lowest value of the tail lamp intensity within the generated area.

6.1.6 WARPAGE

6.2 **Color**—The color of the light from the stop lamp shall be red as specified in SAE J578.

6.3 **Plastic Materials**—The plastic materials used in the optical parts shall meet the requirements of SAE J576.

6.4 **Design Requirements**

6.4.1 If a stop lamp is combined with a tail lamp or a clearance lamp and a replaceable multiple light source is used, the light source retention system shall be designed with an indexing means so that the light source is properly indexed. Removable light source retention systems shall have an indexing feature so that they cannot be reinserted into the lamp housing in a random position, unless the lamp will perform its intended function with random light source orientation.

6.4.2 The effective projected luminous lighted lens area of a single lamp shall be at least 75 cm².

6.4.3 If a multiple compartment lamp or multiple lamps are used to meet the photometric requirements, the effective projected luminous lens area of each compartment or lamp shall be at least 40 cm² provided the combined area is at least 75 cm².

TABLE 1—STOP LAMP PHOTOMETRIC PERFORMANCE REQUIREMENTS

Zone	Test Point Deg.	Zone Total Luminous Intensity, Candela, Red
1	10U— 5L	50
	5U—20L	
	5D—20L	
	10D— 5L	
2	5U—10L	100
	H—10L	
	5D—10L	
3	5U— V	380
	H— 5L	
	H— V	
	H— 5R	
	5D— V	
4	5U—10R	100
	H—10R	
	5D—10R	
5	10U— 5R	50
	5U—20R	
	5D—20R	
	10D— 5R	
Maximum Luminous Intensity, Candela		300.0

¹ The maximum luminous intensity shall not be exceeded over any area larger than that generated by a 0.5 degree radius within the area defined by the test point pattern of Table 2.

² Unless otherwise specified, the lamp shall be considered to have failed the photometric requirements of this document if the luminous intensity at any test point is less than 60% of the values specified in Table 2.

³ Unless otherwise specified, the lamp shall be considered to have failed the photometric requirements of this document if the minimum luminous intensity between test points is less than 60% of the lower design values of Table 2 for the closest adjacent test points on a horizontal and vertical line as defined by the test point pattern.

⁴ The summation of the luminous intensity measurements at the specified test points in the zone shall be at least the values shown.

⁵ When a tail lamp of a clearance lamp is combined with a stop lamp, see 6.1.5.2 of this document for luminous intensity ratio requirements.

⁶ Throughout the photometric pattern defined by the corner points of 20U-45R, 10D-45R, and 10D-45L, the light intensity shall be not less than 0.4 candela in red.

6.5 Installation Requirements—The stop lamp shall meet the following requirements as installed on the vehicle.

- 6.5.1 The stop lamps shall be mounted on the permanent structure of the vehicle, facing rearward, at the same height and spaced as far apart laterally as practicable, so that the signal will be clearly visible.
- 6.5.2 Visibility of each stop lamp shall not be obstructed by any part of the vehicle throughout the photometric test pattern unless the lamp is designed to comply with all photometric and visibility requirements with these obstructions considered.

To be considered visible, the lamp must provide an unobstructed view of a portion of the lighted outer lens surface, excluding reflex reflector area, of at least 13 cm² measured at a horizontal angle of 45 degrees to the left and 45 degrees to the right of the longitudinal axis of the vehicle and a vertical angle from 20 degrees up to 10 degrees down.

Table 1, Note 6. Where more than one lamp or optical area is lighted on each side of the vehicle, only one such area on each side need comply.

7. Guidelines

7.1 Design Guidelines

7.1.1 Photometric design guidelines are contained in Table 2 and its footnotes.

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

7.2.1 Performance of lamps may deteriorate significantly as a result of dirt, grime, snow, and ice accumulation on the optical surfaces. Installation of the device on the vehicle should be considered to minimize the effects of these factors.

7.2.2 Where it is expected that the device must perform in extremely severe environments, or where it is expected to be totally immersed in water, the user should specify devices specifically designed for such use.

8. **Advance Requirements**—This section of the document gives advance notice to manufacturers and users of the device of a pending change in the requirements for a stop lamp. The change in the requirements shall be effective on devices marketed and used on or after January 1, 1996.

Table 3 and Table 4 and the footnotes.

TABLE 2—STOP LAMP PHOTOMETRIC DESIGN GUIDELINES

Test Point Deg.	Luminous Intensity, Candela, Red
10U— 5L	16.0
5R	16.0
5U—20L	10.0
10L	30.0
V	70.0
10R	30.0
20R	10.0
H—10L	40.0
5L	80.0
V	80.0
5R	80.0
10R	40.0
5D—20L	10.0
10L	30.0
V	70.0
10R	30.0
20R	10.0
10D— 5L	16.0
5R	16.0
Maximum Luminous Intensity, Candela	300.0

¹ The maximum luminous intensity shall not be exceeded over any area larger than that generated by a 0.25 degree radius within the area defined by the test point pattern of Table 2.

² When a tail lamp or a clearance lamp is combined with a stop lamp, see 6.1.5.2 of this document for luminous intensity ratio requirements.

³ Throughout the photometric pattern defined by the corner points of 20U-45L, 20U-45R, 10D-45R, and 10D-45L, the light intensity shall be not less than 0.4 candela in red.

TABLE 3—STOP LAMP PHOTOMETRIC PERFORMANCE REQUIREMENTS—ADVANCE REQUIREMENTS

Zone	Test Point Deg.	Zone Total Luminous Intensity, Candela, Red
1	20U—45L	12
	20U—20L	
	10D—20L	
	10D—45L	
2	10U— 5L	50
	5U—20L	
	5D—20L	
	10D— 5L	
3	5U—10L	100
	H—10L	
	5D—10L	
4	5U— V	380
	H— 5L	
	H— V	
	H— 5R	
	5D— V	
5	5U—10R	100
	H—10R	
	5D—10L	
6	10U— 5R	50
	5U—20R	
	5D—20R	
	10D— 5R	
7	20U—45R	12
	20U—20R	
	10D—20R	
	10D—45R	
Maximum Luminous Intensity, Candela		300 Red

¹ The maximum luminous intensity shall not be exceeded over any area larger than that generated by a 0.5 degree radius within the area defined by the test point pattern of Table 4.

² Unless otherwise specified, the lamp shall be considered to have failed the photometric requirements of this document if the luminous intensity at any test point is less than 60% of the values specified in Table 4.

³ Unless otherwise specified, the lamp shall be considered to have failed the photometric requirements of this document if the minimum luminous intensity between test points is less than 60% of the lower design values of Table 4 for the closest adjacent test points on a horizontal and vertical line as defined by the test point pattern.

⁴ The summation of the luminous intensity measurements at the specified test points in the zone shall be at least the values shown.

⁵ When a tail lamp or a clearance lamp is combined with a stop lamp, see 6.1.5.2 of this document for luminous intensity ratio requirements.

TABLE 4—STOP LAMP PHOTOMETRIC DESIGN GUIDELINES—ADVANCE REQUIREMENTS

Test Point Deg.	Luminous Intensity, Candela, Red
20U—45L	1.0
20L	5.0
20R	5.0
45R	1.0
10U—5L	16.0
5R	16.0
5U—20L	10.0
10L	30.0
V	70.0
10R	30.0
20R	10.0
H—10L	40.0
5L	80.0
V	80.0
5R	80.0
10R	40.0
5D—20L	10.0
10L	30.0
V	70.0
10R	30.0
20R	10.0
10D—45L	1.0
20L	5.0
5L	16.0
5R	16.0
20R	5.0
45R	1.0
Maximum Luminous Intensity, Candela	300 Red

¹ The maximum luminous intensity shall not be exceeded over any area larger than that generated by a 0.25 degree radius within the area defined by the test point pattern of Table 4.

² When a tail lamp or a clearance lamp is combined with a stop lamp, see 6.1.5.2 of this document for luminous intensity ratio requirements.