

SURFACE VEHICLE STANDARD

SAE J2042

Issued 1991-06-30

Submitted for recognition as an American National Standard

CLEARANCE, SIDEMARKER, AND IDENTIFICATION LAMPS FOR USE ON MOTOR VEHICLES 2032 mm OR MORE IN OVERALL WIDTH

1. Scope—This SAE Standard provides test procedures, requirements, and guidelines for clearance, sidemarker, and identification lamps intended for use on vehicles 2032 mm or more in overall width. A clearance lamp, a sidemarker lamp, or an identification lamp conforming to the requirements of this document may be used on vehicles less than 2032 mm in overall width.

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

SAE J578—Color Specification

SAE J592—Clearance, Sidemarker, and Identification Lamps

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

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

FMVSS 108

FHWA 393 Subpart B

TTMA #RP-9

TMC #RP-702

2.2 Definitions

2.2.1 CLEARANCE LAMP—A clearance lamp provides light to the front or rear of a vehicle to indicate the overall width and height.

2.2.2 SIDEMARKER LAMP—A sidemarker lamp provides light to the side of a vehicle to indicate the overall length of the vehicle. Additional sidemarker lamps may also be mounted at intermediate locations on the side of the vehicle. The rear sidemarker lamp used on a trailer is also referred to as a tracking lamp.

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2.2.3 IDENTIFICATION LAMP—An identification lamp is a group of three lamps in a horizontal row which provide light to the front or rear or both, having a light center spacing of not less than 150 mm nor more than 300 mm apart, to identify vehicles 2032 mm or more in overall width.

2.2.4 COMBINATION CLEARANCE AND SIDEMARKER LAMP—A combination clearance and sidemarker lamp is a single lamp which simultaneously meets the requirements of a clearance and a sidemarker lamp.

3. Lighting Identification Code—Clearance, sidemarker, or identification lamps may be identified by the code "P3"; combination clearance and sidemarker lamps may be identified by the code "PC2," in accordance with SAE J759.

4. Tests

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

4.1.1 VIBRATION

4.1.2 MOISTURE

4.1.3 DUST

4.1.4 CORROSION

4.1.5 PHOTOMETRY

4.1.5.1 The photometric test shall be made at a device distance of at least 3 m from the photometer.

4.1.5.2 The H-V axis of a clearance or identification lamp shall be taken to be parallel to the longitudinal axis of the vehicle, when the device is mounted in its design position.

4.1.5.3 The H-V axis of a sidemarker lamp shall be taken to be perpendicular to a vertical plane passing through the longitudinal axis of the vehicle, when mounted in its design position.

4.1.5.4 The H-V axis of a combination clearance and sidemarker lamp shall be taken to be parallel to the longitudinal axis of the vehicle when testing the clearance lamp function, and perpendicular to a vertical plane passing through the longitudinal axis of the vehicle when testing the sidemarker lamp function, when the device is mounted in its design position.

4.1.6 WARPAGE TEST ON DEVICES WITH PLASTIC COMPONENTS

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

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

5. Requirements

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

5.1.1 VIBRATION

5.1.2 MOISTURE

5.1.3 DUST

5.1.4 CORROSION

5.1.5 PHOTOMETRY—The device tested shall meet the photometric performance requirements of Table 1 and its footnotes, except that front yellow clearance and identification lamps that are roof mounted on the vehicle need not meet the photometric requirements at 20 degrees down; 45 degrees left to 45 degrees right as specified in footnote 7.

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

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

5.1.6 WARPAGE

TABLE 1—CLEARANCE, SIDEMARKER, AND IDENTIFICATION LAMP PHOTOMETRIC PERFORMANCE REQUIREMENTS

Zone	Test Points Deg.	Zone Total Luminous Intensity, Candela, Red	Zone Total Luminous Intensity, Candela, Yellow
1	10U — 45L H — 45L 10D — 45L	0.75	1.86
2	10U — V H — V 10D — V	0.75	1.86
3	10U — 45R H — 45R 10D — 45R	0.75	1.86
Maximum Luminous Intensity, Candela, Red, rear only		18.0	

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 a zone shall be at least the values shown.
5. Combination clearance and sidemarker lamps shall conform with both clearance and sidemarker lamp photometric performance requirements.
6. When a clearance lamp is combined with a stop lamp or turn signal lamp, see 5.1.5.1 of this document for luminous intensity ratio requirements.
7. Throughout the photometric pattern defined by the corner points of 20U-45L, 20U-45R, 20D-45R, and 20D-45L, the light intensity shall be not less than 0.1 candela in red or 0.2 candela in yellow.

- 5.2 Color**—The color of the light from the front clearance lamps, the front identification lamps, and the front and intermediate sidemarker lamps shall be yellow.

The color of the light from the rear clearance lamps, rear identification lamps, and the rear side-marker lamp (aka a tracking lamp on a trailer) shall be red.

The color shall meet the requirements of SAE J578.

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

5.4 Design Requirements

- 5.4.1 A clearance lamp shall not be combined with a tail lamp.
- 5.4.2 A clearance lamp may be combined with a turn signal lamp or a stop lamp.
- 5.4.3 A sidemarker lamp may be combined with a side turn signal lamp.
- 5.4.4 A clearance lamp, identification lamp, or a sidemarker lamp may be combined with a reflex reflector.
- 5.4.5 If a clearance lamp is combined with a turn signal lamp or a stop lamp, or if a sidemarker lamp is combined with a side turn signal 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.

5.5 Installation Requirements

- 5.5.1 Clearance lamps shall be mounted on the permanent structure of the vehicle as near as practicable to the upper left and right extreme edges of the vehicle.
- 5.5.2 Sidemarker lamps shall be mounted on the permanent structure of the vehicle not less than 380 mm above the road surface measured from the center of the device at vehicle curb weight.
An intermediate yellow sidemarker lamp shall be mounted at the midpoint on vehicles 7.6 m or more in overall length.
The red, rear sidemarker lamp, used on trailers, also referred to as a tracking lamp, shall be mounted on the permanent structure of the trailer not less than 380 mm nor more than 1525 mm above the road surface measured from the center of the lamp at trailer curb weight.
- 5.5.3 Identification lamps shall be mounted on the permanent structure of the vehicle as near as practicable to the vehicle centerline and to the top of the vehicle.
- 5.5.4 When the rear identification lamps are mounted at the extreme height of the vehicle, rear clearance lamps need not meet the requirement that they be mounted as close as practicable to the top of the vehicle.
- 5.5.5 Visibility of each clearance lamp, sidemarker lamp, or identification lamp shall not be obstructed by any part of the vehicle throughout the photometric test pattern for the lamp unless the lamp is designed to comply with all photometric and visibility requirements considered, except that front yellow clearance and identification lamps that are roof mounted on the vehicle need not meet the photometric requirements at 20 degrees down, 45 degrees left to 45 degrees right, as specified in footnote 7, Table 1.

6. Guidelines

6.1 Design Guidelines

- 6.1.1 PHOTOMETRICS—Photometric design guidelines are contained in Table 2 and its footnotes.

6.2 Installation Guidelines

- 6.2.1 The following guidelines apply to devices used on the vehicle and shall not be considered part of the requirements.
- 6.2.2 Performance of the lamps may deteriorate significantly as a result of dirt, grime, snow, and ice accumulation on the optical surfaces. Installation of the device on vehicles should be considered to minimize the effect of these factors.
- 6.2.3 Where it is expected that the device must perform in extremely severe environments such as in off-highway, mining, fuel haulage, or where it is expected to be totally immersed in water, the user should specify devices specifically designed for such use.

TABLE 2—CLEARANCE, SIDEMARKER, AND IDENTIFICATION LAMP PHOTOMETRIC DESIGN GUIDELINES

Test Points Deg.	Luminous Intensity, Candela, Red	Luminous Intensity, Candela, Yellow
45L	0.25	0.62
10U — V	0.25	0.62
45R	0.25	0.62
45L	0.25	0.62
H — V	0.25	0.62
45R	0.25	0.62
45L	0.25	0.62
10D — V	0.25	0.62
45R	0.25	0.62
Maximum Luminous Intensity, Candela, Red, rear only	18.0	

1. The maximum luminous intensity shall not be exceeded over any area larger than that generated by a 0.25 degree radius within the solid angle defined by the test points in Table 2.
2. For combined clearance and sidemarker lamps, both clearance and sidemarker photometric design guidelines shall apply.
3. When a clearance lamp is combined with a stop lamp or a turn signal lamp, see 5.1.5.1 of this document for luminous intensity ratio requirements.
4. Throughout the photometric pattern defined by the corner points of 20U-45L, 20U-45R, 20D-45R, and 20D-45L, the light intensity shall be not less than 0.10 candela in red or 0.20 candela in yellow.

7. 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 clearance lamps, sidemarker lamps, and identification lamps. The change in requirements shall be effective on devices marketed and used on or after January 1, 1996.

See Tables 3 and 4 and the footnotes.

PREPARED BY THE SAE LIGHTING COORDINATING COMMITTEE AND
THE HEAVY-DUTY LIGHTING STANDARDS COMMITTEE

TABLE 3—CLEARANCE, SIDEMARKER, AND IDENTIFICATION LAMP PHOTOMETRIC PERFORMANCE REQUIREMENTS—ADVANCE REQUIREMENTS

Zone	Test Points Deg.	Zone Total Luminous Intensity, Candela, Red	Zone Total Luminous Intensity, Candela, Yellow
1	20U — 45L 10U — 45L H — 45L 10D — 45L 20D — 45L	1.4	3.4
2	10U — V H — V 10D — V	1.2	3.0
3	20U — 45R 10U — 45R H — 45R 10D — 45R 20D — 45R	1.4	3.4
Maximum Luminous Intensity, Candela, Red, rear only		18.0	

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 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. Combination clearance and sidemarker lamps shall conform with both clearance and sidemarker lamp photometric performance requirements.
5. The summation of the luminous intensity measurements at the specified test points in a zone shall be at least the values shown.
6. When a clearance lamp is combined with a stop lamp or a turn signal lamp, see 5.1.5.1 of this document for luminous intensity ratio requirements.

TABLE 4—CLEARANCE, SIDEMARKER, AND IDENTIFICATION LAMP PHOTOMETRIC DESIGN GUIDELINES—
ADVANCE REQUIREMENTS

Test Points Deg.	Luminous Intensity, Candela, Red	Luminous Intensity, Candela, Yellow
20U — 45L	0.10	0.20
45R	0.10	0.20
10U — 45L	0.40	1.0
V	0.40	1.0
45R	0.40	1.0
H — 45L	0.40	1.0
V	0.40	1.0
45R	0.40	1.0
10D — 45L	0.40	1.0
V	0.40	1.0
45R	0.40	1.0
20D — 45L	0.10	0.20
45R	0.10	0.20
Maximum Luminous Intensity, Candela, Red, rear only	18.0	

1. The maximum luminous intensity shall not be exceeded over any area larger than that generated by a 0.25 degree radius within the solid angle defined by the test points in Table 4.
2. For combined clearance and sidemarker lamps, both clearance and sidemarker photometric design guidelines shall apply.
3. When a clearance lamp is combined with a stop lamp or a turn signal lamp, see 5.1.5.1 of this document for luminous intensity ratio requirements.