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SURFACE VEHICLE INFORMATION REPORT

SAE J1432

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Submitted for recognition as an American National Standard

(R) High-Mounted Stop Lamps for Use on Vehicles 2032 mm or More in Overall Width

1. ***Scope***—This SAE Recommended Practice provides test procedures, requirements, and guidelines for high-mounted stop lamps intended for use on vehicles 2032 mm or more in overall width. This document applies to trucks, motor coaches, van type trailers, and other vehicles with permanent structure greater than 2.8 m high. This document does not apply to school buses, truck tractors, pole trailers, flat-bed trailers, and trailer converter dollies. The purpose of the high-mounted stop lamp or lamps is to provide a signal over intervening vehicles to the driver of following vehicles.

2. ***References***

2.1 Applicable Publications—The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

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

SAE J387—Terminology—Motor Vehicle Lighting
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
SAE J2139—Tests for Lighting Devices, Reflective Devices, and Components Used on Vehicles 2032 mm or More in Overall Width
SAE J2261—Stop Lamps and Front and Rear Turn Signal Lamps for Use on Vehicles 2032 mm or More in Overall Width

2.1.2 OTHER PUBLICATIONS

Truck Trailer Manufacturers Association RP-9
The Maintenance Council RP-702

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 J567—Lamp Bulb Retention System for Requirements and Gages Used in Retention System Design
SAE J1957—Center High-Mounted Stop Lamp Standard for Vehicles Less than 2032 mm in Overall Width
SAE J1889—L.E.D. Lighting Devices

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SAE WEB ADDRESS http://www.sae.org

2.2.2 CANADIAN FEDERAL PUBLICATIONS—Available from Transport Canada, Motor Vehicle Standards and Research Branch, Ottawa, Ontario K1A 0N5.

CMVSS-108

2.2.3 FMVSS PUBLICATIONS—Available from the Superintendent of Documents, U. S. Government Printing Office, Mail Stop: SSOP, Washington, DC 20402-9320.

Federal Motor Vehicle Safety Standard 49 CFR 571.108
Federal Highway Administration 49 CFR PART 393 Subpart B

3. Definitions

3.1 High-Mounted Stop Lamp—The signaling element of a pedal operated stop lamp system giving a brake-actuated, steady burning warning light to the rear of the vehicle. It is intended to provide a signal to the operators of following vehicles. High-mounted stop lamps are supplemental to, and should not be confused with stop lamps as described in SAE J2261.

3.2 Multiple Lamp Arrangement—An array of two or more separate lamps on each side of the vehicle which operate together for a particular lighting function. The amount of separation is defined by 6.1.6.1 of this document.

4. Lighting Identification Code—High-mounted stop lamps for use on vehicles 2032 mm or more in overall width, may be identified by the code U2 in accordance with SAE J759.

5. Tests

5.1 The device shall be tested according to the procedures specified in SAE J2139. 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 WARPAGE TEST —The lamp shall have its light emitting lens surface pressed into a vinyl covered (PVC) cushion so that the light emitting surface is fully enveloped by the vinyl cover. The cushion shall consist of a pure vinyl (PVC) covering over padding consisting of 20-lb density urethane foam, 6-inches thick.

5.1.5.1 The lamp shall be positioned in the normal mounting position as used on the vehicle.

5.1.5.2 All light sources of the lamp shall be powered for the duration of the test. The lamp(s) shall be operated at 12.8 V for a 12-V system; and 25.6 V for a 24-V system.

5.1.5.3 The test shall be conducted at an ambient temperature of 22 °C ± 3 ° C.

5.1.5.4 The duration of the test shall be 1 h.

5.1.6 PHOTOMETRY

5.1.6.1 Photometric measurement shall be made with the light source of the device at least 3 m from the photometer. The H-V axis of the device shall be taken parallel to the longitudinal axis of the vehicle. Photometric measurements shall be made with the light source steady burning.

5.1.6.2 Photometric measurements of multiple lamp arrangements may be made by either of the following methods of aligning the axis of each lamp with the photometer.

5.1.6.2.1 All lamps shall be photometered together provided that a line from the light source of each 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 lamps are photometered together, the H-V axis shall intersect the midpoint between their light sources.

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

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 document 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 WARPAGE —Upon completion of the test, the device shall be visually examined for warpage of plastic components. If warpage is observed that could result in failure of other tests contained in this document, the test(s) shall be performed on the warped sample to ensure compliance.

6.1.6 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.

6.1.6.1 Any multiple lamp arrangement may be used to meet the photometric requirements of a high-mounted stop lamp. If multiple lamp arrangements are used and the distance between adjacent light sources does not exceed 560 mm for two-lamp arrangements and does not exceed 410 mm for three-lamp arrangements, then the combination of the lamps may be used to meet the photometric requirements of Table 1. If the distance between adjacent light sources exceeds the above dimensions, each lamp shall comply with the photometric requirements of Table 1.

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

6.1.6.3 When a clearance lamp or identification lamp is combined with a high-mounted stop lamp and the maximum intensity of the clearance lamp or identification lamp is located on or 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 clearance lamp or identification lamp luminous intensity within the generated area.

6.2 Color—The color of the light from the high-mounted 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.

TABLE 1—HIGH-MOUNTED STOP LAMP PHOTOMETRIC PERFORMANCE REQUIREMENTS(1)(2)(3)(4)

ZONE	TEST POINT DEG.	MINIMUM LUMINOUS INTENSITY TOTAL FOR ZONE (CD)
	5U - V	
	H - 5L	
1	H - V	125
	H - 5R	
	5D - V	
	5U - 5R	
	5U - 10R	
2	H - 10R	98
	5D - 10R	
	5D - 5R	
	5U - 5L	
3	5U - 10L	98
	H - 10L	
	5D - 10L	
	5D - 5L	
	10D - 10L	
4	10D - V	32
	10D - 10R	
	MAXIMUM LUMINOUS INTENSITY (CD)	130

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. The measured values at each test point shall not be less than 60% of the value specified in Table 2
3. The summation of the luminous intensity measurements at the specified test points in the zone shall be at least the values shown.
4. When a clearance lamp or identification lamp is combined with a high-mounted stop lamp, see 6.1.6.2 of this document, for luminous intensity ratio requirements.

6.4 Design Requirements

6.4.1 If a high-mounted stop lamp is combined with a clearance lamp or identification 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 to avoid improper orientation of the light source. 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, as defined in SAE J387, of a single lamp shall be at least 50 cm^2.

6.4.3 If multiple lamps are used to meet the photometric requirements of Table 1, the effective projected luminous lens area of each lamp shall be at least 30 cm^2.

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

6.5.1 The high-mounted 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 requirements of Table 1 with these obstructions considered.

6.5.2 Two high-mounted stop lamps are required to be installed on each vehicle spaced as far apart as practicable at a minimum height of 2.8 m measured from the road surface to the center of the lens with the vehicle unladen. On vehicles where the structure prohibits installation of two high-mounted stop lamps, a single high-mounted stop lamp or a multiple lamp arrangement may be located on the vertical centerline of the vehicle at a minimum height of 2.8 m.

6.5.3 The high-mounted stop lamp or lamps shall be mounted so that their H-V axis are horizontal and parallel to the longitudinal axis of the vehicle with the vehicle unladen.

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 high-mounted 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, the user should specify devices specifically designed for such use. Heat buildup in the lamp should be considered in applications where the lamp will be pressed into the loading dock cushions.

7.2.3 The luminous intensity of the light source may vary with applied voltage. When designing the wiring circuit for the high-mounted stop lamps, the wiring should be sized accordingly so that adequate power is provided for the stop lamps to function without degrading the function of the antilock braking system (ABS).

TABLE 2—HIGH-MOUNTED STOP LAMP PHOTOMETRIC DESIGN GUIDELINES(1)(2)(3)

TEST POINTS (deg)	TEST POINTS (deg)	MINIMUM LUMINOUS INTENSITY (cd)
5U	10L	16
	10R	16
	5L	25
	5R	25
	V	25
H	10L	16
	10R	16
	5L	25
	5R	25
	V	25
5D	10L	16
	10R	16
	5L	25
	5R	25
	V	25
10D	10L	8
	10R	8
	V	16
MAXIMUM LUMINOUS INTENSITY (CD)		130

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 clearance lamp or identification lamp is combined with a high-mounted stop lamp, see 6.1.6.2 of this document, for luminous intensity ratio requirements.
3. When making photometric measurements at specific test points, the candela values between test points shall not be less than the lower specified value of the two closest adjacent test points on a horizontal or vertical line for minimum values.

8. *Notes*

8.1 Marginal Indicia—The change bar (l) 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 HEAVY-DUTY LIGHTING COMMITTEE