SAE International™

SURFACE VEHICLE STANDARD

SAE J2040 APR2010

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Superseding J2040 MAR2002

Tail Lamps (Rear Position Lamps) for Use on Vehicles 2032 mm or More in Overall Width

RATIONALE

Moved SAE J387 to referenced documents from related documents

Moved SAE J1889 to referenced documents from related documents, and corrected title

Corrected Reference to Federal Highway Administration to Federal Motor Carrier Safety Administration

Corrected TMC Address

Changed definition to be consistent with SAE J387

Replaced 3.2, 3.3, 3.4 Definitions for Stop, Turn and Clearance lamps with the following statement “The terminology contained in SAE J387 shall apply to this standard.” This is consistent with other SAE standards.

Added the following statement to photometry test to advise document users on the use of SAE J1889 “The test methods and procedures of SAE J1889 shall also be applied if LED light sources are present in the lamp.

Replaced Table 1 with Figure 1 as requested by Lighting Advisory Group, and changed all related references to Table 1 with Figure 1

Changed current Figures 1 and 2 to 2 and 3 respectively

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1. SCOPE

This SAE Standard provides test procedures, requirements, and guidelines for tail lamps intended for use on vehicles 2032 mm or more in overall width. Tail lamps conforming to the requirements of this document may also 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. 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, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J387 Terminology Motor Vehicle Lighting

SAE J576 Plastic Material 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 J1889 L.E.D. Signal and Marking Lighting Devices

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

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this document.

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

2.2.1 SAE Publications

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J567 Lamp Bulb Retention System for Requirements and Gages used in Retention System Design

SAE J1330 Laboratory Accuracy Guidelines

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

2.2.2 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 49CFR 571.108

Federal Motor Carrier Safety Administration 49CFR part 393 Subpart B

2.2.3 TMC and TTMA Publications

Available from the Technology and Maintenance Council, American Trucking Associations, 950 North Glebe Road, Suite 210, Arlington, VA 22203-4181, Tel: (703) 838-1700, www.truckline.com.

TTMA #RP-9 Location of Lighting Devices for Trailers

TMC #RP-702A Trailer Lamp and Reflector Placement

TMC #RP-704B Heavy Duty Lighting Systems for Trailers

TMC #AV 7-1 Heavy Duty Lighting Systems for Trailers

3. DEFINITIONS

3.1 TAIL LAMP

Tail Lamp (Rear Position) - Whether separate or in combination with other lamps, tail lamps are located on both the left and right rear of a vehicle to indicate the presence and width of a vehicle by a steady operating, low intensity light when viewed from the rear.

3.2 The terminology contained in SAE J387 shall apply to this standard.

4. LIGHTING IDENTIFICATION CODE

Tail lamps for use on vehicles 2032 mm or more in overall width may be identified by the code “T2” in accordance with SAE J759.

5. TESTS

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

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

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

5.1.5.1 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.

5.1.5.2 Photometric measurements shall be made with the light source steadily burning. Photometric measurements of multiple lamp arrangements may be made by either of the following methods.

5.1.5.2.1 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 the extreme light sources.

5.1.5.2.2 Each lamp shall be photometered separately by aligning the axis of each lamp with the axis of the photometer. The photometric measurement for the entire multiple lamp arrangement shall be determined by adding the photometric outputs from each individual lamp at its corresponding test point.

5.1.5.3 The test methods and procedures of SAE J1889 shall also be applied if LED light sources are present in the lamp.

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 document shall meet the requirements of SAE J2139 or as indicated.

6.1.1 Vibration

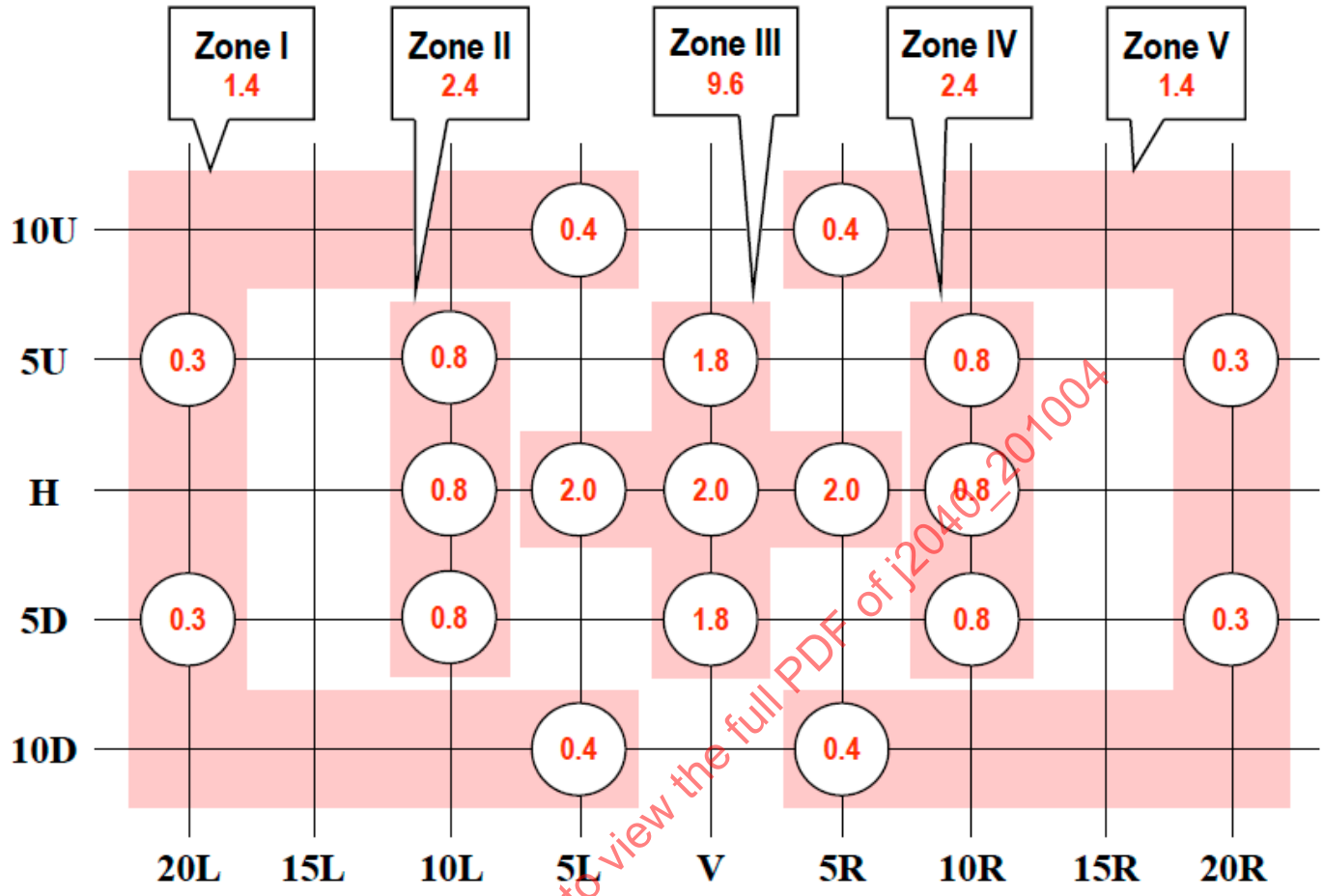
6.1.2 Moisture

6.1.3 Dust

6.1.4 Corrosion

6.1.5 The lamp shall be designed to conform to the zone total photometric requirements of Figure 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.

6.1.5.1 An arrangement of lamps may be used to meet the photometric requirements of Figure 1 provided the distance between adjacent light source does not exceed 560 mm for two lamp arrangements or does not exceed 410 mm for multiple lamp arrangements. If the distance between light sources exceeds those distances detailed previously then, each lamp shall individually comply with the photometric requirements of Figure 1.



1. The maximum luminous intensity is 18 cd at H or above within the photometric pattern shown.
2. The Measured value at each test point shall not be less than 60% of the required minimum value for that individual test point location.
3. The sum of the luminous intensity measurements at each test point within a zone shall not be less than the zone total shown. The luminous intensity measurements at each discrete test point shown within the corresponding zone are the values used to calculate the specified zone total.
4. 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.
5. Ratio requirements of 6.1.5.2 apply.
6. Multiple lamps requirements of 6.1.5.1 apply.

FIGURE 1 - PHOTOMETRIC REQUIREMENTS
MINIMUM LUMINOUS INTENSITY (cd)

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

6.4.2 The effective projected luminous lighted lens area of a single lamp shall be at least 75 cm^2.

6.4.3 A tail lamp shall not be optically combined with a clearance lamp.

6.5 Installation Requirements

The tail lamp shall meet the following requirements as installed on the vehicle.

6.5.1 The tail 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 Each tail lamp shall be designed to comply with all photometric requirements of Figure 1 with all vehicular obstructions considered.

6.5.3 Each tail lamp installed shall comply with one of the following visibility requirements. (Left hand shown, right hand symmetrically opposite)

6.5.3.1 Each tail lamp must provide a minimum of 13 cm^2 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 from 15 degrees above to 15 degrees below the horizontal; (see Figure 2).