The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE STANDARD

SAE J585

REV. MAR2000

Issued 1918-03
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Superseding J585 DEC1994

Submitted for recognition as an American National Standard

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

Foreword—This Document has also changed to comply with the new SAE Technical Standards Board format. Definitions have changed to Section 3. All other section numbers have changed accordingly.

1. Scope—This SAE Standard provides test procedures, requirements, and guidelines for tail lamps (rear position lamps).

2. References

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

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 J759—Lighting Identification Code
SAE J2040—Tail Lamps (Rear Position Lamps) for Use 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.

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

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 J594—Reflex Reflectors
SAE J1395 APR85—Front and Rear Turn Signal Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width
SAE J1398 MAY85—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
SAE J2042—Clearance, Sidemarker, and Identification Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width

TO PLACE A DOCUMENT ORDER; (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS http://www.sae.org

2.2.2 FMVSS SPECIFICATION—Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

FMVSS 108 (56 FR 64733 – 64737)—Lamps, Reflective Devices, and Associated Equipment

3. Definitions

3.1 Tail Lamps—Lamps used to designate the rear of a vehicle by a steady burning low intensity light.

3.2 Multiple Compartment Lamp—A device which gives its indication by two or more separately lighted areas which are joined by one or more common parts such as a housing or lens.

3.3 Multiple Lamp Arrangement—An array of two or more separated lamps on each side of the vehicle which operate together or give a signal.

***4. Lighting Identification Code*—**Tail lamps may be identified by the code "T" in accordance with SAE J759.

5. Tests

5.1 SAE J575 is a part of this report. The following tests are applicable with the 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—In addition to the test procedure in SAE J575, the following apply:

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

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

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 by aligning the axis of each lamp or compartment with the photometer. 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 report.

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. If a multiple compartment lamp 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 in Table 1. If the distance between adjacent light sources exceeds the previous dimensions, each compartment or lamp shall comply with the photometric performance requirements for one lighted section in Table 1.

6.1.5.3 When a tail lamp is combined with the turn signal or stop lamp, the signal lamp intensity 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 turn signal or stop lamp intensity 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 axes for both the tail lamp and the turn signal or stop lamp is within the dimensions specified in 6.1.5.2, the ratio of the turn signal or 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 turn signal or stop lamp are optically combined. When the tail lamp is combined with the turn signal or stop lamp and the maximum luminous intensity of the tail lamp is located below horizontal and within an area generated by a 1.0 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 the light from a tail lamp shall be red as specified in SAE J578.

TABLE 1—PHOTOMETRIC REQUIREMENTS[1][2]

Zone	Test Points (Degrees)	Minimum Luminous Intensity (cd)[3] Number Lighted Sections 1	Minimum Luminous Intensity (cd)[3] Number Lighted Sections 2	Minimum Luminous Intensity (cd)[3] Number Lighted Sections 3	Zone Total Luminous Intensity (cd)[4] Number Lighted Sections 1	Zone Total Luminous Intensity (cd)[4] Number Lighted Sections 2	Zone Total Luminous Intensity (cd)[4] Number Lighted Sections 3
	10U 5L	0.4	0.7	1.0			
I	5U 20L	0.3	0.5	0.7	1.4	2.4	3.4
	5D 20L	0.3	0.5	0.7			
	10D 5L	0.4	0.7	1.0			
	5U	0.8	1.4	2.0			
II	H 10L	0.8	1.4	2.0	2.4	4.2	6.0
	5D	0.8	1.4	2.0			
	5U V	1.8	3.1	4.5			
	H 5L	2.0	3.5	5.0			
III	H V	2.0	3.5	5.0	9.6	16.7	24.0
	H 5R	2.0	3.5	5.0			
	5D V	1.8	3.1	4.5			
	5U	0.8	1.4	2.0			
IV	H 10R	0.8	1.4	2.0	2.4	4.2	6.0
	5D	0.8	1.4	2.0			
	10U 5R	0.4	0.7	1.0			
V	5U 20R	0.3	0.5	0.7	1.4	2.4	3.4
	5D 20R	0.3	0.5	0.7			
	10D 5R	0.4	0.7	1.0			
	Maximum Luminous Intensity (cd)[5]				18	20	25

1. Ratio requirements of 6.1.5.3 apply.
2. Multiple compartment lamp ormultiple lamps requirements of 6.1.5.2 apply.
3. 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.
4. The sum of the luminous intensity 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.
5. 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.

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

6.3 Design Requirements

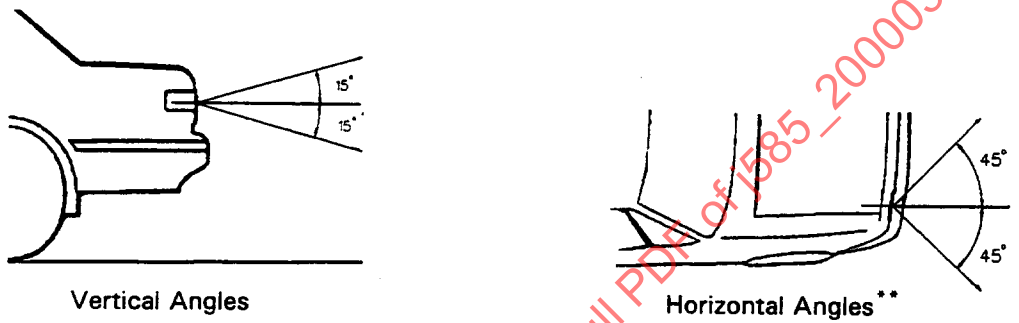
6.3.1 If a turn signal or stop lamp is optically combined with the tail lamp and a two-filament replaceable bulb is used, the bulb shall have an indexing base and the socket shall be designed so that bulbs with nonindexing bases cannot be used. Removable sockets shall have an indexing feature so that they cannot be reinserted into lamp housings in random positions, unless the lamp will perform its intended function with random light source orientation.

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

6.4.1 Each tail lamp shall be designed to comply with all photometric requirements of Table 1 with all vehicular obstructions considered.

6.4.2 Each tail lamp shall be designed to comply with one of the following visibility requirements:

a. Each 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 in any direction from 15 degrees above to 15 degrees below the horizontal (see Figure 1).

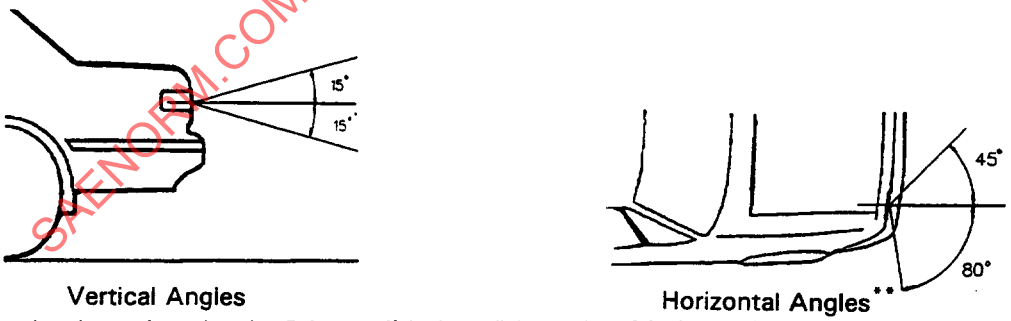


*The downward angle may be reduced to 5 degrees if the lower lighted edge of the lamp is less than 750 mm above the ground
**Left side shown; right side symmetrically opposite.

FIGURE 1—TAIL LAMP VISIBILITY REQUIREMENTS—UNOBSTRUCTED PROJECTED AREA

b. Each lamp must provide a luminous intensity not less than 0.05 cd throughout the photometric pattern defined by the corner points specified as follows:

1. 15 degrees above horizontal, 45 degrees inwards, and 80 degrees outwards
2. 15 degrees below horizontal, 45 degrees inwards, and 80 degrees 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

7. Guidelines

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

7.1.1 Tail lamps on the rear of the vehicle should be spaced as far apart laterally as practicable so that the signal will be clearly visible and its intent clearly understood.

7.1.2 The luminous intensity of incandescent filament bulbs will vary with applied voltage. The electrical wiring in the vehicle should be adequate to supply design voltage to the lamp filament.

7.1.3 Performance of lamps may deteriorate significantly as a result of dirt, grime, and/or snow accumulation on their 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 extremely severe environments, such as in off-highway, mining, fuel haulage, or where it is expected that they will be totally immersed in water, the user should specify lamps specifically designed for such use.

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 LIGHTING COORDINATING COMMITTEE AND
THE SAE SIGNALLING AND MARKING DEVICES STANDARDS COMMITTEE

APPENDIX A

A.1 As a matter of additional information, attention is called to SAE J567 for requirements and gages used in socket design.

A.2 For vehicles over 2032 mm wide see SAE J2040.

SAE J585 Revised MAR2000

Rationale—The changes are as follows:

For many years a majority of the SAE Signal 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 tojust 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.

SAE J585 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:

SAE J585 Tail Lamps

Zones I and V (3 Lighted Sections) changed from 3.5 cd to 3.4 cd (–2.8%)
Zone III (2 Lighted Sections) changed from 16.8 cd to 16.7 cd (–0.6%)

Photometry Requirements—SAE Standards Versus FMVSS 108

Exhibit A shows the FMVSS 108 “Zone Total only” cd requirements as underlined values in the table. The same information is shown as follows with the addition of the “% variance” between FMVSS and SAE.

Exhibit A SAE J585 Tail Lamps
Zone III (2 Lighted Sections) SAE 16.7 cd versus FMVSS 108 16.8 cd (–0.6%)
Zones I and V (3 Lighted Sections) SAE 3.4 cd versus FMVSS 108 3.5 cd (–2.9 %)

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