SAE International™

SURFACE VEHICLE STANDARD

SAE J887

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School Bus Warning Lamps

1. Scope

This SAE Standard provides test procedures, requirements, and guidelines for red and yellow school bus warning 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.

2.1.1 SAE PUBLICATIONS

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

SAE J575—Test Methods and Equipment for Lighting Devices and Components for Use on Vehicles Less Than 2032 mm in Overall Width
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 J1690—Flashers
SAE J1889—LED Lighting Devices
SAE J2139—Tests for Lighting Devices and Components Used on Vehicles 2032 mm or More in Overall Width

2.1.2 ASTM PUBLICATIONS

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM E 308-85—Standard Method for Computing the Colors of Objects by Using the CIE System

3. Definitions

3.1 School Bus Red Warning Lamps

School bus red warning lamps are lights alternately flashing at 1 to 2 Hz per lamp, mounted horizontally both front and rear, intended to inform other users of the highway that such vehicle is stopped on highway to take on or discharge school children.

3.2 School Bus Yellow Warning Lamps

School bus yellow warning lamps are lights alternately flashing at 1 to 2 Hz per lamp, mounted horizontally both front and rear, intended to inform other users of the highway that such vehicle is about to stop to take on or discharge school children.

4. Lighting Identification Code

Lamps conforming to this document may be identified with the code W2 in accordance with SAE J759.

5. Tests

5.1 SAE J575 and SAE J2139 is part of this document. 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

5.1.5.1 All photometric measurements shall be made with the front face of the lamp at a distance of at least 3 m from the photometer. The lamp axis shall be taken as the horizontal line through the light source parallel to what would be the longitudinal axis of the vehicle, if the lamp were mounted in its normal position on the vehicle.

5.1.5.2 The school bus warning lamp shall be operated at design voltage. Design voltage shall be 12.8 V for nominal 12 V electrical systems, 25.6 V for nominal 24 V electrical systems and 38.4 V for 36 V electrical systems.

5.1.5.3 LED lamps shall be tested according to SAE J1889 Photometry Test section.

5.1.5.4 An optional alternate measure of photometric performance can be made using flash energy if the lamp is incapable of being operated in a steady state mode.

5.1.5.4.1 The device shall be allowed to operate until output is stable prior to making photometric measurements.

5.1.5.4.2 Photometric flash energy measurements (candela seconds) shall be taken as the average of at least ten consecutive flash cycles. There shall be an off time before each flash of at least 50% of the total flash cycle time.

5.1.6 WARPAGE

Test on devices with plastic components.

5.2 SAE J578

Color Specification is a part of this document.

5.3 SAE J576

Plastic materials for use in optical parts such as lenses and reflex reflectors of motor vehicle lighting devices is a part of this document.

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 or SAE J2139.

6.1.2 MOISTURE

SAE J575 or SAE J2139.

6.1.3 DUST

SAE J575 or SAE J2139.

6.1.4 CORROSION

SAE J575 or SAE J2139.

6.1.5 PHOTOMETRY

SAE J575 or SAE J1889 or SAE J2139.

6.1.5.1 The lamp under test shall meet the photometric performance requirements contained in 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.

TABLE 1—PHOTOMETRIC PERFORMANCE REQUIREMENTS SCHOOL BUS WARNING LAMPS

Zone	Test Point Degree	Test Point Degree	Minimum Luminous Intensity (Candela) Red	Minimum Luminous Intensity (Candela) Yellow	Minimum Zone Total Luminous Intensity (Candela) Red	Minimum Zone Total Luminous Intensity (Candela) Yellow
	H	30L	30	75		
	5D	30L	30	75		
1	5U	20L	150	375	590	1475
	H	20L	180	450		
	5D	20L	200	500		
	10U	5L	20	50		
2	10U	V	50	125	90	225
	10U	5R	20	50		
	5U	10L	300	750		
	5U	5L	300	750		
3	5U	V	300	750	1500	3750
	5U	5R	300	750		
	5U	10R	300	750		
	H	10L	400	1000		
	H	5L	500	1250		
4	H	V	600	1500	2400	6000
	H	5R	500	1250		
	H	10R	400	1000		
	5D	10L	300	750		
	5D	5L	450	1125		
5	5D	V	450	1125	1950	4875
	5D	5R	450	1125		
	5D	10R	300	750		
	10D	5L	40	100		
6	10D	V	40	100	120	300
	10D	5R	40	100		
	5U	20R	150	375		
	H	20R	180	450		
7	5D	20R	200	500	590	1475
	H	30R	30	75		
	5D	30R	30	75		

NOTE 1—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.

NOTE 2—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.

NOTE 3—An adjustment in lamp aim from design position may be made, provided that such adjustment does not exceed 3 degrees. All zones shall comply after final re-aim.

6.1.5.2 Alternate Method

The lamp under test shall meet the photometric performance requirements contained in Table 2 and its footnotes. The summation of the flash energy measurements at the specified test points in a zone shall be at least the value shown. Additionally, the instantaneous intensity of each flash must exceed at least 60% of the values given in table 2 for a duration of at least 50 msec.

6.1.6 WARPAGE

SAE J575 or SAE J2139.

6.2 Color

The lamp shall comply with the red or yellow requirements specified in SAE J578.

6.3 Plastic Materials

SAE J576.

6.4 Design Requirements

6.4.1 The functional lighted lens area of a school bus warning lamp shall not be less than 120 cm^2.

7. Guidelines

The mounting and use of school bus warning lamps are specified by various legal agencies. The following guidelines, if followed, will enhance performance of the system and uniformity in use throughout the various jurisdictional agencies. They are not part of the test provisions, specifications, requirements, or procedures.

7.1 The yellow lamps should be automatically deactivated and the red lamps activated when the vehicle is stopped to take on or discharge school children.

7.2 For circuit interrupted incandescent filament devices, see SAE J1690. The “on” period of the flasher should be long enough to permit a bulb filament to approach full brightness.

7.3 There should be a visible or an audible means of giving a clear and unmistakable indication to the driver when the warning lamps are activated.

7.4 Front and rear warning lamps should be spaced as far apart laterally as practical with the yellow lamps mounted inboard of the red lamps. In no case should the spacing between the inboard lamps be less than 1000 mm, as measured from the nearest edge of the lens.

7.5 The warning lamps should be mounted on the same horizontal centerline as high as practical at the front above the windshield and on the same horizontal centerline as high as practical at the rear so that the lower edge of the lenses is not lower than the top line of the side window openings.

TABLE 2—PHOTOMETRIC PERFORMANCE REQUIREMENTS (ALTERNATE METHOD) SCHOOL BUS WARNING LAMPS

Zone	Test Point Degree	Test Point Degree	Minimum Total Zonal Flash Energy (Candela Seconds) Red	Minimum Total Zonal Flash Energy (Candela Seconds) Yellow	Minimum Zone Total Flash Energy (Candela Seconds) Red	Minimum Zone Total Flash Energy (Candela Seconds) Yellow
	H	30L	7	18		
	5D	30L	7	18		
1	5U	20L	36	89	141	351
	H	20L	43	107		
	5D	20L	48	119		
	10U	5L	5	12		
2	10U	V	12	30	22	54
	10U	5R	5	12		
	5U	10L	72	178		
	5U	5L	72	178		
3	5U	V	72	178	360	890
	5U	5R	72	178		
	5U	10R	72	178		
	H	10L	95	238		
	H	5L	119	297		
4	H	V	143	356	571	1426
	H	5R	119	297		
	H	10R	95	238		
	5D	10L	72	178		
	5D	5L	107	267		
5	5D	V	107	267	465	1157
	5D	5R	107	267		
	5D	10R	72	178		
	10D	5L	10	24		
6	10D	V	10	24	30	72
	10D	5R	10	24		
	5U	20R	36	89		
	H	20R	43	107		
7	5D	20R	48	119	141	351
	H	30R	7	18		
	5D	30R	7	18		

NOTE 1—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.

NOTE 2—The sum of the flash energy measurements at each test point within a zone shall not be less than the Zone Total Flash Energy shown.

NOTE 3—An adjustment in lamp aim from design position may be made, provided that such adjustment does not exceed 3 degrees. All zones shall comply after final re-aim.