

Flashing Warning Lamps for Authorized Emergency, Maintenance and Service Vehicles—SAE J595 AUG83

SAE Recommended Practice
Completely Revised August 1983

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SAE Recommended Practice

Report of the Lighting Committee, approved December 1948, completely revised August 1983. Rationale statement available.

1. Purpose—The purpose of this technical report is to establish general requirements for flashing warning lamps for use on authorized emergency, maintenance, and service vehicles.

2. Scope—This technical report provides design guidelines, test procedure references, and performance requirements for flashing incandescent warning lamps. It is intended to apply to, but is not limited to, surface land vehicles.

3. Definition—A flashing warning lamp is a lamp in which the light source is turned on and off by circuit interruption producing a repetitive flash of light which is directionally aimed and will project a flashing beam signal over a minimum area from 20 deg right to 20 deg left on a horizontal plane and from 10 deg up to 10 deg down on a vertical plane.

4. Test Procedures—The following sections of SAE J575, are a part of this technical report:

Section 2.1—Lighting Devices

Section 2.2—Bulbs

Section 2.3—Test Fixture

Section 3—Laboratory Facilities

Section 4.1—Vibration Test

Section 4.2—Moisture Test

Section 4.3—Dust Test

Section 4.4—Corrosion Test

Section 4.5—Color Test (See SAE J578)

Section 4.6—Photometry Test

Photometric measurements shall be made with the device mounted in its normal operating position and all luminous intensity measurements shall be made with the incandescent filament of the signal lamp 3 m or more from the photometer screen. The lamp shall be mounted so that the horizontal and vertical plane through the photometer axis also passes through the center of the test bulb filament. Photometry shall be done with the filament burning continuously.

Section 4.8—Warpage Test on Devices with Plastic Components

A sample device shall be mounted in its normal operating position, operating at a flash rate of 1.50 ± 0.17 Hz with a $50 \pm 2\%$ current on time and at the voltage recommended by the bulb manufacturer in a circulating air oven for 1 h within a temperature range of 46–49°C.

5. Dimensional Requirements—The effective projected luminous area measured on a plane at right angles to the axis of the lamp shall be not less than 60 cm².

6. General Requirements

6.1 Photometric Design Guidelines—Design guidelines are listed in Table 1—Photometric Design Guidelines.

6.2 Lighting Identification Code—The lighting identification code should be "W" in accordance with SAE J759.

7. Performance Requirements

7.1 Lighting Devices—Sample devices submitted for laboratory tests shall be representative of devices as regularly manufactured and marketed.

7.2 Bulbs—Requirements are based on laboratories using accurately rated bulbs operated at their designed mean spherical luminous intensity. Sealed units shall be seasoned (lighted) at 12.8 V for 1% of their rated average laboratory life or 10 h maximum prior to photometry and then operated at their design voltage. (For units designed to operate on other than a 12-volt circuit, check manufacturer for proper seasoning schedule.)

7.3 Vibration—Upon completion of the test, there shall be no observed rotation, displacement, cracking, or rupture of parts of the test device (except bulb(s) and sealed beam unit internal components) that would result in failure of any other tests contained in Section 4 of SAE J575. Cracking or rupture of parts of the device affecting its mounting shall also constitute a failure.

7.4 Moisture—Upon completion of the test, the moisture accumulation in the test device shall be 2 mL or less. For devices with an interior volume greater than 7000 mL, the maximum allowable moisture accumu-

lation in the test device shall be 0.03% of the total interior volume of the test device.

7.5 Dust—Upon completion of the test, the test device shall be considered to have met all the requirements of the dust test when complying with either of the following requirements:

7.5.1 No dust shall be found on the interior surface of the test device, or

7.5.2 The ratio of the maximum luminous intensities (exterior only cleaned to exterior and interior cleaned) shall be a minimum of 0.9.

7.6 Corrosion—Upon completion of the test, there shall be no observed corrosion that would result in the failure of any other test contained in Section 4 of SAE J575.

7.7 Color—The color of the light emitted from the flashing warning lamps shall be white, yellow, or red as specified in SAE J578.

7.8 Photometry—The lamp shall meet the zonal photometric requirements of Table 2—Photometric Requirements.

7.8.1 For the device to comply with the photometric performance requirements, the summation of the luminous intensity values shall meet the values specified in Table 2.

7.8.2 The measured luminous intensity at each test point shall be not less than 60% of the values specified in Table 1.

7.8.3 An adjustment in lamp orientation from the design position may be made in determining compliance to the performance photometric requirements, provided such adjustment does not exceed 3 deg in any direction. All zone totals must comply after reaim.

7.9 Warpage—Upon completion of the test, there shall be no observed warpage of plastic components of the test device that would result in the failure of any other test contained in Section 4 of SAE J575.

8. Plastic Material—Plastic materials used in optical parts shall comply with the requirements of SAE J576.

9. General Installation Recommendations—These general recommendations apply to the device as used on the vehicle and are not part of the performance requirements.

9.1 Front and rear warning lamps should be mounted as high and as far apart as practicable. The location of front warning lamps should be such that they can be clearly distinguished when the headlamps are lighted on the lower beam.

9.2 Visibility of the warning lamps should be unobstructed by any part of the vehicle 10 deg above to 10 deg below the horizontal and from 45 deg to the right to 45 deg to the left of the center line of the vehicle.

9.3 There should be a visible or audible means of giving a clear and unmistakable indication to the driver when the warning lamps are turned "on."

9.4 To improve the efficiency of the signal, it is recommended that, where practical, the area surrounding the lamp should be black.

9.5 **Flash Rate**—The flash rate when observed from a fixed position shall be between 1.0–2.0 Hz—when operated at the voltage recommended by the manufacturer. The "on" period of the lamp shall be as specified in SAE J945 and/or SAE J1054.

The ϕ symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.

TABLE 1—PHOTOMETRIC DESIGN GUIDELINES

Test Points, deg	Luminous Intensity, Candela		
	White	Yellow	Red
5L 10U-V 5R	80 200 80	40 100 40	20 50 20
20L 10L 5L 5U-V 5R 10R 20R	80 200 400 600 400 200 80	40 100 200 300 200 100 40	20 50 100 150 100 50 20
20L 10L 5L H-V 5R 10R 20R	120 300 800 1200 800 300 120	60 150 400 600 400 150 60	30 75 200 300 200 75 30
20L 10L 5L 5D-V 5R 10R 20R	80 200 400 600 400 200 80	40 100 200 300 200 100 40	20 50 100 150 100 50 20
5L 10D-V 5R	80 200 80	40 100 40	20 50 20

TABLE 2—PHOTOMETRIC REQUIREMENTS

Zones	Test Points, deg	Luminous Intensity, Candela		
		White Zone Total	Yellow Zone Total	Red Zone Total
1	5U-10L 5U-20L H-20L 5D-20L 5D-10L	600	300	150
2	10U-5L 10U-V 10U-5R	320	160	80
3	5U-5L H-10L 5D-5L	1000	500	250
4	5U-V H-5L H-V H-5R 5D-V	3600	1800	900
5	5U-5R H-10R 5D-5R	1000	500	250
6	10D-5L 10D-V 10D-5R	320	160	80
7	5U-10R 5U-20R H-20R 5D-20R 5D-10R	600	300	150

APPENDIX

The appendix contains additional information considered useful in application to this standard.

Attention is called to SAE J567, for requirements and gages to be used in socket design.