The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
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SURFACE VEHICLE RECOMMENDED PRACTICE

Submitted for recognition as an American National Standard

SAE J1054 REV. SEP94

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WARNING LAMP ALTERNATING FLASHERS

1. Scope—This SAE Recommended Practice defines the test conditions, procedures, and minimum design requirements for nominal 6, 12, and 24 V warning lamp alternating flashers.

(R) *2. References*

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

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

SAE J595—Flashing Warning Lamps for Authorized Emergency, Maintenance, and Service Vehicles
SAE J759—Lighting Identification Code
SAE J823—Flasher Test
SAE J887—School Bus Warning Lamps

2.2 Definition

2.2.1 FLASHER—A device installed in a vehicle lighting system which has the primary function of causing warning lamps to alternately flash when the system is activated. Secondary functions may include the visible pilot(s) indication for the warning system and an audible signal to indicate when the flasher is operating (recommended by SAE J887 and J595).

3. Flasher Identification Code—Flashers conforming to this document may be identified in accordance with SAE J759.

4. Tests

4.1 Test Equipment—The standard test equipment and circuitry for performing flasher tests shall conform with the specifications in SAE J823.

4.2 Test Procedures—All the following tests shall be performed at 12.8 V (or 6.4 V or 25.6 V) at the bulbs unless otherwise specified.

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4.2.1 START TIME—The start time is the time to complete one cycle (both load circuits have been energized and de-energized) after voltage is applied to the flasher. For fixed-load flashers, the test shall be made with the specific ampere design loads connected. For variable-load flashers, the test shall be made with both the minimum and maximum ampere design loads connected. The test shall be made in an ambient temperature of 24 °C ± 5 °C. The start time shall be measured and recorded for three starts, each of which is separated by a cooling interval of at least 5 min at 24 °C ± 5 °C.

4.2.2 VOLTAGE DROP—The lowest voltage drop across the flasher shall be measured between the input and each load terminal at the flasher and during the "on" period. The test shall be made with the specific maximum ampere design load connected and in an ambient temperature of 24 °C ± 5 °C. The voltage drop shall be measured and recorded during any three cycles after the flasher has been operating for five consecutive cycles.

4.2.3 FLASH RATE AND PERCENT CURRENT ON TIME—The flash rate and percent current on time of each load terminal shall be measured and recorded after the flasher has completed five consecutive cycles and shall be an average of at least three consecutive cycles at each of the following bulb voltages and ambient temperature conditions:

a. 12.8 V (or 6.4 V or 25.6 V) and 24 °C ± 5 °C
b. 12.0 V (or 6.0 V or 24.0 V) and -17 °C ± 3 °C
c. 15.0 V (or 7.5 V or 30.0 V) and -17 °C ± 3 °C
d. 11.0 V (or 5.5 V or 22.0 V) and 50 °C ± 3 °C
e. 14.0 V (or 7.0 V or 28.0 V) and 50 °C ± 3 °C

The flashers shall be temperature stabilized before each test. The test shall be made with the specific ampere design load connected for each circuit.

4.2.4 EXTREME TEMPERATURE TESTS—The flasher shall be subjected to ambient temperatures of 63 °C ± 3 °C and -32 °C ± 3 °C until stabilized. The start time and flash rate shall be measured and recorded at each extreme temperature. The measurements must be completed within the first minute of energization, otherwise the procedure shall be as specified in 4.2.1 and 4.2.3a.

4.2.5 DURABILITY—The durability test shall be conducted under the following conditions:

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a. 24 °C ± 5 °C ambient temperature
b. 13.0 V (6.5 V for 6.0 V nominal system or 26.0 V for 25.6 V nominal system) applied to the input terminal of the test circuit
c. Specific maximum ampere design load
d. 100 h of intermittent flashing (15 s on, 15 s off) followed by 50 h of continuous flashing

5. Performance Requirements

5.1 Start Time—The average and maximum of the three start time measurements (4.2.1) for the flasher shall not exceed 1.5 and 2.0 s respectively.

5.2 Voltage Drop—The average of the three voltage drop measurements (4.2.2) shall not exceed 0.5 V. No single measurement may exceed 0.8 V.

5.3 Flash Rate and Percent Current On Time—At each load terminal, the flash rate shall be a minimum of 60 and a maximum of 120 per minute and the percent current "on" time shall be a minimum of 30 and a maximum of 75. The total of the percent current "on" times for the two terminals shall be a minimum of 90 and a maximum of 110.

5.4 **Extreme Temperature**—At the extreme temperature conditions, start time shall not exceed 5 s and flash rate shall be not less than 30 nor more than 150 flashes per minute.

5.5 **Durability**—The flasher shall conform to 5.1, 5.2, and 5.3 (under test procedure 4.2.3a only) at the start and conclusion of test.

6. Notes

6.1 **Marginal Indicia**—The (R) 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.

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