

SURFACE VEHICLE RECOMMENDED PRACTICE

Submitted for recognition as an American National Standard

FLASHERS

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

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified herein. The latest issue of the 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 J823—Flasher Test

SAE J887—School Bus Warning Lamps

SAE J910—Hazard Warning Signal Switch

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 FEDERAL PUBLICATION—Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

FMVSS-108

2.2.2 ISO PUBLICATION—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ISO 4082—Road vehicles—Motor vehicles flasher units

2.2.3 JIS PUBLICATION—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

JIS D 5707—Flasher Units for Automobiles

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3. Definitions

- 3.1 Turn Signal Flasher**—A device installed in a vehicle lighting system which has the primary function of causing the turn signal lamps to flash when the turn signal switch is actuated. Secondary functions may include the visible pilot indication for the turn signal system (required by SAE J910) and an audible signal to indicate when the flasher is operating.
- 3.2 Hazard Warning Signal Flasher**—A device installed in a vehicle lighting system which has the primary function of causing all of the turn signal lamps to flash when the hazard warning switch is actuated. Secondary functions may include the visible pilot indication for the hazard warning signal system (required by SAE J910) and an audible signal to indicate when the flasher is operating.
- 3.3 Combination Flasher**—A device which satisfies all the turn signal and hazard warning requirements of this document. These devices are used on vehicles whose operation or mode of operation presents a variable electrical load to the flasher.
- 3.4 Warning Lamp Alternating 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 actuated. 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).
- 3.5 "Class A" Flashers**—Flashers designed to perform in vehicles whose expected life or mode of operation requires a flasher with normal durability. Examples of these vehicles are passenger cars and light-duty trucks.
- 3.6 "Class B" Flashers**—Flashers designed to perform in vehicles whose expected life or mode of operation requires a flasher with extended durability. Examples of these vehicles are heavy-duty trucks, buses, and taxicabs.

4. Flasher Identification Code ~~3/4~~

Flashers conforming to this document may be marked with the following information.

SAE J1690
Class designation
Application (i.e., Turn Signal Flasher)
Minimum and maximum ampere load rating

5. Tests

- 5.1 Test Equipment**—The standard test equipment and circuitry for performing flasher tests shall conform with the specifications in SAE J823, Flasher Test Equipment.
- 5.2 Test Procedures**—All of the following tests shall be performed at 12.8 V for nominal 12 V devices, 6.4 V for nominal 6 V devices and 25.6 V for nominal 24 V devices and at an ambient temperature of 24 °C ± 5 °C unless otherwise specified.

5.2.1 START TIME

5.2.1.1 Turn Signal, Hazard Warning Signal, and Combination Flashers—The start time of a normally closed type flasher is the time to open the circuit after the voltage is applied, provided the closed circuit remains closed for a minimum of 0.10 s. If the closed circuit opens in less than 0.10 s, the flasher shall be considered a normally open type flasher for this test. The start time of a normally open type flasher is the time to complete one cycle (close the circuit and then open the circuit) after the voltage is applied. For a fixed load flasher, the test shall be made with the specific ampere design load connected. For a variable load flasher, the test shall be made with the minimum and maximum ampere design loads for both the turn and hazard warning signal functions. 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.

5.2.1.2 Warning Lamp Alternating Flashers—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 conducted with the specific ampere design loads connected. For a variable load flasher, the test shall be conducted with both the minimum and maximum ampere design loads connected. 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.

5.2.2 VOLTAGE DROP

5.2.2.1 Turn Signal, Hazard Warning Signal, and Combination Flashers—The lowest voltage drop across the flasher shall be measured between the input and the load terminals at the flasher and during the "on" period. The voltage drop shall be measured and recorded during any three cycles after the flasher has been operating for five consecutive cycles. For a fixed load flasher, the test shall be made with the specific ampere design load connected. For a variable load flasher, the test shall be made with the maximum ampere design load connected.

5.2.2.2 Warning Lamp Alternating Flashers—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 voltage drop shall be measured and recorded during any three cycles after the flasher has been operating for five consecutive cycles. For fixed load flashers, the test shall be made with the specific maximum ampere design load connected. For a variable load flasher, the test shall be conducted with the maximum ampere design load connected.

5.2.3 FLASH RATE AND PERCENT CURRENT ON TIME—The flash rate and percent current on time shall be measured and recorded after the flasher has completed five consecutive cycles. The average of a minimum of three consecutive cycles shall be determined.

The flasher shall be temperature stabilized before each test. For a fixed load flasher, the test shall be made with the specific ampere design load connected. For a variable load flasher, the test shall be made with both the minimum and maximum ampere design loads.

5.2.3.1 Turn Signal Flashers and Warning Lamp Alternating Flashers—The test shall be conducted at each of the following bulb voltage and ambient temperature conditions:

- a. 12.8 V (or 6.4 V or 25.6 V) and $24^{\circ}\text{C} \pm 5^{\circ}\text{C}$.
- b. 12.0 V (or 6.0 V or 24.0 V) and $-17^{\circ}\text{C} \pm -3^{\circ}\text{C}$.
- c. 15.0 V (or 7.5 V or 30.0 V) and $-17^{\circ}\text{C} \pm -3^{\circ}\text{C}$.
- d. 11.0 V (or 5.5 V or 22.0 V) and $50^{\circ}\text{C} \pm -3^{\circ}\text{C}$.
- e. 14.0 V (or 7.0 V or 28.0 V) and $50^{\circ}\text{C} \pm -3^{\circ}\text{C}$.