School Bus Stop Arm–
SAE J1133 APR84

SAE Recommended Practice
Completely Revised April 1984

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PREPRINT

φ SCHOOL BUS STOP ARM—SAE J1133 APR84 SAE Recommended Practice

Report of the Lighting Committee, approved April 1976, completely revised April 1984. Rationale statement available.

1. Scope—This SAE Technical Report provides test procedures, requirements, and guidelines for school bus stop arms.

2. Definition—A school bus stop arm is an auxiliary device used to signal that a school bus has stopped to load or discharge passengers. It supplements devices specified by SAE J887, School Bus Warning Lamps.

3. Lamps for use on school bus stop arms may be identified by the code "I" in accordance with SAE J759, Lighting Identification Code.

4. Tests

4.1 SAE J575, Tests for Motor Vehicle Lighting Devices and Components, is a part of this report. The following tests are applicable, with the modifications indicated:

4.1.1 VIBRATION TEST

4.1.2 MOISTURE TEST

4.1.3 DUST TEST

4.1.4 CORROSION TEST

4.1.5 PHOTOMETRY—In addition to the test procedures in SAE J575, the following apply:

4.1.5.1 Photometric measurements shall be made with the light source(s) of the lamp(s) at least 3 m from the photometer. The H-V axis shall be taken as parallel to the longitudinal axis of the vehicle.

4.1.5.2 Photometric measurements shall be made with the bulb filament steadily burning.

4.1.6 WARPAGE TEST FOR DEVICES WITH PLASTIC COMPONENTS

4.2 Color Test—SAE J578, Color Specification for Electric Signal Lighting Devices, is a part of this report.

4.3 Durability—The device shall be subjected to a test of 45 000 cycles at a rate not to exceed 0.2 Hz and at a temperature of 25 ± 3°C. A cycle shall consist of movement from the parked or retracted position to the fully extended position and return to the parked position.

5. Requirements

5.1 Performance Requirements—A device, when tested in accordance with the test procedures specified in Section 4, shall meet the following requirements:

5.1.1 VIBRATION—SAE J575

5.1.2 MOISTURE—SAE J575

5.1.3 DUST—SAE J575

5.1.4 CORROSION—SAE J575

5.1.5 PHOTOMETRY—In addition to the requirements of SAE J575, the school bus stop arm lamps shall meet the following photometric performance requirements:

5.1.5.1 The summation of the luminous intensity readings of the specific test points in a zone shall meet the values in Table 1, Photometric Performance Requirements.

5.1.5.2 When calculating the zone total, the measured luminous intensity for a test point shall not be less than 60% of the value specified for that test point in Table 2, Photometric Design Guidelines.

5.1.6 WARPAGE—SAE J575

5.1.7 COLOR—The color of light emitted from the school bus stop arm lamps shall be red as specified in SAE J578.

5.1.8 DURABILITY—Failure of the device to operate in the intended electrical or mechanical manner during or at the conclusion of the test shall constitute a failure. Internal bulb failure shall not be considered as failure of the device.

5.1.9 FLASH RATE—The two lamps on each face shall flash alternately with the rate and percent "on" time as required in SAE J1054, Warning Lamp Alternating Flashers.

5.2 Material Requirements—Plastic materials used in the optical parts shall meet the requirements of SAE J576, Plastic Materials for Use in Optical Parts Such as Lenses and Reflectors of Motor Vehicle Lighting Devices.

5.3 Design Requirements

5.3.1 A school bus stop arm shall have on both the front and rear the word "STOP" in letters which are at least 150 mm in height and have a stroke width of at least 20 mm.

5.3.2 School bus stop arms shall have a minimum of two lamps to the front and two lamps to the rear, or two double-faced lamps may be used.

5.3.3 Lamps shall be activated at the commencement of the stop arm extension cycle and deactivated when the stop arm is retracted.

6. Guidelines

6.1 Photometric design guidelines for lamps used on school bus stop arms, when tested in accordance with paragraph 4.1.5 of this report, are contained in Table 2, Photometric Design Guidelines.

6.2 Installation Guidelines—The following apply to school bus stop arms as used on the vehicle, and shall not be considered part of the requirements.

6.2.1 The school bus stop arm should be installed on the left outside of the bus body and be mounted so as to be seen readily by motorists approaching from either the front or rear of the bus.

6.2.2 If the device is operated by a manual switch, that switch shall be located so as to be easily accessible to the driver.

6.3 Design Guidelines

6.3.1 The lamps should be located in the extreme top and bottom portions of the stop arm, one above the other.

6.3.2 It is recommended that the word "STOP" be displayed as white letters against a red background, and that the stop arm have the shape of a regular octagon which is at least 450 x 450 mm. The octagon should have a white border at least 12 mm wide. The maximum extension should not exceed 560 mm beyond the left side of the vehicle. The school bus stop arm may also optionally be reflectorized.

6.3.3 The two lamps on each face should flash alternately with a flash rate of 1–2 Hz and with a current "on" time of 50%.

7. Appendix—As a matter of information, attention is called to SAE J567 for requirements and gages to be used in socket design.

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.

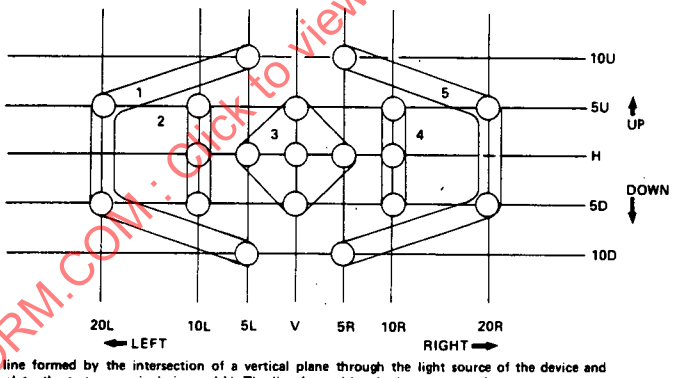
TABLE 1—PHOTOMETRIC PERFORMANCE REQUIREMENTS

Zone	Test Points (deg)	Total Zonal Luminous Intensity (cd)
1	10U—5L 5U—20L 5D—20L 10D—5L	52
2	5U—10L H—10L 5D—10L	100
3	5U—V H—5L H—V H—5R 5D—V	380
4	5U—10R H—10R 5D—10R	100
5	10U—5R 5U—20R 5D—20R 10D—5R	52
Maximum Luminous Intensity (cd) at any Individual Test Point		300

NOTES:

1. For the lamp to conform to the photometric zonal performance requirements, the summation of the candela measurements at the specific test points in a zone shall meet or exceed the values specified for that zone in Table 1.
2. When calculating the zone total, the measured candela for a test point shall not be less than 60% of the value specified for that test point in Table 2.
3. See Fig. 1 for a graphical description of the Zonal Boundaries.

GRAPHICAL DESCRIPTION OF THE ZONAL BOUNDARIES
See Table 1 for Zone Values.



The line formed by the intersection of a vertical plane through the light source of the device and normal to the test screen is designated V. The line formed by the intersection of a horizontal plane through the light source and normal to the test screen is designated H. The point of intersection of these two lines is designated H-V. The other points on the test screen are measured in terms of degree from these two lines. Degrees to the right (R) and to the left (L) are regarded as being to the right and left of the vertical line when the observer stands behind the lighting device and looks in the direction of the emanating light beam when the device is properly aimed for photometry with respect to the H-V point. Similarly, the upward angles designated as U and the downward angles designated D, refer to light emanating at angles above and below the horizontal line, respectively.

FIG. 1