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INTERNATIONAL
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SURFACE VEHICLE STANDARD

SAE J554

REV. AUG87

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Supersedes J554b

Submitted for recognition as an American National Standard

ELECTRIC FUSES (CARTRIDGE TYPE)

Foreword—This Document has also changed to comply with the new SAE Technical Standards Board Format. References were added as Section 2. All other section numbers have changed.

1. ***Scope***—The fuses shown are for use in motor vehicles, boats, and trailers to protect electrical wiring and equipment. This standard is for the construction shown and is not intended to restrict the design and use of other configurations and materials capable of meeting the vehicle requirements.

2. ***References***—There are no referenced publications specified herein

3. ***Definition***—A fuse is a device designed to open the electric circuit when subjected to overcurrents that could damage the circuit or equipment. This action is to be nonreversible, and the fuse is intended to be replaced after the circuit malfunction has been corrected.

4. ***Materials***—The fuses shown shall have clear glass tubes. End caps shall be of brass, copper, or other copper alloy and shall be plated with nickel or other suitable material having satisfactory electrical and corrosion protective properties.

5. ***Construction***—Fuse caps shall be tightly attached to the glass tube and the ends shall be square and free of solder externally. Fuse elements shall be clearly visible through the glass tube. Fuses shall be capable of being passed through a tubular gage having a length as long as the fuse and having a uniform inside diameter of 0.258–0.259 in (6.55–6.60 mm). Preferred and other fuse dimensions are shown in Figure 1.

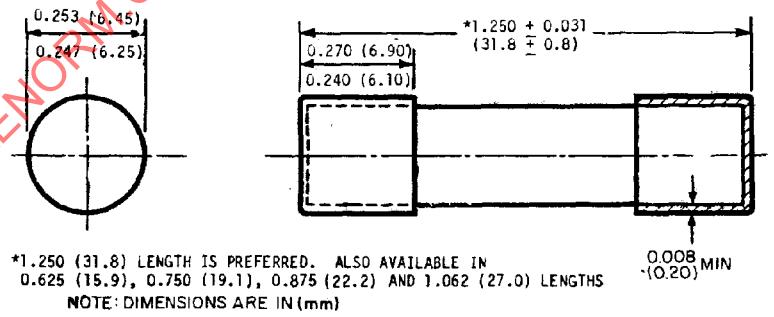

FIGURE 1—FUSE DIMENSIONS

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6. *Application*

6.1 General—This standard applies to fuses of all lengths. However, the fuse derating chart shown in Figure 2 applies specifically to the preferred length of 1.250 in (31.8 mm). The fuse manufacturer should be contacted for recommendations on other available lengths. (See Figure 1.)

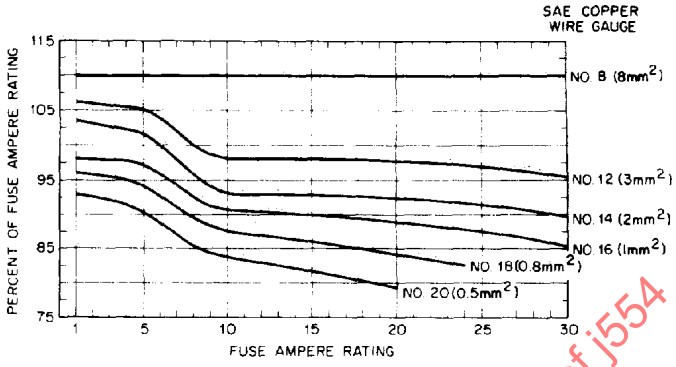

FIGURE 2—FUSE DERATING FOR VARIOUS WIRE SIZES
(1.250 IN (31.8 MM) LENGTH)

6.2 Ampere Rating—This standard covers ampere ratings up to and including 30 A. Preferred ampere ratings are shown in Table 1. These ratings are determined at 75°F (24°C) ambient temperature. Approximate capacity change with respect to temperature is shown in Figure 3 for all length fuses. The use of fuses in ambient temperatures beyond the limits shown is not recommended without thorough testing experimentally in the vehicle. It is further recommended that fuses not be loaded to 100% of the adjusted capacity, according to ambient temperature, due to electrical system variances. See Figure 2 for additional deratings when fuses are used on cable gage sizes other than the test gage wire.

TABLE 1—FUSE COLOR CODES

Ampere Rating	Color	Ampere Rating	Color
1	Dark green	9	Orange
2	Gray	10	Red
2-1/2	Purple	14	Black
3	Violet	15	Light blue
4	Pink	20	Yellow
5	Tan	25	White
6	Gold	30	Light green
7-1/2	Brown		

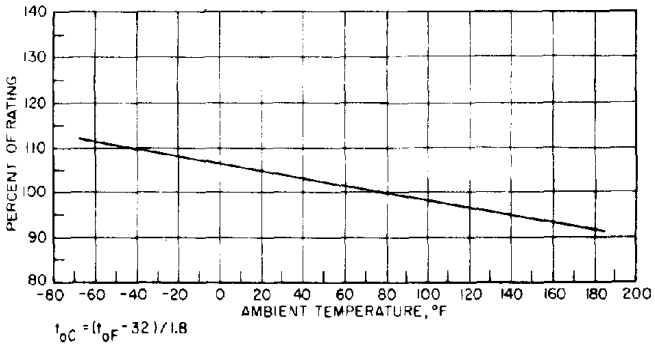

FIGURE 3—EFFECT OF AMBIENT TEMPERATURE ON AMPERE RATING OF SAE SPECIFICATION FUSES

6.3 Voltage Rating—Fuses shall be capable of interrupting any voltage up to and including 32 VDC.

6.4 Maximum Voltage Drop—The maximum voltage drop (in millivolts) at rated current across the fuse only, shall be as shown in Table 2, when measured across the fuse from ferrule to ferrule.

7. Performance—Tests shall be conducted within an ambient temperature range of 75 ± 9 °F (24.0 ± 5 °C) except for the overcurrent test which is to be conducted at 75 ± 2 °F (23.9 ± 1.2 °C).

7.1 Ampere Rating Tests—Fuses shall carry 110% of rated current continuously for 4 h, shall open at 135% of rated current in less than 1 h, and shall open at 200% of rated current in less than 10 s.

7.2 Cycling Test—Fuses shall perform satisfactorily for a 50 000 cycle load test. Each cycle shall consist of applying 70% of the rated current carrying capacity for 10 s followed by a 10 s interval of no applied current.

TABLE 2—MAXIMUM VOLTAGE DROP OF FUSE AT RATED CURRENT

Ampere Rating	Maximum Voltage Drop (Millivolts)
1	325.0
2	300.0
2-1/2	275.0
3	250.0
4	235.0
5	215.0
6	200.0
7-1/2	185.0
9	170.0
10	165.0
14	155.0
15	150.0
20	135.0
25	125.0
30	120.0

7.3 Vibration Test—Fuses shall perform satisfactorily after undergoing the following tests: Suitably mounted samples shall be subjected to a simple harmonic motion having an amplitude of 0.03 in (0.8 mm) travel (0.06 in (1.5 mm) maximum total excursion). The frequency shall be varied uniformly between the limits of 10 and 55 Hz. The entire range of 10–55 Hz and returning to 10 Hz shall be traversed in approximately 1 min. This motion shall be applied for a period of 2 h in each of the three mutually perpendicular directions (total of 6 h).

7.4 Procedure—The fuses, with the exceptions noted in the vibration test, shall be mounted horizontally. When testing two or more fuses in series, the fuses shall be mounted no less than 6 in (152 mm) apart and with no less than 24 in (609 mm) of interconnecting cable. All electrical tests shall be made using SAE No. 8[1] gage copper wire, and with fuse clip attachment terminals that have a maximum voltage drop of 4 mV per ampere when measured between points located on the wire 3 in (76 mm) from the attachment terminals. This determination shall be made by using a solid copper dummy 0.250 in (6.35 mm) in diameter and 1.250 ± 0.005 in (31.75 ± 0.13 mm) long, with suitably plated ferrules, installed in the fuse clips.

7.5 Marking—Fuses shall be permanently and legibly marked on the end caps with the ampere rating and the manufacturer's name or trademark. In addition, the ampere rating may be marked on the glass using numerals that are 0.150–0.200 in (4.0–5.0 mm) in height, or the fuses may be color coded with a permanent stripe around the interior or exterior of the glass tube. If a color stripe is used, the fuse element must still be clearly visible through the glass tube. This color coding shall be as shown in Table 1.

8. Notes

8.1 Marginal Indicia—The change bar (l) located in the left margin is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. An (R) symbol to the left of the document title indicates a complete revision of the report.

PREPARED BY THE SAE CIRCUIT PROTECTION AND SWITCHING DEVICES SUBCOMMITTEE
OF THE SAE ELECTRICAL AND ELECTRONIC SYSTEMS TECHNICAL COMMITTEE

1. Conductor cross section area to be not less than 14.810 cir mil (7.23 mm^2).