SAE International™

SURFACE VEHICLE RECOMMENDED PRACTICE

J163

REV. JUL2006

Issued 1974-01
Revised 2006-07

Superseding J163 DEC2001

Low Tension Wiring and Cable Terminals and Splice Clips

RATIONALE

This document has been revised to delete referenced SAE documents that are obsolete and replace them with the applicable current SAE documents. Wire/Cable sizes have been converted to metric sizes per SAE J1127 and SAE J1128.

1. SCOPE

The SAE Recommended Practice covers the application requirements for terminals and splice clips attached to stranded low tension wiring and cable as shown in SAE J1127 and SAE J1128. In addition, it covers maximum voltage drop limits for friction type connections.

2. REFERENCES

2.1 Applicable Publications

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest version of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J1127 Battery Cable

SAE J1128 Low Tension Primary Cable

3. USE OF TERMINALS

Friction (quick disconnect) type brass connections should be used only where the maximum temperature (environmental ambient plus rise due to current), measured at the center of the terminal surface, does not exceed the capabilities of the physical properties of the material. Maximum temperatures for terminal materials other than brass should also be determined prior to using so as to be compatible with the physical properties of these materials.

Electrical connections and splices of standard types must be protected, as application dictates, from moisture, salt, soil accumulation, acid, or corrosive vapor which will deteriorate the connection beyond the limits of this recommended practice.

4. PERFORMANCE REQUIREMENTS (ELECTRICAL)

Terminals or splice clips shall be attached to wire or cable in such a manner that, following the humidity test, the voltage drop across the attachment shall not exceed the values in Table 1. Friction connections (terminal to terminal) shall be such that following four repeated insertions and the humidity test, the voltage drop across the connection shall not exceed the values in Table 2. For a terminal to be acceptable, all specimens tested must meet the requirements.

TABLE 1 - WIRE TO TERMINAL OR WIRE TO WIRE (SPLICE CLIP METHOD)
VOLTAGE DROP (AFTER HUMIDITY TEST)

Wire/Cable (SAE Gage)	Test Current, A	Drop, mV Uninsulated Terminal	Drop, mV Preinsulated Terminal
0.5 mm (20 ga)	5	3	3.5
0.8 mm (18 ga)	10	5	5.5
1 mm (16 ga)	15	8	9
2 mm (14 ga)	20	10	11
3 mm (12 ga)	30	15	17
5 mm (10 ga)	40	20	22
8 mm (8 ga)	50	25	--
13 mm (6 ga)	60	15	--
19 mm (4 ga)	70	18	--
32 mm (2 ga)	80	20	--
50 mm (1/0 ga)	90	23	--
62 mm (2/0 ga)	100	25	--

TABLE 2 - FRICTION VOLTAGE DROP
(AFTER HUMIDITY TEST AND FOUR INSERTIONS)

Wire/Cable (SAE Gage)	Test Current, A	Drop, mV
0.5 mm (20 ga)	5	7.5
0.8 mm (18 ga)	10	15
1 mm (16 ga)	15	22.5
2 mm (14 ga)	20	30
3 mm (12 ga)	30	45
5 mm (10 ga)	40	60
8 mm (8 ga)	50	75

5. TEST PROCEDURE

Tests shall be conducted at 23 °C ± 3 °C (73 °F ± 5 °F). Test samples shall consist of terminals or splice clips attached to 305 mm (12 in) of wire. It is suggested that at least 10 specimens of each wire size be subjected to each test.

6. VOLTAGE DROP TEST

Measurements shall be made after the temperature of the specimen has stabilized (2 h under test load).