



1/2/2024

Subject: Change to SAE/USCAR-21, Rev 4 (Letter #8)

Changes have been made to the USCAR-21 specification today that adds detail to how to define a “stable temperature” when performing voltage drop measurements. Please direct any comments or questions related to this update to EWCAP@uscar.org.

Situation:

The Voltage Drop Test of USCAR21 Revision4 (Section 6.5.6.4) has a procedure in Step #3 that calls for high enough test currents that require the lab to “allow the temperature of samples to stabilize with current applied.” In researching this requirement, it has been learned that lower test currents can be used successfully without heating the samples enough to be concerned with temperature rise. The change below lowers the test current to an acceptable level so that temperature is not a factor.

Resolution:

- 1) Change test currents as shown in RED to table 4.5.6.4.2
- 2) Remove step 6.5.6.4 #3 that calls for temperature stability
- 3) Change applicability to include 6mm wire as shown in RED to table 4.5.6.4.2
- 4) Reword the “Purpose” section of the voltage drop test (4.5.6.1) to eliminate conflicting statements with the updated procedure.

4.5.6.4 Procedure

NOTE: For crimp samples with multiple wires, apply this procedure for each individual cable. This applies even for configurations where the same size wire is used more than once unless the customer has approved a deviation.

1. Perform a visual inspection of components per 4.2.
2. Apply current based on wire size per table 4.5.6.4-2 at points A and D of Figure 4.5.6.2.

TABLE 4.5.6.4-2 - VOLTAGE DROP TEST CURRENT

Wire Size (mm ²)	Current (A)
≥ 6 and <12	50-10 *
≥12 and <20	75-10
≥20 and <30	100-10
≥30 and <40	100-10
≥40 and <50	100-10
≥50 and <60	100-10
≥60 and ≤120	100-10

3. ~~Allow the temperature of samples to stabilize with current applied.~~

* For cross-sections from 6mm² up to and including 10 mm², the dry circuit measuring method (100 mA; open circuit voltage ≤ 20 mV) may be used. This allows for compatibility with resistance measurements based on DIN EN 60512-2-1.

4.5.5.5 Acceptance Criteria

This is a conditioning procedure only. There are no acceptance criteria.

4.5.6 Voltage Drop Measurement Procedure

~~This test is intended to be used for terminals crimped on >6 mm² wire size.~~

4.5.6.1 Purpose

- ~~1. This procedure defines measuring the termination voltage drop of static crimped contacts under high energy conditions. It is to be used to validate terminal/wire combinations where the wire core cross-section is >6 mm².~~
- ~~2. Current is applied to the sample under test so voltage drop of the termination can be measured. Power supply voltage will be allowed to float during this test.~~