EWCAP
ELECTRICAL WIRING COMPONENT APPLICATION PARTNERSHIP

05/08/25
Subject: Change #3 to SAE/USCAR-2, Revision 9

This letter describes a change to the USCAR-2 specification. Comments and questions can be sent to EWCAP@uscar.org.

Situation:

In USCAR-2 Section 5.4.9 the wording in the Purpose statement would make this test not applicable to ISL style connector designs. The intent of this test is to ensure the connector provides feedback to the harness assembler in the event that the terminals are not fully seated in the locked position.

Resolution

5.9.4 Cavity Damage Susceptibility

5.9.4.1 Purpose

This test is intended to demonstrate resistance to damage when the connector TPA (or PLR or ISL as applicable) is forcefully inserted on a connector with one or more terminals in an incomplete (unseated) position. The cavity and other plastic and metal parts must subsequently be able to be assembled correctly and retain full function following such an event. ~~This procedure does not apply to connectors where the TPA is designed to push the terminal into its seated and locked position or to TPAs that are designed such that their mating direction interferes or is perpendicular with a terminal that is unseated~~.

5.9.4.2 Equipment

- Force tester

5.9.4.3 Procedure

1. Obtain samples. Samples consist of five connectors with terminal secondary locks in the un-seated position and five terminated leads for each terminal size in the connector.

2. Randomly select one cavity of each terminal size from each connector sample. Note that testing is done for each of the terminal sizes used when testing hybrid connectors.

3. Determine the applicable test force to be applied to the secondary lock using this procedure: Add 40 N to the maximum force measured to seat the TPA/PLR device (with all terminals located properly) per 5.4.5.2.3 A4. The test force shall be the determined force or 80 N for ≥1.5 nominal size terminals and 60 N for <1.5 terminals whichever is greater. Note that the force will increase quickly and an automated stop on the machine applying the force will be needed.

4. Partially insert a terminated lead into the selected cavity. The terminal should be inserted until it is just short of locking into position. While holding the terminal in this position, apply the force determined in step 3 at a rate not to exceed 50 mm/min to the terminal secondary lock in the direction of normal

seating. Record whether the TPA traveled to its normal seated and locked position.

5. Remove the force, remove the terminal from the cavity, and inspect both the terminal and connector for damage ~~seat the terminal in its normal position. Inspect for damage. Seat the secondary lock.~~ and complete the following:

   a. If the terminal does not demonstrate functional damage, reinsert the terminal into the cavity and lock the TPA.

   b. If the terminal demonstrates functional damage, replace the terminal with a virgin test lead, insert it into the cavity and lock the TPA.

6. Perform a terminal retention test on each terminated lead per 5.4.1.3 B.

5.9.4.4 Acceptance Criteria

1. When the force in step 4 is fully applied, the TPA shall not seat in its final position.

2. Terminal retention must meet the force listed in the far-right (post humidity) column of Table 5.4.1.4.

NOTE: Moisture conditioning is not required for this group, the heading of the table applies to a different test.

3. No damage shall be seen in the inspection from step 5, if the terminal demonstrates functional damage and is replaced, it must be noted in the Test Report and discussed with the applicable OEM Connector Engineer for next-steps. Connector Specifications must also be updated to document that mis-inserted terminals must be replaced during harness assembly.