



Size 16 Pin & Socket Terminals

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) XRC Stamped Contact System.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 2 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Connectivity (TE) Documents

- [109-1](#) General Requirements for Testing
- [114-160698](#) Size 16 Terminal Application Specification
- [C-2500060](#) Size 16 Pin Terminal Customer Drawing
- [C-2500062](#) Size 16 Socket Terminal Customer Drawing

2.2 Industry Documents

- DIN 72551-6: Road Vehicles—Low-Tension Cables—Part 6: Single-Core, Unscreened with Thin Insulation Wall; Dimensions, Materials, Marking
- ISO 6722: Road Vehicles—60 V and 600 V Single-Core Cables—Dimensions, Test Methods, and Requirements
- SAE J1128: Low Voltage Primary Cable
- SAE J2030: Heavy-Duty Electrical Connector Performance Standard
- USCAR-2: Performance Spec for Automotive Electrical Connector Systems
- USCAR-21: Performance Spec for Cable - to - Terminal Electrical Crimp

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction, materials, and physical dimensions specified on the applicable product drawing.

3.2. Ratings

- Voltage: See connector product specification
- Current (Amp):

Wire Size mm ²	Current Rating (A)
2.00	13
1.50	12
1.00	10
0.75	10
0.50	7

- Temperature:
 - Nickel -40°C to +125°C
 - Gold -40°C to +125°C

3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

VISUAL

3.3.1. Examination of Product

- A. Procedure: SAE J2030
- B. Method: Visually inspected for use of materials, proper construction, correct part number and insert markings and over-all quality of workmanship. Damaged or improperly manufactured contacts, galling of metal parts, nicks and burrs of metal parts were considered adequate basis for rejection.
- C. Requirement: The contacts shall be correctly constructed, marked and shall show good quality and workmanship

3.3.2. Low Level Contact Resistance (Dry Circuit)

- A. Procedure: SAE J2030
- B. Method: Test with applied voltage not to exceed 20 mV open circuit and the test current shall be limited to 100 mA. The resistance of the equal length of wire (reference wire) shall be subtracted from the same reel as used for the connector wiring. Gold and Nickel plated contacts
- C. Requirement: 30 milliohms Max.

3.3.3. Contact Resistance (Voltage Drop)

- A. Procedure: SAE J2030
- B. Method: Using test currents as defined. The resistance of an equal length wire (reference wire) shall be subtracted from the actual readings to determine the added resistance of the terminal. The reference wire shall be from the same reel as used for the connector wiring.
- C. Requirement:

Wire Size mm ²	Test Current Amp	Voltage Drop max mV
2.00	13	100
1.50	12	
1.00	10	
0.75	10	
0.50	7	

3.3.4. Maximum Current Capability (Open air without housing)

- A. Procedure: USCAR-2
- B. Method: Samples shall be mounted in an enclosure which protects the immediate environment from external movement of air. Measure and record the voltage drop across 150mm of the conductor to be used for the test. Attach conductor ends of the terminal pairs to form one continuous series circuit and attach the thermocouples to each mated pair. Mount the circuit in the draft-free enclosure. Use at least 10 terminal pairs. Test samples at room temperature then slowly adjust the power supply until current level of 50% of the maximum expected value for the wire size. Wait at least 15 minutes for the circuit temperature to stabilize. Increase in increments or 10% of that value until a temperature rise over ambient of 55°C was achieved. Record ambient temperature, temperature of each terminal pair interface and millivolt drop across each mated pair.
- C. Requirement: T-rise curve graph at 20% above current rating.

MECHANICAL

3.3.5. Crimp Tensile

- A. Procedure: USCAR-21
- B. Method: Apply an axial force at a rate between 25±6 mm/minute. If the terminal has a cable insulation crimp it shall be rendered mechanically ineffective. Samples are pulled to destruction.
Crimp Specification: 114-160066
- C. Requirement:

Wire Size mm ²	Tensile Strength Min [N]
2.00	111
1.50	
1.00	
0.75	
0.50	67

3.3.6. Contact Retention (In Housing)

- A. Procedure: SAE J2030
- B. Method: The contacts shall be subjected to a direct pull. The minimum value specified shall be applied for 1 minute. The pull is to be exerted on the conductor by means of a tension-testing machine or equivalent to prevent sudden or jerking force during test.
- C. Requirement: 111 N Min. The terminal shall maintain its original position in the connector throughout the test.

3.3.7. Durability

- A. Procedure: SAE J2030
- B. Method: Test samples shall be mated and unmated complete cycles at room temperature.
 - a. Nickel: = 50 cycles
 - b. Gold: = 100 cycles
- C. Requirement: No evidence of damage to the contacts, contact plating which may be detrimental to reliable contact performance.

3.3.8. Terminal-Terminal Insertion Force

- A. Procedure: Not Applicable
- B. Method: Sockets shall be mounted in a suitable fixture for applying gradually increasing loads for the insertion using the pin.
- C. Requirement:

Plating	Mating Cycle	Insertion Force [N] Max
Nickel	1 st	11.1
	50 th	22.2
Gold	/	11.1

ENVIRONMENTAL

3.3.9. Temperature Life

- A. Procedure: SAE J2030
- B. Method: The wired mated connectors shall be subjected to 1000 hours at +125°C without current flowing.
- C. Requirement: Contact resistance not to exceed 100mV after test.

3.3.10. Thermal Cycle

- A. Procedure: Not Applicable
- B. Method: Cycle mated connectors from -40°C to +125°C. Connectors to remain at each temperature extreme for one (1) hour minimum. Mated connectors are to be cycled a total of 20 complete cycles.
- C. Requirement: Contact resistance not to exceed 100mV after test.

3.3.11. Thermal Shock

- A. Procedure: SAE J2030
- B. Method: Subjected test sample to 10 cycles. One cycle shall consist of a soak time at -40°C then a transition within 2 min to an ambient of +125°C, with a soak time there and then a transition back to -40°C within 2 min. The soak times shall be established as the time necessary to bring the internal connector temperature on test to within 5°C of each of the ambient temperatures.
- C. Requirement: Contact resistance not to exceed 100mV after test.

TEST SEQUENCE

Seq	Requirements	Group1 Mechanical	Group2 Mechanical	Group3 Mechanical	Group4 Mechanical	Group5 Electrical	Group6 Electrical Mechanical	Group7 Electrical Environmental
3.3.1	Visual Inspection	1,5	1,3	1,3	1,3	1,5	1,7	1,13
3.3.2	Dry Circuit Resistance						2,5	2,5,8,11
3.3.3	Voltage Drop Resistance					2	3,6	3,6,9,12
3.3.4	Maximum Test Current Capability					4		
-*	Terminal Crimp X-Section		2					
3.3.5	Crimp Tensile			2				
3.3.6	Terminal - Connector retention force				2			
3.3.7	Durability	3				3	4	
3.3.8	Terminal to Terminal Engage/Disengage	2,4						
3.3.9	Temperature Life							7
3.3.10	Thermal Cycle							10
3.3.11	Thermal Shock							4

* :Refer to the Crimp Spec.114-160698

4. REVISION HISTORY

Rev Ltr	Brief Description of Change	Date	Dwn	Apvd
A	Initial Release	29AUG2023	R.C	Z.Z