
Fuse and Relay Box Assy

1. SCOPE**1.1 Content**

This specification covers the performance , tests and quality requirements for the Fuse and Relay Box Assembly for automotive vehicle , P/N's 881698 , 881695 and 1989750 .

1.2 Qualification

When tests are performed on the subject product line , the procedures specified in TE 109 series specifications shall be used . All inspections shall be performed using the applicable Inspection Plan and Product Drawing .

2. APPLICABLE DOCUMENTS

The following documents form a part of this Specification to the extent specified here in. In the event of conflict between the requirements of this Specification and the Product Drawing shall take precedence. In the event of conflict between the requirements of this Specification and the referenced documents, this Specification shall take precedence.

2.1 Tyco Electronics Specifications :

- a) 109-1 Rev C: General requirements for Test Specifications.
- b) 109 Series : Test Specifications as indicated in Figure 1 (Comply with MIL-STD-202 Rev 01 Apr 1980 , MIL-STD-1344 Rev 31 Oct 1973 and EIA RS-364 Rev 17 Aug 1971).
- c) 108-37011 Rev. "B" : Fuse Contact Terminal Specification
- d) 108-18013 Rev. "D" : Jr. Power Timer Terminal Specification
- e) 108-18025 Rev. "O" : STD Power Timer Terminal Specification
- f) 108-37013 Rev. "O" : 9 w Combined Jr./STD Power Timer & Pos. Lock , Hsg Specification
- g) 108-3017 Rev. "C" : Positive Lock Terminal Specification

2.2 Commercial Standards :

- a) ABNT 5171 Rev Nov/1981: .375 S. Fastin-on Terminal – Tests methods.

3. REQUIREMENTS**3.1 Design and Construction**

Fuse and Relay Box Assembly shall be of the design , construction and physical dimensions specified on the applicable product drawing .

3.2 Materials :

a) Housing : P. A. 6.6 + 30% Miner. Reinf. UL-94 HB.

3.3 Ratings :

a) Operating Temperature : -40° C to 85° C.
b) Frequency Range : 10/500 Hz.

3.4 Performance and Test Description

The product is designed to meet the electrical , mechanical and environmental performance requirements specified in Figure 1 . All tests are performed at ambient environmental conditions per TE Specification 109-1 , unless otherwise specified .

3.5 Test Requirements and Procedures Summary :

| TEST DESCRIPTION | REQUIREMENT | PROCEDURE |
|--|---|---|
| Examination of Product. | Meet requirements of product drawing. | Visual, dimensional and functional per applicable inspection plan. |
| ELECTRICAL | | |
| Termination Resistance, Specified Current. | See Product Spec. Terminals (2.1 and 2.2). | Measure potential drop of mated contacts assembled in housing ; Standard EIA-364-6B . |
| Dielectric Withstanding Voltage. | No break down or flashover when 1 Kv is applied for 1 minute. | Test between adjacent contact of mated connector assemblies ; Standard EIA-364-20B . |
| Insulation Resistance. | $R \geq 10 \text{ m } \Omega$. | Test between adjacent contact of mated connector assembly ; Standard EIA-364-21C . |
| Temperature Rise vs Current. | See Product Spec. Terminals (2.1 and 2.2). | Measure temperature rise vs current ; Standard EIA-364-70A . |
| MECHANICAL | | |
| Vibration Sinusoidal High Frequency (Fuse Box, Hsg's 4w and 9w and Terminals assembled). | No electrical discontinuities greater than 1 microsecond. | Subject mated connectors to 10 G's, between 10 to 500 Hz traversed in 15 min. 8 hours in each of 3 mutually perpendicular planes ; Standard EIA-364-28D . |
| Mating Force Hsg vs Frame. | 30 N maximum for hsg. 4w and 9w. | Measure force necessary to mate connector ass'y with locking latches ; Standard EIA-364-13B . |
| Unmaking Force Hsg vc Frame. | 80 N minimum for Hsg. 4w. 180 N minimum for Hsg 9w. | Measure force necessary to unmated connector assembly with locking latches ; Standard EIA-364-13B . |
| Contact Insertion Force. | See Product Spec. Terminals and Hsg (2.1 and 2.2). | Measure force to insert contact into housing ; Tyco Electronics Spec. 109-41 |
| Contact Retention Force. | See Product Spec. Terminals and Hsg (2.1 and 2.2). | Measure terminal retention force into Hsg ; Tyco Electronics Spec. 109-30 |
| Durability, 9 way Housing vc Frame. | Mating – unmaking. | Mate and unmated connector assemblies for 10 cycles ; Standard EIA-364-9C . |

Figure 1

| ENVIRONMENTAL | | |
|---------------------------------|--|---|
| Thermal Shock | No physicals damage; mate and unmated. | Subject mated connectors to 5 cycles : +85° C for 4h. , –40° C for 4 h ; Standard EIA-364-32C . |
| Humidity – Temperature Cycling. | – Shall meet visual requirements, show no physical damage. – Insulation Resistance $R \geq m \Omega$. | Subject mated connector to 10 humidity–temperature cycles between 25° C at 95% RH ; Standard EIA-364-31B . Standard EIA-364-21C . |
| Salt Spray, Corrosion. | See Product Spec. Terminals and Hsg (2.1 and 2.2). | Subject mated connector to 48 h. at 5% of concentration NaCl (temperature 35° C \pm 2° C ; Standard EIA-364-26B . |
| Temperature Life. | Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in the test sequence in Figure 2. | Subject mated connectors to temperature life at 90° C for 200 hours duration ; Standard EIA-364-17B . |
| Flammability. | Combustion velocity: < 100 mm/minimum. | Subject polymeric material bars to flame ; Tyco Electronics Spec 109–10 . |

Figure 1 (cont.)

3.6 Contact Test and Sequence

| Test or Examination | Test Group | | | | |
|--------------------------------------|---------------|-----|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 |
| | Test Sequence | | | | |
| Examination of Product | 1,8 | 1,5 | 1,5 | 1,8 | 1,5 |
| Insulation Resistance | | | | 2,6 | |
| Termination Resistance Spec. Current | 3,5 | 2,4 | 2,4 | | |
| Temperature Rise vs. Current | | | | | 3 |
| Vibration | 6 | | | | |
| Mating Force | 2 | | | | |
| Unmaking Forc | 7 | | | | |
| Contact Insertion Force | | | | | 2 |
| Contact Retention Force | | | | | 4 |
| Durability | 4 | | | | |
| Thermal Shock | | | | 4 | |
| Humidity – Temperature Cycling | | | | 5 | |
| Corrosion, Salt Spra | | | 3 | | |
| Temperature Life | | 3 | | | |
| Dielectric Withstanding Voltage | | | | 3,7 | |

Figure 2

(a) Numbers indicate sequence in which testes are performed

4. QUALITY ASSURANCE PROVISIONS

4.1 Qualification Testing

- a) Connector housing contacts shall be prepared in accordance with applicable instruction sheets .They shall be selected at random from current production .
- b) Qualification inspection shall be verified by testing samples as specified in Figure 2.
- c) Acceptance : Failures attributed to equipment , test setup or operator deficiencies shall not disqualify the product .
When product failures occur , corrective action shall be taken and samples resubmitted for qualification .

4.2 Quality Conformance Inspection

The applicable Tyco Electronics Quality Inspection Plans will specify the acceptable quality level to be used . Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification .

4.3 Requalification Testing

If change significantly affecting form , fit or function are made to the product or to the manufacturing process , product assurance shall coordinate requalification testing consisting of all or part of the original testing sequence as determined by the product engineering .

| History | | | | |
|---------|-------------|----------------------------------|-------------------|---------------|
| Rev. | Date | Description | Prepared | Approved |
| O | 07-Oct-1993 | Released | ----- | ----- |
| A | 06-Aug-1997 | LB00-0270-97 | ----- | ----- |
| B | 06-Jun-2003 | LB00-0169-03 | ----- | ----- |
| C | 28-Apr-2009 | Item 1.1 – added new part number | Sandro H.Oliveira | Andre Metzker |