AMPSEAL Strain Relief

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the AMPSEAL Strain Relief.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on 14 December 2018 (P/N 2138259 & 2138260) and 13 April 2022 (P/N 2389806 & 2389807).

2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and referenced documents, this specification shall take precedence.

2.1. TE Documents

- 109-1: Test Specification (General Requirements for Test Specifications)
- 114-16016: Application Specification (AMPSEAL* Automotive Plug Connector and Header Assembly)

2.2. Industry Documents

- EIA 364: Durability Test Procedure for Electrical Connectors and Contacts
- SAE J1455: Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications
- ISO 20653: Road vehicles - Degrees of Protection (IP-Code) - Protection of Electrical Equipment Against Foreign Objects, Water and Access

2.3. Reference Document

- 109-197 Test Specification (TE Test Specification vs EIA and IEC Test Methods)

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	Current	Temperature
N/A	N/A	-40°C to 125 °C

3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions per test specification 109-1.

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Visual		
Initial examination of product	Meets requirements of product drawing.	EIA-364-18B Visual, dimensional and functional per applicable quality inspection plan.
Final examination of product	Meets visual requirements.	EIA-364-18B Visual, dimensional and functional per applicable quality inspection plan.
MECHANICAL		
Handling Drop Test	8 Position: 1.0m 14 Position: 1.0m 23 Position: 1.0m 35 Position: 0.5m	SAE J1455 4.11.3.1 The strain relief attached to a connector shall be fully functional after a drop
Miscellaneous Component Mating and Unmating	Strain relief to be mated and unmated without damage	Mate and unmate to plug assembly by hand
ENVIRONMENTAL		
Temperature Cycling	Conditioning only Parts must pass subsequent mechanical tests	EIA 364-32F Ten cycles between -40°C and 105°C with 2 hrs. at each temperature extreme 3°C/min transition
Temperature Life (105 °C)	Conditioning only Parts must pass subsequent mechanical tests	EIA 364-17C 105°C for 96 hours
Temperature Life (125°C)	Conditioning only Parts must pass subsequent mechanical tests	EIA 364-17C 125°C for 200 hours
Low Temperature	Conditioning only Parts must pass subsequent mechanical tests	-40°C for 96 hours
IPX9K High Pressure Spray	The strain relief shall stay attached to the connector after high pressure spray	ISO 20653:2006

Figure 1

NOTE
Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

3.4. Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)			
	1	2	3	4
	TEST SEQUENCE (b)			
Initial examination of product	1,7	1,5	1,4	1,4
Temperature Cycling	2			
Temperature Life (105°C)	3			
Low Temperature	4			
Temperature Life (125°C)		2		
Miscellaneous Component Mating and Unmating	5	3		
Handling Drop Test			2	
IPX9K High Pressure Spray				2
Final examination of product	6	4	3	3

Figure 2

NOTE

(a) See paragraph 4.1A

(b) Numbers indicate sequence in which tests are performed.

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. Each test group shall consist of the minimum number of samples specified in Figure 3.

Sample Quantities for Test Sequences

Test Group	Plug Assembly	Plug Assembly Sample Qty.	Strain Relief	Strain Relief Sample Qty.
1	8P: 776286-1 14P: 776273-1 23P: 770680-1 35P: 776164-1	8P: 3 14P: 3 23P: 6 35P: 6	8P: 2138529-1 14P: 2138530-1 23P: 2389806-1 35P: 2389807-1	8P: 6 14P: 6 23P: 12 35P: 12
2		8P: 3 14P: 3 23P: 6 35P: 6		8P: 6 14P: 6 23P: 12 35P: 12
3		8P: 6 14P: 6 23P: 12 35P: 12		8P: 12 14P: 12 23P: 24 35P: 24
4		8P: 2 14P: 2 23P: 6 35P: 6		8P: 4 14P: 4 23P: 12 35P: 12

Figure 3

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 3

4.2. Requalification Testing

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

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken, and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

5. SETUP FIGURES

Environmental Testing

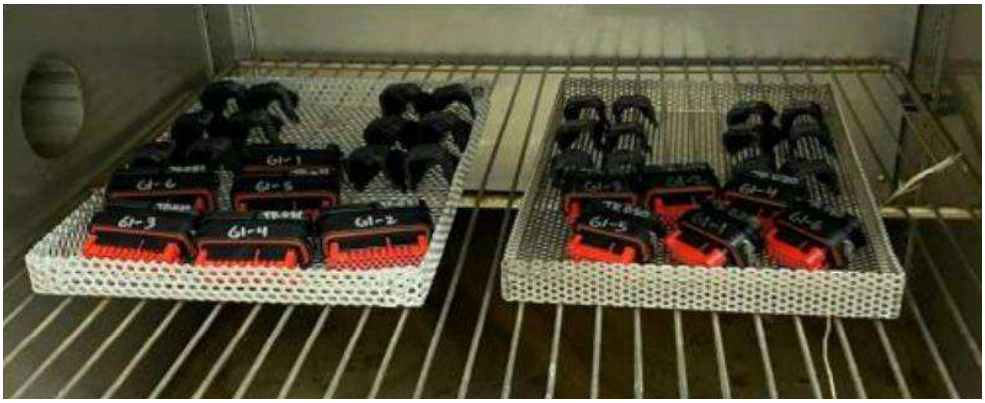

Figure 4

Drop Testing

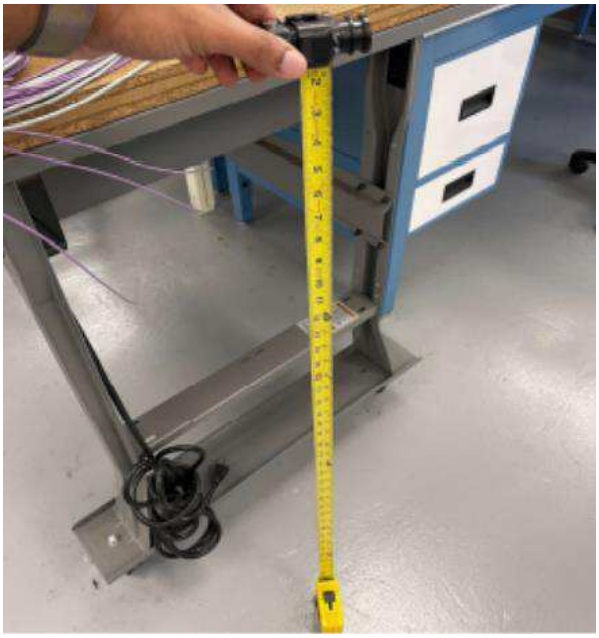

Figure 5

High Pressure Spray Testing (IPX9K)

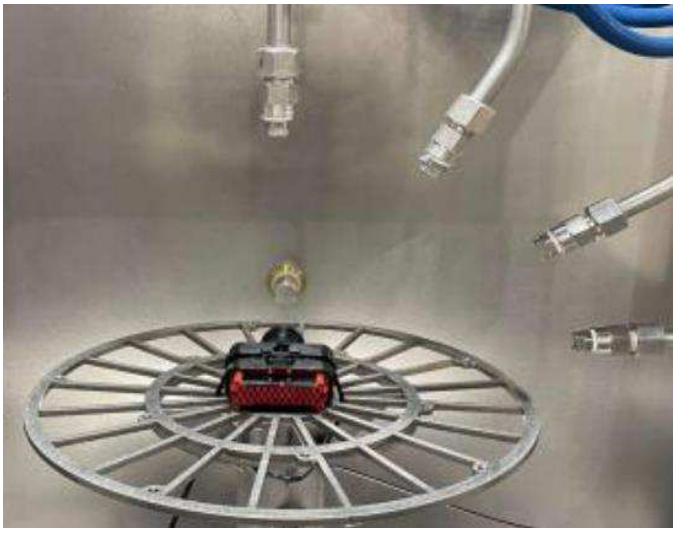

Figure 6

6. REVISION HISTORY

Revision	Date	Revision Description
A	31 May 2022	Initial Release