AMP-FIT* Plastic Pipe Fittings

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for AMP-FIT* plastic pipe fittings, manifolds, and .375 inch plastic tubing fittings. Fittings are made of corrosion-resistant material and are capable of providing leak-proof connections in pressurized type CA-3131 dry air pipe systems.

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 in Apr98. The test file numbers for this testing are ACL 34740004A and 34740004B. This documentation is on file at and available from the Americas Global Automotive Division Product Reliability Center.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, 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 the referenced documents, this specification shall take precedence.

2.1. AMP Documents

A. 109-1: General Requirements for Test Specifications
B. 109 Series: Test Specifications as indicated in Figure 1
C. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Government or Commercial Documents
D. 408-2916: Instruction Sheet
E. 408-3190: Instruction Sheet
F. 408-6693: Instruction Sheet
G. 408-6880: Instruction Sheet
H. 501-440: Qualification Test Report

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

A. Housings: Nylon
B. Inserts: Aluminum, brass, stainless steel
C. Valves: Aluminum, brass, stainless steel

3.3. Ratings

A. Operating pressure: 15 psig
B. Operating temperature: -18 to 46°C

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per AMP Specification 109-1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and AMP Instruction Sheets 408-2916, 408-3190, 408-6693 and 408-6880.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Electrical continuity.	0 ohms resistance on 20 k ohm scale.	AMP Spec 109-1026. Test assemblies using volt-ohm meter. See Figure 3.
MECHANICAL		
Tensile test.	No evidence of physical damage to the couplings prior to the destruction of the plastic pipe.	AMP Spec 109-16. Pull both types of pipe assemblies apart until separation from plastic pipe occurs. See Figures 4 and 5.
Check valve flow test.	.75 psig maximum pressure required to open or close the valve. No evidence of leakage or air flow with valve in closed position.	AMP Spec 109-1024. Perform check valve pressure differential and air flow.
Air leakage test.	No evidence of air bubbles.	AMP Spec 109-1025. Pressurize both types of pipe assemblies with 15 psi. See Figures 4 and 5.
ENVIRONMENTAL		
Temperature cycling.	See Note.	AMP Spec 109-75-2. Subject both types of pipe assemblies to -18 to 46°C with ½ hour soak at each temperature extreme. 512 cycles at 2 hours per cycle. See Figures 4 and 5.

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.*

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)			
	1(b)	2	3(c)	4(d)
	Test Sequence (e)			
Examination of product	1,3	1,5	1,6	1,6
Electrical continuity	2(f)			
Tensile test			5	5
Check valve flow test		2,4		
Leakage test			2,4	2,4
Temperature cycling		3	3	3

NOTE

(a) See Para 4.1.A.
(b) See Figure 3.
(c) See Figure 4.
(d) See Figure 5.
(e) Numbers indicate sequence in which tests are performed.
(f) CA-3131 fittings only.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Samples shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test group 1 shall consist of 3 pipe assemblies with each assembly consisting of 2 lengths of CA-3131 pipe with a branch tee connector. All 3 types (H, L, and K) of branch tee connectors shall be tested. Test group 2 shall consist of 30 check valves with pipe or tube length of 6 ±.5 inches. Test group 3 shall consist of 5 pipe assemblies with each assembly consisting of 4 lengths of CA-3131 pipe, 2 transition couplings, 2 pulling eyes, and 1 Type K branch tee fitting assembled per Figure 4. Test group 4 shall consist of 5 pipe assemblies with each assembly consisting of 2 lengths of CA-3131 pipe, 3 transition couplings, 2 pulling eyes, 3 lengths of .375 inch diameter tubing, 1 female disconnect, one ⅜ tee fitting, and 1 F valve assembled per Figure 5.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 2.

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 samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable AMP 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.

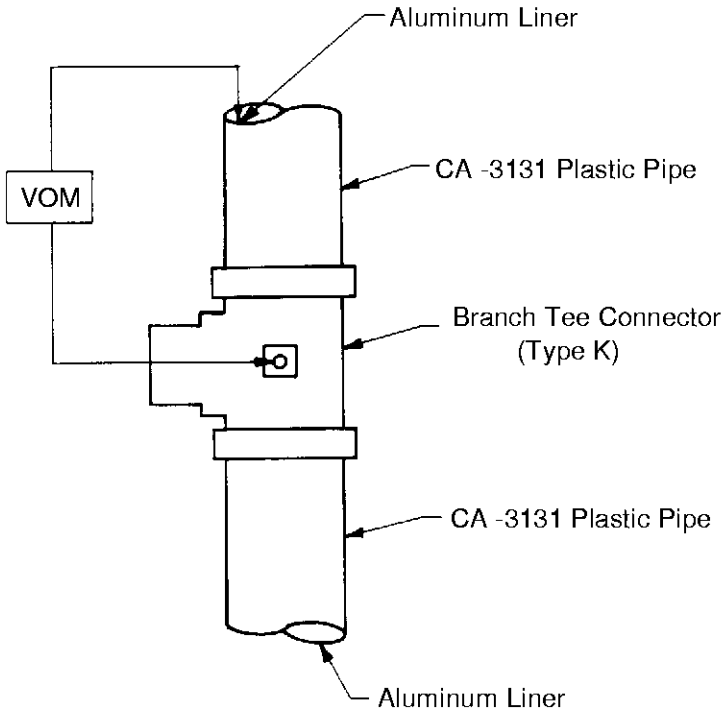

Figure 3
Electrical Continuity

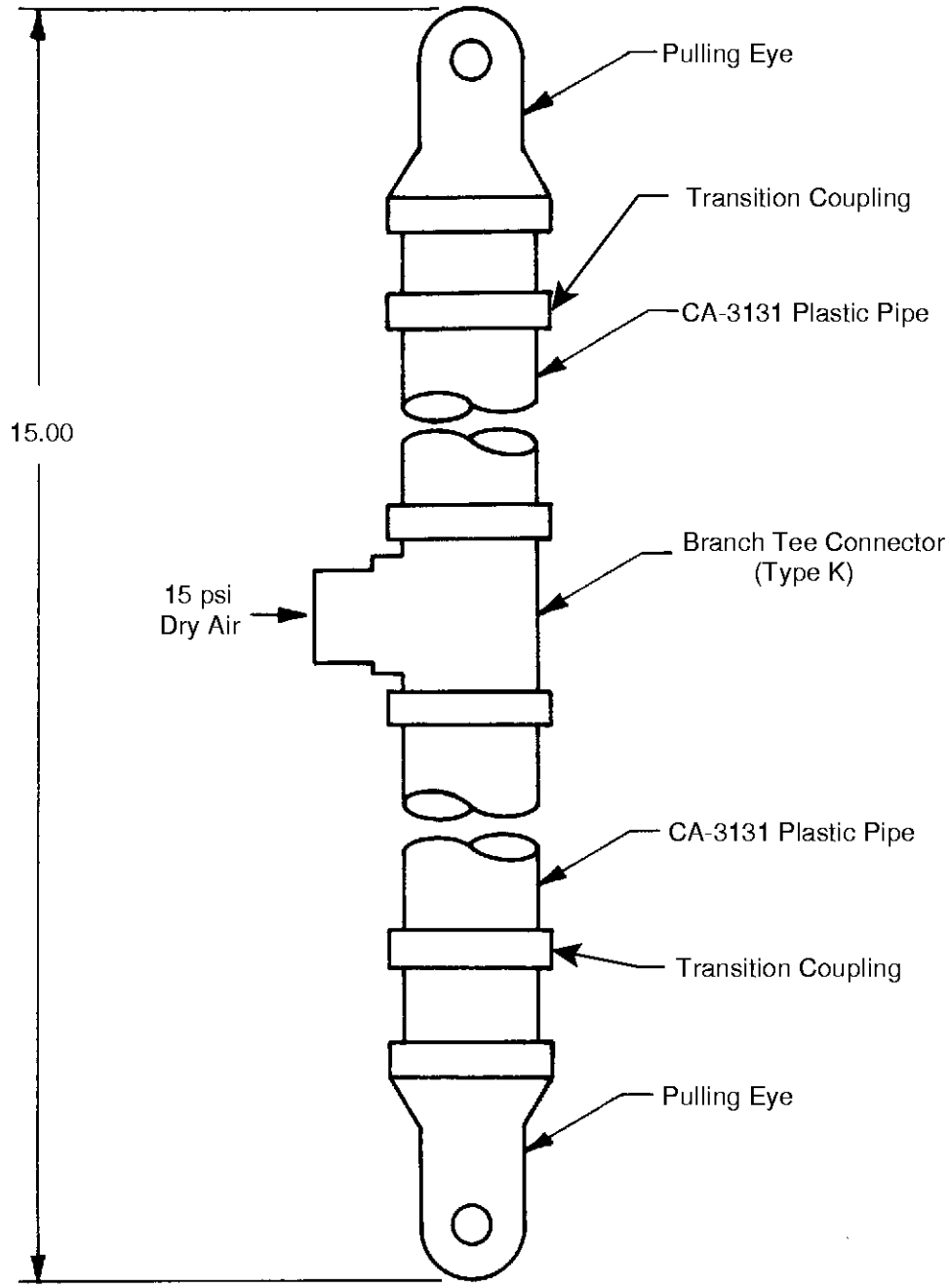

Figure 4
Tensile Test

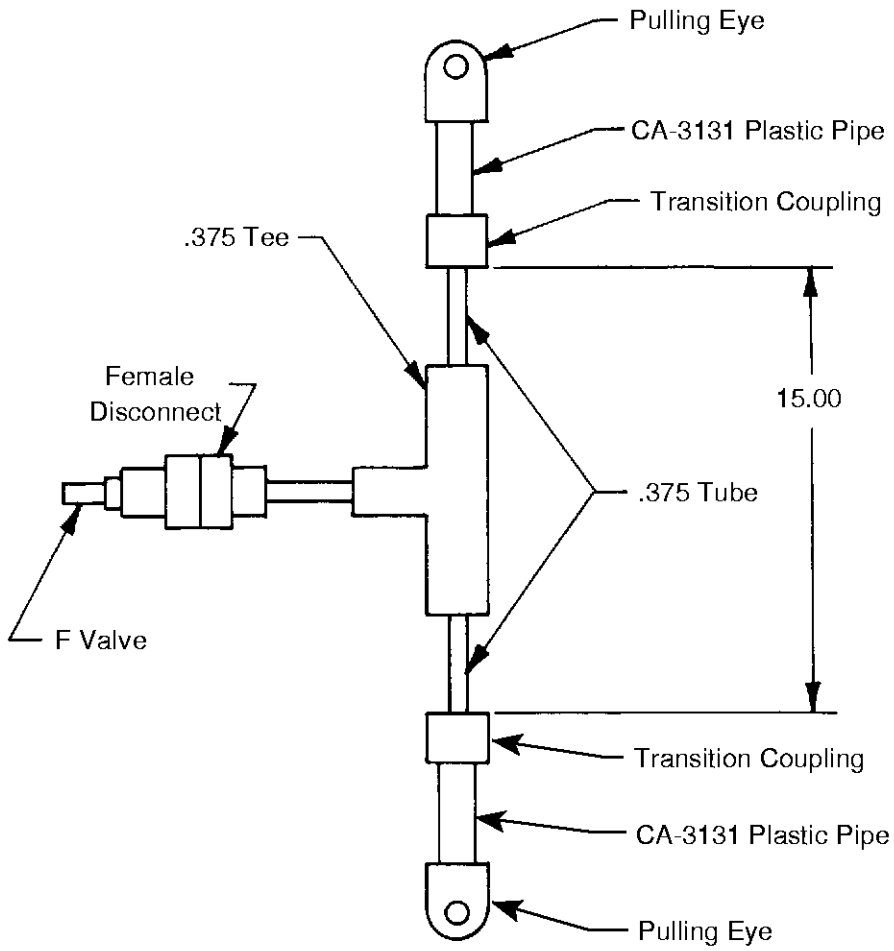

Figure 5
Tensile Test, .375 Tubing