AMERICAN NATIONAL STANDARD

ANSI/EIA-364-29B-1998
Approved: February 5, 1998

# EIA STANDARD

EIA-364-29B

## TP-29B

## Contact Retention Test Procedure for Electrical Connectors

## EIA-364-29B

**(Revision of EIA-364-29A)**

**MAY 1998**

**ELECTRONIC INDUSTRIES ALLIANCE**

**ENGINEERING DEPARTMENT**

Electronic Industries Alliance

NOTICE

EIA Engineering Standards and Publications are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need. Existence of such Standards and Publications shall not in any respect preclude any member or nonmember of EIA from manufacturing or selling products not conforming to such Standards and Publications, nor shall the existence of such Standards and Publications preclude their voluntary use by those other than EIA members, whether the standard is to be used either domestically or internationally.

Standards and Publications are adopted by EIA in accordance with the American National Standards Institute (ANSI) patent policy. By such action, EIA does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the Standard or Publication.

This standard is based upon the major technical content of International Electrotechnical Commission standard 512-8, test 15a, contact retention in insert, 1993-01. It conforms in all essential respects to this IEC standard.

This Standard does not purport to address all safety problems associated with its use or all applicable regulatory requirements. It is the responsibility of the user of this Standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before its use.

Published by

©ELECTRONIC INDUSTRIES ALLIANCE 1998
Engineering Department
2500 Wilson Boulevard
Arlington, VA 22201

**PRICE: Please refer to the current**
**Catalog of EIA, JEDEC, and TIA STANDARDS and ENGINEERING PUBLICATIONS**
**or call Global Engineering Documents, USA and Canada (1-800-854-7179)**
**International (303-397-7956)**

PLEASE!

DON"T VIOLATE
THE
LAW!

CONTENTS

(This page left blank)

TEST PROCEDURE No. 29B

# CONTACT RETENTION TEST PROCEDURE FOR ELECTRICAL CONNECTORS

(From EIA Standards Proposal No. 3989, formulated under the cognizance EIA CE-2.0 Committee on National Connector Standards.)

## 1 Introduction

### 1.1 Scope

This standard establishes a test method to impose axial forces on the connector contacts to determine the ability of the connector to withstand forces that tend to displace contacts from their proper location within the connector insert and resist contact pullout. These forces may be the result of:

1.1.1 Loads on wire connected to the contacts.

1.1.2 Forces required to restrict contact push-through during assembly of removable type contacts into connector inserts.

1.1.3 Forces produced by mating contacts during connector mating.

1.1.4 Dynamic forces produced by vibration and shock during normal use of the connectors.

1.1.5 Forces relating to bundling strains on the wire.

### 1.2 Object

The object of this test procedure is to detail a standard method to assess the ability of the contact retaining system to withstand the axial mechanical stresses likely to be encountered during normal usage.

## 2 Test resources

2.1 Equipment

The test equipment shall consist of:

2.1.1 Force gauges, of suitable range for the contact size under test, so that readings will be in the middle 50% of the scale, where practicable, with a nominal full scale accuracy of ± 2%.

2.1.2 Dial indicator gauges, or other suitable instruments of such range for the contacts under test that the readings will be in the middle 50% of the scale, with a nominal full scale accuracy of ± 2%.

2.1.3 Suitable compression device (such as an arbor press).

2.1.4 Steel test probes to adapt the force gauge plunger to the particular contact (pin, socket, hermaphroditic) front or wiring end under test.

2.1.5 Contact insertion and removal tools, as required.

## 3 Test specimen

3.1 Description

3.1 The specimen shall consist of a plug or receptacle with all contacts in place.

3.2 Preparation

3.2.1 All backshell hardware and compression rings, if any, shall be removed.

3.2.2 When the Specification requires the contact retention to be tested from the wire side of the connector, contacts shall have the wires cut flush or the contacts replaced as specified in the referencing document. Simulated contacts that duplicate the retention feature geometry may be used in lieu of actual contacts to facilitate testing.

## 4 Test procedure

4.1 The unmated connector shall be mounted in a position of axial alignment of the contacts with the plunger of the test gauge. A minimum of 6.1 millimeters (0.25 inch) of space shall be provided on the opposite side under test to permit any "push-through" that may occur.

4.2 Select 20% of the contacts, but not fewer than six contacts of each size. At least one contact shall be near the periphery and one near the center of the connector.

4.3 Determine the direction (axially) in which the test shall be conducted from the referencing document. Establish the reference (zero displacement) position of the contact. The contact may be lightly preloaded 13.3 newtons (3 pounds) maximum, to assure proper seating.

4.4 Measure the dimensional position of the contact relative to its reference point or plane in the connector, and record the value.

4.5 Apply an axial load to the contact at the rate of approximately 4.4 newtons per second (1 pound per second) until the specified force has been reached. The specified force shall be maintained for 6 seconds ± 1 second during which measurement of displacement shall be made or the load shall be removed and the displacement measured as specified in the referencing document.

4.6 If the test is required in two directions, repeat 4.3 through 4.5 from the opposite direction.

## 5 Details to be specified

The following details shall be specified in the referencing document:

5.1 Number of specimens to be tested

5.2 Axial direction(s) in which the test shall be conducted

5.3 Axial load

5.4 Maximum allowable contact displacement during application of specified load or after removal of the specified load, or both

5.5 Special requirements or precautions, if any

## 6 Test documentation

Documentation shall contain the details specified in clause 5, with any exceptions, and the following:

6.1 Title of test

6.2 Specimen description, including fixturing

6.3 Test equipment used, and date of last and next calibration

6.4 Test procedure

6.5 Values and observations.

6.5.1 Force applied; see 4.5

6.5.2 Measured contact displacement during application or after removal of specified force, as specified; see 4.5

6.6 Name of operator and date of test


Electronic Industries Alliance