

(R) Terminals, Lug: Splices, Conductor: Crimp Style,
Copper, General Specification For

FSC 5940

RATIONALE

The purpose of the AS7928A revision is to correct out of date references. Minor technical changes may have occurred to clarify a requirement.

1. SCOPE

1.1 Scope

This specification covers insulated and uninsulated crimp-style copper terminal lugs and conductor splices for stranded conductors.

1.2 Classification

Terminals and conductor splices covered by this specification shall be of the following types and classes, as specified (see 6.3):

Type I - Uninsulated

Type II - Insulated

Class 1 - Terminals and conductor splices which conform to all of the requirements of this specification when installed with the crimping tool or crimping dies shown on the applicable AS, specification sheet.

Class 2 - Terminals and conductor splices which conform to the material and marking requirements of this specification are replaceable by class 1 terminals, and conform to the performance requirements of this specification when crimped with a tool having crimping dies and motion conforming to the terminal manufacturer's control drawing required by 3.6 (see 6.1.5).

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2. APPLICABLE DOCUMENTS

2.1 Issues of Documents

The following documents, of the issue in effect on date of invitation of bids or request for purchase, form a part of this specification to the extent specified herein:

FEDERAL

TT-I-735A	Isopropyl Alcohol
PPP-B-585	Boxes, Wood, Wire bound
PPP-B-676	Boxes, Setup

MILITARY

MIL-STD-129	Standard Practice for Military Marking
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts
MIL-HDBK-454	General Guidelines for Electronic Equipment
MIL-STD-1916	DOD Preferred Methods for Acceptance of Products
MIL-STD-2073-1	DOD Standard Practice for Military Packaging
MIL-PRF-5606	Hydraulic Fluid, Petroleum Base, Aircraft, Missile, and Ordnance
MIL-DTL-5624	Turbine Fuel, Aviation, Grades JP-4 and JP-5
MIL-PRF-7808	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MS25189	Terminal, Lug, Flag Type, Crimp Style, Copper, Class 1
MIL-DTL-83133	Turbine Fuels, Aviation, Kerosene Types, NATO F-34 (JP-8), NATO F-34, and JP-8+100

(Copies of the above government specifications, standards, and handbooks are available from the Defense Printing Service Detachment Office, Bldg. 4D (Customer Service), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Other Publications

The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for purchase shall apply:

NATIONAL BUREAU OF STANDARDS PUBLICATION (www.nist.gov)

FED-STD-H28	Screw-Threads Standards for Federal Services
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(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, DC 20402.)

AMERICAN NATIONAL STANDARDS INSTITUTE

ANSI/ISO 10012-1 Quality Assurance Requirements for Measuring Equipment

(Application for copies should be addressed to the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, <http://www.ansi.org>.)

AMERICAN SOCIETY for QUALITY

ASQ Z1.4 Sampling Procedures and Tables for Inspection by Attributes

(Application for copies should be addressed to the American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203, or <http://www.asq.org>.)

AMERICAN SOCIETY for TESTING and MATERIALS

ASTM B 75 Seamless Copper Tube

ASTM B 152 Copper Sheet, Strip, Plate and Rolled Bar

ASTM B 187 Standard Specification for Copper, Bus Bar, Rod, and Shapes and General Purpose Rod

ASTM B 272 Copper Flat Products with Finished (Rolled or Drawn) Edges (Flat Wire and Strip)

ASTM B 339 Standard Specification for Pig Tin

ASTM B 545 Standard Specification for Electrodeposited Coatings of Tin

ASTM D 1974 Methods for Closing, Sealing and Reinforcing Fiberboard Boxes

ASTM D 5118/
ASTM D 5118M Fabrication of Fiberboard Shipping Boxes

ASTM D 3951 Package, Commercial

ASTM D 3953 Steel and Seals, Flat, Strapping

ASTM D 5486 Standard Specification for Pressure-sensitive Tape for Package, Box Closure, and Sealing

ASTM D 6251 Standard Specification for Natural Wood-Cleated Panelboard Shipping Boxes

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Drive, West Conshohocken, PA 19428-2959.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO) <http://www.iso.ch>

ISO 10012-1 Quality Assurance Requirements for Measuring Equipment

(Application for copies should be addressed to the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, <http://www.ansi.org> or the International Organization for Standardization (ISO), 1, rue de Varembe, Case postale 56, CH-1211 Geneva 20, Switzerland, <http://www.iso.ch>.)

NATIONAL CONFERENCE of STANDARDS LABORATORIES

NCSL Z540-1 General Requirements for Calibration Laboratories and Measuring and Test Equipment

(Application for copies should be addressed to the National Conference of Standards Laboratories, 2995 Wilderness Place, Suite 107, Boulder, CO 80301-5405, <http://www.ncsli.org>.)

SAE INTERNATIONAL

SAE AS7928 References:

AMS 1424 Deicing/Anti-Icing Fluid, Aircraft, SAE Type I

SAE AS7928 applicable detail specifications:

AMS 1424 Deicing/Anti-Icing Fluid, Aircraft, SAE Type I

AS7928/1 Terminals, Lug and Splices, Conductor, Crimp Style, Copper Terminal, Lug, Crimp Style, Copper, Insulated, Ring Tongue, for Thin Wall Wire, Type II, Class 1 for 105 °C Total Conductor Temperature

AS7928/2 Terminals, Lug and Splices, Conductor, Crimp Style, Copper, Insulated, Rectangular Tongue, for Thin Wall Wire, Type II, Class 1 for 105 °C Total Conductor Temperature

AS7928/4 Terminals, Lug and Splices, Conductor, Crimp Style, Copper Terminal, Lug, Insulated, Ring Tongue, Bell-Mouthed, Type II, Class 1 (for 150°C) Total Conductor Temperature)

AS7928/5 Terminals, Lug and Splices, Conductor, Crimp Style, Splice, Electric (Permanent, Type II, Class 1) for 105°C Total Conductor Temperature

AS7928/6 Terminals, Lug and Splices, Conductor, Crimp Style, Splice, Electric (Permanent, Type II, Class 1) for 150°C Total Conductor Temperature

AS7928/7 Terminal Lug and Splices, Conductor, Crimp Style, Copper, Terminal Lug, Crimp Style, Copper, Uninsulated, Ring Tongue Type I, Class 1 for 175°C Total Conductor Temperature

AS17143 Terminal, Lug, Crimp Style, Copper, Insulated, Rectangular Tongue, Type II, Class 1 for 105°C Total Conductor Temperature

AS20659 Terminal, Lug, Crimp Style, Copper, Uninsulated, Ring Tongue, Type I, Class 1, for 175 °C Total Conductor Temperature

AS21004 Terminal, Lug, Uninsulated, Rectangular Tongue, Crimp Style, Copper, Type I, Class 1 for 175°C Total Conductor Temperature

AS25036 Terminal, Lug, Crimp Style, Copper, Insulated, Ring Tongue, Bell-Mouthed, Type II, Class 1 (for 105 °C Total Conductor Temperature)

AS25274 Cap, Electrical (Wire End, Crimp Style, Type II, Class 1) for 105°C Total Conductor Temperature

(Application for copies of SAE specifications may be obtained from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

3. REQUIREMENTS

3.1 Acquisition Specifications

The individual item requirements shall be as specified this acquisition specification and in accordance with the applicable detail specification (see 2.2). If there are any conflict between requirements of this specification and the detail specification, the latter shall govern. Unless otherwise specified by contract or purchase order, product purchased to this specification will be supplied to the latest revision in effect at issuance of the contract or purchase order (see 6.2).

3.2 Qualification

The lug terminals and conductor splices furnished under this specification shall be products which are qualified for listing on the applicable qualified products list at the time set for opening of bids or purchase (see 4.5 and 6.3).

3.3 Material

The material shall be as specified herein. However, when a material not specified is used, it shall be such that the lug terminals and conductor splices conform to the performance requirements of this specification. Some materials have application restrictions (see 6.1.10). Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product. Alternate materials shall be approved by the activity responsible for qualification (see 6.3).

3.3.1 Metals

The lug terminals and conductor splices shall be fabricated from copper conforming to ASTM B 187, ASTM B 272, ASTM B 152, ASTM B 75 or as specified on the applicable AS specification sheet.

3.3.2 Insulation Material

The insulation material shall be permanently colored thermoplastic or as specified on the applicable AS or MS specification sheet. Conductor splices need not be totally colored, but a permanent identifying color shall be clearly distinguishable on some portion of the splice. The insulation material shall be non-corrosive, resistant to abrasion and fungus, and shall not support combustion.

3.3.3 Fungus-Resistant Material

Only fungus-resistant material shall be used. The manufacturer shall submit certification to this effect for qualification approval. The certification shall be included in the manufacturer's certified test report to the activity responsible for qualification (see 4.5.2.1).

3.4 Design and Construction

Lug terminals and conductor splices shall conform in all respects to the design, dimensions and construction specified herein and on the applicable AS or MS specification sheet. Each terminal size shall be designed for attachment to wire sizes specified on the applicable AS or MS specification sheet by having the terminal receiving barrel reshaped around the conductor. For class 1 terminals and conductor splices, it shall be possible to perform the reshaping operation by means of a crimping tool or crimping dies conforming to the applicable AS or MS specification sheet. For class 2 terminals and conductor splices, it shall be possible to perform this reshaping operation by means of tooling detailed on the manufacturer's control drawings. Terminals and conductor splices shall exhibit no evidence of fracturing or spalling as a result of the reshaping operation. Wire insertion shall be facilitated by bell mouth or chamfer of wire barrel. There shall be no protruding sharp edges of the terminal or conductor splice when reshaping the crimp barrel to the contour of the wire during or after the crimping operation.

3.4.1 Wire Facility

Each size lug terminal and conductor splice shall be designed for attachment to the wire diameter range or size specified in the applicable AS or MS specification sheet.

3.4.2 Mounting Holes

The tongue of each size lug terminal shall be designed for attachment to the stud size specified. The diameter of the clearance hole for each stud size is listed in Table 1 or on the applicable AS or MS specification sheet.

TABLE 1 - CLEARANCE HOLE (REFERENCE)

Stud Size ^{1/}	Clearance Hole Diameter		Clearance Hole (Reference)					
	Minimum	Maximum	Inch	mm	Inch	mm	Inch	mm
2 (0.086)	0.090	0.098	0.086	2.18	0.190	4.83	0.437	11.10
4 (0.112)	0.114	0.122	0.090	2.29	0.193	4.90	0.448	11.38
5 (0.125)	0.129	0.137	0.098	2.49	0.203	5.16	0.463	11.76
6 (0.138)	0.142	0.152	0.112	2.84	0.216	5.49	0.500	12.70
8 (0.164)	0.168	0.178	0.114	2.90	0.220	5.59	0.510	12.95
10 (0.190)	0.193	0.203	0.122	3.10	0.236	5.99	0.525	13.34
12 (0.216)	0.220	0.236	0.125	3.18	0.250	6.35	0.625	15.88
1/4 (0.250)	0.260	0.275	0.129	3.28	0.260	6.60	0.651	16.54
5/16 (0.312)	0.323	0.338	0.137	3.48	0.275	6.99	0.666	16.92
3/8 (0.375)	0.385	0.400	0.138	3.51	0.312	7.92	0.750	19.05
7/16 (0.437)	0.448	0.463	0.142	3.61	0.323	8.20	0.770	19.56
1/2 (0.500)	0.510	0.525	0.152	3.86	0.338	8.59	0.785	19.94
5/8 (0.625)	0.651	0.666	0.164	4.17	0.375	9.53	0.875	22.23
3/4 (0.750)	0.770	0.785	0.168	4.27	0.385	9.78	0.895	22.73
7/8 (0.875)	0.895	0.910	0.178	4.52	0.400	10.16	0.910	23.11

^{1/} Stud size in accordance with FED-STD-H28. Metric equivalents (to the nearest 0.01 mm) are given for general information only and are based upon 1 inch - 25.4 mm.

3.4.3 Wire Insulation Support

When specified on the applicable AS or MS specification sheet, wire insulation supports shall be required which encompasses the wire insulation and which when deformed by the crimping tool is not required to grip the wire insulation.

3.4.4 Insulation

Insulation of polyvinylchloride (PVC) shall not be allowed for use in or on any aerospace vehicles (see individual specification sheet). Insulated (type II) lug terminals and conductor splices shall be insulated over the entire outer surface of the barrel and wire insulation support. The insulation, and metal sleeve if used, shall remain in its original position on the barrel of the terminal or conductor splice before and after crimping except as specified in 3.5.5. The insulation shall exhibit no evidence of fracturing or spalling as a result of the reshaping operation.

3.4.5 Finish

Unless otherwise specified (see 3.1), lug terminals and conductor splices shall have conducting parts tin plated over their entire surface in accordance with ASTM B 545 and ASTM B 339 (see 6.1.11). Bare copper exposed at slug-out points on lug terminals, in strip form, shall not in itself be cause for rejection. The slug-out points shall not exceed 1/8 inch in width. Mercury shall not be used in the manufacture of these terminals.

3.5 Performance Requirements

The lug terminals and conductor splices shall conform to the following requirements, when crimped to each of the specified wire sizes with the applicable tool or crimping dies specified in 3.4. The specified performance of the terminals and splices is premised on there being no nicked or broken strands of the conductor.

3.5.1 Voltage Drop

When tested as specified in 4.7.2, the millivolt drop of the lug terminal or conductor splice shall not exceed the millivolt drop of an equivalent length of wire by more than the value specified in Table 2.

3.5.2 Current Cycling

When tested as specified in 4.7.3, the voltage drop (see 3.5.1) shall be as specified in the applicable columns of Table 2 under "after test".

3.5.3 Dielectric Withstanding Voltage (type II)

When tested as specified in 4.7.4, insulated lug terminals and conductor splices shall show no evidence of damage, arcing, or breakdown.

3.5.4 Salt Spray (corrosion)

When tested as specified in 4.7.5, lug terminals and conductor splices shall show no evidence of exposure of the base metal or blistering of the plated surfaces. After salt spray, the voltage drop and tensile strength shall be as specified in Table 2 or Table 3 as applicable. For voltage drop, the "after test" requirement shall apply.

3.5.5 Axial Load

3.5.5.1 Axial Load (type I, multiple piece construction, crimped and uncrimped specimens)

On multiple piece construction, the metal sleeve on uncrimped lug terminals shall withstand a minimum axial force of 8 pounds and shall not move more than 1/32 inch on the barrel of the lug terminal. The metal sleeve on a crimped lug terminal shall withstand a minimum axial force of 8 pounds (see 4.7.6.1 and 4.7.6.2).

3.5.5.2 Axial Load (type II, crimped and uncrimped specimens)

The insulation, and metal sleeve if used, on uncrimped lug terminals or conductor splices shall withstand a minimum axial force of 8 pounds and shall not move more than 1/32 inch on the barrel of the lug terminal or conductor splice. The insulation, and metal sleeve if used, on a crimped lug terminal or conductor splice shall withstand a minimum axial force of 8 pounds and shall meet the dielectric withstanding voltage requirement specified in 3.5.3 (see 4.7.6.3 and 4.7.6.4).

TABLE 2 - PERFORMANCE REQUIREMENTS

Wire Size (Nominal) AWG	Test Current (Amperes) A	Maximum Voltage Drop (mV) - Millivolt Drop of Equivalent Length of Wire Plus Appropriate Value Below								Tensile Strength lb (min.)	
		Initial				After Test					
		Lug		Splice		Lug		Splice		Lug/Splice	Lug
		Conductor Coating		Conductor Coating		Conductor Coating		Conductor Coating		Conductor Coating	Conductor Coating
		Tin or Silver	Nickel	Tin or Silver	Nickel	Tin or Silver	Nickel	Tin or Silver	Nickel	Tin or Silver	Nickel
26	3	3	5	6	-	5	8	10	-	7	5 <u>1</u> /
24	4.5	2	5	4	-	4	8	8	-	10	7 <u>1</u> /
22	9	1	5	2	-	3	8	6	-	15	11
20	11	1	5	2	-	3	8	6	-	19	13
18	16	1	5	2	-	3	8	6	-	38	27
16	22	1	5	2	-	3	8	6	-	50	35
14	32	1	5	2	-	3	8	6	-	70	49
14	32	-	-	6	-	-	-	8 <u>1</u> /	-	70	-
12	41	1	5	2	-	3	8	6	-	110	77
10	55	1	5	2	-	3	8	6	-	150	105
8	73	1	5	2	-	3	8	6	-	225	158
6	101	1	5	2	-	3	8	6	-	300	210
4	135	1	2	2	-	3	4	6	-	400	300
2	181	1	2	2	-	3	4	6	-	550	440
1	211	1	2	2	-	3	4	6	-	650	585
0	245	2	2	4	-	4	4	8	-	700	700
00	283	2	2	4	-	4	4	8	-	750	750
000	328	2	2	4	-	4	4	8	-	825	825
0000	380	2	5	4	-	4	8	8	-	875	875

^{1/} Soft copper alloy wire, nickel plated.

3.5.6 Vibration

When tested as specified in 4.7.7.1 or 4.7.7.2, there shall be no evidence of cracking, breaking, or loosening of parts. After vibration, the voltage drop shall not exceed the "after test" values specified in Table 2, and tensile strength shall be not less than the values specified in Table 2 or Table 3, as applicable.

3.5.7 Tensile Strength

When tested as specified in 4.7.8, lug terminals and conductor splices shall not break or separate from the wire to which it is terminated before the minimum tensile strength specified in Table 2 or Table 3, as applicable, is reached.

3.5.7.1 Additional Tensile Strength Requirements

Table 3 tensile strength requirements shall apply only to the AS17143 and AS21004 detail specifications:

TABLE 3 - TENSILE STRENGTH REQUIREMENTS

Wire Size AWG	Navy Cable Size AN	Tensile Strength lb (min.)
22-18	1 (1)	15
	1 (7)	16
	1 (10)	15
	1-1/2 (1)	24
	1-1/2 (7)	
	1-1/2 (16)	23
	1-1/2 (41)	24
	2 (7)	
16-14	2-1/2 (1)	40
	2-1/2 (19)	38
	2-1/2 (26)	41
	3 (7)	43
	4 (1)	50
	4 (19)	
	4 (7)	
	4 (41)	
12-10	6 (7)	60
	6 (19)	
	9 (7)	100
	9 (37)	

3.5.8 Immersion (type II)

After testing as specified in 4.7.9.1 or 4.7.9.2, lug terminals and conductor splices shall withstand the dielectric withstanding voltage test (see 4.7.4).

3.5.9 Heat Aging (type II)

After testing as specified in 4.7.10.1 or 4.7.10.2, lug terminals and conductor splices shall meet the dielectric withstanding voltage requirements specified in 3.5.3. Discoloration of the insulation material during this test shall not be cause for rejection.

3.5.9.1 Heat Aging (type 1)

After testing as specified in 4.7.10.3, lug terminals shall meet the requirements of 3.8.

3.5.10 Flammability (type II)

When tested as specified in 4.7.11, lug terminal and splice insulation shall be self-extinguishing within 30 seconds after removal from flame.

3.5.11 Low-temperature Crimp (type II)

When tested as specified in 4.7.1 2, insulated lug terminals and splices shall show no evidence of rupture or cracking and shall withstand the dielectric withstanding voltage test (see 4.7.4).

3.6 Manufacturer's Control Drawing

The terminal manufacturer shall prepare a control drawing for the crimping dies used to crimp his class 2 terminals and conductor splices for the applicable tests. The control drawing shall specify the critical dimensions and motion of the dies and shall also specify the acceptance and in-service gauging requirements. The terminal manufacturer shall certify to the equipment manufacturer that the equipment manufacturer's dies are in accordance with the control drawing and shall furnish to the equipment manufacturer the acceptance and in-service gauging requirements (see 4.5.2.1).

3.7 Identification of Product

Class 1 and class 2 terminals, and conductor splices for wire sizes 22 and larger shall have the wire size, or range as shown on the applicable AS or MS specification sheet and the manufacturer's trademark legibly molded or stamped on the part. In addition, type II terminals and conductor splices shall be color coded in accordance with the applicable AS or MS specification sheet for identification purposes. Unless otherwise specified in the detail specification, the part number shall be as follows:

Example: M7928/8-15

M7928: Basic specification AS7928

/8: Detail specification description of terminal type

-15: Terminal size (i.e. accommodates size 22 wire with a #10-stud hole)

3.8 Workmanship

Lug terminals and conductor splices shall be free from burrs, sharp edges, blistering, pitting or peeling of plating, cracks, and other defects which may affect serviceability.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

Unless otherwise specified in the contract, the manufacturer is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the manufacturer may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the activity responsible for qualification. The purchaser reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Test Equipment and Inspection Facilities

Test and measuring equipment and inspection facilities of sufficient accuracy, quality and quantity to permit performance of the required inspection shall be established and maintained by the manufacturer. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with NCSL Z540-1 or ISO 10012-1.

4.2 Classification of Inspections

The inspections specified herein are classified as follows:

- a. Materials inspection (4.3).
- b. Qualification inspection (4.5).
- c. Quality conformance inspection (4.6).

4.3 Materials Inspection

Materials inspection shall consist of certification supported by verifying data that the materials listed in Table 4 used in fabricating the lug terminals and conductor splices, are in accordance with the applicable specification or requirements prior to such fabrication.

TABLE 4 - MATERIALS INSPECTION

Material	Requirement Paragraph	Applicable Specification or Requirement
Metals	3.3.1	ASTM B 187, ASTM B 272, ASTM B 152, or ASTM B 75
Fungus resistant	3.3.3	MIL-HDBK-454 Guideline 4

4.4 Inspection Conditions

Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMENTS" of MIL-STD-202.

4.4.1 Assembly to Conductors

All lug terminals and conductor splices shall be crimped on the wire by the testing activity, using the specified crimping tool and dies (see 3.1 and 4.5.2.1). The type of wire specified on the applicable AS or MS specification sheet shall be used when performing the specified tests. Where a lug terminal or conductor splice is designed to cover a range of wire sizes, the specified number of sample units for testing shall be selected for both the minimum and maximum wire size within the wire range.

4.4.2 Attachment

During temperature and voltage tests, lug terminals shall be securely bolted back-to-back with a minimum clearance in free air of 18 inches in all directions. Steel bolts, nuts, and washers of the appropriate stud size shall be used. When assembled, the bolt shall not extend more than 1/8 inch beyond the nut (see Figure 1).

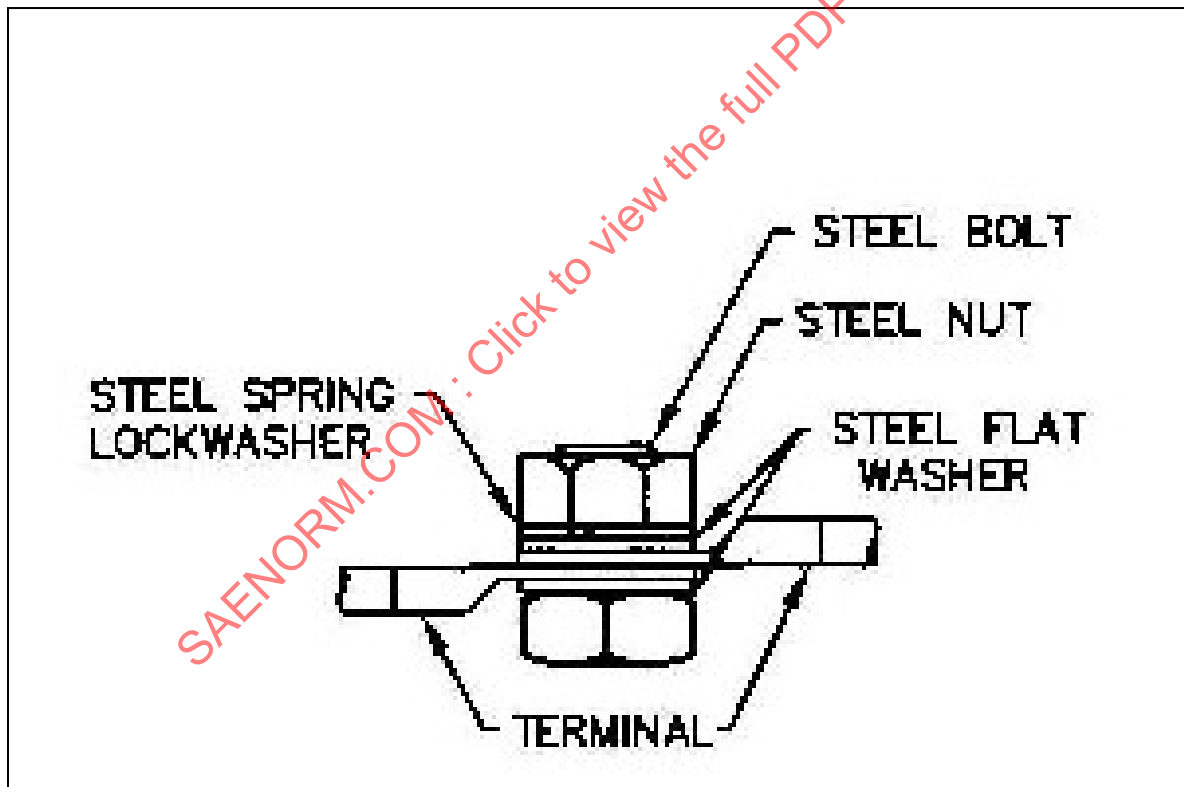


FIGURE 1 - TERMINAL ASSEMBLY

4.4.3 Temperature Stabilization

Voltage drop measurements shall be made after the temperature of the wire has stabilized. Temperature stabilization shall be determined by three consecutive readings within ± 1 °C at intervals of 3 minutes each.

4.5 Qualification Inspection

Qualification inspection shall be performed on sample units produced with equipment and procedures normally used in production at a laboratory acceptable to the activity responsible for qualification (see 6.4) for class 1 terminals and conductor splices (see 4.5.1) and in-plant by the manufacturer for class 2 units (see 4.5.2).

4.5.1 Class 1

Samples for each part number shall be separately packaged and forwarded to the activity responsible for qualification as designated in the letter of authorization (see 6.4). Each sample shall be identified by marking each package with the following information:

Sample for qualification

Specification AS7928 and revision letter

AS or MS specification sheet part number _____ (class 1 items)

TERMINALS, LUG; OR SPLICE, CONDUCTOR: (as appropriate)

CRIMP STYLE, COPPER

Type _____ Class _____

Name of manufacturer

Manufacturer's part number

Submitted (date) under authorization (reference letter authorizing the inspection)

4.5.2 Class 2

Qualification inspection shall be performed by the manufacturer and the test report shall be furnished to the activity responsible for qualification (see 6.4). Upon approval by the activity responsible for qualification, the control drawing number for the crimping dies (see 3.6) shall be listed in the applicable qualified products list.

4.5.2.1 Test Reports

The manufacturer shall furnish the activity responsible for qualification with a certified test report, in duplicate, showing quantitative results for class 2 terminals and splices as required by this specification and further certified in the forwarding letter by an officer of the manufacturer. The report shall designate the equivalent part number of the class 1 terminal or conductor splice which will replace the class 2 terminal or conductor splice submitted. The report shall also include the manufacturer's control drawings specified in 3.6 and the part numbers of the tool and die used to perform the qualification tests.

4.5.3 Sample Size

The number of lug terminals or conductor splices specified in Table 5 for each barrel size of each AS or MS specification (see 3.1) for which qualification is sought shall be submitted for qualification inspection. In addition, five lug terminals for each stud size for which qualification is sought shall be submitted for visual and dimensional examination. Fifteen additional class 1 lug terminals or conductor splices shall be submitted to the activity responsible for qualification for any additional testing deemed necessary. The sample size shall be the same for class 1 and class 2 terminals and conductor splices.

4.5.4 Inspection Routine

Sample units shall be subjected to the qualification inspection specified in Table 5, in the order shown. All sample units shall be subjected to the inspection of group I. The sample units shall then be divided into groups II through X, as shown in Table 5, and subjected to the inspection for their particular group.

4.5.5 Failures

One or more failures shall be cause for refusal to grant qualification approval.

4.5.6 Qualification by Similarity (group I testing required)

Qualification by similarity to qualified lug terminals and splices is permissible for those lug terminals and splices, Class 1 or Class 2, of the same type and wire size when the materials, design and manufacturing processes are identical except for tongue shapes or non-essential dimensions that differ due to the multiple stud sizes, various stud configurations or minor design considerations. When materials, design and manufacturing processes differ, sufficient testing to prove the adequacy of the affected characteristic may be required to obtain qualification by similarity. Full details of the similarities and differences, with proposed tests, if the submitter deems necessary, shall be submitted to the activity responsible for qualification for approval prior to commencing testing.

4.5.7 Retention of Qualification

To retain qualification, the manufacturer shall track and compile data for the activity responsible for qualification every 12 months on the groups A and B tests, and every 36 months on the group C tests. The activity responsible for qualification shall establish the initial reporting date for submission of the data at the 36 month interval. The report shall consist of:

- a. (Group A tests compiled every 12 months) A summary of the results of the test performed for inspection of product for delivery, group A, indicating as a minimum the number of lots that have passed and the number that failed. The results of tests of all reworked lots shall be identified and accounted for. The activity responsible for qualification may request Group A data at any time.
- b. (Group B tests compiled every 12 months) A summary of the results of the tests performed for periodic inspection, Group B, including the number and mode of failures. The summary shall include results of all group A quality conformance inspection performed and completed during the 12 month period. If the summary of the test results indicates non-conformance with specification requirements and corrective action acceptable to the activity responsible for qualification has not been taken, action may be taken to remove the failing product from the qualified list. The production of a new lot and resulting Group A and B sampling is not considered an acceptable corrective action. The activity responsible for qualification may request Group B data at any time (see 6.4).
- c. (Group C tests every 36 months) A summary of the results of the tests performed for periodic inspection, group C, including the number and mode of failures. If the summary of test results indicates non-conformance with specification requirements and corrective action acceptable to the activity responsible for qualification has not been taken, action may be taken to remove the failing product from the qualified products list (see 6.4).

TABLE 5 - QUALIFICATION INSPECTION

Inspection	Requirement Paragraph	Method Paragraph	Sample Units	
			Type	
			I	II
<u>Group I</u>				
Visual and dimensional examination	3.1, 3.3, 3.4, 3.7, and 3.8	4.7.1	26 16 <u>2</u> /	40 52 <u>1</u> /
<u>Group II</u>				
Voltage drop	3.5.1	4.7.2	4	4
Current cycling	3.5.2	4.7.3		
Voltage drop	3.5.1	4.7.2		
<u>Group III</u>				
Voltage drop	3.5.1	4.7.2	4	4
Vibration	3.5.6	4.7.7		
Voltage drop	3.5.1	4.7.2		
Tensile strength	3.5.7	4.7.8		
<u>Group IV</u>				
Immersion (105 °C)	3.5.8	4.7.9.1	-	8
Immersion (150 °C)	3.5.8	4.7.9.2		20 <u>1</u> /
Dielectric withstanding voltage (type II)	3.5.3	4.7.4		
<u>Group V</u>				
Flammability	3.5.10	4.7.11	-	2
<u>Group VI</u>				
Voltage drop	3.5.1	4.7.2	4	4
Salt spray (corrosion)	3.5.4	4.7.5		
Voltage drop	3.5.1	4.7.2		
Tensile strength	3.5.7	4.7.8		
<u>Group VII</u>				
Heat aging (105 °C)	3.5.9	4.7.10.1	-	4
Heat aging (150 °C)	3.5.9	4.7.10.2	-	4 <u>1</u> /
Dielectric withstanding voltage (type II)	3.5.3	4.7.4		
Heat aging (175 °C)	3.5.9.1	4.7.10.3	4 <u>4</u> /	

TABLE 5 - QUALIFICATION INSPECTION (CONTINUED)

<u>Group VIII</u>				
Low-temperature crimp (type II)	3.5.11	4.7.12	-	4
Dielectric withstanding voltage (type II)	3.5.3	4.7.4		
<u>Group IX</u>				
Axial load (type I)	3.5.5.1	4.7.6.1 and 4.7.6.2	10 <u>3/</u>	
Axial load (type II)	3.5.5.2	4.7.6.3 and 4.7.6.4		10
Dielectric withstanding voltage (type II)	3.5.3	4.7.4		

1/ Applicable to 150 °C items only (see 3.1)

2/ Applicable to one-piece construction only

3/ Applicable to multiple-piece construction only

4/ Applicable to 175 °C items only (see 3.1)

Failure to submit the report within 30 days after the end of each 36 month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the manufacturer shall immediately notify the activity responsible for qualification at any time that the Group B or C inspection data indicated failure of the qualified product to meet the requirements of this specification.

In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during two consecutive reporting periods there has been no production, the manufacturer may be required, at the discretion of the activity responsible for qualification, to submit a representative item of those covered by a single specification sheet to testing in accordance with the qualification inspection requirements.

4.6 Quality Conformance Inspection

4.6.1 Inspection of Product for Delivery

Inspection of product for delivery shall consist of group A inspection.

4.6.2 Inspection Lot

An inspection lot, as far as practicable, shall consist of all lug terminals and conductor splices of a single type, class, size, and composition manufactured under essentially the same conditions and offered for inspection at one time.

4.6.3 Group A Inspection

Group A inspection shall consist of the examination and tests specified in Table 6 and shall be made on the same set of sample units, in the order shown. After the visual examination is completed, the lot shall be divided and tensile strength tests performed on both the minimum and the maximum diameter wires within the accommodated wire range.

4.6.3.1 Sampling Plan

Statistical sampling and inspection shall be in accordance with ANSI/ASQ Z1.4 for special inspection levels. The acceptable quality level (AQL) shall be as specified in Table 6. Major and minor defects shall be as defined herein (see 6.5) and Table 6.

4.6.3.2 Rejected Lots

If an inspection lot is rejected, the manufacturer may rework it to correct the defects, or screen out the defective units, and resubmit for re-inspection. Resubmitted lots shall be inspected using tightened inspection. Such lots shall be separate from new lots, and shall be clearly identified as re-inspected lots.

TABLE 6 - GROUP A INSPECTION

Inspection	Requirement Paragraph	Method Paragraph	AQL (Percent Defective)		Sampling Plan
			Major	Minor	
Visual and mechanical examination	3.1, 3.3, 3.4, 3.7, and 3.8	4.7.1	1.0	4.0	S-4
Tensile strength	3.5.7	4.7.8	0.65	-	S-1

4.6.4 Periodic Inspection

Periodic inspection shall consist of groups B and C. Except when the results of these inspections show noncompliance with the applicable requirements (see 6.5), delivery of products which have passed group A shall not be delayed pending the results of these periodic inspections.

4.6.4.1 Group B Inspection

Group B inspection shall consist of the tests specified in Table 7, in the order shown, and the sample shall be selected from inspection lots that have passed group A inspection.

TABLE 7 - GROUP B INSPECTION

Inspection	Requirement Paragraph	Method Paragraph
Group 1 (15 units) (type II only)		
Dielectric withstanding voltage	3.5.3	4.7.4
Group 2 (15 units) (any type)		
Voltage drop	3.5.1	4.7.2

4.6.4.1.1 Sampling Plan

Fifteen type I and 30 type II lug terminals or conductor splices, as applicable, shall be selected from those covered by a single AS or MS specification sheet and having the same barrel size, 12 months after the date of notification of qualification, and after each subsequent 12 month period. A manufacturer's normal quality control tests and production tests may be used to fulfill all or part of group B inspection; however, all of the group B inspection shall be completed as specified.

4.6.4.1.2 Failures

If one or more units fail to pass group B inspection, the sample shall be considered to have failed.

4.6.4.1.3 Disposition of Samples

Samples which have been subjected to group B inspection shall not be delivered on the contract or order.

4.6.4.2 Group C Inspection

Group C inspection shall consist of the examinations and tests specified in Table 8, in the order shown. Group C inspection shall be made on sample units selected from inspection lots which have passed the groups A and B inspection.

4.6.4.2.1 Sampling Plan

As specified in 4.5.3, the number of sampling units of each wire size and type shall be selected from production lots 36 months after the date of notification of qualification, and after each subsequent 36-month period. In those cases where a terminal or conductor splice covers a range of wire sizes, the number of sample units shall be selected for a maximum and an equal number for the minimum wire size within the range.

4.6.4.2.2 Failures

If one or more units fail to pass group C inspection, the sample shall be considered to have failed.

TABLE 8 - GROUP C INSPECTION

Inspection	Requirement Paragraph	Method Paragraph	Sample Units	
			Type	
			I	II
<u>Group I</u>				
Current cycling	3.5.2	4.7.3	4	4
Voltage drop	3.5.1	4.7.2		
<u>Group II</u>				
Vibration	3.5.6	4.7.7	4	4
Voltage drop	3.5.1	4.7.2		
Tensile strength	3.5.7	4.7.8		
<u>Group III</u>				
Immersion (105 °C)	3.5.8	4.7.9.1	-	8
Immersion (150 °C)	3.5.8	4.7.9.2		20
Dielectric withstanding voltage (type II)	3.5.3	4.7.4		
<u>Group IV</u>				
Flammability	3.5.10	4.7.11	-	2
<u>Group V</u>				
Salt spray (corrosion)	3.5.4	4.7.5	4	4
Voltage drop	3.5.1	4.7.2		
Tensile strength	3.5.7	4.7.8		

See footnotes at end of table

TABLE 8 - GROUP C INSPECTION (CONTINUED)

<u>Group VI</u>				
Heat aging (105 °C)	3.5.9	4.7.10.1	-	4
Heat aging (150 °C) <u>1/</u>	3.5.9	4.7.10.2	-	4
Dielectric withstanding voltage (type II)	3.5.3	4.7.4		
Heat aging (175 °C) <u>3/</u>	3.5.9.1	4.7.10.3	4	
<u>Group VII</u>				
Low-temperature crimp (type II)	3.5.11	4.7.12	-	4
Dielectric withstanding voltage (type II)	3.5.3	4.7.4		
<u>Group VIII</u>				
Axial load (type I)	3.5.5.1	4.7.6.1 and 4.7.6.2	10 <u>2/</u>	10
Axial load (type II)	3.5.5.2	4.7.6.3 and 4.7.6.4		
Dielectric withstanding voltage (type II)	3.5.3	4.7.4		

1/ Applicable to 150 °C items only (see 3.1)

2/ Applicable to multiple-piece construction only

3/ Applicable to 175 °C items only (see 3.1)

4.6.4.2.3 Disposition of Sample Units

Sample units which have been subjected to group C inspection shall not be delivered on the contract or order. Group A, B, and C samples shall be held by the manufacturer for a minimum of two retention periods.

4.6.5 Inspection of Preparation for Delivery

Except when commercial packaging is specified, the sampling and inspection of the preservation-packaging and interior package marking shall be in accordance with the group A and B quality conformance inspection requirements of MIL-STD-2073-1. The sampling and inspection of the packing and marking for shipment and storage shall be in accordance with the quality assurance provisions of the applicable container specification and the marking requirements of MIL-STD-2073-1. The inspection of commercial packaging shall be as specified in the contract or purchase order (see 6.3).

4.7 Methods of Examination and Test

4.7.1 Visual and Mechanical Examination

Lug terminals and conductor splices shall be examined to verify that the materials, design, construction, physical dimensions, marking and workmanship are in accordance with this specification and applicable AS or MS specification sheet. Dimensions shall conform to those specified on the manufacturer's drawing for class 2, and to the applicable AS specification sheet for class I. Classification of defects for visual and mechanical examination shall be as specified in Table 9.

TABLE 9 - CLASSIFICATION OF DEFECTS

Examination of product	Major	Minor
Dimensions:		
Overall length (max.)	X	-
Width of tongue (max.)	X	-
Stud hole (min.)	X	-
Center of stud hole to end of tongue (max.)	X	-
Washer clearance	X	-
All other dimensions	-	X
Materials	X	-
Workmanship and marking	-	X

4.7.2 Voltage Drop (see 3.5.1)

Lug terminals and conductor splices shall be tested as follows:

- a. Test points: Lug terminal measurements shall be made by puncturing the insulation of the current-carrying conductor 1/16 inch back from the wire-receiving end of the terminal for one test point and using the intersection of the tongue and barrel for the other test point. The distance between the two test points shall be noted.

Conductor splice measurements shall be made by puncturing the insulation of the current-carrying conductor on each end of the splice 1/16 inch back from the wire-receiving end of the splice. The distance between the two test points shall be noted.

Measurement of the current-carrying conductor shall be made by puncturing the conductor insulation the same distance between test points as that noted for the terminal and splice measurements. The conductor measurement shall be made midway on the wire between termination joints. The millivolt drop of the equivalent length of wire may be determined by averaging four readings taken on 10-inch lengths of wire selected at random throughout the supply of wire to be used for subsequent tests.

- b. Measurements: The millivolt drop through the crimp termination and the current-carrying conductor shall be measured while the specified test current (see Table 2) is being applied and after the temperature of the wire has stabilized (see 4.4.3).

4.7.3 Current Cycling (see 3.5.2)

Test samples attached to 3-foot lengths of appropriate wire shall be subjected to 50 current cycles. Each cycle shall consist of 30 minutes at 125 percent of the test current specified in Table 2, followed by 15 minutes at no load. Voltage drops shall be measured at test currents specified in Table 2 after the test assembly has returned to room temperature.

4.7.4 Dielectric Withstanding Voltage (type II) (see 3.5.3)

Insulated lug terminals and conductor splices shall be tested in accordance with method 301 of MIL-STD-202. The following details shall apply:

- a. Preparation of specimen - The tongue of the type II crimped lug terminal shall be sealed with a suitable insulating compound to a depth sufficient to close the open end of the lug barrel without covering the depression resulting from the applied crimping pressure. One of the wires in a type II crimped splice shall be cut as close to the insulating sleeve as possible and the wire entrance end shall be insulated as described above. For samples exposed to fluids, samples may be soaked in mineral spirits for a couple minute then washed with mineral spirits to clean off the bulk of the fluid remaining. Samples may then be drained for a couple minutes, sonicated rinse in acetone, drained then placed in an oven at ± 50 °C for 10 minutes to dry. The samples shall be immersed in a 5 percent salt water solution to a depth sufficient to cover the crimped areas of the barrel and insulating grip. Dielectric failures shall be visually confirmed as occurring though the sleeve and not at the ends of the sleeve. Preparation of the specimen and dielectric test shall be repeated on the same sample, if an end of a sleeve failure occurs.
- b. Magnitude of voltage - 1500 volts.
- c. Nature of potential - Alternating Current (AC).

4.7.5 Salt Spray (corrosion) (see 3.5.4)

The salt spray (corrosion) test shall be in accordance with method 101, test condition B of MIL-STD-202. Terminal lugs shall be crimped to short lengths of proper size wire and mounted in the salt spray (corrosion) chamber in a horizontal position. Conductor splices shall be crimped to short lengths of wire and free ends of the wire shall be terminated with approved lug terminals. Adjoining samples shall be separated by at least 1/4 inch. During this test, the samples shall not come in contact with metallic or wooden objects, and the salt spray (fog) shall be a salt solution concentration of 5 percent (by weight) and shall have free access to the samples. The samples shall be removed from the salt spray, washed with distilled water, air dried for a minimum of 1 hour and examined for compliance with 3.5.4. Prior to subsequent testing, the corrosion on the terminal's tongue shall be removed. The terminal lugs and conductor splices shall then be subjected to the voltage drop (see 4.7.2) and tensile strength (see 4.7.8) tests.

4.7.6 Axial Load

4.7.6.1 Axial Load (type I, multiple piece construction, uncrimped specimens) (see 3.5.5.1)

Five uncrimped specimens shall have a 0.022 inch diameter hole drilled through the insulating sleeve and a piano wire of 0.020 inch diameter shall be inserted through the drilled hole. The specimens shall then be fastened in a tensile testing machine and the axial force specified in 3.5.5.1 shall be exerted on the piano wire (see Figure 2). An alternate test method may be used provided the requirements of 3.5.5.1 are met.

4.7.6.2 Axial Load (type I, multiple piece construction, crimped specimens) (see 3.5.5.1)

Five new specimens shall be crimped to the specified smallest size wire accommodated by the terminal lug. The specimens shall be tested by applying the specified axial force (see 3.5.5.1) at a maximum speed of 1 inch per minute between the crimped conductor and a suitable test jig positioned under the metal sleeve. The free end of the crimped conductor and the test jig shall be fastened in the jaws of the tensile machine (see Figure 3).

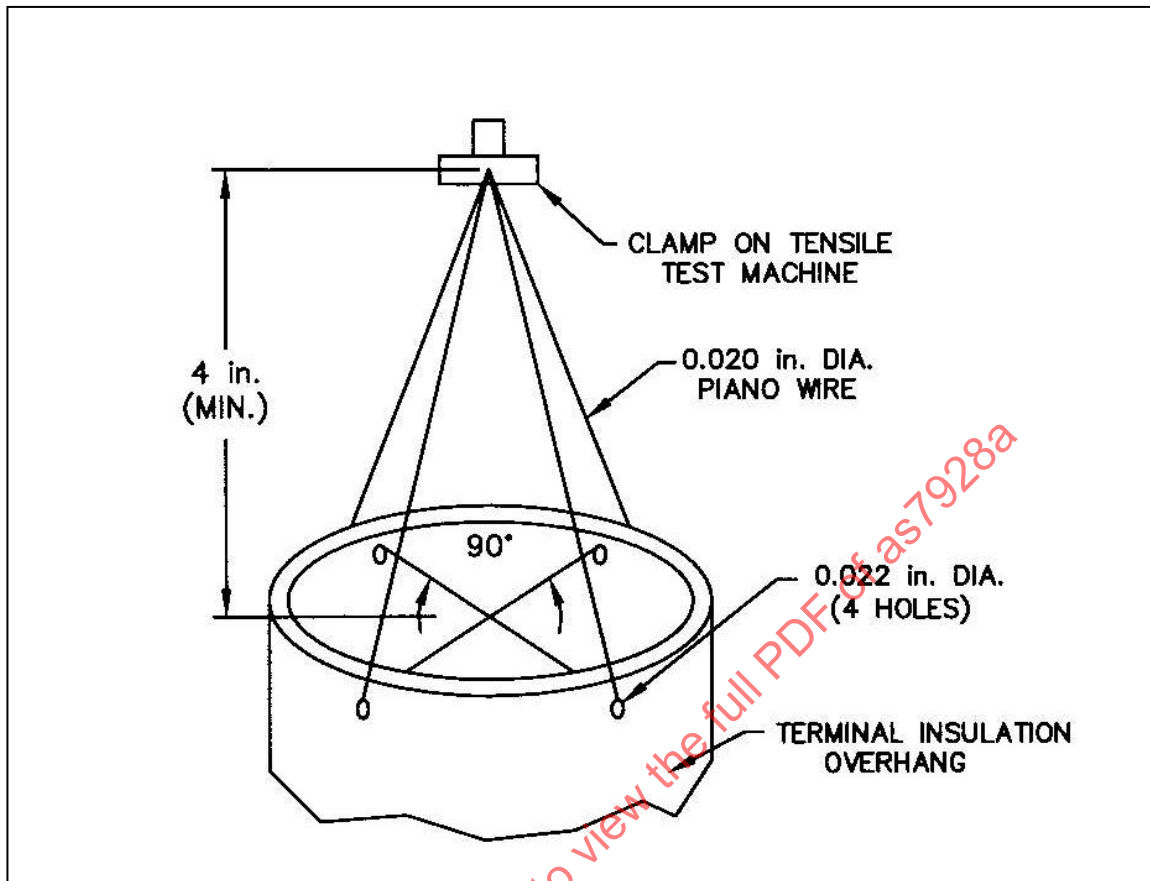


FIGURE 2 - SET UP FOR AXIAL LOAD TEST (UNCRIIMPED SPECIMENS)

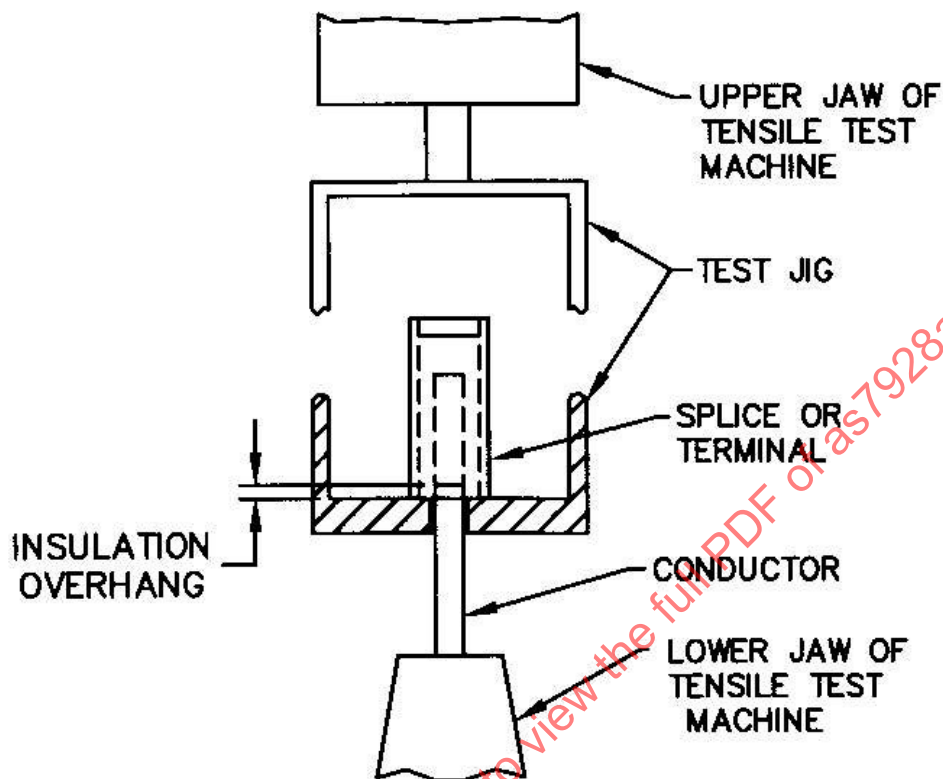


FIGURE 3 - SET UP FOR AXIAL LOAD TEST (CRIMPED SPECIMENS)

4.7.6.3 Axial Load (type II, uncrimped specimens) (see 3.5.5.2)

Five uncrimped specimens, each of type II terminal lugs, and conductor splices shall have four 0.022 inch diameter holes drilled through the insulation overhang, and metal sleeve if used, and four piano wires of 0.020 inch diameter shall be inserted through the drilled holes. The specimens shall then be fastened in a tensile testing machine and the axial force specified in 3.5.5.2 shall be exerted on the piano wires (see Figure 2). An alternate test method may be used provided the requirements of 3.5.5.2 are met.

4.7.6.4 Axial Load (type II, crimped specimens) (see 3.5.5.2)

Five new specimens each of the terminal lugs and conductor splices shall be crimped to the specified smallest size wire accommodated by the terminal lug or splice. The specimens shall then be subjected to humidity (steady state) in accordance with test condition B, method 103, of MIL-STD-202. After completion of the humidity conditioning, prior to axial load, (one conductor of the splice shall be cut as close to the insulation sleeve as possible) the terminal lug and conductor splice specimens shall be tested by applying the specified axial force (see 3.5.5.2) at a maximum speed of 1 inch per minute between the crimped conductor and a suitable test jig positioned under the insulation overhang. The free end of the crimped conductor and the test jig shall be fastened in the jaws of the tensile machine (see Figure 3). Each crimped terminal lug or conductor splice shall then be tested for dielectric withstanding voltage as specified.

4.7.7 Vibration

4.7.7.1 Vibration (with insulation support and sizes 12 and larger without insulation support) (see 3.5.6)

Lug terminals and conductor splices shall be attached to a length of wire. The terminals shall be rigidly mounted to and not more than 1 inch above the vibrating platform by their normal mounting means (see Figure 4). The test terminals shall be so mounted that the junction of the other end of the test sample shall be secured to a stable support 12 inches external to the vibrating table with only enough tension to remove the slack from the wire. Conductor splices shall be assembled and so mounted that the center of the splice is 6 inches from the vibrating platform and 6 inches from the support (see Figure 5). Lug terminals shall be attached to the opposite ends of the wires attached to the conductor splice to insure equal distribution of stress among the strands. The specimens shall be vibrated in accordance with method 201 of MIL-STD-202 for 18 hours on each of two axes mutually perpendicular to each other and to the axis of the wire. Following the test, the lug terminal and conductor splice shall be subjected to the voltage drop (see 4.7.2) and tensile strength (see 4.7.8) tests.

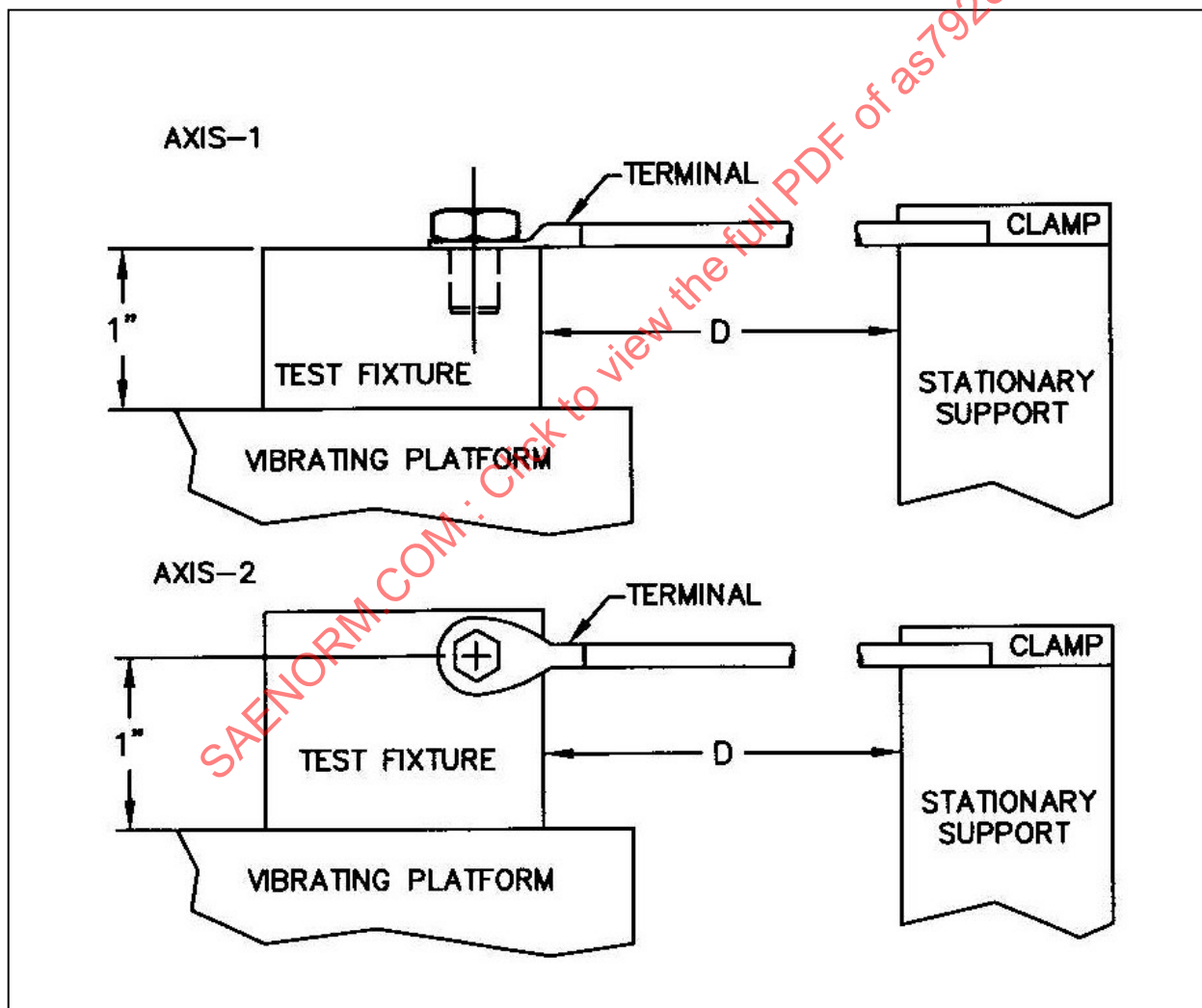


FIGURE 4 - VIBRATION TEST FOR LUG TERMINALS

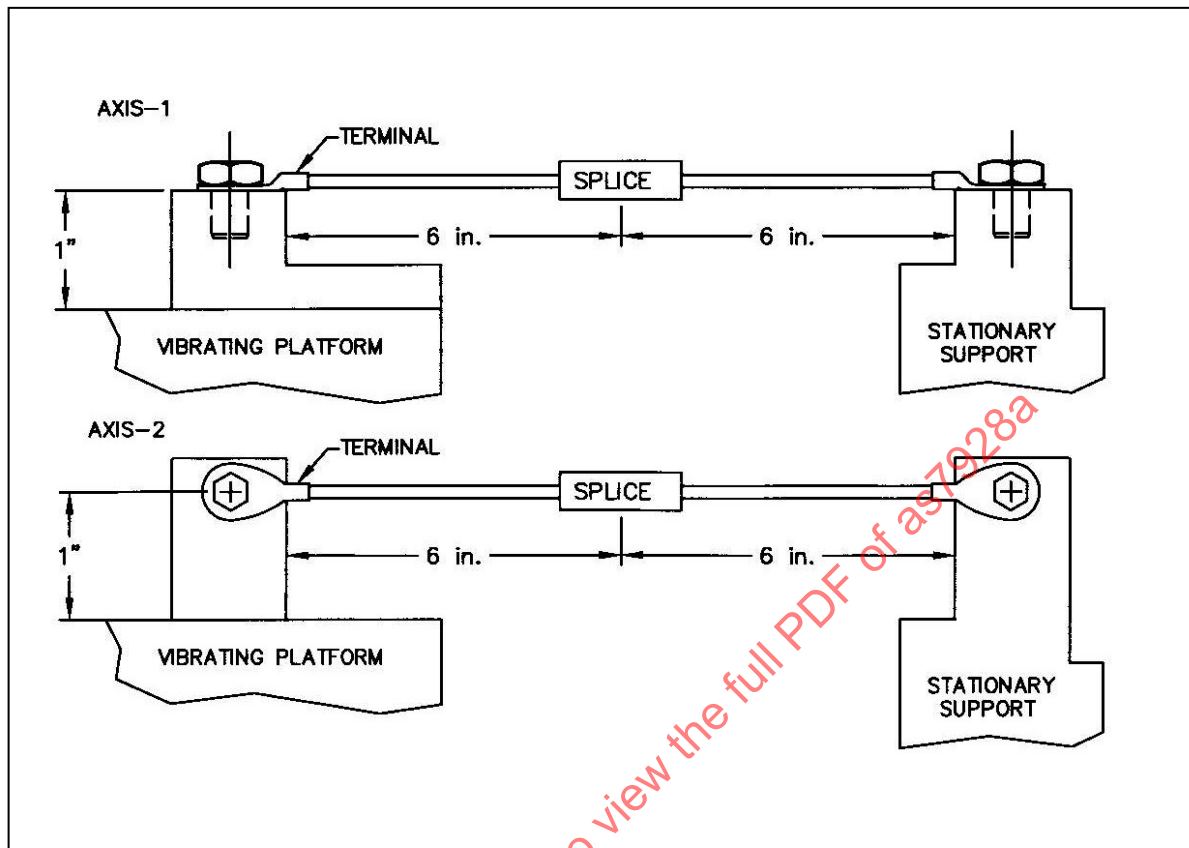


FIGURE 5 - VIBRATION TEST FOR CONDUCTOR SPLICES

4.7.7.2 Vibration (lug terminals sizes 14 and smaller without insulation support) (see 3.5.6)

Lug terminals shall be attached to a length of wire. The terminals shall be rigidly mounted to a test fixture 1 inch in height, securely fastened to the vibrating platform (see Figure 4). The test terminals shall be so mounted that the junction of the terminal tongue and barrel lies directly at the edge of the test fixture. The opposite end of the wire shall be clamped securely to a stationary support external to the vibrating platform and 17 inches ($\pm 1/2$ inch) from the test fixture with only enough tension applied to remove the slack from the wire. The test fixture shall then be moved toward the stationary support (or vice versa) a distance of $1/8$ inch ($\pm 1/32$ inch) to put a controlled amount of slack in the wire. The terminals shall be vibrated in accordance with method 201 of MIL-STD-202 for 2 hours in each of two axes mutually perpendicular to each other and to the axis of the wire. Following the test, the lug terminals shall be subjected to the voltage drop (see 4.7.2) and tensile strength (see 4.7.8) tests.

4.7.8 Tensile Strength (see 3.5.7)

Lug terminals and conductor splices attached to suitable wires (see 4.4.1) shall be placed in a standard tensile-testing machine and sufficient force applied to pull the wire out of the sample or break the wire or sample. The speed of head travel of the tensile device shall be 1.0 ± 0.25 inch per minute. The clamping surfaces may be serrated to provide sufficient clamping force. The wired assemblies shall meet the requirements of 3.5.7.

4.7.9 Immersion

4.7.9.1 Immersion (type II) 105 °C Temperature Rating (see 3.5.8)

Four Insulated samples shall be immersed in aviation hydraulic fluid conforming to MIL-PRF-5606, and four immersed in aircraft lubricating oil conforming to MIL-PRF-7808 at 48 to 50 °C for a period of 20 hours. Upon removal from the fluids, the samples shall be air-dried for 1 hour at room temperature, after which time any remaining excess fluid may be wiped from each sample. The samples shall then be subjected to the dielectric withstanding test (see 4.7.4).

4.7.9.2 Immersion (type II) 150 °C Temperature Rating (see 3.5.8)

Four Insulated samples shall be immersed in each fluid listed in Table 10 at the specified temperature for a period of 20 hours. Upon removal from the fluids, the samples shall be air-dried for 1 hour at room temperature, after which time any remaining excess fluid may be wiped from each sample. The samples then shall be subjected to the dielectric withstanding voltage test (see 4.7.4).

TABLE 10 - IMMERSION FLUIDS

Fluid Type	Specification	Fluid Temperature
JP-4 and/or JP-5 or JP-8 Turbine Fuel	MIL-DTL-5624 or MIL-DTL-83133	48 to 50 °C
Isopropyl Alcohol	TT-I-735	48 to 50 °C
Anti-icing/deicing Fluid	AMS 1424 or equivalent (Skydrol-500B, etc)	48 to 50 °C
Hydraulic Fluid	MIL-PRF-5606	48 to 50 °C
Lubricating Oil	MIL-PRF-7808	48 to 50 °C

4.7.10 Heat Aging

4.7.10.1 Heat Aging (type II) 105 °C Temperature (see 3.5.9)

Insulated lug terminals and conductor splices attached to suitable wires shall be conditioned in a heat chamber at a temperature of 121 °C $\pm$ 1 °C for a period of 120 hours. After removal from the chamber, the specimens shall be cooled to a temperature of 23 °C $\pm$ 3 °C within a period of 1 hour. When cool, the specimens shall be subjected to the dielectric withstanding voltage test (see 4.7.4).

4.7.10.2 Heat Aging (type II) 150 °C Temperature (see 3.5.9)

Insulated lug terminals and conductor splices attached to suitable wires shall be conditioned to a heat chamber at a temperature of 175 °C $\pm$ 5 °C for a period of 120 hours. After removal from the chamber, the specimens shall be cooled to a temperature of 23 °C $\pm$ 3 °C within a period of 1 hour. When cooled, the specimens shall be subjected to the dielectric withstanding voltage test (see 4.7.4).

4.7.10.3 Heat Aging (type I) 175 °C Temperature (see 3.5.9.1)

Uninsulated lug terminals attached to suitable wires shall be conditioned in a heat chamber at a temperature of 193 °C $\pm$ 5 °C for a period of 120 hours. After removal from the chamber, the specimens shall be cooled to a temperature of 23 °C $\pm$ 3 °C within a period of 1 hour. When cool, the specimens shall be subjected to the salt spray (corrosion) test (see 4.7.5).

4.7.11 Flammability (type II) (see 3.5.10)

Insulated lug terminals and conductor splices attached to suitable conductors shall be suspended in a draft-free enclosure above a Bunsen burner with a wing-top flame spreader. The tip of a 2-inch gas flame with an inner core one-third its height shall be applied for a period of 20 seconds to one-half the length of insulation. The Bunsen burner shall have a 1/4-inch inlet, a nominal bore of 3/8 inch, and a length of approximately 4 inches above the primary inlets. The wing-top flame spreader shall have a 1/16-inch by 2-inch opening.

4.7.12 Low-temperature Crimp (type II) (see 3.5.11)

Insulated lug terminals and conductor splices, suitable wires (see 4.4.1) and the crimping tool shall be maintained at a temperature of $-5^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for a period of 1 hour. The specimens shall be crimped to the proper size wire while still at $-5^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The specimens shall then be exposed to $-65^{\circ}\text{C} \pm 1^{\circ}\text{C}$, and maintained at that temperature for a period of 1 hour. When the specimens have reached room temperature, they shall be subjected to the dielectric withstanding voltage test specified in 4.7.4.

5. PACKAGING

5.1 Preservation

Preservation shall be level A or C, or as specified (see 6.3).

5.1.1 Level A

5.1.1.1 Cleaning

Terminal lugs and conductor splices shall be cleaned in accordance with MIL-STD-2073-1.

5.1.1.2 Drying

Terminal lugs and conductor splices shall be dried in accordance with MIL-STD-2073-1.

5.1.1.3 Preservative

Preservatives shall not be used.

5.1.1.4 Unit Packaging

Unless otherwise specified (see 6.3), terminal lugs and conductor splices shall be unit packaged ten each in accordance with MIL-STD-2073-1, method III insuring compliance with the applicable requirements of that specification.

5.1.1.5 Intermediate Packaging

Terminal lugs and conductor splices packaged as specified in 5.1.1.4 shall be placed in intermediate containers conforming to ASTM D 5486 Type 5. Intermediate containers shall be uniform in size, shape and quantities, shall be of minimum tare and cube and shall contain multiples of five unit packages, not to exceed 100 unit packages. No intermediate packaging is required when the total quantity shipped to a single destination is less than 100 unit packages.

5.1.2 Commercial Packing

Terminal lugs and conductor splices shall be clean, dry and packaged in a manner that will afford adequate protection against corrosion, deterioration and physical damage during shipment from supply source to the first receiving activity. This level may conform to the supplier's commercial practice when such meets the requirements of this level.