

## NATIONAL AIRCRAFT STANDARD

AIRCRAFT INDUSTRIES ASSOCIATION OF AMERICA, INC., 1725 DE SALES STREET, N. W. WASHINGTON, D. C. 20036

FED SUP CLASS

5935

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Inactive For New Design  
After 1/30/81

## 1. SCOPE

- 1.1 THIS SPECIFICATION COVERS ELECTRICAL MULTI-CONTACT CONNECTORS FOR USE WITH PRINTED WIRING.
- 1.2 CLASSIFICATION - MULTI-CONTACT CONNECTORS FOR USE WITH PRINTED WIRING SHALL BE OF THE SIZES AND CLASSES SHOWN ON THE APPLICABLE NATIONAL AIRCRAFT STANDARD DRAWINGS LISTED IN SECTION 2 OF THIS SPECIFICATION.

## 2. APPLICABLE SPECIFICATIONS, STANDARDS AND DRAWINGS

- 2.1 THE FOLLOWING SPECIFICATIONS, STANDARDS, AND DRAWINGS OF THE ISSUE IN EFFECT ON DATE OF INVITATION FOR BIDS FORM A PART OF THIS SPECIFICATION TO THE EXTENT SPECIFIED HEREIN:

## SPECIFICATIONS:

## FEDERAL:

|           |                                      |
|-----------|--------------------------------------|
| QQ-A-591  | ALUMINUM ALLOY DIE CASTINGS          |
| QQ-P-416  | PLATINGS; CADMIUM (ELECTRODEPOSITED) |
| PPP-B-566 | BOXES, FOLDING, PAPERBOARD           |
| PPP-B-585 | BOXES; WOOD, WIREWOUND               |
| PPP-B-591 | BOXES; FIBERBOARD, WOOD-CLEATED      |
| PPP-B-621 | BOXES; WOOD, NAILED AND LOCK-CORNER  |
| PPP-B-636 | BOXES; FIBER, SOLID                  |
| PPP-B-676 | BOXES; SET-UP, PAPERBOARD            |

## MILITARY:

|            |                                                                                         |
|------------|-----------------------------------------------------------------------------------------|
| MIL-M-14   | MOLDING PLASTICS AND MOLDED PLASTIC PARTS, THERMOSETTING                                |
| JAN-P-100  | PACKAGING AND PACKING FOR OVERSEAS SHIPMENT, GENERAL SPECIFICATION FOR                  |
| PPP-B-601  | PACKAGING AND PACKING FOR OVERSEAS SHIPMENT, BOXES; WOOD, CLEATED, PLYWOOD              |
| MIL-P-116  | PRESERVATION, METHODS OF                                                                |
| MIL-E-5272 | ENVIRONMENTAL TESTING, AERONAUTICAL AND ASSOCIATED EQUIPMENT; GENERAL SPECIFICATION FOR |

CUSTODIAN: ELECTRONIC EQUIPMENT TECHNICAL COMMITTEE

PROCUREMENT  
SPECIFICATIONTITLE  
CONNECTORS, ELECTRICAL, FOR  
PRINTED WIRINGCLASSIFICATION  
SPECIFICATIONNAS 713  
SHEET 1 OF 1

IN FORMULATING AND APPROVING NAS STANDARDS, AIA AND ITS COMMITTEES WILL NOT INVESTIGATE OR GUARANTEE THE ACCURACY OF THE INFORMATION CONTAINED HEREIN. THE USER SHALL BE RESPONSIBLE FOR PROTECTING THEMSELVES AGAINST LIABILITY FOR INFRINGEMENT OF PATENTS.

THE DRAWING SUPERSEDES ALL ANTECEDENT STANDARD DRAWINGS FOR THE SAME PRODUCT, AND SHALL BECOME EFFECTIVE FOR VENDOR MANUFACTURING NOT LATER THAN 6 MONTHS AFTER THE LATEST DATE OF APPROVAL SHOWN.

APPROVAL DATE 9/15/56 REVISION ① 31 July 1958 ② 31 July 1981

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IN FORMULATING AND APPROVING NAS STANDARDS, AIA AND ITS COMMITTEES WILL NOT INVESTIGATE PATENTS WHICH MIGHT BE INFRINGED BY SUCH STANDARDS, NOR WILL IT BE RESPONSIBLE FOR PROTECTING INVENTORS AGAINST INFRINGEMENT OF PATENTS.

THIS DRAWING SUPERSEDES ALL PREVIOUS STANDARD DRAWINGS FOR THE SAME PRODUCT, AND SHALL BE EFFECTIVE FOR VENDOR MANUALS AND CUSTOMERS NOT LATER THAN 6 MONTHS AFTER THE LATEST DATE OF APPROVAL SHOWN.

SPECIFICATIONS (CONTINUED):  
MILITARY:

MIL-E-5400 ELECTRONIC EQUIPMENT, AIRBORNE, GENERAL SPECIFICATION FOR  
MIL-L-10547 LINERS, CASE, WATERPROOF  
MIL-M-18794 MOLDING PLASTICS AND MOLDED PLASTIC PARTS, THERMOSETTING, DIALLYL PHTHALATE RESIN

## STANDARDS:

MIL-STD-129 MARKING OF SHIPMENTS  
MIL-STD-130 IDENTIFICATION MARKING OF U.S. MILITARY PROPERTY  
MIL-STD-202 TEST METHODS FOR ELECTRONIC AND ELECTRIC COMPONENT PARTS

DRAWINGS

## NATIONAL AIRCRAFT STANDARDS (NAS)

NAS714 CONNECTOR, ELECTRICAL FEMALE  
NAS715 CONNECTOR, ELECTRICAL, MALE

(COPIES OF SPECIFICATIONS, STANDARDS, DRAWINGS, AND PUBLICATIONS REQUIRED BY CONTRACTORS IN CONNECTION WITH SPECIFIC PROCUREMENT FUNCTIONS SHOULD BE OBTAINED FROM THE PROCURING AGENCY OR AS DIRECTED BY THE CONTRACTING OFFICER).

## 3. DESIGN REQUIREMENTS

- 3.1 QUALIFICATION - ANY CONNECTOR FURNISHED UNDER THIS SPECIFICATION SHALL BE A PRODUCT WHICH HAS BEEN TESTED TO AND HAS PASSED THE QUALIFICATION TESTS SPECIFIED HEREIN.
- 3.2 MATERIALS - MATERIALS SHALL CONFORM TO APPLICABLE SPECIFICATIONS AND SHALL BE AS SPECIFIED HEREIN. MATERIALS WHICH ARE NOT COVERED BY APPLICABLE SPECIFICATIONS, OR WHICH ARE NOT SPECIFICALLY DESCRIBED HEREIN, SHALL BE OF THE BEST QUALITY, OF THE LIGHTEST PRACTICABLE WEIGHT, SUITABLE FOR THE PURPOSE INTENDED, AND SUBJECT TO PRIOR APPROVAL OF THE PROCURING AGENCY.

CUSTODIAN: ELECTRONIC EQUIPMENT TECHNICAL COMMITTEE

PROCUREMENT SPECIFICATION

TITLE

CONNECTORS, ELECTRICAL, FOR  
PRINTED WIRINGCLASSIFICATION  
SPECIFICATIONNAS713  
SHEET 2 OF 14

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- 3.2.1 NON-MAGNETIC MATERIALS** - UNLESS OTHERWISE EXEMPTED BY THIS SPECIFICATION, ALL COMPONENT PARTS SHALL BE OF NON-FERROUS MATERIAL OR A MATERIAL GENERALLY CONSIDERED TO BE NON-MAGNETIC.
- 3.2.2 SHELLS** - SHELLS SHALL BE MADE FROM HIGH-GRADE ALUMINUM. DISSIMILAR METALS SHALL NOT BE USED IN INTIMATE CONTACT UNLESS SUITABLY PROTECTED AGAINST ELECTROLYTIC CORROSION. SEE PARA. 3.1.8 OF MIL-E-5400. DIE CASTINGS SHALL CONFORM TO COMPOSITION No. 1, 2, 5, 5A, 10, OR 11 OF SPECIFICATION QQ-A-591. WORKMANSHIP TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF SPECIFICATION QQ-A-591.
- 3.2.2.1 ACCESSORIES** - ALL METAL ACCESSORIES, SUCH AS ROLL PINS, RIVETS, INSERT RETAINERS, ETC., SHALL BE MADE OF ALUMINUM; OR, OTHER METALS COMPATIBLE WITH ALUMINUM (SEE MIL-E-5400 PARA. 3.1.8); OR, METALS SUITABLY PLATED TO PROTECT AGAINST ELECTROLYTIC ACTION.
- 3.2.3 INSERT MATERIAL** - INSERTS SHALL BE SUCH AS TO ENABLE THE CONNECTOR TO MEET THE REQUIREMENTS OF THIS SPECIFICATION. THE MATERIAL SHALL BE A MINERAL-FILLED TYPE CONFORMING TO SPECIFICATION MIL-M-14, TYPES MME OR MDG; OR, SPECIFICATION MIL-M-18794, TYPES SDI-5 OR SDI-30.
- 3.2.4 CONTACTS** - CONTACTS SHALL BE MADE FROM SUITABLE CONDUCTIVE MATERIAL. ALL CONTACTING SURFACES SHALL BE SMOOTH, WITH GOLD FLASH OVER SILVER PLATE FINISH.
- 3.2.5 FINISH** - ALL METAL PARTS OTHER THAN ELECTRICAL CONTACTS SHALL BE CADMIUM PLATED IN ACCORDANCE WITH SPECIFICATION QQ-P-416, TYPE II, CLASS 1 OR 2, EXCEPT THAT A PRELIMINARY PLATING OF OTHER METAL IS PERMISSIBLE. THE RESULTING FINISH SHALL BE IRIDESCENT GOLD IN COLOR AND ELECTRICALLY CONDUCTIVE.
- 3.3 DESIGN AND CONSTRUCTION** - CONNECTORS SHALL BE DESIGNED AND CONSTRUCTED TO CONFORM TO DRAWING NAS 714 AND NAS 715 AS APPLICABLE. DETAIL PARTS OF THE CONNECTOR SHALL BE SECURELY ATTACHED WITHIN THEIR SHELLS TO INSURE PROPER MATING.

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THIS DRAWING SUPERSEDES ALL PREVIOUS STANDARDS DRAWINGS FOR THE SAME. THE LATEST DATE OF APPROVAL SHOWN IS THE DATE OF THE LATEST REVISION. THE DATE OF THE LATEST REVISION IS NOT LATER THAN 6 MONTHS AFTER THE DATE OF APPROVAL.

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3.3.1 CONTACT DESIGN - CONTACT DESIGN SHALL BE SUCH THAT NEITHER THE PINS NOR THE SOCKETS WILL BE DAMAGED BY ANY POSSIBLE TWISTING OR FORCING DURING THE PROCESS OF MATING CONNECTORS.

3.3.1.1 PIN ENGAGING END - THE ENTERING END OF THE PINS SHALL BE FORMED WITH A SPHERICAL RADIUS OR SUITABLE CHAMFER APPROXIMATELY  $1/2$  THE DIAMETER OF THE PIN, ALLOWING FOR A FLAT NOT IN EXCESS OF .015 INCH DIAMETER IN THE CENTER OF THE SPHERICAL DEVELOPMENT.

3.3.1.2 SOCKET ENGAGING END - THE ENTERING END OF THE SOCKET CONTACT SHALL BE ROUNDED OR CHAMFERED TO ALLOW FOR DIRECTING AND CENTERING OF THE ENTERING PIN. THE SOCKET CONTACT SHALL PROVIDE THE SPRING ACTION FOR MAINTAINING THE CONTACTING PRESSURE BETWEEN THE PIN AND THE SOCKET. SOCKET TYPE CONTACTS SHALL BE SO CONSTRUCTED THAT LIQUID SOLDER IN THE SOLDER CUP CANNOT LEAK THROUGH TO THE FRONT OF THE SOCKET AND PREVENT INSERTION OF THE PIN.

3.3.1.3 PRINTED CARD END - THE ENTERING END OF THE PINS SHALL BE FORMED WITH A SPHERICAL RADIUS OR SUITABLE CHAMFER APPROXIMATELY  $1/2$  THE DIAMETER OF PIN, ALLOWING FOR A FLAT NOT IN EXCESS OF .015 INCH DIAMETER IN THE CENTER OF THE SPHERICAL DEVELOPMENT. THE PINS SHALL BE SUITABLY COATED FOR DIP SOLDERING.

3.3.1.4 SOLDER CUPS - THE LOCATION OF THE SOLDER CUP SHALL BE SUCH THAT NORMAL SOLDERING OPERATIONS SHALL NOT IMPAIR ANY OTHER PARTS OF THE ASSEMBLY. ALL SOLDER CAVITIES SHALL BE SO DESIGNED THAT LIQUID SOLDER WILL NOT ESCAPE DURING NORMAL SOLDERING OPERATION AND INTERFERE WITH THE FLOAT OF THE CONTACT. THE SOLDER CUPS SHALL BE AS SHOWN ON NAS714.

3.3.1.5 FILLED SOLDER CUPS - ALL SOLDER CUPS SHALL BE COMPLETELY FILLED WITH 60-40 SOLDER. THE FLUX SHALL BE WATER WHITE ROSIN OR EQUIVALENT WITH A SUITABLE SOLVENT. A THIN FILM OF FLUX SHALL COVER THE TOP OF THE SOLDER.

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THIS DRAWING SUPERSEDES ALL PREVIOUS STANDARDS DRAWINGS FOR THE SAME. IT IS THE RESPONSIBILITY OF THE USER TO OBTAIN THE LATEST EDITION OF THIS STANDARD. THE DATE OF APPROVAL SHOWN ON THIS DRAWING IS THE DATE OF THE LATEST EDITION OF THIS STANDARD.

- 3.3.2 **MOUNTING** - MEANS SHALL BE PROVIDED TO SECURELY ATTACH THE CONNECTOR TO SHEET METAL SURFACES INSIDE THE EQUIPMENT AS INDICATED ON THE APPLICABLE NAS DRAWINGS. MEANS SHALL BE PROVIDED TO COMPENSATE FOR A 1/16 INCH TOTAL MISALIGNMENT WHEN MATING AND FOR THE PREVENTION OF CONTACT DAMAGE.
- 3.3.3 **POLARIZATION** - POLARIZATION OF EACH MALE CONNECTOR WITH ITS FEMALE CONNECTOR SHALL BE ACCOMPLISHED SO THAT IT WILL BE IMPOSSIBLE TO MATE THE CONNECTORS OR MAKE ELECTRICAL CONTACT BETWEEN ANY OF THE VARIOUS TERMINALS OF THE CONNECTORS IN ANY OTHER THAN THE INTENDED POSITION.
- 3.3.4 **INTERCHANGEABILITY OF CONNECTORS** - THE CONNECTOR MADE BY ONE MANUFACTURER SHALL BE INTERCHANGEABLE WITH THE CONNECTOR OF THE SAME DESIGN AND SIZE MADE BY ANY OTHER MANUFACTURER. DIMENSIONS AND OTHER CONTROLLABLE FEATURES ARE SHOWN ON THE APPLICABLE NAS DRAWING.
- 3.3.5 **INSERT DESIGN** - INSERTS SHALL BE DESIGNED AND CONSTRUCTED WITH PROPER SECTIONS AND RADII IN ORDER THAT THEY WILL NOT READILY CHIP, CRACK, OR BREAK IN ASSEMBLY OR IN NORMAL SERVICE. HOLLOW TYPE AND SPLIT TYPE INSERTS SHALL NOT BE USED. DEPRESSIONS FOR FRONT AND REAR PIN INSERT PIECES AND REAR SOCKET INSERT PIECES, USED TO ACHIEVE CREEPAGE DISTANCE, SHALL NOT BE LOCATED DIRECTLY OPPOSITE ON FRONT AND REAR SURFACES OF INDIVIDUAL PIECES WHEN THE RESULTANT REDUCTION IN CROSS SECTIONAL AREA WOULD CAUSE STRUCTURAL WEAKNESS. SOCKET INSERTS SHALL PROVIDE SUITABLE PROTECTION AGAINST A SOCKET CONTACTING A PIN BEFORE THE FEMALE CONNECTOR HAS BEEN POLARIZED WITH ITS MATING PART.
- 3.3.6 **CONTACT SPACING** - THE EFFECTIVE SURFACE CREEPAGE DISTANCE AND ACTUAL AIR SPACING BETWEEN CONTACTS, AND BETWEEN CONTACTS AND SHELL (GROUND), SHALL NOT BE LESS THAN THAT REQUIRED TO PROVIDE A MINIMUM VOLTAGE BREAKDOWN AT SEA LEVEL OF 2500 VRMS. THIS VOLTAGE IS A DESIGN LIMIT. QUALIFICATION AND ACCEPTANCE TEST VOLTAGES SHALL BE TAKEN FROM PARAGRAPH 4.4.

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