FEDERAL SUPPLY CLASS
5999

RATIONALE

REVISE TO INCLUDE COMMENTS RECEIVED BY THE GOVERNMENT AND INDUSTRY, REMOVE GOVERNMENT JARGON, UPDATE REFERENCES, ALIGN SPECIFICATION WITH SAE GUIDELINES, AND REVIEW SPECIFICATION FOR KNOWN TECHNICAL PROBLEMS.

NOTICE

THE REQUIREMENTS FOR PROCURING THE PRODUCT DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE LATEST ISSUE OF SAE AS39029.

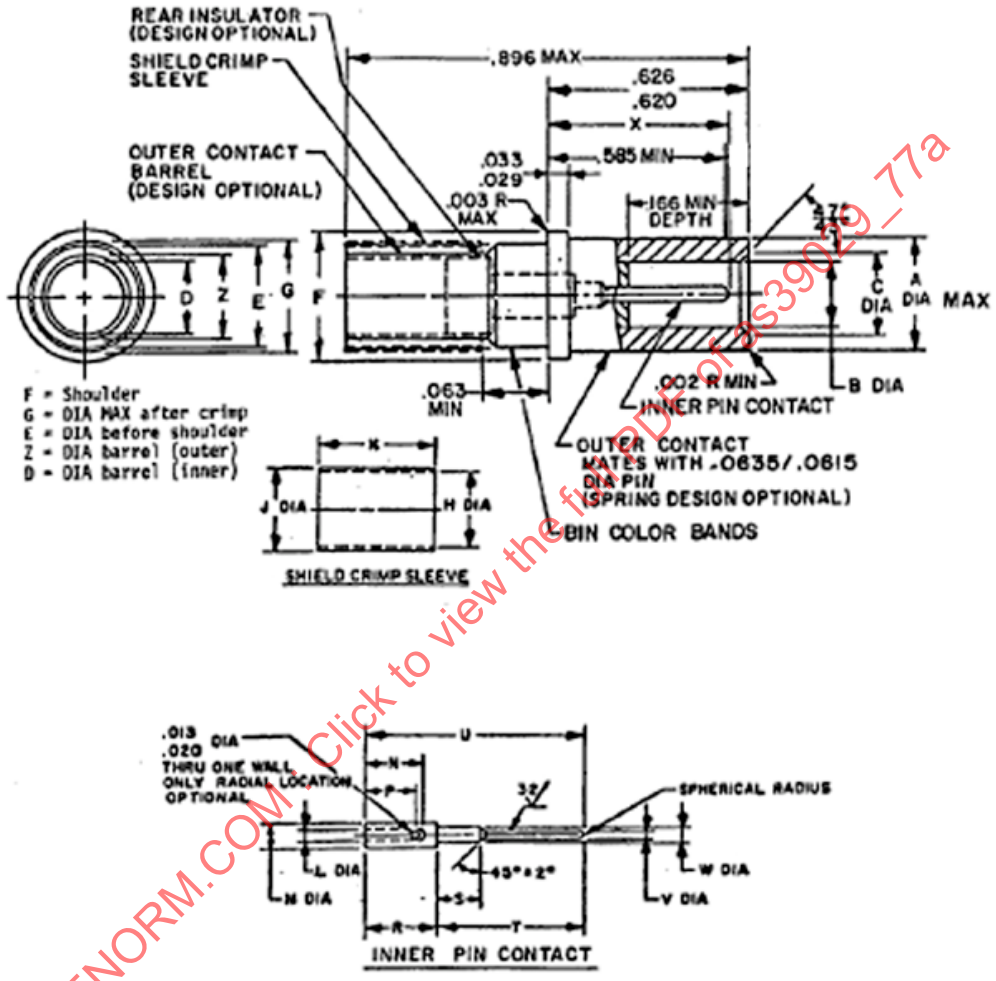
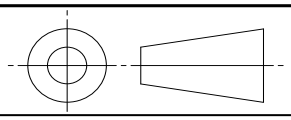


FIGURE 1 – SOCKET CONTACTS

(SEE DESIGN PARAGRAPH FOR ADDITIONAL DIMENSIONAL DETAILS).

THIRD ANGLE PROJECTION



ISSUED 2000-07 REVISED 2011-02

CUSTODIAN: AE-8C1

PROCUREMENT SPECIFICATION: AS39029

SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

(R) CONTACTS, ELECTRICAL CONNECTOR, SOCKET, CRIMP REMOVABLE, SHIELDED, SIZE 16 (FOR MIL-DTL-38999 SERIES I, III, AND IV CONNECTORS)

TABLE 1 - CONTACT DIMENSIONS

BIN CODE	A DIA MAX	B DIA	C DIA	D DIA MIN	E DIA	F DIA	G DIA MAX	H DIA MIN	J DIA MAX	K	L DIA MIN
428	.113 (2.87)	.068 (1.73) .065 (1.65)	.089 (2.26) .084 (2.13)	.0670 (1.70)	.103 (2.62) .101 (2.57)	.130 (3.30) .127 (3.23)	.108 (2.74)	.105 (2.67)	.120 (3.05)	.105 (2.67) .095 (2.41)	.0210 (.53)
429				.0575 (1.46)				.094 (2.39)			.0210 (.53)
430				.0670 (1.70)				.105 (2.67)			.0355 (.90)
431				.0575 (1.46)				.094 (2.39)			.0270 (.69)

TABLE 1 – CONTACT DIMENSIONS (CONTINUED)

BIN CODE	M DIA MAX	N MIN	P	R	S	T	U REF	V DIA	W DIA	X	Z DIA MAX
428	.046 (1.17)	.103 (2.62)	.094 (2.39) .087 (2.21)	.125 (3.18) .119 (3.02)	.079 (2.01) .073 (1.85)	.269 (6.83) .266 (6.76)	.3895 (9.89)	.0155 (.39) .0145 (.37)	.030 (.76) .028 (.71)	.611 (15.52) .601 (15.27)	.085 (2.16)
429	.046 (1.17)										.076 (1.93)
430	.052 (1.32)										.085 (2.16)
431	.046 (1.17)										.076 (1.93)

TABLE 2 – MARKING AND DESIGN CHARACTERISTICS

BIN CODE	COLOR BANDS			CABLE ACCOMMODATED	CONTACT CAVITY SIZE	TYPE	CLASS
	1ST	2ND	3RD				
428	YELLOW	RED	GRAY	3/ M17/119-RG174 M17/113-RG316 M17/094-RG179 1/ 2/ TIMES AA3248 1/ 2/ TELEDYNE 11299 1/ 2/ THERMAX 75-738-BCCWXE 1/ 2/ TENSOLITE 30888/L707YX-1	16	D	B
429	YELLOW	RED	WHITE	M17/093-RG178			
430	YELLOW	ORANGE	BLACK				
431	YELLOW	ORANGE	BROWN	1/ TENSOLITE 24713/A955KK1 1/ TENSOLITE 26723/A955KK1			

1/ OR EQUIVALENT.
2/ HIGH TENSILE STRENGTH COPPER ALLOY WIRE.
3/ M17/119-RG174 PVC NOT FOR NAVY USE.

TABLE 3 – TOOLS

BIN CODE	INNER CONTACT		OUTER CONTACT		INSTALLING TOOL	REMOVAL TOOL
	BASIC CRIMPING TOOL	POSITIONER	BASIC CRIMPING TOOL	POSITIONER		
428, 429, 430, 431	M22520/2-01	M22520/2-35	M22520/4-01	M22520/4-02	M81969/8-07 OR M81969/14-03	M81969/8-08 OR M81969/14-03

TABLE 4 – CONTACT ENGAGEMENT AND SEPARATION FORCES

TEST PIN DIAMETER (INCH)	MINIMUM SEPARATION FORCE (OUNCES)		MAXIMUM ENGAGEMENT FORCE (OUNCES)		MAXIMUM AVERAGE ENGAGEMENT FORCE (OUNCES)	
	INITIAL	AFTER CONDITIONING	INITIAL	AFTER CONDITIONING	INITIAL	AFTER CONDITIONING
.0635 (1.61) +.0002 (0.01) -.0000 (0.00)	N/A	N/A	30	36	N/A	N/A
.0615 (1.56) +.0000 (0.00) -.0002 (0.01)	2.0	1.5	N/A	N/A	N/A	N/A

TABLE 5 – CONTACT RESISTANCE

BIN CODE	CABLE ACCOMMODATED	MAXIMUM VOLTAGE DROP (MILLIVOLTS)					
		25° +3°, -0°C		25° +3°, -0°C 2/		200° +3°, -0°C	
		INNER	OUTER	INNER	OUTER	INNER	OUTER
428	5/ M17/119-RG174 M17/113-RG316 M17/094-RG179 1/ 3/ TIMES AA3248 1/ 3/ TELEDYNE 11299 1/ 3/ THERMAX 75-738-BCCWXE 1/ 3/ TENSOLITE 30888/L707YX-1	55 55 120 170 170 170 170 170	85 75 70 150 150 150 150 150	66 66 144 204 204 204 204 204	102 90 84 180 180 180 180 180	94 4/ 94 204 290 290 290 290 290	145 4/ 128 119 255 255 255 255 255
429	M17/093-RG178	120	110	144	132	204	187
430		65 65	100 100	78 78	120 120	111 111	170 170
431	1/ TENSOLITE 24713/A955KK1 1/ TENSOLITE 26723/A955KK1	120 120 120 55 65	110 110 110 100 100	144 144 144 66 78	132 132 132 120 120	204 204 204 94 111	187 187 187 170 170

1/ OR EQUIVALENT
2/ AFTER CONDITIONING
3/ HIGH TENSILE STRENGTH COPPER ALLOY WIRE
4/ 85° +3, -0° C IS MAXIMUM OPERATING TEMPERATURE OF CABLE
5/ M17/119-RG174 PVC NOT FOR NAVY USE

TABLE 6 – LOW SIGNAL LEVEL CONTACT RESISTANCE (INNER CONTACT ONLY) AND TENSILE STRENGTH

BIN CODE	CABLE ACCOMMODATED	MAXIMUM CONTACT RESISTANCE (MILLIOHMS)		TENSILE LOAD (POUNDS MINIMUM)	
		INITIAL	AFTER CONDITIONING	INNER CONTACT	OUTER CONTACT
428	3/ M17/119-RG174 M17/113-RG316 M17/094-RG179 1/ 2/ TIMES AA3248 1/ 2/ TELEDYNE 11299 1/ 2/ THERMAX 75-738-BCCWXE 1/ 2/ TENSOLITE 30888/L707YX-1	55 55 120 170 170 170 170 170	66 66 144 204 204 204 204 204	15.0 10.0 3.5 7.0 7.0 7.0 7.0 7.0	15.0 15.0 15.0 35.0 35.0 35.0 35.0 35.0
429	M17/093-RG178	120	144	3.5	10.0
430		65 65	78 78	15.0 15.0	15.0 15.0
431	1/ TENSOLITE 24713/A955KK1 1/ TENSOLITE 26723/A955KK1	120 120 120 55 65	144 144 144 66 78	4.0 4.0 4.0 4.0 4.0	10.0 10.0 10.0 10.0 10.0

1/ OR EQUIVALENT
2/ HIGH TENSILE STRENGTH COPPER ALLOY WIRE
3/ M17/119-RG174 PVC NOT FOR NAVY USE

TABLE 7 – PART NUMBER AND BIN CODE

PART NUMBER	BIN CODE	SUPERSEDED
M39029/77-428	428	M39029/77-16A
M39029/77-429	429	M39029/77-16B
M39029/77-430	430	M39029/77-16C
M39029/77-431	431	M39029/77-16D

REQUIREMENTS: ALL REQUIREMENTS SHALL CONSIST OF THIS SPECIFICATION AND THE LATEST ISSUE OF AS39029.

1. DESIGN:

   CONTACTS SHALL BE DESIGNED IN ACCORDANCE WITH FIGURE 1, TABLES 1 AND 2. DIMENSIONS ARE IN INCHES, METRIC EQUIVALENTS ARE GIVEN FOR GENERAL INFORMATION ONLY. DIMENSIONS SHOWN APPLY AFTER PLATING. THE .585 MIN DIMENSION IS THE POINT AT WHICH A SQUARE ENDED PIN OF THE SAME BASIC DIAMETER AS THE MATING CONTACT FIRST ENGAGES THE SOCKET CONTACT SPRING. CRIMP DEFORMATION: THE MAXIMUM DIAMETER OVER THE CRIMPED PORTION OF THE SHIELD CRIMP SLEEVE SHALL NOT EXCEED G DIAMETER.

2. TOOLS:

   TOOLS REQUIRED FOR CRIMPING CONTACTS TO THE WIRE/CABLE AND THE INSTALLING/REMOVAL FROM THE CONNECTOR SHALL BE IN ACCORDANCE WITH TABLE 3.

3. PART NUMBERS:

   CONTACT PART NUMBERS SHALL BE IN ACCORDANCE WITH TABLE 7. SUPERSEDED PART NUMBERS ARE AS SPECIFIED.

4. MATERIALS:

   MATERIALS SHALL BE IN ACCORDANCE WITH AS39029.

5. MECHANICAL:

MECHANICAL PROPERTIES SHALL BE IN ACCORDANCE WITH AS39029. CONTACT ENGAGEMENT AND SEPARATION FORCES (OUTER SOCKET CONTACT ONLY): THE ENGAGEMENT DEPTH SHALL BE AS ENCOUNTERED IN NORMAL SERVICE. THE TEST PINS SHALL BE IN ACCORDANCE WITH AS31971 EXCEPT THE DIAMETERS SHALL BE AS SPECIFIED IN TABLE 4, AND SURFACE ROUGHNESS SHALL NOT EXCEED 3 MICROINCHES. PROVISION FOR CLEARANCE HOLE SHALL BE PROVIDED. TENSILE STRENGTH (INNER AND OUTER CONTACT CRIMP JOINT): SEE TABLE 6.

6. ELECTRICAL:

ELECTRICAL PROPERTIES SHALL BE IN ACCORDANCE WITH AS39029. LOW SIGNAL LEVEL CONTACT RESISTANCE (INNER CONTACT ONLY): SEE TABLE 6. CONTACT RESISTANCE: SEE TABLE 5. TEST CURRENT: INNER CONTACT - 1 AMPERE, OUTER CONTACT - 12 AMPERES. DIELECTRIC WITHSTANDING VOLTAGE (APPLIED BETWEEN INNER AND OUTER CONTACT): TEST VOLTAGE- AT SEA LEVEL - 800 VAC RMS, AT 50 000 FEET - 250 VAC RMS.

7. ENVIRONMENTAL:

ENVIRONMENTAL PROPERTIES SHALL BE IN ACCORDANCE WITH AS39029.

RANDOM VIBRATION: CONNECTORS/CONTACTS SHALL BE TESTED IN ACCORDANCE WITH EIA-364-28.. THE FOLLOWING DETAILS SHALL APPLY:

a. TEST CONDITION V USING THE VIBRATION ENVELOPE SHOWN IN FIGURE 2.

b. VIBRATION TO BE CONDUCTED AT STANDARD TEST CONDITIONS.

c. DURATION SHALL BE 8 HOURS IN THE LONGITUDINAL DIRECTION AND 8 HOURS IN A PERPENDICULAR DIRECTION FOR A TOTAL OF 16 HOURS.

HIGH-IMPACT SHOCK: CONNECTORS SHALL BE COUPLED TOGETHER BY NORMAL COUPLING MEANS. ALL CONNECTORS SHALL BE WIRED IN A SERIES CIRCUIT WITH 100 MILLIAMPERES MAXIMUM CURRENT FLOW THROUGH THE SERIES CIRCUIT DURING HIGH-IMPACT SHOCK. CONNECTORS SHALL BE MONITORED FOR ANY DISCONTINUITIES. A DETECTOR CAPABLE OF DETECTING ALL DISCONTINUITIES IN EXCESS OF 1 MICROSECOND SHALL BE USED. WIRED AND MATED CONNECTORS SHALL BE SUBJECTED TO THE TEST SPECIFIED IN MIL-S-901, GRADE A WITH THE FOLLOWING MODIFICATIONS AND ADDITIONS. MOUNTING FIXTURE SHALL BE IN ACCORDANCE WITH MIL-S-901, LIGHT WEIGHT. THE CABLE OR WIRE BUNDLE SHALL BE SUPPORTED ON A STATIONARY FRAME IN SUCH A MANNER TO PROVIDE A FREE FLEXING CABLE LENGTH BETWEEN FRAME AND FIXTURE OF NOT LESS THAN 36 INCHES (914.4 MM). TEST CONDITION A. THE PLUG SHALL BE TERMINATED WITH AT LEAST 80 PERCENT OF WIRED CONTACTS. THE WIRE BUNDLE SHALL BE PROVIDED WITH STRAIGHT, OPEN FRAME, STRAIN RELIEF ACCESSORY HARDWARE.

8. QUALIFICATION:

THE MANUFACTURER'S RELIABILITY ASSURANCE PROGRAM SHALL COMPLY WITH THE AS9100 AEROSPACE STANDARD FOR QUALITY MANAGEMENT SYSTEM REQUIREMENTS. OTHER ESTABLISHED AND INDUSTRY RECOGNIZED QUALITY ASSURANCE STANDARDS THAT ASSURE ALL PRODUCTS PRODUCED CONFORM TO THE CONTRACT REQUIREMENTS ARE ACCEPTABLE. HOWEVER, IF USED, IT IS THE RESPONSIBILITY OF THE MANUFACTURER TO PROVIDE EVIDENCE OF COMPLIANCE TO AS9100. THE QUALIFYING ACTIVITY (QA) AUTHORITY RESERVES THE RIGHT TO MONITOR, MEASURE, AND VALIDATE COMPLIANCE AT THEIR DISCRETION.