FEDERAL SUPPLY CLASS
5999

RATIONALE

REVISE TO REMOVE GOVERNMENT JARGON, UPDATE REFERENCES, ALIGN SPECIFICATION WITH SAE GUIDELINES, ADD THE COMMERCIAL CRIMP TOOL OPTIONS FOR THE INNER CONTACT, AND TO ADD APPLICATION NOTES INDICATING CONTACT IS NOT RECOMMENDED FOR NEW DESIGN AND CONTACT PIECE PARTS ARE NOT RECOMMENDED TO BE MIXED BETWEEN QPL SOURCES.

NOTICE

THE COMPLETE REQUIREMENTS FOR PROCURING THE PRODUCT DESCRIBED HEREIN SHALL CONSIST OF THIS DOCUMENT AND THE LATEST ISSUE OF AS39029.

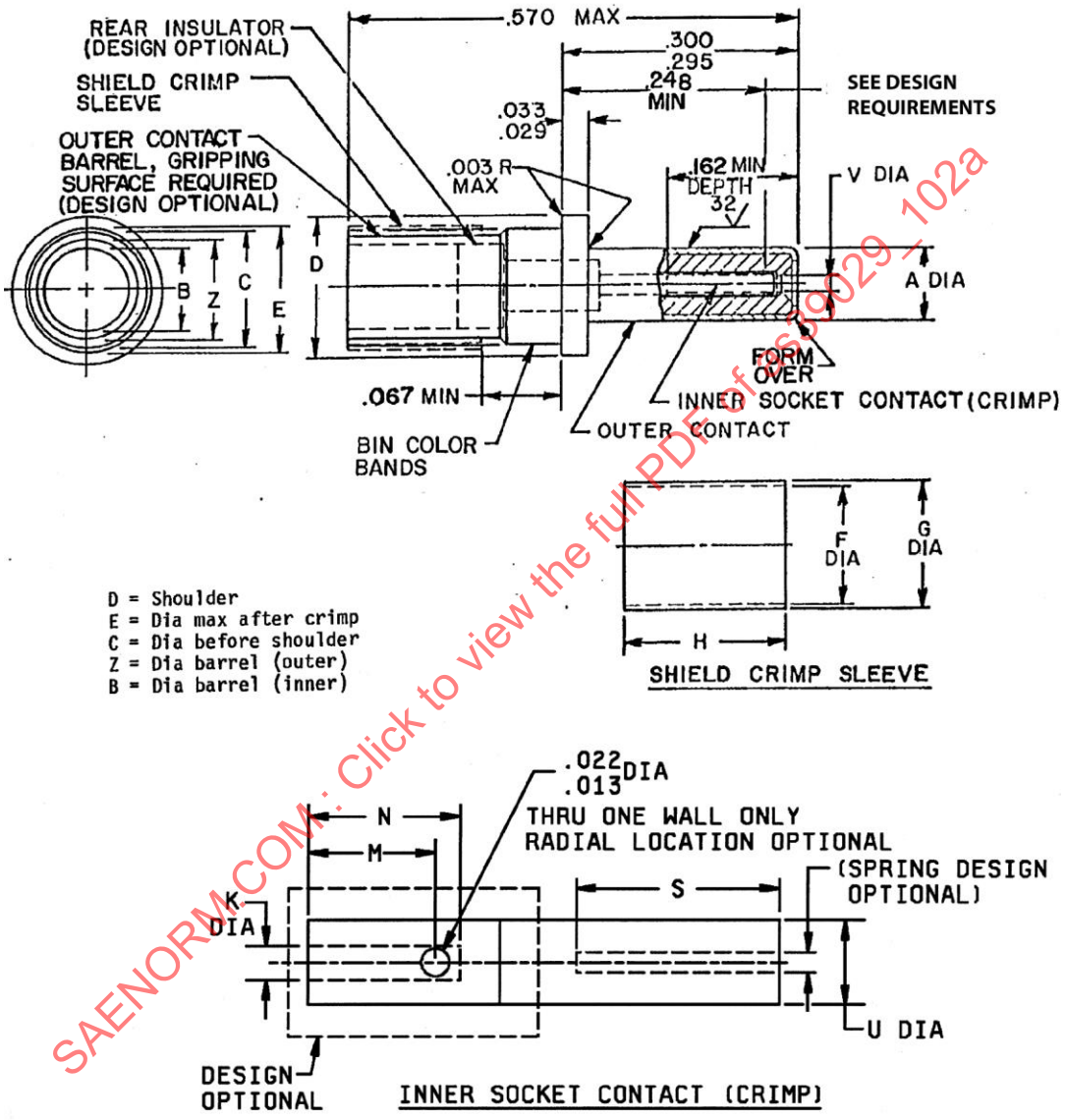
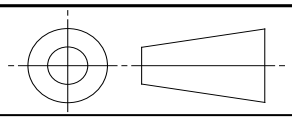


FIGURE 1 - PIN CONTACTS

For more information on this standard, visit
https://www.sae.org/standards/content/AS39029/102A/

THIRD ANGLE PROJECTION



ISSUED 2000-09 REVISED 2016-04 REAFFIRMED 2020-12

CUSTODIAN: AE-8/AE-8C1

PROCUREMENT SPECIFICATION: AS39029

SAE INTERNATIONAL

AEROSPACE STANDARD

(R) CONTACTS, ELECTRICAL CONNECTOR, PIN, CRIMP REMOVABLE, COAXIAL, SIZE 12 (FOR MIL-DTL-38999 SERIES I, II, III AND IV CONNECTORS)

TABLE 1 - DIMENSIONS

BIN CODE	A DIA	B DIA MIN	C DIA	D DIA	E DIA MAX	F DIA MIN	G DIA MAX	H	K DIA MIN	M	N	S MIN	U	V	Z DIA MAX
558	.095 (2.41) .093 (2.36)	.066 (1.68)	.151 (3.84) .148 (3.76)	.182 (4.62) .179 (4.55)	.156 (3.96)	.127 (3.23)	.169 (4.29)	.180 (4.57) .170 (4.32)	.022 (.560)	.063 (1.60) .088 (2.24)	.084 (2.13) .100 (2.54)	.135 (3.43)	.0350 (.889) .0310 (.787)	.027 (.686) .025 (.635)	.110 (2.79)

TABLE 2 - DESIGN CHARACTERISTICS

BIN CODE	COLOR BANDS			CONTACT CAVITY SIZE	CABLE ACCOMMODATED.	TYPE	CLASS
	1ST	2ND	3RD				
558	GREEN	GREEN	GRAY	12	M17/113-RG316 M17/094-RG179	D	B

TABLE 3 – TOOLS

BIN CODE	INNER CONTACT TOOLING 1/	OUTER CONTACT TOOLING		INSTALLING TOOL	REMOVAL TOOL
	BASIC CRIMP TOOL/CONTACT POSITIONER COMBINATIONS	BASIC CRIMPING TOOL	DIE		
558	DEUTSCH-BASIC TOOL - MH992, POSITIONER - KI303S 2/	M22520/5-01	M22520/5-03	M81969/8-09 OR M81969/14-04	M81969/8-10 OR M81969/14-04
	TRI-STAR-BASIC TOOL - M22520/2-01, POSITIONER - K1430 2/				
	AMPHENOL-BASIC TOOL - MH992, POSITIONER - K1360 2/				

1/ INNER CONTACT MAY BE CRIMPED OR SOLDERED
2/ SEE REQUIREMENT NOTE 8 AND APPLICATION NOTE 3.

TABLE 4 - CONTACT RESISTANCE

BIN CODE	CABLE ACCOMMODATED	MAXIMUM VOLTAGE DROP (MILLIVOLTS)						MAXIMUM AVERAGE VOLTAGE DROP
		25° C +3°, -0°		25° C +3°, -0° 1/		200° C +3°, -0°		
		INNER	OUTER	INNER	OUTER	INNER	OUTER	
558	M17/094-RG179	55	75	66	90	94	128	N/A
	M17/113-RG316	120	70	144	84	204	119	N/A

1/ AFTER CONDITIONING

TABLE 5 - 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
558	M17/094-RG179 M17/113-RG316	55 120	66 144	10.0 3.5	15.0 15.0

TABLE 6 - CONTACT ENGAGEMENT AND SEPARATION FORCE

TEST PIN DIAMETER (INCH)	MINIMUM SEPARATION FORCE (OUNCES)		MAXIMUM ENGAGEMENT FORCE (OUNCES)		MAXIMUM AVERAGE ENGAGEMENT FORCE
	INITIAL	AFTER CONDITIONING	INITIAL	AFTER CONDITIONING	
.0205 (0.521) +.0002 (0.005) -.0000 (0.000)	N/A	N/A	12	14	N/A
.0195 (0.495) +.0000 (0.000) -.0002 (0.005)	0.5	0.4	N/A	N/A	N/A

TABLE 7 – PART NUMBER AND BIN CODE

PART NUMBER	BIN CODE	SUPERSEDED PART NUMBER
M39029/102-558	558	N/A

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 AND TABLE 1. DIMENSIONS ARE IN INCHES, METRIC EQUIVALENTS ARE GIVEN FOR GENERAL INFORMATION ONLY. DIMENSIONS SHOWN APPLY AFTER PLATING. THE .248 MIN DIMENSION IS THE POINT AT WHICH A SQUARE ENDED PIN OF THE SAME BASIC DIAMETER AS THE MATING CONTACT FIRST ENGAGES THE OUTER CONTACT SPRING. PROVISION FOR CLEARANCE HOLE SHALL BE PROVIDED. CRIMP DEFORMATION: THE MAXIMUM DIAMETER OVER THE CRIMPED PORTION OF THE SHIELD CRIMP SLEEVE SHALL NOT EXCEED E 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 (INNER 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 6, AND SURFACE ROUGHNESS SHALL NOT EXCEED 3 MICROINCHES. PROVISION FOR CLEARANCE HOLE SHALL BE PROVIDED.

   TENSILE STRENGTH (INNER AND OUTER CONTACT): SEE TABLE 5.

6. ELECTRICAL:

   ELECTRICAL PROPERTIES SHALL BE IN ACCORDANCE WITH AS39029.

   CONTACT RESISTANCE: SEE TABLE 4.

   TEST CURRENT:

   INNER CONTACT - 1.0 AMPERE.

   OUTER CONTACT - 12.0 AMPERES.

   LOW SIGNAL LEVEL CONTACT RESISTANCE (INNER CONTACT ONLY): SEE TABLE 5.

   NOMINAL IMPEDANCE: 50 OHMS.

VOLTAGE STANDING WAVE RATIO (VSWR) (APPLICABLE TO M17/113-RG316 CABLE ONLY):

a. THE VSWR OF THIS PIN CONTACT MATED WITH A MIL-C-39029/103 SOCKET CONTACT SHALL NOT EXCEED 1.20 ± .04F (F IN GHz) FROM 500 MHz TO 3 GHz UNDER ALL OF THE FOLLOWING CONDITIONS. THESE CONDITIONS APPLY WHEN THE CONTACTS ARE ASSEMBLED TO M17/113-RG316 CABLES:

    1. PIN AND SOCKET CONTACTS ENGAGED, .755 ± .005 FROM RETENTION SHOULDER TO RETENTION SHOULDER.

    2. PIN AND SOCKET CONTACTS ENGAGED, .783 ± .005 FROM RETENTION SHOULDER TO RETENTION SHOULDER.

    3. PIN AND SOCKET CONTACTS ENGAGED, .810 ± .005 FROM RETENTION SHOULDER TO RETENTION SHOULDER.

b. SWEPT FREQUENCY VSWR TEST SETUP: MATED PAIR OF CONTACTS SHALL BE TESTED USING A HEWLETT-PACKARD 8510 VECTOR NETWORK ANALYZER AS FOLLOWS:

    1. USE THE HEWLETT-PACKARD 8510 CALIBRATED AT THE OUTPUT PORT OR AT A CONNECTOR SAVER CONNECTED TO THE OUTPUT PORT.

    2. SWEEP-RAMP MODE, 401 POINTS, 500 MHz TO 3.0 GHz.

    3. MAKE UP ONE RG316 CABLE ASSEMBLY (APPROXIMATELY 6 INCHES LONG) WITH A MIL-C-39029/102 ON ONE END AND AN SMA CONNECTOR ON THE OTHER END.

    4. MAKE UP ANOTHER RG316 CABLE ASSEMBLY (APPROXIMATELY ONE FOOT LONG) WITH A MIL-C-39029/103 ON ONE END AND AN SMA CONNECTOR ON THE OTHER END.

    5. TERMINATE THE SMA CONNECTOR ON THE LONGER ASSEMBLY WITH A 50 OHM LOAD AND MATE PER ENGAGEMENT POSITION 1 THE MIL-C-39029/102 AND MIL-C-39029/103 CONTACTS.

    6. CONNECT THE OTHER SMA CONNECTOR TO THE APC-3.5 PORT WHICH HAD BEEN CALIBRATED.

    7. CHANGE THE DISPLAY TO TIME DOMAIN, BAND PASS.

    8. SET THE GATE CENTER AT THE COAXIAL CONTACT INTERFACE AND THE GATE WIDTH AT 2.25 NANOSECONDS.

    9. TURN THE GATE ON AND RETURN TO THE FREQUENCY DOMAIN.

    10. PLOT THE CONNECTOR PAIR VSWR (S_{11}).

    11. VERIFY THAT THE DISPLAYED VSWR (S_{11}) COMPLIES WITH THE VSWR LIMITS SPECIFIED FOR THE MATED PAIR OF CONTACTS.

    12. REPEAT (5) THROUGH (11) WITH PIN AND SOCKET CONTACTS MATED PER ENGAGEMENT POSITIONS 2 AND 3.

INSERTION LOSS (APPLICABLE TO M17/113-RG316 CABLE ONLY): DB MAXIMUM = .11 X $\sqrt{F}$ (F IN GHZ). WHEN MEASURED IN ACCORDANCE WITH MIL-C-39012 AT 3 GHZ, THE INSERTION LOS SHALL NOT EXCEED .20 DB.

DIELECTRIC WITHSTANDING VOLTAGE (APPLIED BETWEEN INNER AND OUTER CONTACT):

TEST VOLTAGE:

AT SEA LEVEL - 1000 V RMS

AT 50000 FEET - 250 V RMS

7. ENVIRONMENTAL:

ENVIRONMENTAL PROPERTIES SHALL BE IN ACCORDANCE WITH AS39029.

VIBRATION: TEST CONDITION D, IN ACCORDANCE WITH METHOD 204 OF MIL-STD-202. EXCEPT THE VIBRATION FREQUENCY SHALL BE SINUSOIDAL.

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

a. USE THE VIBRATION ENVELOPE SHOWN ON FIGURE 2 HEREIN.