

NOTE: The document identifier and heading has been changed on this page to reflect that this is a performance specification. There are no other changes to this document. The document identifier on subsequent pages has not been changed, but will be changed the next time this document is revised.

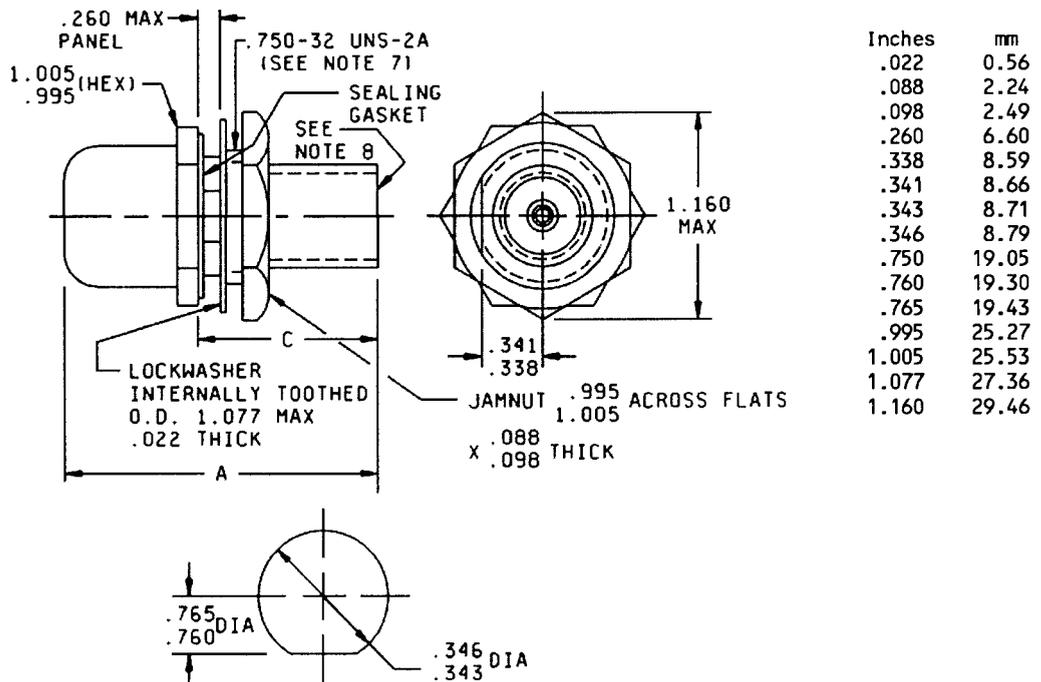
MIL-PRF-39012/40G
 26 September 1994
 SUPERSEDING
 MIL-C-39012/40F
 14 December 1987

PERFORMANCE SPECIFICATION SHEET

CONNECTORS, RECEPTACLE, ELECTRICAL, COAXIAL, RADIO FREQUENCY (SERIES SC (CABLED), SOCKET CONTACT, JAM NUT, REAR MOUNTED, CLASS 2)

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and the issue of the following specification listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation: MIL-PRF-39012.

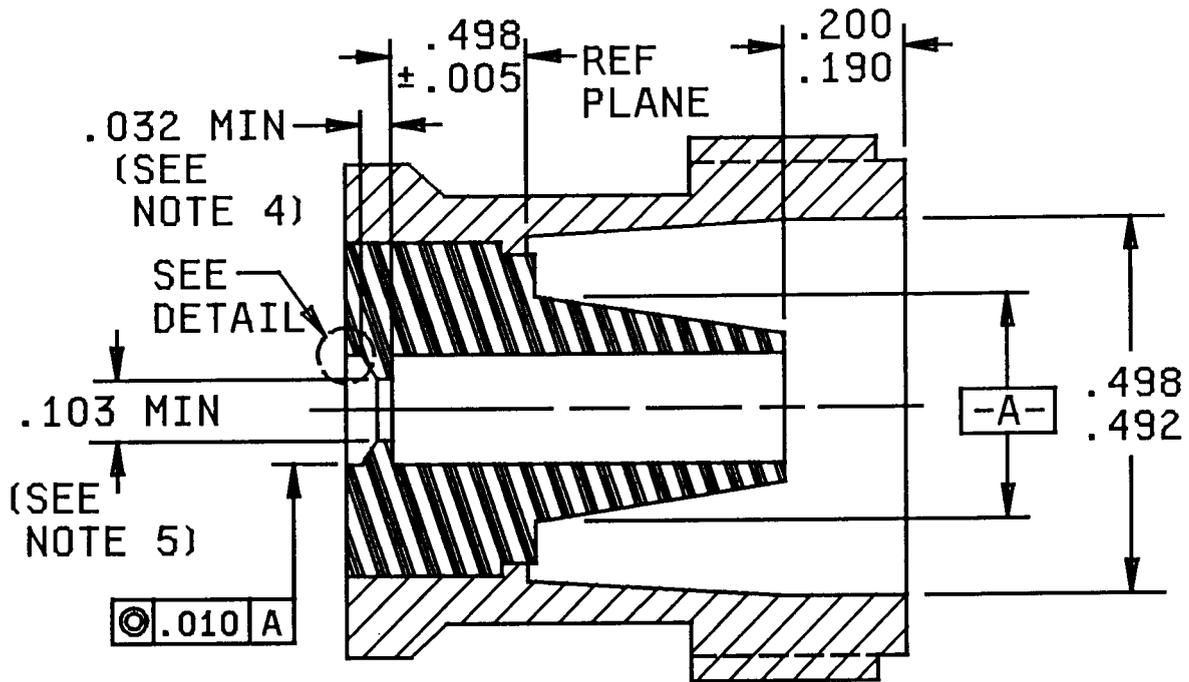


NOTES:

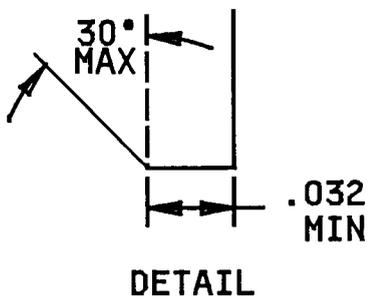
1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. For dimensions A and C, see tables I and III.
4. Wrench flats to accommodate standard wrench in accordance with FED-STD-H28, appendix 10.
5. Dimension A defines the maximum length of the connector when assembled to the appropriate cable.
6. All undimensioned pictorial configurations are for reference purposes only.
7. Full threads to within .063 (1.60 mm) of shoulder.
8. Series SC, socket contacts, in accordance with MIL-STD-348, 309.2.

MTG HOLE

FIGURE 1. General configuration.



CATEGORY D



Inch	mm
.005	0.13
.010	0.25
.032	0.81
.103	2.61
.492	12.49
.498	12.65

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. All undimensioned pictorial configurations are for reference purposes only.
4. Chamfer is optional. If chamfer is used, put chamfer on a 30° maximum.
5. Dimension to meet connector performance requirements.

FIGURE 2. Mating dimensions for socket termination.

TABLE I. Dash numbers, cross-reference, and dimensions - Continued.

Dash no. 1/	Applicable cable M17/ 2/	Dimensions	Inches (Millimeters)				
			Minimum	Maximum			
CATEGORY C - FIELD REPLACEABLE (MIL-C-22520 CRIMP TOOL) SEE FOOTNOTE NEXT TO APPLICABLE CABLE FOR CRIMP DIE 3/ 7/							
0014 Cable group VIII	2-RG6 4/ 8/ 180-00001 4/ 8/ 73-RG212 8/ 162-00001 8/ 188-00001 8/ 199-00001 8/ 112-RG304 5/8/ 171-00001 8/	A C	.915 (23.24)	2.030 (51.56) 1.045 (26.54)			
0015 Cable group XA	65-RG165 5/6/9/ 159-00001 9/ 74-RG213 9/ 189-00001 9/ 163-00001 9/						
0016 Cable group XB	75-RG214 9/ 190-00001 9/ 164-00001 9/ 86-00001 6/9/ 127-RG393 5/9/ 174-00001 9/						
0017 Cable group XD	77-RG216 4/ 8/ 9/ 191-00001 4/						
0018	078-RG217 4/ 8/						
0021 Cable group XC	6-RG11 4/9/ 181-00001 4/9/ 62-RG144 4/5/6/9/						
0022 Cable group IX	92-RG115 5/6/9/ 168-00001 9/						
CATEGORY D - FIELD REPLACEABLE - DEFINED PIECE PART 3/7/10/11/							
0501 Cable group XB	75-RG214 190-00001 164-00001 86-00001 6/ 127-RG393 5/ 174-00001				A C	.915 (23.24)	2.030 (51.56) 1.045 (26.54)
0502 Cable group XA	65-RG165 5/ 159-00001 74-RG213 189-00001 163-00001						
0503 Cable group VIB	60-RG142 6/ 158-00001 84-RG223 167-00001 194-00001 200-00001 128-RG400 5/ 175-00001						

See footnotes at end of table.

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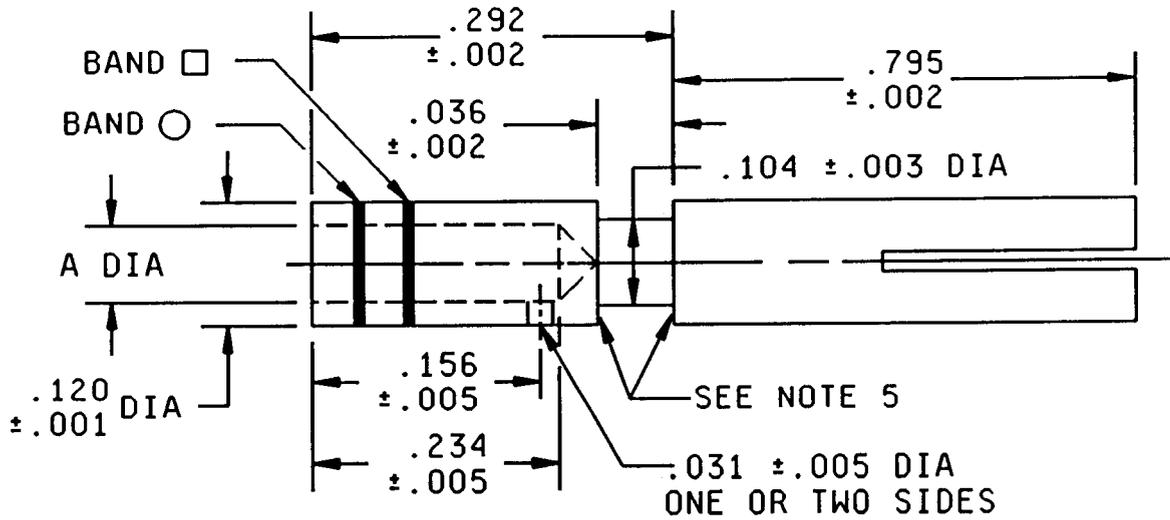
TABLE I. Dash numbers, cross-reference, and dimensions.

Dash no. <u>1/</u>	Applicable cable M17/ <u>2/</u>	Dimensions	Inches (millimeters)	
			Minimum	Maximum
CATEGORY A - FIELD SERVICEABLE (NO SPECIAL TOOLS REQUIRED) <u>3/</u>				
0023 Cable group VIII	2-RG6 <u>4/</u> 180-00001 <u>4/</u> 73-RG212 162-00001 188-00001 199-00001 112-RG304 <u>5/</u> 171-00001	A C	.985 (25.02)	2.100 (53.34) 1.045 (26.54)
0024 Cable group X	6-RG11 <u>4/</u> 181-00001 <u>4/</u> 62-RG144 <u>4/</u> 65-RG165 159-00001 74-RG213 189-00001 163-00001 75-RG214 190-00001 164-00001 86-00001 <u>6/</u> 127-RG393 <u>5/</u> 174-00001 77-RG216 191-00001			
0026 Cable group XII	78-RG217 <u>5/</u> 165-00001 188-00001			
0019 Cable group XIII	72-RG211 161-00001			
0027 Cable group XIV	79-RG218 <u>5/</u> 166-00001 193-00001			
0025 Cable group XI	74-RG215 <u>5/</u> 189-00002			
0028 Cable group IX	92-RG115 <u>5/6/</u> 168-00001			

See footnotes at end of table.

TABLE I. Dash numbers, cross-reference, and dimensions - Continued.

- 1/ For cross-reference of dash number to superseded PIN or type designation, see table IV.
- 2/ The latest version of each cable shall be applicable.
- 3/ These connectors have captivated center contacts.
- 4/ These are not 50-ohm cables; therefore, when attached to the specified connectors, VSWR, RF leakage, and insertion loss are not applicable.
- 5/ Cable to be used when performing tests requiring cable except as in 4/ and 6/.
- 6/ Cable to be used for the 200°C temperature cycling tests.
- 7/ These connectors are assembled, using the applicable crimp tool, to the specified cable stripper as shown on figure 4.
- 8/ M22520/5-35 closure A or M22520/5-55 closure A.
- 9/ M22520/5-61.
- 10/ Complete connector assembly shall consist of a body, center contact, ferrule, and assembly instructions.
- 11/ Not to be used in army equipment.



CENTER CONTACT

Inches	mm	Inches	mm	Inches	mm	Inches	mm
.001	0.03	.043	1.09	.250	6.35	.438	11.13
.002	0.05	.098	2.49	.292	7.42	.460	11.68
.003	0.08	.104	2.64	.351	8.92	.492	12.50
.005	0.13	.120	3.05	.375	9.52	.500	12.70
.015	0.38	.156	3.96	.394	10.01	.510	12.95
.031	0.79	.220	5.59	.406	10.31	.600	15.24
.036	0.91	.234	5.94	.418	10.62	.795	20.19

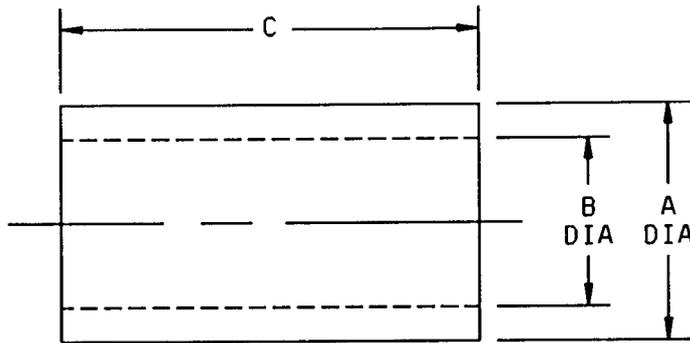
Dash no.	Contact no. 1/	A (inches)	Basic crimp tool 2/	Crimp die or positioner	Crimp tensile minimum	Color band □	Color band ○
0501 0502	40-10	.098 ±.002	M22520/1-01	M22520/1-14	60 pounds	Red	Gold
0503	40-11	.043 +.001 -.002			20 pounds	Blue	

1/ Contacts numbers are for identification only.
 2/ Class 2 tool may be used by OEM (see MIL-C-22520).

NOTES:

- Dimensions are in inches.
- Metric equivalents are given for information only.
- Contact material shall be phosphor bronze or copper beryllium.
- Crimp tensile test shall be in accordance with MIL-C-39029.
- Maximum break of .003 inch (0.08 mm).
- Copyright notice: All information disclosed in these specification sheet which is or may be copyrighted is reproduced herein with the express permission of the copyright owner.
- Color bands shall be positioned such that no coloring material enters the inspection hole.

FIGURE 3. Contact and ferrule dimensions for category D only.

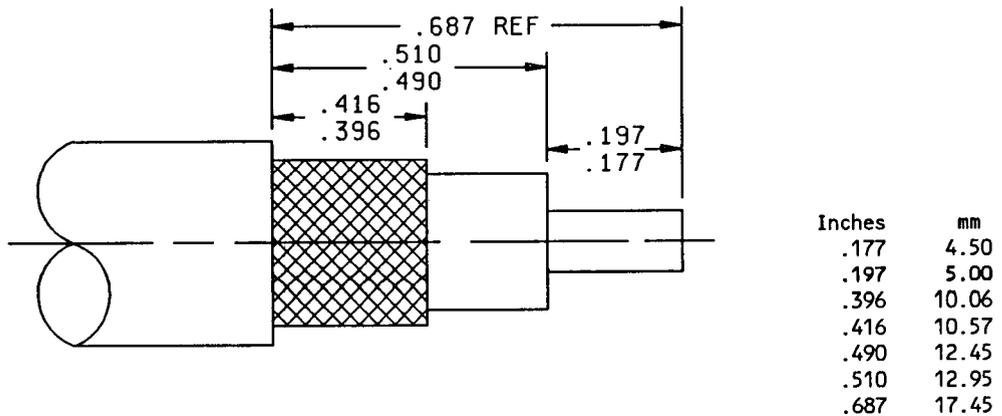


Dash number	Ferrule number ^{1/}	A	B	C ±.015	Basic crimp tool ^{2/}	Crimp die or positioner M22520/5-
0501	40-50	.492 ±.003	.438 ±.003	.600	M22520/5-01	25
0502	40-51	.492 ±.003	.418 ±.003	.600		Closure A or 61
0503	40-52	.250 ±.003	.220 ±.003	.500		5, 11, 57 Closure A or 19 Closure B

^{1/} Ferrule numbers are for identification only.

^{2/} Class 2 tools may be used by OEM (see MIL-C-22520).

FIGURE 3. Contact and ferrule dimensions for category D only - Continued.



NOTES:

- Dimensions are in inches.
- Metric equivalents are given for information only.

FIGURE 4. Cable stripping dimensions for field replaceable connectors.

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ENGINEERING DATA:

Nominal impedance: 50 ohms.

Frequency range: 0 to 11,000 MHz.

Voltage rating:

1,000 volts rms maximum working voltage at sea level.

250 volts rms maximum at 70,000 feet.

Temperature rating: -65°C to +165°C.

REQUIREMENTS:

Design and configuration: See figure 1.

Force to engage and disengage:

Longitudinal force: Not applicable.

Torque: 6 inch-pounds maximum.

Coupling proof torque: Not applicable.

Inspection conditions: Coupling torque: 6-10 inch pounds.

Mating characteristics: See figure 2 and MIL-STD-348 for dimensions.

Center contact (socket):

Oversize test pin: .098 diameter minimum, 16 microinch finish (nonclosed entry contacts only).

Insertion depth: .125 minimum.

Number of insertions: 1.

Insertion force test: Steel test pin diameter .092 minimum.

Test pin finish: 16 microinches.

Insertion force: 2 pounds maximum.

Withdrawal force test: Steel test pin diameter .090 maximum.

Withdrawal force: 2 ounces minimum.

Test pin finish: 16 microinches.

Hermetic seal: Not applicable.

Leakage (pressurized connectors): Not applicable.

Insulation resistance: Method 302 of MIL-STD-202, test condition B. 5,000 megohms minimum.

Center contact retention: (Applicable to captivated-center-contact connectors only.) 15 pounds minimum axial force for all cables except RG400 and RG142; 6 pounds minimum for RG400 and RG142.

Corrosion (salt spray): Method 101 of MIL-STD-202, test condition B.

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Voltage standing wave ratio (VSWR): From 500 to 11,000 MHz, or approximately 80 percent of upper cutoff frequency of the cable, whichever is lower; 1.30 maximum.

Swept frequency VSWR test setup:

Item 6: VSWR shall be less than $1.015 + .005 F$ (F in GHz).

Item 16: VSWR shall be less than $1.015 + .005 F$ (F in GHz).

Second step of VSWR checkout procedure - VSWR shall be less than $1.045 + .019 F$ (F in GHz).

Group B inspection - VSWR shall be less than $1.10 + .01 F$ (F in GHz).

Qualification and group C inspection - VSWR shall not exceed 1.15.

Connector durability: 500 cycles minimum at 12 cycles/minute maximum. The connector shall meet the mating characteristics and force to engage and disengage requirements.

Contact resistance: In milliohms maximum.

	<u>Initial</u>	<u>After environment</u>
Center contact	1.0	1.5
Outer contact	.15	Not applicable
Braid to body	.05	Not applicable

Dielectric withstanding voltage: Method 301 of MIL-STD-202. 3,000 volts rms minimum at sea level for connectors using other than RG400 and RG142; 1,500 volts rms minimum for connectors using RG400 and RG142.

Vibration, high frequency: Method 204 of MIL-STD-202, test condition B. No discontinuity permitted.

Shock: Method 213 of MIL-STD-202, test condition I. No discontinuity permitted.

Thermal shock: Method 107 of MIL-STD-202, test condition B, except test high temperature shall be +85°C. High temperature shall be +200°C for connectors using +200°C cables (see table I and III).

Moisture resistance: Method 106 of MIL-STD-202. No measurements at high humidity. Insulation resistance shall be at least 200 megohms within 5 minutes after removal from humidity.

Corona level:

Voltage: 750 volts rms minimum.

Altitude: 70,000 feet.

RF high potential withstanding voltage:

Voltage and frequency: 2,500 volts rms tested at a frequency from 5 to 7.5 MHz.

Leakage current: Not applicable.

Cable retention force:

Noncrimp assemblies: 75 pounds minimum.

Crimp assemblies:

- 50 lbs minimum for cables .155-.189 OD.
- 60 lbs minimum for cables .190-.229 OD.
- 75 lbs minimum for cables .230-.249 OD.
- 90 lbs minimum for cables .250 OD and larger.

Coupling mechanism retention force: Not applicable.

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RF leakage: -90 dB minimum, tested at a frequency between 2 and 3 GHz.

Insertion loss:

.15 dB maximum at 9 GHz.

.05 \sqrt{F} (GHz) dB max tested at 3 GHz and 6 GHz.

Part or Identifying Number (PIN): M39012/40- (dash number from table I or "B" number from table III).

TABLE II. Group qualification. 1/

Group	Submission and qualification of any of the following connectors <u>2/</u> M39012/40	Qualifies the following connectors M39012/40
I	-0024	-0023 -0024 -0025 -0026 -0027 -0028
II	B0030	B0029 B0030 B0031 B0032 B0033 B0034 B0035
III	-0015	-0014 -0015 -0016 -0017 -0018 -0021 -0022
IV	-0501 -0502	-0501 -0502 -0503
V	-0503	-0503

1/ If a connector manufacturer produces a connector which meets all the requirements for two or more connector PIN's (within the same series), the manufacturer may receive qualification approval for two or more connector PIN's by qualifying the one connector. It is not necessary that such connectors be in the same group. Each connector, however, must be marked with its own appropriate PIN. For group qualification, the connectors must be of similar design.

2/ For qualification retention, where more than one part is listed in a group in this column, data may be supplied on any of those parts in order to retain qualification for those parts in the corresponding right-hand column. The part does not necessarily have to be the part initially qualified.

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TABLE III. CATEGORY B - NONFIELD REPLACEABLE (SPECIAL TOOLS MAY BE REQUIRED). 1/

NOT FOR ARMY, NAVY, OR AIR FORCE USE. FOR OEM USE ONLY

PIN <u>2/</u> <u>3/</u> M39012/40B	Applicable cable <u>4/</u> M17/	Dimensions	Inches (millimeters)	
			Minimum	Maximum
0029	073-RG212 <u>5/</u> 112-RG304	A C	.915 (23.24)	2.100 (53.34) 1.045 (26.54)
0030	065-RG165 <u>6/</u> 074-RG213 <u>5/</u>			
0031	75-RG214 <u>5/</u> RG-225/U <u>6/</u>			
0032	078-RG217 <u>5/</u>			
0033	6-RG11 <u>7/</u> 62-RG144 <u>6/7/</u>			
0034	77-RG216 <u>7/</u>			
0035	92-RG115 <u>6/</u>			

1/ For maintenance replacements for category B, see table V.

2/ For cross-reference of dash number to superseded PIN or type designation, see table IV.

3/ These connectors have captivated center contacts.

4/ The latest version of each cable shall be applicable.

5/ Cable to be used when performing tests requiring cable except as in 6/ and 7/.

6/ Cable to be used for the +200°C temperature cycling tests.

7/ These are not 50-ohm cables; therefore, when attached to the specified connectors, VSWR, RF leakage, and insertion loss are not applicable.

TABLE IV. Cross-reference of PIN's. ^{1/}

Preferred PIN M39012/40	Substitute for PIN or type designation
-0006	
-0007	M23329/5-11
-0008	M23329/5-12
-0009	
-0012	
-0013	
-0014	
-0015	M23329/5-15
-0016	
-0017	
-0018	
-0021	
-0022	
-0023	M39012/40-0001
-0024	M39012/40-0002
-0025	M39012/40-0003
-0026	M39012/40-0004
-0027	M39012/40-0005
-0028	
B0029	M39012/40-0006, M39012/40-0029
B0030	M39012/40-0007, M39012/40-0030
B0031	M39012/40-0008, M39012/40-0031
B0032	M39012/40-0009, M39012/40-0032
B0033	M39012/40-0012, M39012/40-0033
B0034	M39012/40-0013, M39012/40-0034
B0035	M39012/40-0035
-0501	
-0502	
-0503	

^{1/} The superseded PIN or the type designation is for cross-reference only. Where a superseded PIN or type designation is not given, none was assigned or will be assigned. The PIN M39012/40-XXXX shall be used in all cases for marking and identifying the connector.

TABLE V. Maintenance replacements for category B.

Category B number ^{1/}	Category C dash number	Category A dash number	Category D dash number
B0006	0014	0023	---
B0007	0015	0024	0502
B0008	0016	0025	0501
B0009	0018	0026	---
B0012	0021	---	---
B0012	0017	---	---
B0029	0014	0023	---
B0030	0015	0024	0502
B0031	0016	0024	0501
B0032	0018	0026	---
B0033	0021	---	---
B0034	0017	---	---
B0035	0022	0028	---

^{1/} Category B connectors are for original installation only.
They will not be stocked or procured by the Government.

Revision letters are not used to denote changes due to the extensiveness of the changes.

CONCLUDING MATERIAL

Custodians:

Army - CR
Navy - EC
Air Force - 85
NASA - NA

Preparing activity:

DLA - ES

(Project 5935-3932-29)

Review activities:

Army - AT, AV, EA, MI
Navy - AS, MC, OS, SH
Air Force - 11, 19, 99