

INCH-POUND

MS20659K

30 June 1995

~~SUPERSEDING~~

MS20659J

15 January 1981

AN659

15 January 1981

## DETAIL SPECIFICATION SHEET

TERMINAL, LUG, CRIMP STYLE, COPPER, UNINSULATED,  
RING TONGUE, TYPE I, CLASS I, FOR 175°C TOTAL CONDUCTOR TEMPERATURE

This specification sheet 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 MIL-T-7928 listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation.

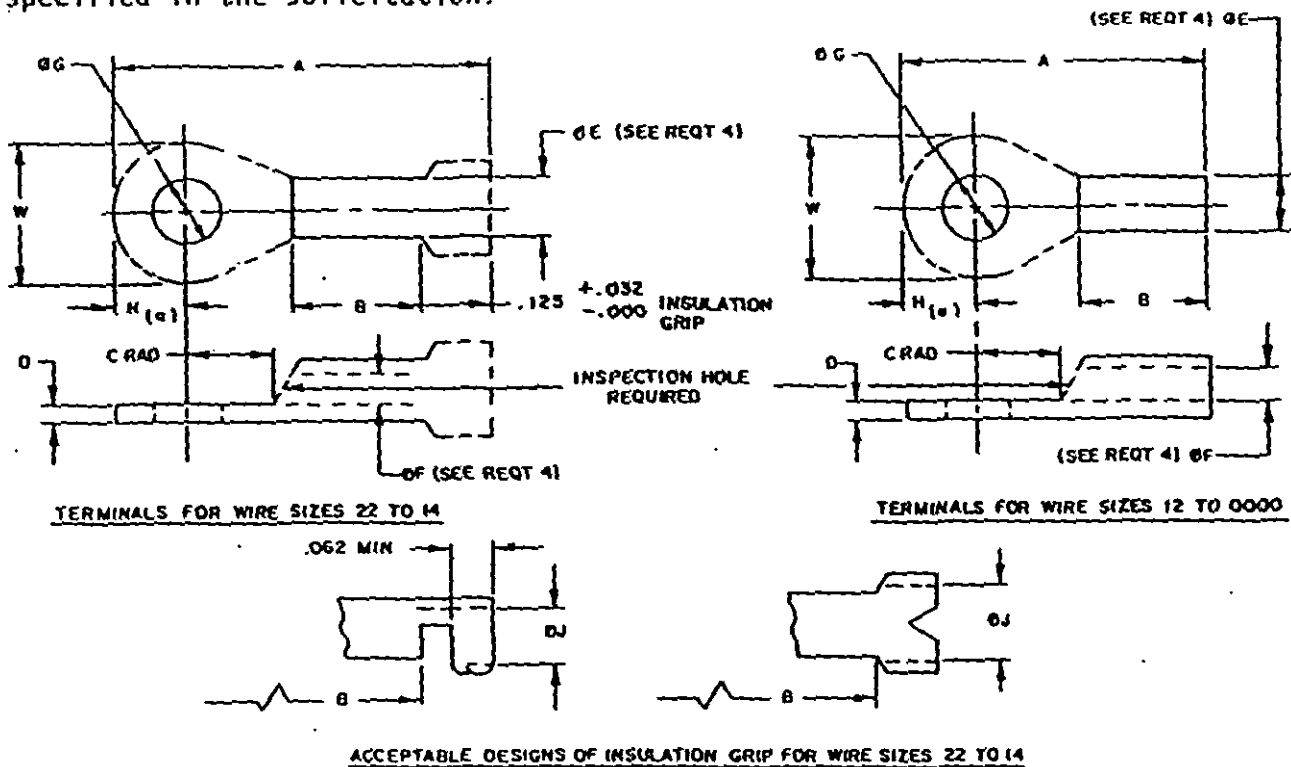


FIGURE 1. Insulation grip and terminals.

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## NOTES:

1. "H" max and min dimension shall be one-half of "W" max and min dimensions, respectively.
2. Contour indicated by phantom lines may vary from that shown to suit individual manufacturer's design.
3. Where split barrel construction is used, the split shall be permanently sealed and not open as the result of crimping.
4. Dimensions are in inches.
5. Metric equivalents (to the nearest .01 mm) are given for general information only and are based upon 1 inch = 25.4 mm.

FIGURE 1. Insulation grip and terminals - Continued.

## REQUIREMENTS:

1. Material: Soft copper, QQ-C-502, Class A.  
Copper tubing, ASTM B75-68.  
Gilding metal, 95 percent copper, 5 percent zinc.
2. Finish: Tin-plated. See acquisition specification.
3. Qualification testing: For qualification, terminals shall be tested with any one of the following wires: MIL-W-5086, MIL-W-16878, MIL-W-22759/1, 9 or 11, or MIL-W-81381/1, 3 or 7. Terminals shall be tested with tooling as follows: MIL-C-22520/24 hand crimping tool for sizes 22 through 10; MS25441 crimping tool and MS90485 crimping dies for size 8 and larger. MIL-C-2194 cables shall be used for testing MS20659-161 through MS20659-166 terminals with MIL-C-22520/25 crimping tool and MIL-C-22520/24 crimping tool.
4. Average diameter of "E" and "F" shall be within specification dimensions: Max and min dimensions due to ovalization shall be within 3% of specification requirements.

## NOTES:

1. Table I shows dash numbers and dimensions. Table II shows the relationship between wire size and Navy cable size.
2. MS20659-1 thru -61 dash numbers covered by revision B, dated 23 May 1963, are cancelled after 1 March 1969.

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3. Interchangeability relationship: Dash numbers MS20659-101 through -161 can replace the cancelled MS20659-1 through -61 parts, respectively. The cancelled MS20659-1 through -61 parts can not always replace the MS20659-101 through -161 parts. Existing Government stock of cancelled parts may be used until exhausted.
  
4. Certain provisions of this specification sheet are the subject of international standardization agreement (ASCC AIR STD 12/4). When amendment, revision, cancellation of this specification sheet is proposed which will modify the international agreement concerned, the preparing activity will take appropriate reconciliation action through international standardization channels, including departmental standardization offices, to change the agreement or make other appropriate accommodations.

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TABLE I. Dash numbers and dimensions.

DASH NO.	WIRE SIZE	STUD SIZE	A MAX	B MIN	C MIN RAD	D		Ø E	Ø F	Ø G		Ø J MIN	W		MIL-E-16366 (SHIPS) REFERENCE
						MAX	MIN			MAX	MIN		MAX	MIN	
167		2 (.086)			.115					.098	.090		.260	.178	
138		4 (.112)	.890		.125					.122	.114			.210	
101		6 (.138)								.152	.142				L 33, 1-2
102	22-18	10 (.190)	.958	.250	.172	.045	.023	.140	.073	.203	.193	.120	.320	.305	L 36, 1-2
161		5/16 (.312)	1.187		.284			.115	.052	.338	.323		.540	.450	L 65, 1-2
125		3/8 (.375)	1.308		.328					.400	.385		.540	.520	L 66, 1-2
162		1/2 (.500)	1.530		.378					.525	.510		.733	.703	L 67, 1-2
139		4 (.112)	.947		.125					.122	.114		.266	.234	
103		6 (.138)	.955		.172					.152	.142		.327	.297	L 33, 2-1/2-4
126		6 (.138)	.947		.175					.203	.193	.153	.327	.234	
104	16-14	10 (.190)	.955	.250	.172	.053	.029	.162	.095	.338	.323		.540	.450	L 35, 2-1/2-4
163		5/16 (.312)	1.219		.284			.145	.081	.400	.385		.540	.520	L 65, 2-1/2-4
127		3/8 (.375)	1.290		.328					.525	.510		.733	.703	L 66, 2-1/2-4
164		1/2 (.500)	1.593		.378					.152	.142		.317	.290	L 67, 2-1/2-4
165		6 (.138)	.955		.202					.203	.193		.391	.365	L 36, 6-9
105		10 (.190)	.959	.250	.172			.230	.139	.338	.323		.547	.485	L 65, 6-9
106	12-10	5/16 (.312)	1.156		.295	.080	.037	.210	.129	.400	.385		.598	.536	L 66, 6-9
128		3/8 (.375)	1.172		.328					.525	.510		.733	.703	L 67, 6-9
166		1/2 (.500)	1.718		.378					.178	.168		.429	.386	
140		8 (.164)	1.150		.234					.203	.193				
107		10 (.190)			.265					.275	.260		.478	.435	
141	8	1/4 (.250)	1.219	.315	.265	.084	.038	.272	.166	.338	.323		.590	.547	
108		5/16 (.312)	1.297		.295			.260	.176	.400	.385		.590	.547	
129		3/8 (.375)			.328					.525	.510		.833	.680	
142		1/2 (.500)	1.545		.440					.203	.193		.503	.460	
130		10 (.190)	1.312		.238					.275	.260				
109		1/4 (.250)			.265					.338	.323		.623	.580	
131	6	5/16 (.312)	1.437	.375	.305	.084	.043	.316	.232	.400	.385		.833	.700	
110		3/8 (.375)			.328			.295	.222	.525	.510				
143		1/2 (.500)	1.676		.440					.203	.193		.628	.480	
144		10 (.190)	1.400		.276					.275	.260				
111		1/4 (.250)			.308					.338	.323		.648	.605	
132	4	5/16 (.312)	1.489	.437	.328	.095	.047	.380	.290	.400	.385		.833	.710	
112		3/8 (.375)			.328			.365	.280	.525	.510				
145		1/2 (.500)	1.721		.440					.203	.193				

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TABLE I. Dash numbers and dimensions - Continued.

DASH NO.	WIRE SIZE	STUD SIZE	A MAX	B MIN	C MIN RAD	D		ØE	ØF	ØG		ØJ MIN	H	
						MAX	MIN			MAX	MIN		MAX	MIN
146		10(.190)	1.732	.505	.343	.109	.054	$\frac{.473}{.450}$	$\frac{.365}{.355}$	.203	.193		.711	.668
147	1/4(.250)	.275								.260				
148	5/16(.312)	.338								.323				
149	3/8(.375)	.400								.385				
150	7/16(.437)	.463								.448				
151	1/2(.500)	1.895	.453							.525	.510		.804	.740
115		1/4(.250)	1.845	.565	.383	.125	.070	$\frac{.527}{.505}$	$\frac{.398}{.388}$	.275	.260		.783	.740
116	5/16(.312)	.338								.323				
117	3/8(.375)	.400								.385				
118	7/16(.437)	.463								.448				
119	1/2(.500)	.525								.510				
120		1/4(.250)	2.045	.630	.418	.125	.070	$\frac{.578}{.558}$	$\frac{.458}{.438}$	.275	.260		.853	.810
121	5/16(.312)	.338								.323				
122	3/8(.375)	.400								.385				
123	7/16(.437)	.463								.448				
124	1/2(.500)	.525								.510				
125		1/4(.250)	2.320	.700	.473	.129	.075	$\frac{.640}{.620}$	$\frac{.520}{.500}$	.275	.260		.956	.913
126	5/16(.312)	.338								.323				
127	3/8(.375)	.400								.385				
128	7/16(.437)	.463								.448				
129	1/2(.500)	.525								.510				
130		5/16(.312)	2.455	.718	.513	.140	.085	$\frac{.714}{.690}$	$\frac{.577}{.557}$	.338	.323		1.053	1.010
131	3/8(.375)	.400								.385				
132	7/16(.437)	.463								.448				
133	1/2(.500)	.525								.510				
134		5/16(.312)								2.755	.734			
135	3/8(.375)	.400	.385											
136	7/16(.437)	.463	.448											
137	1/2(.500)	.525	.510											
138		5/16(.312)	2.955	2.971	.765							.338	.323	
139	3/8(.375)	.400								.385				
140	7/16(.437)	.463								.448				
141	1/2(.500)	.525								.510				
142		5/16(.312)								2.955	2.971			
143	3/8(.375)	.400	.385											
144	7/16(.437)	.463	.448											
145	1/2(.500)	.525	.510											
146		5/16(.312)	2.955	2.971										.338
147	3/8(.375)	.400								.385				
148	7/16(.437)	.463								.448				
149	1/2(.500)	.525								.510				
150		5/16(.312)								2.955	2.971			
151	3/8(.375)	.400	.385											
152	7/16(.437)	.463	.448											
153	1/2(.500)	.525	.510											
154		5/16(.312)	2.955	2.971										
155	3/8(.375)	.400								.385				
156	7/16(.437)	.463								.448				
157	1/2(.500)	.525								.510				
158		5/16(.312)								2.955	2.971			
159	3/8(.375)	.400	.385											
160	7/16(.437)	.463	.448											
161	1/2(.500)	.525	.510											
162		5/16(.312)	2.955	2.971										
163	3/8(.375)	.400								.385				
164	7/16(.437)	.463								.448				
165	1/2(.500)	.525								.510				
166		5/16(.312)								2.955	2.971			
167	3/8(.375)	.400	.385											
168	7/16(.437)	.463	.448											
169	1/2(.500)	.525	.510											
170		5/16(.312)	2.955	2.971										
171	3/8(.375)	.400								.385				
172	7/16(.437)	.463								.448				
173	1/2(.500)	.525								.510				
174		5/16(.312)								2.955	2.971			
175	3/8(.375)	.400	.385											
176	7/16(.437)	.463	.448											
177	1/2(.500)	.525	.510											
178		5/16(.312)	2.955	2.971										
179	3/8(.375)	.400								.385				
180	7/16(.437)	.463								.448				
181	1/2(.500)	.525								.510				
182		5/16(.312)								2.955	2.971			
183	3/8(.375)	.400	.385											
184	7/16(.437)	.463	.448											
185	1/2(.500)	.525	.510											
186		5/16(.312)	2.955	2.971										
187	3/8(.375)	.400								.385				
188	7/16(.437)	.463								.448				
189	1/2(.500)	.525								.510				
190		5/16(.312)								2.955	2.971			
191	3/8(.375)	.400	.385											
192	7/16(.437)	.463	.448											
193	1/2(.500)	.525	.510											
194		5/16(.312)	2.955	2.971										
195	3/8(.375)	.400								.385				
196	7/16(.437)	.463								.448				
197	1/2(.500)	.525								.510				
198		5/16(.312)								2.955	2.971			
199	3/8(.375)	.400	.385											
200	7/16(.437)	.463	.448											
201	1/2(.500)	.525	.510											
202		5/16(.312)	2.955	2.971										
203	3/8(.375)	.400								.385				
204	7/16(.437)	.463								.448				
205	1/2(.500)	.525								.510				
206		5/16(.312)								2.955	2.971			
207	3/8(.375)	.400	.385											
208	7/16(.437)	.463	.448											
209	1/2(.500)	.525	.510											
210		5/16(.312)	2.955	2.971										
211	3/8(.375)	.400								.385				
212	7/16(.437)	.463								.448				
213	1/2(.500)	.525								.510				
214		5/16(.312)								2.955	2.971			
215	3/8(.375)	.400	.385											
216	7/16(.437)	.463	.448											
217	1/2(.500)	.525	.510											
218		5/16(.312)	2.955	2.971										
219	3/8(.375)	.400								.385				
220	7/16(.437)	.463								.448				
221	1/2(.500)	.525								.510				
222		5/16(.312)								2.955	2.971			
223	3/8(.375)	.400	.385											
224	7/16(.437)	.463	.448											
225	1/2(.500)	.525	.510											
226		5/16(.312)	2.955	2.971										
227	3/8(.375)	.400								.385				
228	7/16(.437)	.463								.448				
229	1/2(.500)	.525								.510				
230		5/16(.312)								2.955	2.971			
231	3/8(.375)	.400	.385											
232	7/16(.437)	.463	.448											
233	1/2(.500)	.525	.510											
234		5/16(.312)	2.955	2.971										
235	3/8(.375)	.400								.385				
236	7/16(.437)	.463								.448				
237	1/2(.500)	.525								.510				
238		5/16(.312)								2.955	2.971			
239	3/8(.375)	.400	.385											
240	7/16(.437)	.463	.448											
241	1/2(.500)	.525	.510											
242		5/16(.312)	2.955	2.971										
243	3/8(.375)	.400								.385				
244	7/16(.437)	.463								.448				
245	1/2(.500)	.525								.510				
246		5/16(.312)								2.955	2.971			
247	3/8(.375)	.400	.385											
248	7/16(.437)	.463	.448											
249	1/2(.500)	.525	.510											
250		5/16(.312)	2.955	2.971										
251	3/8(.375)	.400								.385				
252	7/16(.437)	.463								.448				
253	1/2(.500)	.525								.510				
254		5/16(.312)								2.955	2.971			
255	3/8(.375)	.400	.385											
256	7/16(.437)	.463	.448											
257	1/2(.500)	.525	.510											
258		5/16(.312)	2.955	2.971										
259	3/8(.375)	.400								.385				
260	7/16(.437)	.463								.448				
261	1/2(.500)	.525								.510				
262		5/16(.312)								2.955	2.971			
263	3/8(.375)	.400	.385											
264	7/16(.437)	.463	.448											
265	1/2(.500)	.525	.510											
266		5/16(.312)	2.955	2.971										
267	3/8(.375)	.400								.385				
268	7/16(.437)	.463								.448				
269	1/2(.500)	.525								.510				
270		5/16(.312)								2.955	2.971			
271	3/8													

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INCH	mm	INCH	mm	INCH	mm
.023	0.58	.297	7.54	.645	16.38
.029	0.74	.305	7.75	.648	16.46
.032	0.81	.308	7.82	.651	16.54
.037	0.94	.312	7.92	.666	16.92
.038	0.97	.315	8.00	.668	16.97
.043	1.09	.316	8.03	.680	17.27
.045	1.14	.317	8.05	.690	17.53
.047	1.19	.320	8.13	.700	17.78
.052	1.32	.323	8.20	.703	17.86
.053	1.35	.327	8.31	.710	18.03
.054	1.37	.328	8.33	.711	18.06
.062	1.57	.338	8.59	.714	18.14
.070	1.78	.343	8.71	.718	18.24
.073	1.85	.365	9.27	.733	18.62
.075	1.91	.375	9.53	.734	18.64
.080	2.03	.378	9.60	.740	18.80
.084	2.13	.380	9.65	.750	19.05
.085	2.16	.385	9.78	.760	19.30
.086	2.18	.386	9.80	.765	19.43
.095	2.41	.388	9.86	.770	19.56
.096	2.44	.391	9.93	.783	19.89
.109	2.77	.398	10.11	.784	19.91
.112	2.84	.400	10.16	.785	19.94
.114	2.90	.418	10.62	.804	20.42
.115	2.92	.429	10.90	.810	20.57
.122	3.10	.435	11.05	.833	21.16
.125	3.18	.437	11.10	.853	21.67
.129	3.28	.438	11.13	.860	21.84
.138	3.51	.440	11.18	.875	22.23
.139	3.53	.448	11.38	.887	22.53
.140	3.56	.450	11.43	.890	22.61
.142	3.61	.453	11.51	.895	22.73
.145	3.68	.458	11.63	.903	22.94
.152	3.86	.460	11.68	.910	23.11
.153	3.89	.463	11.76	.913	23.19
.162	4.11	.473	12.01	.947	24.05
.164	4.17	.478	12.14	.955	24.26
.168	4.27	.480	12.19	.956	24.28
.172	4.37	.485	12.32	.968	24.59
.176	4.47	.500	12.70	.969	24.61
.178	4.52	.503	12.78	1.010	25.65
.186	4.72	.505	12.83	1.053	26.75
.190	4.83	.510	12.95	1.095	27.81
.193	4.90	.520	13.21	1.150	29.21
.202	5.13	.525	13.34	1.156	29.36
.203	5.16	.527	13.39	1.172	29.77
.210	5.33	.536	13.61	1.187	30.15
.216	5.49	.540	13.72	1.200	30.48
.230	5.84	.547	13.89	1.219	30.96
.232	5.89	.558	14.17	1.249	31.72
.234	5.94	.560	14.22	1.268	32.21
.238	6.05	.565	14.35	1.290	32.77
.250	6.35	.577	14.66	1.297	32.94
.260	6.60	.578	14.68	1.308	33.22
.265	6.73	.580	14.73	1.312	33.32
.266	6.76	.590	14.99	1.400	35.56
.272	6.91	.598	15.19	1.437	36.50
.275	6.99	.605	15.37	1.489	37.82
.276	7.01	.620	15.75	1.530	38.86
.280	7.11	.622	15.80	1.545	39.24
.284	7.21	.623	15.82	1.593	40.46
.290	7.37	.625	15.88	1.676	42.57
.296	7.52	.628	15.95	1.718	43.64
		.630	16.00	1.721	43.71
		.640	16.26		

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TABLE II. Wire size in relation to Navy cable size.

TABLE II. (REF).	
SIZE	NAVY CABLE SIZE
22-18	1 (1)
	1 (7)
	1 (10)
	1-1/2 (1)
	1-1/2 (7)
	1-1/2 (16)
	1-1/2 (41)
16-14	2 (7)
	2-1/2 (1)
	2-1/2 (19)
	2-1/2 (26)
	3 (7)
	4 (1)
	4 (19)
12-10	4 (7)
	4 (41)
	6 (7)
	6 (19)
	9 (7)
	9 (37)

## Custodians:

Army - ER

Navy - AS

Air Force - 85

## Preparing activity:

Navy - AS

(Project No. 5940-1121)

## Review activities:

Army - AR, AV, MI

Navy - EC, SH

Air Force - 11, 99