Installation Instructions

Bendix®

QWL
ELECTRICAL CONNECTORS

Scintilla Division
SIDNEY, NEW YORK 13838

THE Bendix CORPORATION

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FORM L-516-2

TABLE OF CONTENTS

SECTION I

INTRODUCTION

1-1. DESCRIPTION.

1-2. Bendix QWL series connectors are designed and manufactured for use in power control circuits where waterproofing and exceptional resistance to vibration, shock, corrosion, and abrasion are required. When properly installed, these connectors are explosion proof as defined in specification MIL-E-5272A, procedures 1 and 2.

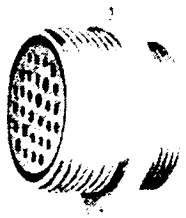
1-3. QWL series connectors have resilient inserts and machined aluminum bar stock shells. Stainless steel slip rings are used where required between sliding surfaces in shell sizes 36 and larger. Sealing gaskets for waterproofing are provided at threaded joints. Cable accessories have left hand threads in order to prevent accidental loosening from occuring when the connector is being uncoupled.

1-4. The QWL connector uses single key polarization, a flat main joint sealing gasket and an accessory of the same size as the shell.

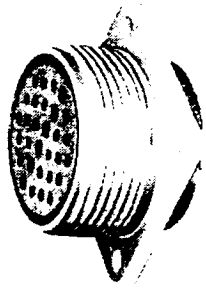
1-5. Typical QWL connector assemblies in Figures 1 through 8.

1-6. A wide range of accessories is available to meet various service and mounting conditions.

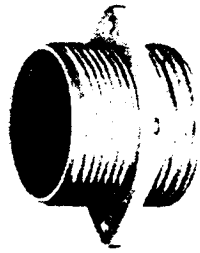
TYPICAL QWL SERIES ELECTRICAL CONNECTORS



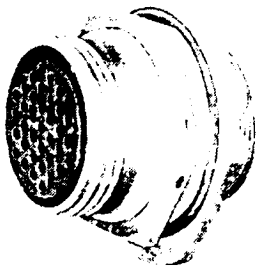
Wall Mounting Receptacle
Figure 1



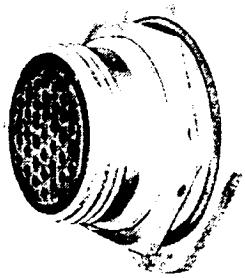
Box Mounting Receptacle
Figure 2



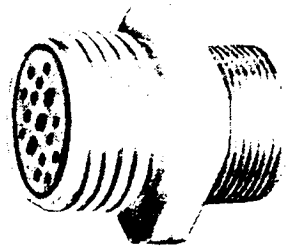
Through Bulkhead Receptacle
Figure 3



Jam Nut Wall Mounting Receptacle
Figure 4

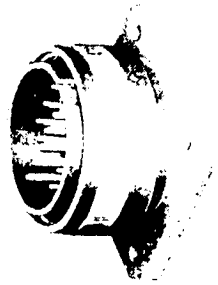


Jam Nut Box Mounting Receptacle
Figure 5



Cable Connecting Plug
Figure 6

Straight Plug
Figure 7



Flange Mount Plug
Figure 8

2-1. INSTALLATION.

CAUTION

Removal of inserts from QWL connectors is not recommended. Removal of inserts breaks the pressure and water-proofing seal incorporated at the time of factory assembly.

2-2. Preparing for Installation.

2-3. Visually check connector and accessory to be sure contacts and other parts have not accidentally become damaged in any way.

2-4. Cleaning.

2-5. Inserts, contacts, and inside surfaces of shells must be kept free of oil, grease and dirt throughout the installation procedure. Use a clean cloth moistened with Neosol* or equivalent.

2-6. Cable and Wire Preparation.

2-7. Provide sufficient cable slack to allow easy installation of the connector.

2-8. Strip cable sheath (to "A" dimension, Figure 9) according to accessory type and dash number (See Table II). Note that when accessories similar to Figure 14 are used which utilize open wire sealing, no "A" dimension is required. Example: 10-113196 Adapter. Hot blade stripping methods are recommended where possible. When other stripping methods are employed, use extreme care to avoid nicking or cutting individual conductor insulation.

2-9. Installing Accessory Components.

2-10. Typical accessories are shown in the exploded views, Figures 10 through 14. Others not shown are installed similarly to those illustrated. Slide the components of the accessory to be used on the cable or wire bundle in the sequence indicated. If a Kellems or similar type of cable grip is to be used, compress the two ends toward each other to expand its diameter so it can be slipped on the cable.

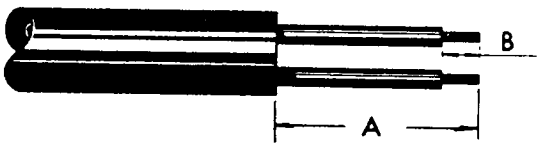


Figure 9. Stripping Dimensions.

TABLE I

CONTACT SIZE	"B" DIMENSION
16	11/32"
12	11/32"
8	11/16"
4	29/32"
0	1-9/32"

2-11. Strip individual insulation to "B" dimension, Figure 9 and Table I, according to contact size and type. Hot wire stripping methods are recommended. If other stripping methods are employed, use extreme care to avoid nicking or cutting wire strands.

2-12. Check to be sure wire strands are not separated. If necessary, reform wires by lightly twisting the strand together.

*Shell Chemical Co., 380 Madison Avenue, New York, 17, New York

TABLE II

"A" Dimension based on AN/MS contacts (75- & 81-series connectors) used with:

Accessory Dash Number	Short Housings 10-101332 10-101333 10-101334 10-101335 10-130320 10-183175 10-183176 10-183494 10-248588 10-262121 10-313347 10-329253	Long Housings 10-113637 10-183994 10-183995 10-189076 10-242916 10-248956 10-305823 10-313378 10-329201 10-329202 10-329637 10-329966	Short Housings 10-130380 10-313118 10-313636	Short Housings 10-183247 10-183248 10-189341 10-242914 10-242915	Adapter 10-113138
121	1.000	------	------	------	------
122	1.687	------	------	------	------
123	1.375	------	------	------	------
141	.875	4.312	.875	.875	------
142	.938	4.312	1.125	.875	------
143	.875	4.312	------	1.562	------
144	1.562	4.312	------	------	------
145	1.125	------	------	------	------
146	1.562	------	------	------	------
151	1.562	------	------	------	------
161	.844	------	.844	1.156	------
162	1.156	------	1.156	1.156	------
163	1.719	------	------	------	------
164	1.156	------	------	------	------
165	1.156	------	------	------	------
166	1.719	------	------	------	------
167	.937	------	------	------	------
171	1.468	4.312	1.218	1.468	------
172	1.218	4.312	1.719	------	------
173	1.719	------	------	------	------
175	1.468	------	------	------	------
174	1.468	4.312	------	------	------
181	1.468	4.312	1.719	1.468	------
182	1.719	4.312	1.719	------	------
183	1.468	4.312	1.500	------	------
184	1.719	------	1.719	------	------
185	1.468	------	1.719	------	------
186	1.719	------	1.468	------	------
187	1.719	4.312	------	------	------
188	1.468	------	------	------	------
190	1.719	------	------	------	------
201	1.719	4.312	1.719	1.468	------
202	1.719	5.312	1.468	------	------
203	1.719	4.312	1.687	------	------
204	1.500	------	1.719	------	------
205	1.719	4.312	1.719	------	------
206	1.468	------	1.719	------	------
207	1.500	------	1.719	------	------
208	1.719	------	------	------	------
209	1.468	------	------	------	------
210	1.468	------	------	------	------
211	1.719	------	------	------	------
221	1.719	4.625	1.719	1.719	------

TABLE II (Continued)

"A" Dimension based on AN/MS contacts (75- & 81-series connectors) used with:

Accessory Dash Number	Short Housings 10-101332 10-101333 10-101334 10-101335 10-130520 10-183175 10-183176 10-183494 10-248588 10-262121 10-313347 10-329253	Long Housings 10-113637 10-183994 10-183995 10-189076 10-242916 10-248956 10-305823 10-313378 10-329201 10-329202 10-329637 10-329966	Short Housings 10-130380 10-313118 10-313636	Short Housings 10-183247 10-183248 10-189341 10-242914 10-242915	Adapter 10-113138
222	1.719	3.562	1.719	1.719	------
223	1.719	4.312	1.812	1.719	------
224	1.719	4.312	1.719	1.719	------
225	1.719	4.312	------	1.719	------
226	1.719	------	------	1.719	------
227	1.719	------	------	1.719	------
228	1.719	------	------	1.719	------
229	1.625	------	------	1.625	------
231	1.719	5.312	------	------	------
241	1.812	4.719	------	1.812	------
242	1.781	4.719	1.781	1.781	------
243	1.812	5.375	1.781	1.812	------
244	1.812	5.375	1.781	1.812	------
245	1.812	5.375	1.781	------	------
246	1.687	4.719	1.781	------	------
247	1.781	------	------	------	------
248	1.812	------	------	------	------
249	1.812	------	------	------	------
281	1.812	4.375	1.781	1.812	------
282	1.812	4.375	1.781	1.812	------
283	1.812	5.375	1.781	1.812	------
284	1.812	4.375	1.750	1.812	------
285	1.812	5.375	------	------	------
286	1.812	5.375	------	------	------
287	1.812	4.375	------	------	------
288	1.812	5.375	------	------	------
289	1.812	5.375	------	------	------
290	1.812	5.375	------	------	------
291	1.812	4.375	------	------	------
292	1.719	5.375	------	------	------
293	1.781	5.375	------	------	------
294	1.781	5.375	------	------	------
295	1.812	4.375	------	------	------
321	1.875	6.437	1.843	1.875	------
322	1.875	5.437	1.843	1.875	------
323	1.875	5.437	------	1.843	------
324	1.875	6.437	------	1.843	------
325	1.875	6.437	------	1.843	------
326	1.906	5.437	------	------	------
327	1.875	------	------	------	------
328	1.875	------	------	------	------
329	1.875	------	------	------	------

TABLE II (Continued)

"A" Dimension based on AN/MS contacts (75- & 81-series connectors) used with:

Accessory Dash Number	Short Housings 10-101332 10-101333 10-101334 10-101335 10-130520 10-183175 10-183176 10-183494 10-248588 10-262121 10-313347 10-329253	Long Housings 10-113637 10-183994 10-183995 10-189076 10-242916 10-248956 10-305823 10-313378 10-329201 10-329202 10-329637 10-329966	Short Housings 10-130380 10-313118 10-313636	Short Housings 10-183247 10-183248 10-189341 10-242914 10-242915	Adapter 10-113138
330	1.875	------	------	------	------
331	1.875	------	------	------	------
332	1.875	------	------	------	------
333	1.875	------	------	------	------
334	1.875	------	------	------	------
335	1.875	------	------	------	------
336	1.875	------	------	------	------
337	1.906	------	------	------	------
361	1.875	5.437	1.843	1.875	------
362	1.875	5.437	1.968	1.875	------
363	1.875	6.562	1.843	1.875	------
364	1.875	5.437	1.843	1.875	------
365	1.875	5.437	------	------	------
366	1.875	5.437	------	------	------
367	1.875	5.437	------	------	------
368	1.875	6.562	------	------	------
369	1.875	6.562	------	------	------
370	1.968	6.562	------	------	------
371	1.875	5.437	------	------	------
372	1.968	------	------	------	------
373	1.875	------	------	------	------
374	1.875	------	------	------	------
375	1.968	------	------	------	------
376	1.875	------	------	------	------
377	1.875	------	------	------	------
378	1.875	------	------	------	------
379	1.875	------	------	------	------
401	1.875	6.562	1.843	------	------
402	1.875	6.562	1.750	------	------
403	1.875	6.562	------	------	------
404	1.875	6.562	------	------	------
405	1.875	6.437	------	------	------
406	1.875	6.437	------	------	------
407	1.937	6.437	------	------	------
408	1.937	6.437	------	------	------
409	1.937	------	------	------	------
410	1.937	6.562	------	------	------
411	1.875	6.562	------	------	------
412	1.968	9.562	------	------	------
413	1.968	9.562	------	------	------
414	1.968	10.437	------	------	------
415	1.875	6.437	------	------	------

TABLE II (Continued)

"A" Dimension based on AN/MS contacts (75- & 81-series connectors) used with:

Accessory Dash Number	Short Housings 10-101332 10-101333 10-101334 10-101335 10-130520 10-183175 10-183176 10-183494 10-248588 10-262121 10-313347 10-329253	Long Housings 10-113637 10-183994 10-183995 10-189076 10-242916 10-248956 10-305823 10-313378 10-329201 10-329202 10-329637 10-329966	Short Housings 10-130380 10-313118 10-313636	Short Housings 10-183247 10-183248 10-189341 10-242914 10-242915	Adapter 10-113138
416	1.875	5.437	------	------	------
417	1.875	5.437	------	------	------
441	2.000	6.437	------	------	------
442	2.000	6.437	------	------	------
443	2.000	6.437	------	------	------
444	------	6.437	------	------	------
445	2.625	6.437	------	------	------
446	------	5.312	------	------	------
447	------	6.437	------	------	------
448	------	6.437	------	------	------
449	------	6.437	------	------	------
450	------	6.312	------	------	------
481	1.687	6.437	------	------	------
482	2.625	6.437	------	------	------
483	1.875	6.437	------	------	------
484	1.875	6.437	------	------	------
485	------	6.437	------	------	------
486	------	6.437	------	------	------
8	------	------	------	------	1.187
10	------	------	------	------	1.187
12	------	------	------	------	1.187
13	------	------	------	------	1.218
14	------	------	------	------	1.187
15	------	------	------	------	1.218
16	------	------	------	------	1.187
17	------	------	------	------	1.218
18	------	------	------	------	1.218
20	------	------	------	------	1.218
22	------	------	------	------	1.218
24	------	------	------	------	1.281
28	------	------	------	------	1.468
32	------	------	------	------	1.500
36	------	------	------	------	1.500
40	------	------	------	------	1.500
44	------	------	------	------	1.406
48	------	------	------	------	1.468

NOTE

Additional application data for determining the correct "A" stripping dimension when the basic assembly (75- & 81- series) is altered.

a. Basic assembly with type F contacts (82- & 83- series) - Subtract 0.125 inch from "A" dimension for all shell sizes except 44 and 48 - Add 0.125.

b. Basic assembly with size 0 and 4 solder type contacts used with AN/MS crimp type (75- & 81- series) - Refer to Section III for "A" and "B".

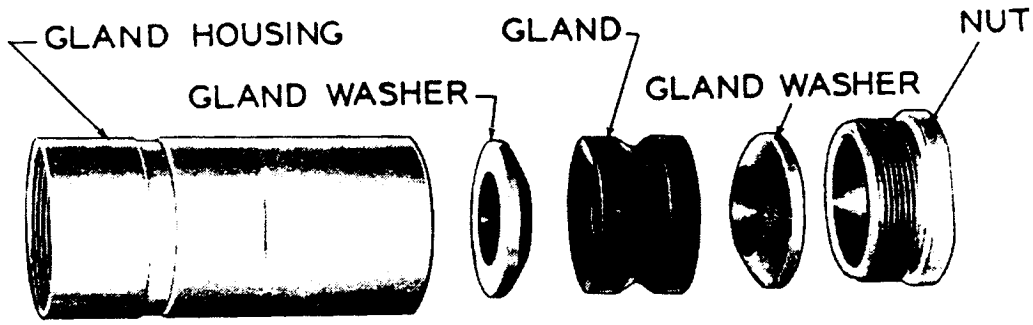


Figure 10. Waterproofing and moderate strain relief for sheathed cables provided by compression of gland. Left hand thread at each end. Basic type: 10-101333, 10-101335.

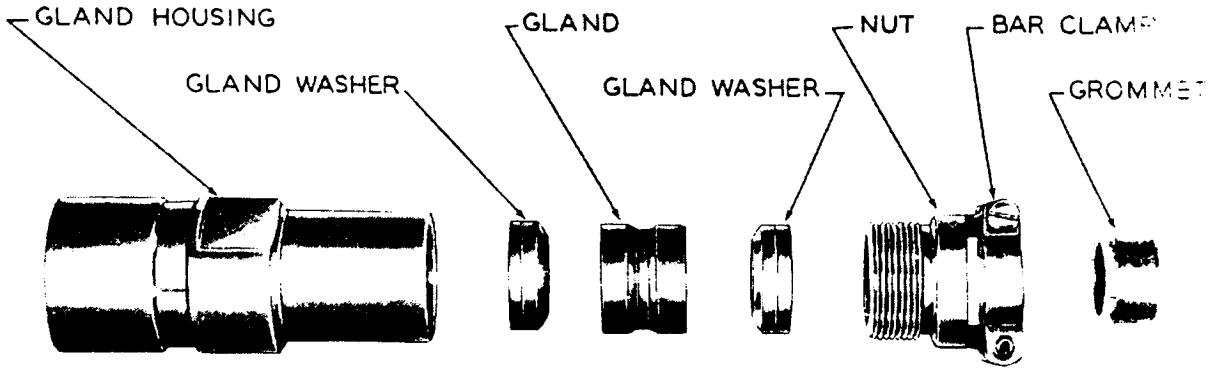


Figure 11. Similar to Figure 10, but with additional strain relief provided by clamping bars. Gland housing threads are left hand at each end. Basic type: 10-130380.

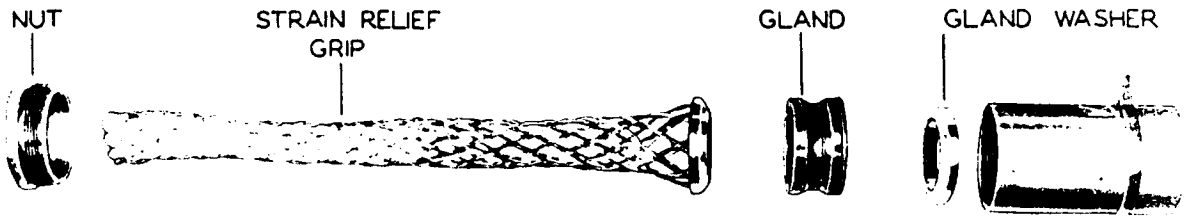


Figure 12. Similar to Figure 10, but has 18-8 stainless steel Kellems cable strain relief grip. Left hand thread each, long or short housings. Basic type: 10-101332, 10-101334, 10-113657 10-248588.

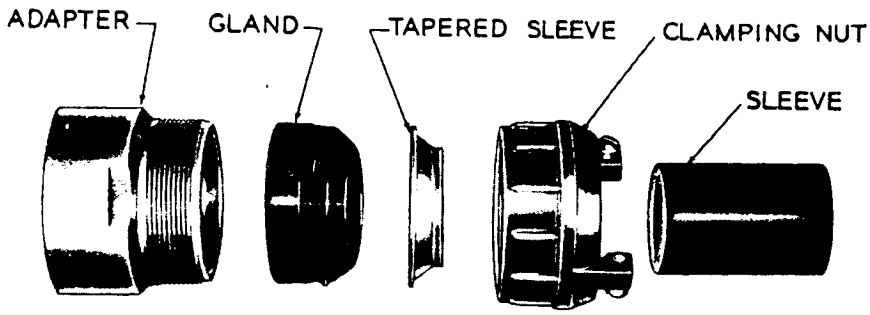


Figure 13. 10-113138 Adapter and MS3057B cable clamp. Left hand thread at connector end of adapter and right hand thread at cable end.

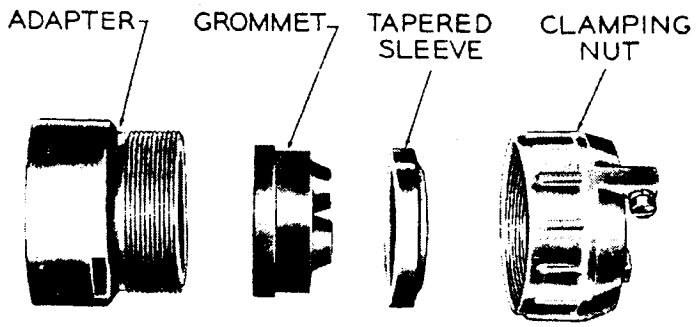


Figure 14. 10-113196 Adapter and 71-74900 cable clamp for individual waterproofing of open wire bundles. Adapter has left hand thread at connector end and right hand thread at cable end.

2-13. Crimping Contacts.

2-14. Insert stripped end of wire into contact wire well and apply a slight pressure on the wire until it is positively bottomed. Make certain that wire strands are visible in the inspection hole provided in wire well.

2-15. Select crimping tool and positioner(s) according to Table III or IV.

2-16. With wire in place, insert contact into crimping tool. Make sure contact and wire are inserted into crimping tool as far as possible. Close tool handles. Refer to applicable publication which further outlines the use and maintenance of the tool being used (See Tables III and IV for publication number).

2-17. Make final visual check to be sure contacts are properly crimped and ends of wires are visible in inspection hole of contact wire well.

TABLE III

Recommended Tooling for AN/MS Crimp Type Contacts Used in 75- and 81-QWL Connectors with MIL-W-5086 Wire.

Publication No.	Contact		Insertion Tool	Removal		Crimping		Setting**
	Size	Type		Tool	Tip	Tool***	Positioner or Locator	
MG-1026 MG-1263 MG-1075	16S	S	11-7345 11-7736 *11-7365-1	11-8250 *11-7368	11-3698 11-3698	11-6941-1 11-8581-3 11-7295	11-6932-1 11-7181-1 11-7771-1	.050-.053 .045-.050
MG-1026 MG-1263 MG-1075	16S	P	11-7345 11-7736 *11-7365-1	11-8250 *11-7368	11-3697 11-3697	11-6941-1 11-8581-3 11-7295	11-6932-1 11-7181-1 11-7771-1	.050-.053 .045-.050
MG-1026 MG-1263 MG-1075	16	S	11-7345 11-7736 *11-7365-1	11-8250 *11-7368	11-3698 11-3698	11-6941-1 11-8581-3 11-7295	11-6932-27 11-7181-21 11-7771-2	.050-.053 .045-.050

TABLE III (Continued)

Recommended Tooling for AN/MS Crimp Type Contacts Used in 75- and 81-QWL Connectors with MIL-W-5086 Wire.

Publication No.	Contact Size	Contact Type	Insertion Tool	Removal Tool	Removal Tip	Crimping Tool***	Crimping Positioner or Locator	Setting**
MG-1026 MG-1263 MG-1075	16	P	11-7345 11-7736 *11-7365-1	11-8250 *11-7368	11-3697 11-3697	11-6941-1 11-8581-3 11-7295	11-6932-2 11-7181-2 11-7771-3	.050-.053 .045-.050
MG-1026 MG-1263 MG-1075	12	S	11-7082 11-7763 *11-7365-2	11-8250 *11-7368	11-3698 11-3698	11-6941-1 11-8581-3 11-7295	11-6932-3 11-7181-3 11-7771-4	.070-.075
MG-1026 MG-1263 MG-1075	12	P	11-7082 11-7763 *11-7365-2	11-8250 *11-7368	11-3696 11-3696	11-6941-1 11-8581-3 11-7295	11-6932-3 11-7181-3 11-7771-4	.070-.075
MG-1082	8	S	11-8220 *11-7365-3	11-8250 *11-7368	11-8251 11-7674-1	11-8447-9		.125-.140
MG-1082	8	P	11-8220 *11-7365-3	11-8250 *11-7368	11-8252 11-7570-3	11-8447-9		.125-.140

* Used with 11-7364 Arbor Press or equivalent.
** Crimp settings determined for MIL-W-5086 wire.
*** For equivalent Bench Mount Tool use 11-8582 Series.

NOTE

The special long AN/MS contacts used in shell sizes 44 and 48, employ the 11-6941 Series Crimping Tool with the 11-6932-31 locator for size 16 sockets, 11-6932-28 locator for size 16 pins and 11-6932-32 locator for size 12 pins and sockets.

TABLE IV

Recommended Tooling for Type "F" Crimp Contacts Used in 82- and 83-series QWL Connectors with MIL-C-13777.

Publication No.	Contact Size	Contact Type	Insertion Tool	Removal Tool	Removal Tip	Crimping Tool	Crimping Positioner or Locator	Setting**
MG-1026	16S	P	11-7345 *11-7365-1	11-8250 *11-7368	11-3697 11-3697	11-6941-2	11-6932-40	.042-.045
MG-1026	16S	S	11-7345 *11-7365-1	11-8250 *11-7368	11-3698 11-3698	11-6941-2	11-6932-40	.042-.045

TABLE IV (Continued)

Recommended Tooling for Type "F" Crimp Contacts Used in 82- and 83-Series QWL Connectors with MIL-C-13777.

Publication No.	Contact		Insertion Tool	Removal		Crimping		Setting**
	Size	Type		Tool	Tip	Tool	Positioner or Locator	
MG-1026	16	P	11-7345 *11-7365-1	11-8250 *11-7368	11-3697 11-3697	11-6941-2	11-6932-12	.042-.045
MG-1026	16	S	11-7345 *11-7365-1	11-8250 *11-7368	11-3698 11-3698	11-6941-2	11-6932-11	.042-.045
MG-1026	12	P	11-7082 *11-7365-2	11-8250 *11-7368	11-3696 11-3696	11-6941-2	11-6932-6	.065-.068
MG-1026	12	S	11-7082 *11-7365-2	11-8250 *11-7368	11-3698 11-3698	11-6941-2	11-6932-13	.065-.068
MG-1082	8	P	11-8220 *11-7365-3	11-8250 *11-7368	11-8252 11-7370-3	11-8447-6		.125-.140
MG-1082	8	S	11-8220 *11-7365-3	11-8250 *11-7368	11-8251 11-7674-1	11-8447-6		.125-.140
MG-1082	4	P	*11-7365-4	*11-7368	11-7370-4	11-8447-5		.125-.140
MG-1082	4	S	*11-7365-4	*11-7368	11-7674-2	11-8447-5		.125-.140
MG-1082	0	P	*11-7365-5	*11-7368	11-7370-5	11-8447-4		.165-.180
MG-1082	0	S	*11-7365-5	*11-7368	11-7674-3	11-8447-4		.165-.180

* Used with 11-7364 Arbor Press or equivalent.
** The optimum setting may deviate from the recommended, due to conductor diameter variation in MIL-C-13777 wire.

2-18. Installing Crimped Contacts.

2-19. Determine appropriate tool for contact insertion according to Table III or IV.

2-20. Use Neosol* or equivalent (Federal Specification O-E-760 Grade IV) as a lubricant to aid in the insertion of contacts.

2-21. Two stage insertion for size 16 contacts is necessary to avoid contact bending. Be sure to follow this procedure.

2-22. Grip the shoulder nearest the mating end of the contact with the shoulder of the contact positioned against the shoulder undercut in the tips of the appropriate insertion tool (See Figure 15).

Figure 15. First Stage of Insertion - Size 16.

2-23. Push the contact into the applicable contact hole in the rear face of the insert until the tips of the insertion tool come into contact with the rear face of the insert.

2-24. Reposition the tips of the insertion tool against the rear of the wire well (See Figure 16).

2-25. Push contact until it is properly seated in the insert.

2-26. Size 12 and 8 contacts need not use

*Shell Chemical Company, 380 Madison Avenue, New York 17, New York.

Figure 16. Second Stage of Insertion - Size 16.

the two stage insertion method. Only steps 2-24 and 2-25 are required.

2-27. If arbor press (11-7365) method of insertion is used, contacts and attached wire should be placed in predetermined insertion tip and inserted into their applicable insert hole. Positive stop setting of arbor press will control contact insertion depth.

2-28. Continue in like manner (depending on method of insertion) to seat remainder of contacts.

2-29. Personnel inserting contacts will normally "feel" contact reach its fully seated position. Visually check mating ends of connector to be sure all contacts are properly inserted to same depth.

2-30. Assembling Accessories.

2-31. Select the illustration from Figures 10 through 14 which applies to the accessory being installed. Check lubrication of gasket in housing or adapter. Starting with parts nearest the connector, assemble in the order shown. Gland housings have left hand threads at each end. Adapters (Figures 13 and 14) have left hand threads at the connector end and right hand threads at cable end. Plugs should be mated to corresponding receptacles to facilitate tightening of threaded accessory being installed.

2-32. With types shown in Figures 10 through 12, lubricate the surfaces indicated in Figure 17 with a thin film of Uni-Temp Grease EP*. Be sure not to get lubricant on the cable or on the inside surfaces of the parts as it will reduce the effective grip of the gland on the cable. Attach the gland housing to the connector shell, then slide the first gland washer and gland into the housing making sure they are seated properly. Slide the remaining gland washer or Kellems type grip, whichever is used, into place against the gland and install the gland nut. If a Kellems or similar grip is used, compress the ends toward each other to increase the diameter and permit it to slide along the cable. Preload Kellems grip by stretching it back along the cable so that tightening of the rear nut will cause grip to bite into the outer cable sheath. Banding clamps should be installed as shown in Figure 18.

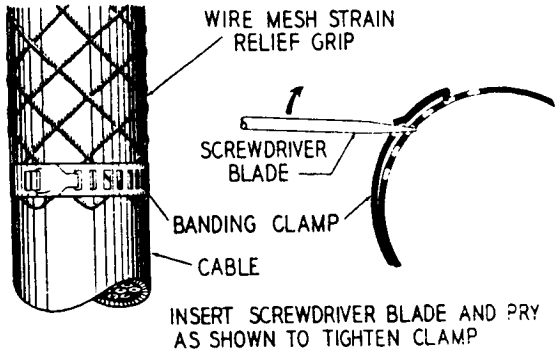


Figure 18. Installing Banding Clamp.

2-33. To assemble the MS3057B cable clamp (Figure 13), attach the adapter to the connector shell and lubricate the surfaces indicated in Figure 19. Do not allow lubricant to get on the inside diameter or on the serrated face of the gland. Assemble the tapered sleeve and gland in clamping nut then slide to adapter. Use a smooth jaw wrench or equivalent to hold adapter from turning while tightening clamping nut.

2-34. When assembling the accessory

*Texaco, Inc.

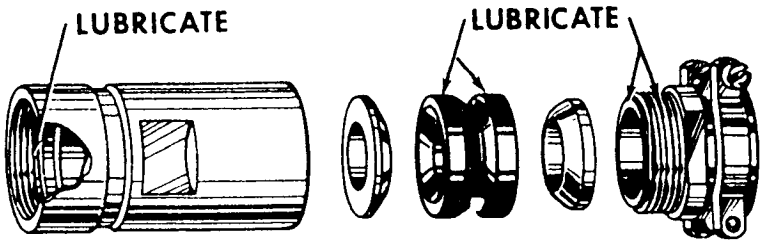


Figure 17. Surfaces to be Lubricated.

shown in Figure 14, first attach the adapter to the connector shell. Work the grommet along the conductors into the recess in the adapter. A 3/8 inch diameter phenolic rod may be shaped like a screw driver with edges rounded and used to help work the grommet into position. Fill any unused grommet holes with correct size plugs as listed in Table V. Check for lubrication on tapered sleeve.

LUBRICATE AREAS AS INDICATED

Figure 19. Lubrication - MS3057B Cable Clamp.

2-35. REPAIR OR REPLACEMENT.

CAUTION

Contacts should be removed only as required. Repeated removal tends to reduce contact retention.

2-36. Removing Contacts for Replacement.

2-37. Unscrew and remove all rear accessories from connector shell. Slide all parts along wires to a position out of the way (including grommet if used.

2-38. Determine the appropriate removal tool from Table III or IV.

2-39. Select and install the correct removal tip.

2-40. Position the tip of the removal tool on/in the contact at the front face of the connector.

2-41. Push the contact back through the insert and remove the contact.

NOTE

Make certain to push the contact in a straight line, parallel to the insert hole, and thus avoid possible damage.

2-42. To replace contacts, follow procedures outlined in paragraphs 2-1 through 2-7 of this section.

TABLE V

Contact Size	Wire Size	Use Plug No.	Color Code
16	22-16	10-101033-12	Blue
12	14-12	10-101033-13	Yellow
8	10-8	10-101033-14	White
4	6-4	10-36750-4	0.312 dia.
0	2-0	10-36750-5	0.500 dia.

SECTION III

QWL - SOLDER TYPE CONTACTS

3-1. INSTALLATION.

3-2. Preparation for Installation.

NOTE

The 10- Series QWL Connectors incorporate factory installed solder type contacts. The accessory assembly sequence is the same as outlined in Section II. Utilize Tables VI and VII to determine "A" and "B" stripping dimensions for use with solder type contacts.

3-3. Make certain that the bare conductors are clean, straight and that the strands are tight together.

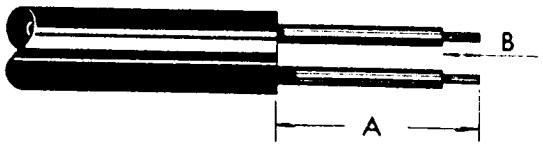


Figure 20. Stripping Dimensions.

TABLE VI

	16	12	8,4,0
Strip Dim. "B"	0.250	0.312	0.625

3-4. Apply a good grade of rosin-alcohol flux to the stripped ends. Do this by dipping

the bare ends in flux about halfway to the insulation. Shake off excess flux. Avoid using excess flux because both flux and solder tend to creep up the conductor during the tinning operation.

3-5. Immediately after fluxing, pre-tin approximately 50% of the length of each exposed conductor end. Use of a solder pot and good grade of 60/40 tin-lead solder at a temperature between 500° and 550°F is recommended (Figure 21). Dip the bare conductor ends into the solder about halfway to the insulation. Hold in bath long enough for the conductors to heat through and tinning of all strands to take place. Avoid overheating which may cause melting, burning or scorching of the insulation. Shake off excess solder when conductors are removed from the bath.

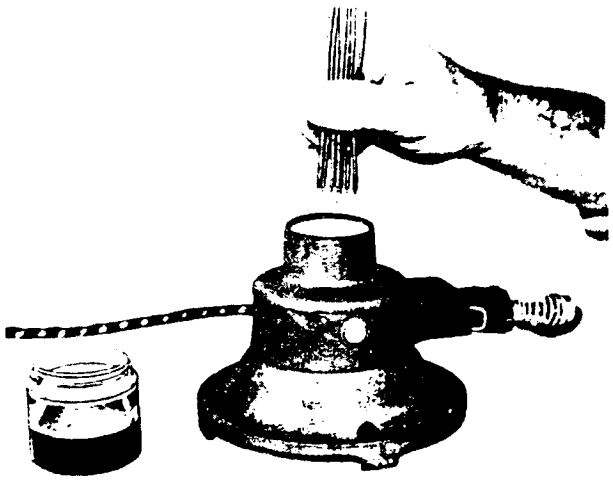


Figure 21. Tinning Wires by Dipping.

3-6. Soldering Contacts.

3-7. Either probe type resistance soldering equipment or a soldering iron is suitable for soldering conductors to contacts installed in connectors. When using an iron, it may be necessary to re-shape the tip to provide for access to contacts in some insert arrangements. The tip should be left as large as practicable in order to obtain the greatest amount of heat transfer in the shortest length of time. Recommended iron sizes are 500 watt for size 0 and 4 contacts, 300 watt for size 8 and 100 to 150 watt for size 12 and 16. The tip should be kept clean, free of pits, and well tinned. Support connectors for soldering in a convenient manner which will leave both hands free for the soldering operation. Jaws of any clamping device should be well covered with some soft material which will prevent damage to the connector shell.

3-8. Soldering Contacts Installed in Inserts.

3-9. The connector should be positioned with the cutaway sides of solderwells as shown in Figure 22. If necessary, the cable being attached should be supported in some convenient manner to avoid any side strain on the connector shell and insert.

3-10. Select the first wire to be soldered and dip in rosin-alcohol flux. It is recommended that soldering start with the bottom row, working across and up.

3-11. Start the wire end into the proper wire well and apply the soldering iron tip or tips of resistance probes (Figure 22) at the side or opposite the cutaway. To avoid a "cold joint", maintain heat until solder both in solder well and on the conductor is completely liquified. Be sure the conductor is pushed to the bottom of the well. Add more solder if needed. Be sure any additional solder melts completely.

Figure 22. Soldering with Resistance Probes.

3-12. While holding the wire steady and properly aligned, remove the heat source and allow solder to cool until completely solid. Permitting the wire to move while the solder is in a plastic state results in crystallization and a weak joint.

3-13. Check to be sure excess solder has not collected on the surfaces of the solderwell. By working quickly, excess may be wiped from the contacts before it solidifies. If heat is necessary to remove excess, hold the wire in correct alignment, as before, until solder in the well is completely solid.

3-14. Proceed in like manner to attach remaining wires to contacts.

3-15. After soldering is complete, remove all excess flux using a stiff brush dipped in Neosol* or equivalent. Allow areas to dry

*Shell Chemical Co., 380 Madison Avenue, New York, 17, N. Y.

thoroughly.

3-16. Soldering Contacts Removed from Inserts.

3-17. Size 0, 4, and 8 contacts may be removed from inserts in QWL Series connectors for soldering if desired. Special pressurized QWL connectors do exist in which the contacts are bonded into the insert and should not be removed for soldering. These special connectors are identified by part numbers other than the standard connector series which uses 10-107XXX as its part number.

3-18. Remove size 8 or larger contacts from inserts by applying pressure on the solder well end. Use a non-metallic rod slightly smaller in diameter than the contact wirewell and a support block with a hole drilled large enough for the contact to pass through (See Figure 23).

NOTE

If crimp type QWL connectors are also being used, the appropriate insertion or removal tools from Tables III and IV may be utilized. Contact will be removed in opposite directions.

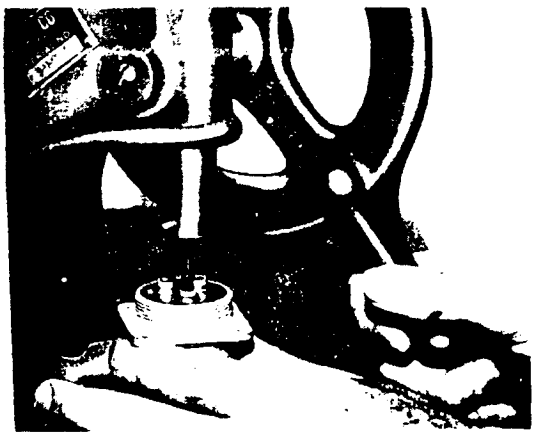


Figure 23. Removing Contacts.

3-19. Support the contact to be soldered in a block having a hole slightly larger than the contact diameter (Figure 24). Apply rosin-alcohol flux to the pre-tinned conductor end or the solder well. Heat the wirewell of the contact with a soldering iron or small torch until solder begins to melt. Continue heating and push the conductor into the well. Maintain heat long enough to be certain solder on the conductor becomes completely liquid but avoid melting or scorching insulation. Add more solder if needed. While holding the wire steady and in line with the contact, remove the heat source and allow the solder to completely solidify. Check to be sure excess solder has not collected outside the solderwell. Remove excess flux with alcohol.

3-20. After soldering is complete, push contacts back into position in the solderwell end of the insert. Contacts may be moistened with Neosol* or equivalent to aid in reassembly. Do not use any other type of lubricant.

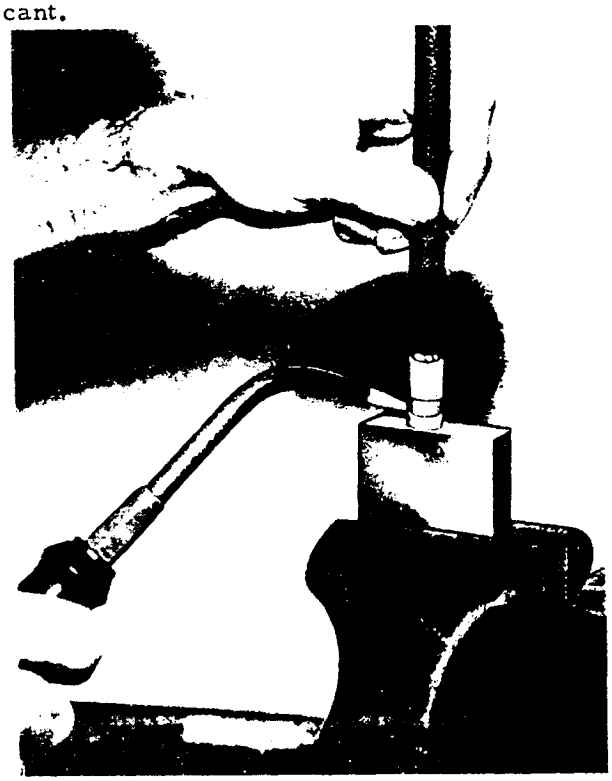


Figure 24. Soldering Wire to Large Contact.

3-21. Assembly of Accessories.

3-22. Proceed with accessory assembly as outlined in paragraphs 2-30 thru 2-34, Section II.

3-23. REPAIR OR REPLACEMENT.

3-24. To remove and replace one or more conductors or a complete connector, access to the wire well is necessary. If a cable accessory is installed, refer to Figures 10 through 14 for parts identification and to determine their relative positions in the assembly.

3-25. For all accessories except those with a Kellems or similar type grip, loosen the bar clamp, if used, and unscrew the gland nut or clamping nut. Gland nuts have left hand threads, clamping nuts (Figures 13 and 14) have right hand threads. Unscrew the gland housing or adapter from the con-

*Shell Chemical Co., 380 Madison Avenue, New York, N. Y.

nector shell and move it back along the cable. Cables should be held to prevent twisting when unscrewing gland housing.

3-26. If a Kellems type grip is installed unscrew the gland nut. Hold the cable from twisting and unscrew the gland housing from the connector. Loosen the wire mesh grip by pushing the housing a couple of inches away from the connector. Grasp the grip at each end and push the ends toward each other. This increases the diameter of the grip so it and the housing can be moved along the cable away from the connector.

3-27. Unsolder conductors from contacts.

3-28. Refer to paragraphs 3-1 through 3-20, Section III, for recommended preparation and soldering procedures.

TABLE VII

"A" Stripping Dimension for AN/MS Solder Type Contacts Used in 10-QWL Series Connectors

Accessory or Adapter P/N	10-248588 10-101334, 10-101335 10-101332, 10-101333				10-113637, 10-248956, 10-242916				10-130380			
Contact Size	16	12	8,4	0	16	12	8,4	0	16	12	8,4	0
Dash No.												
121	1.000	1.125										
122	1.687	1.812										
123	1.375	1.500										
141	.875	1.000	1.125		4.312	4.437	4.562		.875	1.000	1.125	
142	.938	1.062	1.188		4.312	4.437	4.562		1.125	1.250	1.375	
143	.875	1.000	1.125		4.312	4.437	4.562					
144	1.562	1.687	1.812		4.312	4.437	4.562					
145	1.125	1.250	1.375									
146	1.562	1.687	1.812									
151	1.562	1.687	1.812									
161	.844	.969	1.093						.844	.969	1.093	
162	1.156	1.281	1.406						1.156	1.281	1.406	
163	1.719	1.844	1.969									
164	1.156	1.281	1.406									
165	1.156	1.281	1.406									
166	1.719	1.844	1.969									
167	.937	1.062	1.187									
171	1.468	1.593	1.719		4.312	4.437	4.562		1.218	1.344	1.469	
172	1.218	1.344	1.469		4.312	4.437	4.562		1.719	1.844	1.969	
173	1.719	1.844	1.969									
174	1.468	1.593	1.719									
175	1.468	1.593	1.719									
181	1.468	1.593	1.719		4.312	4.437	4.562		1.719	1.844	1.969	
182	1.719	1.844	1.969						1.719	1.844	1.969	
183	1.468	1.593	1.719						1.500	1.625	1.750	
184	1.719	1.844	1.969						1.719	1.844	1.969	
185	1.468	1.593	1.719						1.719	1.844	1.969	
186	1.719	1.844	1.969						1.468	1.593	1.719	
187	1.719	1.844	1.969									
188	1.468	1.593	1.719									
190	1.719	1.844	1.969									
201	1.719	1.844	1.969		4.312	4.437	4.562		1.719	1.844	1.969	
202	1.719	1.844	1.969		5.312	5.437	5.562		1.468	1.593	1.719	
203	1.719	1.844	1.969		4.312	4.437	4.562		1.687	1.812	1.937	
204	1.500	1.625	1.750						1.719	1.844	1.969	
205	1.719	1.844	1.969		4.312	4.437	4.562		1.719	1.844	1.969	
206	1.468	1.593	1.719						1.719	1.844	1.969	
207	1.500	1.625	1.750						1.719	1.844	1.969	

TABLE VII (Continued)

"A" Stripping Dimension for AN/MS Solder Type Contacts Used in 10-QWL Series Connectors

Accessory or Adapter P/N		10-246568, 10-101334, 10-101335, 10-101332, 10-101333				10-113637, 10-248956, 10-242916				10-130380			
Contact Size		16	12	8,4	0	16	12	8,4	0	16	12	8,4	0
Dash No.	208	1.719	1.844	1.969									
	209	1.468	1.593	1.719									
	210	1.468	1.593	1.719									
	211	1.719	1.844	1.969									
	221	1.719	1.844	1.969	1.656	4.625	4.750	4.875	4.562	1.719	1.844	1.969	1.656
	222	1.719	1.844	1.969	1.656	3.562			3.500	1.719	1.844	1.969	1.656
	223	1.719	1.844	1.969	1.656	4.312	4.438	4.562	4.250	1.812	1.937	2.062	1.750
	224	1.719	1.844	1.969	1.656	4.312	4.438	4.562	4.250	1.719	1.844	1.969	1.656
	225	1.719	1.844	1.969	1.656	4.312	4.438	4.562	4.250				
	226	1.719	1.844	1.969	1.656								
	227	1.719	1.844	1.969	1.656								
	228	1.719	1.844	1.969	1.656								
	229	1.625	1.750	1.875	1.562								
	231	1.719	1.844	1.969	1.656	5.312	5.437	5.562	5.250				
	241	1.812	1.937	2.062	1.750	4.719	4.844	4.969	4.656				
	242	1.781	1.906	2.031	1.719	4.719	4.844	4.969	4.656	1.781	1.906	2.031	1.719
	243	1.812	1.937	2.062	1.750	5.375	5.500	5.625	5.312	1.781	1.906	2.031	1.719
	244	1.812	1.937	2.062	1.750	5.375	5.500	5.625	5.312	1.781	1.906	2.031	1.719
	245	1.812	1.937	2.062	1.750	5.375	5.500	5.625	5.312	1.781	1.906	2.031	1.719
	246	1.687	1.812	1.937	1.625	4.719	5.844	5.969	4.656	1.781	1.906	2.031	1.719
	247	1.781	1.906	2.031	1.719								
	248	1.812	1.937	2.062	1.750								
	249	1.812	1.937	2.062	1.750								
	281	1.812	1.937	2.062	1.750	4.375	4.500	4.625	4.312	1.781	1.906	2.031	1.719
	282	1.812	1.937	2.062	1.750	4.375	4.500	4.625	4.312	1.781	1.906	2.031	1.719
	283	1.812	1.937	2.062	1.750	5.375	5.500	5.625	5.312	1.781	1.906	2.031	1.719
	284	1.812	1.937	2.062	1.750	4.375	4.500	4.625	4.312	1.750	1.875	2.000	1.688
	285	1.812	1.937	2.062	1.750	5.375	5.500	5.625	5.312				
	286	1.812	1.937	2.062	1.750	5.375	5.500	5.625	5.312				
	287	1.812	1.937	2.062	1.750	4.375	4.500	4.625	4.312				
	288	1.812	1.937	2.062	1.750	5.375	5.500	5.625	5.312				
	289	1.812	1.937	2.062	1.750	5.375	5.500	5.625	5.312				
	290	1.812	1.937	2.062	1.750	5.375	5.500	5.625	5.312				
	291	1.812	1.937	2.062	1.750	4.375	4.500	4.625	4.312				
	293	1.719	1.844	1.969	1.656	5.375	5.500	5.625	5.312				
	293	1.781				5.375	5.500	5.625	5.312				
	294	1.781				5.375	5.500	5.625	5.312				
	295	1.875				4.375	4.500	4.625	4.312				

TABLE VII (Continued)

"A" Stripping Dimension for AN/MS Solder Type Contacts Used in 10-QWL Series Connectors

Accessory or Adapter P/N		10-248588, 10-101334, 10-101335, 10-101332, 10-101333				10-113637, 10-248956, 10-242916				10-130380			
Contact Size		16	12	8,4	0	16	12	8,4	0	16	12	8,4	0
Dash No.	321	1.875	2.000	2.125	1.812	6.437	6.562	6.687	6.375	1.843	1.969	2.093	1.781
	322	1.875	2.000	2.125	1.812	5.437	5.562	5.687	5.375	1.843	1.969	2.093	1.781
	323	1.875	2.000	2.125	1.812	5.437	5.562	5.687	5.375				
	324	1.875	2.000	2.125	1.812	6.437	6.562	6.687	6.375				
	325	1.875	2.000	2.125	1.812	6.437	6.562	6.687	6.375				
	326	1.906	2.031	2.156	1.843	5.437	5.562	5.687	5.375				
	327	1.875	2.000	2.125	1.812								
	328	1.875	2.000	2.125	1.812								
	329	1.875	2.000	2.125	1.812								
	330	1.875	2.000	2.125	1.812								
	331	1.875	2.000	2.125	1.812								
	332	1.875	2.000	2.125	1.812								
	333	1.875	2.000	2.125	1.812								
	334	1.875	2.000	2.125	1.812								
	335	1.875	2.000	2.125	1.812								
	336	1.875	2.000	2.125	1.812								
	337	1.906	2.031	2.156	1.843								
	361	1.875	2.000	2.125	1.812	5.437	5.562	5.687	5.375	1.843	1.968	2.093	1.781
	362	1.875	2.000	2.125	1.812	5.437	5.562	5.687	5.375	1.968	2.093	2.219	1.906
	363	1.875	2.000	2.125	1.812	6.562	6.687	6.812	6.500	1.843	1.968	2.093	1.781
	364	1.875	2.000	2.125	1.812	5.437	5.562	5.687	5.375	1.843	1.968	2.093	1.781
	365	1.875	2.000	2.125	1.812	5.437	5.562	5.687	5.375				
	366	1.875	2.000	2.125	1.812	5.437	5.562	5.687	5.375				
	367	1.875	2.000	2.125	1.812	5.437	5.562	5.687	5.375				
	368	1.875	2.000	2.125	1.812	6.562	6.687	6.812	6.500				
	369	1.875	2.000	2.125	1.812	6.562	6.687	6.812	6.500				
	370	1.968				6.562	6.687	6.812	6.500				
	371	1.875	2.000	2.125	1.812								
	372	1.968	2.093	2.219	1.906								
	373	1.875	2.000	2.125	1.812								
	374	1.875	2.000	2.125	1.812								
	375	1.968	2.093	2.219	1.906								
	376	1.875	2.000	2.125	1.812								
	377	1.875	2.000	2.125	1.812								
	378	1.875	2.000	2.125	1.812								
	379	1.875	2.000	2.125	1.812								
	401	1.875	2.000	2.125	1.812	6.562	6.687	6.812	6.500	1.843	1.968	2.093	1.781
	402	1.875	2.000	2.125	1.812	6.562	6.687	6.812	6.500	1.750	1.875	2.000	1.688

TABLE VII (Continued)

"A" Stripping Dimension for AN/MS Solder Type Contacts Used in 10-QWL Series Connectors

Accessory or Adapter P/N		10-248588, 10-101334, 10-101335, 10-101332, 10-101333				10-113637, 10-248956, 10-242916				10-130380			
Contact Size		16	12	8,4	0	16	12	8,4	0	16	12	8,4	0
Dash No.	403	1.875	2.000	2.125	1.812	6.562	6.687	6.812	6.500	1.843	1.968	2.093	1.781
	404	1.875	2.000	2.125	1.812	6.562	6.687	6.812	6.500				
	405	1.875	2.000	2.125	1.812	6.437	6.562	6.688	6.375				
	406	1.875	2.000	2.125	1.812	6.437	6.562	6.688	6.375				
	407	1.937	2.062	2.188	1.875	6.437	6.562	6.688	6.375				
	408	1.937	2.062	2.188	1.875	6.437	6.562	6.688	6.375				
	409	1.937	2.062	2.188	1.875								
	410	1.937	2.062	2.188	1.875	6.562	6.687	6.812	6.500				
	411	1.875	2.000	2.125	1.812	6.562	6.687	6.812	6.500				
	412	1.968	2.093	2.219	1.906	9.562	9.687	9.812	9.500				
	413	1.968	2.093	2.219	1.906	9.562	9.687	9.812	9.500				
	414	1.968	2.093	2.219	1.906	10.437	10.562	10.688	10.375				
	415	1.875	2.000	2.125	1.812	6.437	6.562	6.688	6.375				
	416	1.875	2.000	2.125	1.812	5.437	5.562	5.688	5.375				
	417	1.875	2.000	2.125	1.812	5.437	5.562	5.688	5.375				
	441	2.000	2.125	2.250	1.938	6.437	6.562	6.688	6.375				
	442	2.000	2.125	2.250	1.938	6.437	6.562	6.688	6.375				
	443	2.000	2.125	2.250	1.938	6.437	6.562	6.688	6.375				
	444					6.437	6.562	6.688	6.375				
	445	2.625	2.750	2.875	2.563	6.437	6.562	6.688	6.375				
	446					5.312	5.438	5.562	5.250				
	447					6.437	6.562	6.688	6.375				
	448					6.437	6.562	6.688	6.375				
	449					6.437	6.562	6.688	6.375				
	450					6.312	6.437	6.562	6.250				
	481	1.687	1.812	1.937	1.625	6.437	6.562	6.688	6.375				
	482	2.625	2.750	2.875	2.562	6.437	6.562	6.688	6.375				
	483	1.875	2.000	2.125	1.812	6.437	6.562	6.688	6.375				
	484	1.875	2.000	2.125	1.812	6.437	6.562	6.688	6.375				
	485					6.437	6.562	6.688	6.375				
	486					6.437	6.562	6.688	6.375				

TABLE VII (Continued)

"A" Stripping Dimension for AN/MS Solder Type Contacts Used in 10-QWL Series Connectors

Accessory or Adapter P/N		10-113138			
Contact Size		16	12	8,4	0
Dash No.	8	1.250			
	10	1.250			
	12	1.188	1.313	1.438	
	13	1.250	1.375	1.500	
	14	1.188	1.313	1.438	
	15	1.250	1.375	1.500	
	16	1.188	1.313	1.438	1.125
	17	1.250	1.375	1.500	1.188
	18	1.250	1.375	1.500	1.188
	20	1.250	1.375	1.500	1.188
	22	1.250	1.375	1.500	1.188
	24	1.281	1.406	1.531	1.219
	28	1.468	1.593	1.719	1.406
	32	1.531	1.656	1.781	1.469
	36	1.531	1.656	1.781	1.469
	40	1.531	1.656	1.781	1.469
	44	1.406	1.531	1.656	1.343
	48	1.468	1.593	1.719	1.406