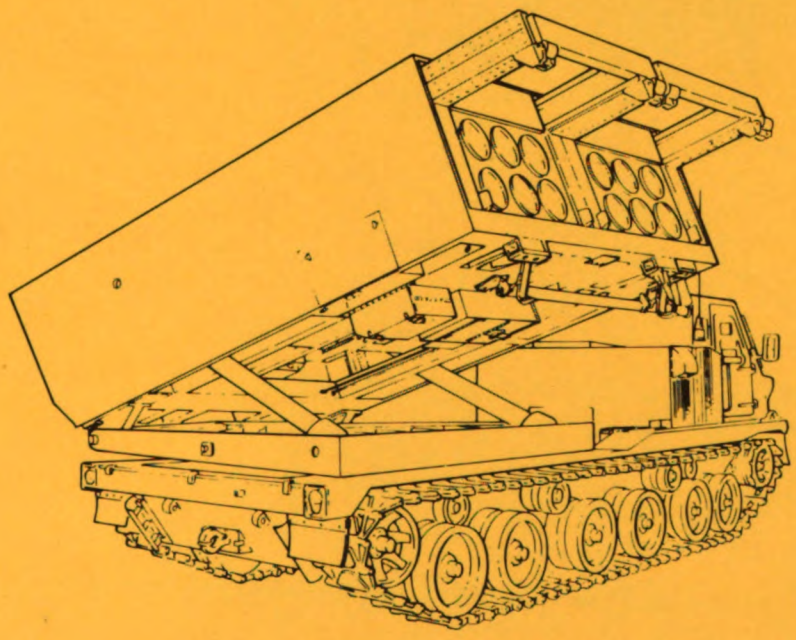
TM 9-1425-646-40

TECHNICAL MANUAL

MAINTENANCE INSTRUCTIONS
GENERAL SUPPORT

LAUNCHER, ROCKET,
ARMORED VEHICLE MOUNTED: M270
(1055-01-092-0596)



MULTIPLE LAUNCH ROCKET SYSTEM

840723-5

DEPARTMENT OF THE ARMY

JULY 1984

WARNING SUMMARY

Listed below is a summary of all warnings that appear in this manual. Warnings relating to the same hazard or those repeated several times throughout the manual are summarized and appear only once on this page. Safety instructions, hazard identification, and warnings for ammunition handling are contained in TM 9-1300-206.

WARNING

Drycleaning solvent.

P-D-680 SOLVENT vapors are toxic. Avoid prolonged or repeated breathing of vapors or solvent contact with skin. Use only with adequate ventilation. Solvent is flammable and should not be used near open flame. Fire extinguishers should be readily available when solvent is used.

WARNING

Methyl-ethyl-ketone.

METHYL-ETHYL-KETONE vapors are toxic. Avoid prolonged or repeated breathing of vapors or contact with skin. Use only with adequate ventilation. Methyl-ethyl-ketone is flammable and should not be used near open flame. Fire extinguisher should be available when solvent is used.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 21-11.

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands or vertical lines in outer margin of page. Extensively changed illustrations are indicated by a miniature pointing hand symbol pointing to the words MAJOR CHANGE.

Dates of issue for original and changed pages are:

Original 0 . . . 16 July 1984

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 191 CONSISTING OF THE FOLLOWING:

Page No.	*Change No.
Cover	0
a	0
b Blank	0
A	0
B Blank	0
i thru vi	0
1-1 thru 1-4	0
2-1 thru 2-151	0
2-152 Blank.	0
A-1	0
A-2 Blank	0
B-1	0
B-2	0
C-1 thru C-4	0
D-1	0
D-2 Blank	0
Glossary-1 thru Glossary-3	0
Glossary-4 Blank	0
Index-1 thru Index-3	0
Index-4 Blank	0
FO-1 (1)	0
FO-1 (2)	0
FO-2	0
FO-3	0
FO-4	0
FO-5	0

*Zero in this column indicates an original page.

ARMY

TECHNICAL MANUAL)
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No. 9-1425-646-40)

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *16 July 1984*

GENERAL SUPPORT MAINTENANCE MANUAL
LAUNCHER, ROCKET, ARMORED
VEHICLE MOUNTED: M270
(1055-01-092-0596)
MULTIPLE LAUNCH ROCKET SYSTEM

TABLE OF CONTENTS

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Missile Command; Attn: DRSMI-SNPM, Redstone Arsenal, AL 35898. A reply will be furnished to you.

LIST OF ILLUSTRATIONS

LIST OF TABLES

LIST OF TABLES – Continued

HOW TO USE THIS MANUAL

This manual is your guide for performing general support maintenance on the Armored Vehicle Mounted Rocket Launcher: M270 components. It begins with general information you need, such as which forms and records you must have, a description of the equipment, something about the tools and equipment required, and some information about spare and repair parts.

To locate information in this manual, use the front cover index, the Table of Contents, the Chapter Contents, or the Alphabetical Index. The front cover index lists the major subjects contained in the manual and the page on which each subject is located. Black tabs on manual pages correspond to front cover index major subject tabs and to boxed heads in the Table of Contents. These black tabs may be used to locate each of the major subjects in the manual. The Table of Contents, in the front of the manual, locates general subjects. The Alphabetical Index is more detailed and will locate specific items. If you need to know where the maintenance procedures are located, look in the Table of Contents. But if you need to know how to remove and install the resolver/connector in the azimuth transducer/switch assembly, look in the Alphabetical Index to locate the procedures. Refer to the illustrated sample.

Maintenance information includes troubleshooting and maintenance procedures. Troubleshooting tests will provide you with solutions to most equipment malfunctions. The solution will often be a maintenance action described in the maintenance procedures. These procedures contain instructions for doing all the tasks that are necessary to restore the equipment to operating condition. You should familiarize yourself with the entire maintenance procedure before beginning the maintenance task.

The maintenance instruction paragraphs cover the maintenance tasks for the items of that component or assembly for which maintenance is authorized by the Maintenance Allocation Chart (MAC) in Appendix B of TM 9-1425-646-20. The maintenance task for each item within the paragraph may be completed as an individual task. It is not necessary to perform the tasks on all items in the paragraph if only one item requires maintenance.

Each maintenance instruction has a paragraph number, title, list of tasks, and initial setup information you need to know before starting the job. The initial setup includes, as required, the following critical information:

Test/Support Equipment – Lists all the test equipment required to perform adjustment or checkout. Also, will list all the support equipment needed for the maintenance procedure. If no test or support equipment is required, heading is omitted.

Tools – Lists the tool kit and any special tools required to perform the tasks. If no tools are required, heading is omitted.

Fabricated Tools – Lists any tool which must be fabricated along with the reference to the appendix containing the fabrication details. If no fabricated tools are required, heading is omitted.

Materials/Parts – Lists all consumable parts and materials required to perform the tasks with reference to an item in Appendix B. If no parts or materials are required, heading is omitted.

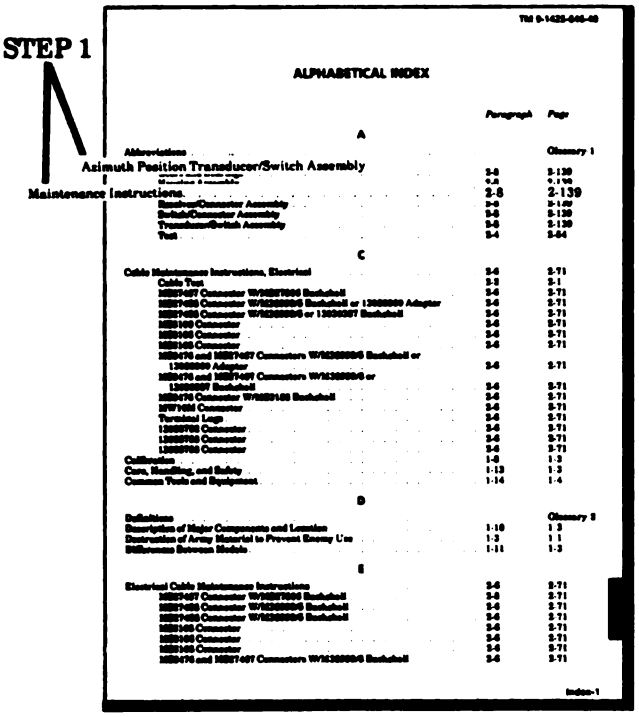
Personnel Required – Lists the number of personnel and their MOS required to perform the tasks.

References – Lists all technical manuals required to complete the tasks. If no other technical manual is required, heading is omitted.

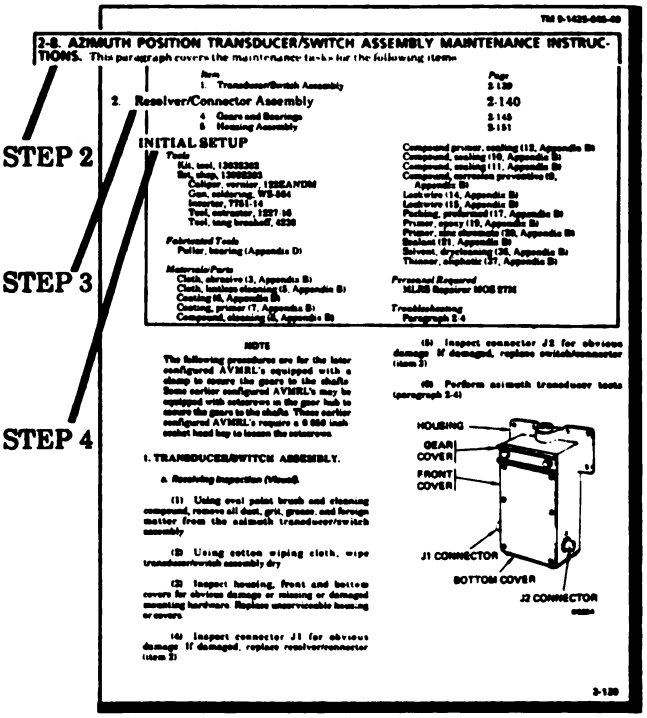
Troubleshooting – Lists the paragraph number (within this manual) or TM that contains the troubleshooting procedure for the maintenance tasks. If no troubleshooting is required, heading is omitted.

You are responsible for performing general support maintenance to maintain the equipment. This manual will help you do that job. So become familiar with it, read it all, including introductory and general information paragraphs. A complete understanding of this manual, as well as the equipment, will make your job considerably easier.

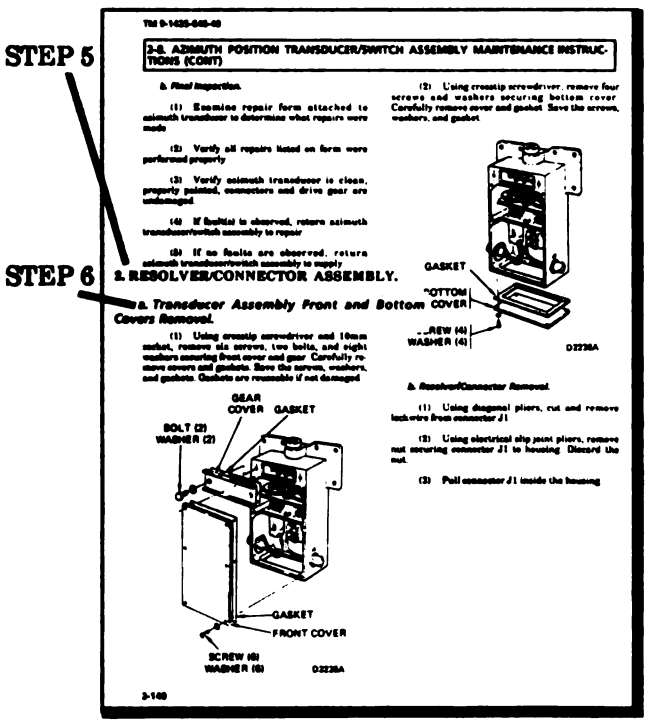
HOW TO USE ALPHABETICAL INDEX



STEP 1. Find item in Alphabetical Index.



STEP 2. Locate paragraph.
STEP 3. Locate item and page.
STEP 4. Check initial setup.



STEP 5. Locate page and item.
STEP 6. Perform task.

CHAPTER 1
INTRODUCTION

CHAPTER CONTENTS

Section I. GENERAL INFORMATION

1-1. SCOPE. This manual contains the general support maintenance instructions for the Armored Vehicle Mounted Rocket Launcher M270. This rocket launcher (figure 1-1) is a mobile, medium-range rocket launching system which is a major component of the Multiple Launch Rocket System (MLRS). The MLRS consists of a M993 tracked vehicle, a M269 rocket launcher, and two 298 millimeter rocket pods. Each rocket pod contains six rockets.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS. Department of the Army forms and procedures used for general support maintenance are those prescribed by DA Pamphlet 738-750, The Army Maintenance Management System. Accidents involving injury to personnel or damage to materiel will be reported on DA Form 285, Accident Report, in accordance with AR 385-40. Explosive ammunition malfunctions will be reported in accordance with AR 75-1.

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE. Special instructions for the destruction of the Armored Vehicle Mounted Rocket Launcher M270 are contained in TM 43-0002-26.

1-4. PREPARATION FOR STORAGE AND SHIPMENT. Refer to TM 38-75 for administrative storage and TM 743-200-1 for storage and materiels handling.

1-1. SCOPE (CONT)

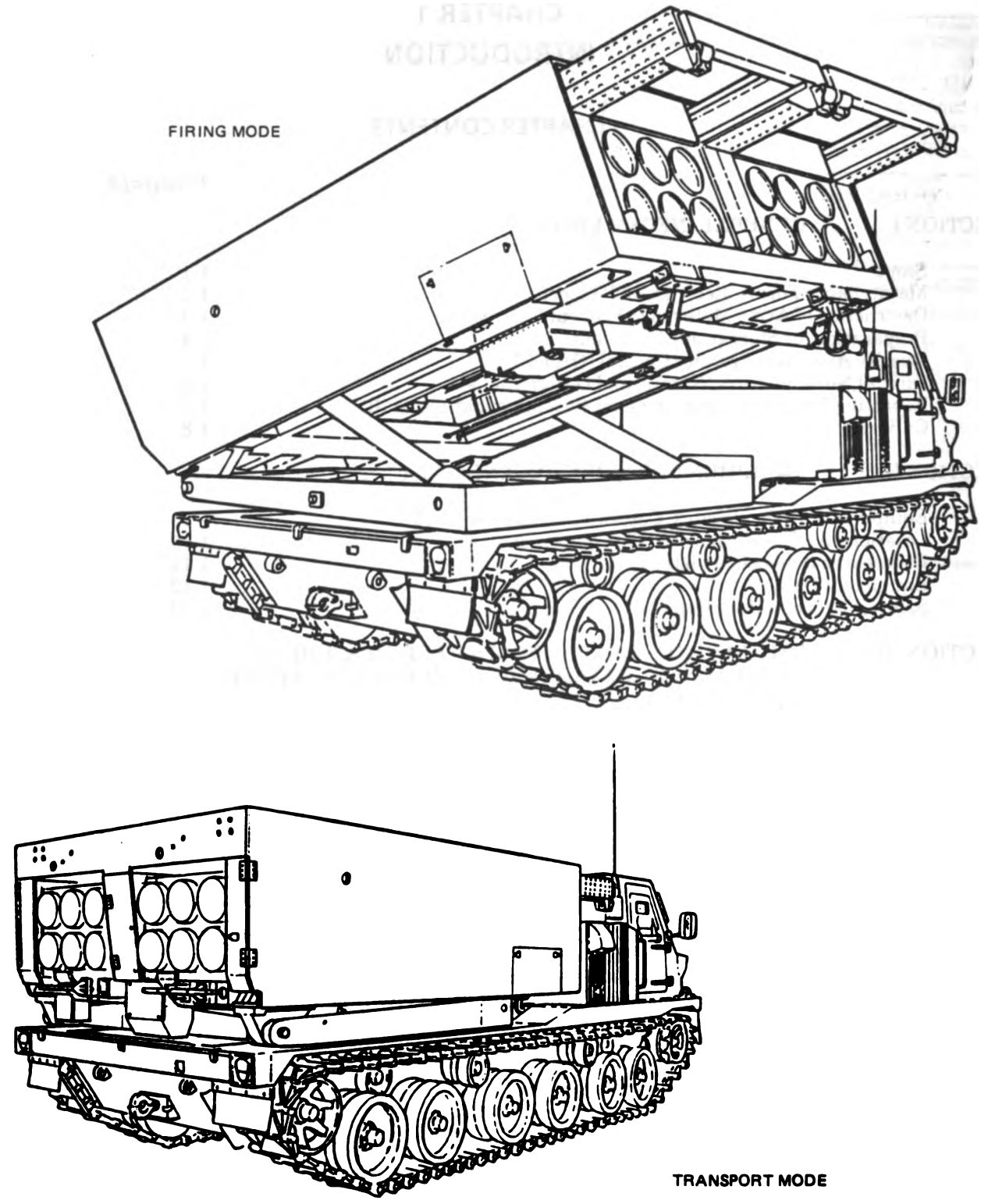


Figure 1-1. Armored Vehicle Mounted Rocket Launcher: M270

1-5. QUALITY ASSURANCE/QUALITY CONTROL (QA/QC). Criteria for quality control inspection for direct and general support shall be in accordance with TM 750-245-8.

1-6. OFFICIAL NOMENCLATURE, NAMES, AND DESIGNATIONS. Table 1-1 is the nomenclature cross-reference list used in this manual.

Table 1-1. Nomenclature Cross-Reference List

COMMON NAME	OFFICIAL NOMENCLATURE
Launcher Loader, Self-Propelled (SPLL)	Launcher, Rocket, Armored Vehicle Mounted: M270
Launcher Loader Module (LLM)	Launcher, Rocket: M269
Launch Pod/ Container, Loaded (LP/C)	Rocket Pod, 298 Millimeter: M26
Launch Pod/ Container, Trainer (LP/C)	Rocket Pod, 298 Millimeter, Training: M27

1-7. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). If your MLRS needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on a SF 368 (Quality Deficiency Report). Mail it to us at U.S. Army Missile Command, ATTN: DRSMI-SNEM, Redstone Arsenal, AL 35898. We'll send you a reply.

1-8. CALIBRATION. At the time calibration requirements are finally determined, the equipment requiring calibration will be identified and the publications containing calibration procedures will be listed. Refer to TB 750-25 for calibration records and procedures.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-9. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES. Information on the MLRS characteristics, capabilities, and features is contained in the Operator's Manual TM 9-1425-646-10.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. Component location is shown in the Organizational Maintenance Manual TM 9-1425-646-20. A description of the components is in the Operator's Manual TM 9-1425-646-10. Location and description of major components of the MLRS carrier are contained in TM 9-1450-646-10.

1-11. DIFFERENCES BETWEEN MODELS. There are no model differences between the self-propelled launcher loaders.

1-12. EQUIPMENT DATA. Data regarding physical and operational characteristics of the MLRS is in the Operator's Manual TM 9-1425-646-10.

1-13. SAFETY, CARE, AND HANDLING. Instructions for care and handling, and the safety precautions required to properly handle the rockets are provided in TM 9-1425-646-10. General ammunition safety, care, and handling instructions are contained in TM 9-1300-206. Safety, care, and handling instructions and important precautions to be observed for maintaining the MLRS are provided in the procedures as they occur.

Section III. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

1-14. COMMON TOOLS AND EQUIPMENT. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

1-15. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT. Special tools, TMDE, and support equipment authorized for use at General Support maintenance level are listed and illustrated in Repair Parts and Special Tools List TM 9-1425-646-34P.

1-16. REPAIR PARTS. Repair parts are listed and illustrated in the Repair Parts and Special Tools List TM 9-1425-646-34P.

CHAPTER 2
TROUBLESHOOTING AND MAINTENANCE INSTRUCTIONS

CHAPTER CONTENTS

Section I. TROUBLESHOOTING

2-1. INTRODUCTION. This section contains various cabling tests and tests and adjustments for elevation and azimuth transducers. These tests and adjustments constitute troubleshooting at the general support level.

2-2. CABLE TEST.

a. General. Troubleshooting (test) procedures for the SPLL cables are performed with the aid of adapter cables and a PDC Inc Model 128A circuit tester. These procedures are performed before repair (fault isolation) and after repair (repair verification). Repair of a cable assembly is limited to the replacement of connectors and/or terminal lugs. Refer to paragraph 2-6 for cable maintenance instructions. Refer to TM 9-4935-647-14, for operation and maintenance of the circuit tester. Refer to TM 9-24935-646-14 for adapter cables operating and maintenance instructions.

b. Cable Test Setup.

(1) Connect adapter cable connector WT1-P1 to J39 on input cable test box and connector WT1-P2 to J2 on circuit tester.

(2) Connect adapter cable connector WT3-P5 to J81 on output cable test box and WT3-P6 to J3 on circuit tester.

(3) Connect interface cable connector WT2-P3 to J38 on input cable test box and connector WT2-P4 to J80 on output cable test box.

(4) Set controls on circuit tester to measure continuity resistance of each conductor. Continuity resistance of each conductor shall not exceed 0.50 ohm.

(5) Set controls on circuit tester to measure insulation resistance between conductors. With 500 volts dc applied for 5 seconds, the insulation resistance between each conductor and connector shell and each conductor shall be a minimum of 200 megohms.

(6) Refer to table 2-1 for location of test procedure on each cable.

(7) After completion of tests, disconnect test setup and complete all required forms. Attach forms to cable and route cable to repair or to supply.

2-2. CABLE TEST (CONT)

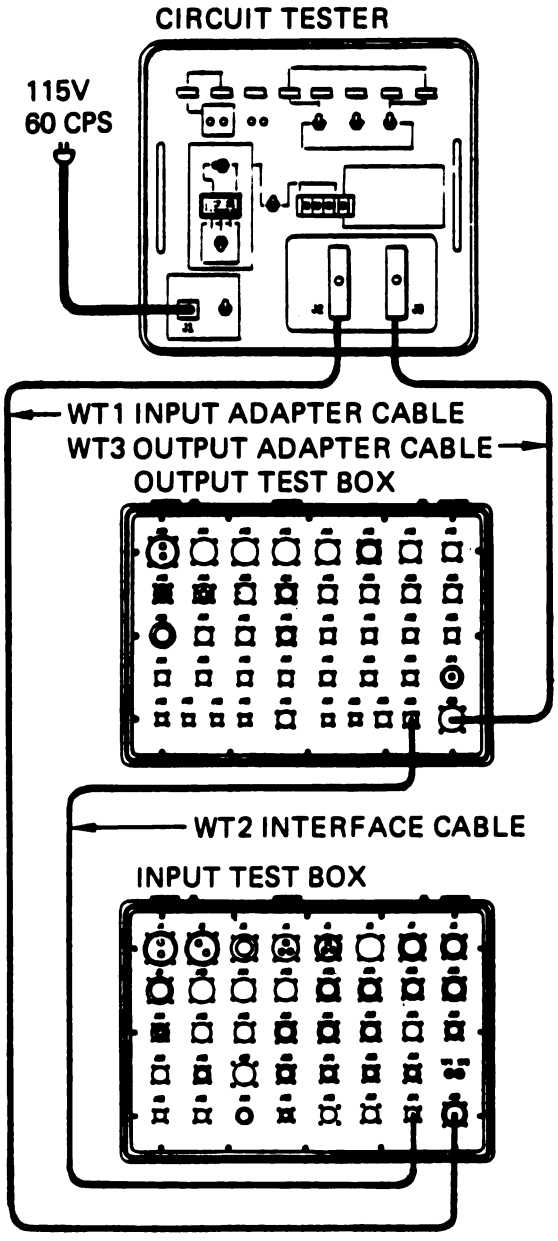


Table 2-1. Cable Test Procedure

CABLE NO.	TEST	PAGE
W1 (Test 1)	1	2-3
W1 (Test 2)	2	2-6
W4	3	2-8
W6	4	2-9
W10	5	2-11
W12	6	2-12
W15	7	2-13
W23 (Test 1)	8	2-14
W23 (Test 2)	9	2-16
W23 (Test 3)	10	2-17
W24	11	2-17
W25	12	2-20
W26	13	2-22
W27	14	2-23
W32 (Test 1)	15	2-24
W32 (Test 2)	16	2-25
W34	17	2-25
W35 (Test 1)	18	2-26
W35 (Test 2)	19	2-27
W35 (Test 3)	20	2-28
W40	21	2-28
W41	22	2-29
W43	23	2-30
W53	24	2-30
W57	25	2-31
W59	26	2-32
W60	27	2-35
W61	28	2-37
W67	29	2-38
W68	30	2-40
W74	31	2-43
W75	32	2-44
W76	33	2-45
W80	34	2-46
W81	35	2-47
W82	36	2-48
W83	37	2-48
W84	38	2-49

2-2. CABLE TEST (CONT)

c. *Test Procedures.*

(1) Cable W1, Test No. 1.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-2.

(d) Connect cable connector W1J2 to J7 of input cable test box.

(e) Connect cable connector W1P2 to J43 of output cable test box.

(f) Connect cable connector W1P3 to J72 of output cable test box.

(g). Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-2. Cable W1 Test No. 1 Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W1J2/1	W1P2/1		
2	W1J2/95	W1P3/B		
3	W1J2/90	W1P2/90		
4	W1J2/91	W1P2/91		
5	W1J2/92	J1P2/92		
6	W1J2/93	W1P2/93		
7	W1J2/94	W1P3/C		
8	W1J2/8	W1P2/8		
9	W1J2/9	W1P2/9		
10	W1J2/10	W1P2/10		
11	W1J2/11	W1P2/11		
12	W1J2/12	W1P2/12		
13	W1J2/13	W1P2/13		
14	W1J2/14	W1P2/14		
15	W1J2/15	W1P2/15		
16	J7/16	J43/16	Restart	Open
17	W1J2/17	W1P2/17		
18	W1J2/18	W1P2/18		
19	W1J2/19	W1P2/19		
20	W1J2/20	W1P2/20		
21	W1J2/21	W1P2/21		
22	W1J2/22	W1P2/22		
23	W1J2/23	W1P2/23		
24	W1J2/24	W1P2/24		
25	J7/25	J43/25	Restart	Open
26	W1J2/26	W1P2/26		
27	W1J2/27	W1P2/27		
28	W1J1/29	W1P2/29		

Table 2-2. Cable W1 Test No. 1 Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
29	W1J1/30	W1P2/30		
30	W1J1/31	W1P2/31		
31	W1J1/32	W1P2/32		
32	W1J1/33	W1P2/33		
33	W1J1/34	W1J1/34		
34	J7/36	J43/36	Restart	Open
35	W1J2/37	W1P2/37		
36	W1J1/38	W1P2/38		
37	W1J2/39	W1P2/39		
38	W1J2/40	W1P2/40		
39	W1J2/41	W1P2/41		
40	J7/42	J43/42	Restart	Open
41	W1J2/43	W1P2/43		
42	W1J2/44	W1P2/44		
43	W1J2/45	W1P2/45		
44	W1J2/46	W1P2/46		
45	W1J2/47	W1P2/47		
46	W1J2/48	W1P2/48		
47	J7/49	J43/49	Restart	Open
48	J7/50	J43/50	Restart	Open
49	J7/51	J43/51	Restart	Open
50	J7/52	J43/52	Restart	Open
51	J7/53	J43/53	Restart	Open
52	J7/54	J43/54	Restart	Open
53	W1J2/56	W1P2/56		
54	W1J2/57	W1P2/57		
55	W1J2/58	W1P2/58		
56	J7/59	J43/59	Restart	Open
57	J7/60	J43/60	Restart	Open
58	J7/61	J43/61	Restart	Open
59	J7/62	J43/62	Restart	Open
60	J7/63	J43/63	Restart	Open
61	W1J2/64	W1P2/64		
62	W1J2/65	W1P2/65		
63	W1J2/66	W1P2/66		
64	W1J2/67	W1P2/67		
65	W1J2/68	W1J2/68		
66	J7/69	J43/69	Restart	Open
67	J7/70	J43/70	Restart	Open
68	J7/71	J43/71	Restart	Open
69	W1J2/72	W1P2/72		

Table 2-2. Cable W1 Test No. 1 Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
70	W1J2/73	W1P2/73		
71	W1J2/74	W1P2/74		
72	W1J2/75	W1P2/75		
73	W1J2/76	W1P2/76		
74	W1J2/77	W1P2/77		
75	W1J2/78	W1P2/78		
76	W1J2/79	W1P2/79		
77	W1J2/80	W1P2/80		
78	W1J2/81	W1P2/81		
79	W1J2/82	W1P2/82		
80	W1J2/83	W1P2/83		
81	W1J2/84	W1P2/84		
82	W1J2/85	W1P2/85		
83	J7/86	J43/86	Restart	Open
84	W1J2/87	W1P2/87		
85	W1J2/88	W1P2/88		
86	W1J2/89	W1P2/89		
87	W1J2/2	W1P2/2		
88	W1J2/3	W1P2/3		
89	W1J2/4	W1P2/4		
90	W1J2/5	W1P2/5		
91	W1J2/6	W1P2/6		
92	W1J2/7	W1P2/7		
93	W1J2/96	W1P2/96		
94	W1J2/97	W1P2/97		
95	W1J2/98	W1P3/A		
96	W1J2/99	W1P2/99		
97	W1J2/100	W1P2/100		
98			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(2) Cable W1, Test No. 2.

(a) Disconnect W1J2, W1P2, and W1P3 from cable test boxes.

(b) Perform cable test setup (paragraph b).

(c) Refer to TM 9-4935-647-14 and perform tester self-test.

(d) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-3.

(e) Connect cable connector W1J1 to J14 of input cable test box.

(f) Connect cable connector W1P1 to J44 of output cable test box.

(g) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-3. Cable W1 Test No. 2 Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W1J1/1	W1P1/1		
2	J14/2	J44/2	Restart	Open
3	J14/3	J44/3	Restart	Open
4	J14/4	J44/4	Restart	Open
5	J14/5	J44/5	Restart	Open
6	J14/6	J44/6	Restart	Open
7	J14/7	J44/7	Restart	Open
8	J14/8	J44/8	Restart	Open
9	J14/9	J44/9	Restart	Open
10	W1J1/10	W1P2/10		
11	J14/11	J44/11	Restart	Open
12	W1J1/12	W1P2/12		
13	W1J1/14	W1P2/14		
14	W1J1/15	J1P2/15		
15	W1J1/16	W1P2/16		
16	J14/17	J44/17	Restart	Open
17	W1J1/18	W1P1/18		
18	W1J1/19	W1P1/19		
19	W1J1/20	W1P1/20		
20	W1J1/21	W1P1/21		
21	W1J1/22	W1P1/22		
22	W1J1/23	W1P1/23		
23	W1J1/24	W1P1/24		
24	W1P2/25	W1P1/25		
25	J14/26	J44/26	Restart	Open
26	W1J1/28	W1P1/28		

Table 2-3. Cable W1 Test No. 2 Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
27	W1J1/29	W1P1/29		
28	W1J1/30	W1P1/30		
29	W1J1/31	W1P1/31		
30	W1J1/32	W1P1/32		
31	W1J1/33	W1P1/33		
32	W1J1/34	W1P1/34		
33	W1J1/35	W1P1/35		
34	W1J1/37	W1P1/37		
35	W1J1/38	W1P1/38		
36	W1J1/39	W1P1/39		
37	W1J1/40	W1P1/40		
38	W1J1/41	W1P1/41		
39	W1J1/42	W1P1/42		
40	W1J1/43	W1P1/43		
41	W1J1/44	W1P1/44		
42	W1J1/48	W1P1/48		
43	W1J1/50	W1P1/50		
44	W1J1/51	W1P1/51		
45	W1J1/52	W1P1/52		
46	W1J1/53	W1P1/53		
47	W1J1/54	W1P1/54		
48	W1J1/55	W1P1/55		
49	W1J1/56	W1P1/56		
50	W1J1/57	W1P1/57		
51	W1J1/58	W1P1/58		
52	W1J1/59	W1P1/59		
53	W1J1/60	W1P1/60		
54	W1J1/61	W1J1/61		
55	W1J1/62	W1J1/62		
56	W1J1/63	W1J1/63		
57	W1J1/64	W1J1/64		
58	J14/65	J44/65	End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(3) Cable W4.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-4.

(d) Connect cable connector W4P2 to J12 of input cable test box.

(e) Connect cable connector W4P1 to J46 of output cable test box.

(f) Connect cable connector W4P3 to J71 of output cable test box.

(g) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-4. Cable W4 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W4P2/P	W4P3/H		
2	W4P2/R	W4P1/R		
3	W4P2/S	W4P1/S		
4	W4P2/T	W4P3/K		
5	W4P2/U	W4P3/A		
6	W4P2/V	J46/V	Shield	Open
7	W4P2/W	W4P1/W		
8	W4P2/X	W4P1/X		
9	W4P2/Y	W4P1/Y		
10	W4P2/Z	W4P1/Z		
11	W4P2/A	W4P1/A		
12	W4P2/B	W4P1/B		
13	W4P2/C	W4P1/C		
14	W4P2/D	W4P1/D		
15	W4P2/E	W4P1/E		
16	W4P2/F	W4P1/F		
17	W4P2/G	W4P1/G		
18	W4P2/H	W4P1/H		
19	W4P2/J	W4P1/J		
20			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(4) Cable W6.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-5.

(d) Connect cable connector W6P1 to J19 of input cable test box.

(e) Connect cable connector W6P2 to J50 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-5. Cable W6 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	J19/1	J50/1	Restart	Open
2	J19/2	J50/2	Restart	Open
3	J19/3	J50/3	Restart	Open
4	J19/4	J50/4	Restart	Open
5	W6P1/5	W6P2/5		
6	W6P1/6	W6P2/6		
7	W6P1/7	W6P2/7		
8	J19/8	J50/8	Restart	Open
9	W6P1/9	W6P2/9		
10	J19/10	J50/10	Restart	Open
11	W6P1/11	W6P2/11		
12	W6P1/12	W6P2/12		
13	W6P1/13	W6P2/13		
14	J19/14	J50/14	Restart	Open
15	J19/15	J50/15	Restart	Open
16	W6P1/16	W6P2/16		
17	J19/17	J50/17	Restart	Open
18	W6P1/18	W6P2/18		
19	W6P1/19	W6P2/19		
20	W6P1/20	W6P2/20		
21	W6P1/21	W6P2/21		
22	W6P1/22	W6P2/22		
23	W6P1/23	W6P2/23		
24	W6P1/24	W6P2/24		
25	J19/25	J50/25	Restart	Open
26	W6P1/26	W6P2/26		
27	W6P1/27	W6P2/27		
28	W6P1/28	W6P2/28		

Table 2-5. Cable W6 Test Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
29	W6P1/29	W6P2/29		
30	W6P1/30	W6P2/30		
31	W6P1/31	W6P2/31		
32	W6P1/32	W6P2/32		
33	W6P1/33	W6P2/33		
34	W6P1/34	W6P2/34		
35	W6P1/35	W6P2/35		
36	J19/36	J50/36	Restart	Open
37	J19/37	J50/37	Restart	Open
38	J19/38	J50/38	Restart	Open
39	J19/39	J50/39	Shield	Open
40	J19/40	J50/40	Restart	Open
41	J19/41	J50/41	Restart	Open
42	J19/42	J50/42	Restart	Open
43	J19/43	J50/43	Restart	Open
44	J19/44	J50/44	Restart	Open
45	J19/45	J50/45	Restart	Open
46	W6P1/46	W6P2/46		
47			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(5) Cable W10.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-6.

(d) Connect cable connector W10P2 to J34 of input cable test box.

(e) Connect cable connector W10P1 to J64 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-6. Cable W10 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W10P2/A	W10P1/1		
2	W10P2/B	W10P1/2		
3	W10P2/C	W10P1/3		
4	W10P2/D	W10P1/4		
5	W10P2/E	W10P1/5		
6	W10P2/F	W10P1/6		
7	N/A	N/A	Restart	Open
8	N/A	N/A	Restart	Open
9	N/A	N/A	Restart	Open
10	N/A	W10P1/7	Shield	Open
			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(6) Cable W12.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-7.

(d) Connect cable connector W12P1 to J28 of input cable test box.

(e) Connect cable connector W12P2 to J58 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-7. Cable W12 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W12P1/8	W12P2/8		
2	W12P1/10	W12P2/10		
3	W12P1/15	W12P2/15		
4	W12P1/16	W12P2/16		
5	W12P1/17	W12P2/17		
6	J28/18	W12P2/18	Shield	Open
7	W12P1/19	W12P2/19		
8	W12P1/20	W12P2/20		
9	W12P1/21	W12P2/21		
10	W12P1/22	W12P2/22		
11	W12P1/11	W12P2/11		
12	W12P1/12	W12P2/12		
13	W12P1/13	W12P2/13		
14	W12P1/14	W12P2/14		
15	W12P1/9	W12P2/9		
16	W12P1/7	W12P2/7		
17	W12P1/1	W12P2/1		
18	W12P1/2	W12P2/2		
19	W12P1/3	W12P2/3		
20	W12P1/4	W12P2/4		
21	W12P1/5	W12P2/5		
22	W12P1/6	W12P2/6		
23			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(7) Cable W15.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-8.

(d) Connect cable connector W15P1 to J6 of input cable test box.

(e) Connect cable connector W15P2 to J42 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-8. Cable W15 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W15P1/A	W15P2/A		
2	W15P1/B	W15P2/B		
3	W15P1/C	W15P2/C		
4	W15P1/D	W15P2/D		
5	W15P1/E	W15P2/E		
6	W15P1/F	W15P2/F		
7	W15P1/G	W15P2/G		
8	W15P1/H	W15P2/H		
9	W15P1/K	W15P2/K		
10	W15P1/N	W15P2/N		
11	W15P1/P	W15P2/P		
12	W15P1/R	W15P2/R		
13	W15P1/S	W15P2/S		
14	W15P1/T	W15P2/T		
15	W15P1/U	W15P2/U		
16	W15P1/V	W15P2/V		
17	W15P1/W	W15P2/W		
18	W15P1/X	W15P2/X		
19	W15P1/Y	W15P2/Y		
20	W15P1/Z	W15P2/Z		
21	W15P1/B	W15P2/B		
22	W15P1/C	W15P2/C		
23	W15P1/D	W15P2/D		
24	W15P1/E	W15P2/E		
25	W15P1/F	W15P2/F		
26	W15P1/G	W15P2/G		
27	W15P1/H	W15P2/H		
28	W15P1/M	W15P2/M		
29	W15P1/N	W15P2/N		

Table 2-8. Cable W15 Test Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
30	W15P1/P	W15P2/P		
31	W15P1/Q	W15P2/Q		
32	W15P1/R	W15P2/R		
33	W15P1/S	W15P2/S		
34	W15P1/T	W15P2/T		
35	W15P1/U	W15P2/U		
36	W15P1/W	J42/W	Shield	Open
37	W15P1/X	W15P2/X		
38	W15P1/Y	W15P2/Y		
39	W15P1/Z	W15P2/Z		
40	W15P1/BB	W15P2/BB		
41	W15P1/CC	W15P2/CC		
42	W15P1/DD	W15P2/DD		
43	W15P1/EE	W15P2/EE		
44	W15P1/FF	W15P2/FF		
45	W15P1/GG	W15P2/GG		
46	W15P1/LL	W15P2/LL		
47	W15P1/MM	W15P2/MM		
48	W15P1/NN	W15P2/NN		
49	W15P1/PP	W15P2/PP		
50			End Test	Open
111			Backshell	

(8) Cable W23, Test No. 1.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-9.

(d) Connect the following cable connectors to the input cable test box:

Connector	Test Box
W23P1	J25
W23P3	J33

(e) Connect the following cable connectors to the output cable test box:

Connector	Test Box
W23J1	J51
W23P2	J70
W23P4	J67
W23P5	J57
W23P7	J63

(f) Connect cable test accessory WT5 to output test box J79.

(g) Connect WT5TC2 to W23T2.

NOTE

Do not connect cable connector W23P6 or WT5TC1.

(h) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-9. Cable W23 Test No. 1 Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W23P4/1	W23P5/8		
2	W23P1/13	W23P7/12		
3	W23P1/8	W23P7/7		
4	W23P1/9	W23P7/8		
5	W23P1/10	W23P7/9		
6	W23P1/11	W23P7/13		
7	W23P1/12	W23P7/11		
8	W23P1/29	W23P3/C		
9	W23P1/2	W23P2/B		
10	W23P1/1	W23P2/A		
11	W23P1/3	W23P5/11		
12	W23P1/4	W23P5/12		
13	W23P1/25	W23P5/13		
14	W23P1/26	W23P5/14		
15	W23P4/2	W23P5/9		
16	W23P4/13	W23P5/7		
17	W23P1/14	W23P5/1		
18	W23P1/15	W23P5/2		
19	W23P1/16	W23P5/3		
20	W23P1/17	W23P5/4		
21	W23P1/18	W23P5/5		
22	W23P4/12	W23P5/6		
23	N/A	N/A	Restart	Open
24	W23P1/27	W23P3/A		
25	W23P1/28	W23P3/B		
26	W23P1/30	W23P3/D		
27	W23P1/37	W23J1/U		
28	W23P1/33	W23J1/V		
29	W23P1/34	W23J1/A		
30	W23P1/35	W23J1/W		
31	W23P1/36	W23J1/C		
32	W23P1/31	W23J1/X		
33	W23P1/32	W23J1/Y		
34	W23P1/19	W23J/Z		
35	W23P1/20	W23J/A		
36	W23P1/21	W23J/S		
37	W23P1/22	W23J/T		
38	W23P1/23	W23J/11		
39	W23P1/24	J78		
40			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(9) Cable W23, Test No. 2.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-10.

(d) Disconnect cable connectors connected in test No. 1.

(e) Connect cable connector W23P4 to J67 of output cable test box.

(f) Connect cable connector W23P6 to J32 of input cable test box.

(g) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-10. Cable W23 Test No. 2 Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	N/A	N/A	Restart	Open
2	N/A	N/A	Restart	Open
3	N/A	N/A	Restart	Open
4	N/A	N/A	Restart	Open
5	N/A	N/A	Restart	Open
6	N/A	N/A	Restart	Open
7	N/A	N/A	Restart	Open
8	N/A	N/A	Restart	Open
9	N/A	N/A	Restart	Open
10	N/A	N/A	Restart	Open
11	N/A	N/A	Restart	Open
12	N/A	N/A	Restart	Open
13	N/A	N/A	Restart	Open
14	N/A	N/A	Restart	Open
15	N/A	N/A	Restart	Open
16	W23P4/13	W23P6/3		
17	N/A	N/A	Restart	Open
18	N/A	N/A	Restart	Open
19	N/A	N/A	Restart	Open
20	N/A	N/A	Restart	Open
21	N/A	N/A	Restart	Open
22	W23P4/12	W23P6/1		
23			End Test	Open
111			Backshell	

NOTE

W23P4 Tested to W23P6. Remove all other connectors.

2-2. CABLE TEST (CONT)

(10) Cable W23, Test No. 3.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-11.

(d) Connect cable connector W23P5 to J57 of output cable test box.

(e) Connect cable test accessory WT1P5 to J79.

(f) Connect TC1 to W23T1.

(g) Refer to TM 9-4935-647-14 and perform cable test.

Table 2-11. Cable W23 Test No. 3 Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	N/A	N/A		Open
2	W23WT1	W23P5/10		
3			End Test	Open

(11) Cable W24.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-12.

(d) Connect cable connector W24P2 to J10 of input cable test box.

(e) Connect cable connector W24P1 to J43 of output cable test box.

(f) Connect cable connector W24P3 to J63 of output cable test box.

(g) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-12. Cable W24 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W24P2/1	W24P1/1		
2	W24P2/95	W24P3/12		
3	W24P2/90	W24P3/7		
4	W24P2/91	W24P3/8		
5	W24P2/92	W24P3/9		
6	W24P2/93	W24P3/13		
7	W24P2/94	W24P3/11		
8	W24P2/8	W24P1/8		
9	W24P2/9	W24P1/9		
10	W24P2/10	W24P1/10		
11	W24P2/11	W24P1/11		
12	W24P2/12	W24P1/12		
13	W24P2/13	W24P1/13		
14	W24P2/14	W24P1/14		
15	W24P2/15	W24P1/15		
16	W24P2/16	W24P1/16		
17	W24P2/17	W24P1/17		
18	W24P2/18	W24P1/18		
19	J10/19	J43/19	Restart	Open
20	W24P2/20	W24P1/20		
21	W24P2/21	W24P1/21		
22	W24P2/22	W24P1/22		
23	J10/23	J43/23	Restart	Open
24	J10/24	J43/24	Restart	Open
25	W24P2/25	W24P1/25		
26	J10/26	J43/26	Restart	Open
27	W24P2/27	W24P1/27		
28	W24P2/29	W24P1/29		
29	J10/30	J43/30	Restart	Open
30	W24P2/31	W24P1/31		
31	J10/32	J43/30	Restart	Open
32	W24P2/33	W24P1/33		
33	J10/34	J43/34	Restart	Open
34	W24P2/36	W24P1/36		
35	W24P2/37	W24P1/37		
36	W24P2/38	W24P1/38		
37	W24P2/39	W24P1/39		
38	J10/40	J43/40	Restart	Open
39	J10/41	J43/41	Restart	Open

Table 2-12. Cable W24 Test Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
40	W24P2/42	W24P1/42		
41	W24P2/43	W24P1/43		
42	W24P2/44	W24P1/44		
43	J10/45	J43/45	Restart	Open
44	W24P2/46	W24P1/46		
45	W24P2/47	W24P1/47		
46	W24P2/48	W24P1/48		
47	W24P2/49	W24P1/49		
48	W24P2/50	W24P1/50		
49	W24P2/51	W24P1/51		
50	W24P2/52	W24P1/52		
51	W24P2/53	W24P1/53		
52	W24P2/54	W24P1/54		
53	W24P2/56	W24P1/56		
54	W24P2/57	W24P1/57		
55	J10/58	J43/58	Restart	Open
56	W24P2/59	W24P1/59		
57	W24P2/60	W24P1/60		
58	W24P2/61	W24P1/61		
59	W24P2/62	W24P1/62		
60	W24P2/63	W24P1/63		
61	W24P2/64	W24P1/64		
62	W24P2/65	W24P1/65		
63	J10/66	J43/66	Restart	Open
64	J10/67	J43/67	Restart	Open
65	W24P2/68	W24P1/68		
66	W24P2/69	W24P1/69		
67	W24P2/70	W24P1/70		
68	W24P2/71	W24P1/71		
69	W24P2/72	W24P1/72		
70	W24P2/73	W24P1/73		
71	W24P2/74	W24P1/74		
72	J10/75	J43/75	Restart	Open
73	J10/76	J43/76	Restart	Open
74	W24P2/77	W24P1/77		
75	J10/78	J43/78	Restart	Open
76	W24P2/79	W24P1/79		
77	W24P2/80	W24P1/80		
78	W24P2/81	W24P1/81		
79	W24P2/82	W24P1/82		

Table 2-12. Cable W24 Test Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
80	J10/83	J43/83	Restart	Open
81	W24P2/84	W24P1/84		
82	W24P2/85	W24P1/85		
83	W24P2/86	W24P1/86		
84	W24P2/87	W24P1/87		
85	W24P2/88	W24P1/88		
86	W24P2/89	W24P1/89		
87	W24P2/2	W24P1/2		
88	W24P2/3	W24P1/3		
89	W24P2/4	W24P1/4		
90	W24P2/5	W24P1/5		
91	W24P2/6	W24P1/6		
92	J10/7	J43/7	Restart	Open
93	W24P2/96	W24P1/96		
94	W24P2/97	W24P1/97		
95	W24P2/98	W24P1/98		
96	N/A	J43/99	Restart	Open
97	N/A	J43/100	End Test	Open
111			Backshell	

(12) Cable W25.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-13.

(d) Connect cable connector W25P1 to J11 of input cable test box.

(e) Connect cable connector W25J1 to J59 of output cable test box.

(f) Connect cable connector W25P2 to J54 of output cable test box.

(g) Connect cable connector W25P3 to J75 of output cable test box.

(h) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-13. Cable W25 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W25P1/C	W25J1/15		
2	W25P1/G	W25P2/C		
3	W25P1/H	W25P2/D		
4	W25P1/P	W25P3/3		
5	W25P1/Q	W25P3/1		
6	W25P1/T	W25J1/20		
7	W25P1/U	W25J1/1		
8	W25P1/V	W25J1/11		
9	W25P1/W	W25J1/10		
10	W25P1/X	W25J1/13		
11	W25P1/Y	W25J1/12		
12	W25P1/Z	W25J1/8		
13	W25P1/A	W25J1/14		
14	W25P1/B	W25J1/3		
15	W25P1/C	W25J1/2		
16	W25P1/D	W25J1/5		
17	W25P1/E	W25J1/4		
18	W25P1/F	N/A	Shield	Open
19	W25P1/G	W25J1/6		
20	W25P1/H	W25J1/22		
21	W25P1/I	W25J1/9		
22	W25P1/J	W25J1/16		
23	W25P1/K	W25J1/17		
24	W25P1/M	W25P2/F		
25	W25P1/N	W25P2/B		
26	W25P1/J	W25P2/E		
27	W25P1/S	W25J1/21		
28	W25P1/R	W25P2/G		
29	W25P1/S	W25P2/A		
30	W25P1/T	W25P2/H		
31			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(13) Cable W26.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-14.

(d) Connect cable connector W26P1 to J2 of input cable test box.

(e) Connect cable connector W26P2 to J1 of input cable test box.

(f) Connect cable connector W26P3 to J75 of output cable test box.

(g) Connect cable connector W26P4 to J63 of output cable test box.

(h) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-14. Cable W26 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W26P1/B	W26P4/1		
2	W26P2/D	W26P3/2		
3	W26P1/H	W26P3/6		
4	W26P2/E	W26P1/E		
5	W26P1/D	W26P3/1		
6	W26P1/F	W26P3/4		
7	W26P2/G	W26P1/G		
8	W26P2/B	W26P4/2		
9	W26P2/A	W26P1/A		
10	W26P1/C	W26P1/C		
11			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(14) Cable W27.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-15.

(d) Connect cable connector W27P1 to J2 of input cable test box.

(e) Connect cable connector W27P2 to J1 of input cable test box.

(f) Connect cable connector W27P3 to J75 of output cable test box.

(g) Connect cable connector W27P4 to J63 of output cable test box.

(h) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-15. Cable W27 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W27P1/B	W27P4/1		
2	W27P2/D	W27P3/2		
3	W27P1/H	W27P3/6		
4	W27P2/E	W27P1/E		
5	W27P1/D	W27P3/1		
6	W27P1/F	W27P3/4		
7	W27P2/G	W27P1/G		
8	W27P2/B	W27P4/2		
9	W27P2/A	W27P1/A		
10	W27P1/C	W27P2/C		
11			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(15) Cable W32, Test No. 1.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-16.

(d) Connect cable connector W32J1 to J20 of input cable test box.

(e) Connect cable connector W32J2 to J21 of input cable test box.

(f) Connect cable connector W32P1 to J50 of output cable test box.

(g) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-16. Cable W32 Test No. 1 Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W32J1/1	W32P1/1		
2	W32J1/2	W32P1/2		
3	W32J1/3	W32P1/3		
4	W32J1/7	W32P1/4		
5	W32J1/5	W32P1/5		
6	W32J1/6	W32P1/6		
7	W32J1/8	W32P1/7		
8	W32J1/9	W32P1/8		
9	W32J1/10	W32P1/9		
10	W32J1/11	W32P1/10		
11	W32J1/12	W32P1/11		
12	W32J1/13	W32P1/12		
13	W32J1/4	Shield	Restart	Open
14	W32J2/1	W32P1/14		
15	W32J2/2	W32P1/15		
16	W32J2/3	W32P1/16		
17	W32J2/7	W32P1/17		
18	W32J2/5	W32P1/18		
19	W32J2/6	W32P1/19		
20	W32J2/8	W32P1/20		
21	W32J2/9	W32P1/21		
22	W32J2/10	W32P1/22		
23	W32J2/11	W32P1/23		
24	W32J2/12	W32P1/24		
25	W32J2/13	W32P1/25		
26	W32J1/17	W32P1/26		
27	W32J2/17	W32P1/27		
28	W32J2/4	Shield		
			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(16) Cable W32, Test No. 2.

(a) Disconnect all connectors from previous test.

(b) Insert cable test adapter WT6 into W32P1 pin 26.

(c) Insert cable test adapter WT7 into W32J1 pin 17.

(d) Connect ohmmeter between WT6 and WT7. Ohmmeter should read 0.5 ohms or less.

(e) Remove cable test adapter WT7 from W32J1 pin 17 and insert into W32J1 pin 54. Ohmmeter should read 0.5 ohms or less.

(f) Remove cable test adapter WT7 from W32J1 pin 54 and insert into W32J1 pin 51. Ohmmeter should read 0.5 ohms or less.

(g) Remove cable test adapter WT7 from W32J1 pin 51 and insert into W32J1 pin 45. Ohmmeter should read 0.5 ohms or less.

(h) Remove cable test adapter WT7 from W32J1 pin 45 and insert into W32J1 pin 18. Ohmmeter should read 0.5 ohms or less.

(i) Remove cable test adapter WT6 from W32P1 pin 26 and insert into W32P1 pin 27.

(j) Remove cable test adapter WT7 from W32J1 pin 18 and insert into W32J2 pin 17. Ohmmeter should read 0.5 ohms or less.

(k) Remove cable test adapter WT7 from W32J2 pin 17 and insert into W32J2 pin 18. Ohmmeter should read 0.5 ohms or less.

(l) Remove cable test adapter WT7 from W32J2 pin 18 and insert into W32J2 pin 45. Ohmmeter should read 0.5 ohms or less.

(m) Remove cable test adapter WT7 from W32J2 pin 45 and insert into W32J2 pin 51. Ohmmeter should read 0.5 ohms or less.

(n) Remove cable test adapter WT7 from W32J2 pin 51 and insert into W32J2 pin 54. Ohmmeter should read 0.5 ohms or less.

(o) Disconnect ohmmeter and cable test adapters.

(17) Cable W34.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-17.

(d) Connect cable connector W34P7 to J18 of input cable test box.

(e) Connect the following cable connectors to output cable test box:

Connector	Test Box
W34P1	J65
W34P2	J68
W34P3	J66
W34P4	J60
W34P5	J73
W34P6	J75

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-17. Cable W34 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W34P7/A	W34P4/A		
2	W34P7/S	W34P2/A		
3	W34P7/T	W34P2/C		
4	W34P7/Y	W34P6/3		
5	W34P7/X	W34P6/1		
6	W34P7/W	W34P5/3		
7	W34P7/C	W34P5/5		
8	W34P7/Z	W34P3/C		
9	W34P7/U	W34P1/A		
10	W34P7/V	W34P1/B		
11	W34P7/A	W34P1/C		
12			End Test	Open
111			Backshell	

(18) Cable W35, Test No. 1.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-18.

(d) Connect cable connector W35J1 to J30 of input cable test box.

(e) Connect the following cable connectors to output cable test box:

Connector	Test Box
W35P1	J77
W35P2	J62
W35P3	J61
W35P4	J60
W35P6	J70
W35P7	J69

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-18. Cable W35 Test No. 1 Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W35J1/11	W35P4/A		
2	W35P1/2	W35J1/6	Restart	Open
3	W35P2/B	W35P3/B		
4	W35P1/10	W35P3/A		
5	W35J1/7	W35P1/1		
6	W35J1/9	W35P2/A		
7	N/A	N/A		
8	W35J1/3	W35P7/A		
9	W35J1/2	W35P6/B		
10	W35J1/1	W35P6/A		
11	W35J1/4	W35P7/B		
12	W35J1/12	W35P4/B		
13	W35J1/5	W35P7/C		
14	W35J1/13	W35P4/C		
15	W35J1/14	W35P4/D		
16			End Test	Open
111			Backshell	

(19) Cable W35, Test No. 2.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-19.

(d) Connect cable connector W35P1 to J77 of output cable test box.

(e) Connect cable connector W35P5 to J74 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-19. Cable W35 Test No. 2 Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	N/A	N/A	Restart	Open
2	W35P5/3	W35P1/2		
3			End Test	Open

2-2. CABLE TEST (CONT)

(20) Cable W35, Test No. 3.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-20.

(d) Connect cable connector W35J1 to J30 of input cable test box.

(e) Connect cable connector W35P5 to J74 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-20. Cable W35 Test No. 3 Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	N/A	N/A	Restart	Open
2	W35J1/6	W35P5/3		
3	N/A	N/A	Restart	Open
4	N/A	N/A	Restart	Open
5	N/A	N/A	Restart	Open
6	N/A	N/A	Restart	Open
7	W35J1/8	W35P5/1		
8			End Test	Open

(21) Cable W40.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-21.

(d) Connect cable connector W40P1 to J17 of input cable test box.

(e) Connect cable connector W40P2 to J47 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-21. Cable W40 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W40P1/A	W40P2/A		
2	W40P1/B	W40P2/B		
3	W40P1/C	W40P2/C		
4	W40P1/D	W40P2/D		
5	W40P1/E	W40P2/E		
6			End Test	Open
111			Backshell	

(22) Cable W41.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-22.

(d) Connect cable connector W41P1 to J17 of input cable test box.

(e) Connect cable test accessory WT1P4 to J35 of input cable test box.

(f) Connect TC1 to W41WT1, TC2 to W41WT2, and TC3 to W41WT3.

(g) Connect cable connector W41J1 to J48 of output cable test box.

(h) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-22. Cable W41 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W41P1/A	W41J1/A		
2	W41P1/B	W41J1/B		
3	W41WT1	W41J1/C		
4	W41WT2	W41J1/D		
5	W41WT3	W41J1/E		
			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(23) Cable W43.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-23.

(d) Connect cable connector W43P1 to J31 of input cable test box.

(e) Connect cable connector W43P2 to J60 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-23. Cable W43 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W43P1/A	W43P2/A		
2	N/A	N/A	Restart	Open
3	N/A	N/A	Restart	Open
4	N/A	N/A	Restart	Open
5	N/A	N/A	Restart	Open
6	N/A	N/A	Restart	Open
7	N/A	N/A	Restart	Open
8	N/A	N/A	Restart	Open
9	N/A	N/A	Restart	Open
10	N/A	N/A	Restart	Open
11	N/A	N/A	Restart	Open
12	W43P1/B	W43P2/B		
13	N/A	N/A	Restart	Open
14	W43P1/C	W43P2/C		
15	W43P1/D	W43P2/D		
16			End Test	Open
111			Backshell	

(24) Cable W53.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-24.

(d) Connect cable connector W53P1 to J3 of input cable test box.

(e) Connect cable connector W53P2 to J41 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-24. Cable W53 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W53P1/A	W53P2/A		
2	W53P1/B	W53P2/B		
3	W53P1/C	W53P2/C		
4	W53P1/D	W53P2/D		
5	W53P1/E	W53P2/E		
6	W53P1/F	W53P2/F		
7	W53P1/G	W53P2/G		
8	W53P1/H	W53P2/H		
9	W53P1/J	W53P2/J		
10			End Test	Open
111			Backshell	

(25) Cable W57.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-25.

(d) Connect cable connector W57P1 to J26 of input cable test box.

(e) Connect cable connector W57P2 to J74 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-25. Cable W57 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	P57P1/A	W57P2/2		
2	N/A	J74/3	Restart	Open
3	N/A	N/A	Restart	Open
4	W57P1/C	W57P2/6		
5	W57P1/D	W57P2/4		
6	N/A	N/A	Restart	Open
7	W57P1/B	W57P2/1		
			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(26) Cable W59.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-26.

(d) Connect cable connector W59P1 to J8 of input cable test box.

(e) Connect cable connector W59P2 to J43 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-26. Cable W59 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W59P1/1	W59P2/2		
2	W59P1/95	W59P2/95		
3	W59P1/90	W59P2/90		
4	W59P1/91	W59P2/91		
5	W59P1/92	W59P2/92		
6	W59P1/93	W59P2/93		
7	W59P1/94	W59P2/94		
8	W59P1/8	W59P2/8		
9	W59P1/9	W59P2/9		
10	W59P1/10	W59P2/10		
11	W59P1/11	W59P2/11		
12	W59P1/12	W59P2/12		
13	W59P1/13	W59P2/13		
14	W59P1/14	W59P2/14		
15	W59P1/15	W59P2/15		
16	J8/16	J43/16	Restart	Open
17	W59P1/17	W59P2/17		
18	W59P1/18	W59P2/18		
19	W59P1/19	W59P2/19		
20	W59P1/20	W59P2/20		
21	W59P1/21	W59P2/21		
22	W59P1/22	W59P2/22		
23	W59P1/23	W59P2/23		
24	W59P1/24	W59P2/24		
25	J8/25	J43/25	Restart	Open
26	W59P1/26	W59P2/26		
27	W59P1/27	W59P2/27		
28	W59P1/29	W59P2/29		

Table 2-26. Cable W59 Test Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
29	W59P1/30	W59P2/30		
30	W59P1/31	W59P2/31		
31	W59P1/32	W59P2/32		
32	W59P1/33	W59P2/33		
33	W59P1/34	W59P2/34		
34	J8/36	J43/36	Restart	Open
35	W59P1/37	W59P2/37		
36	W59P1/38	W59P2/38		
37	W59P1/39	W59P2/39		
38	W59P1/40	W59P2/40		
39	W59P1/41	W59P2/41		
40	J8/42	J43/42	Restart	Open
41	W59P1/43	W59P2/43		
42	W59P1/44	W59P2/44		
43	W59P1/45	W59P2/45		
44	W59P1/46	W59P2/46		
45	W59P1/47	W59P2/47		
46	W59P1/48	W59P2/48		
47	J8/49	J43/49	Restart	Open
48	J8/50	J43/50	Restart	Open
49	J8/51	J43/51	Restart	Open
50	J8/52	J43/52	Restart	Open
51	J8/53	J43/53	Restart	Open
52	J8/54	J43/54	Restart	Open
53	W59P1/56	W59P2/56		
54	W59P1/57	W59P2/57		
55	W59P1/58	W59P2/58		
56	J8/59	J43/59	Restart	Open
57	J8/60	J43/60	Restart	Open
58	J8/61	J43/61	Restart	Open
59	J8/62	J43/62	Restart	Open
60	J8/63	J43/63	Restart	Open
61	W59P1/64	W59P2/64		
62	W59P1/65	W59P2/65		
63	W59P1/66	W59P2/66		
64	W59P1/67	W59P2/67		
65	W59P1/68	W59P2/68		
66	J8/69	J43/69	Restart	Open
67	J8/70	J43/70	Restart	Open
68	J8/71	J43/71	Restart	Open

Table 2-26. Cable W59 Test Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
69	W59P1/72	W59P2/72		
70	W59P1/73	W59P2/73		
71	W59P1/74	W59P2/74		
72	W59P1/75	W59P2/75		
73	W59P1/76	W59P2/76		
74	W59P1/77	W59P2/77		
75	W59P1/78	W59P2/78		
76	W59P1/79	W59P2/79		
77	W59P1/80	W59P2/80		
78	W59P1/81	W59P2/81		
79	W59P1/82	W59P2/82		
80	W59P1/83	W59P2/83		
81	W59P1/84	W59P2/84		
82	W59P1/85	W59P2/85		
83	J8/86	J43/86	Restart	Open
84	W59P1/87	W59P2/87		
85	W59P1/88	W59P2/88		
86	W59P1/89	W59P2/89		
87	W59P1/2	W59P2/2		
88	W59P1/3	W59P2/3		
89	W59P1/4	W59P2/4		
90	W59P1/5	W59P2/5		
91	W59P1/6	W59P2/6		
92	W59P1/7	W59P2/7		
93	W59P1/96	W59P2/96		
94	W59P1/97	W59P2/97		
95	W59P1/98	W59P2/98		
96	W59P1/99	W59P2/99		
97	W59P1/100	W59P2/100		
98			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(27) Cable W60.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-27.

(d) Connect cable connector W60P1 to J44 of output cable test box.

(e) Connect cable connector W60P2 to J15 of input cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-27. Cable W60 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W60P2/1	W60P1/1		
2	J15/2	J44/2	Restart	Open
3	J15/3	J44/3	Restart	Open
4	W60P2/4	W60P1/4		
5	W60P2/5	W60P1/5		
6	J15/6	J44/6	Restart	Open
7	J15/7	J44/7	Restart	Open
8	J15/8	J44/8	Restart	Open
9	J15/9	J44/9	Restart	Open
10	W60P2/10	W60P2/10		
11	J15/11	J44/11	Restart	Open
12	W60P2/12	W60P1/12		
13	W60P2/14	W60P1/14		
14	W60P2/15	W60P1/15		
15	W60P2/16	W60P1/16		
16	J15/17	J44/17	Restart	Open
17	W60P2/18	W60P1/18		
18	W60P2/19	W60P1/19		
19	W60P2/20	W60P1/20		
20	W60P2/21	W60P1/20		
21	W60P2/22	W60P1/22		
22	W60P2/23	W60P1/23		
23	W60P2/24	W60P1/24		
24	W60P2/25	W60P1/25		
25	J15/26	J44/26	Restart	Open
26	W60P2/28	W60P1/28		
27	W60P2/29	W60P1/29		
28	W60P2/30	W60P1/30		

Table 2-27. Cable W60 Test Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
29	W60P2/31	W60P1/31		
30	W60P2/32	W60P1/32		
31	W60P2/33	W60P1/33		
32	W60P2/34	W60P1/34		
33	W60P2/35	W60P1/35		
34	W60P2/37	W60P1/37		
35	W60P2/38	W60P1/38		
36	W60P2/39	W60P1/39		
37	W60P2/40	W60P1/40		
38	W60P2/41	W60P1/41		
39	W60P2/42	W60P1/42		
40	W60P2/43	W60P1/43		
41	W60P2/44	W60P1/44		
42	W60P2/48	W60P1/48		
43	W60P2/50	W60P1/50		
44	W60P2/51	W60P1/51		
45	W60P2/52	W60P1/52		
46	W60P2/53	W60P1/53		
47	W60P2/54	W60P1/54		
48	W60P2/55	W60P1/55		
49	W60P2/56	W60P1/56		
50	W60P2/57	W60P1/57		
51	W60P2/58	W60P1/58		
52	W60P2/59	W60P1/59		
53	W60P2/60	W60P1/60		
54	W60P2/61	W60P1/61		
55	W60P2/62	W60P1/62		
56	W60P2/63	W60P1/63		
57	W60P2/64	W60P1/64		
58	J15/65	J44/65	End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(28) Cable W61.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-28.

(d) Connect cable connector W61P1 to J12 of input cable test box.

(e) Connect cable connector W61P2 to J46 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-28. Cable W61 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	J12/P	J46/P	Restart	Open
2	W61P1/R	W61P2/R		
3	W61P1/S	W61P2/S		
4	W61P1/T	W61P2/T		
5	W61P1/U	W61P2/U		
6	W61P1/V	W61P1/V		
7	W61P1/W	W61P2/W		
8	W61P1/X	W61P2/X		
9	W61P1/Y	W61P2/Y		
10	W61P1/Z	W61P2/Z		
11	W61P1/A	W61P2/A		
12	W61P1/B	W61P2/B		
13	W61P1/C	W61P2/C		
14	W61P1/D	W61P2/D		
15	W61P1/E	W61P2/E		
16	W61P1/F	W61P2/F		
17	W61P1/G	W61P2/G		
18	W61P1/H	W61P2/H		
19	W61P1/J	W61P2/H		
20			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(29) Cable W67.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-29.

(d) Connect cable connector W67P1 to J44 of output cable test box.

(e) Connect cable connector W67J1 to J16 of input cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-29. Cable W67 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W67J1/1	W67P1/1		
2	J16/2	J44/2	Restart	Open
3	J16/3	J44/3	Restart	Open
4	W67J1/4	W67P1/4		
5	W67J1/5	W67P1/5		
6	J16/6	J44/6	Restart	Open
7	J16/7	J44/7	Restart	Open
8	J16/8	J44/8	Restart	Open
9	J16/9	J44/9	Restart	Open
10	W67J1/10	W67P1/10		
11	J16/11	J44/11	Restart	Open
12	W67J1/12	W67P1/12		
13	W67J1/14	W67P1/14		
14	W67J1/15	W67P1/15		
15	W67J1/16	W67P1/16		
16	J16/17	J44/17	Restart	Open
17	W67J1/18	W67P1/18		
18	W67J1/19	W67P1/19		
19	W67J1/20	W67P1/20		
20	W67J1/21	W67P1/21		
21	W67J1/22	W67P1/22		
22	W67J1/23	W67P1/23		
23	W67J1/24	W67P1/24		
24	W67J1/25	W67P1/25		
25	J16/26	J44/26	Restart	Open
26	W67J1/28	W67P1/28		
27	W67J1/29	W67P1/29		
28	W67J1/30	W67P1/30		

Table 2-29. Cable W67 Test Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
29	W67J1/31	W67P1/31		
30	W67J1/32	W67P1/32		
31	W67J1/33	W67P1/33		
32	W67J1/34	W67P1/34		
33	W67J1/35	W67P1/35		
34	W67J1/37	W67P1/37		
35	W67J1/38	W67P1/38		
36	W67J1/39	W67P1/39		
37	W67J1/40	W67P1/40		
38	W67J1/41	W67P1/41		
39	W67J1/42	W67P1/42		
40	W67J1/43	W67P1/43		
41	W67J1/44	W67P1/44		
42	W67J1/48	W67P1/48		
43	W67J1/50	W67P1/50		
44	W67J1/51	W67P1/51		
45	W67J1/52	W67P1/52		
46	W67J1/53	W67P1/53		
47	W67J1/54	W67P1/54		
48	W67J1/55	W67P1/55		
49	W67J1/56	W67P1/56		
50	W67J1/57	W67P1/57		
51	W67J1/58	W67P1/58		
52	W67J1/59	W67P1/59		
53	W67J1/60	W67P1/60		
54	W67J1/61	W67P1/61		
55	W67J1/62	W67P1/62		
56	W67J1/63	W67P1/63		
57	W67J1/64	W67P1/64		
58	J16/65	J44/65	End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(30) Cable W68.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-30.

(d) Connect cable connector W68J1 to J9 of input cable test box.

(e) Connect cable connector W68P1 to J43 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-30. Cable W68 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W68J1/1	W68P1/1		
2	W68J1/95	W68P1/95		
3	W68J1/90	W68P1/90		
4	W68J1/91	W68P1/91		
5	W68J1/92	W68P1/92		
6	W68J1/93	W68P1/93		
7	W68J1/94	W68P1/94		
8	W68J1/8	W68P1/8		
9	W68J1/9	W68P1/9		
10	W68J1/10	W68P1/10		
11	W68J1/11	W68P1/11		
12	W68J1/12	W68P1/12		
13	W68J1/13	W68P1/13		
14	W68J1/14	W68P1/14		
15	W68J1/15	W68P1/15		
16	J9/16	J43/16	Restart	Open
17	W68J1/17	W68P1/17		
18	W68J1/18	W68P1/18		
19	W68J1/19	W68P1/19		
20	W68J1/20	W68P1/20		
21	W68J1/21	W68P1/21		
22	W68J1/22	W68P1/22		
23	W68J1/23	W68P1/23		
24	W68J1/24	W68P1/24		
25	J9/25	J43/25	Restart	Open
26	W68J1/26	W68P1/26		
27	W68J1/27	W68P1/27		
28	W68J1/29	W68P1/29		

Table 2-30. Cable W68 Test Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
29	W68J1/30	W68P1/30		
30	W68J1/31	W68P1/31		
31	W68J1/32	W68P1/32		
32	W68J1/33	W68P1/33		
33	W68J1/34	W68P1/34		
34	J9/36	J43/36	Restart	Open
35	W68J1/37	W68P1/37		
36	W68J1/38	W68P1/38		
37	W68J1/39	W68P1/39		
38	W68J1/40	W68P1/40		
39	W68J1/41	W68P1/41		
40	J9/42	J43/42	Restart	Open
41	W68J1/43	W68P1/43		
42	W68J1/44	W68P1/44		
43	W68J1/45	W68P1/45		
44	W68J1/46	W68P1/46		
45	W68J1/47	W68P1/47		
46	W68J1/48	W68P1/48		
47	J9/49	J43/49	Restart	Open
48	J9/50	J43/50	Restart	Open
49	J9/51	J43/51	Restart	Open
50	J9/52	J43/52	Restart	Open
51	W68J1/53	W68P1/53	Restart	Open
52	W68J1/54	W68P1/54	Restart	Open
53	W68J1/56	W68P1/56		
54	W68J1/57	W68P1/57		
55	W68J1/58	W68P1/58		
56	J9/59	J43/59	Restart	Open
57	J9/60	J43/60	Restart	Open
58	J9/61	J43/61	Restart	Open
59	J9/62	J43/62	Restart	Open
60	J9/63	J43/63	Restart	Open
61	W68J1/64	W68P1/64		
62	W68J1/65	W68P1/65		
63	W68J1/66	W68P1/66		
64	W68J1/67	W68P1/67		
65	W68J1/68	W68P1/68		
66	J9/69	J43/69		
67	J9/70	J43/70	Restart	Open
68	J9/71	J43/71	Restart	Open

Table 2-30. Cable W68 Test Data – Continued

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
69	W68J1/72	W68P1/72		
70	W68J1/73	W68P1/73		
71	W68J1/74	W68P1/74		
72	W68J1/75	W68P1/75		
73	W68J1/76	W68P1/76		
74	W68J1/77	W68P1/77		
75	W68J1/78	W68P1/78		
76	W68J1/79	W68P1/79		
77	W68J1/80	W68P1/80		
78	W68J1/81	W68P1/81		
79	W68J1/82	W68P1/82		
80	W68J1/83	W68P1/83		
81	W68J1/84	W68P1/84		
82	W68J1/85	W68P1/85		
83	J9/86	J43/86	Restart	Open
84	W68J1/87	W68P1/87		
85	W68J1/88	W68P1/88		
86	W68J1/89	W68P1/89		
87	W68J1/2	W68P1/2		
88	W68J1/3	W68P1/3		
89	W68J1/4	W68P1/4		
90	W68J1/5	W68P1/5		
91	W68J1/6	W68P1/6		
92	W68J1/7	W68P1/7		
93	W68J1/96	W68P1/96		
94	W68J1/97	W68P1/97		
95	W68J1/98	W68P1/98		
96	W68J1/99	W68P1/99		
97	W68J1/100	W68P1/100		
98			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(31) Cable W74.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-31.

(d) Connect cable connector W74P1 to J12 of input cable test box.

(e) Connect cable connector W74J1 to J45 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-31. Cable W74 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W74P1/P	W74J1/P		
2	W74P1/R	W74J1/R		
3	W74P1/S	W74J1/S		
4	W74P1/T	W74J1/T		
5	W74P1/U	W74J1/U		
6	W74P1/V	W74J1/V		
7	W74P1/W	W74J1/W		
8	W74P1/X	W74J1/X		
9	W74P1/Y	W74J1/Y		
10	W74P1/Z	W74J1/Z		
11	W74P1/A	W74J1/A		
12	W74P1/B	W74J1/B		
13	W74P1/C	W74J1/C		
14	W74P1/D	W74J1/D		
15	W74P1/E	W74J1/E		
16	W74P1/F	W74J1/F		
17	W74P1/G	W74J1/G		
18	W74P1/H	W74J1/H		
19	W74P1/J	W74J1/J		
20			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(32) Cable W75.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-32.

(d) Connect cable connector W75P2 to J1 of input cable test box.

(e) Connect cable connector W45P1 to J40 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-32. Cable W75 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W75P2/H	W75P1/H		
2	W75P2/D	W75P1/D		
3	N/A	N/A		
4	W75P2/E	W75P1/E		
5	N/A	N/A		
6	N/A	N/A		
7	W75P2/G	W75P1/G		
8	W75P2/B	W75P1/B		
9	W75P2/A	W75P1/A		
10	J1/C	N/A	End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(33) Cable W76.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-33.

(d) Connect cable connector W76P2 to J1 of input cable test box.

(e) Connect cable connector W76P1 to J40 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-33. Cable W76 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W76P2/H	W76P1/H		
2	W76P2/D	W76P1/D		
3	N/A	N/A		
4	W76P2/E	W76P1/E		
5	N/A	N/A		
6	N/A	N/A		
7	W76P2/G	W76P1/G		
8	W76P2/B	W76P1/B		
9	W76P2/A	W76P1/A		
10	J1/C	N/A	End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(34) Cable W80.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-34.

(d) Connect cable connector W80J1 to J30 of input cable test box.

(e) Connect cable connector W80P1 to J52 of output cable test box.

(f) Connect cable connector W80P2 to J53 of output cable test box.

(g) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-34. Cable W80 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W80J1/11	W80P1/B		
2	J30/6	N/A	Restart	Open
3	N/A	N/A	Restart	Open
4	J30/10	N/A	Restart	Open
5	W80J1/7	W80P1/D		
6	W80J1/9	W80P1/A		
7	J30/8	N/A	Restart	Open
8	W80J1/3	W80P2/A		
9	J30/2	N/A	Restart	Open
10	W80J1/1	W80P2/D		
11	J30/4	N/A	Restart	Open
12	J30/12	N/A	Restart	Open
13	W80J1/5	W80P2/B		
14	W80J1/13	N/A	Shield	Open
15	J30/14	N/A	Restart	Open
16	W80J1/15	W80P2/F		
17	W80J1/16	W80P2/C		
18	W80J1/17	W80P2/E		
19	W80J1/18	W80P1/F		
20	W80J1/19	W80P1/C		
21	W80J1/20	W80P1/E		
22			End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(35) Cable W81.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-35.

(d) Connect cable connector W81P2 to J28 of input cable test box.

(e) Connect cable connector W81P1 to J55 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-35. Cable W81 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	J28/8	N/A	Restart	Open
2	J28/10	NA	Restart	Open
3	W81P2/15	W81P1/15		
4	W81P2/16	W81P1/16		
5	W81P2/17	W81P1/17		
6	W81P2/18	W81P1/18		
7	W81P2/19	W81P1/19		
8	W81P2/20	W81P1/20		
9	J28/21	N/A	Restart	Open
10	J28/22	N/A	Restart	Open
11	W81P2/11	W81P1/11		
12	J28/12	N/A	Restart	Open
13	W81P2/13	W81P1/13		
14	J28/14	N/A	Restart	Open
15	W81P2/9	W81P1/9		
16	W81P2/7	W81P1/7		
17	W81P2/1	W81P1/1		
18	J28/2	N/A	Restart	Open
19	W81P2/3	W81P1/3		
20	J28/4	N/A	Restart	Open
21	W81P2/5	W81P1/5		
22	J28/6	N/A	End Test	Open
111			Backshell	

2-2. CABLE TEST (CONT)

(36) Cable W82.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-36.

(d) Connect cable connector W82J1 to J4 of input cable test box.

(e) Connect cable connector W82J2 to J48 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-36. Cable W82 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W82J1/A	W82J2/A		
2	W82J1/B	W82J2/B		
3			End Test	Open
111			Backshell	

(37) Cable W83.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-37.

(d) Connect cable connector W83J1 to J13 of input cable test box.

(e) Connect cable connector W83J2 to J45 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-37. Cable W83 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W83J1/P	W83J2/P		
2	W83J1/R	W83J2/R		
3	W83J1/S	W83J2/S		
4	W83J1/T	W83J2/T		
5	W83J1/U	W83J2/U		
6	W83J1/V	W83J2/V		
7	W83J1/W	W83J2/W		
8	W83J1/X	W83J2/X		
9	W83J1/Y	W83J2/Y		
10	W83J1/Z	W83J2/Z		
11	W83J1/A	W83J2/A		
12	W83J1/B	W83J2/B		
13	W83J1/C	W83J2/C		
14	W83J1/D	W83J2/D		
15	W83J1/E	W83J2/E		
16	W83J1/F	W83J2/F		
17	W83J1/G	W83J2/G		
18	W83J1/H	W83J2/H		
19	W83J1/J	W83J2/J		
20			End Test	Open
111			Backshell	

(38) Cable W84.

(a) Perform cable test setup (paragraph b).

(b) Refer to TM 9-4935-647-14 and perform tester self-test.

(c) Refer to TM 9-4935-647-14 and program the memory for each test position which has an OPEN test status as indicated in table 2-38.

(d) Connect cable connector W84P1 to J5 of input cable test box.

(e) Connect cable connector W84P2 to J49 of output cable test box.

(f) Refer to TM 9-4935-647-14 and perform the cable test.

Table 2-38. Cable W84 Test Data

TEST POSITION	FROM CONN/PIN	TO CONN/PIN	REMARKS	TEST STATUS
1	W84P1/A	W84P2/A		
2	W84P1/B	W84P2/B		
3			End Test	Open
111			Backshell	

2-3. ELEVATION POSITION MONITOR TRANSDUCER ASSEMBLY TEST.

a. General. Test procedures for the elevation position monitor transducer assembly are limited to the performance of resolver test.

b. Tools/Test Equipment. Following is a list of tools and test equipment required to perform test on elevation transducer assembly:

Audio oscillator, 1311A-9701
Azimuth position transducer breakout box, 13103680
Digital voltmeter, 8050A-01 (2 required)
Oscilloscope, dual trace, 212 (500 kHz)
Synchro angle indicator (Angle position indicator), SR202
Test cable, 13103717
Tool kit, 13032302

c. Resolver Test.

NOTE

This test is written using a 1311A-9701 audio oscillator as the power supply; however, any power supply that can provide 11.7 to 11.9 VRMS, 1 watt, 400 hertz may be used. The power supply should be monitored throughout the test and if voltage goes out of tolerance, adjustments should be stopped until power supply is brought back within tolerance.

If the assembly fails any part of this test or a distorted waveform is noted, refer to paragraph 2-7 for resolver/connector replacement procedures.

(1) Connect breakout box cable P1 to connector J1 on transducer.

(2) Connect breakout box cable J1 to the test cable, then the cable to input terminals of angle position indicator (API). Connect wires as follows:

Cable J1	API
J1-12	RH
J1-11	RL
J1-9	S1
J1-7	S2
J1-13	S3
J1-8	S4

(3) Connect adapter cable from the 600-ohm terminal of the power supply to the breakout box P/S dual binding post.

(4) Connect digital voltmeter (DVM) test leads to the breakout box DVM dual binding post. Set DVM for maximum ac voltage.

(5) Connect channel 2 of the oscilloscope to the breakout box test jacks J1-12 (RH-high) and J1-11 (RL-low).

(6) Connect channel 1 of oscilloscope to the breakout box test jacks J1-9 (R2-high) and J1-13 (R4-low).

(7) Adjust API for:

Control	Position
L-L VOLT	11.8
MODE	RSLVR
TRK-FRZ	TRACK
BND WIDTH	LO
LOC-REM	LOCAL

(8) Adjust oscilloscope for:

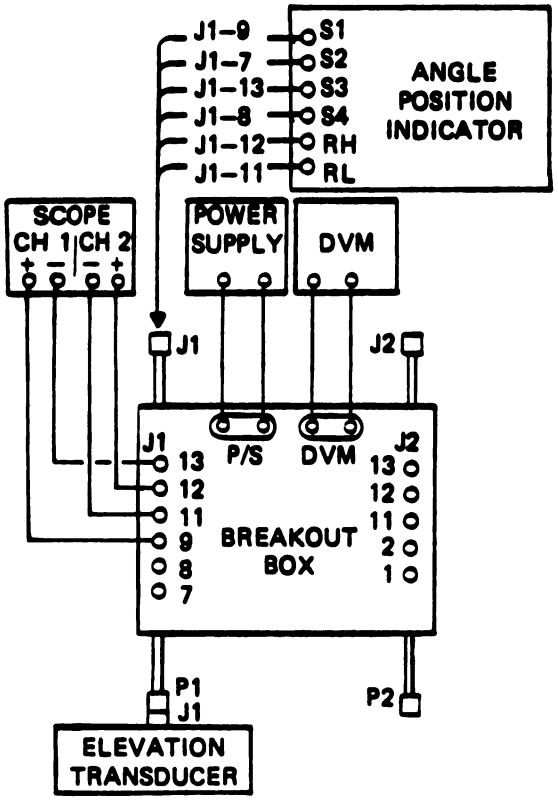
CH 1	CH 2
	Trigger
Pos Sig	Pos Sig
20V/DIV	20V/DIV
1MS/DIV	1MS/DIV
Sweep-Norm	Sweep-Norm
AC input	AC input

(9) Set power supply controls for:

Control	Position
Frequency control	400 Hz
Voltage control	minimum voltage

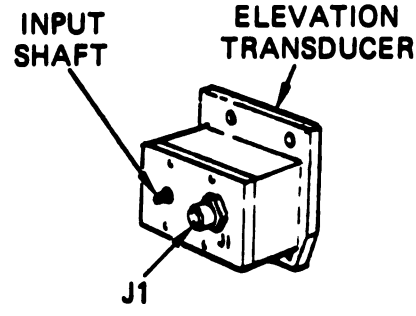
2-3. ELEVATION POSITION MONITOR TRANSDUCER ASSEMBLY TEST (CONT)

(10) Turn on DVM, API, and power supply. Adjust power supply 11.7 to 11.9 volts ac as measured on DVM.

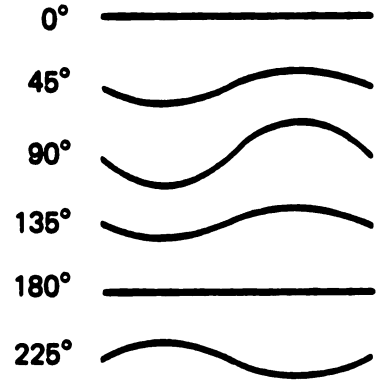


(11) While observing the oscilloscope and API, rotate input shaft on transducer and compare waveform on channels 1 and 2 of the oscilloscope.

(12) Verify that the two signals are out of phase in the range of 0 to 180 degrees. If waveforms are not correct, replace resolver/connector assembly (paragraph 2-7).



CHANNEL 1 WAVEFORMS
R2–R4 VOLTAGE AT API ANGLE OF:

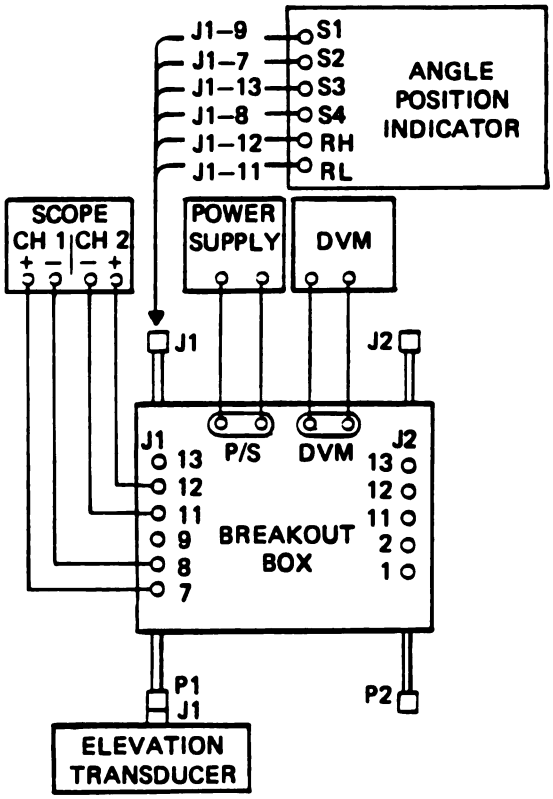


CHANNEL 2 WAVEFORMS
RH–RL VOLTAGE AT ALL ANGLES

2-3. ELEVATION POSITION MONITOR TRANSDUCER ASSEMBLY TEST (CONT)

(13) Disconnect channel 1 leads from breakout box test jacks J1-9 and J1-13.

(14) Connect channel 1 leads to breakout box test jacks J1-7 (R1-high) and J1-8 (R3-low).

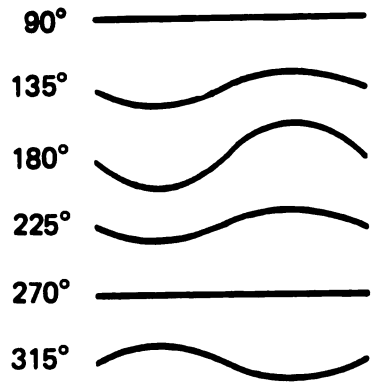


(15) Rotate input shaft on transducer in opposite direction from rotation in step (11) so API angle goes from 180 to 90 degrees. Compare waveform on channels 1 and 2.

(16) Verify that the waveforms are out of phase in the range of 180 to 90 degrees.

(17) Rotate input shaft through 0 to 270 degrees, then to 180 degrees, and verify that the waveform is out of phase between 270 and 180 degrees. Leave input shaft in this position (180 degrees as indicated on API). If waveforms are not correct, replace resolver/connector assembly (paragraph 2-7).

CHANNEL 1 WAVEFORMS
R1–R3 VOLTAGE AT API ANGLE OF:



CHANNEL 2 WAVEFORMS
RH–RL VOLTAGE AT ALL ANGLES

(18) Disconnect oscilloscope from breakout box test jacks, and turn it off.

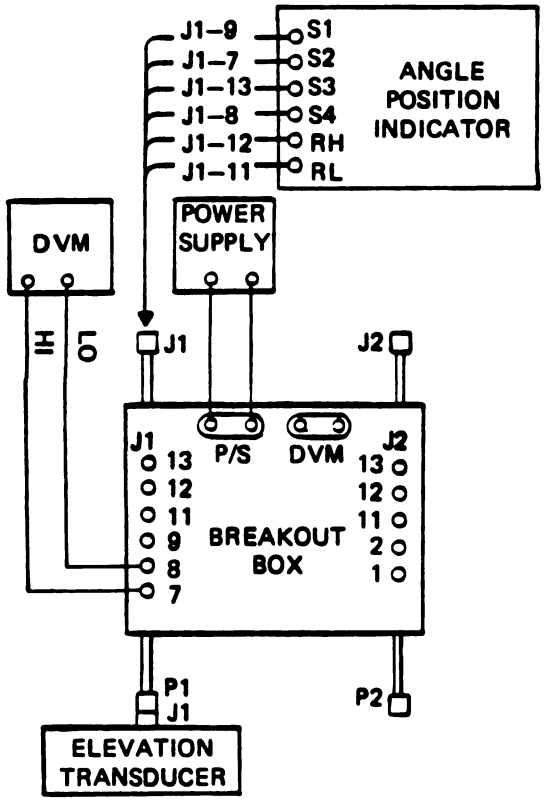
(19) Check power supply voltage on DVM for 11.7 to 11.9 volts ac.

(20) Disconnect DVM leads from breakout box binding posts.

(21) Connect DVM leads to breakout box test jacks J1-7 (R1-high) and J1-8 (R3-low).

2-3. ELEVATION POSITION MONITOR TRANSDUCER ASSEMBLY TEST (CONT)

(22) While observing DVM, rotate input shaft from 180 to 270 degrees, then to 0 degrees, then to 90 degrees, and then to near 180 degrees. Note that the R1-R3 voltage did not exceed 12.3 volts. If voltage measurements are not correct, replace resolver/connector assembly (paragraph 2-7).



(23) Connect DVM leads to breakout box test jacks J1-9 (R2-high) and J1-13 (R4-low).

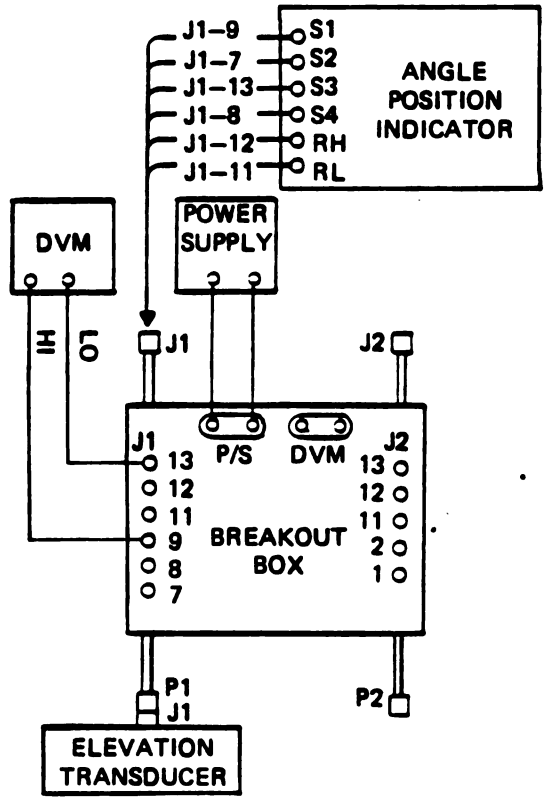
(24) While observing DVM, rotate input shaft from 180 to 90, then to 0, then to 270, then to near 180 degrees. Note that the R2-R4 voltage did not exceed 12.3 volts. Return input shaft to 0 degrees. If voltage measurements are not correct, replace resolver/connector assembly (paragraph 2-7).

(25) This completes the resolver test. Turn off test equipment and disconnect breakout box cable P1 from transducer assembly.

(26) Disconnect adapter cable from power supply.

(27) Disconnect breakout box cable J1 from API.

(28) Disconnect DVM test leads from breakout box.



2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST.

a. General. Troubleshooting procedures for the azimuth position transducer/switch assembly consist of two tests and five adjustments procedures. These are:

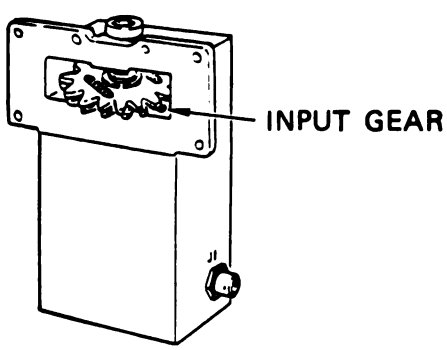
b. Tools/Test Equipment. Following is a list of tools and test equipment required to perform test and adjustments on azimuth position transducer/switch assembly:

Audio oscillator, 1311A-9701
Azimuth position transducer breakout box, 13103680
Digital voltmeter, 8050A-01 (2 required)
Oscilloscope, dual trace, 212 (500 kHz)
Synchro angle indicator (Angle position indicator), SR 202
Test cable, 13103717
Tool kit, 13032302

c. Gear Binding Test.

(1) Rotate input gear by hand and verify smooth, free rotation.

(2) If binding is detected, refer to fault isolation of binding gear (paragraph j).



d. Resolver Test.

NOTE

This test is written using a 1311A-9701 oscillator as the power supply; however, any power supply that can provide 11.7 to 11.9 VRMS, 1 watt, 400 hertz may be used. The power supply should be monitored throughout the test and if the voltage goes out of tolerance, the adjustments should be stopped until the power supply is brought back within tolerance.

If the assembly fails any part of this test or a distorted waveform is noted, refer to paragraph 2-8 for resolver/connector replacement procedures.

(1) Connect breakout box cable P1 to connector J1 on transducer/switch assembly, and cable P2 to connector J2.

(2) Connect breakout box cable J1 to the test cable, then the test cable to the input terminals of the angle position indicator (API). Connect wires as follows:

Cable J1	API
J1-12	RH
J1-11	RL
J1-9	S1
J1-7	S2
J1-13	S3
J1-8	S4

(3) Connect adapter cable from the 600-ohm terminal of the power supply to the breakout box P/S dual binding post.

2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(4) Connect digital voltmeter (DVM) test leads to the breakout box DVM dual binding post. Set DVM for maximum ac voltage.

(5) Connect channel 2 of the oscilloscope to the breakout box test jacks J1-12 (RH-high) and J1-11 (RL-low).

(6) Connect channel 1 of oscilloscope to the breakout box test jacks J1-9 (R2-high) and J1-13 (R4-low).

(7) Adjust angle position indicator (API) for:

11.8V
TRK
LO
LOCAL
RSLVR

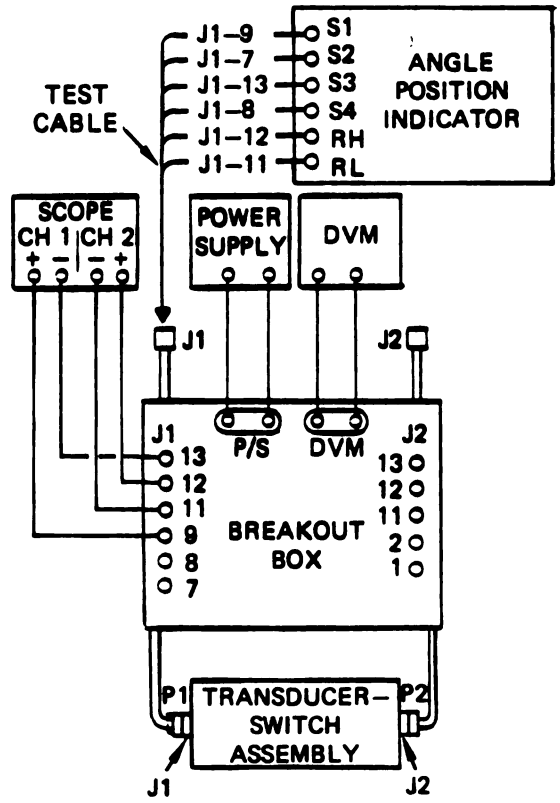
(8) Adjust oscilloscope for:

CH 1	CH 2
	Trigger
Pos signal	Pos signal
20V/div	20V/div
1ms/div	1ms/div
Sweep-Normal	Sweep-Normal
AC input	AC input

(9) Set power supply controls for:

Control	Position
Frequency control	400 Hz
Voltage control	minimum voltage

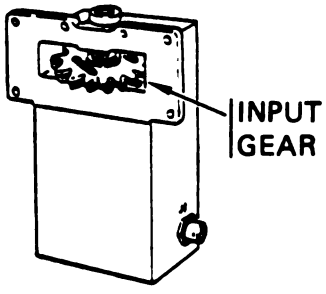
(10) Turn on DVM, API, and power supply. Adjust power supply to 11.7 to 11.9 volts ac as measured on DVM.



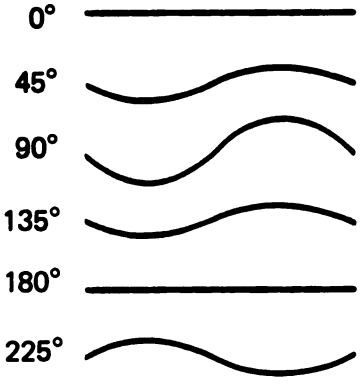
2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(11) Rotate input gear on transducer and compare waveform on channels 1 and 2 of the oscilloscope.

(12) Verify that the two signals are out of phase in the range of 0 to 180 degrees. If waveforms are not correct, replace resolver/connector assembly (paragraph 2-8).



CHANNEL 1 WAVEFORMS
R2–R4 VOLTAGE AT API ANGLE OF:



CHANNEL 2 WAVEFORMS
RH–RL VOLTAGE AT ALL ANGLES

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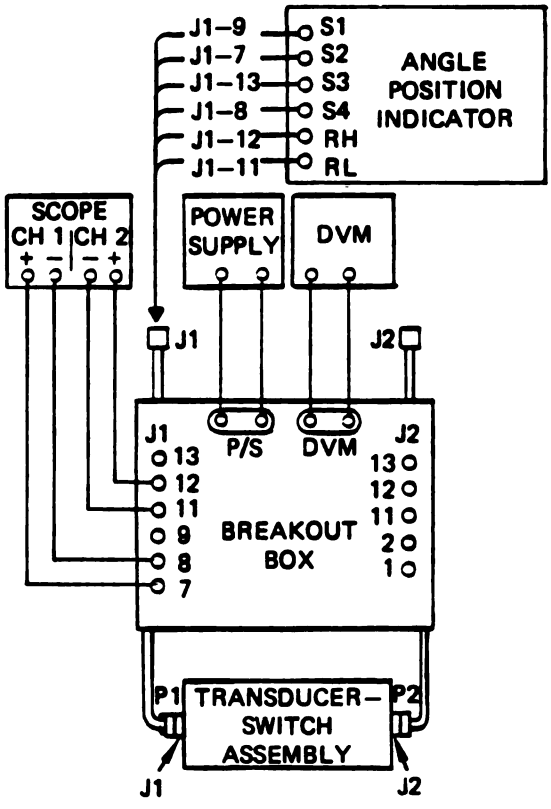
(13) Disconnect channel 1 leads from breakout box test jacks J1-9 and J1-13.

(14) Connect channel 1 leads to breakout box test jacks J1-7 (R1-high) and J1-8 (R3-low).



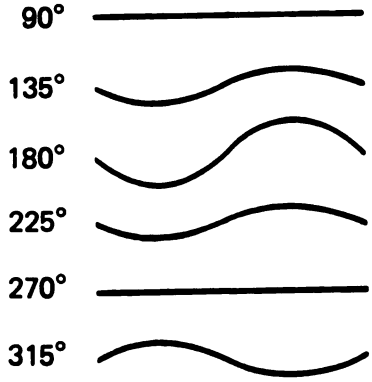
(15) Rotate input gear on transducer in opposite direction from rotation in step (11) so API angle goes from 180 to 90 degrees. Compare waveform on channels 1 and 2.

(16) Verify that the waveforms are out of phase in the range of 180 to 90 degrees.

2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(17) Rotate input gear through 0 to 270 degrees, then to 180 degrees, and verify that the waveform is out of phase between 270 and 180 (but not in phase at 180 degrees). Leave input gear in this position (180 degrees as indicated on API). If waveforms are not correct, replace resolver/ connector assembly (paragraph 2-8).

CHANNEL 1 WAVEFORMS
R1–R3 VOLTAGE AT API ANGLE OF:



CHANNEL 2 WAVEFORMS
RH–RL VOLTAGE AT ALL ANGLES

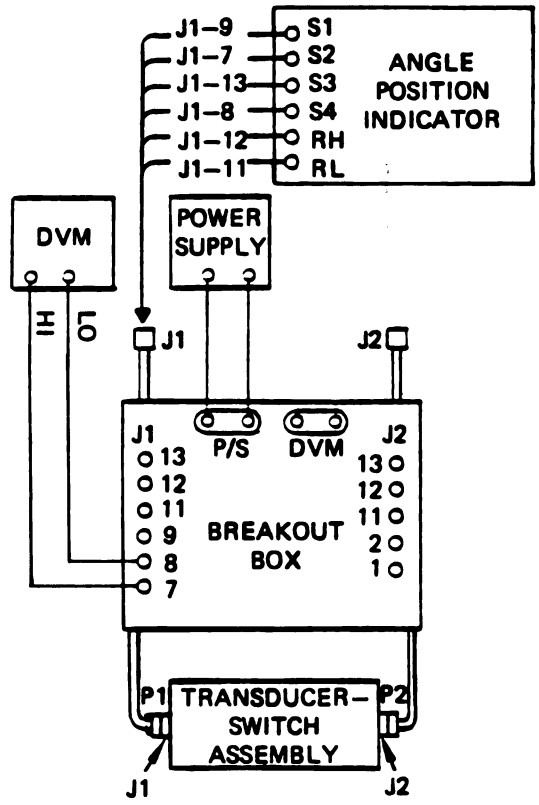
(18) Disconnect oscilloscope from breakout box test jacks and turn it off.

(19) Check power supply voltage on DVM for 11.7 to 11.9 volts ac.

(20) Disconnect DVM leads from breakout box binding posts.

(21) Connect DVM leads to breakout box test jacks J1-7 (R1-high) and J1-8 (R3-low).

(22) While observing voltage reading on DVM, rotate input gear from 180 to 270 degrees, then to 0 degrees, and then to near 180 degrees. Note that voltage does not exceed 12.3 volts. If voltage measurements are not correct, refer to fault isolation of resolver test (paragraph k).



(23) Connect DVM leads to breakout box test jacks J1-9 (R2-high) and J1-13 (R4-low).

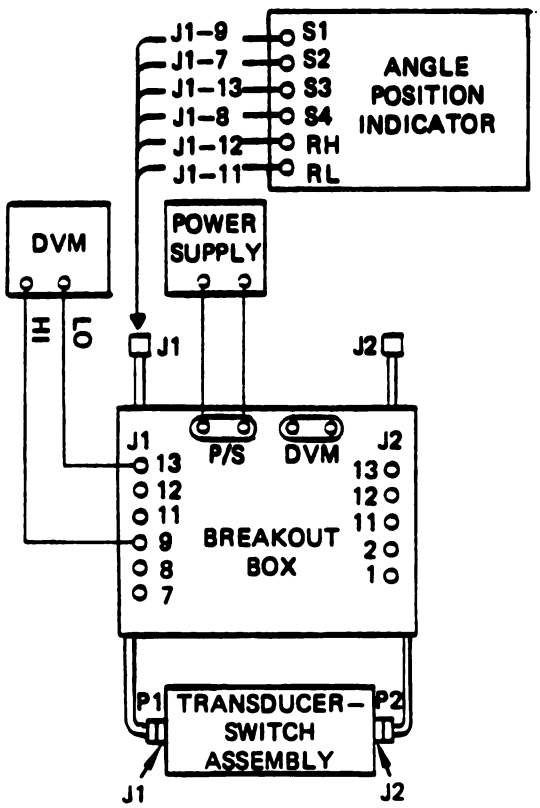
(24) While observing voltage reading on DVM, rotate input gear from 180 to 90 degrees, then to 0 degrees, then to 270 degrees, and then to near 180 degrees. Note that voltage does not exceed 12.3 volts. Reconnect DVM to breakout box DVM dual binding post. If voltage measurements are not correct, refer to fault isolation of resolver test (paragraph k).

(25) Rotate input gear until API reads 0 degrees. Use a pencil or chalk and mark one of the teeth of gear.

(26) Rotate input gear 360 degrees (to marked gear tooth) and note the API increases to 15.53 to 15.73 degrees. Return input gear to 0 degrees.

2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(27) Leave equipment connected for rotary limit switch adjustment.



e. Rotary Limit Switch Adjustments.

CAUTION

The rotary limit switch has internal stops. Do not overtighten the adjusting screws as damage to the switch can result. If the desired angle has not been reached when a marked increase in resistance is felt, loosen lockscrew on opposite side of deck and then complete adjustment. Go back to the other side of deck and reset the adjustment on that side.

NOTE

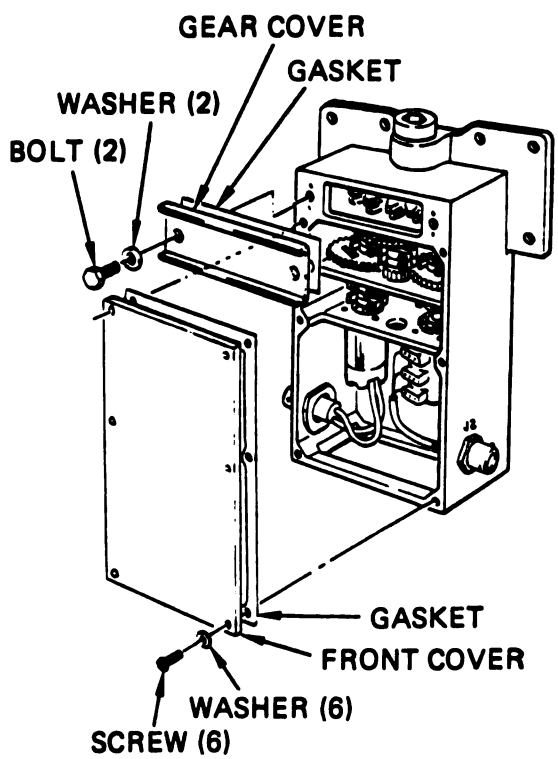
If the transducer/switch assembly passed the binding gear and resolver tests and the rotary limit switch cannot be adjusted, the switch/connector assembly is faulty. Refer to paragraph 2-8 for switch replacement procedure.

(1) Using No. 2 crosstip screwdriver and 10mm socket, remove six screws, two bolts, and eight washers securing cover.

NOTE

Gasket is reuseable if not damaged.

(2) Remove cover and gasket. Replace a defective gasket.



2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

f. Switch Deck A Adjustment.

NOTE

If switch deck A cannot be adjusted within the following limits, replace switch/ connector assembly (paragraph 2-8).

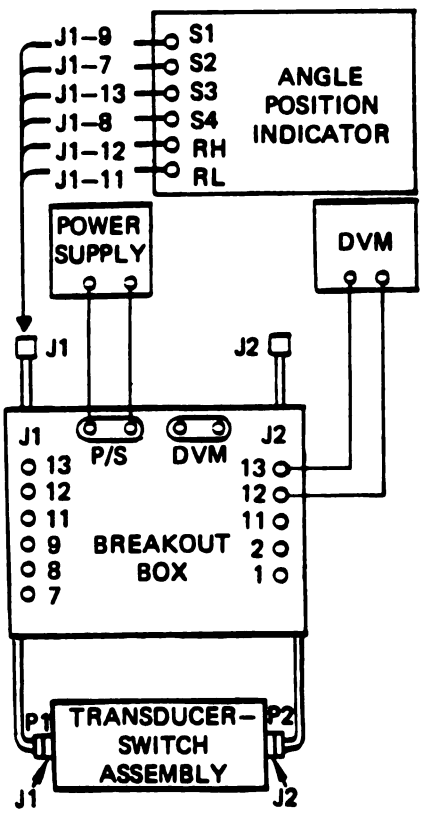
(1) Connect test leads to DVM.

(2) Turn on DVM and set controls for 200-ohm range.

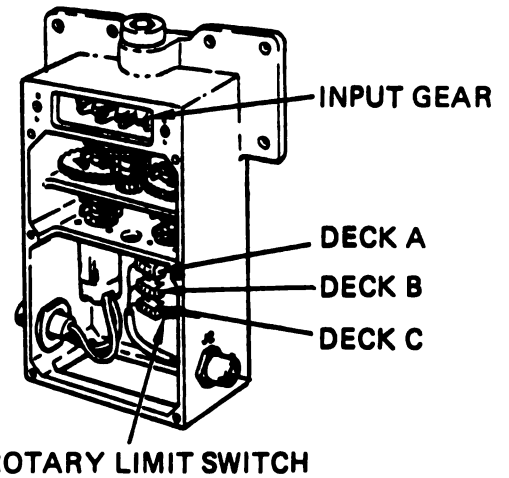
NOTE

The rotary limit switch consists of three decks, each deck has two actuation points. (During 360 degree switch shaft rotation, the contacts of each deck will alternately be open and closed.) The following procedures adjust these points of actuation.

(3) Connect DVM test leads to breakout box test jacks J2-12 and J2-13.

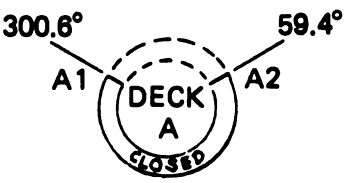


(4) Rotate input gear on transducer until API reads approximately 0 degrees. Verify that DVM is indicating open contacts. If not, refer to misoriented switch adjustment (paragraph i).



ROTARY LIMIT SWITCH

(5) Rotate input gear on transducer until point A2 is found where the switch is now actuating.



MOVING SCREW A CW MOVES THE 59.4° LINE TOWARD 90°

MOVING SCREW G CW MOVES THE 300.6° LINE TOWARD 360°

PINS 12 AND 13 CLOSED AS SHOWN

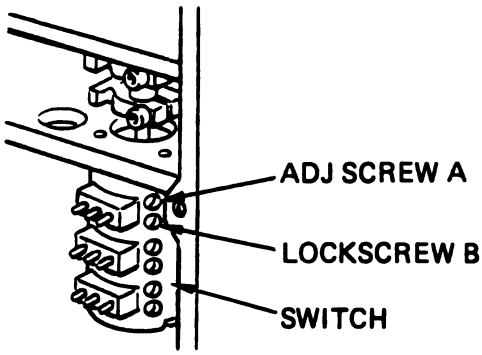
NOTE

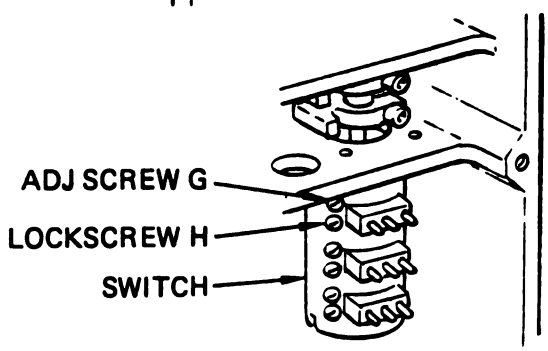
The procedure of finding the existing switch actuation point must be followed throughout this procedure to insure that the switch starting point is known before beginning the adjustment.

(6) Using flat tip screwdriver, loosen lockscrews B and H one turn.

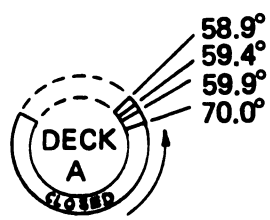
2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(7) Using flat tip screwdriver, turn adjusting screw A, moving transducer input gear as required, until switch actuates at 59 degrees as indicated on API. Tighten lockscrew H.





(8) Rotate transducer input gear until API indicates approximately 70 degrees. Rotate gear back and adjust screw A until the switch contacts open at 58.9 to 59.9 degrees as indicated on API. Turning screw A clockwise moves the 59.4 degree line toward 90 degrees.



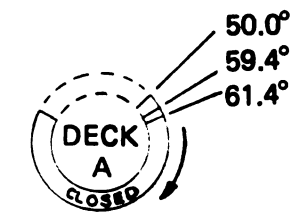
ROTATION DIRECTION FOR OPEN SWITCH CONTACT ADJ

NOTE

It may take several attempts to make the adjustment. If necessary, slightly tighten lockscrew B to complete the adjustment without overshooting the actuating point.

The difference between 59.4 and 61.4 degrees for opening and closing of contacts is expected with this switch.

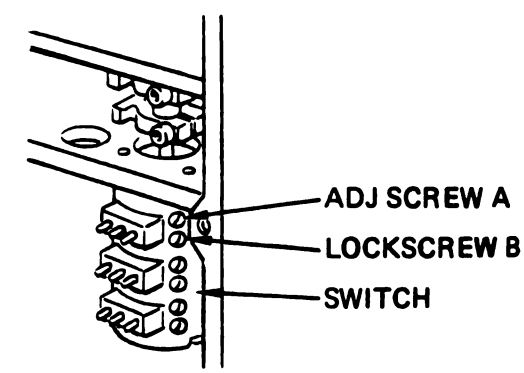
(9) Rotate transducer input gear until API indicates approximately 50 degrees. Rotate gear to increase angle to approach the 59.4 degree point again. Verify that, with the API angle increasing, the switch contacts close at a maximum of 61.4 degrees.



ROTATION DIRECTION FOR CLOSED SWITCH CONTACT ADJ

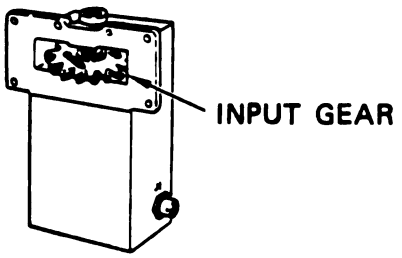
(10) Readjust screw A as necessary to open switch contacts at 58.9 to 59.9 degrees, and close the contacts at a maximum of 61.4 degrees.

(11) Using flat tip screwdriver, tighten lockscrew B.



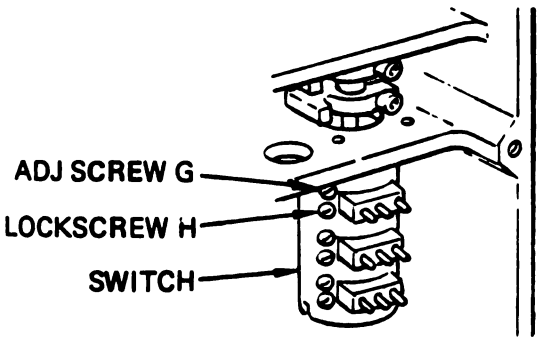
2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(12) Rotate input gear on transducer back through 0 degrees on API to find point A1 where switch is now actuating.



(13) Using flat tip screwdriver, loosen lockscrew H and turn adjusting screw G, moving input gear as required, until switch actuates at approximately 300 degrees.

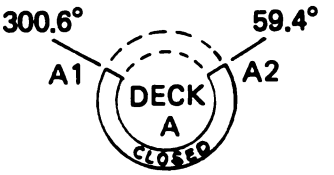
(14) Rotate input gear back until API indicates approximately 290 degrees; then rotate gear towards 300 degrees, and adjust screw G until the switch contacts open at 300.1 to 301.1 degrees as indicated on the API. Turning screw G clockwise moves the 300.6 degree line toward 360 degrees.



(15) Rotate input gear until API indicates approximately 310 degrees then rotate gear back toward 300 degrees. Verify that the API angle decreases and switch contacts close at a minimum of 298.6 degrees.

(16) Readjust screw G as necessary to open switch contacts at 300.1 to 301.1 degrees and close contacts at a minimum of 298.6 degrees.

(17) Tighten lockscrew H and recheck adjustment.



MOVING SCREW A CW MOVES THE 59.4° LINE TOWARD 90°

MOVING SCREW G CW MOVES THE 300.6° LINE TOWARD 360°

PINS 12 AND 13 CLOSED AS SHOWN

g. Switch Deck B Adjustment.

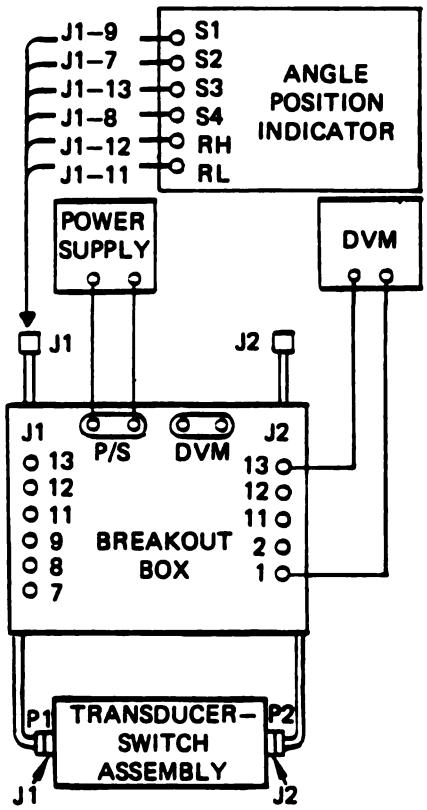
NOTE

If switch deck B cannot be adjusted within the following limits, replace switch/ connector assembly (paragraph 2-8).

(1) Disconnect DVM test leads from breakout box test jacks J2-12 and J2-13 and connect test leads to test jacks J2-1 and J2-13.

2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(2) Rotate input gear on transducer until API reads approximately 0 degrees. Verify that DVM is indicating closed contacts. If not, refer to misoriented switch adjustment (paragraph i).



(3) Rotate input gear on transducer until point B2 is found where the switch is now actuating.

MOVING SCREW I CW MOVES THE 86.2° LINE TOWARD 90°

MOVING SCREW C CW MOVES THE 273.8° LINE TOWARD 360°

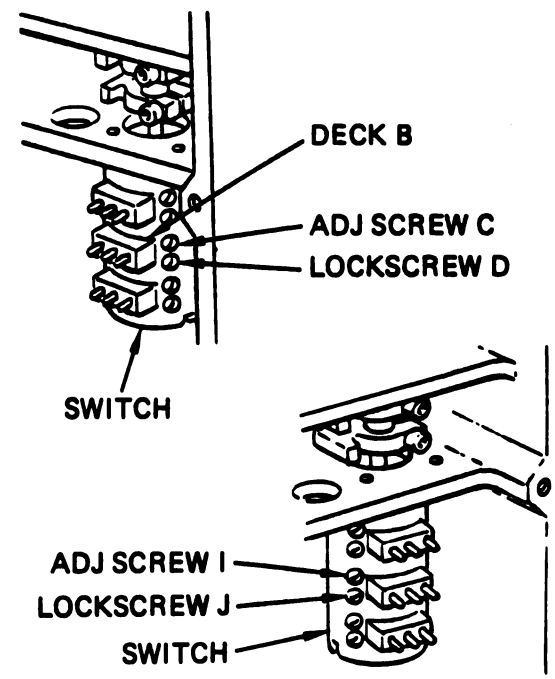
PINS 1 AND 13 CLOSED AS SHOWN

NOTE

The procedure of finding the existing switch actuation point must be followed throughout this procedure to insure that the switch starting point is known before beginning the adjustment.

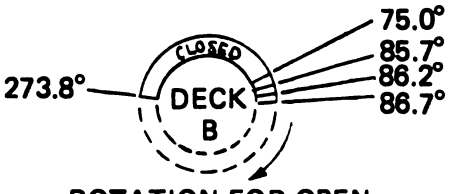
(4) Using flat tip screwdriver, loosen lockscrews D and J one turn.

(5) Using flat tip screwdriver, turn adjusting screw I, moving transducer input gear as required, until switch actuates at approximately 86 degrees as indicated on API. Tighten lockscrew D.



2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

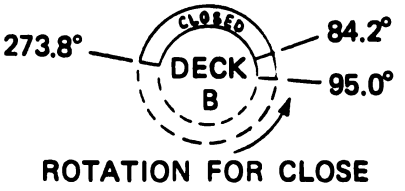
(6) Rotate transducer input gear until API indicates approximately 75 degrees. Rotate gear back toward the actuating point and adjust screw I until the switch contacts open at 85.7 to 86.7 degrees as indicated on API.



NOTE

It may take several attempts to make the adjustment. If necessary, slightly tighten lockscrew J to complete the adjustment without overshooting the actuating point.

(7) Rotate transducer input gear until API indicates approximately 95 degress. Rotate gear back and verify that, with the API angle decreasing, the switch contacts close at a minimum of 84.2 degrees.

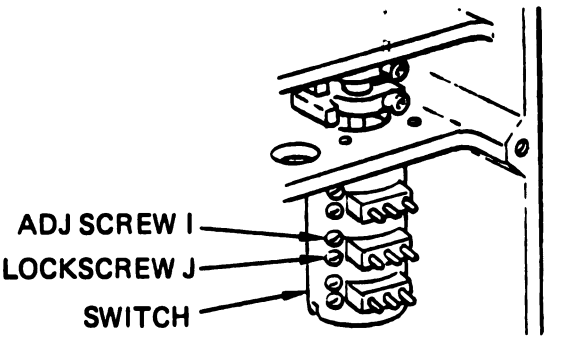


NOTE

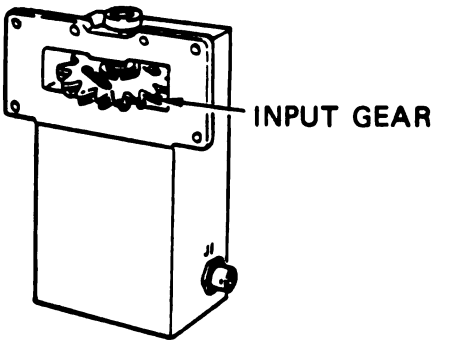
The difference between the 86.2 and 84.2 degrees for opening and closing of contacts is expected with this switch.

(8) Readjust screw I as necessary to open switch contacts at 85.7 to 86.7 degrees, and close the contacts at a minimum of 84.2 degrees.

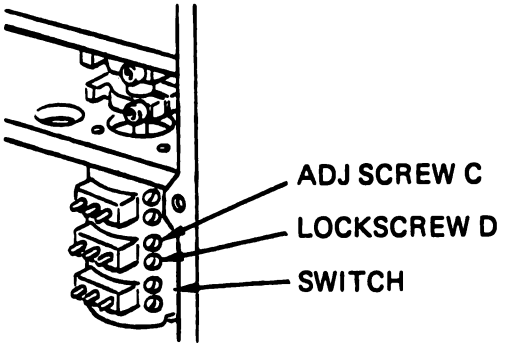
(9) Using flat tip screwdriver, tighten lockscrew J.



(10) Rotate input gear on transducer back through 0 degrees on API to find point B1 where switch is now actuating.



(11) Using flat tip screwdriver, loosen lockscrew D and turn adjusting screw C, moving input gear as required, until switch actuates at approximately 274 degrees.



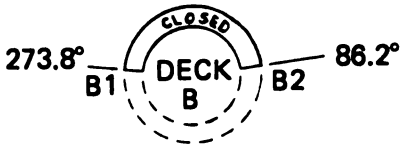
2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(12) Rotate input gear back until API indicates approximately 285 degrees. Rotate gear toward 274 degrees and adjust screw C until the switch contacts open at 273.3 to 274.3 degrees as indicated on the API. Turning screw C clockwise moves the 273.8 degree line toward 360 degrees.

(13) Rotate input gear until API indicates approximately 265 degrees; then rotate gear back toward 274 degrees. Verify that the API angle increases and the switch contacts close at a maximum of 275.8 degrees.

(14) Readjust screw C as necessary to open switch contacts at 273.3 to 274.3 degrees and close switch contacts at a maximum of 275.8 degrees.

(15) Tighten lockscrew D and recheck adjustment.



MOVING SCREW I CW MOVES THE 86.2° LINE TOWARD 90°

MOVING SCREW C CW MOVES THE 273.8° LINE TOWARD 360°

PINS 1 AND 13 CLOSED AS SHOWN

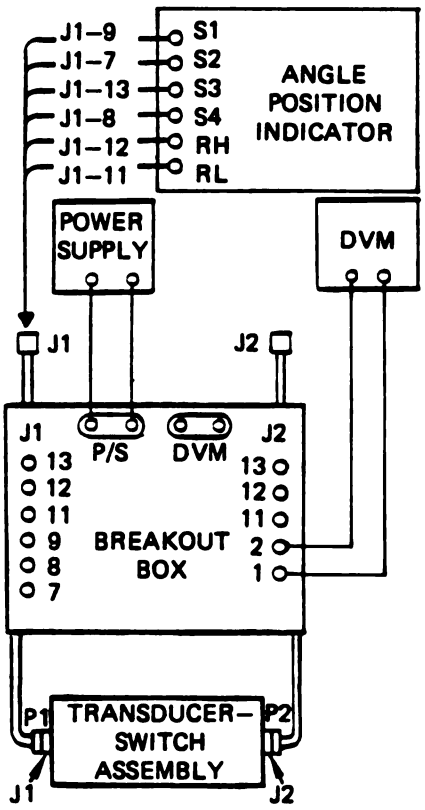
h. Switch Deck C Adjustment.

NOTE

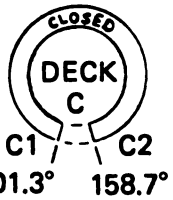
If switch deck C cannot be adjusted within the following limits, replace switch/ connector assembly (paragraph 2-8).

(1) Disconnect DVM test leads from breakout box test jacks J2-1 and J2-13 and connect test leads to test jacks J2-1 and J2-2.

(2) Rotate input gear on transducer until API reads approximately 0 degrees. Verify that DVM is indicating closed contacts. If not, refer to misoriented switch adjustment (paragraph i).



(3) Rotate input gear on transducer until point C2 is found where the switch is now actuating.



MOVING SCREW K CW MOVES THE 158.7° LINE TOWARD 180°

MOVING SCREW E CW MOVES THE 201.3° LINE TOWARD 270°

PINS 1 AND 2 CLOSED AS SHOWN

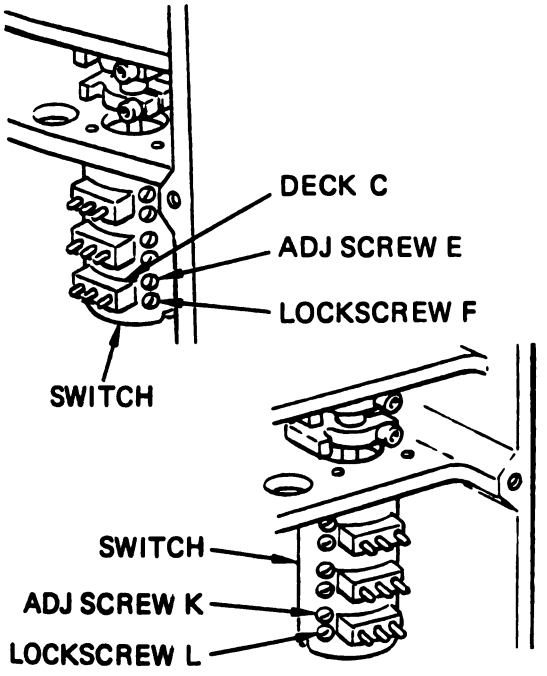
2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

NOTE

The procedure of finding the existing switch actuation point must be followed throughout this procedure to insure that the switch starting point is known before beginning the adjustment.

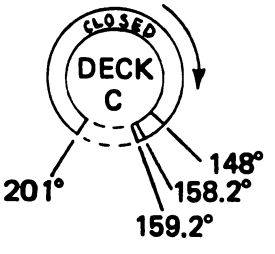
(4) Using flat tip screwdriver, loosen lockscrews F and L one turn.

(5) Using flat tip screwdriver, turn adjusting screw K, moving transducer input gear as required, until the switch actuates at approximately 158 degrees as indicated on API. Tighten lockscrew F.



(6) Rotate transducer input gear until API indicates approximately 148 degrees. Rotate gear back towards the actuating point and adjust screw K until the contacts open at 158.2 to 159.2 degrees as indicated on the API.

ROTATION DIRECTION FOR OPEN SWITCH CONTACT ADJ.

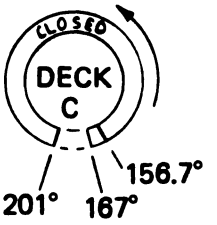


NOTE

It may take several attempts to make the adjustment. If necessary, slightly tighten lockscrew L to complete the adjustment without overshooting the actuating point.

(7) Rotate transducer input gear until API indicates approximately 167 degrees. Rotate gear back and verify that, with the API angle decreasing, the switch contacts close at a minimum of 156.7 degrees.

ROTATION DIRECTION FOR CLOSED SWITCH CONTACT ADJ.

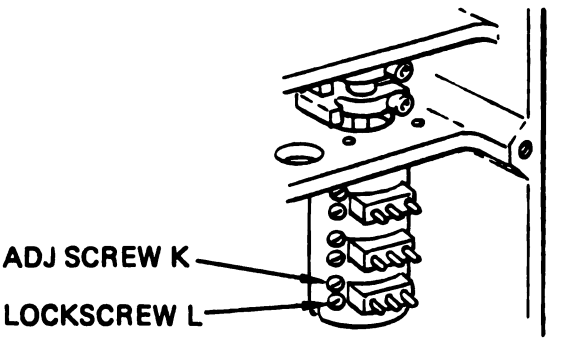


NOTE

The difference between the 158.7 and 156.7 degrees for opening and closing of contacts is expected with this switch.

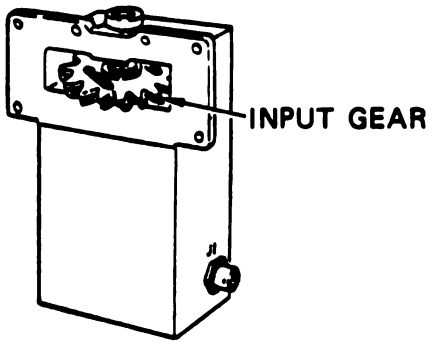
(8) Readjust screw K as necessary to open switch contacts at 158.2 to 159.2 degrees, and close the contacts at a minimum of 156.7 degrees.

(9) Using a flat tip screwdriver, tighten lockscrew L.

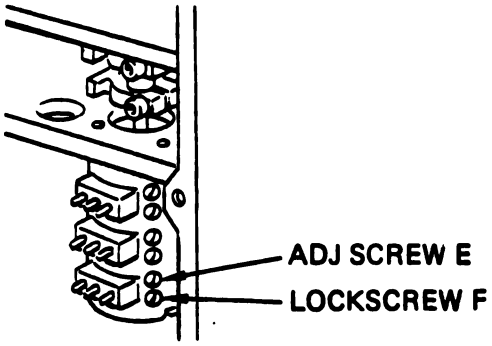


2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(10) Rotate input gear on transducer back through 0 degrees on API to find point C1 where switch is now actuating.



(11) Using flat tip screwdriver, loosen lockscrew F and turn adjusting screw E, moving input gear as required, until switch actuates at approximately 200 degrees.



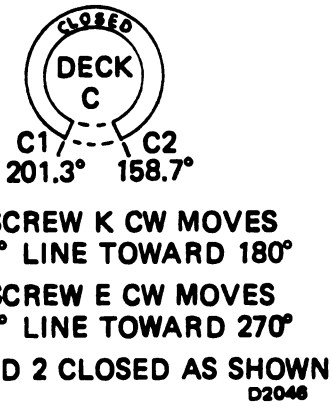
(12) Rotate input gear until API indicates approximately 211 degrees. Rotate gear toward 200 degrees and turn adjusting screw E until the switch contacts open at 200.8 to 201.8 degrees as indicated on the API. Turning screw E clockwise moves the 201.3 degree line toward 270 degrees.

(13) Rotate input gear until API indicates 190 degrees, then rotate gear back toward 201 degrees. Verify that the API angle increases and the switch contacts close at a maximum of 203.3 degrees.

(14) Readjust screw E as necessary to open switch contacts at 200.8 to 201.8 degrees and close switch contacts maximum of 203.3 degrees.

(15) Tighten lockscrew F and recheck adjustment.

(16) This completes the adjustment of the rotary limit switch.

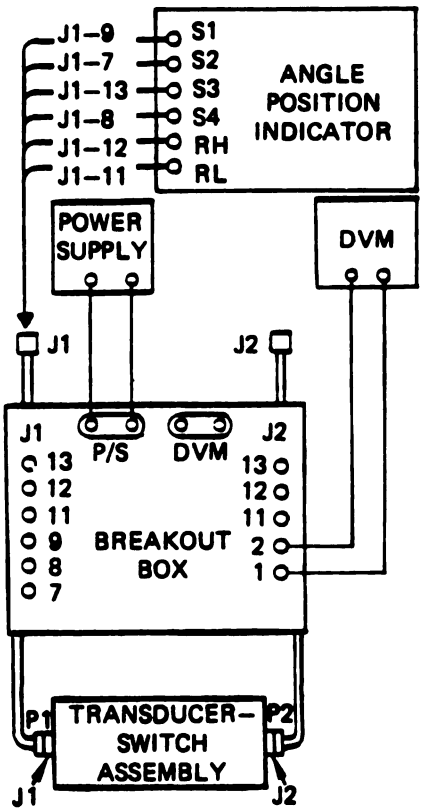


(17) Turn off test equipment and disconnect breakout box cables from connectors J1 and J2 on transducer/switch.

(18) Disconnect test leads from DVM and breakout box.

(19) Disconnect adapter cable No. 3 from power supply.

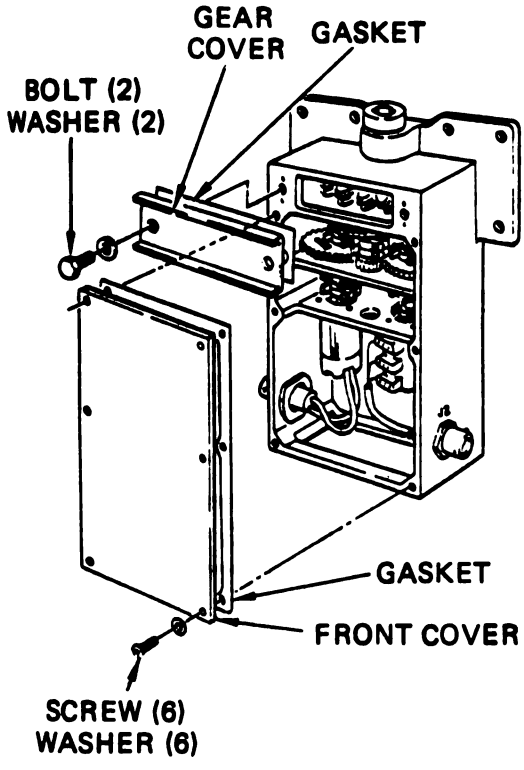
(20) Disconnect breakout box cable J1 from API.



2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(21) Position gasket and cover on transducer/switch housing.

(22) Using No. 2 crosstip screwdriver and 10mm socket, install six screws, two bolts, and eight washers. Tighten screws and bolts to 0.5 to 0.8 N•m.



l. Misoriented Switch Adjustment.

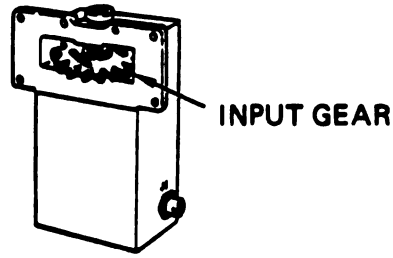
NOTE

This procedure establishes the correct orientation of the switch closure angle required to adjust the rotary limit switch. The procedure covers orienting the switch closure angle for deck A. All other decks are done the same way.

Test equipment connections for each switch deck remain as described in paragraph f (for deck A), paragraph g (for deck B), or paragraph h (for deck C).

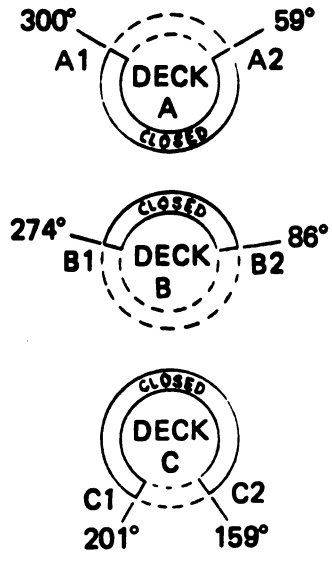
If any switch deck cannot be adjusted within limits, replace switch/connector assembly in (paragraph 2-8).

(1) Rotate transducer/switch input gear to point A2 where the switch actuation occurs.



(2) Note the angle on the API. It should be approximately 59 degrees (86 degrees for B2 and 159 degrees for C2).

(3) Rotate input gear so that the API angle goes through 0 degrees until point A1 is found, establishing the other limit of the switch closure. It should be approximately 300 degrees (274 degrees for B1 and 201 degrees for C1).



(4) Using flat tip screwdriver, loosen lockscrews H and B for deck A (D and J for deck B, and F and L for deck C).

(5) Turn adjusting screw A (C for deck B, E for deck C) and move gear so that point A2 moves to the position shown.

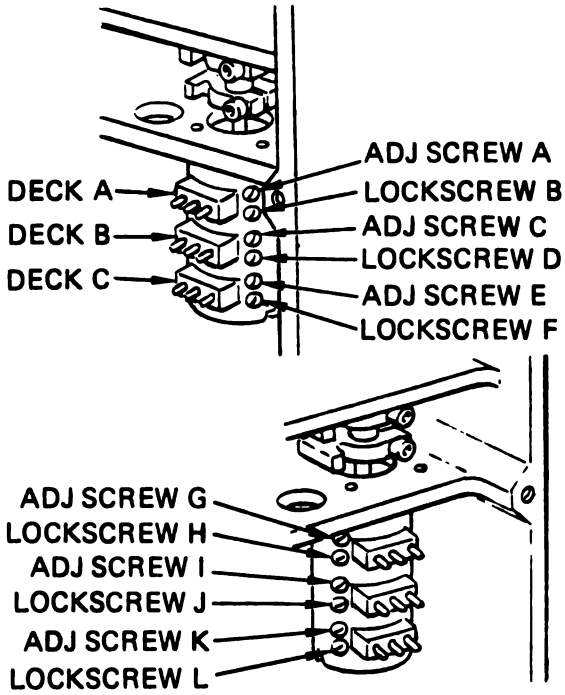
2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(6) Rotate input gear until point A1 is found again. It should have moved to a new position. Return to point A2.

(7) Continue adjusting screw A and rotating gear until A2 is approximately in the position shown. Point A1 will also move to a new position.

(8) Using flat tip screwdriver, tighten lockscrews B and H for deck A (D and J for deck B, and F and L for deck C).

(9) This completes the adjustment of a misoriented switch. Complete adjustment of the appropriate switch deck can now be made.



j. Fault Isolation of Binding Gear.

(1) Using crosstip screwdriver, remove six screws and washers securing front cover. Remove cover and gasket.

(2) Inspect all gears for proper mesh. Inspect split gears for broken or disconnected springs.

(3) Using 7/64-inch socket head key, loosen clamp screw on gear B.

(4) Spin gear E and check for evidence of gear binding. If binding still exists, perform step (5). If no binding exists, perform step (7).

(5) Retighten clamp screw on gear B. Examine gears A and F for broken teeth. Replace gear if defective. If gears are not defective, loosen clamp screw in gears A and spin gear E (paragraph 2-8).

(6) If no binding exists, replace bearings for gears A and B. If binding still exists, replace bearings for gears E and F (paragraph 2-8).

(7) Inspect gears B, C, and D for broken teeth. Replace gears if defective. If gears are not defective, retighten clamp screw on gear B and loosen clamp screw on gear D. Spin gear E (paragraph 2-8).

(8) If no binding exists, replace bearings for gear D. If binding still exists, replace bearings for gear C (paragraph 2-8).

WARNING

Methyl-ethyl-ketone vapors are toxic. Avoid prolonged or repeated breathing of vapors and contact with skin. Use only with adequate ventilation. Methyl-ethyl-ketone is flammable and should not be used near open flame. Fire extinguisher should be available when solvent is used.

(9) Using methyl-ethyl-ketone, clean sealing compound from cover gasket. Install cover and gasket and secure with six screws and washers. Using crosstip screwdriver, tighten screws.

k. Fault Isolation of Resolver Test.

(1) Turn off power source.

(2) Using DVM, measure resistance between J1-12 and J1-11. Resistance should be 60 to 82 ohms. If resistance is not correct, replace resolver/connector (paragraph 2-8).

2-4. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY TEST (CONT)

(3) Using DVM, measure resistance between J1-7 and J1-8, and J1-9 and J1-13. Resistance should be 176 to 238 ohms. If resistance is not correct, replace resolver/connector (paragraph 2-8).

NOTE

If resolver passed the resistance checks, a slipping gear may be the fault.

(4) Using crosstip screwdriver, remove six screws and washers securing front cover. Remove front cover and gasket.

(5) Spin gear E and verify that all gears are turning.

(6) Hold gear E and try to turn gear C. If gear C turns, hold each gear until loose clamp screw is found. If gear C does not turn, check clamp screws securing coupling between resolver and gears.

(7) If loose clamp screw is found, remove and clean it. Apply sealing compound to clamp screw and reinstall. Tighten clamp screw.

WARNING

Methyl-ethyl-ketone vapors are toxic. Avoid prolonged or repeated breathing of vapors and contact with skin. Use only with adequate ventilation. Methyl-ethyl-ketone is flammable and should not be used near open flame. Fire extinguisher should be available when solvent is used.

(8) Using methyl-ethyl-ketone, clean sealing compound from cover gasket.

(9) Install gasket and front cover and secure with six screws and washers. Using crosstip screwdriver, tighten screws.

Section II. MAINTENANCE

2-5. GENERAL MAINTENANCE PROCEDURES. The following general inspection and cleaning procedures should be used when performing maintenance. Special inspections and cleaning procedures, when required, are included with each maintenance task.

a. Inspect.

(1) Bolts, nuts, and screws for stripped threads or other damage. Repair or replace as necessary.

(2) Gears for cracked, chipped, or missing teeth. Repair or replace as necessary.

(3) Components for chipped paint, rust, broken welds, elongated holes, or other visual damage. Repair or replace as required.

(4) Electrical cables and connectors for cracked or broken insulation, bare wires, burned or charred component parts, loose or damaged pins or connectors. Repair or replace as required.

b. Clean and Paint.

(1) Using cotton wiping cloth and approved solvent, if required, clean all components before installation.

(2) Spot paint all areas that have chipped or scratched paint.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS. This paragraph covers the maintenance tasks for the following items:

INITIAL SETUP

Tools
- Kit, tool, 13032302
- Set, shop, 13032303
  - Handle, solder iron, KC1200
  - Heater, gun type, 1000W, 535
  - Holder, solder iron, H300
  - Scissors, electrician, 175E
  - Stripper, wire, hand, 45-202
  - Tip, soldering iron, PL333 or 4039
  - Tool, crimping, M22520/5-01, M22520/1-01, or CCT-DL
  - Tool, insertion, TR22D1T
  - Tool, removal, TR22DRT
  - Tool, soldering aid, SH20A
  - Wrench, spanner, adjustable, 314-21N

Materials/Parts
- Adhesive (2, Appendix B)
- Cloth, abrasive (3, Appendix B)
- Cloth, abrasive (4, Appendix B)
- Sleeving, insulation (22, Appendix B)
- Sleeving, insulation (23, Appendix B)
- Sleeving, insulation (24, Appendix B)
- Sleeving, insulation (25, Appendix B)
- Sleeving, insulation (26, Appendix B)
- Sleeving, insulation (27, Appendix B)
- Sleeving, insulation (28, Appendix B)
- Sleeving, insulation (29, Appendix B)
- Sleeving, insulation (30, Appendix B)
- Sleeving, insulation (31, Appendix B)
- Sleeving, insulation (32, Appendix B)
- Sleeving, insulation (33, Appendix B)
- Sleeving, insulation (34, Appendix B)
- Solder, wire (35, Appendix B)
- Varnish (38, Appendix B)

Personnel Required
- MLRS Repairer MOS 27M

Troubleshooting
- Paragraph 2-2

NOTE

Upon receipt of a defective cable, inspect connectors and cable for any defect which might damage the cable tester. If a defect is found, refer to table 2-39 and repair connector. If a defect is not found, refer to paragraph 2-2 and perform the cable test. Figures 2-1 through 2-27 and FO-1 through FO-5 are cable assembly wiring diagrams for all cable assemblies used on the Rocket Launcher M270.

Refer to table 2-39 to find the designation number of the cable (first column) and connector (second column) you wish to repair. The X in the item number column opposite the connector identifies the maintenance instruction item where the connector and backshell (if required) repair can be found.

Table 2-40 lists the heat shrinkable insulation sleeving needed to repair some cable connectors. Table format and use is the same as table 2-39 described above; however, the vertical item number columns identify sleeving listed in Appendix B, Expendable Supplies and Materials List.

Table 2-39. Cable and Connector Repair Reference

CABLE NO./ PART NO./ FIGURE NO.	CONN. NO.	REPAIR PROCEDURE ITEM NO.														Back-shell Not Req.	Back-shell Part of Con-nector
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
W1 13030313 Fig. 2-1	P1 P2 P3 J1 J2							 X	X X				 X X				
W4 13030312 Fig. 2-2	P1 P2 P3								 X	X				 X		 X	
W6 13030313 Fig. 2-3	P1 P2								X X								
W9					R A	E T	P	A D	I E	R P	E O	D T					
W10 13030348 Fig. 2-4	P1 P2			 X						X							 X
W12 13030315 Fig. 2-5	P1 P2								X X								
W13		N	O	N	-	R	E	P	A	I	R	A	B	L	E		
W14		 D	R I	E R	P E	A C	I T	R	E S	D U	 P	A P	T O	 R	 T		
W15 13030317 Fig. 2-6	P1 P2								X X								
W18		N	O	N	-	R	E	P	A	I	R	A	B	L	E		
W19		N	O	N	-	R	E	P	A	I	R	A	B	L	E		
W20		N	O	N	-	R	E	P	A	I	R	A	B	L	E		
W23 13030322 Fig. FO-1	P1 P2 P3 P4 P5 P6 P7 J1 WT-1 WT-2						 X		 X X X X	 X		 X			 X X	 X X	 X

Table 2-39. Cable and Connector Repair Reference – Continued

CABLE NO./ PART NO./ FIGURE NO.	CONN. NO.	REPAIR PROCEDURE ITEM NO.														Back-shell Not Req.	Back-shell Part of Con-nector
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
W24 13030323 Fig. 2-7	P1 P2 P3								X X	 X							
W25 13030324 Fig. 2-8	P1 P2 P3 J1								X X	 X 			 X				
W26 13030325 Fig. FO-2	P1 P2 P3 P4					X X			 X	 X 							X X
W27 13030345 Fig. FO-3	P1 P2 P3 P4					X X			 X	 X 							X X
W32 13030326 Fig. 2-9	P1 J1 J2									X 			 X X				
W33		N	O	N	-	R	E	P	A	I	R	A	B	L	E		
W34 13030328 Fig. FO-4	P1 P2 P3 P4 P5 P6 P7								 X X	X X X X X 							
W35 13030329 Fig. FO-5	P1 P2 P3 P4 P5 P6 P7 J1						 X X 		 X 	X X X X 		 X					 X X
W38 13030330 Fig. 2-10	P1 WT-1 WT-2										X 				 X X	 X X	
W40 13030332 Fig. 2-11	P1 P2					X X											

Table 2-39. Cable and Connector Repair Reference – Continued

CABLE NO./ PART NO./ FIGURE NO.	CONN. NO.	REPAIR PROCEDURE ITEM NO.														Back-shell Not Req.	Back-shell Part of Con-nector
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
W41 13030333 Fig. 2-12	P1 J1 WT-1 WT-2 WT-3				X	X									X X X	X X X	
W43 13030335 Fig. 2-13	P1 P2								X	X							
W53 13030337 Fig. 2-14	P1 P2	X	X														X X
W57 13030338 Fig. 2-15	P1 P2					X			X								X
W59 13030339 Fig. 2-16	P1 P2									X X							
W60 13030340 Fig. 2-17	P1 P2								X	X							
W61 13030341 Fig. 2-18	P1 P2								X	X							
W65		N	O	N	-	R	E	P	A	I	R	A	B	L	E		
W67 13030343 Fig. 2-19	P1 J1									X		X					
W68 13030344 Fig. 2-20	P1 J1									X		X					
W74 13030346 Fig. 2-21	P1 J1									X		X					
W75 and W76 13030347 Fig. 2-22	75P1 75P2 76P1 76P2				NOTE Refer to item 15 for flexible conduit replacement.	X X X X											X X X X

Table 2-39. Cable and Connector Repair Reference – Continued

CABLE NO./ PART NO./ FIGURE NO.	CONN. NO.	REPAIR PROCEDURE ITEM NO.														Back-shell Not Req.	Back-shell Part of Con-nector
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
W80 13030352 Fig. 2-23	P1 P2 J1					X X						X					X X
W81 13030353 Fig. 2-24	P1 P2								X	X							
W82 13030356 Fig. 2-25	J1 J2					X X											X X
W83 13030357 Fig. 2-26	J1											X	X				
W84 13030358 Fig. 2-27	P1 P2					X	X										X X

Table 2-40. Insulation Sleeving Requirements

CABLE REFERENCE DESIGNATOR	CONN. NO.	APPENDIX B ITEM NO.											
		22	23	24	25	26	27	28	29	30	32	33	34
W1	P1 P2 P3 J1 J2		X					X X X X					
W4	P1 P2 P3		X			X X							
W6	P1 P2						X X						
W10	P1 P2			X X									
W12	P1 P2			X X									
W15	P1 P2								X X				

Table 2-40. Insulation Sleeving Requirements – Continued

CABLE REFERENCE DESIGNATOR	CONN. NO.	APPENDIX B ITEM NO.											
		22	23	24	25	26	27	28	29	30	32	33	34
W23	P1						X						
	P2	X											
	P3	X											
	P4		X										
	P5			X									
	P6		X										
	P7	X											
	J1			X									
W24	P1								X				
	P2								X				
	P3			X									
W25	P1						X						
	P2				X								
	P3		X										
	J1				X								
W26	P3		X										
	P4		X										
W27	P3		X										
	P4		X										
W32	P1						X						
	J1				X								
	J2				X								
W34	P1		X										
	P2		X										
	P3		X										
	P4		X										
	P5		X										
	P6		X										
	P7			X									
W35	P1		X										
	P2		X										
	P3		X										
	P4		X										
	P5		X										
	P6		X										
	P7		X										
	J1				X								
W38	P1	X											
W40	P1				X								
	P2				X								
W41	P1		X										
	J1				X								

Table 2-40. Insulation Sleeving Requirements – Continued

CABLE REFERENCE DESIGNATOR	CONN. NO.	APPENDIX B ITEM NO.											
		22	23	24	25	26	27	28	29	30	32	33	34
W43	P1 P2		X X										
W53	P1 P2								X X				
W57	P1 P2	X X											
W59	P1 P2							X X					
W60	P1 P2							X X					
W61	P1 P2					X X							
W67	P1 J1								X X				
W68	P1 J1									X X			
W74	P1 J1					X X							
W80	P1 P2 J1		X X	X									
W81	P1 P2				X X								
W82	J1 J2		X X										
W83	J1 J2					X X							
W84	P1 P2		X X										

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

1. CONNECTOR 13028752.

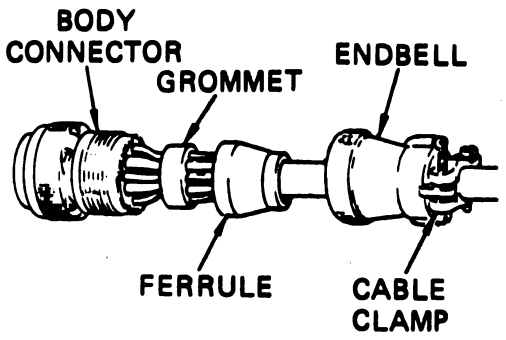
a. Removal.

(1) Using flat tip screwdriver, loosen two cable clamp screws on connector endbell.

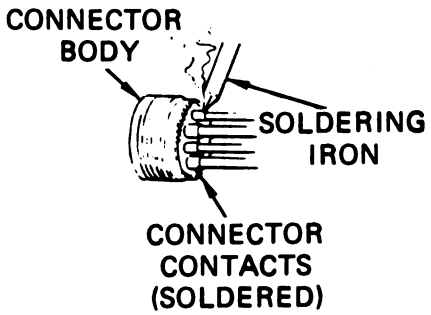
(2) Using electrical slip joint pliers, unscrew endbell from connector body. Slide it up the cable.

(3) Slide ferrule and grommet back from connector far enough to allow for unsoldering wires.

(4) Identify and tag wires for reconnection.



(5) Using soldering iron, unsolder and disconnect wires from connector contacts. Remove connector body.



NOTE

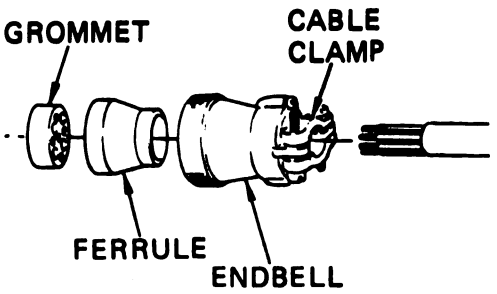
If complete connector assembly is being replaced, continue with step a (6). If connector body only is being replaced, proceed to step b (3).

(6) Slide grommet, ferrule, endbell, and cable clamp off end of cable.

b. Installation.

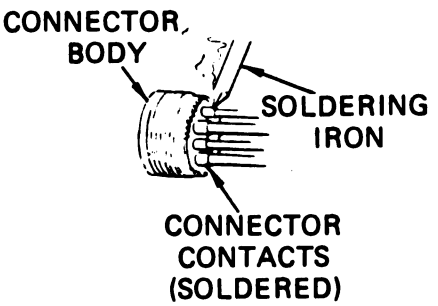
(1) Slide new endbell and cable clamp over cable end.

(2) Identify wires tagged during removal and install new ferrule and grommet over ends of wire.



(3) Refer to appropriate figure (table 2-39) for proper orientation. Using soldering iron and solder, start with innermost contact and working outward, solder wires to new connector body.

(4) Using varnish brush, apply a coat of varnish to soldered connections.

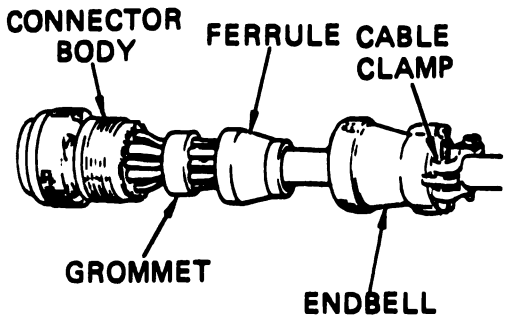


2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

(5) Slide grommet, ferrule, and endbell up against connector body. Screw endbell onto connector body.

(6) Using flat tip screwdriver, tighten two cable clamp screws on endbell.

(7) Perform cable test (paragraph 2-2).



2. CONNECTOR 13028753.

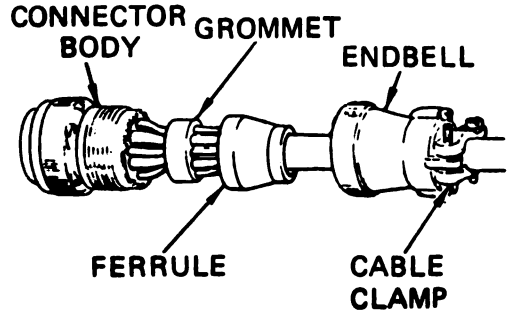
a. Removal.

(1) Using flat tip screwdriver, loosen two cable clamp screws on connector endbell.

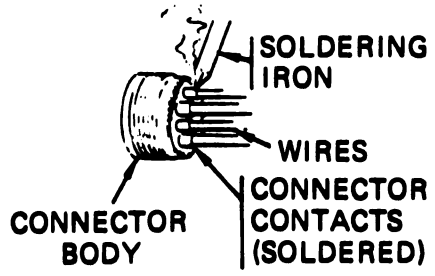
(2) Using electrical slip joint pliers, unscrew endbell from connector body. Slide it up the cable.

(3) Slide ferrule and grommet back from connector far enough to allow for unsoldering wires.

(4) Identify and tag wires for reconnection.



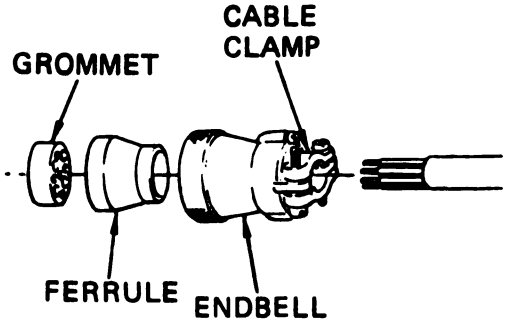
(5) Using soldering iron, unsolder and disconnect wires from connector contacts. Remove connector body.



NOTE

If complete connector assembly is being replaced, continue with step a (6). If connector body only is being replaced, proceed to step b (3).

(6) Slide grommet, ferrule, endbell, and cable clamp off of end of cable.

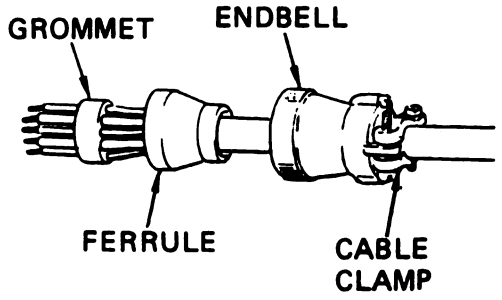


b. Installation.

(1) Slide new endbell and cable clamp over cable end.

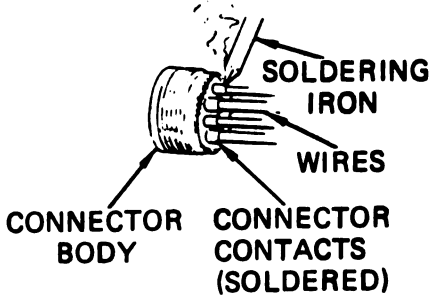
(2) Identify wires tagged during removal and install new ferrule and grommet over ends of wire.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



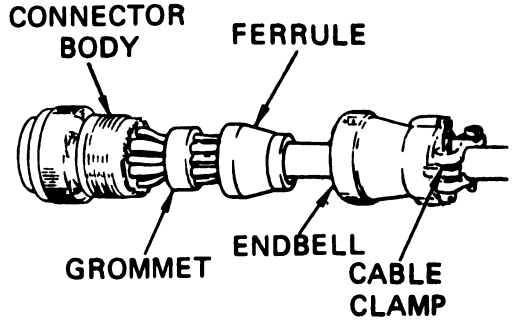
(3) Refer to appropriate figure (table 2-39) for proper orientation. Using soldering iron, starting with innermost contact and working outward, solder wires to new connector body.

(4) Using varnish brush, apply a coat of varnish to soldered connections.



(5) Slide grommet, ferrule, and endbell up against connector body. Screw endbell onto connector body.

(6) Using flat tip screwdriver, tighten two cable clamp screws on endbell.



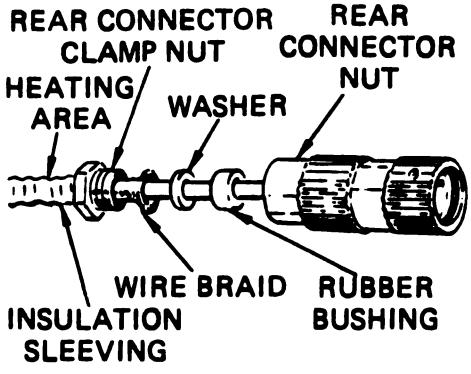
(7) Perform cable test (paragraph 2-2).

3. CONNECTOR 13028760.

a. Removal.

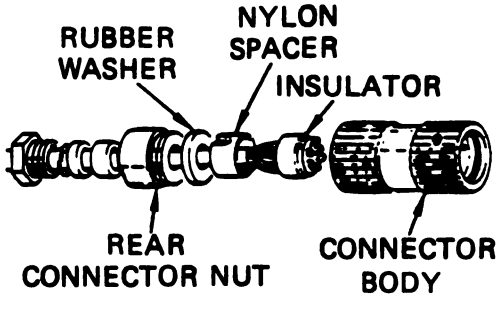
(1) Using electrical slip joint pliers and 3/4-inch open end wrench, loosen and separate connector clamp nut from rear connector nut.

(2) Using electric heater gun, heat cable insulation sleeving behind connector clamp nut so insulation sleeving can be pushed back up cable approximately 20mm.



(3) Using electrical slip joint pliers, disconnect rear connector nut from connector body.

(4) Press insulator out of connector body. Remove connector body.



(5) Identify and tag wires for reconnection.

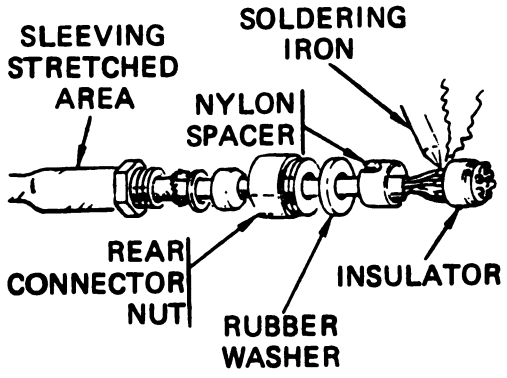
(6) Using soldering iron, unsolder and disconnect wires from connector contacts. Remove connector component parts from cable.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

NOTE

It may be necessary to reheat and stretch insulation sleeving to allow removal of rear clamp nut and spring.

(7) Using pocket knife, cut approximately 90mm length of insulation sleeving from end of cable. Do not cut into wire insulation.

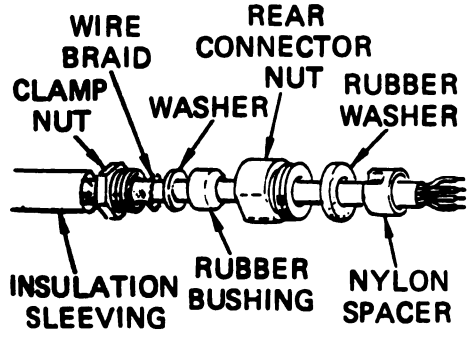


b. Installation.

(1) Using pocket knife and machinist scale, cut a 150mm length of insulation sleeving (table 2-40).

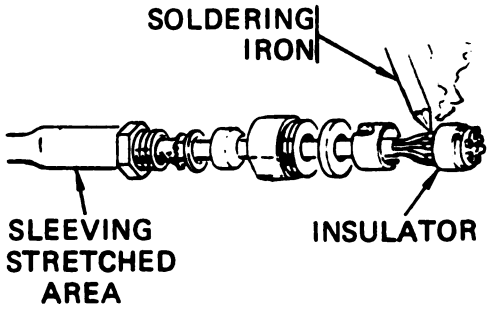
(2) Using steel pen and epoxy ink, apply reference designation marking to insulation sleeving. Then slide sleeving over end of cable.

(3) Using electrical slip joint pliers and 3/4-inch open end wrench, disassemble new connector and place components (properly oriented) over end of cable.

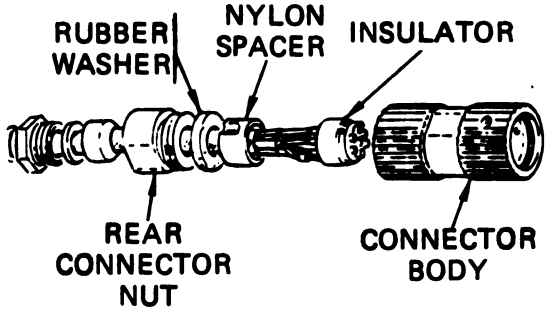


(4) Identify wires tagged during removal. Refer to appropriate figure (table 2-39) for proper orientation. Using soldering iron and solder, start with innermost contact and work outward, solder wires to connector contacts.

(5) Using varnish brush, apply a thin coat of varnish to all solder joints.



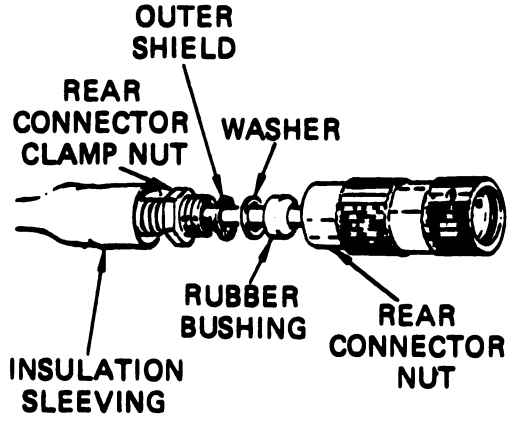
(6) Aline keyways and insert insulator into connector body. Then install nylon spacer, rubber washer, and rear connector nut. Using electrical slip joint pliers, tighten rear connector nut into connector body.



(7) Push rubber bushing and washer into rear connector nut. Flair outer shield so it will compress between washer and rear connector clamp nut.

(8) Using electrical slip joint pliers and 3/4-inch open end box wrench, tighten rear connector clamp nut into rear connector nut.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

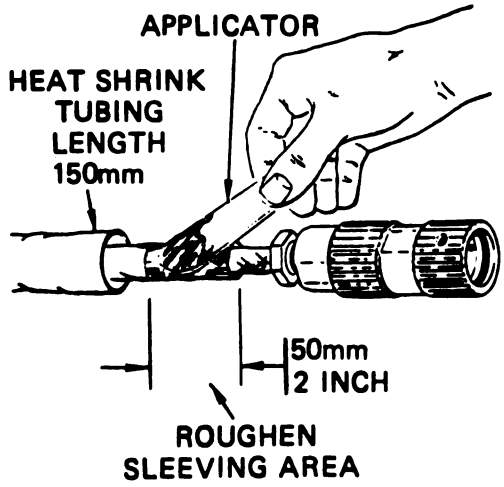


(9) Using abrasive cloth (4, Appendix B), roughen outer sleeving of cable for a distance of approximately 50mm from end that was cut off in step a (7).

(10) Using abrasive cloth (3, Appendix B), wipe roughened area clean.

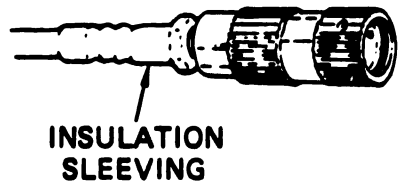
(11) Mix a small amount of two-part epoxy adhesive (2, Appendix B) according to instructions on kit.

(12) Using applicator, apply a light coat of adhesive to roughened area.



(13) Slide 150mm length of insulation sleeving up over rear connector clamp nut. Using heat gun, shrink sleeving in place.

(14) Perform cable test (paragraph 2-2).



4. CONNECTOR MS3100.

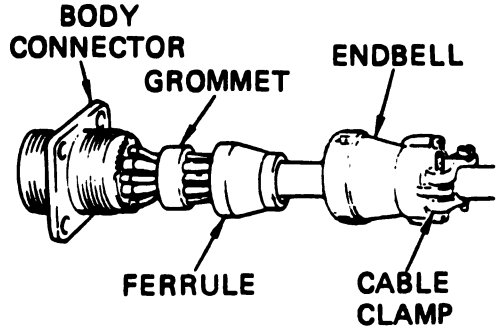
a. Removal.

(1) Using flat tip screwdriver, loosen two cable clamp screws on connector endbell.

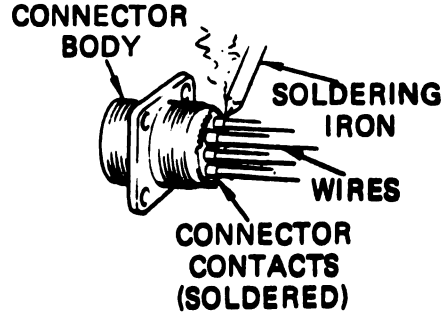
(2) Using electrical slip joint pliers, unscrew endbell from connector body. Slide it up the cable.

(3) Slide ferrule and grommet back from connector body far enough to allow for unsoldering wires.

(4) Identify and tag wires for reconnection.



(5) Using soldering iron, unsolder and disconnect wires from connector contacts. Remove connector body.



2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

NOTE

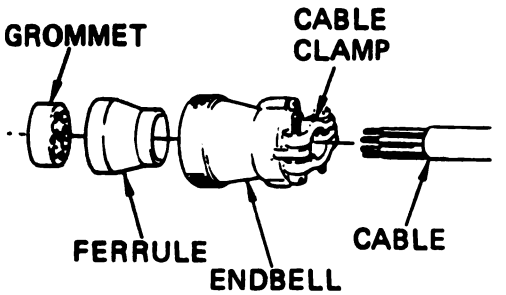
If complete connector assembly is being replaced, continue with step a (6). If connector body only is being replaced, proceed to step b (3).

(6) Slide grommet, ferrule, endbell, and cable clamp off end of cable.

b. Installation.

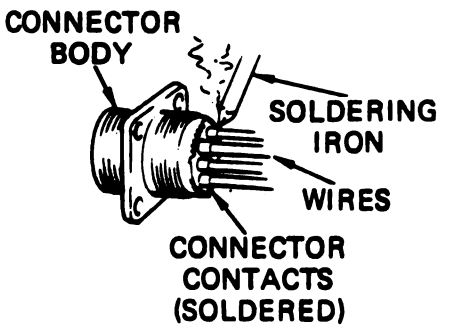
(1) Slide new endbell and cable clamp over cable end.

(2) Identify wires tagged during removal and install new ferrule and grommet over ends of wire.



(3) Refer to appropriate figure (table 2-39) for proper orientation. Using soldering iron, start with innermost contact and working outward, solder wires to new connector body.

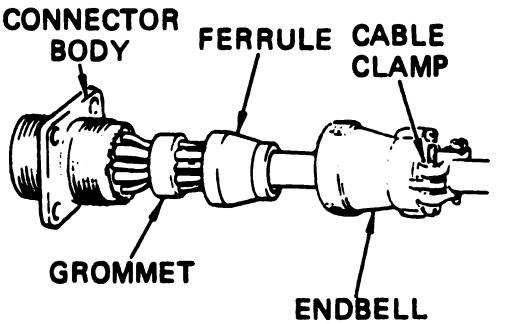
(4) Using varnish brush, apply a coat of varnish to soldered connections.



(5) Slide grommet and ferrule up against connector body.

(6) Stretch cable wire braid to reach as close to connector body as possible.

(7) Screw endbell onto connector body.



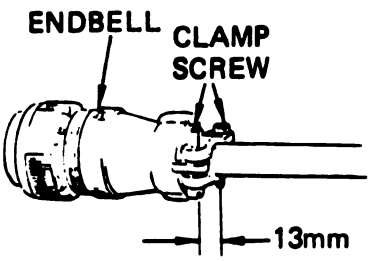
NOTE

Wire braid must extend a minimum of 13mm under cable clamp.

(8) Make certain wire braid extends a minimum of 13mm under cable clamp. Then, using electrical slip joint pliers, tighten endbell and cable clamp on connector body.

(9) Using flat tip screwdriver, tighten two cable clamp screws on endbell.

(10) Perform cable test (paragraph 2-2).



2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

5. CONNECTOR MS3106.

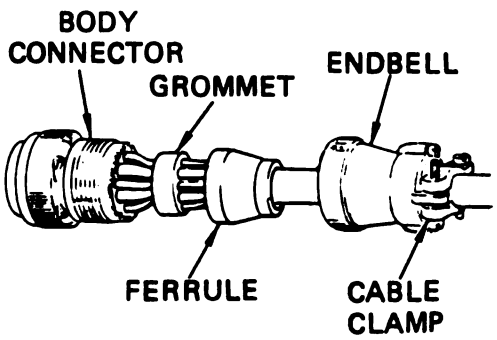
a. Removal.

(1) Using flat tip screwdriver, loosen two cable clamp screws on connector endbell.

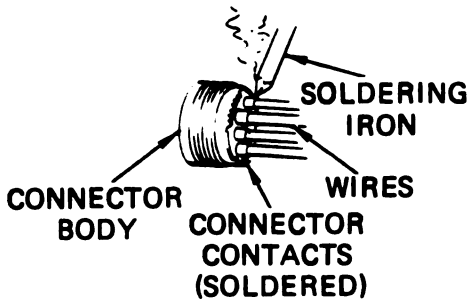
(2) Using electrical slip joint pliers, unscrew endbell from connector body. Slide it up the cable.

(3) Slide ferrule and grommet back from connector far enough to allow for unsoldering wires.

(4) Identify and tag wires for reconnection.



(5) Using soldering iron, unsolder and disconnect wires from connector contacts. Remove connector body.



NOTE

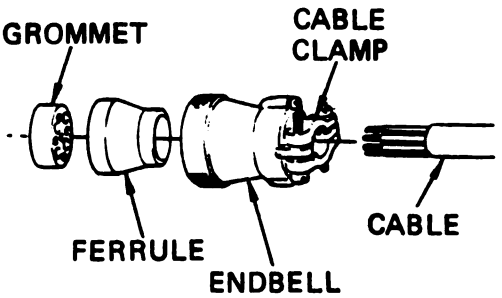
If complete connector assembly is being replaced, continue with step a (6). If connector body only is being replaced, proceed to step b (3).

(6) Slide grommet, ferrule, endbell, and cable clamp off of end of cable.

b. Installation.

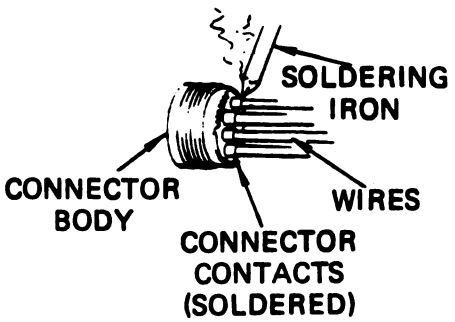
(1) Slide new endbell and cable clamp over cable end.

(2) Identify wires tagged during removal and install new ferrule and grommet over ends of wire.



(3) Refer to appropriate figure (table 2-39) for proper orientation. Using soldering iron, start with innermost contact and working outward, solder wires to new connector body.

(4) Using varnish brush, apply a coat of varnish to soldered connection.



(5) Slide grommet and ferrule up against connector body.

(6) Stretch cable wire braid to reach as close to connector body as possible.

(7) Screw endbell onto connector body.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

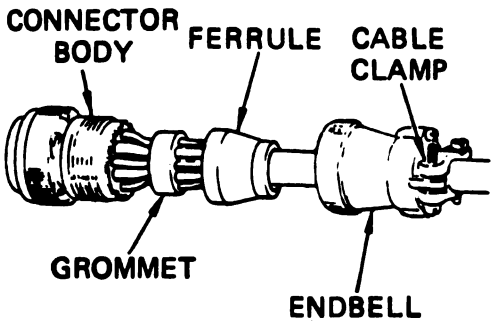
NOTE

Wire braid must extend a minimum of 13mm under cable clamp. .

(8) Make certain wire braid extends a minimum of 13mm under cable clamp. Then, using electrical slip joint pliers, tighten endbell and cable clamp on connector body.

(9) Using 3/16 inch flat tip screwdriver, tighten two cable clamp screws on endbell.

(10) Perform cable test (paragraph 2-2).

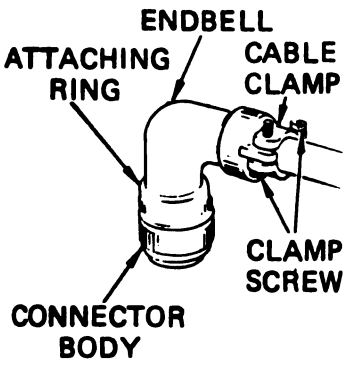


6. CONNECTOR MS3108.

a. Removal.

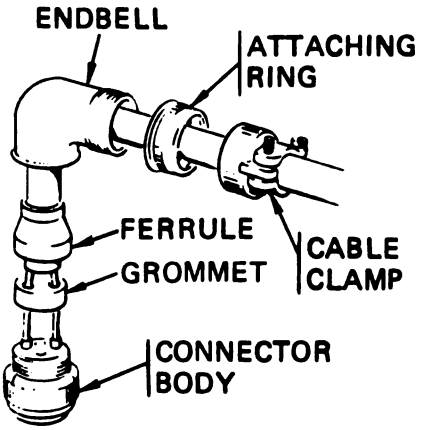
(1) Using flat tip screwdriver, loosen two cable clamp screws on cable clamp.

(2) Using electrical slip joint pliers, disconnect cable clamp from endbell. Slide it up the cable.



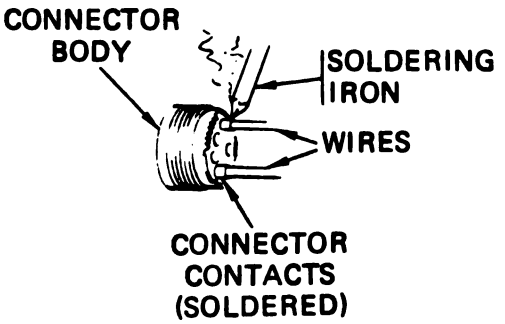
(3) Using electrical slip joint pliers, disconnect endbell attaching ring from connector body. Slide it up the cable.

(4) Slide endbell, ferrule, and grommet away from connector body far enough to allow for unsoldering wires.



(5) Identify and tag wires for reconnection.

(6) Using soldering iron, unsolder and disconnect wires from connector contacts. Remove connector body.



NOTE

If complete connector assembly is being replaced, continue with step a (7). If connector body only is being replaced, proceed to step b (3).

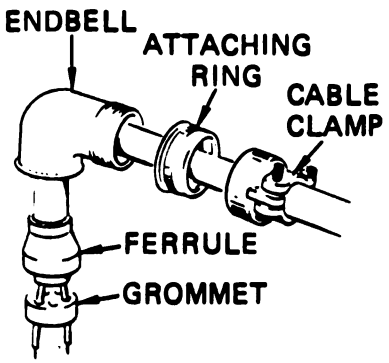
(7) Slide grommet, ferrule, endbell, attaching ring, and cable clamp off end of cable.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

b. Installation.

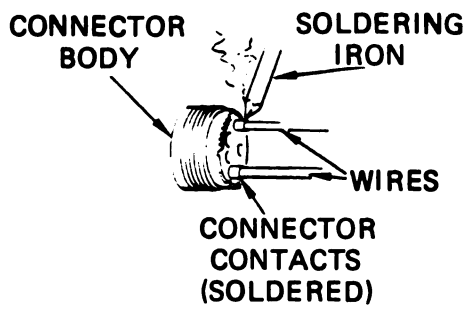
(1) Slide new cable clamp, attaching ring, and endbell over cable end.

(2) Identify wires tagged during removal and install new ferrule and grommet over ends of wire.



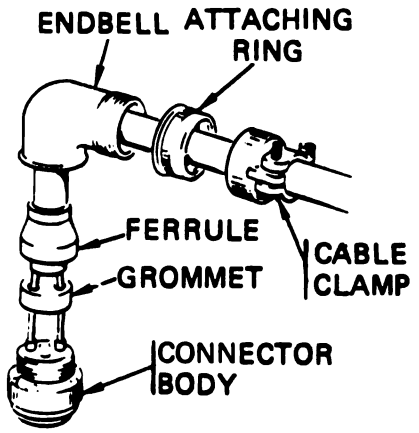
(3) Refer to appropriate figure (table 2-39) for proper orientation. Using soldering iron, start with innermost contact and working outward, solder wires to new connector body contacts.

(4) Using varnish brush, apply a coat of varnish to soldered connections.

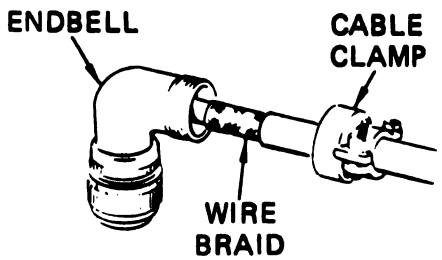


(5) Slide grommet, ferrule, and endbell up against connector body.

(6) Slide attaching ring over endbell. Using electrical slip joint pliers, tighten attaching ring on connector body.



(7) Stretch cable wire braid to reach as close to endbell as possible.



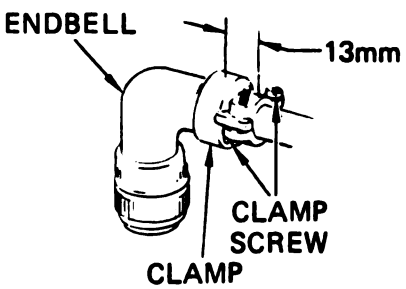
NOTE

Wire braid must extend a minimum of 13mm under cable clamp.

(8) Make certain wire braid extends a minimum of 13mm under cable clamp. Then, using electrical slip joint pliers, tighten clamp on endbell.

(9) Using flat tip screwdriver, tighten two screws on cable clamp.

(10) Perform cable test (paragraph 2-2).



2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

7. CONNECTOR MS3476 WITH BACKSHELL MS3188.

a. Removal.

(1) Using flat tip screwdriver, loosen two cable clamp screws on cable clamp.

(2) Using electrical slip joint pliers, disconnect backshell clamp assembly from rear adapter. Slide clamp assembly, grommet follower, and grommet back up the cable.

(3) Using electrical slip joint pliers, disconnect rear adapter from sleeve assembly. Slide it up the cable.

(4) Slide rear ferrule up the cable. Squeeze expanded portion of wire braid (shielding) until it can be inserted in forward ferrule. Slide forward ferrule up the cable.

(5) Using electrical slip joint pliers, disconnect sleeve assembly from connector body. Slide it up the cable.

(6) Identify and tag wires for reconnection.

(7) Using contact removal/insertion tool, push contacts out of connector body. Remove connector body.

NOTE

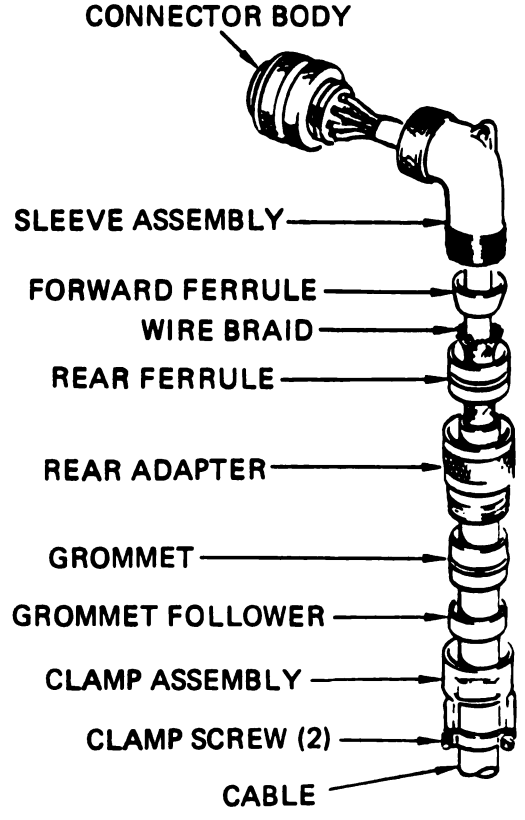
If complete connector assembly is being replaced, continue with step a (8). If connector body only is being replaced, proceed to step b (4).

(8) Remove sleeve assembly, forward ferrule, rear ferrule, rear adapter, grommet, grommet follower, and cable clamp assembly from end of cable.

(9) Using diagonal pliers, cut off old contacts evenly and as close to contacts as possible.

b. Installation.

(1) Disassemble new connector assembly. Slide cable clamp assembly, grommet follower, grommet, rear adapter, rear ferrule, forward ferrule, and sleeve assembly on cable.

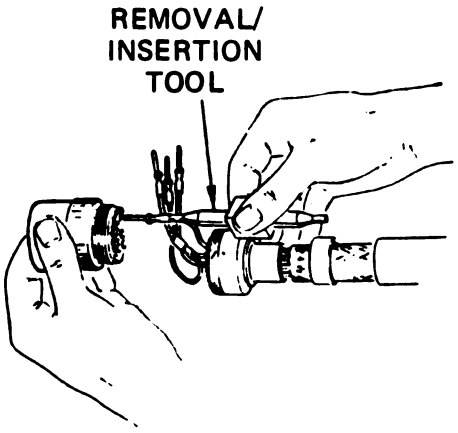


(2) Using hand wire strippers, strip off wire insulation approximately 5mm from end of each wire.

(3) Using crimping tool, crimp contact on wire. Repeat step for each contact requiring replacement.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

(4) Refer to appropriate figure (table 2-39) and using contact removal/insertion tool, insert contacts into connector, starting in the center and working outward. Fill all unused connector contact holes with uncrimped contacts and sealing plugs.



(5) Slide sleeve assembly up against connector. Using electrical slip joint pliers, tighten sleeve on connector.

(6) Slide forward ferrule up against sleeve. Flare wire braid (shield) over tapered end of forward ferrule. Using diagonal pliers, trim wire braid as necessary to get a good form fit over ferrule. Then slide rear ferrule over wire braid and forward ferrule.

(7) Slide rear adapter up against sleeve assembly. Using electrical slip joint pliers, tighten rear adapter onto sleeve assembly.

(8) Press grommet and grommet follower into rear adapter.

(9) Slide cable clamp up against rear adapter. Using electrical slip joint pliers, tighten cable clamp assembly to rear adapter.

(10) Using flat tip screwdriver, tighten two clamp screws.

(11) Perform cable test (paragraph 2-2).

8. CONNECTORS MS3476 and MS27467 WITH BACKSHELL M38999/5, or ADAPTER 13032000.

a. Removal.

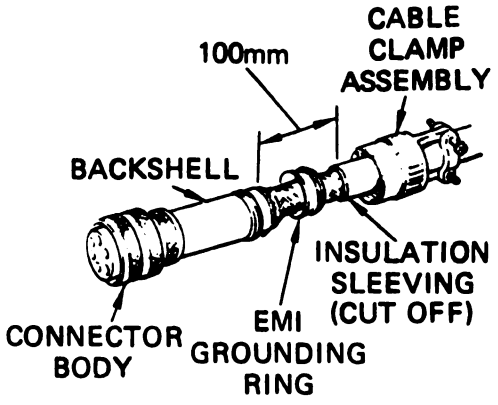
(1) Using flat tip screwdriver, loosen two cable clamp screws.

(2) Using electrical slip joint pliers, disconnect cable clamp from backshell. Slide it up the cable.

(3) Using pocket knife and machinist rule, measure and cut off a 100mm length of outer insulation sleeving. Slide EMI grounding ring up the cable.

(4) Squeeze expanded portion of wire braid (shielding) until it can be inserted in backshell. Using electrical slip joint pliers, disconnect backshell from connector body. Slide backshell up the cable.

(5) Identify and tag wires for reconnection.



(6) Using contact removal/insertion tool, push contacts out of connector body. Remove connector body.

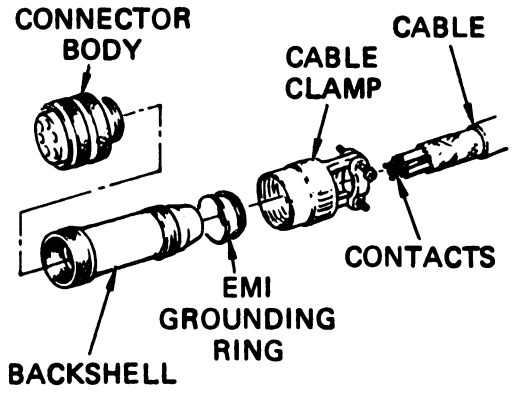
NOTE

If complete connector and backshell assembly are being replaced, continue with step a (7). If connector body only is being replaced, proceed to step b (6).

(7) Remove backshell, EMI grounding ring, and cable clamp from end of cable.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

(8) Using diagonal pliers, cut off old wires evenly and as close to contacts as possible.

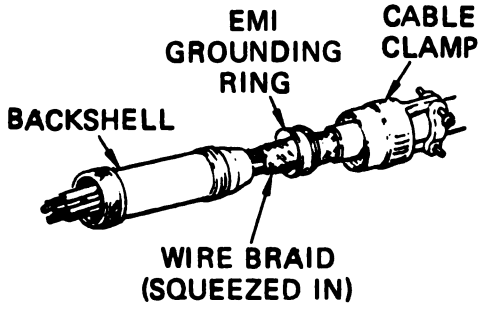


b. Installation.

(1) Using pocket knife and machinist rule, cut off a 150mm length of insulation sleeving (table 2-40).

(2) Using steel pin and epoxy ink, apply reference designation marking to insulation sleeving. Then slide sleeving over end of cable.

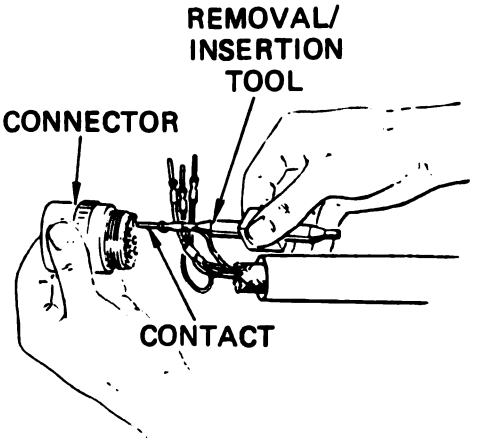
(3) Disassemble new backshell assembly. Slide cable clamp, EMI grounding ring, and backshell over end of cable.



(4) Using hand wire strippers, strip off wire insulation approximately 5mm from end of each wire.

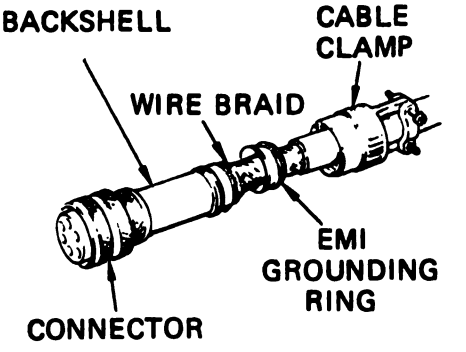
(5) Using crimping tool, crimp contact on wire. Repeat step for each contact requiring replacement.

(6) Refer to appropriate figure (table 2-39) and using contact removal/insertion tool, insert contacts into connector, starting in the center and working outward. Fill all unused connector holes with uncrimped contacts and sealing plugs.



(7) Slide backshell up against connector. Using electrical slip joint pliers, tighten backshell on connector.

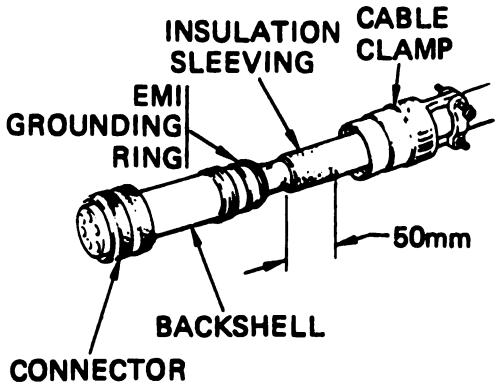
(8) Flare wire braid over tapered end of backshell. Using diagonal pliers, trim wire braid as necessary to get a good form fit over backshell. Then slide EMI grounding ring up against flared portion of braid and backshell.



(9) Using abrasive cloth (4, Appendix B), roughen outer sleeving of cable for a distance of approximately 50mm from end of sleeving.

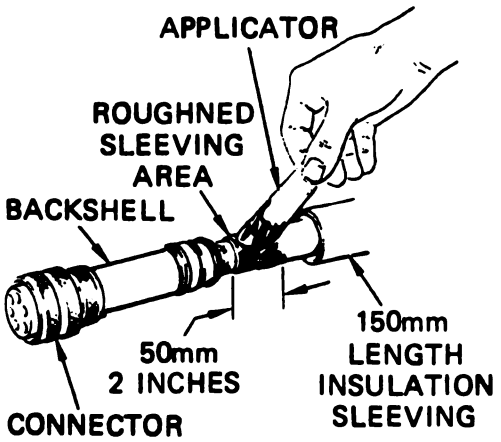
2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

(10) Using abrasive cloth (3, Appendix B), wipe roughened area clean.

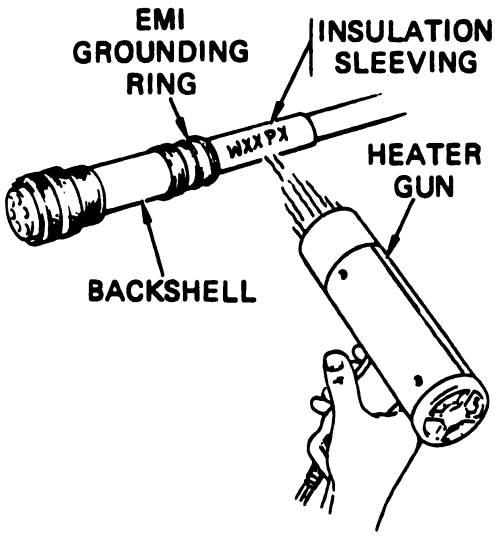


(11) Mix a small amount of two-part epoxy adhesive (2, Appendix B) according to instructions on kit.

(12) Using applicator, apply a light coat of adhesive to roughened area.



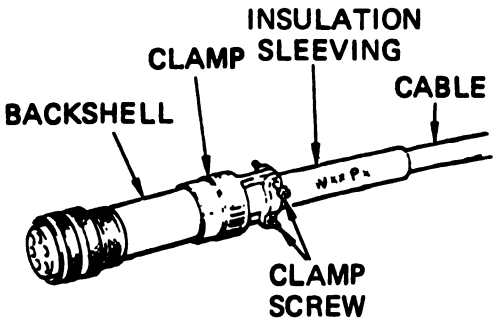
(13) Slide 150mm length of insulation sleeving into position (up against EMI grounding ring) completely covering wire braid. Using heat gun, shrink sleeving in place.



(14) Slide cable clamp up against backshell. Using electrical slip joint pliers, tighten cable clamp to backshell.

(15) Using flat tip screwdriver, tighten two cable clamp screws.

(16) Perform cable test (paragraph 2-2).



2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

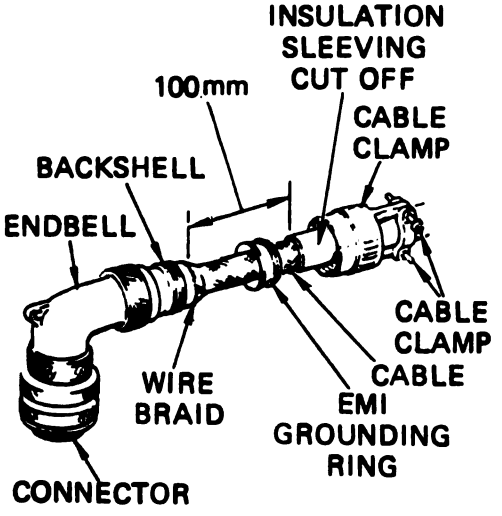
9. CONNECTORS MS3476 and MS27467 WITH BACKSHELL M38999/8 or 13030387.

a. Removal.

(1) Using flat tip screwdriver, loosen two cable clamp screws.

(2) Using electrical slip joint pliers, disconnect cable clamp from backshell. Slide it up the cable.

(3) Using pocket knife and machinist rule, cut off a 100mm length of outer insulation sleeving. Slide EMI grounding ring up the cable.

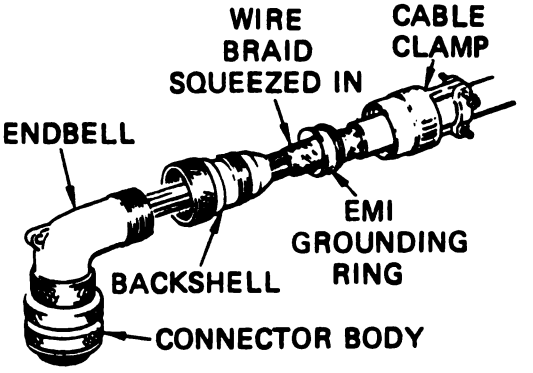


(4) Squeeze expanded portion of wire braid until it can be inserted in backshell. Using electrical slip joint pliers, disconnect backshell from backshell endbell. Slide backshell up the cable.

(5) Using electrical slip joint pliers, disconnect backshell endbell from connector body. Slide endbell up the cable.

(6) Identify and tag wires for reconnection.

(7) Using contact removal/insertion tool, push contacts out of connector body. Remove connector body.

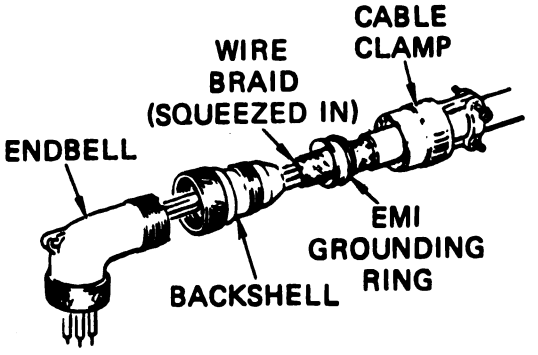


NOTE

If complete connector and backshell assembly are being replaced, continue with step a (8). If connector body only is being replaced, proceed to step b (6).

(8) Remove endbell, backshell, EMI grounding ring, and cable clamp from end of cable.

(9) Using diagonal pliers, cut off old wires evenly and as close to contacts as possible.



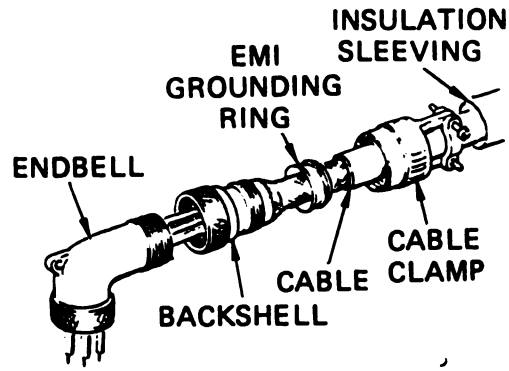
b. Installation.

(1) Using pocket knife and machinist rule, cut off a 150mm length of insulation sleeving (table 2-40).

(2) Using steel pen and epoxy ink, apply reference designation marking to insulation sleeving. Then slide sleeving over end of cable.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

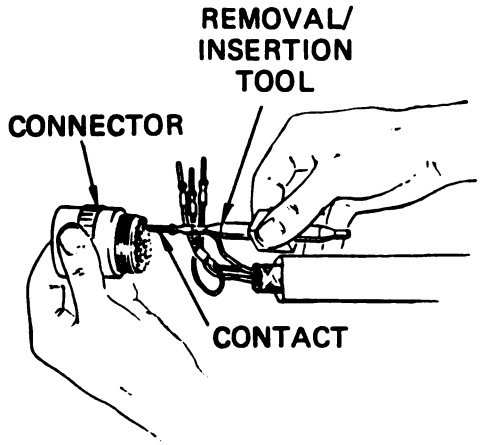
(3) Disassemble new backshell assembly. Slide cable clamp, EMI grounding ring, backshell, and endbell over end of cable.



(4) Using hand wire strippers, strip off wire insulation approximately 5mm from end of each wire.

(5) Using crimping tool, crimp contact on wire. Repeat step for each contact requiring replacement.

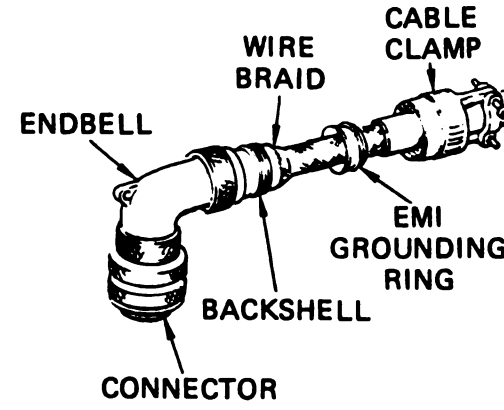
(6) Refer to appropriate figure (table 2-39) and using contact removal/insertion tool, insert contacts into connector, starting in the center and working outward. Fill all unused connector holes with uncrimped contacts and sealing plugs.



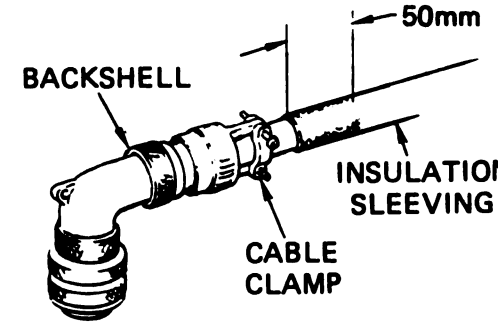
(7) Slide backshell endbell up against connector. Using electrical slip joint pliers, tighten endbell on connector.

(8) Slide backshell up against endbell. Using electrical slip joint pliers, tighten backshell on endbell.

(9) Flare wire braid over tapered end of backshell. Using diagonal pliers, trim wire braid as necessary to get a good form fit over backshell. Then slide EMI grounding ring up against flared portion of braid and backshell.



(10) Slide cable clamp up against backshell. Using electrical slip joint pliers, tighten cable clamp on backshell.



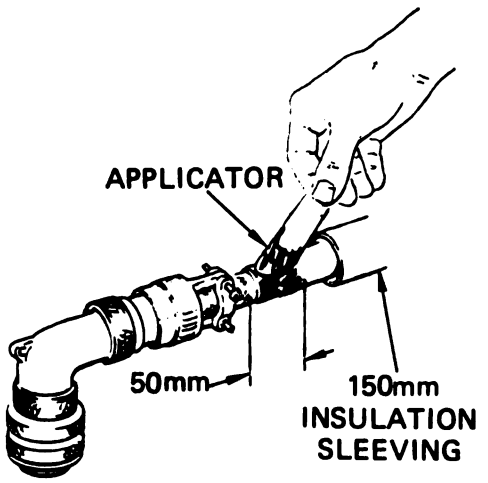
(11) Using abrasive cloth (3, Appendix B), roughen outer sleeving of cable for a distance of approximately 50mm from end of sleeving.

(12) Using abrasive cloth (3, Appendix B), wipe roughened area clean.

(13) Mix a small amount of two-part epoxy adhesive (2, Appendix B), according to instructions on kit.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

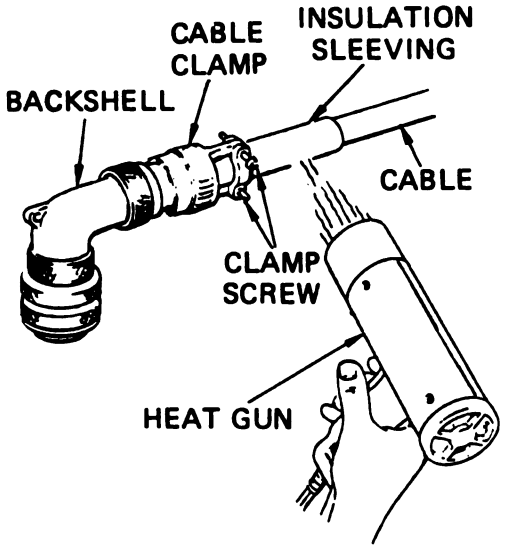
(14) Using applicator, apply a light coat of adhesive to roughened area.



(15) Slide 150mm length of insulation sleeving into position (through cable clamp and up against EMI grounding ring) completely covering wire braid (shield). Using heat gun, shrink sleeving in place.

(16) Using flat tip screwdriver, tighten two cable clamp screws.

(17) Perform cable test (paragraph 2-2).



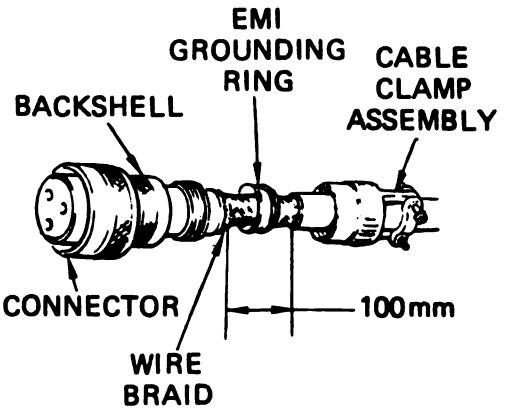
10. CONNECTOR MS27467 WITH BACKSHELL MS27506.

a. Removal.

(1) Using flat tip screwdriver, loosen two cable clamp screws.

(2) Using electrical slip joint pliers, disconnect cable clamp from backshell. Slide it up the cable.

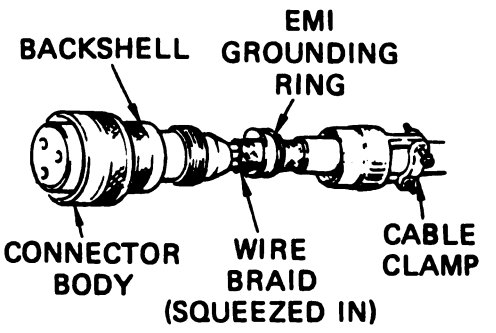
(3) Using pocket knife and machinist rule, cut off a 100mm length of outer insulation sleeving. Slide EMI grounding ring up the cable.



(4) Squeeze expanded portion of wire braid until it can be inserted in backshell. Using electrical slip joint pliers, disconnect backshell from connector body. Slide backshell up the cable.

(5) Identify and tag wires for reconnection.

(6) Using contact removal/insertion tool, push contacts out of connector body. Remove connector body.



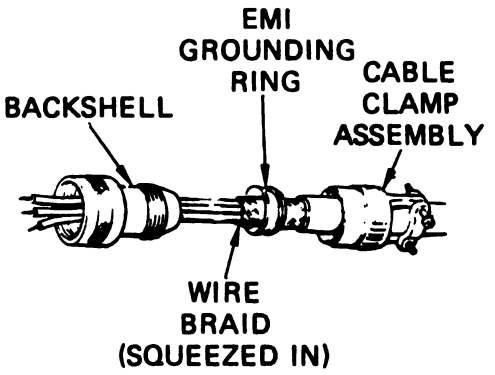
2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

NOTE

If complete connector and backshell assembly are being replaced, continue with step a (7). If connector body only is being replaced, proceed to step b (4).

(7) Remove backshell, EMI grounding ring, and cable clamp from end of cable.

(8) Using diagonal pliers, cut off old wires evenly and as close to contacts as possible.

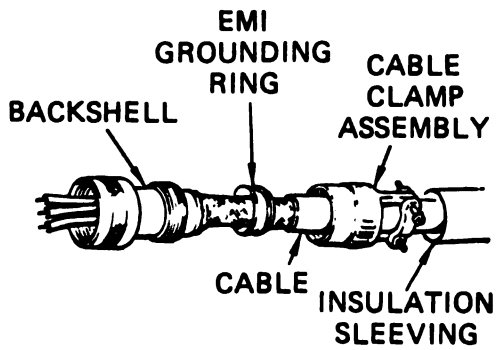


b. Installation.

(1) Using pocket knife and machinist rule, cut off a 150mm length of insulation sleeving (table 2-40).

(2) Using steel pen and epoxy ink, apply reference designator marking to insulation sleeving. Then slide sleeving over end of cable.

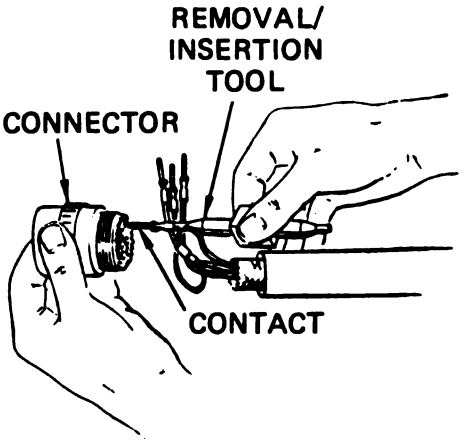
(3) Disassemble new backshell assembly. Slide cable clamp, EMI grounding ring, and backshell over end of cable.



(4) Using hand wire strippers, strip off wire insulation approximately 5mm from end of each wire.

(5) Using crimping tool, crimp contact on wire. Repeat step for each contact requiring replacement.

(6) Refer to appropriate figure (table 2-39) and using contact removal/insertion tool, insert contacts into connector, starting in the center and working outward. Fill all unused connector holes with uncrimped contacts and sealing plugs.

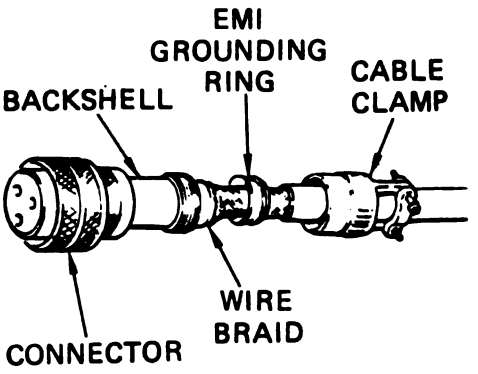


(7) Slide backshell up against connector. Using electrical slip joint pliers, tighten backshell to connector.

(8) Flare wire braid over tapered end of backshell. Using diagonal pliers, trim wire braid as necessary to get a good form fit over backshell. Then slide EMI grounding ring up against flared portion of braid and backshell.

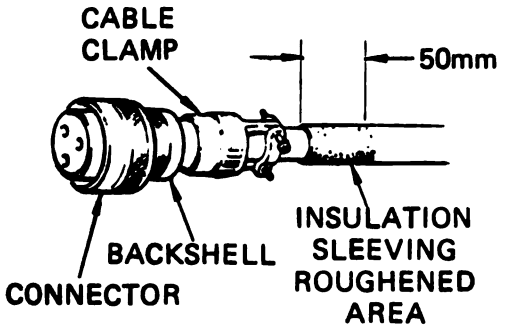
2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

(9) Slide cable clamp up against backshell. Using electrical slip joint pliers, tighten cable clamp on backshell.



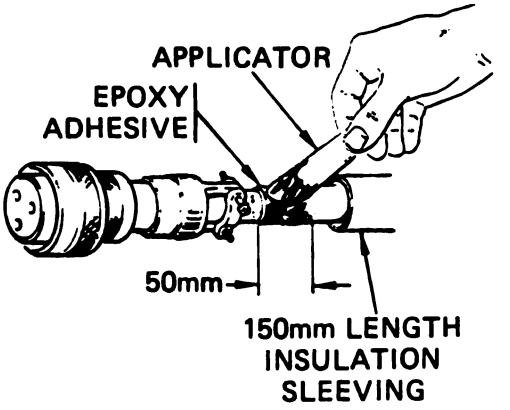
(10) Using abrasive cloth (4, Appendix B), roughen outer sleeving of cable for a distance of approximately 50mm from end of sleeving.

(11) Using abrasive cloth (3, Appendix B), wipe roughened area clean.



(12) Mix a small amount of two-part epoxy adhesive (2, Appendix B) according to instructions on kit.

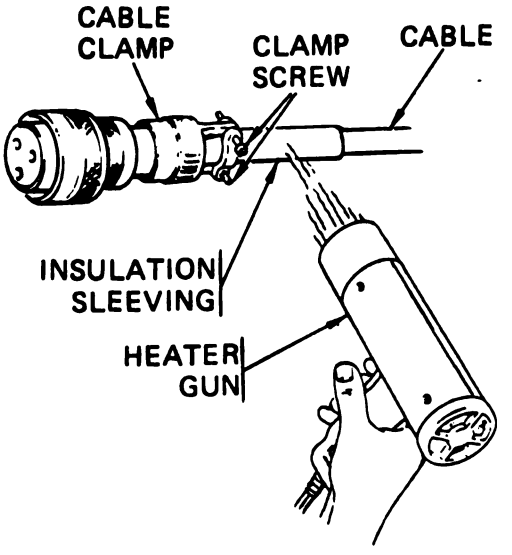
(13) Using applicator, apply a light coat of adhesive to roughened area.



(14) Slide 150mm length of insulation sleeving into position (through cable clamp and up against EMI grounding ring) completely covering wire braid (shield). Using heat gun, shrink sleeving in place.

(15) Using flat tip screwdriver, tighten two cable clamp screws.

(16) Perform cable test (paragraph 2-2).



2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

11. CONNECTOR MS27468 WITH BACKSHELL M38999/5 or ADAPTER 13032000.

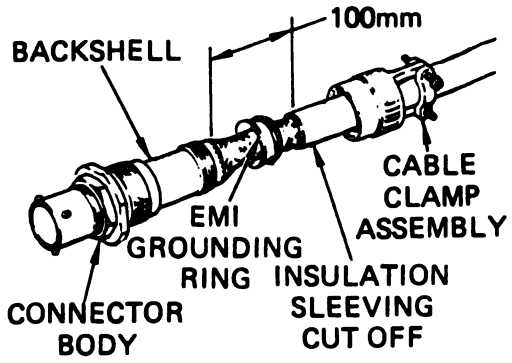
a. Removal.

(1) Using flat tip screwdriver, loosen two cable clamp screws.

(2) Using electrical slip joint pliers, disconnect cable clamp from backshell. Slide it up the cable.

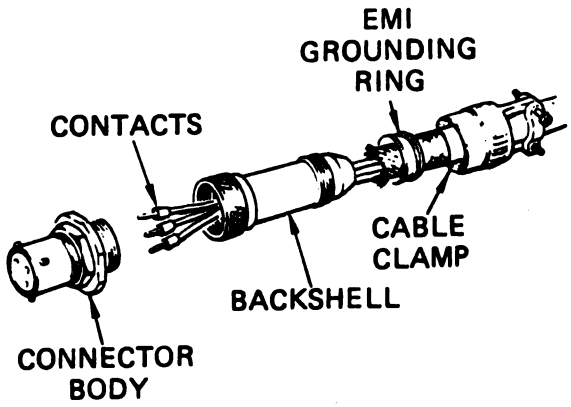
(3) Using pocket knife and machinist rule, cut off a 100mm length of outer insulation sleeving. Slide EMI grounding ring up the cable.

(4) Squeeze expanded portion of wire braid until it can be inserted in backshell. Using electrical slip joint pliers, disconnect backshell from connector body. Slide backshell up the cable.



(5) Identify and tag wires for reconnection.

(6) Using contact removal/insertion tool, push contacts out of connector body. Remove connector body.



NOTE

If complete connector and backshell assembly are being replaced, continue with step a (7). If connector body only is being replaced, proceed to step b (4).

(7) Remove backshell, EMI grounding ring, and cable clamp from end of cable.

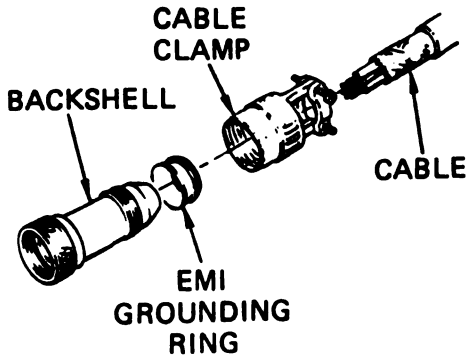
(8) Using diagonal pliers, cut off old wires evenly and as close to contacts as possible.

b. Installation.

(1) Using pocket knife and machinist rule, cut off a 150mm length of insulation sleeving (table 2-40).

(2) Using steel pen and epoxy ink, apply reference designation marking to insulation sleeving. Then slide sleeving over end of cable.

(3) Disassemble new backshell assembly. Slide cable clamp, EMI grounding ring, and backshell over end of cable.

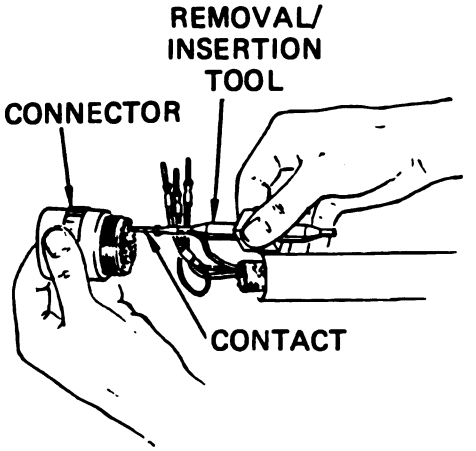


(4) Using hand wire strippers, strip off wire insulation approximately 5mm from end of each wire.

(5) Using crimping tool, crimp contact on wire. Repeat step for each contact requiring replacement.

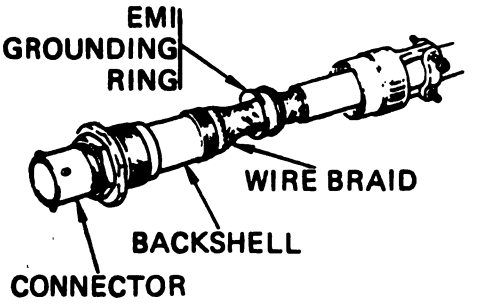
2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

(6) Refer to appropriate figure (table 2-39) and using contact removal/insertion tool, insert contacts into connector, starting in the center and working outward. Fill all unused connector holes with uncrimped contacts and sealing plugs.



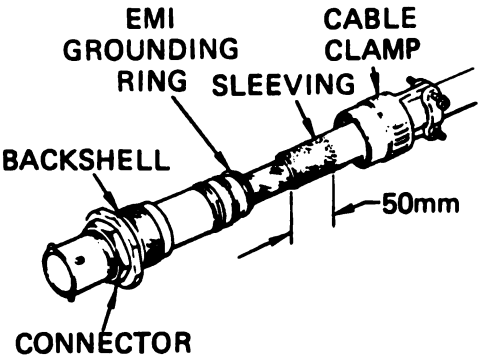
(7) Slide backshell up against connector. Using electrical slip joint pliers, tighten backshell on connector.

(8) Flare wire braid over tapered end of backshell. Using diagonal pliers, trim wire braid as necessary to get a good form fit over backshell. Then slide EMI grounding ring up against flared portion of braid and backshell.



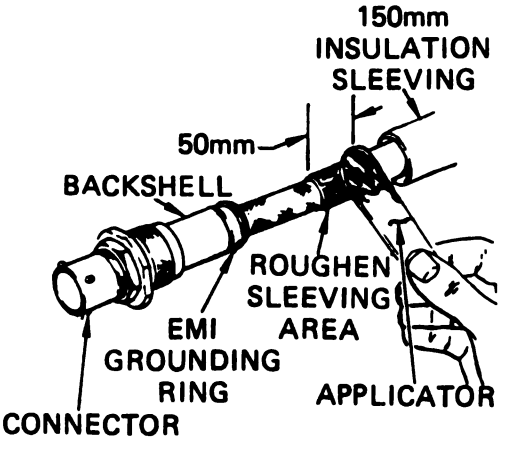
(9) Using abrasive cloth (4, Appendix B), roughen outer sleeving of cable for a distance of approximately 50mm from end of sleeving.

(10) Using abrasive cloth (3, Appendix B), wipe roughened area clean.



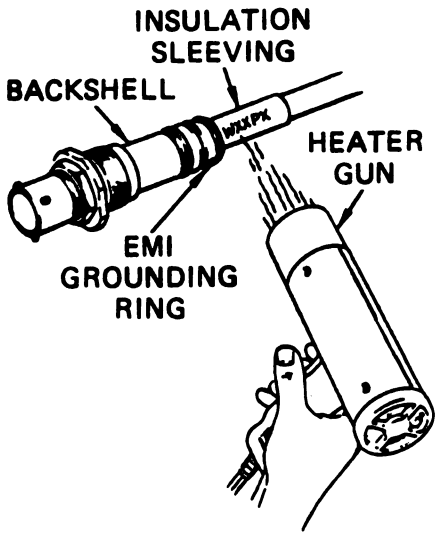
(11) Mix a small amount of two-part epoxy adhesive (2, Appendix B) according to instructions on kit.

(12) Using applicator, apply a light coat of adhesive to roughened area.



2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

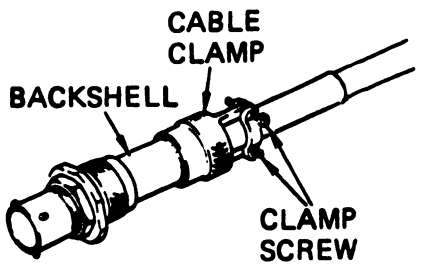
(13) Slide 150mm length of insulation sleeving into position (up against EMI grounding ring) completely covering wire braid. Using heat gun, shrink sleeving in place.



(14) Slide cable clamp up against backshell. Using electrical slip joint pliers, tighten cable clamp to backshell.

(15) Using flat tip screwdriver, tighten two cable clamp screws.

(16) Perform cable test (paragraph 2-2).



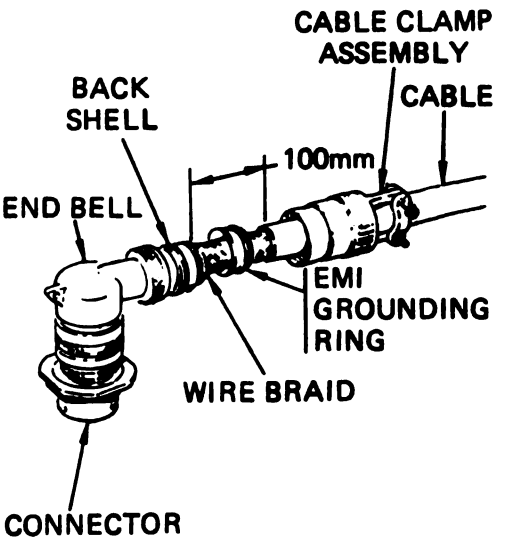
12. CONNECTOR MS27468 WITH BACKSHELL M38999/8 or 13030387.

a. Removal.

(1) Using flat tip screwdriver, loosen two cable clamp screws.

(2) Using electrical slip joint pliers, disconnect cable clamp from backshell. Slide it up the cable.

(3) Using pocket knife and machinist rule, cut off a 100mm length of outer insulation sleeving. Slide EMI grounding ring up the cable.



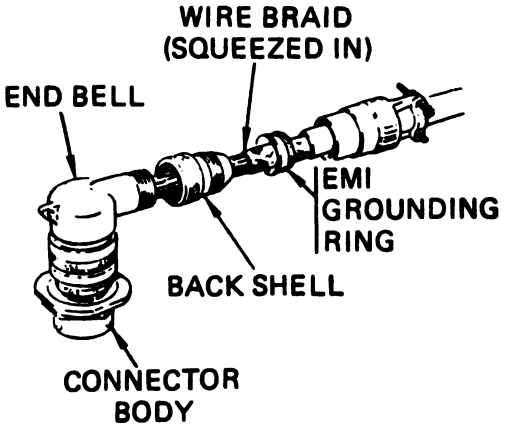
(4) Squeeze expanded portion of wire braid until it can be inserted in backshell. Using electrical slip joint pliers, disconnect backshell from backshell endbell. Slide backshell up the cable.

(5) Using electrical slip joint pliers, disconnect backshell endbell from connector body. Slide endbell up the cable.

(6) Identify and tag wires for reconnection.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

(7) Using contact removal/insertion tool, push contacts out of connector body. Remove connector body.

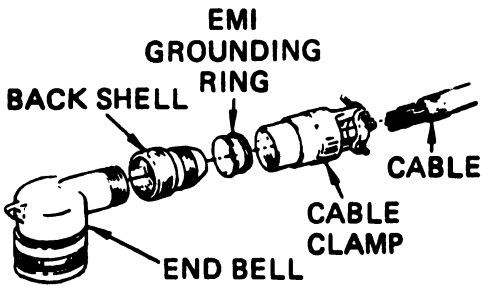


NOTE

If complete connector and backshell assembly are being replaced, continue with step a (8). If connector body only is being replaced, proceed to step b (6).

(8) Remove endbell, backshell, EMI grounding ring, and cable clamp from end of cable.

(9) Using diagonal pliers, cut off old wires evenly, and as close to contacts as possible.

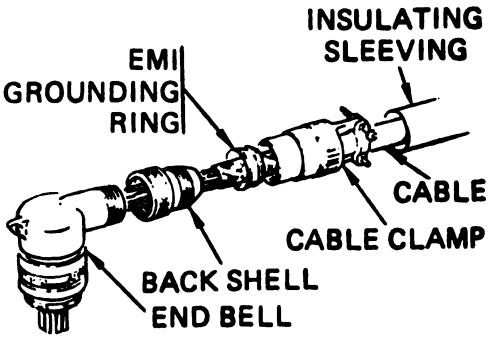


b. Installation.

(1) Using pocket knife and machinist rule, cut off a 150mm length of insulation sleeving (table 2-40).

(2) Using steel pen and epoxy ink, apply reference designation marking to insulation sleeving. Then slide sleeving over end of cable.

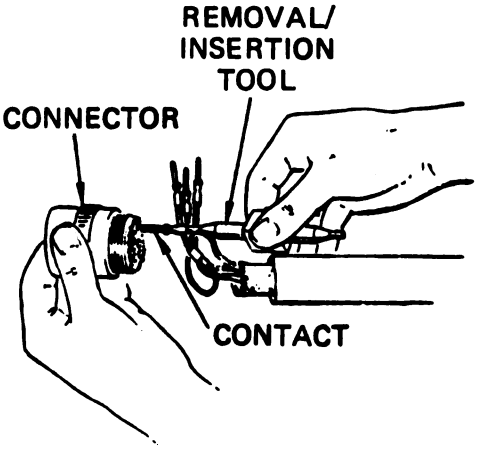
(3) Disassemble new backshell assembly. Slide cable clamp, EMI grounding ring, backshell, and endbell over end of cable.



(4) Using hand wire strippers, strip off wire insulation approximately 5mm from end of each wire.

(5) Using crimping tool, crimp contact on wire. Repeat step for each contact requiring replacement.

(6) Refer to appropriate figure (table 2-39) and using contact removal/insertion tool, insert contacts into connector, starting in the center and working outward. Fill all unused connector holes with uncrimped contacts and sealing plugs.

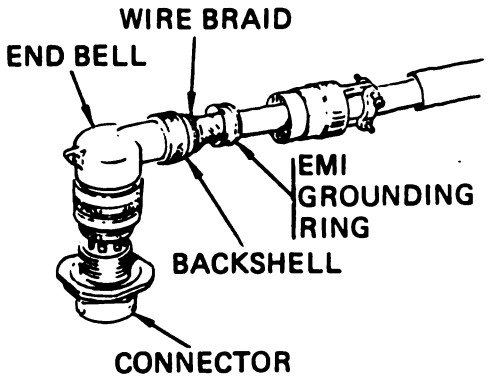


2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

(7) Slide backshell endbell up against connector. Using electrical slip joint pliers, tighten endbell on connector.

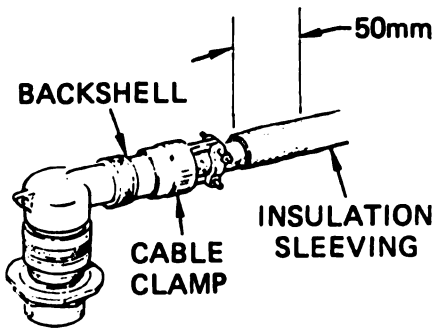
(8) Slide backshell against endbell. Using electrical slip joint pliers, tighten backshell on endbell.

(9) Flare wire braid over tapered end of backshell. Using diagonal pliers, trim wire braid as necessary to get a good form fit over backshell. Then slide EMI grounding ring up against flared portion of braid and backshell.



(10) Slide cable clamp against backshell. Using electrical slip joint pliers, tighten cable clamp on backshell.

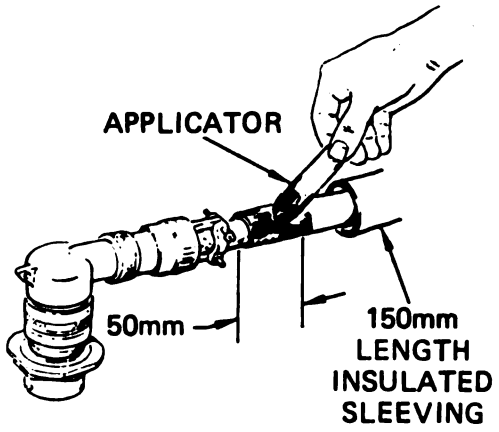
(11) Using abrasive cloth (4, Appendix B), roughen outer sleeving of cable for a distance of approximately 50mm from end of sleeving.



(12) Using abrasive cloth (3, Appendix B), wipe roughened area clean.

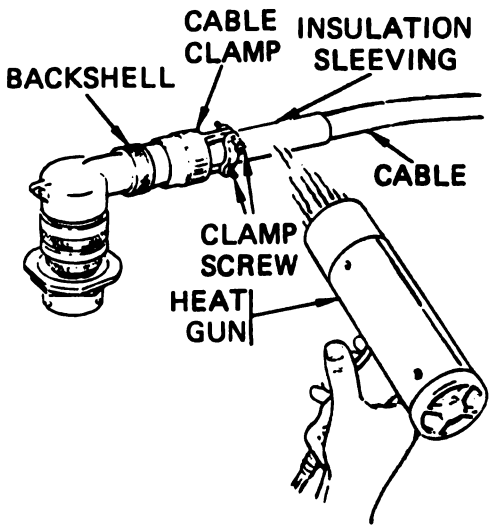
(13) Mix a small amount of two-part epoxy adhesive (2, Appendix B) according to instructions on kit.

(14) Using applicator, apply a light coat of adhesive to roughened area.



(15) Slide 150mm length of insulation sleeving into position (through cable clamp and up against EMI grounding ring) completely covering wire braid. Using heat gun, shrink sleeving in place.

(16) Using flat tip screwdriver, tighten two cable clamp screws.



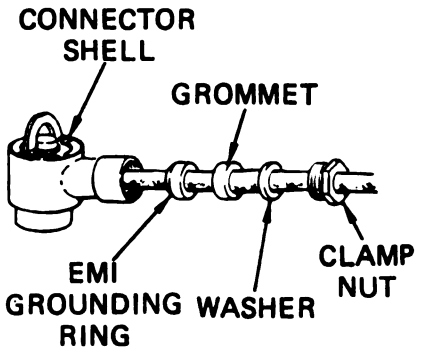
(17) Perform cable test (paragraph 2-2).

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

13. CONNECTOR MW10M.

a. Removal.

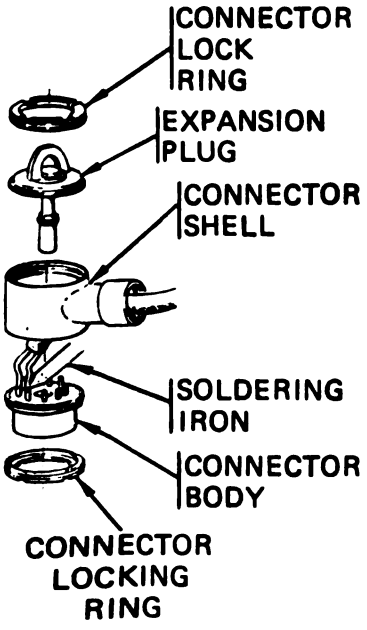
(1) Using 3/4-inch open end wrench, disconnect clamp nut from connector shell. Slide clamp nut, washer, grommet, and EMI grounding ring up the cable.



(2) Using adjustable spanner wrench, remove two connector lockrings. Lift out expansion plug and press connector body out of lower side of connector shell.

(3) Identify and tag wires for reconnection.

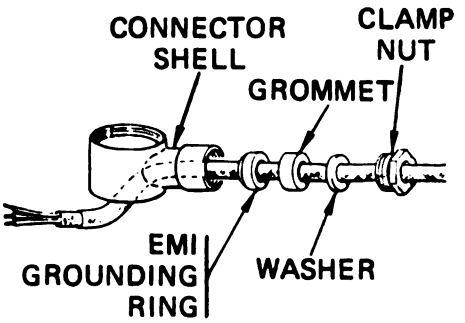
(4) Using soldering iron, unsolder and disconnect wires from connector contacts. Remove connector body.



NOTE

If complete connector assembly is being replaced, continue with step a (5). If connector body only is being replaced, proceed to step b (5).

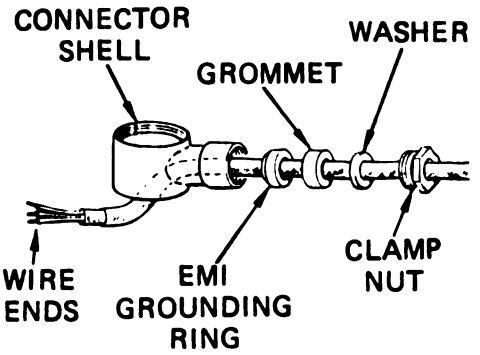
(5) Slide connector shell, EMI grounding ring, grommet, washer, and clamp nut off end of cable.



b. Installation.

(1) Disassemble new connector assembly and slide clamp nut, washer, grommet, EMI grounding ring, and connector shell over cable end.

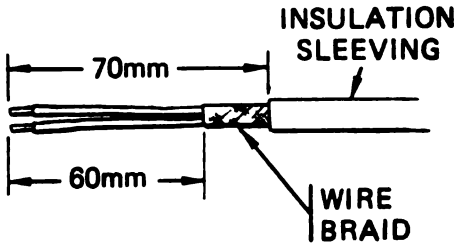
(2) Using diagonal pliers, cut defective wires off evenly, as close to wire ends as possible.



(3) Using hand wire strippers, strip off wire insulation approximately 5mm from end of each wire.

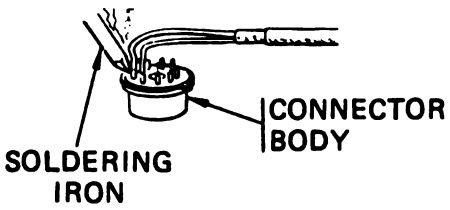
(4) Using scissors and machinist rule, trim insulation sleeving back 70mm from wire ends. Then trim wire braid back 60mm.

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

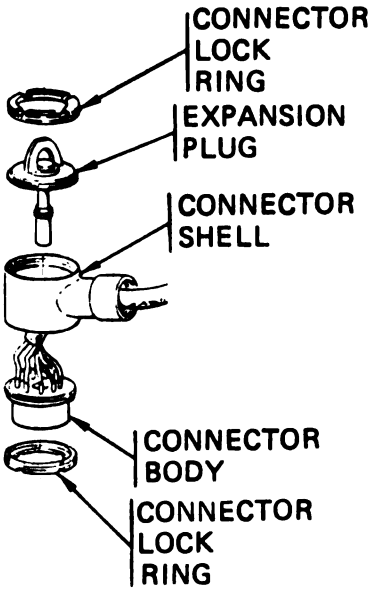


(5) Refer to appropriate figure (table 2-39) for proper orientation. Using soldering iron, start with innermost contact and working outward, solder wires to new connector body contacts.

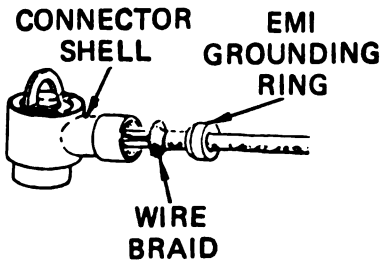
(6) Using varnish brush, apply a coat of varnish to soldered connections.



(7) Press connector body into lower side of connector shell and insert expansion plug from top side of connector shell. Secure with two connector lockrings. Using adjustable spanner wrench, tighten lockrings.

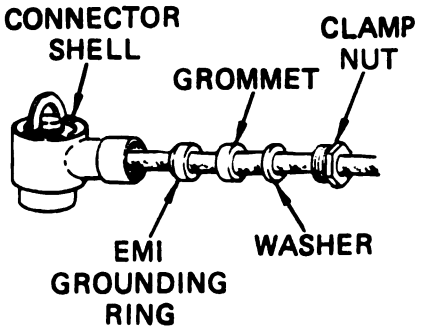


(8) Pull slack out of cable so that wire braid is accessible outside of connector shell. Spread wire braid over end of EMI grounding ring. Using scissors, trim off excess braid.



(9) Push cable and EMI grounding ring into connector shell. Slide rubber grommet, washer, and clamp nut down cable and press grommet into connector shell. Using 3/4-inch open end wrench, tighten clamp nut.

(10) Perform cable test (paragraph 2-2).

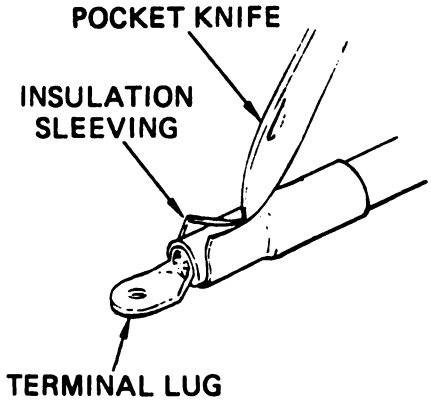


2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

14. TERMINAL LUG.

a. Removal.

(1) Using pocket knife, cut off insulation sleeving which identifies terminal lug.



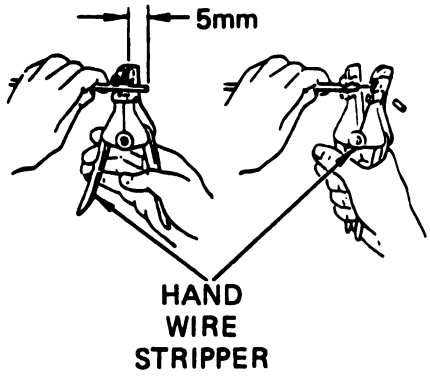
(2) Using diagonal pliers, cut off wires as close to defective terminal lug as possible.

b. Installation.

(1) Using hand wire strippers, strip off wire insulation approximately 5mm from end of wire.

(2) Using machinist rule and diagonal pliers, measure and cut off a 50mm length of appropriate size insulation sleeving (table 2-41).

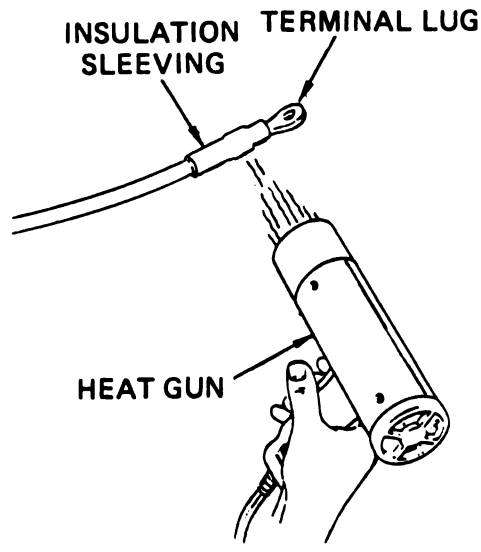
(3) Using steel pen and epoxy ink, apply reference designation marking to insulation sleeving. Then slide sleeving over end of wire.



(4) Refer to table 2-41 for proper size terminal lug. Using terminal crimping tool, crimp new terminal lug to end of wire.

(5) Slide 50mm length of insulation sleeving into position. Using heat gun, shrink sleeving in place.

(6) Perform cable test (paragraph 2-2).



15. W75 and W76 FLEXIBLE CONDUIT.

a. Remove.

(1) Remove connector P1 (item 5).

NOTE

Observe the direction the flexible conduit comes off cable. Install the new flexible conduit in the same direction and properly orientated.

(2) Remove flexible conduit from cable.

b. Install.

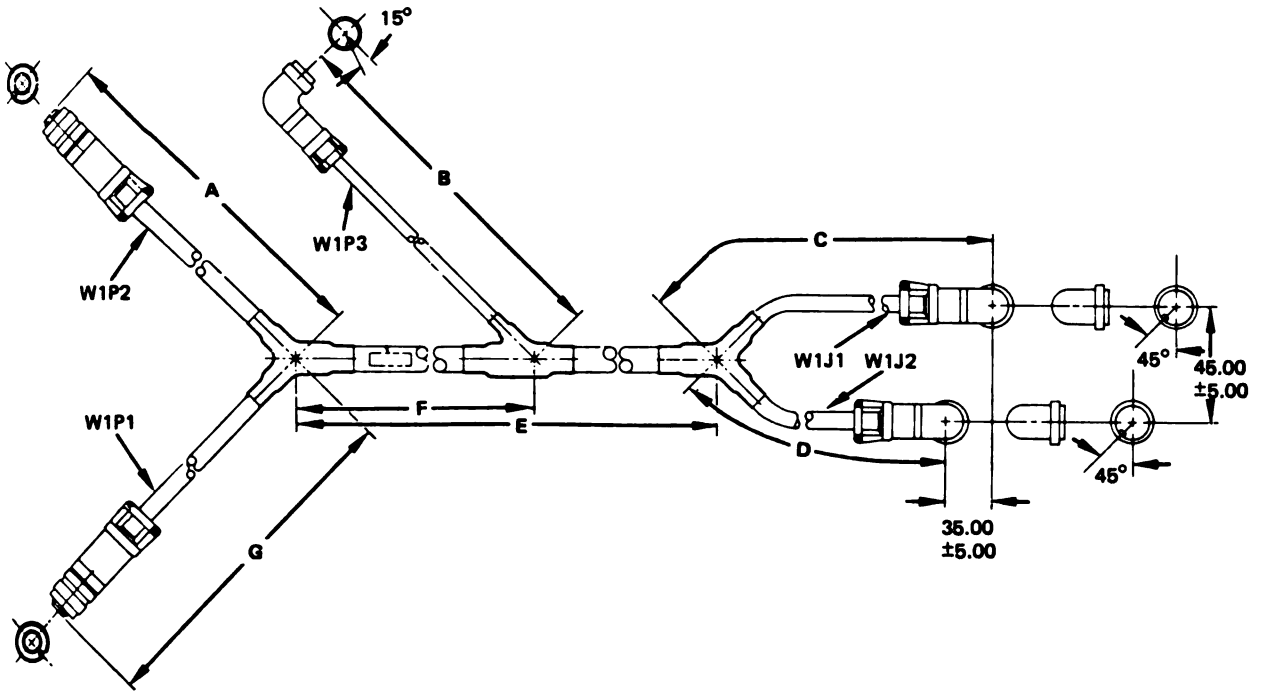
(1) Install new flexible conduit over cable in the same direction and properly orientated as noted during removal.

(2) Install connector P1 (item 5).

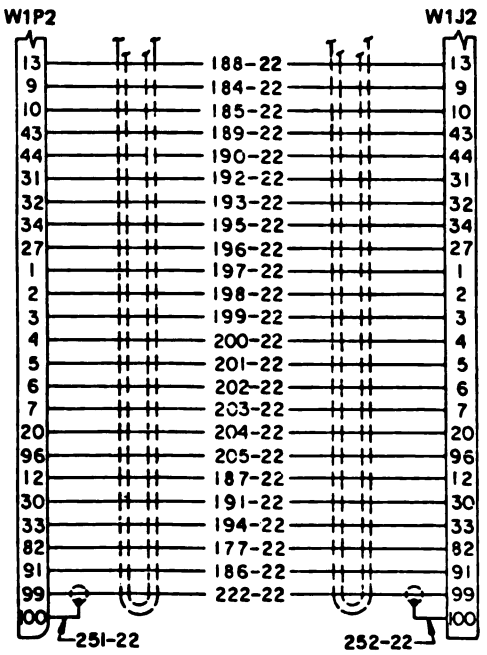
Table 2-41. Cable, Terminal Lug, and Insulation Sleeving Identifier

CABLE/TERMINAL LUG IDENTIFIER	TERMINAL LUG				INSULATION SLEEVING	
	MS25036-103	MS25036-110	MS25036-114	MS25036-155	MS23053/1-001-0 (22, App. B)	M23053/5-103-0 (31, App. B)
W23						
WT-1	X				X	
WT-2	X				X	
W38						
WT-1				X		
WT-2		X				
W41						
WT-1			X		X	
WT-2			X		X	
WT-3			X		X	

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



CONTINUED ON
SHEET 2



DIMENSION	LENGTH (mm)	TOLERANCE (mm)
A	435	±13
B	1130	±13
C	335	±13
D	300	±5.0
E	600	±13
F	210	±13
G	435	±13

Figure 2-1. W1 Cable Assembly Wiring Diagram (Sheet 1 of 2)

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

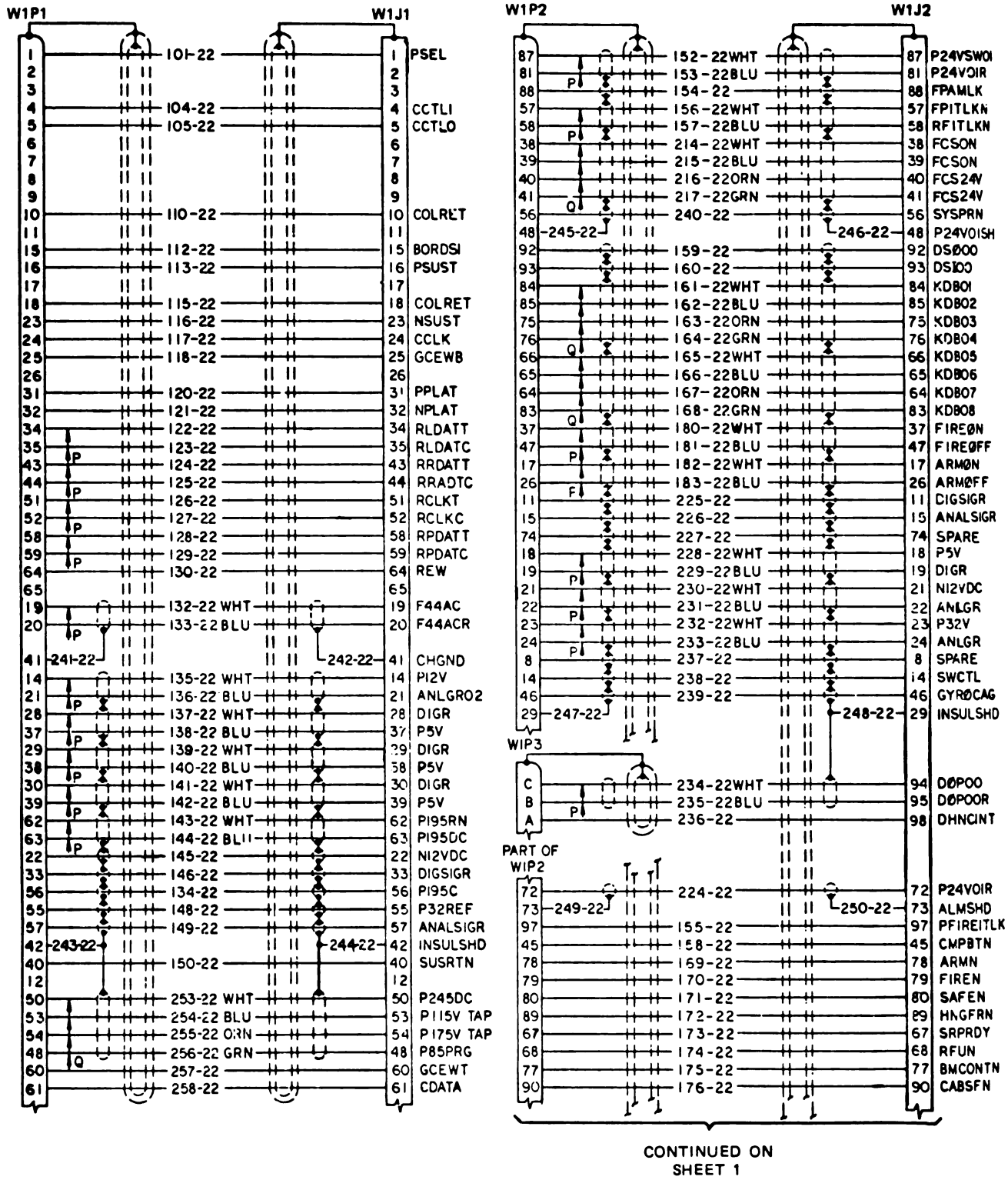
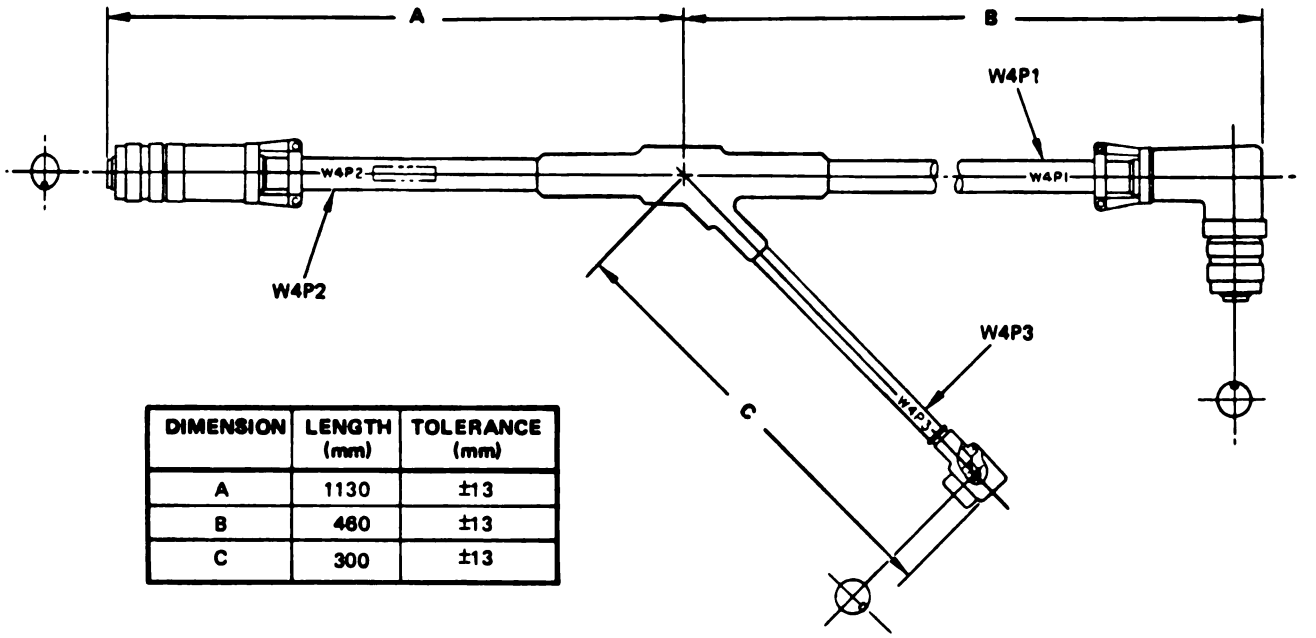


Figure 2-1. W1 Cable Assembly Wiring Diagram (Sheet 2 of 2)

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



DIMENSION	LENGTH (mm)	TOLERANCE (mm)
A	1130	±13
B	460	±13
C	300	±13

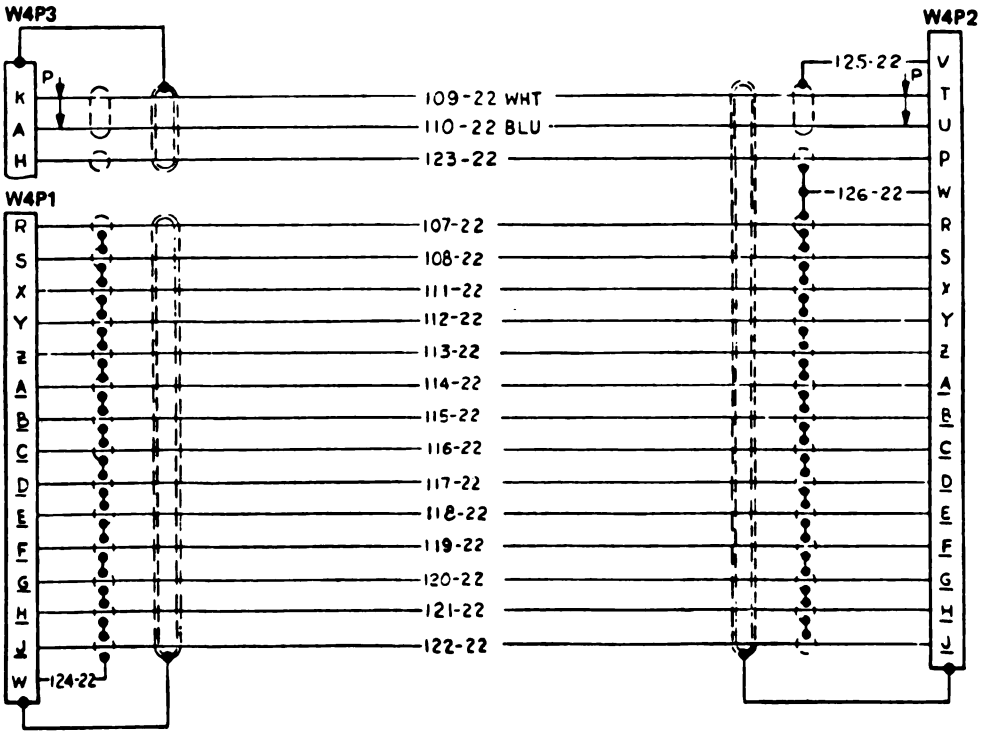
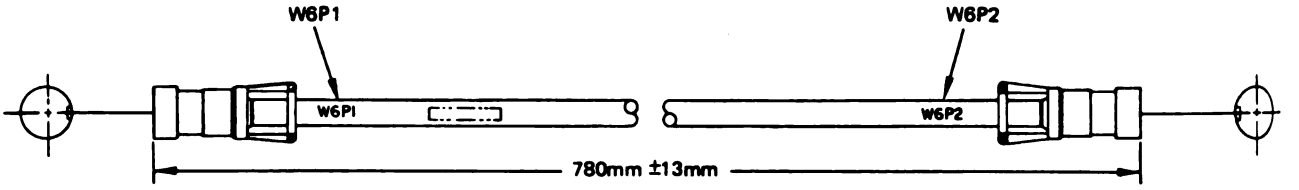


Figure 2-2. W4 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



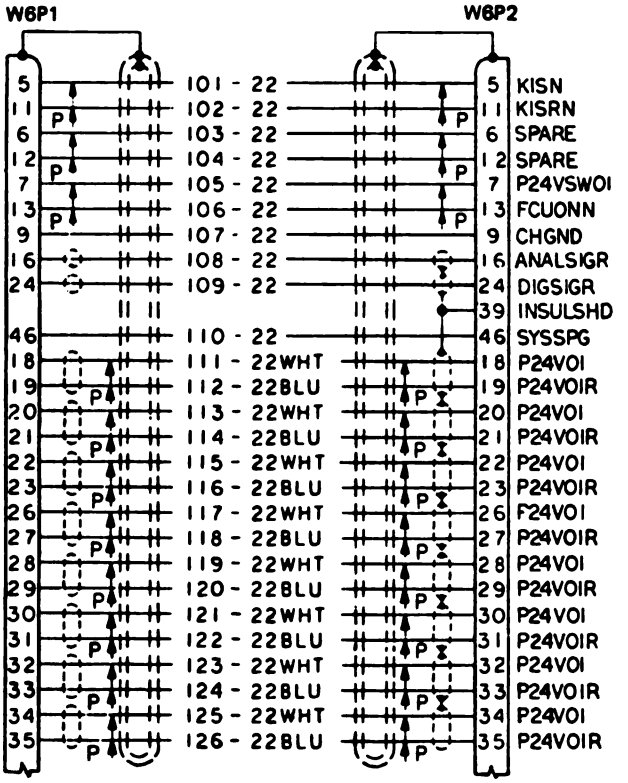


Figure 2-3. W6 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

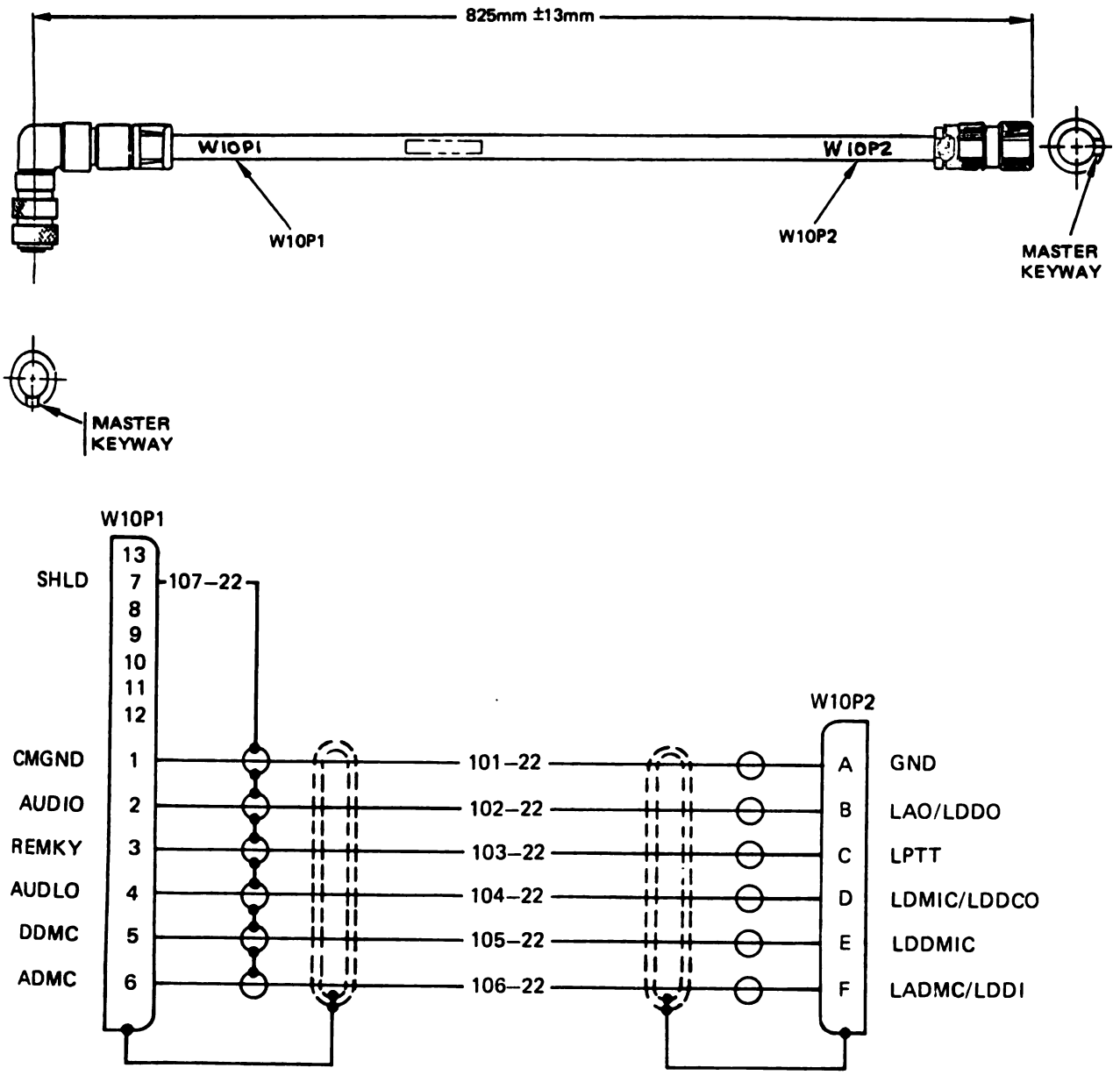
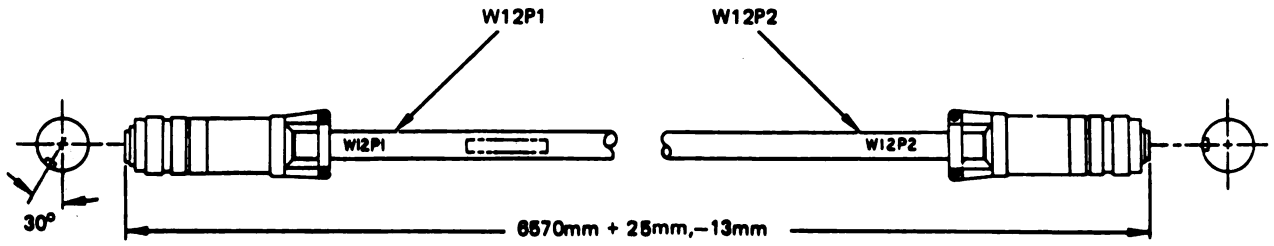


Figure 2-4. W10 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



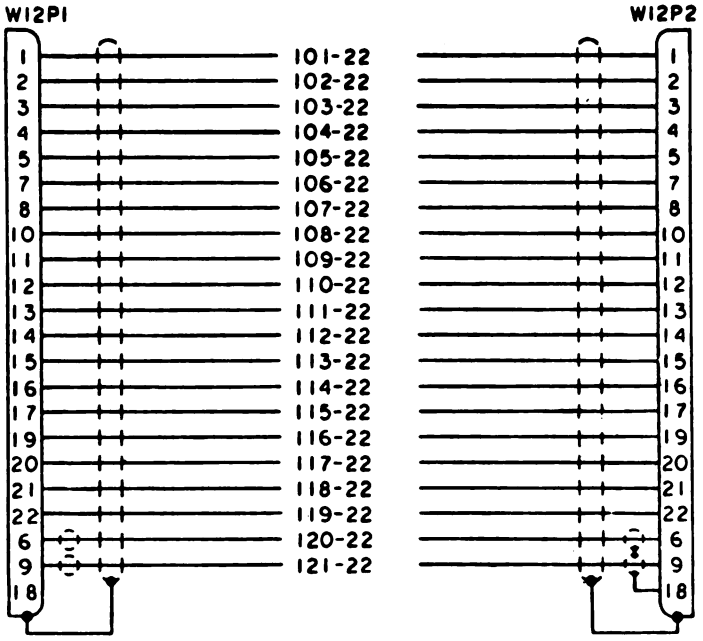
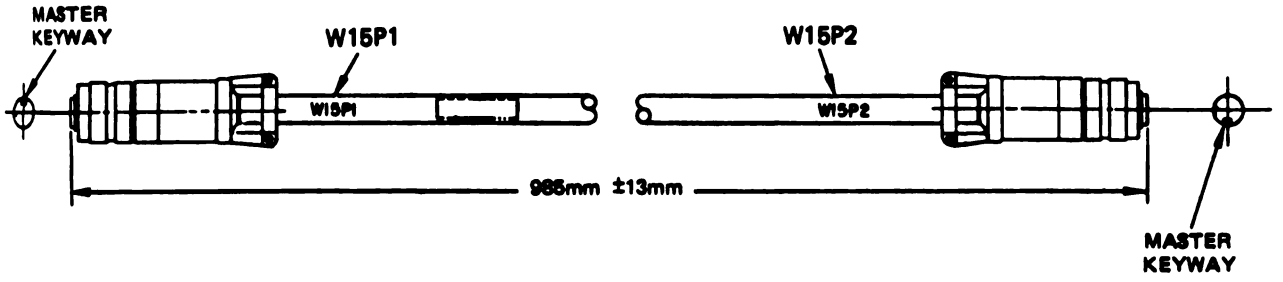
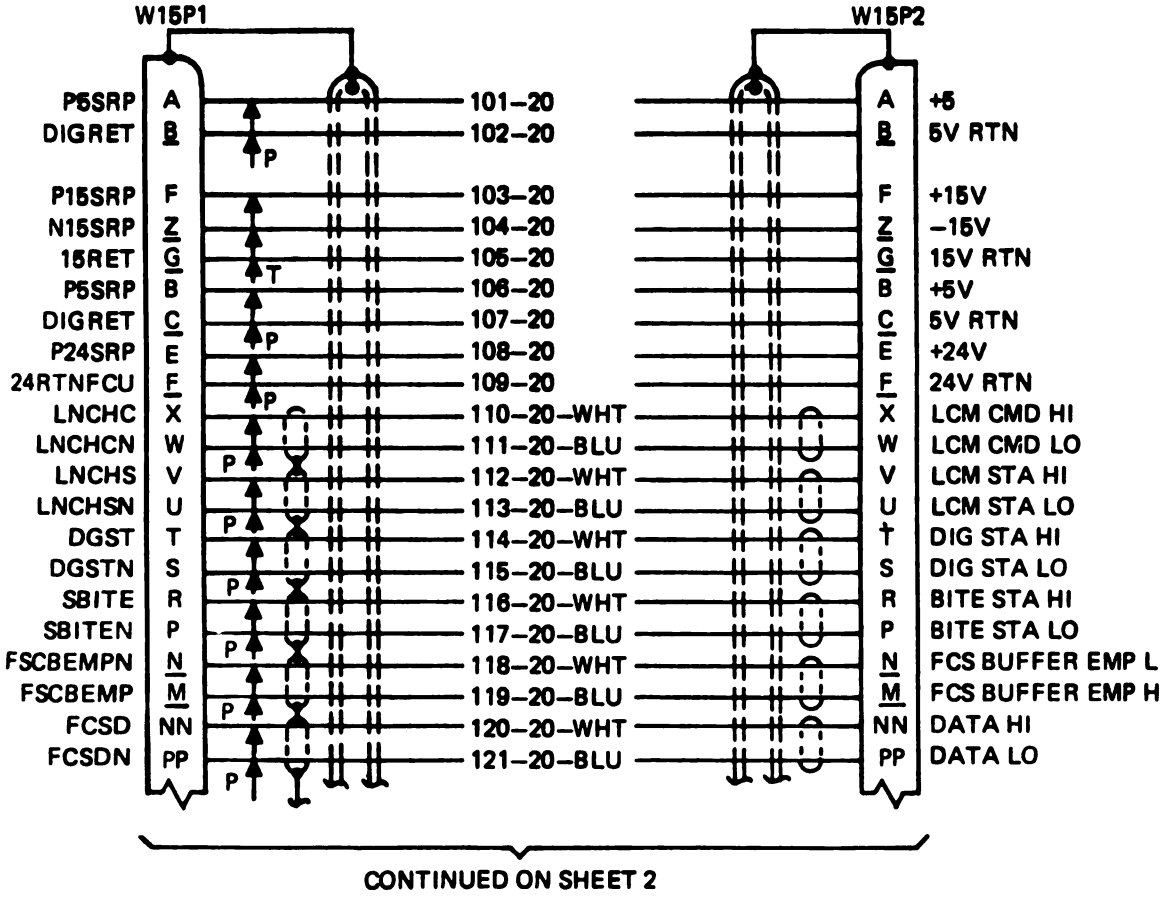


Figure 2-5. W12 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)





CONTINUED ON SHEET 2

Figure 2-6. W15 Cable Assembly Wiring Diagram (Sheet 1 of 2)

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

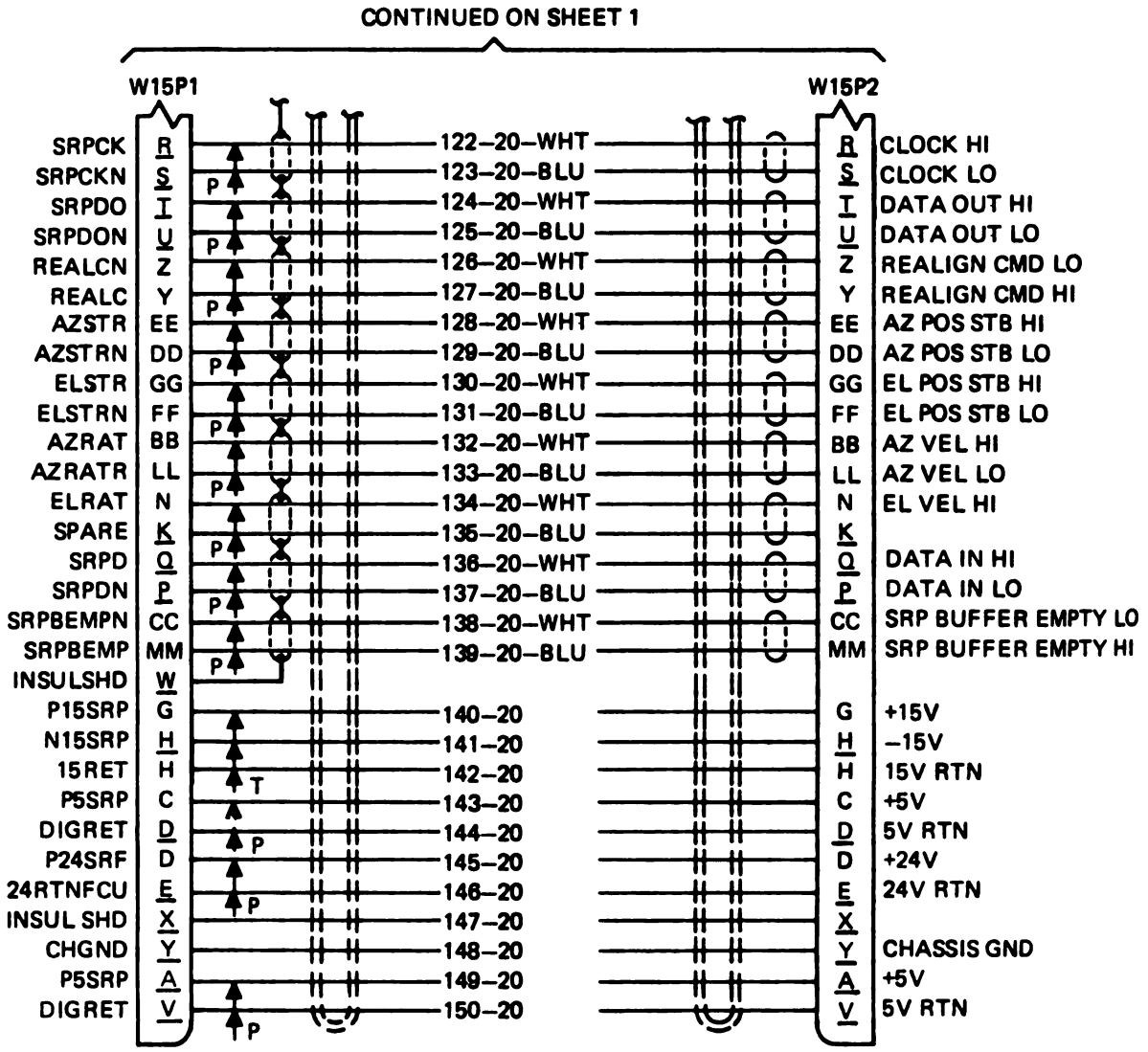
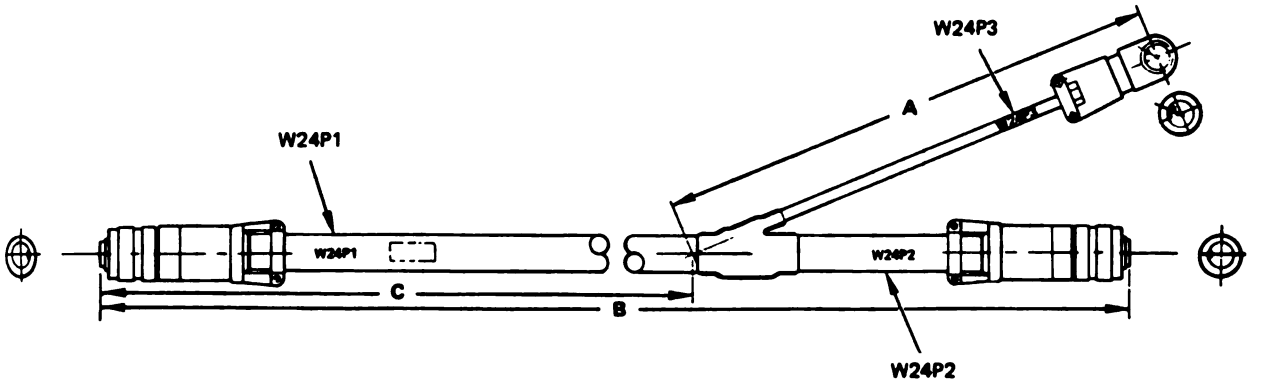


Figure 2-6. W15 Cable Assembly Wiring Diagram (Sheet 2 of 2)

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



DIMENSION	LENGTH (mm)	TOLERANCE (mm)
A	2155	+25, –13
B	2135	+25, –13
C	1835	+25, –13

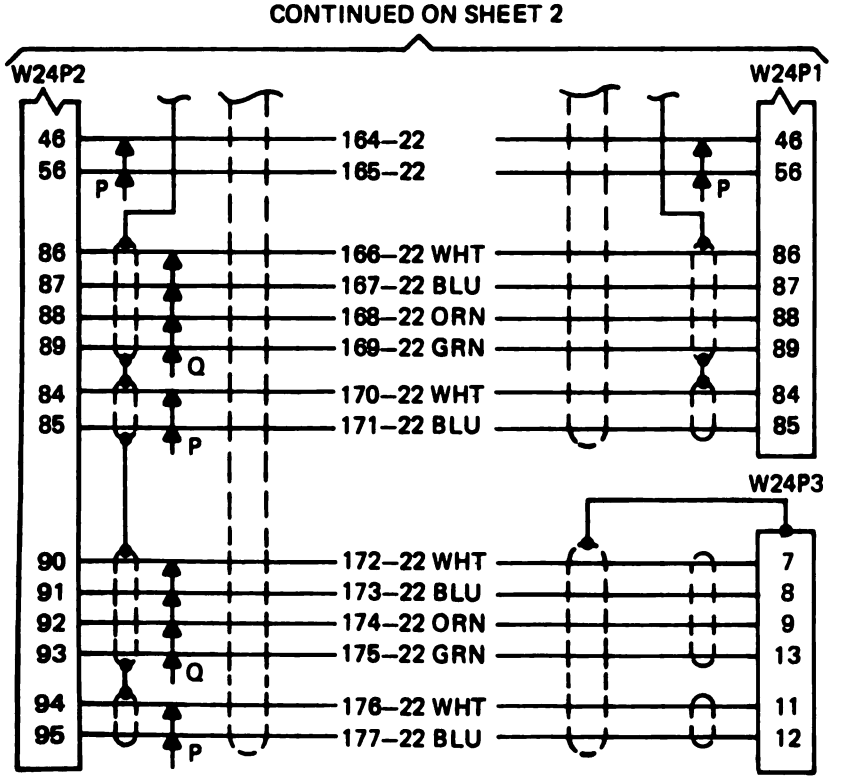


Figure 2-7. W24 Cable Assembly Wiring Diagram (Sheet 1 of 2)

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

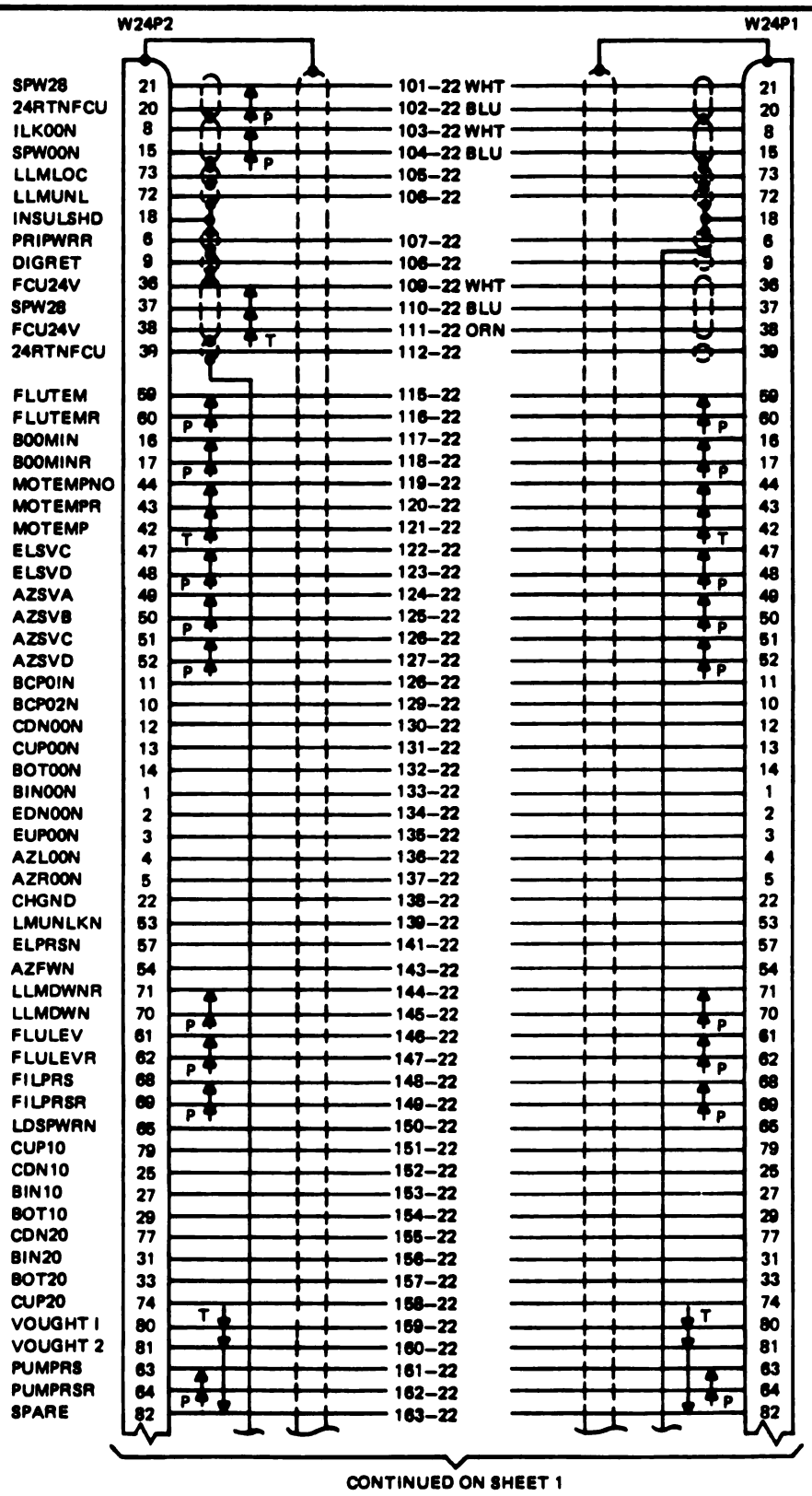
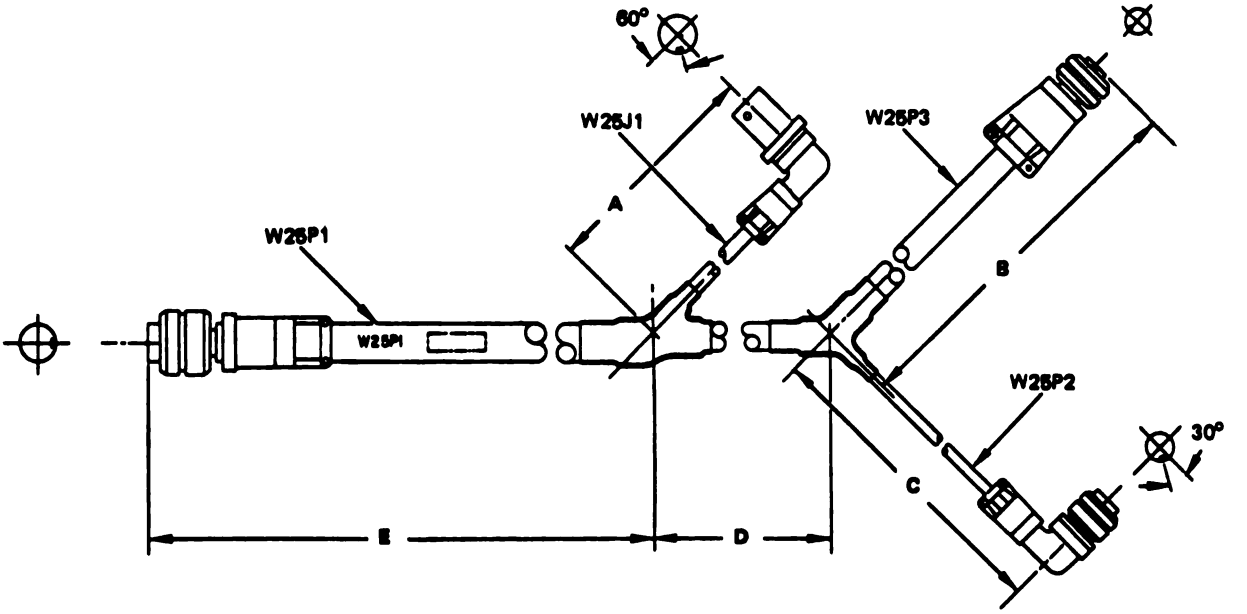
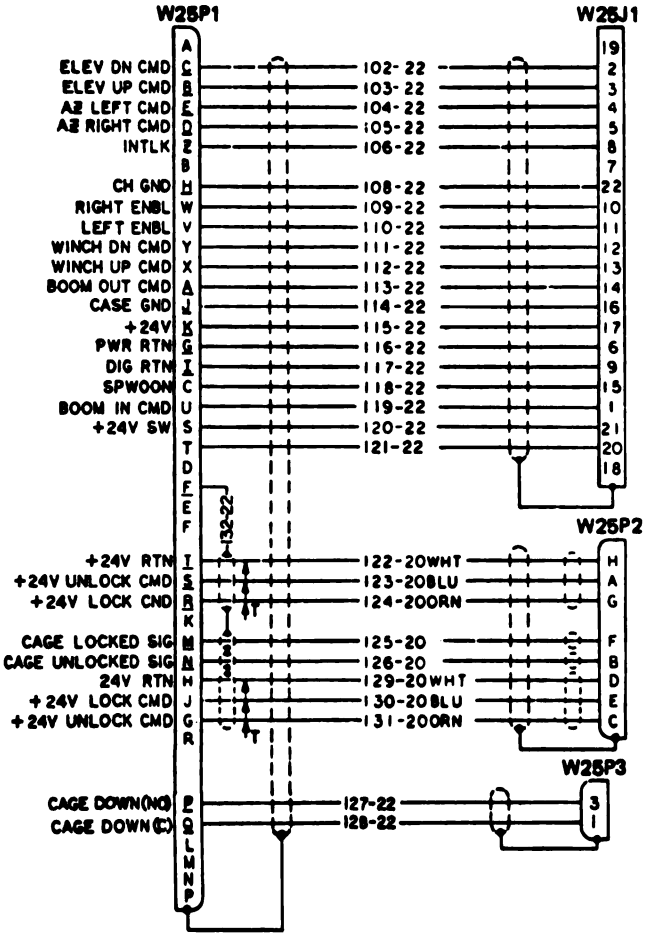


Figure 2-7. W24 Cable Assembly Wiring Diagram (Sheet 2 of 2)

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

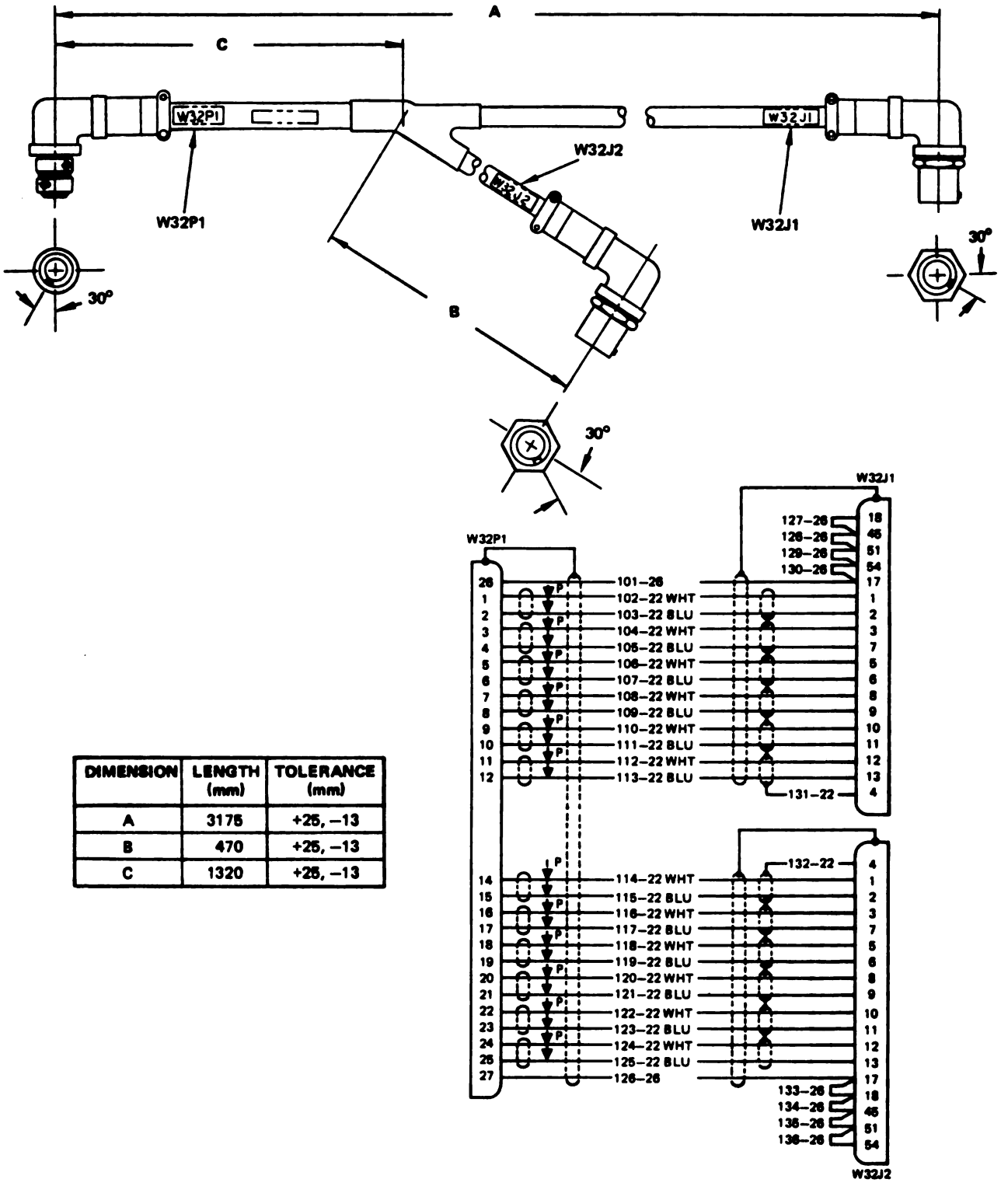




DIMENSION	LENGTH (mm)	TOLERANCE (mm)
A	370	+25, –13
B	975	+25, –13
C	1145	+25, –13
D	5100	+25, –13
E	3125	+25, –13

Figure 2-8. W25 Cable Assembly Wiring Diagram

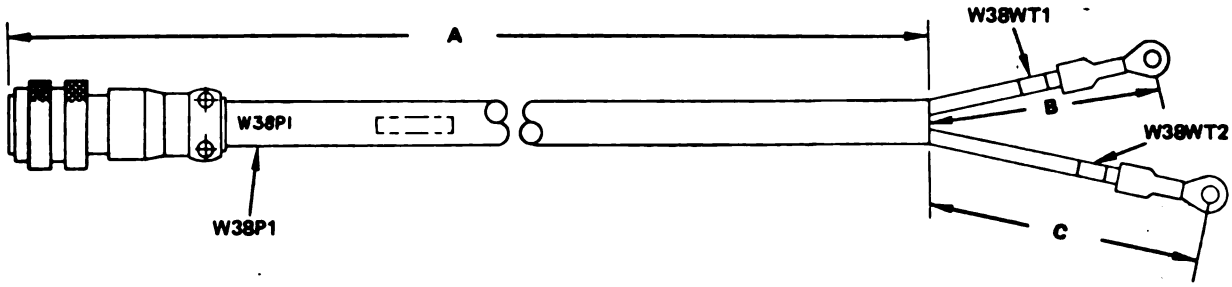
2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



DIMENSION	LENGTH (mm)	TOLERANCE (mm)
A	3175	+25, –13
B	470	+25, –13
C	1320	+25, –13

Figure 2-9. W32 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



DIMENSION	LENGTH (mm)	TOLERANCE (mm)
A	2120	±13
B	75	±13
C	100	±13

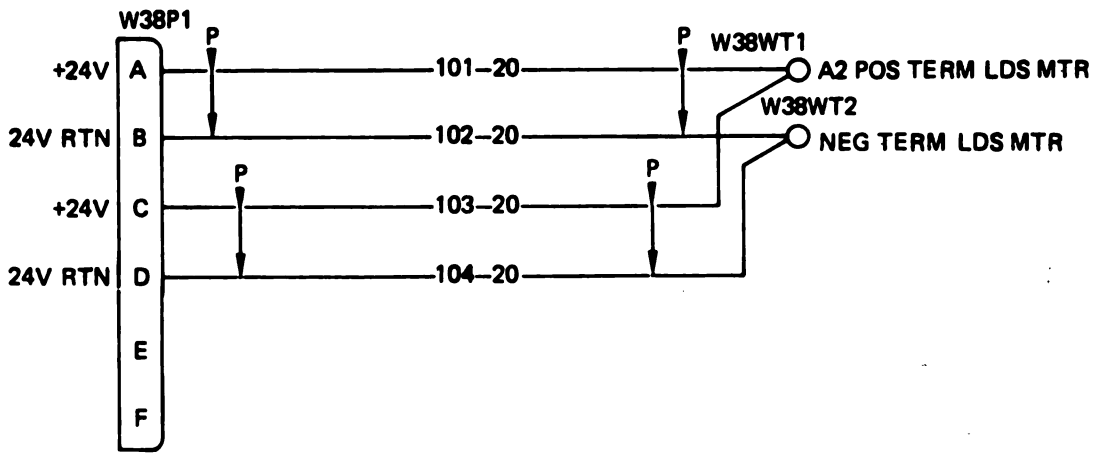


Figure 2-10. W38 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

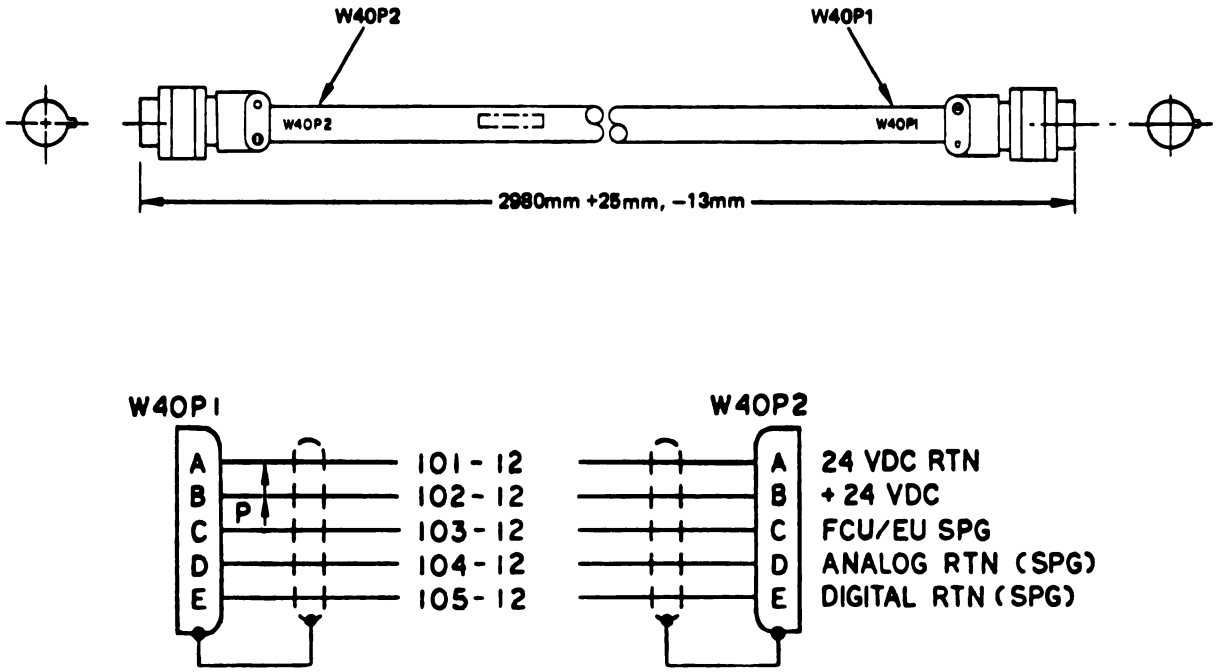
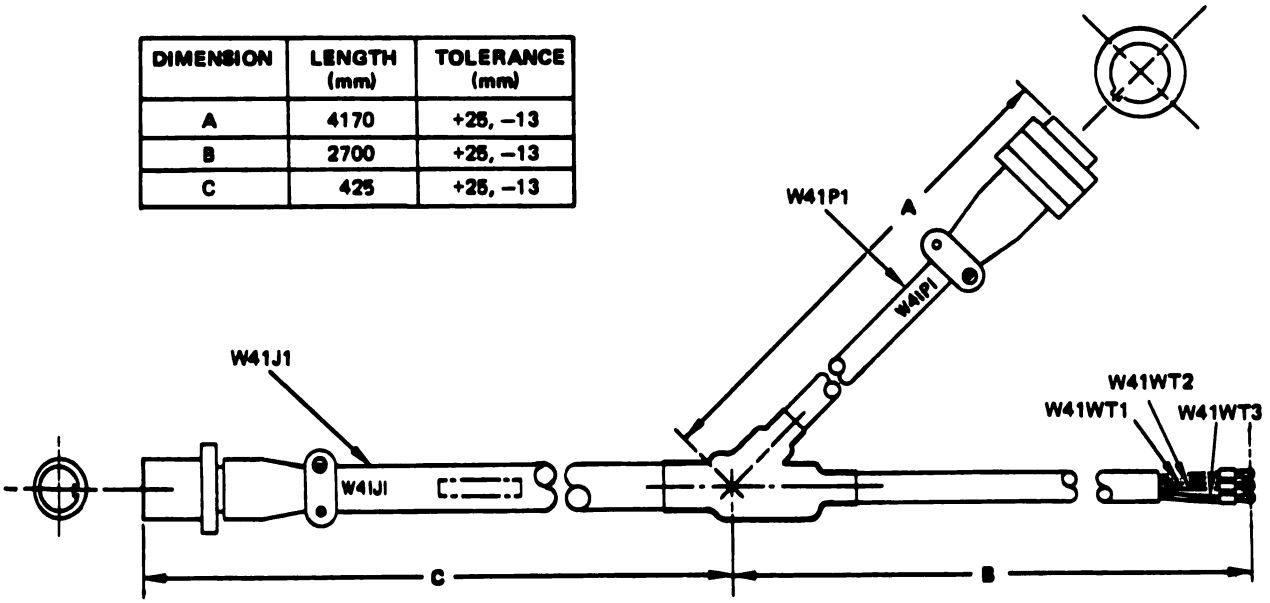


Figure 2-11. W40 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

DIMENSION	LENGTH (mm)	TOLERANCE (mm)
A	4170	+25, –13
B	2700	+25, –13
C	425	+25, –13



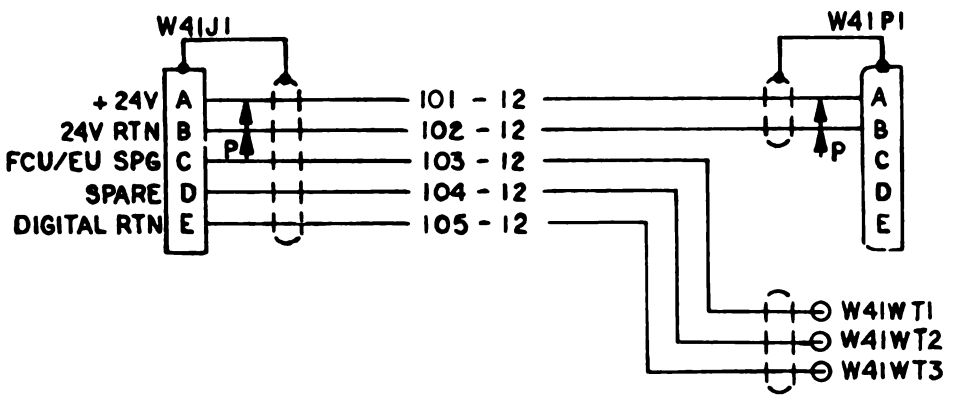
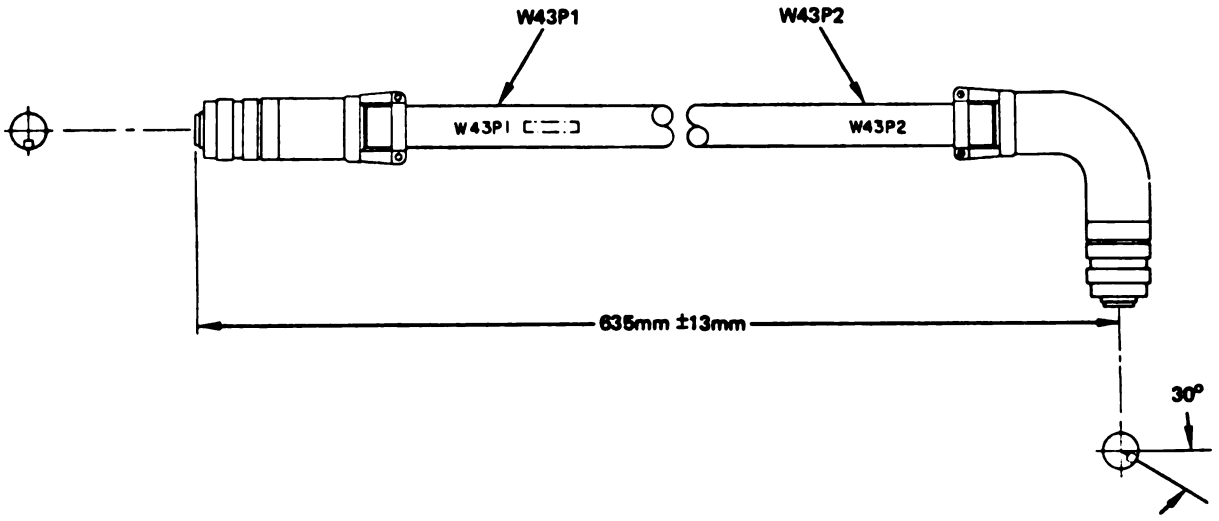


Figure 2-12. W41 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



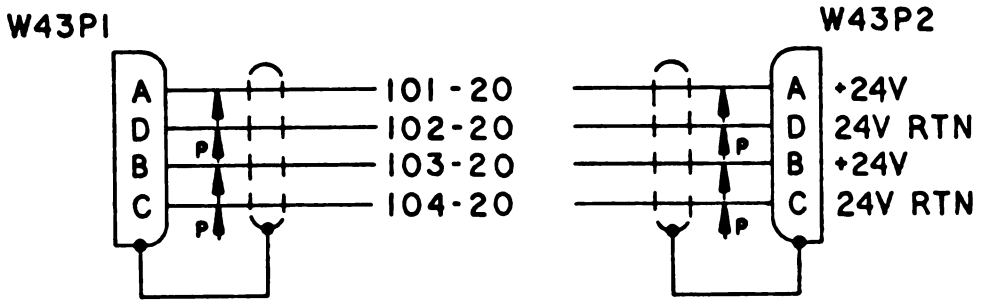
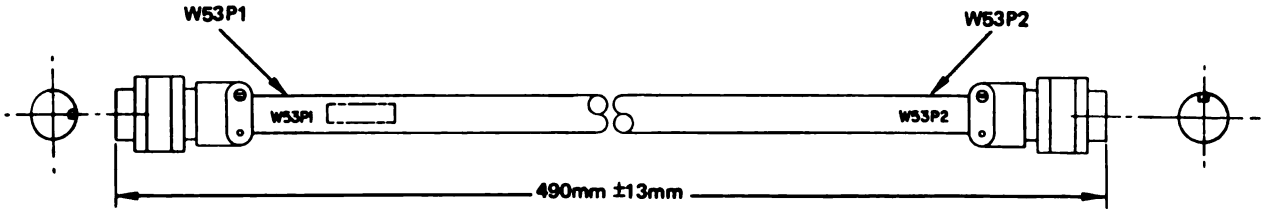


Figure 2-13. W43 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



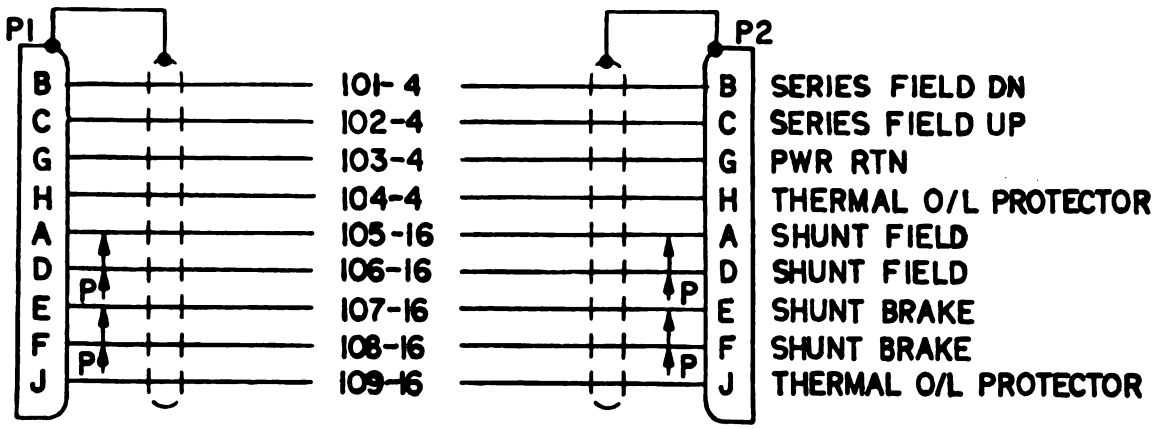
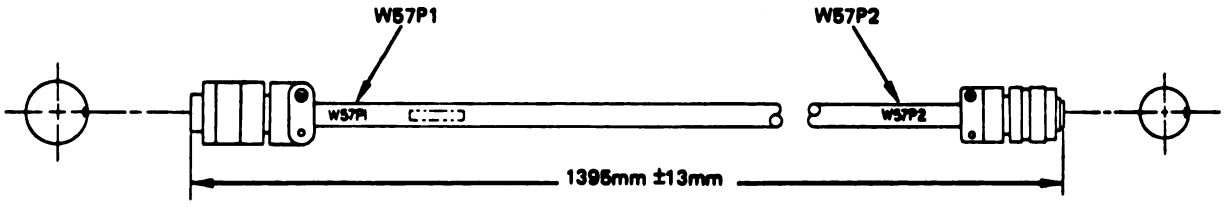


Figure 2-14. W53 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



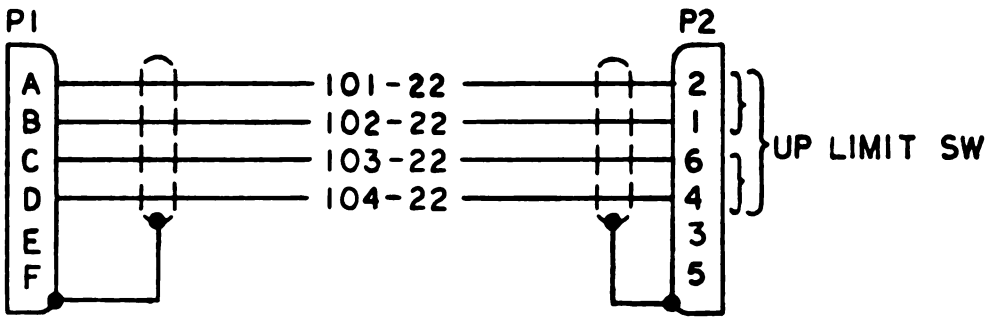
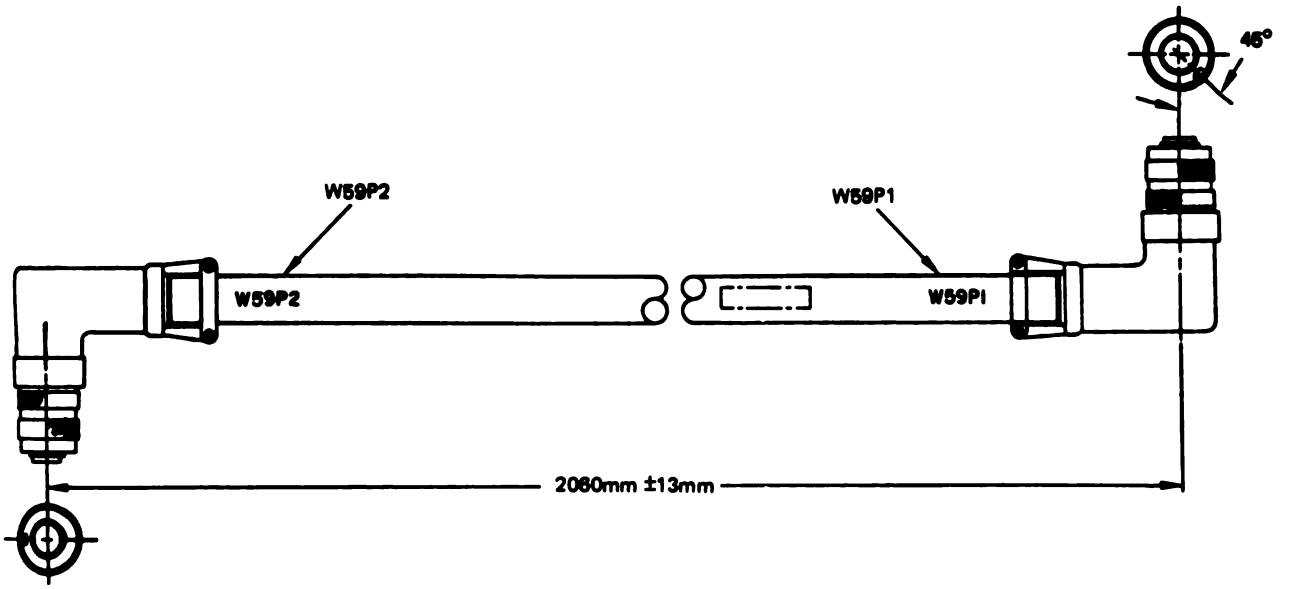


Figure 2-15. W57 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



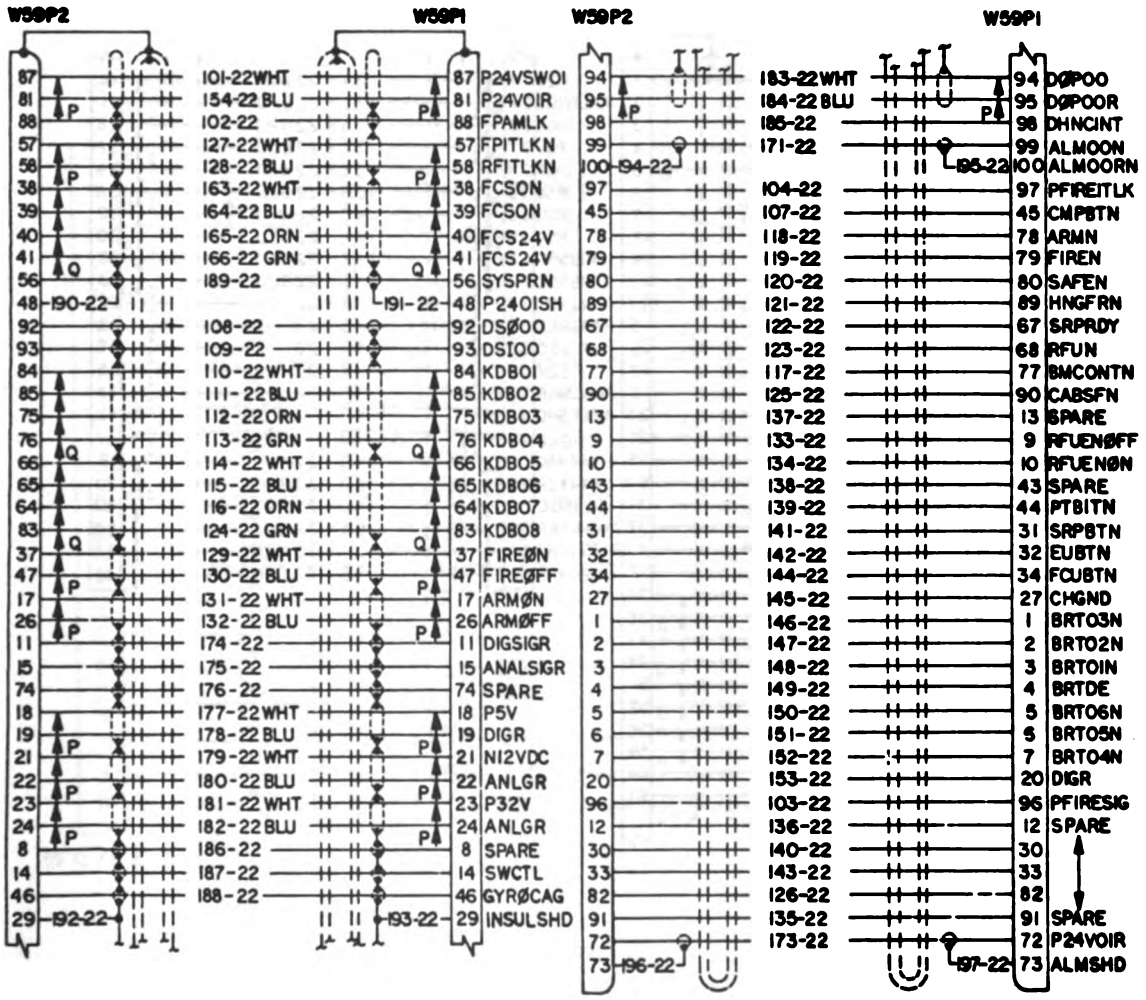
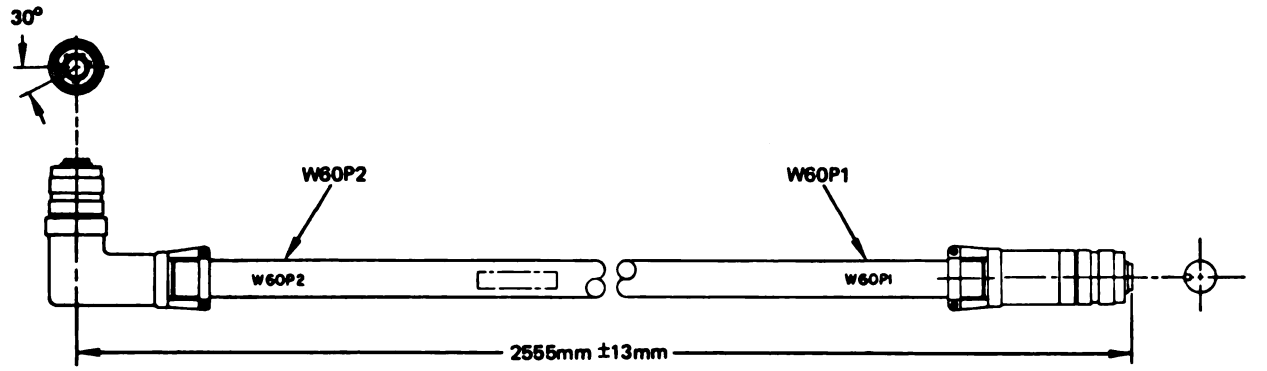


Figure 2-16. W59 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



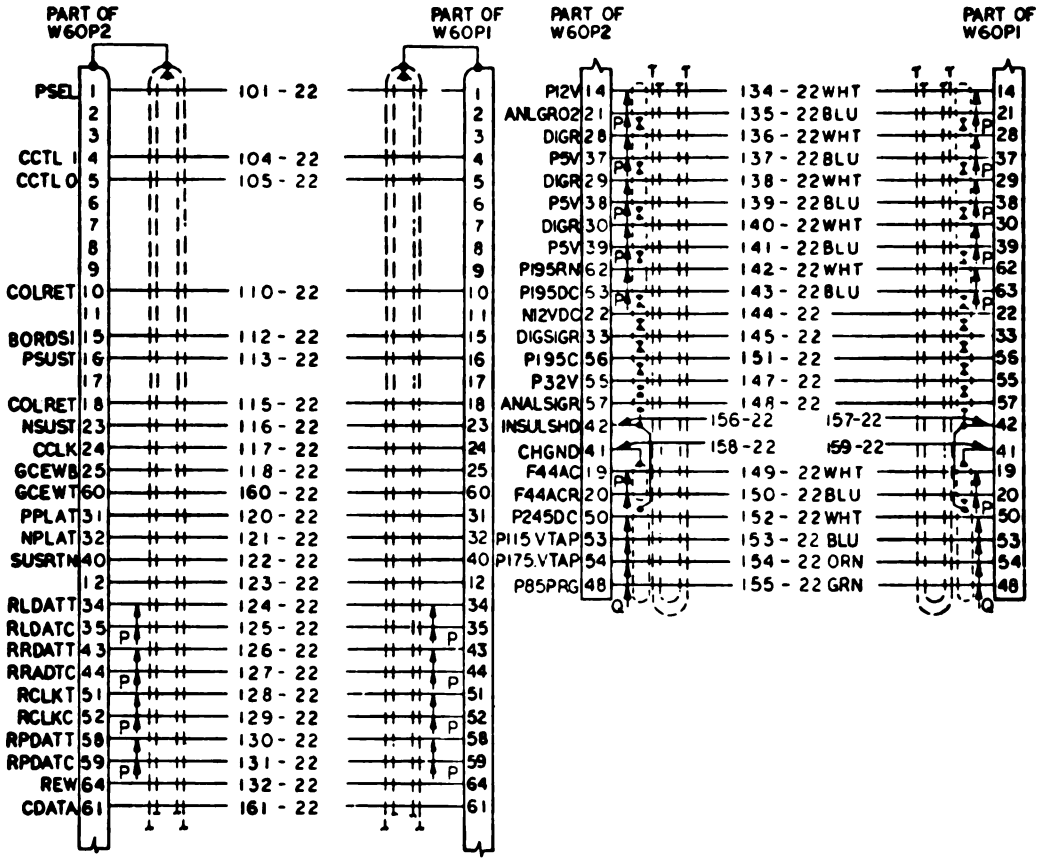
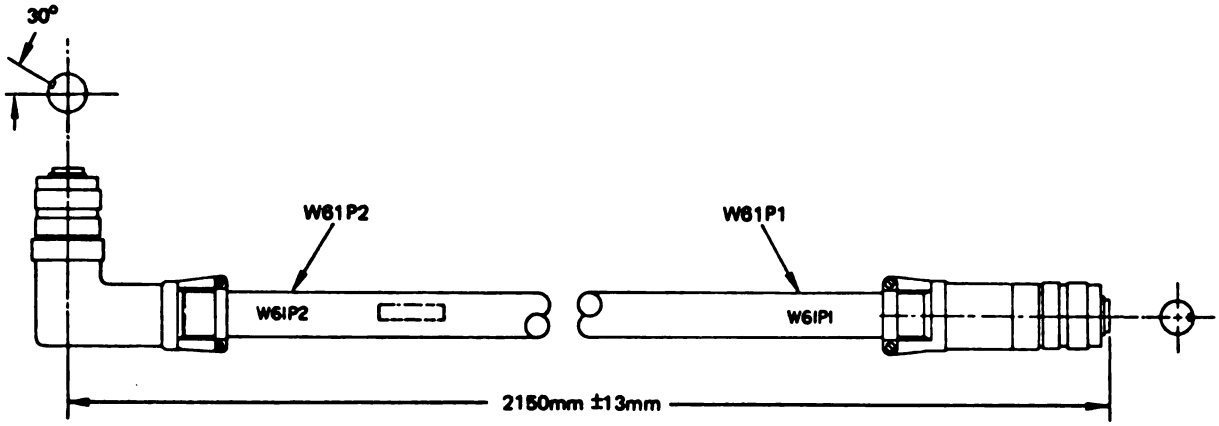


Figure 2-17. W60 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



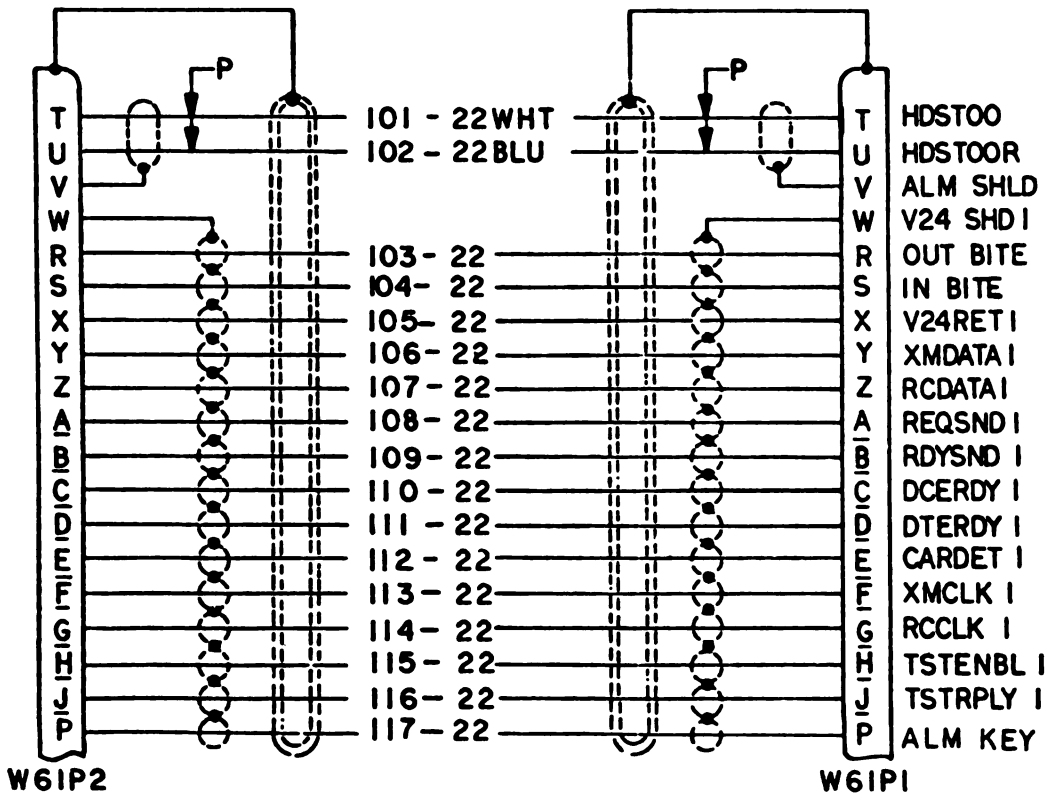
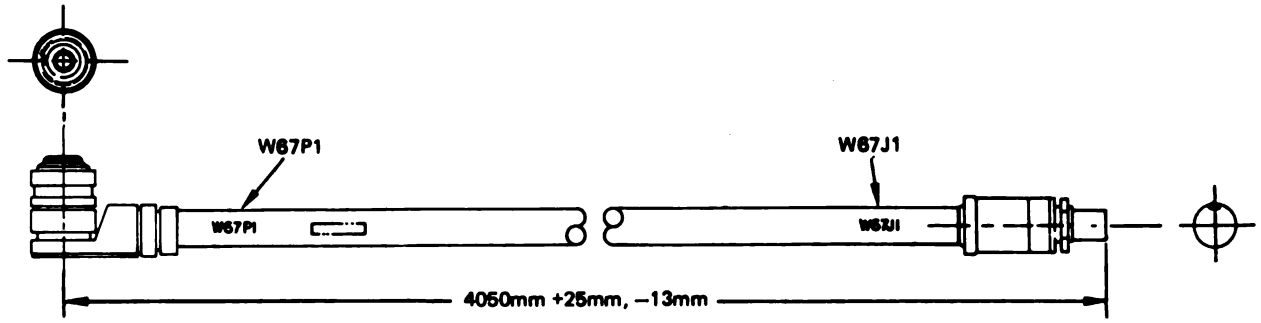
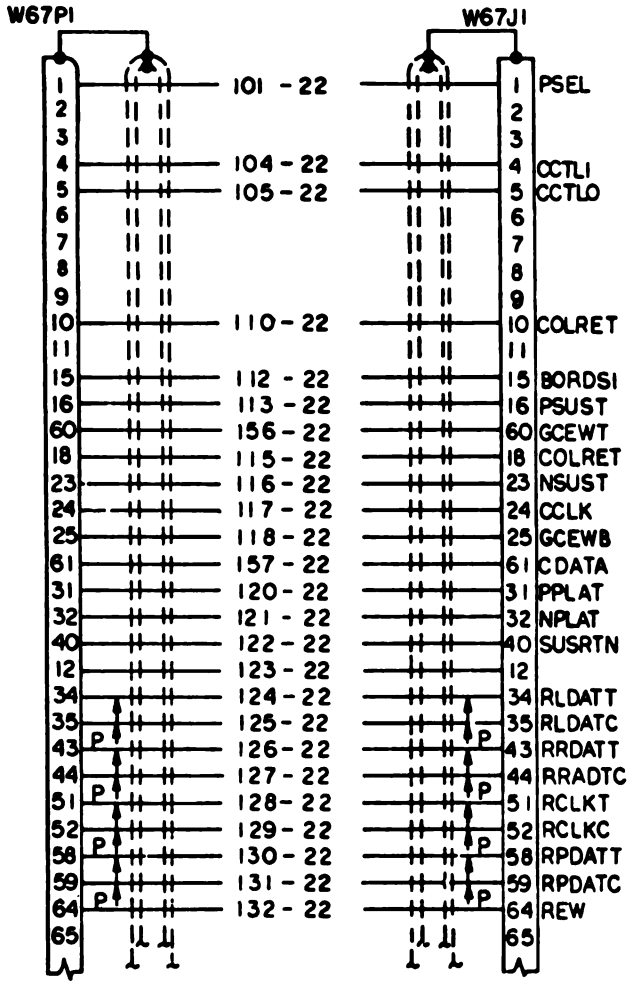


Figure 2-18. W61 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)





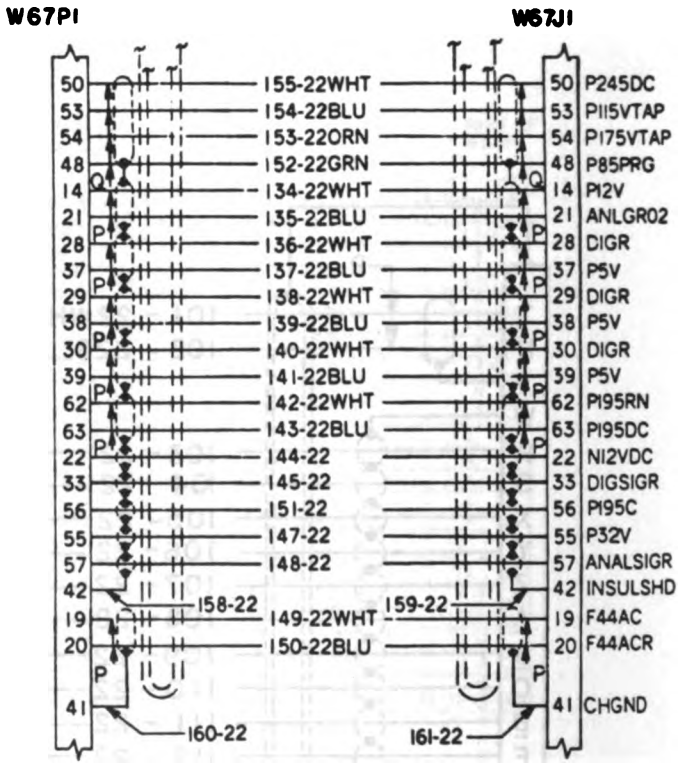
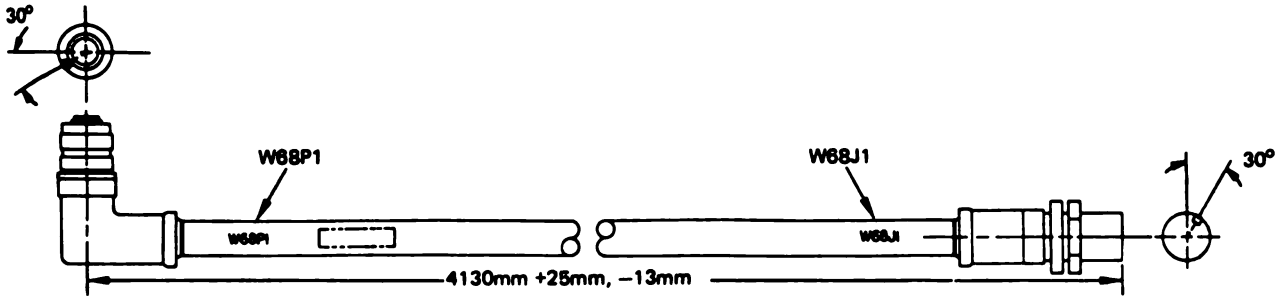


Figure 2-19. W67 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



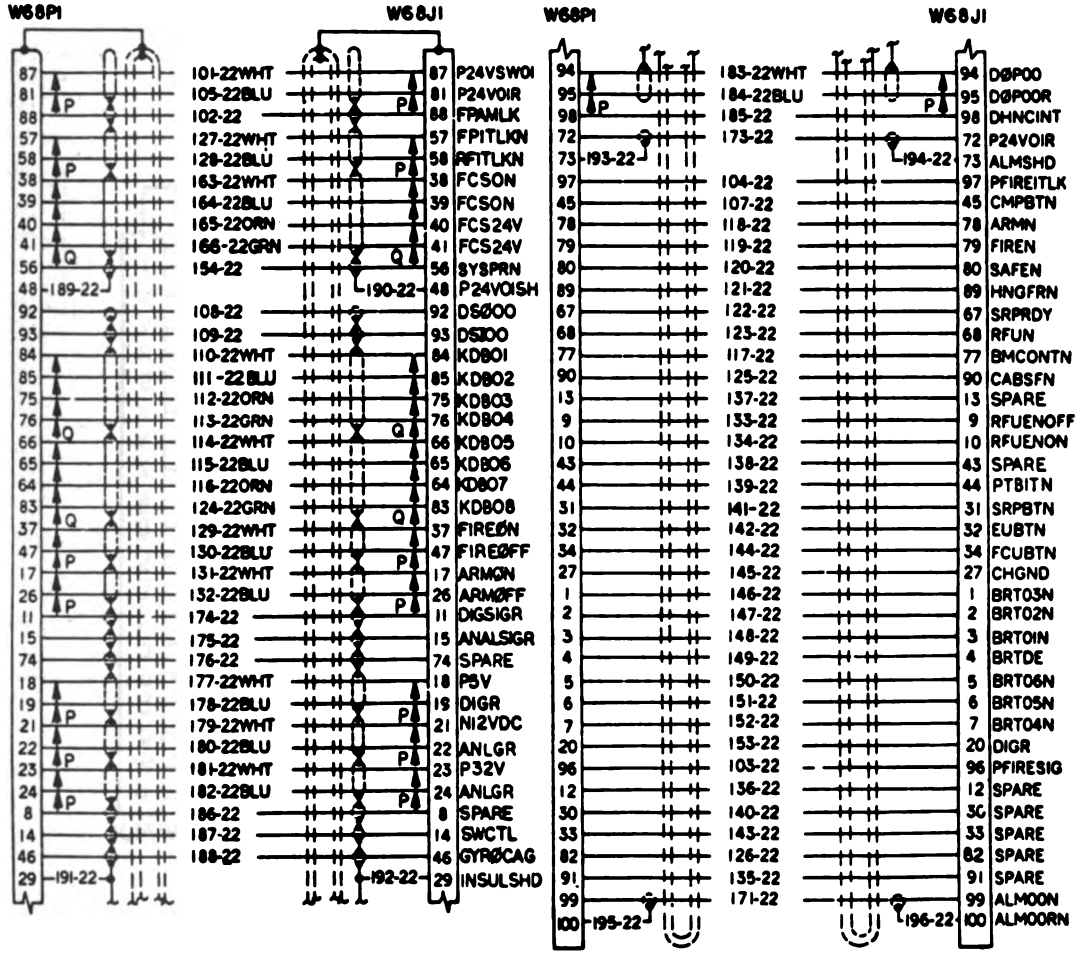
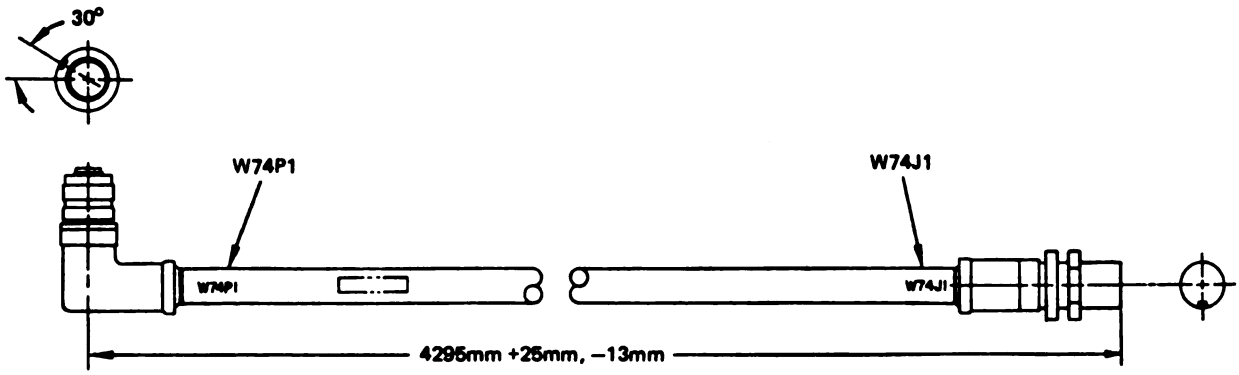


Figure 2-20. W68 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



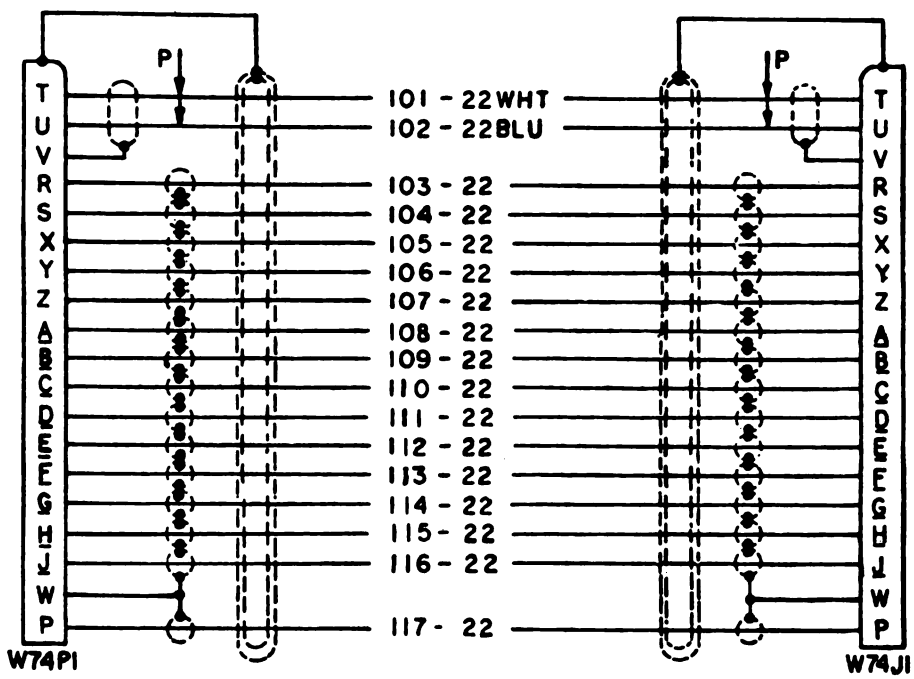
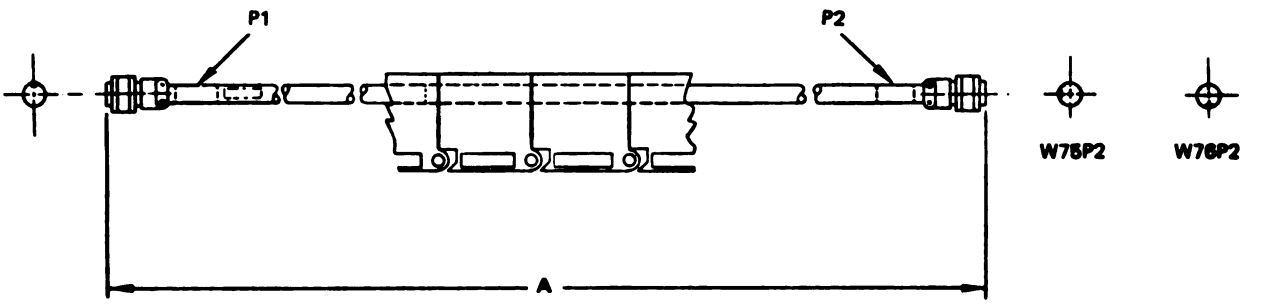


Figure 2-21. W74 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



DIMENSION "A"	LENGTH (mm)	TOLERANCE (mm)
W–75	9090	+25, –13
W–76	7620	+25, –13

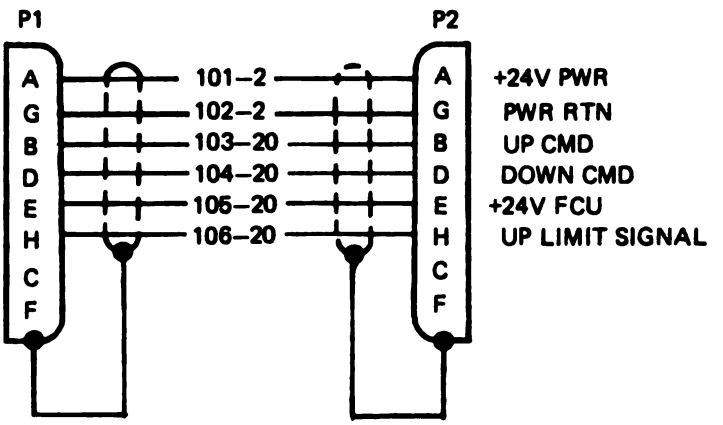
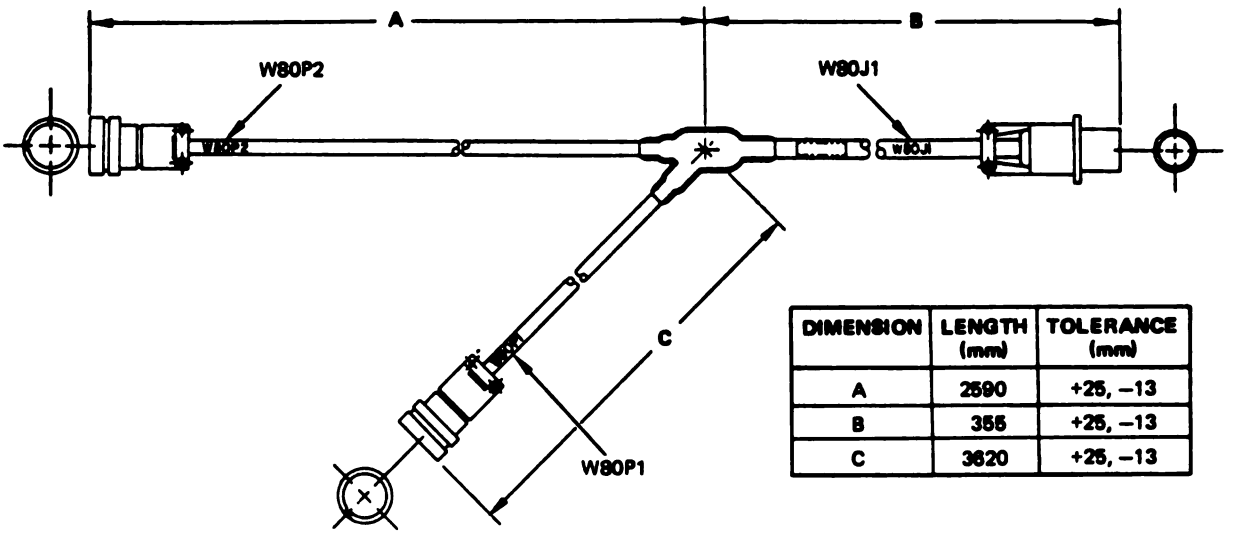


Figure 2-22. W75 and W76 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



DIMENSION	LENGTH (mm)	TOLERANCE (mm)
A	2590	+25, –13
B	355	+25, –13
C	3620	+25, –13

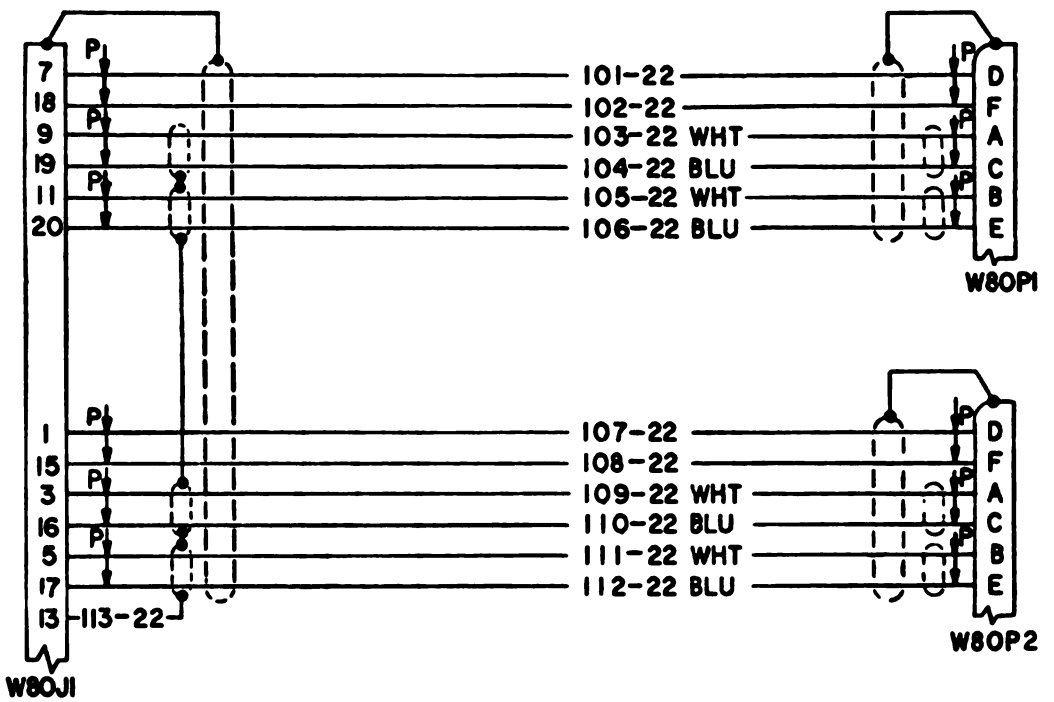


Figure 2-23. W80 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)

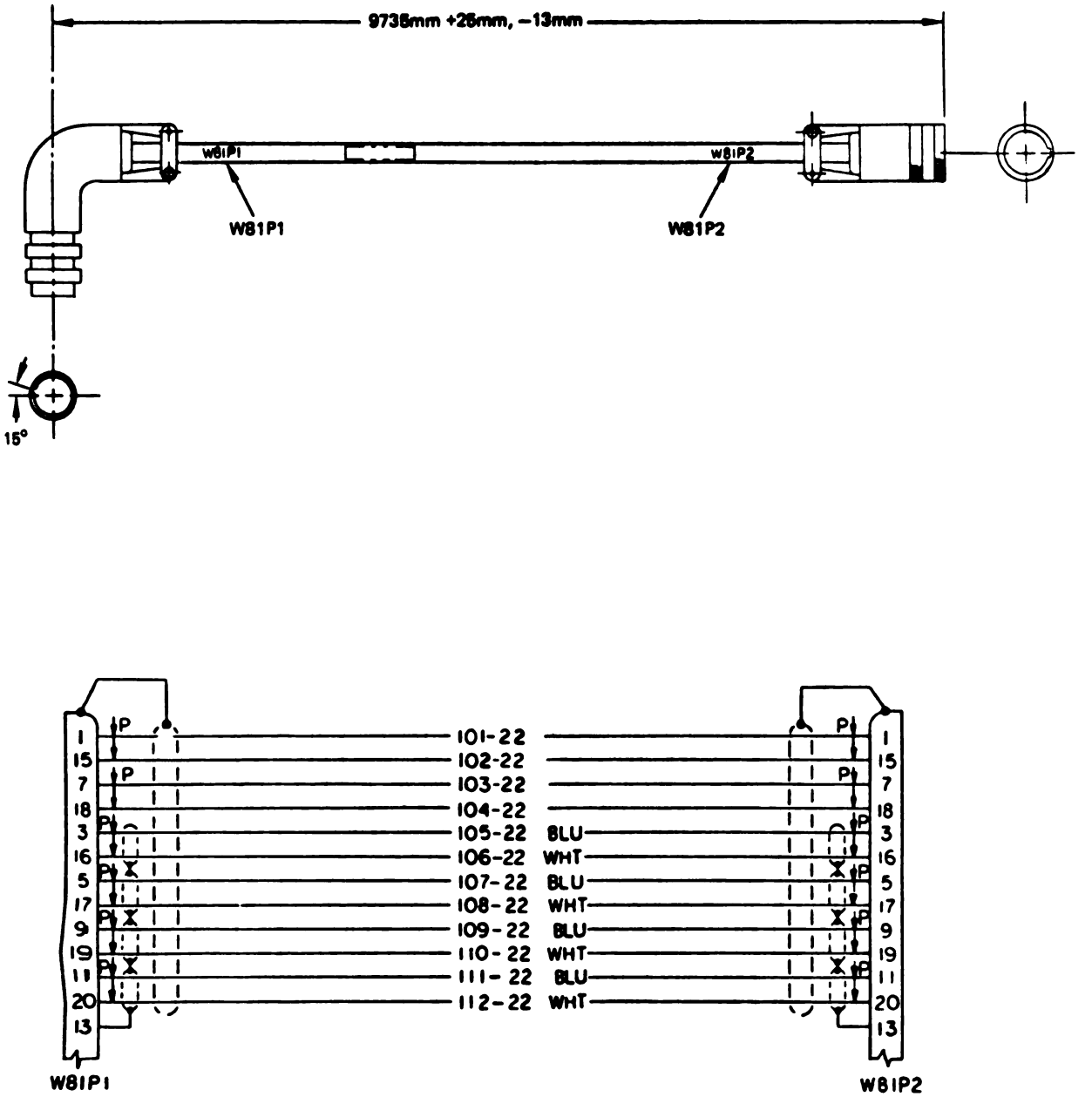
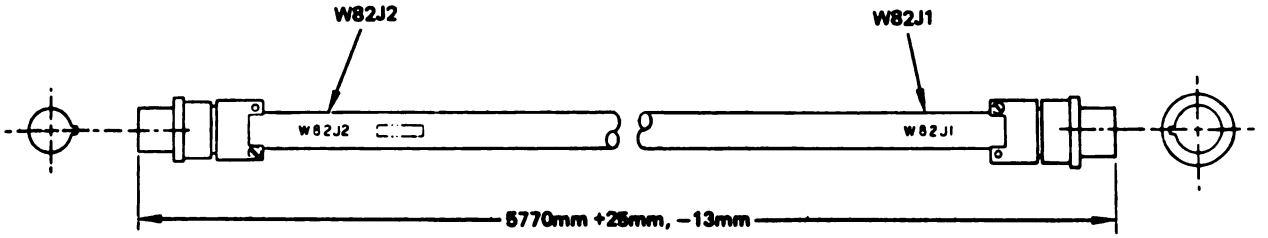


Figure 2-24. W81 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



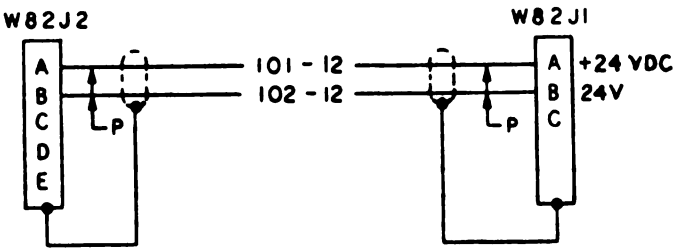
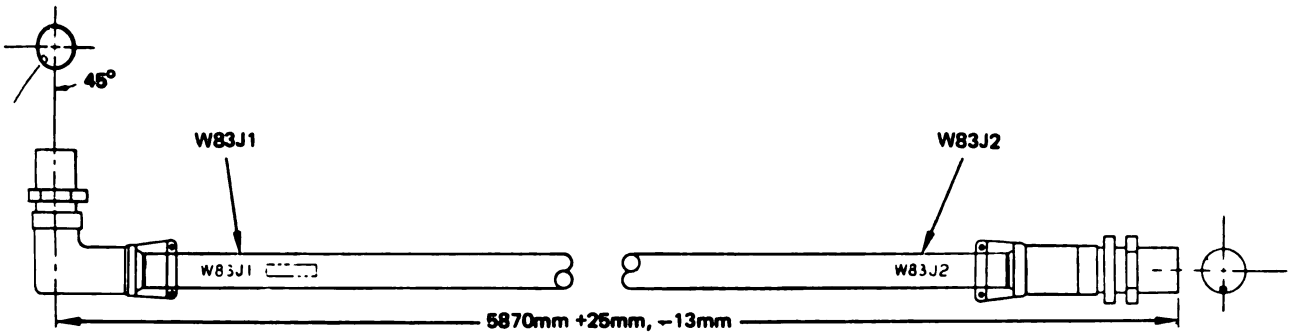


Figure 2-25. W82 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



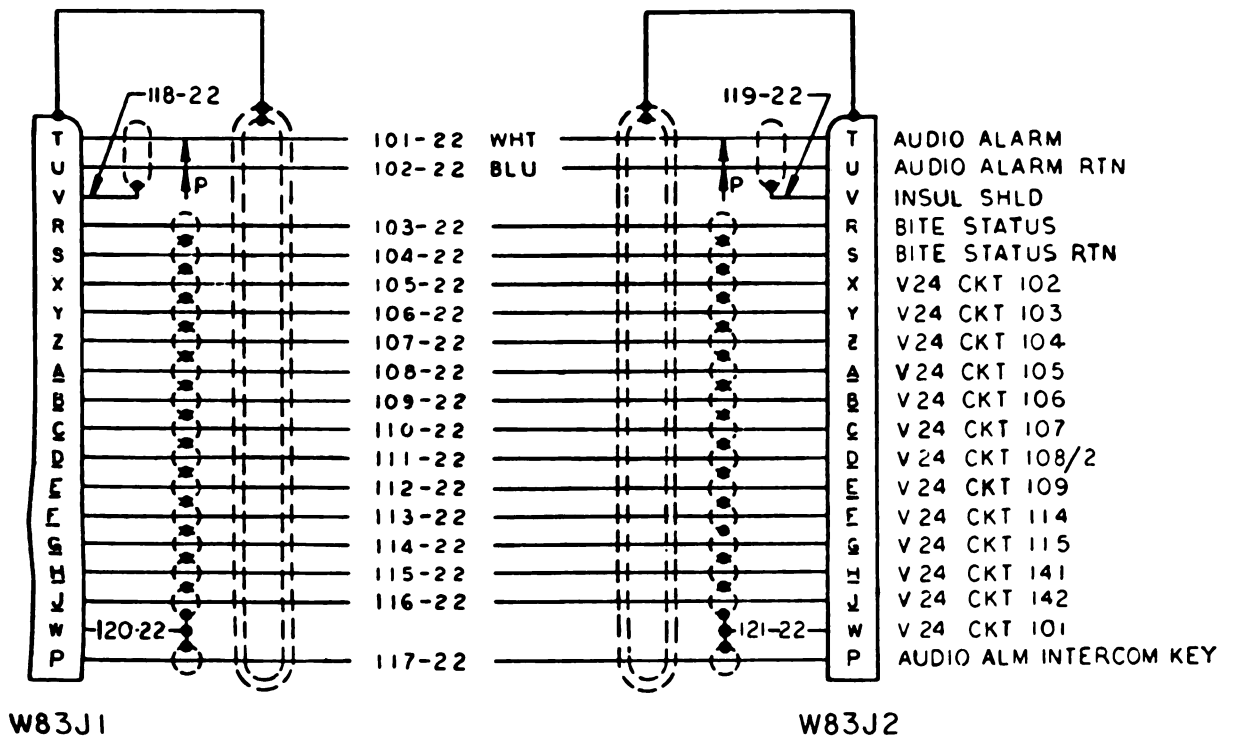
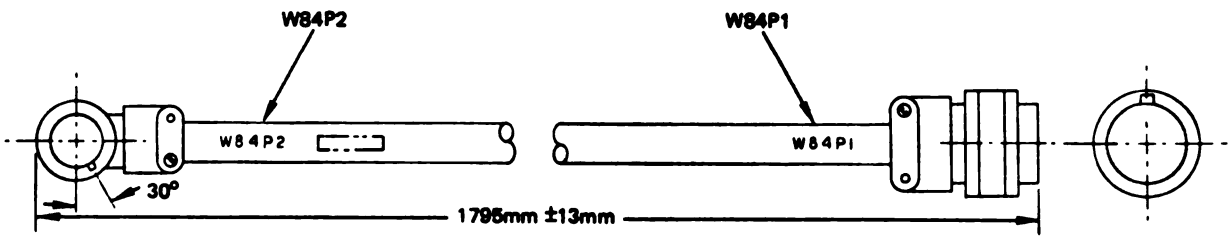


Figure 2-26. W83 Cable Assembly Wiring Diagram

2-6. ELECTRICAL CABLE MAINTENANCE INSTRUCTIONS (CONT)



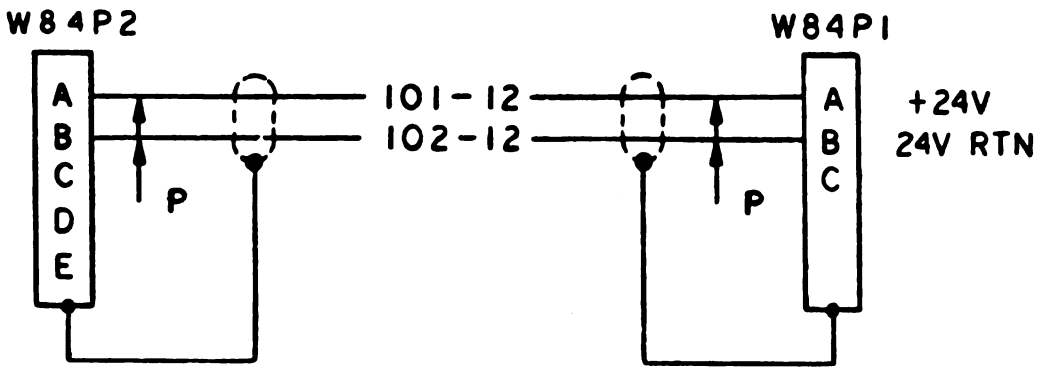


Figure 2-27. W84 Cable Assembly Wiring Diagram

2-7. ELEVATION POSITION MONITOR TRANSDUCER ASSEMBLY MAINTENANCE INSTRUCTIONS. This paragraph covers the maintenance tasks for the following items:

Item	*Page*
1. Elevation Transducer Assembly	2-135
2. Resolver/Connector Assembly	2-135
3. Screw Thread Inserts	2-138

INITIAL SETUP

Tools
Kit, tool, 13032302
Set, shop, 13032303
Extractor, screw thread, 1227-06
Inserter, screw thread, 7751-4
Tang, breakoff tool, 4238-4

Materials/Parts
Cloth, lintless, cleaning (5, Appendix B)
Coating (6, Appendix B)
Compound, cleaning (8, Appendix B)
Iridite (13, Appendix B)
Lockwire (15, Appendix B)
Packing, preformed (17, Appendix B)
Paper, abrasive, garnet (18, Appendix B)
Primer, epoxy (19, Appendix B)
Primer, zinc chromate (20, Appendix B)
Solvent, drycleaning (36, Appendix B)
Thinner, aliphatic (37, Appendix B)

Personnel Required
MLRS Repairer MOS 27

Troubleshooting
Paragraph 2-3

1. ELEVATION TRANSDUCER ASSEMBLY.

a. Receiving Inspection (Visual).

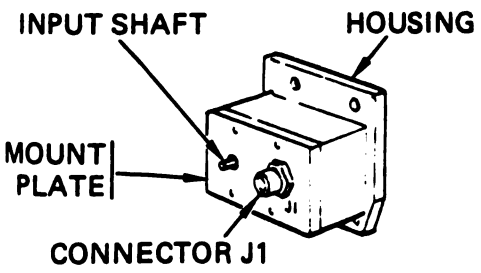
(1) Using oval paint brush and cleaning compound, remove all dust, grease, grit, and foreign matter from elevation transducer assembly.

(2) Using cotton wiping cloth, wipe elevation transducer dry.

(3) Inspect mount plate and housing for obvious damage. If damaged, replace.

(4) Inspect connector for obvious damage. If damaged, replace resolver/connector assembly (paragraph 2).

(5) Perform elevation position monitor transducer test (paragraph 2-3).



b. Final Inspection.

(1) Examine repair form attached to elevation transducer to determine what repairs were made.

(2) Verify all repairs listed on form were performed properly.

(3) Verify elevation transducer is clean, properly painted, and connector is free of broken or bent pins.

(4) If fault(s) is observed, return elevation transducer to repair.

(5) If no faults are observed, return elevation transducer to supply.

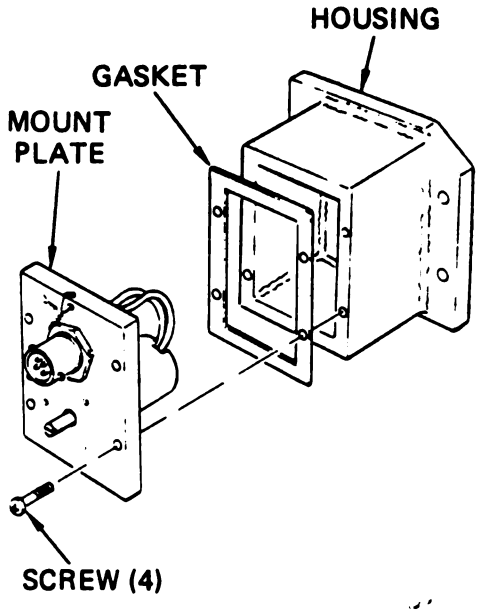
2. RESOLVER/CONNECTOR ASSEMBLY.

a. Synchro Mount Plate Removal.

(1) Using crosstip screwdriver, remove four screws securing synchro mount plate to housing.

2-7. ELEVATION POSITION MONITOR TRANSDUCER ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

(2) Remove synchro mount plate and gasket. Save the gasket; it is reuseable if not damaged.



b. Resolver/Connector Assembly Removal.

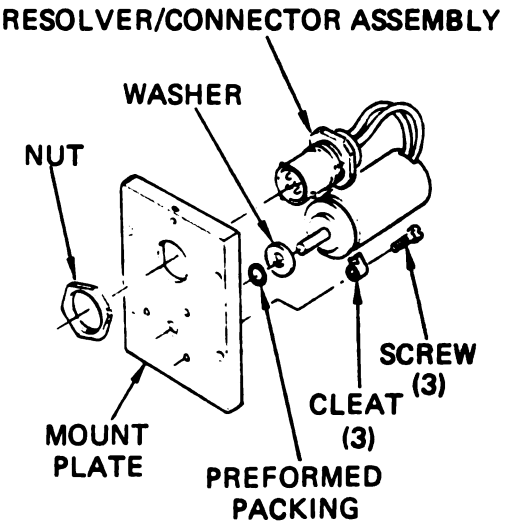
(1) Using diagonal pliers, cut and remove lockwire from connector J1.

(2) Using electrical slip joint pliers, remove nut securing connector J1 to synchro mount plate. Discard nut.

(3) Pull connector J1 inside the synchro mount plate.

(4) Using flat tip screwdriver, remove three synchro clamp cleats. Do not remove the screws from the cleats.

(5) Remove resolver/connector assembly from the synchro mount plate. Remove washer and preformed packing from resolver shaft. Retain the washer, but discard the preformed packing.



c. Inspection.

(1) Check threaded inserts in housing and synchro mount plate for broken or damaged threads or other obvious damage. Refer to item 3 and replace damaged threaded inserts.

(2) Check gasket for breaks and tears or other obvious damage. Replace damaged gasket.

(3) Check synchro clamp cleats for damaged cleat or screw. Replace damaged synchro clamp cleat or screw.

2-7. ELEVATION POSITION MONITOR TRANSDUCER ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

d. Resolver/Connector Assembly Installation.

WARNING

P-D-680 solvent vapors are toxic. Avoid prolonged or repeated breathing of vapors or solvent contact with skin. Use only with adequate ventilation. Solvent is flammable and should not be used near open flame. Fire extinguishers should be readily available when solvent is used.

(1) Mix a solution of one part PC-444A cleaning compound (8, Appendix B) and four parts P-D-680 drycleaning solvent (36, Appendix B).

(2) Apply solution to clean mating surfaces of resolver/connector assembly, mount plate, and housing.

(3) After cleaning, rinse in cold water. Use cleaning cloth; wipe items dry.

(4) Using garnet paper (18, Appendix B), remove all paint (and other finishes) to the bare metal around mounting holes. Remove in an area 1-1/2 times the diameter of the washer that will be used at installation.

(5) Using artist brush, and iridite (13, Appendix B), brush a light coat over the bare metal area.

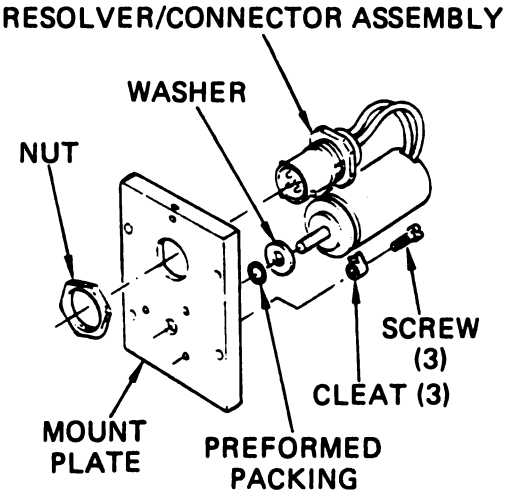
(6) Using flat tip screwdriver, loosely install three synchro clamp cleats in synchro mount plate.

(7) Install washer on resolver shaft and place new preformed packing on top of washer. Install resolver in synchro mount plate.

(8) Rotate resolver in the cleats until connector will fit into mounting hole of the synchro mount plate without kinking the wiring. Using flat tip screwdriver, tighten the three screws.

(9) Insert connector J1 through mounting hole in synchro mount plate.

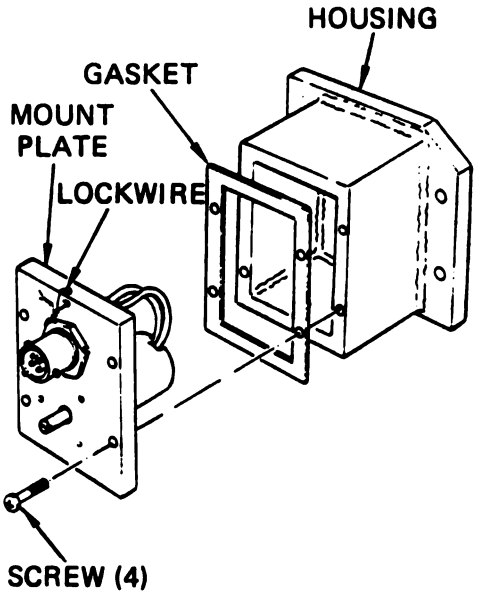
(10) Using 1-inch crowfoot attachment, install and tighten nut on connector. Torque nut 15 to 18 N•m.



(11) Using lockwire and wire twister pliers, safety-wire nut to synchro mount plate.

(12) Position gasket and synchro mount plate on housing.

(13) Using crosstip screwdriver attachment, install and tighten the four screws to secure synchro mount plate and gasket to housing.



2-7. ELEVATION POSITION MONITOR TRANSDUCER ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

e. Spot Paint.

NOTE

Surface(s) to be spot painted must be clean and dry prior to application of primer and finish coat.

(1) Mix a small quantity of epoxy primer (19, Appendix B) in accordance with instructions printed on the container. Allow to stand 30 minutes prior to using.

(2) Using an artist brush, apply a thin coat of primer to area being touched up. Allow to dry for 6 hours prior to applying finish coat.

NOTE

Normally it is not necessary to use a thinner on coating. But, if required, use aliphatic thinner (37, Appendix B).

(3) Mix a small quantity of coating (6, Appendix B) in accordance with instructions printed on the container. Allow to stand 30 minutes prior to using.

(4) Using artist brush, apply a thin coat of the coating to the previously primed areas and light scratches.

(5) Allow to dry 30 minutes before handling. Allow an additional 3 hours before packaging and issue.

(6) Perform resolver test (paragraph 2-3).

(7) If no further maintenance is required, perform final inspection on elevation transducer (item 1, b).

3. SCREW THREAD INSERTS.

NOTE

The removal and installation procedures for replacement of the inserts are identical for the housing inserts and the synchro mount plate inserts.

a. Insert Removal.

(1) Remove synchro mount plate or resolver/connector assembly (item 2, a or 2, b).

(2) Insert extractor tool in defective insert.

(3) Using hammer, strike head of tool a light blow. Turn tool counterclockwise while maintaining steady pressure to remove insert.

b. Insert Installation.

NOTE

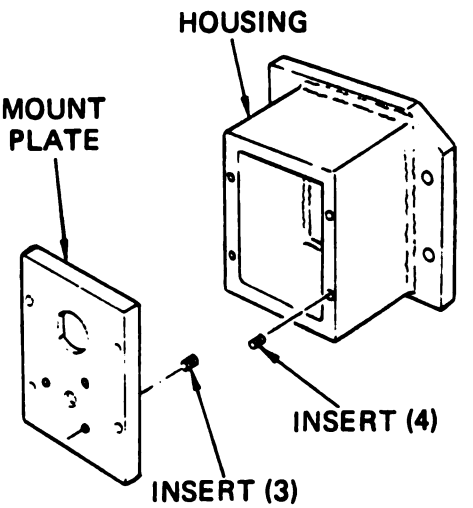
Screw thread insert must be installed while zinc chromate primer is still wet.

(1) Using artist brush, apply zinc chromate primer to external threads of insert.

(2) Using hand insert tool, install threaded insert into hole so that top of insert is slightly below the top surface of tapped hole.

(3) Cock the spring-loaded tang breakoff tool. Insert tool into threaded insert and trigger tool to break off tang. Remove tool and shake out broken tang.

(4) Install resolver/connector assembly and synchro mount plate assembly (item 2, d).



2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS.

This paragraph covers the maintenance tasks for the following items:

INITIAL SETUP

Tools
- Kit, tool, 13032302
- Set, shop, 13032303
  - Caliper, vernier, 122EANDM
  - Gun, soldering, WS-564
  - Inserter, 7751-14
  - Tool, extractor, 1227-16
  - Tool, tang breakoff, 4238

Fabricated Tools
- Puller, bearing (Appendix D)

Materials/Parts
- Cloth, abrasive (3, Appendix B)
- Cloth, lintless cleaning (5, Appendix B)
- Coating (6, Appendix B)
- Coating, primer (7, Appendix B)
- Compound, cleaning (8, Appendix B)
- Compound primer, sealing (12, Appendix B)
- Compound, sealing (10, Appendix B)
- Compound, sealing (11, Appendix B)
- Compound, corrosion preventive (9, Appendix B)
- Lockwire (14, Appendix B)
- Lockwire (15, Appendix B)
- Packing, preformed (17, Appendix B)
- Primer, epoxy (19, Appendix B)
- Primer, zinc chromate (20, Appendix B)
- Sealant (21, Appendix B)
- Solvent, drycleaning (36, Appendix B)
- Thinner, aliphatic (37, Appendix B)

Personnel Required
- MLRS Repairer MOS 27M

Troubleshooting
- Paragraph 2-4

NOTE

The following procedures are for the later configured AVMRL's equipped with a clamp to secure the gears to the shafts. Some earlier configured AVMRL's may be equipped with setscrews in the gear hub to secure the gears to the shafts. These earlier configured AVMRL's require a 0.050 inch-socket head key to loosen the setscrews.

1. TRANSDUCER/SWITCH ASSEMBLY.

a. Receiving Inspection (Visual).

(1) Using oval paint brush and cleaning compound, remove all dust, grit, grease, and foreign matter from the azimuth transducer/switch assembly.

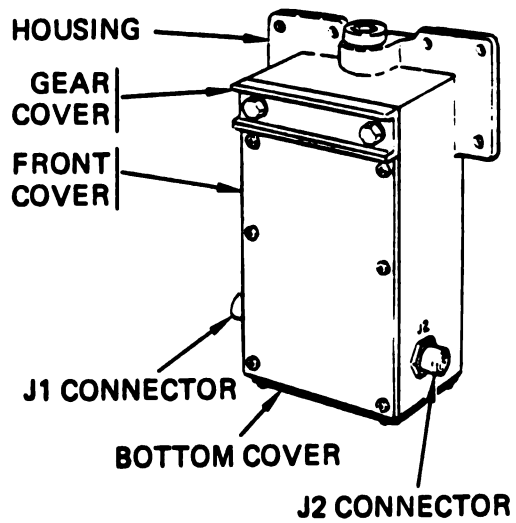
(2) Using cotton wiping cloth, wipe transducer/switch assembly dry.

(3) Inspect housing, front and bottom covers for obvious damage or missing or damaged mounting hardware. Replace unserviceable housing or covers.

(4) Inspect connector J1 for obvious damage. If damaged, replace resolver/connector (item 2).

(5) Inspect connector J2 for obvious damage. If damaged, replace switch/connector (item 3).

(6) Perform azimuth transducer tests (paragraph 2-4).



2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

b. Final Inspection.

(1) Examine repair form attached to azimuth transducer to determine what repairs were made.

(2) Verify all repairs listed on form were performed properly.

(3) Verify azimuth transducer is clean, properly painted, connectors and drive gear are undamaged.

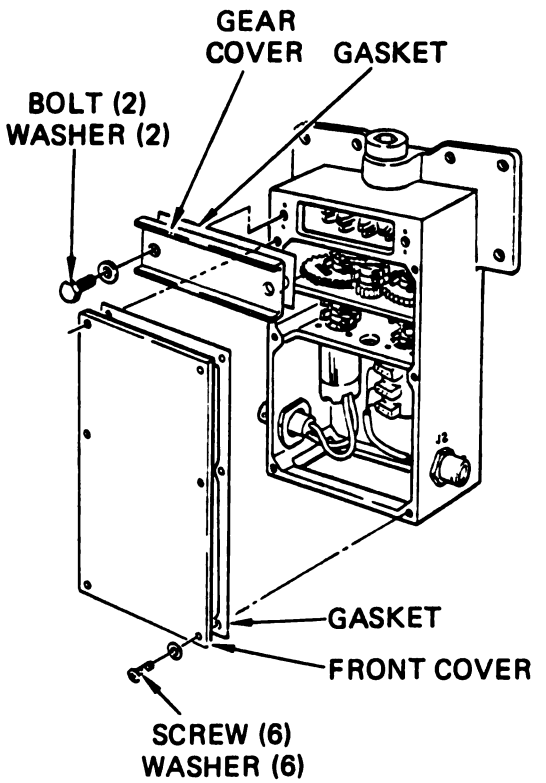
(4) If fault(s) is observed, return azimuth transducer/switch assembly to repair.

(5) If no faults are observed, return azimuth transducer/switch assembly to supply.

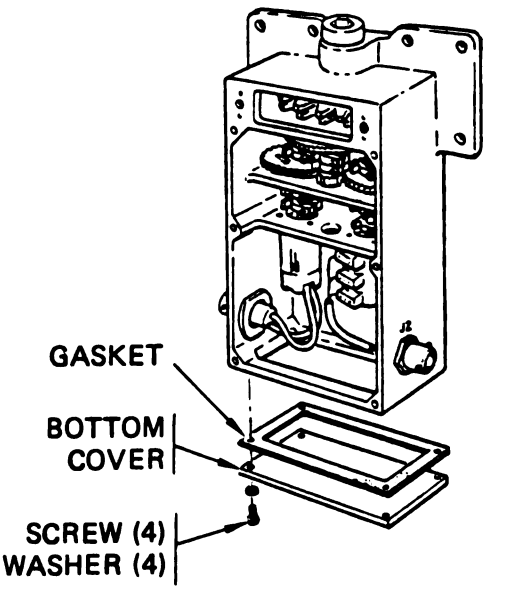
2. RESOLVER/CONNECTOR ASSEMBLY.

a. Transducer Assembly Front and Bottom Covers Removal.

(1) Using crosstip screwdriver and 10mm socket, remove six screws, two bolts, and eight washers securing front cover and gear. Carefully remove covers and gaskets. Save the screws, washers, and gaskets. Gaskets are reuseable if not damaged.



(2) Using crosstip screwdriver, remove four screws and washers securing bottom cover. Carefully remove cover and gasket. Save the screws, washers, and gasket.



b. Resolver/Connector Removal.

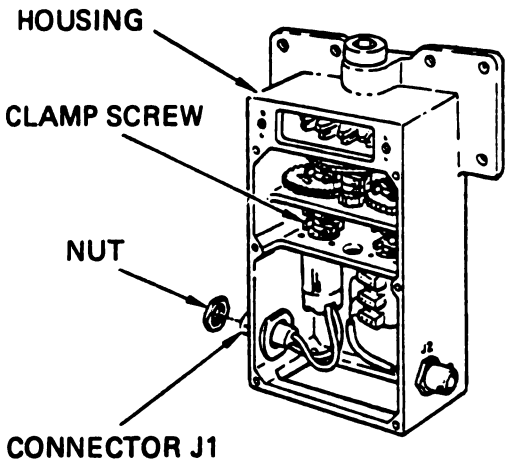
(1) Using diagonal pliers, cut and remove lockwire from connector J1.

(2) Using electrical slip joint pliers, remove nut securing connector J1 to housing. Discard the nut.

(3) Pull connector J1 inside the housing.

2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

(4) Touch clamp screw on bottom of coupling with soldering gun to loosen sealing compound.



(5) Using 7/64-inch socket head key, loosen screw in clamp at bottom of coupling.

(6) Place housing assembly in upside down position. Using flat tip screwdriver, loosen three screws in the synchro clamp cleats. Turn cleats one-half turn to release resolver/connector. Do not remove the screws from cleats and housing.

(7) Remove resolver/connector assembly.

c. Inspection.

(1) Check threaded inserts in housing for broken or damaged threads or other obvious damage. Replace damaged threaded insert (item 5).

(2) Check front cover and bottom cover gaskets for breaks and tears or other obvious damage. Replace damaged gaskets.

(3) Check synchro clamp cleats for damaged cleat or screw. Replace damaged synchro clamp cleat or screw.

d. Resolver/Connector Installation.

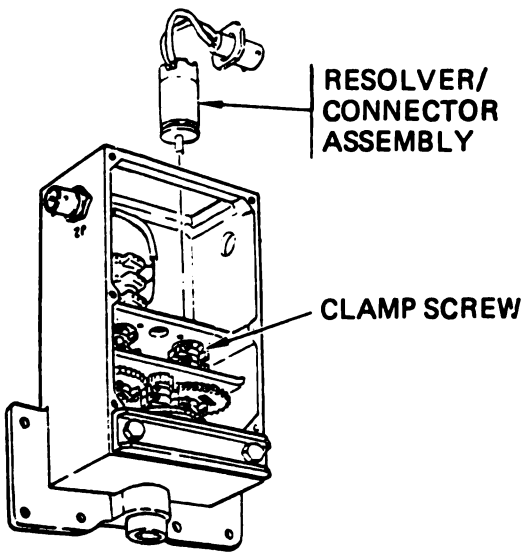
(1) Clean resolver mounting surface for electrical bond.

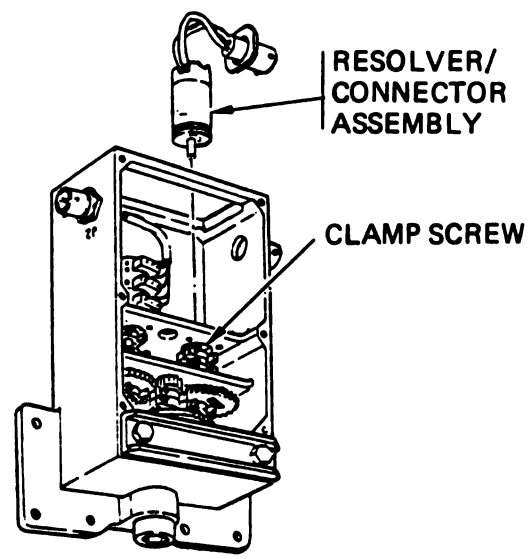
(2) Place housing assembly in an upside down position. Insert resolver shaft in coupling.

(3) Using flat tip screwdriver, loosely tighten three synchro clamp cleats in housing.

(4) Rotate resolver in the cleats until the connector will fit into the mounting hole in the side of the housing without kinking the wiring. Using flat tip screwdriver, tighten cleats handtight.

(5) Clean clamp screw and dip it into sealing compound primer. Using artist brush, apply sealing compound to clamp screw. Using a 7/64-inch socket head key attachment, install clamp crew in coupling handtight.



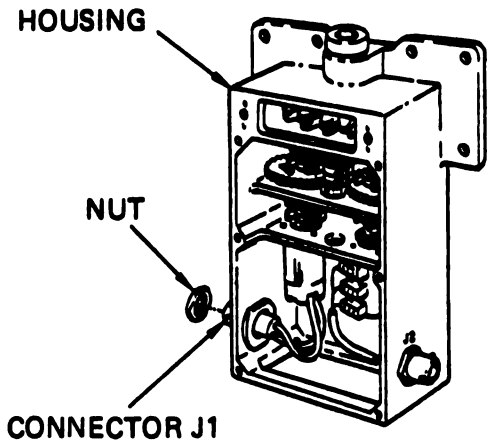


2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

(6) Remove nut from end of connector. Insert connector through J1 mounting hole in housing.

(7) Using electrical slip joint pliers, install nut on connector. Using 1-inch crowfoot attachment, torque nut 15 to 18 N•m.

(8) Using lockwire and wire twister pliers, safety-wire nut to housing.



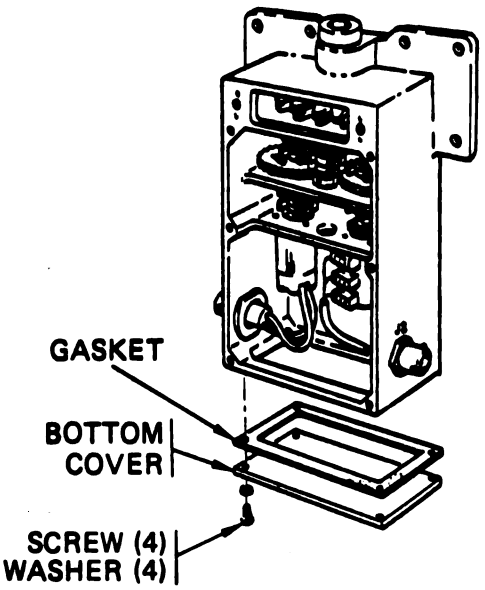
NOTE

Removal and installation of the resolver/connector requires that the resolver test be performed before transducer assembly is put into service again.

(9) Perform resolver test (paragraph 2-4, d).

(10) Apply sealant to both sides of gasket. Position bottom cover and gasket on bottom of housing.

(11) Using crosstip screwdriver attachment, install four screws and washers. Tighten screws until sealant squeezes out.



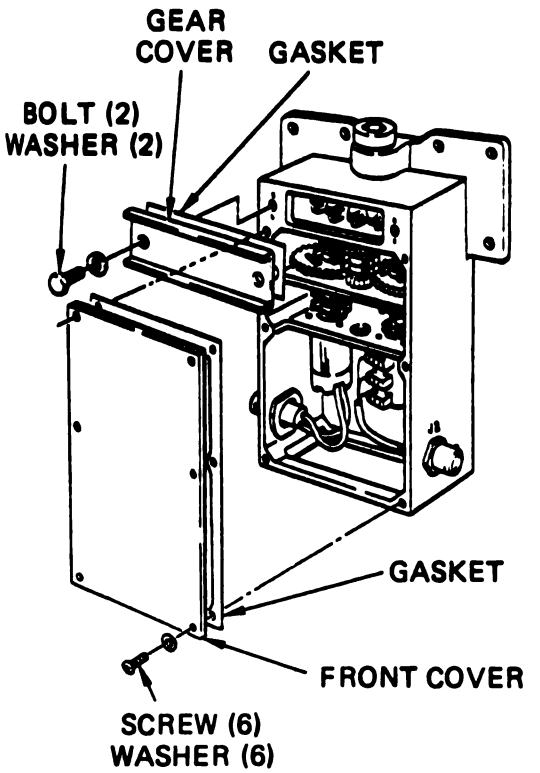
(12) Position front cover and gasket on front of housing.

(13) Using crosstip screwdriver attachment, install six screws and washers. Tighten screws.

2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

(14) Position gear cover and gasket on front of housing, and secure with two bolts and washers. Using 10mm socket, tighten bolts.

(15) Spot paint (paragraph 2-7, e).



3. SWITCH/CONNECTOR ASSEMBLY.

a. Switch/Connector Removal.

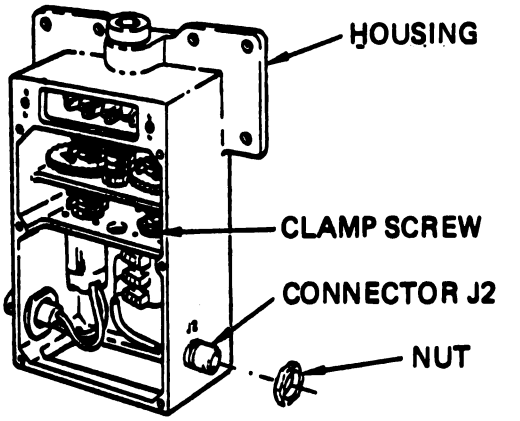
(1) Remove transducer assembly front and bottom covers (item 2, a).

(2) Using diagonal pliers, cut and remove lockwire from connector J2.

(3) Using electrical slip joint pliers, remove nut securing connector J2 to the housing. Discard nut.

(4) Pull connector J2 inside housing.

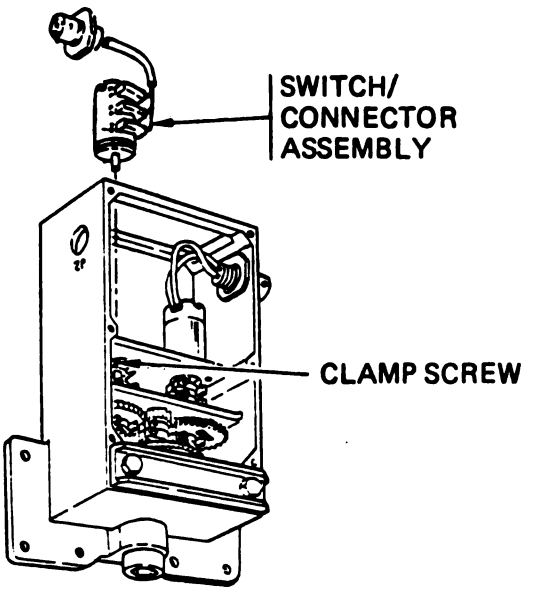
(5) Touch clamp screw on bottom of coupling with soldering gun to loosen sealing compound.



(6) Using 7/64-inch socket head key, loosen screw in clamp at bottom of coupling.

(7) Place housing in upside down position. Using flat tip screwdriver, loosen three screws in the synchro clamp cleats. Turn cleats one-half turn to release switch/connector. Do not remove the screws from cleats and housing.

(8) Remove switch/connector assembly.



2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

b. Inspection.

(1) Check threaded inserts in housing for broken or damaged threads or other obvious damage. Replace damaged threaded insert (item 5).

(2) Check front cover and bottom cover gaskets for breaks and tears or other obvious damage. Replace damaged gasket.

(3) Check synchro clamp cleats for damaged cleat or screw. Replace damaged synchro clamp cleat or screw.

c. Switch/Connector Installation.

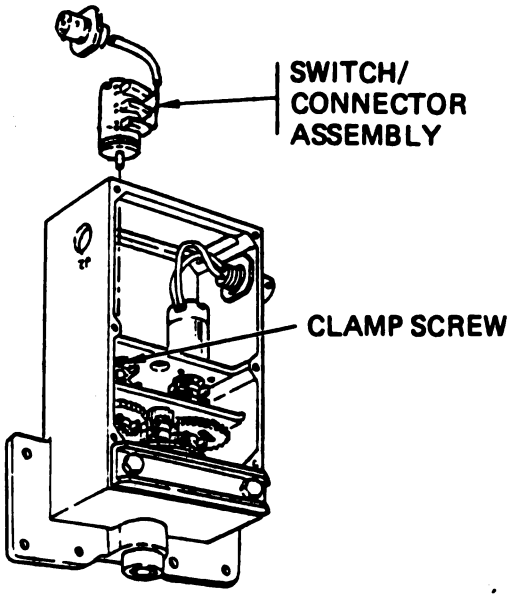
(1) Clean switch/connector mounting surface for electrical bond.

(2) Place housing assembly in an upside down position. Insert switch shaft into coupling.

(3) Using flat tip screwdriver attachment, loosely tighten three synchro clamp cleats in housing.

(4) Rotate switch in cleats until the connector will fit into mounting hole in the side of the housing without kinking the wiring. Make sure that adjusting screws on both sides of the switch are accessible. Tighten cleats handtight.

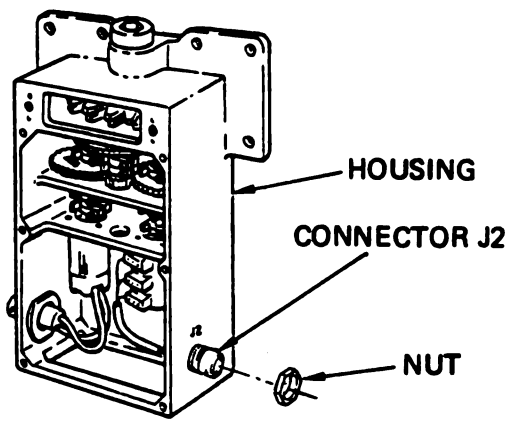
(5) Clean clamp screw and dip it into sealing compound primer. Using artist brush, apply sealing compound to screw. Using a 7/64-inch socket head key attachment, install screw in coupling clamp and handtighten.



(6) Remove nut from end of connector. Insert connector through J2 mounting hole in housing.

(7) Using electrical slip joint pliers, install nut on connector. Using 1-inch crowfoot attachment, torque nut 15 to 18 N•m.

(8) Using lockwire and wire twister pliers, safety-wire nut to housing.



2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

NOTE

Removal and installation of the switch/connector requires that test be performed before transducer assembly is put into service again.

(9) Perform rotary limit switch tests and adjustments (paragraphs 2-4, e through 2-4, h).

(10) Apply sealant to both sides of gasket. Position bottom cover and gasket on bottom of housing. Using crosstip screwdriver attachment, install four screws and washers. Tighten screws until sealant squeezes out.

(11) Position front cover and gasket on front of housing. Using crosstip screwdriver attachment, install six screws and washers. Tighten screws.

(12) Position gear cover and gasket on front of housing and secure with two bolts and washers. Using 10mm socket, tighten bolts.

(13) Spot paint (paragraph 2-7, e).

4. GEARS AND BEARINGS.

a. Gear Removal.

(1) Remove resolver/connector and switch/connector assemblies (items 2 and 3).

NOTE

To help identify location of transducer/switch assembly gears, this procedure identifies them with letters (A, B, C, etc). Letters are not imprinted on gears.

(2) Touch clamp screw on gears (A) and (B) couplings with soldering gun to loosen sealing compound.

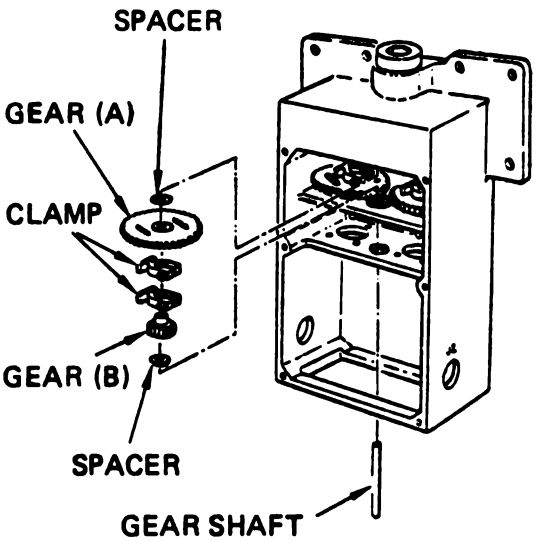
(3) Using 7/64-inch socket head key attachments, loosen clamp screws on two shaft coupling clamps.

NOTE

Each spacer should be identified and the location recorded so that it can be installed in the same place from which it was removed.

(4) Remove gear shaft.

(5) Remove gear (A) and shim spacer. Identify spacer and record location. Remove clamp from gear.



2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

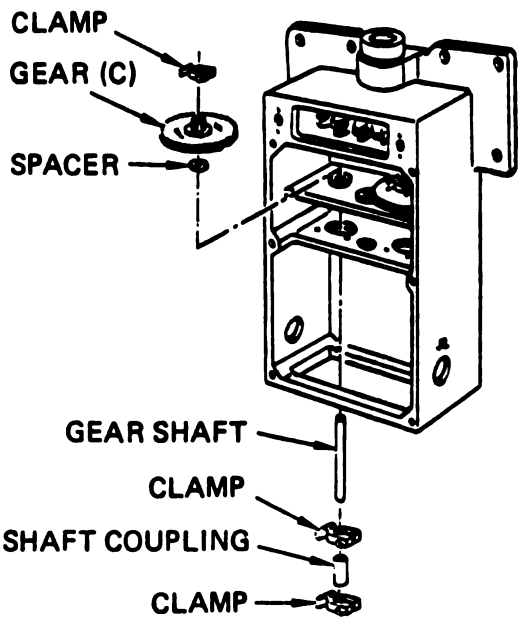
(6) Remove gear (B) and spacer. Identify spacer and record location. Remove clamp from gear.

(7) Touch clamp screw on gear (C) with soldering gun to loosen sealing compound.

(8) Loosen clamp screw with 7/64-inch socket head key.

(9) Remove gear shaft.

(10) Remove gear (C) and spacer below gear. Identify spacer and record location.



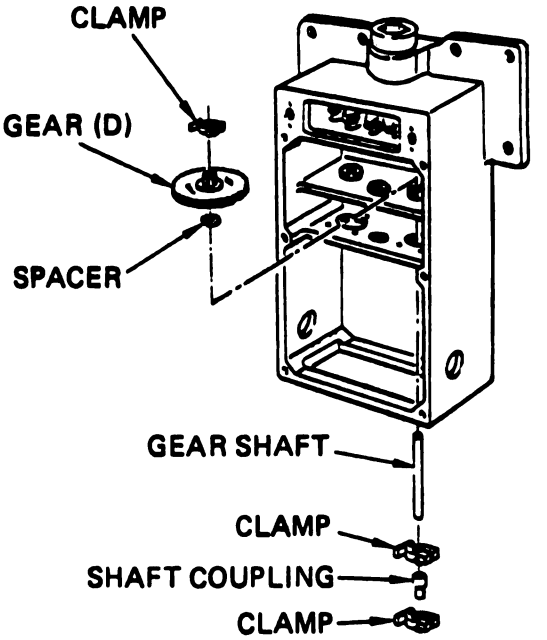
(11) Using 7/64-inch socket head key, loosen clamp screw. Remove two clamps and shaft coupling from shaft.

(12) Touch clamp screw on gear (D) with soldering gun to loosen sealing compound.

(13) Using 7/64-inch socket head key, loosen screw in clamp.

(14) Remove gear shaft.

(15) Remove gear (D), clamp, and spacer below gear. Identify spacer and record location.



(16) Using 7/64-inch socket head key, loosen clamp screw. Remove two clamps and shaft coupling from shaft.

(17) Using 10mm socket head key, remove plug.

(18) Touch clamp screws with soldering gun to loosen sealing compound. Using flat tip screwdriver, remove two-piece clamp securing spur gear (F) on shaft. Remove spur gear and spacer.

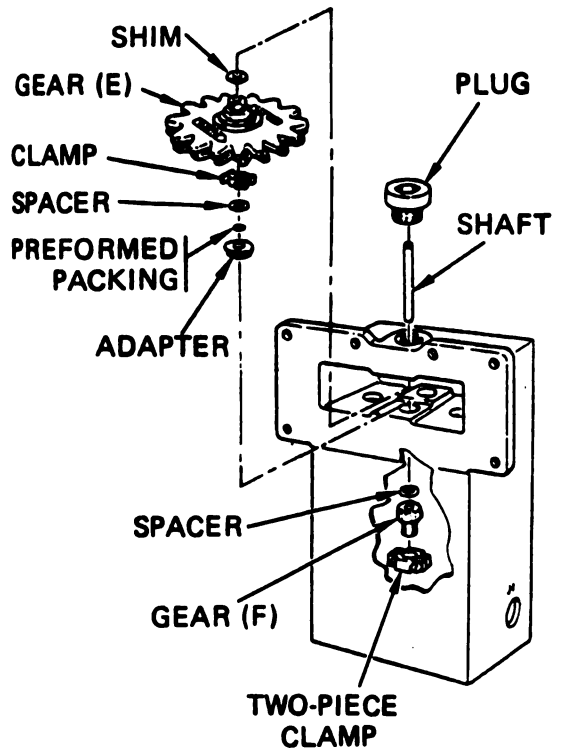
(19) Touch clamp screw with soldering gun to loosen sealing compound. Using 7/64-inch socket head key, loosen clamp screw securing gear assembly (E).

(20) Remove shaft from housing.

2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

(21) Remove gear assembly (E), shim, spacer, and washer.

(22) Remove preformed packing adapter from housing. Remove and discard preformed packing.



b. Bearing Removal.

(1) Remove plug.

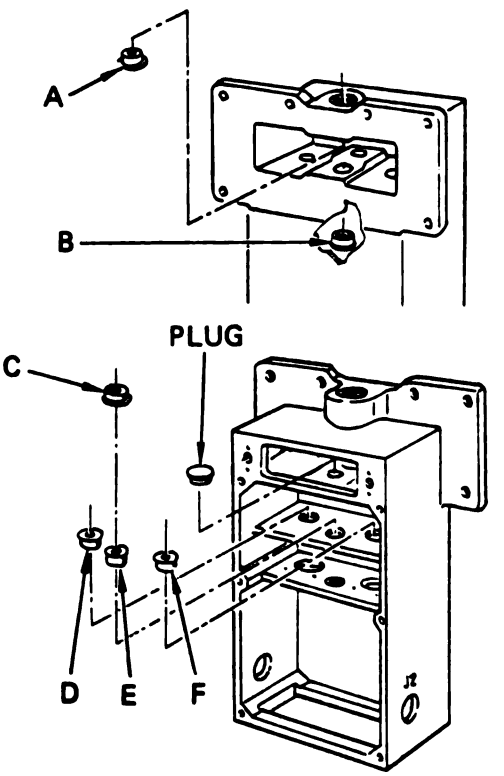
NOTE

Bearings (A) and (E) may be removed with a 3/8-inch pin punch and machinist hammer or a bearing installation/removal tool. Bearings (B), (C), (D), and (F) can only be removed with a bearing installation/removal tool.

(2) Using 3/8-inch drive pin punch and machinist hammer, carefully reach through plug hole in top of housing and tap out and remove bearing (A).

(3) Using 3/8-inch drive pin punch and machinist hammer, carefully reach through bottom of transducer/switch housing and tap out and remove bearing (E).

(4) Install the bearing installation/removal puller to remove bearings (B), (C), (D), and (F). Using 7mm socket to hold hex head screw, and a 7mm box end wrench to tighten nut, push bearing out of mounting.



2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

c. Cleaning and Inspection.

(1) Inspect gears for broken teeth and broken or corroded anti-backlash springs. Replace defective gear.

WARNING

P-D-680 solvent vapors are toxic. Avoid prolonged or repeated breathing of vapors or contact with skin. Use with adequate ventilation. Solvent is flammable and should not be used near open flame. Fire extinguisher should be available when solvent is used.

NOTE

A solution of one part PC444A cleaning compound to four parts of drycleaning solvent may be used for dissolving grease and oil. After cleaning, rinse in cold water. Dry thoroughly.

(2) Using oval paint brush, clean gear (E) with cleaning compound and drycleaning solvent.

(3) Insure that each bearing rotates freely. Replace faulty bearing.

(4) Clean housing upper compartment with rag and drycleaning solvent.

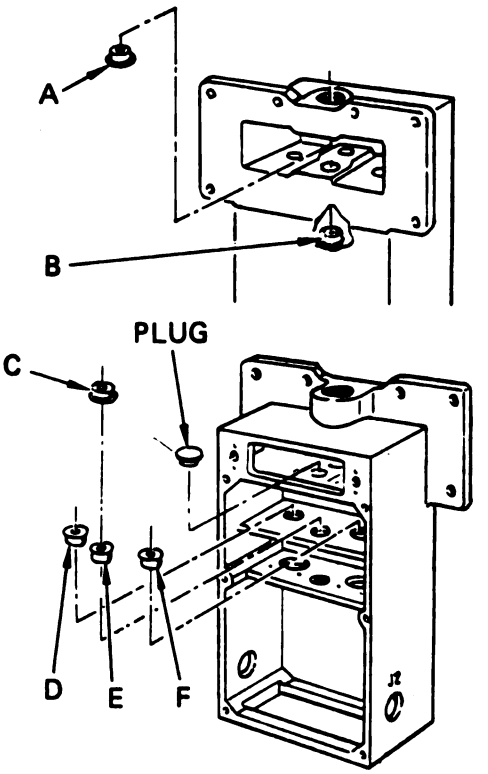
d. Bearing Installation.

(1) Clamp housing in vise.

(2) Using artist brush, apply thin coat of zinc chromate primer to outer diameter of bearings.

(3) Apply sealant to plug. Install plug in housing and allow sealant to dry. Clean cavity in housing of excess sealant before installing bearing (E).

(4) Press bearings into position with flanges oriented as shown. If bearings will not go into place with finger pressure, use bearing installation/removal tool to press in place (paragraph e).



e. Bearing Installation/Removal Tool.

(1) Position bearing in housing.

(2) Install installation/removal tool on bearing with head of bolt and tubing on shank side of bearing. Install washers and nut on lip side of bearing.

(3) Using 7mm socket and 7mm box end wrench, tighten nut to pull bearing into proper position in housing.

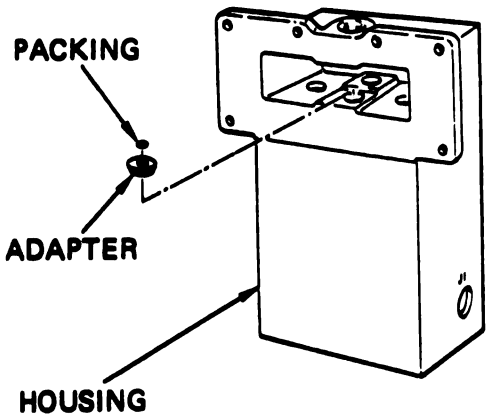
(4) Remove installation/removal tool.

2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

f. Gear Installation.

(1) Lubricate new preformed packing with grease. Install preformed packing inside adapter from flange side.

(2) Press adapter into housing and apply sealant around edge of adapter.

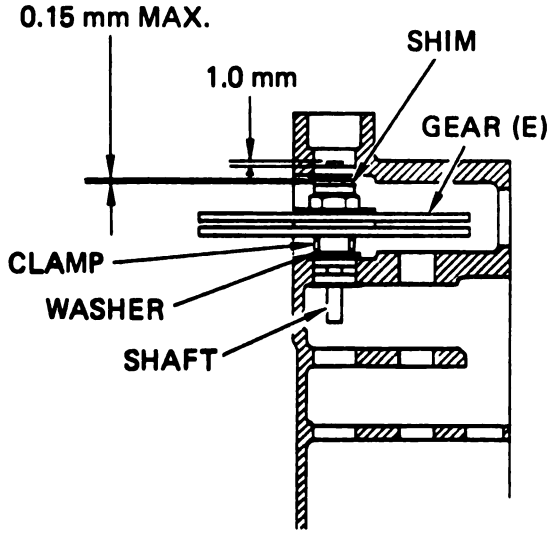


(3) Place clamp on gear assembly (E). Install shim, gear assembly, and washer in housing.

(4) Using thickness gage, measure the gap between upper end of gear hub and face of bearing. Peel shim as required to obtain a maximum gap of 0.15mm.

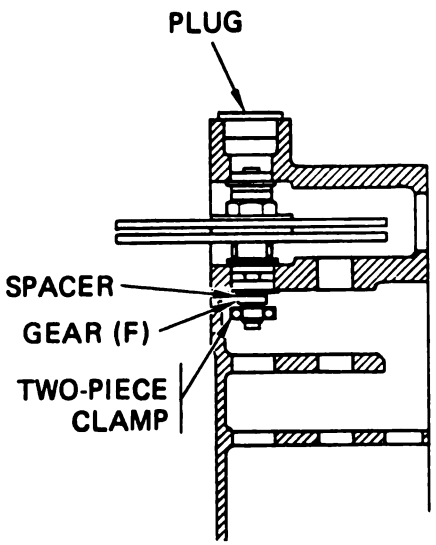
(5) Insert shaft from top of housing through bearing, shim, gear assembly, washer, adapter, and lower bearing leaving shaft 1mm above upper surface of top bearing.

(6) Using 7/64-inch socket head key, tighten clamp screw on gear assembly. Apply sealing compound to clamp screw.



(7) Install spacer and spur gear (F) on shaft. Secure spur gear to shaft with two-piece clamp. Using flat tip screwdriver, tighten clamp screws.

(8) Apply zinc chromate primer to threads of plug. Using 10mm socket head key, install plug in housing.

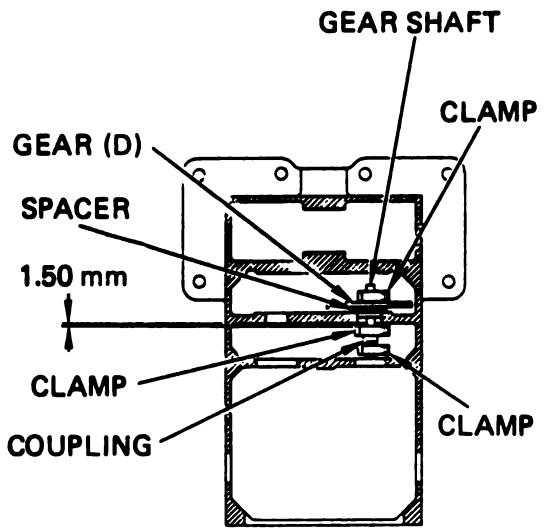


2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

(9) Install clamp on gear (D). Position spacer and gear in housing.

(10) Install two clamps on coupling; then install coupling on shaft. Using 7/64-inch socket head key, tighten upper clamp screw.

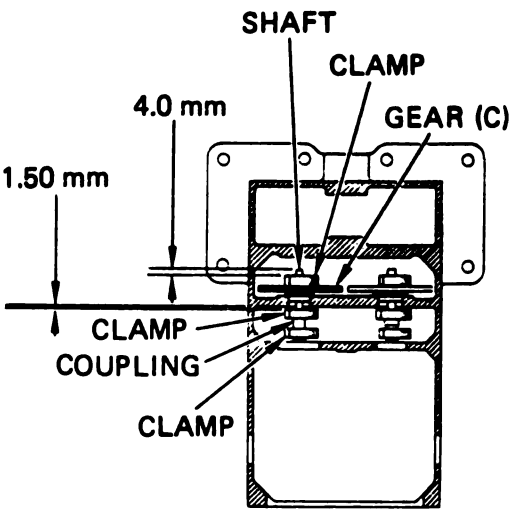
(11) Slide shaft through bearing, spacer, and gear until a clearance of 1.50mm is obtained between coupling and housing. Using 7/64-inch socket head key, tighten clamp screw on gear.



(12) Install clamp on gear (C). Apply corrosion preventive compound between gears. Position spacer and gear in housing.

(13) Install two clamps on coupling and then install coupling on shaft.

(14) Slide shaft through bearing, spacer, and gear until a clearance of 1.50mm is obtained between coupling and housing with shaft positioned 4.0mm above gear clamp. Using 7/64-inch socket head key, tighten clamp screw on gear and upper clamp on coupling.



2-8. AZIMUTH POSITION TRANSDUCER/SWITCH ASSEMBLY MAINTENANCE INSTRUCTIONS (CONT)

(15) Install clamps on gear (A) and spur gear (B). Do not tighten clamp screws.

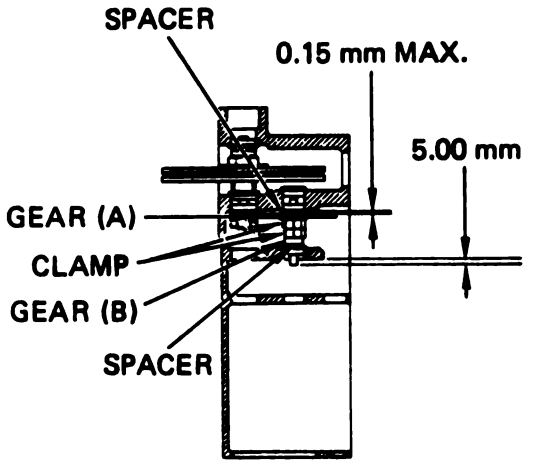
(16) Install gear (A), spur gear (B), and spacer in housing. Using thickness gage measure the gap between upper gear hub and face of bearing. Peel shim as required to obtain a maximum clearance of 0.15mm. Install shim.

(17) Displace teeth of two gears of gear (A) to obtain maximum torsion before engaging gear (F). Displace teeth of two gears of gear (C) to obtain maximum torsion before engaging gear (B).

(18) Install shaft through bearing, spacer, spur gear (B), gear (A), shim, and upper bearing until a maximum of 5.0mm of shaft is below housing shelf.

(19) Using 7/64-inch socket head key, tighten clamp screws on spur gear (B) and gear (A).

(20) Tighten all clamp screws, except clamp screw on gear (A), tight enough to prevent gear from slipping on shaft. Apply sealing compound to all clamp screws except clamp screw on gear (A).



(21) Install resolver/connector and switch/connector assemblies (items 2 and 3).

5. HOUSING ASSEMBLY.

NOTE

The removal and installation procedures for replacement of the inserts are identical for the front and bottom cover inserts and the resolver and switch holddown screw inserts.

a. Insert Removal.

(1) Insert extractor tool in defective insert.

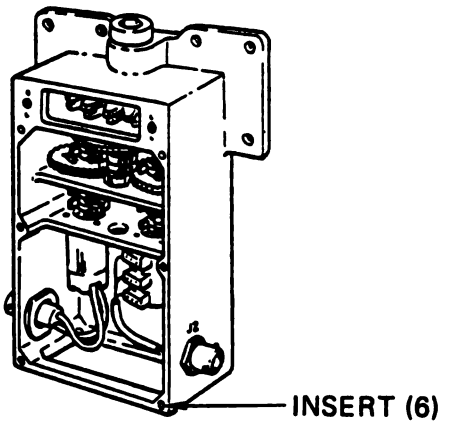
(2) Using hammer, strike the head of the tool a light blow. Turn tool counterclockwise while maintaining steady pressure to remove insert.

b. Insert Installation.

(1) Using artist brush, apply sealant (21, Appendix B) to external threads of insert.

(2) Using hand inserter, install threaded insert into hole so that the top of threaded insert is slightly below the top surface of the tapped hole.

(3) Cock the spring-loaded tang breakoff tool. Insert tool into the threaded insert and trigger tool to break off tang. Remove tool and shake out the broken tang.



APPENDIX A
REFERENCES

A-1. GENERAL. This appendix lists all forms, field manuals, and technical manuals referenced in this manual. These publications will assist you in maintaining the SPLL. You should check them constantly for the latest changes and revisions.

A-2. FIELD MANUALS.

FM 21-11
First Aid

A-3. ARMY REGULATIONS.

AR 75-1
Logistics (General) Malfunctions Involving Ammunitions and Explosives

AR 320-5
Dictionary of United States Army Terms

AR 385-40
Accident Reporting and Records

A-4. FORMS.

DA Form 285
Accident Report

DA Form 2028
Recommended Changes to DA Technical Manuals, Parts Lists, or Supply Manuals 7, 8, or 9

A-5. TECHNICAL MANUALS.

TM 9-1300-206
Care, Handling, Preservation, and Destruction of Ammunition

TM 9-1425-646-10
Operator's Manual, Launcher, Rocket, Armored Vehicle Mounted: M270, Multiple Launch Rocket System

TM 9-1425-646-20
Organizational Maintenance Instructions, Launcher, Rocket, Armored Vehicle Mounted: M270, Multiple Launch Rocket System

TM 9-1425-646-30
Direct Support Maintenance Manual, Launcher, Rocket, Armored Vehicle Mounted: M270, Multiple Launch Rocket System

TM 9-1450-646-10
Operating and Maintenance Instructions, Carrier, MLRS

TM 9-4935-646-14
Operator, Organizational, Direct Support, and General Support Maintenance Manual, Multiple Launch Rocket System Test Equipment

TM 9-4935-647-14
Operator, Organizational, Direct Support, and General Support Maintenance Manual, PDC Model 128A Circuit Tester

TM 43-0002-26
Destruction of Material to Prevent Enemy Use for Multiple Launch Rocket System

TM 740-90-1
Administrative Storage of Equipment

TM 743-200-1
Storage and Materiels Handling

TM 750-245-4
Direct and General Support, Quality Control Inspection Criteria (Guided Missile System)

TM 9-1425-646-34P
Direct Support and General Support Maintenance, Repair Parts, and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Launcher, Rocket, Armored Vehicle Mounted: M270

A-6. MISCELLANEOUS PUBLICATIONS.

DA Pamphlet 738-750
The Army Maintenance Management System (TAMMS)

TB 750-25
Maintenance of Supplies and Equipment, Army Test, Measurement and Diagnostic Equipment Calibration and Repair Support Program

APPENDIX B
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

B-1. SCOPE. This appendix lists expendable supplies and materials you will need to maintain the SPLL. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/ Durable Items.

B-2. EXPLANATION OF COLUMNS.

a. Column 1 – Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., primer coating, 7, Appendix B).

b. Column 2 – National Stock Number. This is the National stock number assigned to the item. Use it to request or requisition the item.

c. Column 3 – Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

d. Column 4 – Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) U/M
1	8040-01-092-0850	Adhesive, MIS-20203 (55717)	
2	8040-00-181-7201	Adhesive, S-1009 (06090)	
3	7920-00-044-9281	Cloth, abrasive, Miracle Wipe L001	
4	5350-00-584-4654	Cloth, abrasive, P-C-1673 (81348)	
5	7920-00-205-3453	Cloth, lintless cleaning, DDD-R-30, Class 2 (81348)	ea
6	8010-01-128-6958	Coating, forest green MIL-C-46168	
7	8010-00-082-2450	Coating, primer, MIL-P-23377, Type 1	
8	6850-01-L15-7695	Compound, cleaning, PC-444 Type 1	
9	8030-01-126-7486	Compound, corrosion preventive, MIL-C-81309 TY1CL2	

(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) U/M
10	8030-00-081-2339	Compound, sealing, MIL-S-22473, Grade EV	
11	8030-01-069-3046	Compound, sealing, MIL-S-46163 TY2GRM50CCBT	
12	8030-00-763-2718	Compound, primer sealing, MIL-S-22473, Grade T	
13	8030-00-953-7757	Iridite, 14-2 clear	
14	9505-00-221-2650	Lockwire, 0.020 inch, MS20995C20 (96906)	lb
15	9505-00-293-4208	Lockwire, 0.032 inch, MS20995C32 (96906)	lb
16	6810-00-264-8983	Methyl-ethyl-ketone, 7527656 (19207)	
17		Packing, preformed, MS28775-008 (96906)	
18	5350-01-127-6855	Paper, abrasive, PP121CL7GRIT240 (81348)	
19	8010-00-082-2450	Primer, epoxy, MIL-P-23377, Type 1	
20	8030-00-515-2208	Primer, zinc chromate, Color Y, TT-P-1757 CMPSN L (81348)	
21	8030-00-723-2746	Sealant, MIL-S-8802CLB2	
22		Sleeving, insulation, M23053/1-001-0	ft
23		Sleeving, insulation, M23053/1-002-0	ft
24		Sleeving, insulation, M23053/1-003-0	ft
25		Sleeving, insulation, M23053/1-004-0	ft
26		Sleeving, insulation, M23053/1-005-0	ft
27		Sleeving, insulation, M23053/1-006-0	ft
28		Sleeving, insulation, M23053/1-007-0	ft
29		Sleeving, insulation, M23053/1-008-0	ft
30		Sleeving, insulation, M23053/1-009-0	ft
31	5970-00-812-2974	Sleeving, insulation, MIL-I-23053/5-103-0	ft
32	5970-00-954-1624	Sleeving, insulation, M23053/5-107-0	ft
33	5970-00-740-2971	Sleeving, insulation, M23053/5-107-9	ft
34	5970-00-812-2967	Sleeving, insulation, M23053/5-108-0	ft
35	3439-00-453-5469	Solder, wire, 0.036 inch, SN 60-W-R-P2	
36	6850-00-231-1985	Solvent, drycleaning, P-D-680 (NATO Code S-752) (81348)	
37	8010-00-181-8080	Thinner, aliphatic, MIL-T-81772	
38	8010-00-180-6343	Varnish, MIL-V-173 (81349)	pt

APPENDIX C
TORQUE LIMITS

C-1. GENERAL.

a. To safely maintain the SPLL, it is necessary to properly torque bolts, screws, and nuts. This appendix lists standard torque values, in newton meters, for different sizes of National Aerospace Standard (NA) and German Standard (DIN) metric fasteners. It also lists standard torque values for nonmetric American fasteners. Special torque values are called out in individual maintenance procedures, as applicable, and have priority over values shown in this appendix. When no special torque value is listed in the maintenance procedures, fasteners will be torqued to values listed here.

b. The grade or strength of a bolt can be determined by the identification marks on the bolthead. Other fasteners can be determined by their part number. Fastener strength influences torque as indicated in the tables C-1 through C-4. An example of strength categories for American nonmetric grades 5 and 8, and metric bolts as marked on the bolthead is as follows:

AMERICAN NONMETRIC	METRIC
 – Grade 5	 – Strength category
 – Grade 8	

c. If the strength category does not appear on the fastener, look up the part number of the fastener in the RPSTL. Use the following explanation of the part number to determine the proper torque.

An example of National Aerospace Standard (NA) part number is:

NA 0036 – 050 004.
(1) (2) (3)

(1) This group of letters and numbers identifies the standard that defines the requirements for manufacturing. The official title of the fastener is given in the standard. In this example, Bolt, Close Tolerance, Hex Head Alloy Steel 1100 MPa, Metric. Fasteners manufactured to this standard have a strength category of 12.9.

NOTE

All NA hex head bolts and panhead screws used on the SPLL have a tensile strength of 1,100 MPa and a strength category of 12.9 as shown in table C-4. Flush head screws used on the SPLL have a shear strength of 660 MPa and a strength category of 10.9.

(2) These three numbers indicate the diameter of the bolt shank in millimeters. In this example, the diameter is 5 millimeters. This is the number in the first column of table C-4.

(3) The three numbers indicate the length of the grip in millimeters. In this example, the grip length is 4 millimeters.

d. Therefore, in this example, a 5mm diameter bolt with a strength category of 12.9 must be torqued to 7 to 8 N•m in accordance with table C-4.

C-1. GENERAL (CONT)

An example of a German Standard (DIN) part number is

M10X1.25X40 DIN960-10.9-B3B
1 2 3 4 5

1. This group of letters and numbers is the thread size. M for metric, 10 for diameter code. The 1.25 indicates coarse or fine thread for this 10mm bolt, 1.25 is fine thread and 1.5 would be coarse thread. The diameter code is the number in the first column of table C-4.

2. This group of numbers indicate the length of the fastener in millimeters. In this example, the length is 40 millimeters.

3. This group of letters and numbers identifies the standard that defines the requirements for manufacturing. The official title of the fastener is given in the standard; in this example, Hexagon Bolt, Metric Fine Thread.

4. This group of numbers identifies the strength category. In this example, the strength category of this bolt is 10.9.

5. When this group of letters appear in a part number, it identifies the finish code on the fastener. In this example, the bolt is cadmium plated.

Other codes that may appear are:

- St - Steel
- Ms - Brass
- A2 - Corrosion Resistant (Cres) Steel

C-2. TORQUE TABLES. Table C-1 lists the recommended torque values for American Standard grade 5 bolt/nut combinations. Table C-2 lists values for grade 8 bolt/nut combinations. Table C-3 lists self-locking nut breakaway torque for American Standard nuts. It also contains an explanation on how to determine breakaway torque. Torque values for metric fasteners are listed in table C-4. Fastener sizes and strength categories are included for those metric fasteners you will find on the SPLL.

Table C-1. Recommended Torque Values (Grade 5 BOLT and NUT COMBINATION)

THREAD SIZE	Torque Nem MIN	MAX
1/4-20	11	15
1/4-28	14	18
5/16-18	23	31
5/16-24	26	34
3/8-16	41	55
3/8-24	46	62
7/16-14	68	89
7/16-20	75	99
1/2-13	102	135
1/2-20	114	151
9/16-12	145	187
9/16-18	163	208
5/8-11	202	271
5/8-18	228	305
3/4-10	356	474
3/4-16	397	530
7/8-9	528	705
7/8-14	583	772
1-8	793	1,057
1-12	867	1,151
1-14	904	1,199

Table C-2. Recommended Torque Values (Grade 8 BOLT and NUT COMBINATION)

THREAD SIZE	Torque Nem MIN	MAX
1/4-20	15	19
1/4-28	16	21
5/16-18	28	39
3/8-16	60	69
3/8-24	68	77
7/16-14	84	112
7/16-20	93	123
1/2-13	127	169
1/2-20	167	189
9/16-12	181	234
9/16-18	203	261
5/8-11	253	338
5/8-18	285	382
3/4-10	446	593
3/4-16	496	661
7/8-9	661	881
7/8-14	729	965
1-8	1,081	1,443
1-12	1,179	1,572

Table C-3. Self-Locking Nut Breakaway Torque Values

THREAD SIZE	MINIMUM BREAKAWAY TORQUE (N•m)	THREAD SIZE	MINIMUM BREAKAWAY TORQUE (N•m)
10-32	0.20	5/8-18	3.60
1/4-28	0.40	3/4-16	5.50
5/16-24	0.70	7/8-14	7.90
3/8-24	1.00	1-12	10.50
7/16-20	1.60	1-1/8-12	13.00
1/2-20	2.00	1-1/4-12	16.00
9/16-18	2.70		

NOTE

To determine breakaway torque, thread nut onto screw or bolt until at least two threads extend through the nut. The nut should not make contact with a mating part. The torque necessary to begin turning the nut again is the breakaway torque. Do not reuse self-locking nuts that do not meet minimum breakaway torque values.

Table C-4. Recommended Torque Values N•m (Metric Fasteners)

DIAMETER CODE OF FASTENER MM	STRENGTH CATEGORY								CRES FASTENERS CODED A2	
	4.8		8.8		(NA FLUSH HD P/N's) 10.9		(NA HEX & PAN HD P/N's) 12.9			
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
2	0.12	0.14	0.24	0.30	0.32	0.40	0.39	0.47	0.21	0.25
3	0.43	0.53	0.87	1.07	1.2	1.4	1.4	1.7	0.74	0.90
4	1.0	1.2	2.0	2.5	2.8	3.4	3.5	4.0	1.7	2.1
5	2.0	2.5	4.0	5.0	5.5	6.5	7.0	8.0	3.5	4.0
6	3.5	4.5	7.0	8.5	9.5	11.5	11.5	13.5	5.5	6.5
8	9.5	11.0	18.5	22.0	24.5	29.5	30.0	36.0	14	17
10	17.5	21.5	35.5	43.0	47.5	57.5	58.0	70.5	27.5	33
12	32.0	39.0	64.0	78.0	84.0	102.5	104	127	49.5	60
14	51	61.5	101	124	133	163	165	202	71	86
16	77.5	94	154	189	202	247	252	308	107	131

Table C-4. Recommended Torque Values Nom (Metric Fasteners) – Continued

DIAMETER CODE OF FASTENER MM	STRENGTH CATEGORY								CRES FASTENERS CODED A2	
	4.8		8.8		(NA FLUSH HD P/N's) 10.9		(NA HEX & PAN HD P/N's) 12.9			
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
18	109	133	218	267	292	356	356	436	101	124
20	157	192	314	384	406	496	507	620	146	178
22	212	259	423	517	545	666	681	832	196	240
24	266	325	533	651	693	847	865	1,057	247	302
27	387	473	774	946	1,053	1,287	1,264	1,544	359	439
30	538	658	1,076	1,316	1,465	1,791	1,758	2,148		
33	726	887	1,452	1,783	1,975	2,413	2,369	2,895		
39	1,161	1,491	2,321	2,837	3,159	3,861	3,789	4,631		

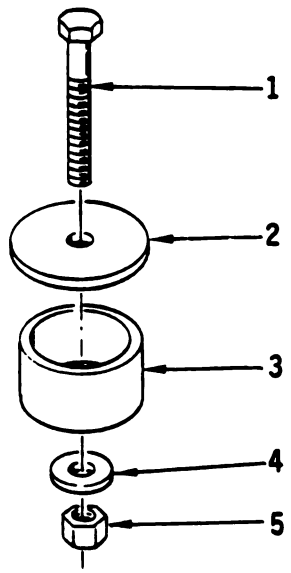
C-3. FREE RUNNING TORQUE.

a. The free running torque is the torque required to turn a nut or a bolt, after the nut has started turning, but before any clamping action is experienced by the structure being fastened. The free running torque is measured when the nut is installed on the bolt with the full threads of the bolt engaged and without any clamping torque being applied. Clamping torque is the torque applied by the nut and bolt clamping the object being fastened.

b. To measure free running torque, thread nuts onto bolts until nut is fully threaded onto bolt. Install a torque wrench and measure the torque required to turn the nut. The nut should not be clamping the bearing caps together when free running torque is being measured.

APPENDIX D
ILLUSTRATED LIST OF MANUFACTURED ITEMS

This appendix includes simplified line drawing illustration for each item authorized to be manufactured/fabricated by general support personnel.



BEARING PULLER PARTS LIST

ITEM	NOMENCLATURE	QTY	PART NUMBER	NOTE
1	SCREW, HEX HD	1	M4X25DIN933-8.8	1
2	WASHER, FLAT	1	AN970-3	1
3	TUBING, METALLIC	1	WWT700-6 3-4INOD	2
4	WASHER, FLAT	1	4.3DIN125MS	3
5	NUT, HEX	1	M4DIN934-8-B3B	1

NOTES:
1. STRENGTH & FINISH IMMATERIAL
2. USE AL OR BRASS CUT TO 0.2 IN (5.2MM)
3. USE AL OR BRASS

Figure D-1. Bearing Removal/Installation Tool

GLOSSARY

Section I. ABBREVIATIONS

ac – Alternating Current

ATE – Automatic Test Equipment

AVMRL's – Armored Vehicle Mounted Rocket Launcher

BC – Boom Controller

BCU – Battery Computer Unit

BIT – Built-In-Test

BITE – Built-In-Test Equipment

CCA – Circuit Card Assembly

CP – Central Processor

CP INT – Central Processor Interface

dc – Direct Current

EIR – Equipment Improvement Recommendation

EMI – Electromagnetic Interference

EQUATE – Electronic Qualification Automatic Test Equipment

EU – Electronic Unit

EU PS – Electronic Unit Power Supply

FCP – Fire Control Panel

FCS – Fire Control System

FCU – Fire Control Unit

FCU PS – Fire Control Unit Power Supply

GFE – Government Furnished Equipment

Hz – Hertz

IAW – In Accordance With

IDC – Interface Data Controller

Insul Slvg – Insulation Sleeving

LDS – Launcher Drive System

LLM – Launcher Loader Module

LP/C – Launch Pod/Container

MAC – Maintenance Allocation Chart

MAX – Maximum

MEM CONT – Memory Control

MEM 1 – Memory 1

MEM 2 – Memory 2

MIN – Minimum

MLRS – Multiple Launch Rocket System

mm – Millimeter

osc – Oscilloscope

PDB – Power Distribution Box

PMCS – Preventive Maintenance Checks and Services

PPS – Primary Power System

rfi – Radio frequency interference

RPSTL – Repair Parts and Special Tools List

RSF – Remote Settable Fuze

SNVT – Short/No Voltage Tester

SPLL – Self-Propelled Launcher Loader

SRP – Stabilization Reference Package

SYM GEN – Symbol Generator

TMDE – Test, Measurement, and Diagnostic Equipment

UUT – Unit Under Test

Vdc – Volts direct current

GLOSSARY – Continued

Section II. DEFINITION OF UNUSUAL TERMS

Actuator
A mechanism that moves a part of the equipment; such as the actuator that elevates the LLM.

Adjust
Bring an out-of-tolerance condition into tolerance by using equipment controls.

Assembly
A combination of parts that may be taken apart without destroying them; and when put together make a complete part of the equipment.

Audible
A sound you can hear.

Automatic
Something done without prompting.

Azimuth
Direction in a flat or horizontal plane, generally expressed in degrees from north. Such as rotation of the LLM.

Clockwise
Rotate or turn to the right, in the direction the hands of a clock move as you look at it.

Component
An essential part of the equipment; a small part, that with other parts, make up the whole equipment.

Computer
An automatic electronic machine that does calculations; such as the fire control computer that figures rocket aiming angle (direction).

Counterclockwise
Rotate or turn to the left, in the opposite direction the hands of a clock move as you look at it.

Data
Factual information used as a basis for decisions or measuring.

Diagnostic
Identifying a problem from its symptoms; an analysis of the cause of the problem.

Digital
Calculations done by a numerical method; such as the fire control computer which operates with numbers expressed directly as digits.

Disengage
To release from, remove from or detach.

Elevation
The angular distance above the horizon. Such as raising the LLM to aim the rockets.

Enable
To make possible; to turn on the equipment.

Fault Message
A short message on the fire control display panel telling you something is wrong with the equipment.

Go, No-Go Indicators
Go indicator tells you that it is safe to continue, or the item tested is within tolerance. No-Go indicates an unsafe or out-of-tolerance condition.

Heading
A compass direction in which the vehicle is traveling.

Initiate
To start or begin.

Inoperative
Does not work.

Interconnect
To connect with one another.

Malfunction
Failure of the equipment to operate properly.

Manual
Hand operated; such as flexible drives requiring hand operation to rotate or elevate the LLM.

Material
The elements or parts of which equipment can be made.

Materiel
Equipment and supplies used by the Army, or any other organization.

GLOSSARY – Continued

Menu
A list of choices from which you may make a selection; such as the diagnostic menu displayed on the fire control display panel.

Mode
A method of operation.

Organizational Maintenance
Maintenance done on vehicle, limited by the support equipment, facilities, and skill level defined in the Maintenance Allocation Chart.

Pinion
A small gear designed to mesh with a large gear; such as the azimuth drive pinion gear.

Printed Circuit Board
Electronic circuit where the conductor is embedded in an insulated material.

Resolver
A device that detects the position of the LLM.

Splined
Parallel grooves in a shaft which mate with keys in a keyway of a connecting part.

Squib
Firing device for the rockets.

Toxic
Poisonous.

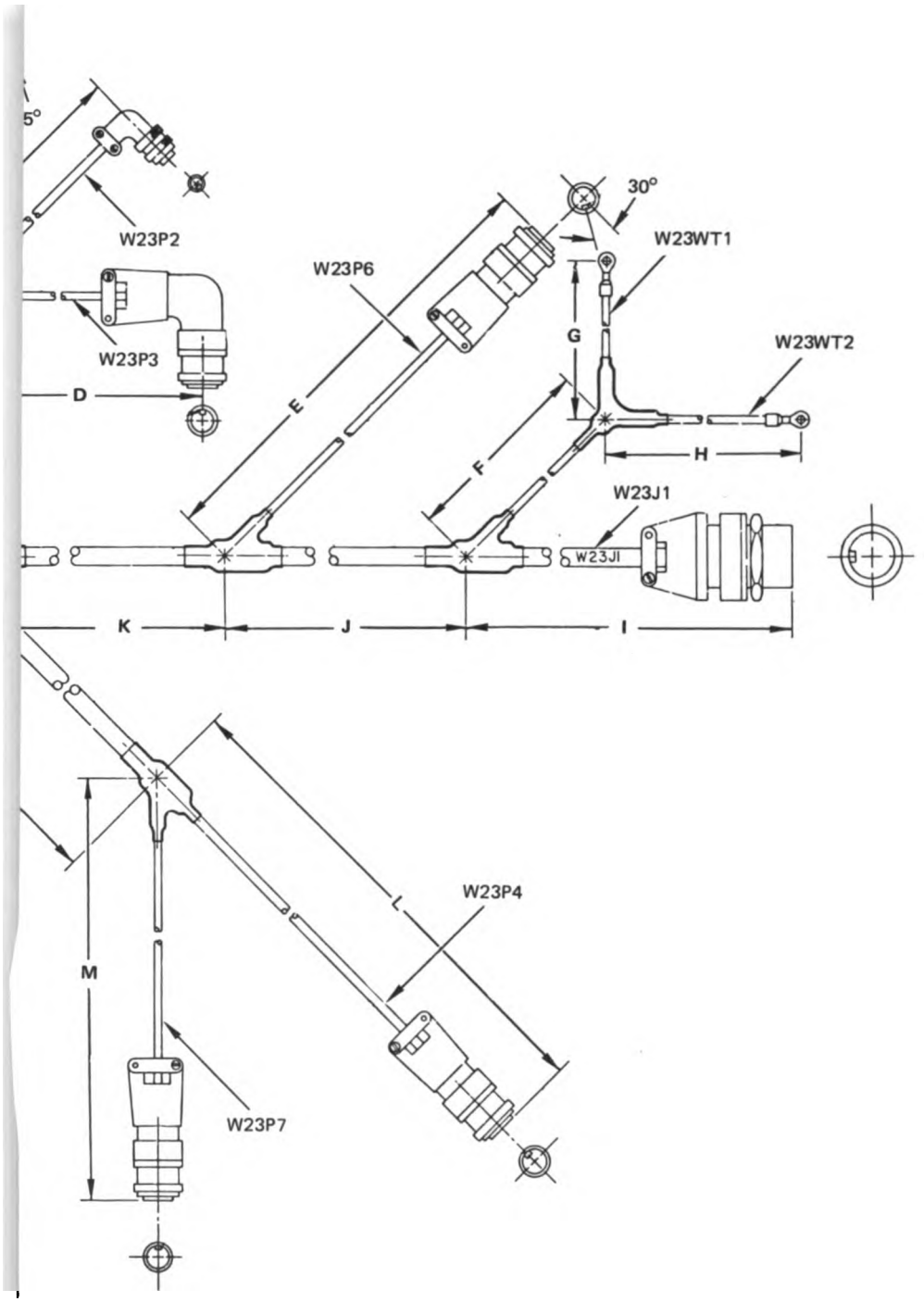
Transmission
The device that transmits power from the hydraulic power supply to the elevation actuators.

Vehicle
The carrier on which the rocket launcher is mounted and transported.

ALPHABETICAL INDEX

ALPHABETICAL INDEX – Continued

ALPHABETICAL INDEX – Continued



W23 Cable Assembly Wiring Diagram

FO-1 (Sheet 1 of 2)

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9-19		9-5	
21-2	step 1C		21-2

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

"B" Ready Relay K11 is shown with two #9 contacts. That contact which is wired to pin 8 of relay K16 should be changed to contact #10.

Reads: Multimeter B indicates 600 K ohms to 9000 K ohms.

Change to read: Multimeter B indicates 600 K ohms minimum.

Reason: Circuit being checked could measure infinity. Multimeter can read above 9000 K ohms and still be correct.

NOTE TO THE READER:

Your comments will go directly to the writer responsible for this manual, and he will prepare the reply that is returned to you. To help him in his evaluation of your recommendations, please explain the reason for each of your recommendations, unless the reason is obvious.

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